THESIS

MICHIGAN STATE LIBRARIES
3 1293 01771 1866

This is to certify that the

dissertation entitled

Flying Together-Taiwan and the Flying Geese Development Model

presented by

Chia-Huang Wang

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Sociology

Major professor

Date 3 May 1999

MSU is an Affirmative Action/Equal Opportunity Institution

O-12771

FLYING TOGETHER?--TAIWAN AND THE FLYING GEESE DEVELOPMENT MODEL

VOLUME I

BY

Chia-Huang Wang

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Sociology

1999

ABSTRACT

FLYING TOGETHER?—TAIWAN AND THE FLYING GEESE DEVELOPMENT MODEL

BY

Chia-Huang Wang

The purposes of this dissertation are: (1)constructing a contemporary flying geese development model by drawing the Japanese experience, and (2)exploring Taiwan's structural position and performance by comparing the Taiwanese experience with the Japanese, as the debaters of the model do not have a common framework and the Taiwanese experience has not been studied extensively and thoroughly.

To fulfill these purposes, the author uses the comparative method, documentary research, and data analysis, to formulate analytical questions and build a theoretical framework to guide the exploration and discussion.

The dissertation first constructs the contemporary flying geese model, presented in Chapter Two, by describing and discussing the Japanese experience, performance, and strategies in terms of Japanese foreign direct investment and trade patterns, cross-border production networks, and the

Japanese developmental state. Then, the Taiwanese state and selected electronic manufacturers are inserted into the framework to make comparisons.

Through the portrait and discussion, not only are the similarities and differences of Taiwan and Japan revealed, but the possible causes and dynamics are reasoned in Chapter Three, Four, and Five, each of which deals with: (1)the Taiwanese patterns of foreign direct investment and trade, (2)the strategies of development and regional division of labor of Taiwanese electronic manufacturers, which have built cross-border production networks, and (3)the challenges confronting the Taiwanese state, as it has formulated and implemented strategies to solve problems.

Finally, in Chapter Six, discussion includes summaries of the major findings revealed in the previous four chapters and the theoretical and policy implications.

Copyright by
Chia-Huang Wang
1999

ACKNOWLEDGEMENTS

I would like to thank Dr. Hill for giving me so much encouragement and invaluable advice, which have helped me sustain the pressures of preparing and writing this dissertation. I also want to thank my committee members, who are Dr. Rita Gallin, Dr. Ruth Hamilton, and Dr. Kevin Kelly, for their patience, kindness, and intellectual awakening.

Furthermore, I would like to thank all those professors who used to teach me during the past six years. Gratitude should be given to Dr. Thomas Connor and Ms. Tammy for their assistance in administrative matters. Certainly, I must appreciate the companionship and support(emotional and intellectual) of my friends at this department, especially Yea-Lin Lin, Shu-Fen(April) Kao, June-Woo Kim, Nina Muckenthaler, and Shashi Pathak.

Finally, I want to thank my father and mother for supporting my studying abroad unconditionally and actively, on the one hand, and my wife, Yu-Chun, for having been accompanying me all the way with her deep love, on the other. And, I want to thank Wei-Wei, my daughter and a little angel, for giving me so much joy. In sum, thank you all, my teachers, family, and friends.

TABLE OF CONTENTS

LIST OF TABLES ix

LIST OF FIGURES xiii

ABBREVIATIONS xiv

CHAPTER 1 INTRODUCTION 1
I. Institutional and Alternative Regional Economic Integration 1
II. The Original Flying Geese Model 5
Hierarchies of Countries 5
Groups of the Flying Geese Based on Regions 7
Industrial Restructuring and the Catch-up Product Cycle 8
III. Debates on the Flying Geese Model 10
IV. Preliminary Review 20
V. Analytical Questions, Research Methods, and Strategies 24
Analytical Questions 25
Methods and Strategies 25

CHAPTER 2 THE CONTEMPORARY FLYING GEESE MODEL 36
I. The Patterns of Japanese Foreign Direct Investment and Corresponding Trade Structures 36
II. The Significance of Japanese FDI 46
International Comparison 47
The Technical Issues 49
The Reinvestment Patterns and Financial Sources 55
III. Trade Patterns 60
Continuance and Changes of the Triangular Trade Patterns 62
The Catch-up Product Cycle 74
IV. Dynamic Regionalization of Japanese Production Networks 83
Conceptual Framework 83
Empirical Cases 96
V. The Regional Extension of the Japanese Developmental State 108
The State As a Planner 110
The State As a Financier 116
From High Regulation to Liberalization 118
Promoting Overseas Investment 122
Japan's Foreign Aid 127

The State As a Promoter 143
VI. Summary 149

CHAPTER 3 THE PATTERNS OF TAIWANESE FOREIGN DIRECT INVESTMENT AND FOREIGN TRADE 152
I. The Patterns of Regional and Sectoral Distribution of Taiwanese FDI 153
II. The Significance of Taiwanese FDI 169
International Comparison 169
Technical Issues Regarding the Data Recording 175
The Reinvestment Patterns and Financial Sources of Taiwanese FDI 183
III. Trade Patterns 189
The Fulcrum Shift of the Taiwan-Centered Trade Triangle 190
The Shaping Factors of the Taiwan-Centered Trade Triangle 199
The Catch-up Product Cycle: the Taiwanese Experience 206
IV. Summary 221

CHAPTER 4 FROM STARTUP TO CRUISE--THE DYNAMIC DEVELOPMENT AND REGIONALIZATION OF THE TAIWANESE ELECTRONICS FIRMS 224
I. The Conceptual Framework of Catch-up 226
II. Case Studies 236
General Development 236
Consumer Electronics 247
Tatung Corporation 247
Action Corporation 258
Industrial Electronics--PCs and Peripherals 263
Acer Group 263
MiTAC Group 277
Jimbau Electronics and Inventec 285
KYE Systems Corporation 289
Electronic Components 292
Semiconductors—ICs 292
Yageo Corporation 302
Printed Circuit Boards(PCBs) 307
Wintelism, Cross-border Production Networks, and the Taiwanese Experience 313
III. Summary 318

CHAPTER 5 REORGANIZING THE TAIWANESE DEVELOPMENTAL STATE 323
I. The State As a Planner 325
The Asian-Pacific Operational Center(APROC) Plan 329
The APROC Plan and Taipei as a World City 336
Toward a Network State?--The Taiwanese Experience 344

The Direction Level 347
The Formulation Level 353
The Implementation Level 356
II. The State As a Financier 362
1 From Sophisticated Regulation to Step-by-Step Liberalization 363
From Absorbing Inward FDI to Calibrating Outward FDI 373
From Receiving Foreign Aids to Providing Aids 380
III. The State As a Promoter 389
IV. Summary 407

CHAPTER 6 CONCLUSION 412
I. Summaries of the Chapters 412
Summaries of Chapter 1 413
Summaries of Chapter 2 413
Summaries of Chapter 3 414
Summaries of Chapter 4 417
Summaries of Chapter 5 419
II. Theoretical and Policy Implications 420

ENGLISH BIBLIOGRAPHY 432
CHINESE BIBLIOGRAPHY 462

LIST OF TABLES

Table 2-1 Patterns of Japanese Foreign Direct Investment(1989-1996, $Million and Percentage) 37

Table 2-2 Patterns of Japanese Foreign Direct Investment within Each Region(1989-1996, $Million, Percentage by Industry) 41

Table 2-3 Accumulated Japanese FDI by Region and Industry(April 1981-March 1993, $ Million and Percentage) 43

Table 2-4 Japanese Foreign Direct Investment in Asia, Percentage Contrast by Industries (1989-1996, Million and Percentage) 45

Table 2-5 Leading Sources of inward FDI to Asian Industrializing Countries 48

Table 2-6 External Assets of Japan(1975-90, Percentage) 53

Table 2-7 Trends in Total Investment by Japanese Affiliates(Manufacture Industries, $ Billion) 57

Table 2-8 Financial Sources of Japanese Overseas Investment, 1989(Percentage) 58

Table 2-9 Trade Balance of Developing Asian Countries(1988-1994, $Million) 63

Table 2-10 Intensity of Export Destination and Import Source of Asian Countries(1988-1994) 65

Table 2-11 Destinations of NIEs exports and origins of NIEs imports(Percentage) 66

Table 2-12 Purchases of Japanese and American TNC Parent and Foreign Affiliates(Percentage) 69

Table 2-13 Procurement and Sales of Asian Affiliates of Japanese Firms(1989, Percentage) 71

Table 2-14 Local Content Ratios in ASEAN 73

Table 2-15 Target Markets of Japanese Foreign Affiliates(1993, Percentage) 74

Table 2-16 Japan, Taiwan, and Korea as Leading Exporters and Importers in the Shares of the World(1980, 1990, 1996, Percentage) 76

Table 2-17 Major Products of Countries at Different Industrial Stages 78

Table 2-18 Intra-industry Indices of Japan and Trading Partners(1980, 1990, and 1996) 81

Table 2-19 Stages of Industrial Restructuring in the Asian Flying Geese Patterns 92

Table 2-20 The Electronics Product Cycle in the Flying Geese Formation 100

Table 2-21 The FDI Outflow from and Inflow into Selected Countries(1990-1994, $ Million) 124

Table 2-22 Regional Distribution of Japan's Bilateral ODA(Percentage) 130

Table 2-23 Major Recipients of Japan's ODA(Percentage) 131

Table 3-1 Taiwanese Overseas Investment, by Area and Industry (1987-1996) 155

Table 3-2 The Taiwanese Overseas Investment in Asia(1991-1996) 161

Table 3-3 The Percentage Comparison of Inward FDI to the Manufacturing Sectors 163

Table 3-4 Aspects of Inward FDI to the ASEAN Four and Vietnam 172

Table 3-5 Inward FDI to Mainland China(1979-1993) 174

Table 3-6 The Data Contrasts between the Taiwanese Government and the Host Countries 177

Table 3-7 The Sectoral Distribution of Taiwanese FDI in Mainland China and other Countries 180

Table 3-8 The FDI by Taiwanese Petrochemical Manufacturers in the Early Nineties 182

Table 3-9 The Financial Sources of Taiwanese Overseas Investment(1991, Number of Firms) 185

Table 3-10 The Taiwanese Investors' Ways of Handling Profits of Overseas Investment, by Host Countries 187

Table 3-11 The Taiwanese Investors' Ways of Handling Profits of Overseas Investment, by Firm Size and by Host Countries(Percentage) 188

Table 3-12 Taiwan's Trade Structure--Export Destinations and Import Sources(1967-1995, Percentage) 191

Table 3-13 Taiwan's Trade Balances with Main Trading Partners(1960-1995, $ Thousand) 193

Table 3-14 Hong Kong as a Transhipping Center between Taiwan and China(1979-1995, $ Million and Percentage) 195

Table 3-15 The Sources of Components, Intermediaries, and Technologies of Taiwanese Overseas Production(1995 and 1996, Percentage) 202

Table 3-16 Target Markets of the Taiwanese Overseas Subsidiaries(Percentage) 204

Table 3-17 The Evolution of Taiwan's Export Structure(1965-1995, Percentage) 208

Table 3-18 Taiwanese FDI in the Textile Industry(1987-1996, $ Million and Percentage) 209

Table 3-19 The Evolution of Taiwan's Export Structure and Industrial Upgrading(1981-1994, Percentage) 213

Table 3-20 The World Shares of Taiwan's IT Products(1991, 1994, and 1996) 215

Table 3-21 Taiwan's Specialization Indices(1965-1995) 216

Table 3-22 The Intra-Industry Indices of Taiwan and Major Trading Partners(1975-1995) 218

Table 4-1 The Export and Import of Taiwanese Products(1992 and 1997, $ 100 Million) 238

Table 4-2 The Ratios of Overseas Production and World Shares of the

Taiwanese IT Manufacturers(1995 and 1996, Percentage) 240

Table 4-3 The Development Trajectories of the Taiwanese Electronics Industry 248

Table 4-4 The Scale and Scope of Tatung Corporation 249

Table 4-5 The Global Production Sites of Chunghwa Picture Tube 257

Table 4-6 Product Categories and Sales of Tatung(1988 and 1997, Percentage) 258

Table 4-7 The Organizational Structure of Acer Group 265

Table 4-8 The Structure of MiTAC Group 278

Table 4-9 Component Sources of MiTAC International 281

Table 4-10 Production and Sales of the Taiwanese IC industry(1987-1996) 293

Table 4-11 The Scale and Product Mix of Yageo Corporation 303

Table 4-12 The Investment and Production of Taiwanese PCB Makers in Mainland China 312

Table 5-1 The Time Frame of the APROC Plan 333

Table 5-2 Taipei and the Representative World Cities 345

Table 5-3 The Structure of Taiwanese Financial Institutions(1971-1995) 366

Table 5-4 Credit Commitments of the CEXIM, by Type of Credit(1987-1995, Percentage) 376

Table 5-5 Credit Commitments of the CEXIM, by Area(1987-1995, Percentage) 377

Table 5-6 Loan Grants by the IECDF(1988-91, $ Million) 381

Table 5-7 Technical Assistance Funded by the IECDF(1988-91, $Million) 383

Table 5-8 Aids and Funds Provided by President Lee to Central American Friendly Countries in 1997($ Million) 404

LIST OF FIGURES

Figure 1-1 The Reversed V-shape of the Flying Geese Formation 6

Figure 1-2 The East Asian Flying Geese Formation 24

Figure 1-3 The Research Framework 29

Figure 2-1 The ODA System of Japan 129

Figure 2-2 The Japanese Concept of Economic Cooperation 135

Figure 4-1 The Conceptual Framework of Catch-up 233

Figure 4-2 Acer's Client-Server Organization 273

Figure 4-3 The Framework of Global Logistics of MiTAC Group 283

Figure 5-1 Japan as the Asian Brain 334

Figure 5-2 The Organization and Mechanism of the Taiwanese Developmental State and Economic Bureaucracy 348

Figure 6-1 Theories of Region Economic Integration of the General Triad 422

Abbreviations

ADB	the Asian Development Bank
APEC	the Asian Pacific Economic Cooperation
BOC	the Bank of Communication
BOFT	the Board of Foreign Trade
BOJ	the Bank of Japan
BTO	build to order
CAD	computer-aided design
CBC	the Central Bank of China
CEPD	the Council for Economic Planning and Development
CETRA	the Chinese External Trade Development Council
CEXIM	the Export-and-Import Bank of China(CEXIM)
CIECD	the Council for International Economic Cooperation and Development
CKD	completely knocked down
CNFI	the Chinese National Federation of Industries
CPC	the China Petroleum Corporation
CSDC	the Corporate Synergy Development Center
CSOE	the Commission of State-Owned Enterprises
CUSA	the Council on United States Aid
DAC	the Development Assistance Committee

DGBAS the Directorate-General of Budget, Accounts, and Statistics

DGPRSB the Directorate General of Postal Remittances & Saving Banks

EDB the Economic Deliberation Board

EDCF the Economic Development Cooperation Fund

EDIS Electronic Distribution Information System

EPA the Economic Planning Agency

EPC the Economic Planning Council

ERSO the Electronics Research and Service Organization

ESB the Economic Stabilization Board

ESCAP the Economic and Social Commission for Asia and the Pacific

FILP the Fiscal Investment and Loan Program

GCC global configuration center

GCCRC the General Chamber of Commerce of the Republic of China

HSIP the Hsinchu Science-based Industrial Park

IECDF the International Economic Cooperation and Development Fund

IDB the Industrial Development Bureau

IDIC the Industrial Development and Investment Center

III the Institute for Information Industry

IIT intra-industry trade

IPR intellectual property right

ITRI the Industrial Technology Research Institute

JAIC the Japan ASEAN Investment Company

JAIDO the Japanese International Development Organization

JDB	the Japan Development Bank
JEXIM	the Export-and-Import Bank of Japan
JICA	the Japan International Cooperation Agency
KD	knocked-down
KEXIM	the Export-and-Import Bank of Korea
LDP	Liberal Democratic Party
MITI	the Ministry of International Trade and Industry
MMC	the Mitsubishi Motor Corporation
MOC	the Ministry of Communication
MOEA	the Ministry of Economic Affairs
MOF	the Ministry of Finance
MOFA	the Ministry of Foreign Affairs
MOM	the Ministry of Munitions
NAIC	the National Association of Industry and Commerce
NRI	the Nomura Research Institute
NTT	the Nippon Telegraph and Telephone
ODA	Official Development Assistance
OECD	the Organization for Economic Cooperation and Development
OECF	the Overseas Economic Cooperation Fund
PRC	the People's Republic of China
RAIC	the Research Association of Industry and Commerce
RBU	regional business unit

SBU strategic business unit

SCAP the Supreme Commander for the Allied Powers

SJETF the Sino-Japanese Economic and Trade Foundation

SMEA the Small and Medium Enterprise Administration

SMT surface mounting technology

SOE state-owned enterprises

TPB the Taiwan Production Board

UNCTAD the United Nation Conference of Trade and Development

CHAPTER 1

INTRODUCTION

I. Institutional and Alternative Regional Economic Integration

Various institutions of regional economic integration have formulated new action programs and certain new ones been formed since the late eighties and early nineties, which is noteworthy as one views the record: there were only six organizations of regional economic integration in the sixties and seventies. The number of similar organizations grew by a factor of three, reaching around twenty in the eighties. The growth did not stop in the nineties, with the result that the total number of organizations of regional economic integration reached sixty-nine in the nineties, most of which focused on Europe(thirty-nine) and America(forty)(JETRO, 1996c).

Following the proliferation of newly created organizations of regional economic integration and the resurgence of the old ones, numerous theories and concepts, such as custom union theory(trade creation and diversion balance), functionalism and neo-functionalism, Marxist interpretation, rational choice theory, intergovernmentalism, federalism, and so forth, some of which are resurgent and some new, have been emerging swiftly, with the North America Free Trade Agreement(NAFTA), the European Union(EU), and the Asian Pacific Economic Cooperation(APEC) as the main targets of research and analysis.

However, with few exceptions, most of these theories and analyses have been focusing on institutional or formal regional economic integration, criticizing the weaknesses of other arguments, highlighting the strengths of their own

theories, or debating what will result from the actions and policies adopted by the member states within each of the organizations. Relatively, few, if any, scholars have paid sufficient attention to the flying geese model and its explanatory power in analyzing the contemporary regional economic dynamics in East and Southeast Asia. While formal or institutional integration represented by European and North American cases is based on treaties, accords, or regulatory frameworks, a type of de facto regional economic integration has been weaving the economic activities of East and Southeast Asian countries into integrated webs, based on trade interaction, investment flows, cross-border production networks, foreign aids, and so on. Though various theories try to prescribe and explain the steps and process of the European integration, such as intergovernmentalism, neo-functionalism, and federalism, which had dominated policy thinking and discussion successively(O'Brien, 1995: 694-701; Corbey, 1995: 254-63), few, if any, systematic theories discuss the de facto economic integration in the West Pacific Rim, except for the flying geese model. Some scholars even doubt whether the economic activities, especially trade patterns, in and around this region can be termed as regionalization or not(Frankel and Kahler, 1993: 6). Whereas proponents and critics argue about the advantages and disadvantages of the NAFTA, scholars who discuss the Asian economic regionalization do not have a predominant theoretical framework in mind; they either participate in debates revolving around the flying geese model or focus on trade, investment, or financial patterns.

Nevertheless, it seems that the flying geese model, the most systematic

theory in explaining the Asian de facto regional economic integration, has caught attention recently. Relevant studies have been conducted to examine the validity and credibility of the flying geese model(Romm, 1992; Kwan, 1994; Das, 1996; Hill and Fujita, 1996a, 1996b, 1997), or to formulate alternative explanations with the intention of abolishing it(Bernard and Ravenhill, 1995; Bernard, 1996; Hatch and Yamamura, 1996). However, two points merit analysis and discussion.

First, it seems that, in most cases, not only does the flying geese model described by proponents and opponents in various debates differ from the original thesis formulated by Akamatsu in certain aspects, but the model perceived by the contenders also demonstrates different profiles. To help one understand the points and arguments put forward by the contenders, it is desirable to clarify the similarities and differences between the original thesis and the contemporary theoretical construction before one goes further.

Second, both the proponents and opponents have one thing in common though their evaluation and conception about the model differ from each other to a significant extent. They all focus on the interactive relationships between Japan, the leading goose, and Southeast Asian developing countries, mainly the ASEAN; all have followed Japan's lead in terms of production regionalization and industrial restructuring. They do mention the roles played by the middle countries in the flying geese formation, but it seems that they have rarely received detailed studies regarding their structural position and activities.

Certainly, it is not fair to say that no one tries to fill in the blanks in the

model. Some scholars have begun to try. For example, studying Korean automobile industry, Yon-Joo Lee not only finds how a third world country, such as South Korea,[1] has caught up with advanced countries in terms of industrialization, but also confirms the reasoning and views of the flying geese model(Lee, 1993).

Nevertheless, there seems to be no detailed study of how Taiwan has been doing in the flying geese formation in Chinese or in English writings. Therefore, the main purpose of this dissertation is to fill in the last blanks by exploring Taiwan's structural position in the contemporary flying geese formation; that is, to describe the performance of Taiwan during the eighties and nineties, and to analyze the politico-economic dynamics and to search for the contributing factors, by situating her within the Japan-led flying geese formation. This effort could help one discuss the strengths and weaknesses of the flying geese model from a more balanced perspective.

The remainder of this chapter has three parts. The first part is a literature review, which describes Akamatsu's original thesis. The second part summarizes the debates about the model. The third is a preliminary review, which lists many differences and similarities between the original thesis and the contemporary profiles, as well as pros and cons. The literature review includes the description of relevant debates and preliminary comments, which provided a

---

[1] South Korea has joined the Organization for Economic Cooperation and

basis for analytical questions. Research methods and strategies specify the research framework and argument sequences.

II. The Original Flying Geese Model

Akamatsu's flying geese model was formulated in the thirties and based on the experience of Japan's industrialization. Drawing on statistical data of Japan's textile and machinery industries, Akamatsu indicated the stages, process, and structures of the flying geese model, with the intention of explaining the patterns of industrial development of Japan and other developing countries.

The three thrusts in the flying geese model are: (1) countries can be categorized by the degree of their industrialization and economic growth, (2)countries have consistent cycles in national industrialization and economic development, and (3)developing countries experience the catch-up product cycle and industrial restructuring after contacting developed countries.

Hierarchies of Countries

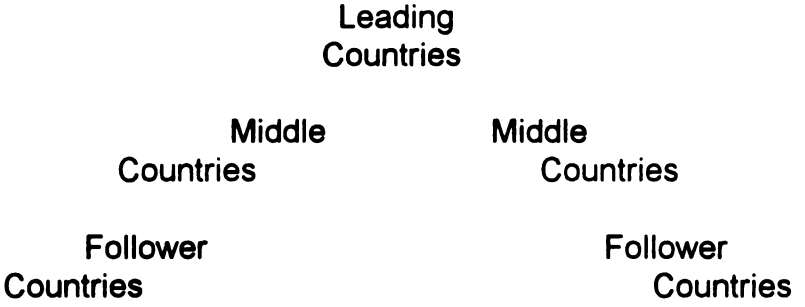
Akamatsu maintains that countries in the world can be categorized into the advanced or leading countries(senshinkoku), follower countries(kooshinkoku), and middle or newly rising countries(shinkookoku)(Korhonen, 1994: 95), according to their industrialization levels and technology capabilities. The advanced countries occupy the leading position in the flying geese formation as they are quite strong in these two aspects. The middle countries are inferior to

---

Development(OECD) on 12 December 1996.

the leading ones but superior to the follower ones in two ways: the middle countries import high technology and machinery from advanced countries, manufacture simple industrial products, and export them to follower countries as well as the world market(Hill and Fujita, 1996: 287-8). Falling behind the leading and middle countries in industrialization levels and technology capabilities, the follower countries are situated at the last tier of the formation(Akamatsu, 1962: 11). The structural relationships among them can be drawn as a reversed V-shape formation.(See Figure 1-1.)

Figure 1-1 The Reversed V-shape of the Flying Geese Formation



Though the industrialization levels of countries in the formation are hierarchical, it does not mean that the structure is fixed. On the contrary, it demonstrates the patterns that middle and follower countries try to keep catching up with the leading country and that the leading country tries to keep the industrial gaps. Akamatsu uses the concepts of homogenization and heterogenization to demonstrate the industrial gaps between industrializing and

industrialized countries, which reflects his learning of Hegelism and Marxism(dialectic view)(Terry, 1997; Korhonen, 1994: 94). To put it simply, when industrializing countries establish labor-intensive industries to produce the consumer goods imported previously either by accepting the relocation of industries from advanced countries or by state promotion(homogenization), industrialized countries would have already upgraded to capital- and intensive-industries(heterogenization), thus keeping the gaps from narrowing. When industrializing countries are capable of establishing capital- and technology-intensive industries(another homogenization), industrialized countries have already been able to produce synthetic materials and consolidate industries with higher technology levels(another heterogenization)(Akamatsu, 4-10).

Groups of the Flying Geese Based on Regions

The flying geese model does not mean that all countries in the world form a big formation. Rather, it stands on a regional perspective, which divides countries according to regional relationships and the hierarchy of countries. According to Akamatsu, there are three flying geese formations in the world: America, Europe, and Asia, each of which is led by the United States, Western European countries, and Japan. Akamatsu did not specify the follower and middle countries in the American and European flying geese formations, but, from his description, the three groups have two similarities. First, the stages of industrial development among countries are not synchronous, but asynchronous. The leading countries devote themselves to developing high technology and trying to widen the gaps between them and other following countries. The middle

and follower countries try to catch up with the leading ones. Second, the industrialization and technology development are not progressing gradually, but sometimes jumping forward and sometimes stagnating. Some follower countries lag behind more and more, without the capabilities to catch up; but some can make it and become a leading country in time(Akamatsu, 1962: 18).

Industrial Restructuring and the Catch-up Product Cycle

According to Akamatsu's flying geese model, seven stages comprise the process of industrialization in Asian developing countries, which can be simplified into three stages: importation, domestic production, and exportation of manufactured products, with the stage sequences of producing crude products, exporting those products, and producing as well as exporting products with better qualities(Korhonen, 1994: 96-8).

The seven stages can be combined into four stages in terms of the combination of product cycles and industrial upgrading.

First, developing countries import consumer products and export primary products. At this stage, domestic craft industries collapse and laborers flow to the primary industry. The preliminary framework of international division of labor is established(Akamatsu, 1962: 12-3).

Second, developing countries begin to develop simple import substitution industrialization(ISI). Developing countries produce consumer products and reap benefits from the already enlarged domestic market for some consumer products. The government must protect domestic industries as well as help import capital goods and raw materials that cannot be sourced domestically. In addition, the

production of consumer products might stimulate the development of energy and transportation industries, which, in turn, would stimulate the production of consumer products(Akamatsu: 13-4).

Third, the stage of export-oriented industrialization(EOI) follows the ISI stage. During this stage, domestic market for consumer products is saturated, which leads to the export of domestically produced goods. Moreover, developing countries are now capable of producing machines which have been imported previously, thus triggering the secondary ISI(Akamatsu: 14-5).

Fourth, if everything goes well, consumer goods produced by developing countries will decrease gradually; capital goods will be produced domestically and exported, which leads to the secondary EOI(Akamatsu: 15-6).

Akamatsu's description of industrial restructuring, characterized by the stages of importation, domestic production, and exporting of the newly industrializing countries, suggests a special version of product cycle different from Vernon's, which is based on the experience of American (multinational) enterprises and divides the process of product cycle into three stages(innovation, maturation or standardization, and relocation of assemblies)(Vernon, 1966: 196-203), which makes it hard to adequately analyze the industrial development of latecomers. In contrast to Vernon's thesis, Akamatsu's version of the product cycle can be termed as the catch-up product cycle, based on the experience of firms and industries in industrializing countries. As will be seen in Chapter Three and Four, the catch-up product cycle would be more appropriate in explaining the industrialization of latecomer countries and firms.

III. Debates on the Flying Geese Model

Akamatsu's theory and the term "flying geese" have been increasingly popular in English literature of economic development and coverage of news media, thanks to the phenomenal growth of Japanese, Taiwanese, and South Korean foreign direct investment(FDI) and trade patterns in East as well as Southeast Asia since the mid eighties, and to the attention paid by those who debate.

On the more theoretically debating side, Hill and Fujita summarize various perspectives, point out their weaknesses, and justify how the flying geese model is better in terms of explaining East Asian and Southeast Asian industrialization and economic development.

According to their description, by using the world-system analysis and the product life cycle theory, Cumings argues that the economic achievement of Northeast Asian countries could be attributed to the political frameworks maintained by the hegemonies(the United States after World War II) and Japanese colonial legacy, which laid the foundation of Taiwan's and Korea's industrialization. In addition to the political framework, the regional division of labor based on the general product life cycle has also been responsible for the industrialization within the region(Hill and Fujita, 1996: 288-89; Cumings, 1987).

Following the thinking of the world-system perspective, Bello extends the dependency thesis in Cumings' interpretation and argues that the East Asian Newly Industrializing Economies(NIEs) have been depending on Japanese technology and become subordinate elements in the Japan-dominated regional

division of labor(Hill and Fujita, 1996: 289-90; Bello and Rosenfeld, 1990; Bello, 1993).

In contrast to Bello and Cumings, Amsden focuses on the roles of the state in the industrial transformation of a bunch of developing countries and formulates the thesis of late industrialization, which maintains that less advanced countries could promote fast industrialization by mobilizing national resources and using the recipe of "learning by doing"(Hill and Fujita, 1996: 290-2; Amsden, 1989).

Moon also notices the roles of the state in industrialization and moves the focus back to the regional dynamics, contending that the flying geese model only fits the regional division of labor in East Asia from the fifties to seventies and that Asian NIEs have been able to compete with Japan in terms of technology levels and world export shares(capital- and technology-intensive goods)(Hill and Fujita, 1996: 292-3; Moon, 1991).

After summarizing those views, Hill and Fujita observe that, though these scholars have their insights, each of their arguments suffer various weaknesses. Cumings predicts that the product cycle was a peculiar product of historical contexts, but the product cycle has extended to most of the West Pacific Rim, including to Southeast Asia, and has promoted industrialization of those neighboring countries. Bello emphasizes the dominating position of Japan, but the newly rising foreign direct investment from the Asian NIEs to Southeast Asia suggests that these NIEs have their own influence. Amsden's study of Korean steel industry confirms that Korea has been able to compete with Japan on many

indicators, which suggests Japan's domination is not invincible. However, Amsden focuses narrowly on national contexts, so much so that she misses the reality of regional division of labor between Japan and Asian developing countries. Moon singles out the competing relationship between Japan and other countries in East Asia, but he ignores the positive side of regional complementarity, such as Japan's assistance in developing the Korean steel industry. In comparison to those theories or arguments, the flying geese model stands out as an appropriate theory with more explanatory power because it expects and describes the complementarity of the Asian regional division of labor and the catch-up product cycle(Hill and Fujita, 1996: 293-6).

On the more empirical side, Hill and Fujita's studies of Osaka's regional linkage strategies, Matsushita's flexible manufacturing and regional production networks in Southeast Asia, as well as Japanese auto makers' investment and production in Southeast Asian countries, confirm the descriptive and explanatory power of the flying geese model. Two of Hill and Fujita's studies will be summarized here. One is their study on Osaka's regional linkages, the other Matsushita's production networks, and practices of flexible manufacturing in Southeast Asia.

By studying the industrial restructuring and overseas production of Osaka's major industries, such as the apparel industry, the making of bicycles and bicycle parts, as well as the manufacturing of the electronics industry, Hill and Fujita demonstrate how Osaka links its industrial development with developing Asian countries and how the flying geese model explains the dynamics fully.

They describe how Japan has developed her industries by following the catch-up product cycle and by relying on the developmental state. The catch-up product cycle includes many attributes, such as borrowing technologies and learning, innovating, continuous industrial upgrading, and strengthening production scale. Of importance is that the catch-up product cycle customized by Japan is characterized by relocating sunset industries overseas as a complementary part of domestic industrial structures, rather than abandoning them, which not only avoids the boomerang or hollowing out effects, but also forms a comprehensive regional division of labor. Also, by using the administrative guidance, cooperating with businesses, and formulating indicative plans, the developmental state in Japan has been facilitating the above-mentioned patterns as well as structures of investment and production. Under these conditions, together with the pressures of protectionism and yen appreciation, each of the three industries based in Osaka has formed complementary regional division of labor, which not only has upgraded Osaka's industries, but also facilitated industrial building in the developing countries. The general patterns of the division of labor are that product design stays in Osaka, that the Asian NIEs and the ASEAN countries specialize in components and parts production with different qualities, and that headquarters are established in Singapore to coordinate regional production, such as procurement, training, and technical aids(Hill and Fujita, 1997).

Hill and Fujita's studies not only focus on a city's regional linkages, but also examine firm strategies and elaborate Japanese regional developmentalism,

which has been based on the flying geese model. Investigating Matsushita's regionalized production networks and practices of flexible manufacturing activities, Hill and Fujita compare the explanatory power of three arguments: regional developmentalism, regional dependency, and regional rivalry. Regional developmentalism includes various types of cooperation between the Japanese developmental state and business, between capitalists and workers, among companies(the keiretsu, a sort of enterprise bloc), as well as cooperation among countries(regional division of labor). Regional dependency emphasizes the aspects of technology dependency and Japanese domination in the framework of regionalization. Regional rivalry contrasts the styles and strategies of American and Japanese transnational corporations(TNC) operating in Asia, claiming that regional networks of production established by American TNCs are flexible and open, and that by Japanese TNCs are closed and rigid. Through field works, Hill and Fujita find that, in Matsushita's case, Japan, Singapore, and Malaysia have formed a complementary division of labor, in which Japanese firms specialize in product design, innovation, and knowledge-intensive activities while Singapore becomes regional headquarters and Malaysia a manufacturing base with upgrading capabilities. These findings suggest that, while leading commentators to notice the external conditioning forces, the argument of regional dependency underestimates the upgrading capabilities of non-Japanese firms and the maneuvers of the developmental state of the Asian industrializing countries. Their findings also reveal that the contrast between American and Japanese TNCs lies not in "flexible" and "rigid," but in cutting

production costs and strengthening the comparative advantages of the manufacturing industries(Hill and Fujita, 1996b).

Other scholars or organizations endorse the flying geese model. Of importance are the Nomura Research Institute(NRI), the United Nations Conference of Trade and Development(UNCTAD) and the Economic and Social Commission for Asia and the Pacific(ESCAP), as well as Das, who stands on Australian perspectives.

The general argument of the NRI recognizes the existence of the flying geese patterns, but it seems that they have not unified the profile of the flying geese model. For example, in his book, Kwan discusses the model in terms of trade interdependence between Japan and the developing Asia in terms of changing comparative advantages, which suggests the production structures in East and Southeast Asian countries are changing. He regulates the trade patterns as a part of his whole policy recommendation; that is, establishing a yen bloc(Kwan, 1994: 81-98). However, in a book dedicated to analyzing the new waves of foreign direct investment in Asia, he and other scholars at the NRI focus on the investment and production strategies of Japanese electronics enterprises(Fukushima and Kwan, 1995).

In contrast to the NRI's focus, the *World Investment Report* of 1995, written by the UNCTAD, constructs the linkages between the FDI patterns and industrial restructuring in the home and host countries. The authors of the report conclude that, in the cases of Japan's industrial development, the textile and apparel industries of the Asian NIEs, as well as the electronics industries of Korea and

Taiwan, FDI could and did exert positive effects because, under some circumstances, FDI and the TNCs have transferred tangible and intangible assets back and forth between the home and host countries. These flows not only have helped the home countries phase out sunset industries and upgrade their industrial structures from labor-intensive industries to capital-, technology, and even knowledge-intensive ones, but have also helped the host countries construct industrial bases and upgrade industrial structures, which, according to the authors, confirms the explanatory power of the flying geese model(UNCTAD, 1995: 239-58).

Interestingly, the ESCAP, another branch organization of the United Nations, describes the flying geese model by delineating the changing patterns of international trade in Asia, not by focusing on investment patterns and industrial restructuring. According to the argument of the ESCAP, the flying geese patterns surfaced as Japan increasingly imported manufactured products from East and South East Asian NIEs from 1990 to 1995. The exports of these NIEs to Japan not only include goods made with simple technologies, but also products which need higher technological capabilities to manufacture(ESCAP, 1997: 91-2).

While the UNCTAD focuses mostly on the linkages between FDI flows and national economic restructuring, Das combines the patterns of FDI and trade, Japan's foreign aid, and the production networks of Japanese TNCs, trying to delineate the integration trends in terms of the flying geese model. His description is more inclusive and general than the above-mentioned arguments. Also, he brings Australia and New Zealand into the picture and put them in front

of the Asian NIEs, using technology levels as the main ordering criteria(Das, 1996: 131-90).

In contrast to those who accentuate the complementary aspects of the model, opponents of the flying geese model often emphasize the dimension of structural dependency, except Amsden, who downplays the connection among countries and criticizes the flying geese model on the ground that it does not apply to other regions since the U.S. did not help trigger economic development of Central and South American countries during the fifties and sixties(Amsden, 1991: 282-3).

Other commentators also try to refute the flying geese model. Making the argument of regional dependency, Bernard and Ravenhill say that, with its focus on industrialization and regional division of labor, the flying geese model is too simplified to analyze the complex politico-economic structures in East Asia. They criticize the model for being more like an ideology, which ignores the fact that East and Southeast Asian NIEs depend on Japan for trade, investment, and technology(Bernard and Ravenhill, 1995).

Later, Bernard criticizes the model from a different perspective and with a more ambitious intention. He tries to surpass the limitations of various views, such as the neo-liberal, the product cycle, and the neo-institutional ones, by conceptualizing East Asian regional formation as the process of structural contradictions and historical development. His dialectical perspective views East Asian regionalization as a dynamic historical process, which results from the interaction of globalization and state-society relationships. According to his

argument, East Asian regionalization led by the flying geese model has resulted in three sets of contradictions. The first one concerns production. Though it has led developing countries to industrialize, the regionalization of Japanese industries is still hierarchical in nature, which means that those countries depend on Japanese industries technologically. Moreover, the regionalization perspective based on the model downplays the fact that cheap labor in those countries has been ruled by authoritarianism, such as Thailand and Indonesia, which is aggravated by ethnic contradictions. Then, the regional extension of Japanese subcontracting system has created local contradictions, characterized by decreasing needs for new laborers, forced retirement, and overworking because of downsizing. The second set refers to triangular trade imbalance among Japan, Asian NIEs, and the United States. The third set is that Japan's lack of resources and needs for food have led Southeastern countries to specialize in food and raw materials production(Bernard, 1996: 336-46), a contemporary version of the problem of dependency indicated by the classical dependency theorists.

Hatch and Yamamura also criticize the model, offering a different perspective. They maintain that the regionalization of Japanese industries, which has its own patterns of foreign direct investment, trade, and technology transfer, does not really benefit countries that fall behind Japan in terms of industrialization and technology level, but embrace East and Southeast Asian NIEs, utilize resources of these countries, continue upgrading Japanese industries, and keep Japan's leading position. Without making policies to

transform these structures, they contend, East and Southeastern Asian NIEs will be the dependent components of Japan's economy, without the prospect of developing autonomous industrialization(Hatch and Yamamura, 1996).

After presenting their theory of "embraced development," which criticizes arguments made by neo-classical economics and the flying geese model, Hatch and Yamamura did a follow-up study in 1995 to see if there had been fundamental transformation within the new situations, such as the recession of Japanese "bubble economy." Their study finds that the Japanese production alliance networks, which are exclusive in nature, in East and Southeast Asia have not changed fundamentally. That is, the regionalization of Japanese production networks not only maintains the structures of technology dependency, worsening trade imbalance, and preventing other Asian countries from catching up with Japan, which is contrary to the expectation of the flying geese model, but also keep pressing subcontractors and local distributors to do business solely with Japanese TNCs, exclude rival(American) firms from competing in fair environments by implicitly and explicitly shaping policies and technical specifications in host countries, as well as exercise extreme control over the production networks, including management personnel and production technology(Hatch and Yamamura, 1997).

Certainly, Marxists would not be absent in the debates. Using the Marxist terms and reasoning, Tabb criticizes that the practices of the flying geese patterns have been characterized by dependent development, Japanese technology domination, captive exports and imports, the regionalization of

Japanese production networks with the scent of neo-imperialism, and oppressed workers(Tabb, 1994: 31-3, 34, 36, 38).

IV. Preliminary Review

From the summary presented above, the contemporary flying geese model has clearly covered more aspects and phenomena than the original thesis developed by Akamatsu and that the flying geese model perceived by the pros and cons has displayed different profiles.

Akamatsu's thesis revolves around the international trade patterns and their relationships with national industrial restructuring, which is followed by the ESCAP's argument. He did mention the state's role of promoting industrialization in developing countries and the effect of promoting industrialization brought by FDI from advanced countries, but he did not make extensive and detailed analysis on these issues, nor did he mention how the leading goose interact with the follower geese, not to mention international production networks. These issues or aspects left by Akamatsu have been enriched by scholars who have noticed the new phenomena, such as the developmental state(Hill and Fujita, 1997; Hatch and Yamamura, 1996; Das, 1996), the surge of FDI from developed and developing countries, and the regionalization of Japanese production networks in East and Southeast Asia(Fujita and Hill, 1997; Hill and Fujita, 1997; Hill and Fujita, 1996a; Hill and Fujita, 1996b; Hatch and Yamamura, 1996; Bernard and Ravenhill, 1995; Das, 1996). These new phenomena and aspects which have been indicated and studied by scholars holding different perspectives suggest that it is no longer sufficient to stick to Akamatsu's original

thesis. One needs to start from his original model and construct a more comprehensive theoretical framework to better understand the ongoing realities.

With regard to the contemporary construction or deconstruction of the flying geese model, five points can be made.

First, the flying geese model, whether it is the original one developed by Akamatsu, or the contemporary practices of Japanese developmental state and TNCs, does not claim to be a comprehensive theoretical framework that covers all dimensions and issues of international and national political economy. Therefore, the accusation that the model is not comprehensive enough is not valid. Also, delineating the structural contradictions of the model does not mean the flying geese patterns do not exist, nor could one falsify the model by just saying that the patterns contain structural contradictions.

Second, the original flying geese model did not promise that all countries in the formation will catch up with the leading one or the middle ones and form a horizontal line definitively. Akamatsu's version already points out that the hierarchy in the formation is a dynamic one. Some countries might catch up and some might fall behind as time passes, the causes of which depend on external environment, national effort on R&D, and state policies(Akamatsu, 1962: 6-7, 18). It is undeniable that the contemporary version advocated by some supporters of the model does present the picture that the vertically integrated and inverse V-shaped formation of the flying geese will become a horizontally integrated one. Saburo Okita, a former Minister of Foreign Affairs of Japan, did present this picture(Tabb, 1994: 31). Nevertheless, the contemporary model presented by

some enthusiastic scholars and politicians has not always been a comprehensive plan of the Japanese government, but a product of learning and groping intermingled with inter-ministerial conflicts. Contrary to the general impression that the Japanese developmental state has always been a monolithic body, there have been conflicts and disputes among ministries and bureaus since the postwar reconstruction and development. The notorious New Asia Industries Development Plan(the AID plan), formulated by the Ministry of International Trade and Industry(MITI) around 1987 and withdrawn later, was an example though it is argued that the essence of the plan has infiltrated into Japanese specific policies and actions(Terry, 1997; Doner, 1993; 188-90). The competition between the Ministry of Foreign Affairs(MOF) and the MITI with regard to the foreign aid is also a good example(Terry, 1997).

Third, opponents of the model do make one valid point; that is, there are structural dependency relationships in the formation, such as technological and market dependency. However, this does not falsify the flying geese model since the international political economy based on capitalism has been characterized by structural inequality and imbalance in terms of economic wealth and political power. What is important is not to view these dimensions of dependency as deterministic and fatalistic, but dynamic ones, which could be transformed by policies or might develop new patterns. As will be discussed later in my dissertation, the patterns of Taiwan's foreign trade show new trends, which could not be explained by the triangular trade patterns delineated by the critics of the flying geese model.

Fourth, from the debates concerning the model, different images and profiles of the flying geese model emerge between the pros and cons as well as among the proponents though they have noticed some discernible patterns, such as the product life cycle and patterns of foreign direct investment. For example, Hill and Fujita have focused on the roles of the Japanese developmental state, the internationalization of Japanese TNCs' production networks. They also contrast the catch-up product cycle and the American product cycle. UNCTAD's investment report concentrates on the linkages between FDI flows and industrial restructuring. In contrast, Kwan and the ESCAP define the changing patterns of international trade within Asia as evidence of the flying geese formation, implicitly implying that the changing structures of international trade have reflected the changing structures of production in the Asian countries. The overlaps and distance suggest the need to integrate their foci and construct a more integrated flying geese model, so that commentators and scholars can evaluate it on common grounds.

Fifth but not the least, in view of the debates between proponents and opponents of the flying geese model, one can see that the middle countries in the flying geese formation have not been studied extensively and closely. Proponents have focused on the leading country and the follower countries at the third level, i.e., the ASEAN four, but have not discussed many details of the structural positions and linkages of Taiwan and Korea in the formation. Opponents of the model only mention how Taiwan and Korea depend on Japanese technology with a couple of cases, except the follow-up study of Hatch

and Yamamura, which is better but not complete enough. They also expect that it is impossible for Taiwan and Korea to catch up with Japan in terms of technology levels(Hatch and Yamamura, 1996: 57-8, 93-4; Bernard and Ravenhill, 1995: 186-7). However, instead of examining cases of Taiwan and Korea in details, they choose to focus their critiques on the whole theoretical status of the flying geese model, with the aid of surveys and interviews.

V. Analytical Questions, Research Methods, and Strategies

As indicated, the pros and cons in the debate use different versions about the model. Even the pros perceive the model differently. It has also been pointed out that the middle countries in the flying formation have not received detailed and extensive studies, especially Taiwan. Therefore, I would like to explore two sets of analytical questions, which, would help one fill in the theoretical and empirical blanks in the formation.(See Figure 1-2.)

Figure 1-2 The East Asian Flying Geese Formation

Japan

Taiwan? Korea

Hong Kong Singapore

Mainland China ASEAN four

Analytical Questions

General analytical questions are listed below while specific questions will be asked and answered in the subsequent chapters.

What are the characteristics of the contemporary flying geese patterns practiced by the Japanese government and transnational corporations(TNCs)? Why and how do they promote these practices? What is the structural position of Taiwan in the flying geese formation? Are there any differences and similarities between Taiwan and Japan with regard to their performance, operation, and status in terms of foreign direct investment, trade, and economic as well as industrial policies? If so, why and how? What is the nature of relationships between Japan, i.e., the leading goose, and the follower countries? Are the relationships dependent, mutual beneficial, or mixed? What are the consequences of the relationships within the flying geese formation? How does one comprehend the politico-economic relationships and linkages between Taiwan and Mainland China? What about Taiwan and South East Asia in the formation? What theoretical and policy implications can one infer from the Japanese and Taiwanese experience?

Methods and Strategies

In writing the dissertation, I have used the comparative method, secondary analysis, and interview techniques.

The comparative method includes many versions. Lijphart's version is formulated more in statistical terms than in qualitative. According to him, the comparative method is similar to the statistical method, a substitute for the

experimental method in almost every dimension, except that cases of the comparative method are too few to be cross-tabulated, which makes it hard to find correlation among variables. Also, the comparative method should not be an independent method in its own right, but the first step of the statistical method(Lijphart, 1971: 684-5).

Przeworski and Teune's comparative method is also formulated more in statistical terms. They maintain that the sorts of research design include "most similar systems" and "most different systems" designs as well as univariate and relationships comparisons(Przeworski and Teune, 1970). They rightly point out that comparative studies should introduce "systemic factors" and "system contexts"(Przeworski and Teune: 13), but, to some extent, to divide research designs into "most similar" and "most different" systems designs is sometimes arbitrary and misleading because "similarities" and "differences" at first glance might turn out to be superficial once one finds out the complex combination of similar and different patterns or causal links.

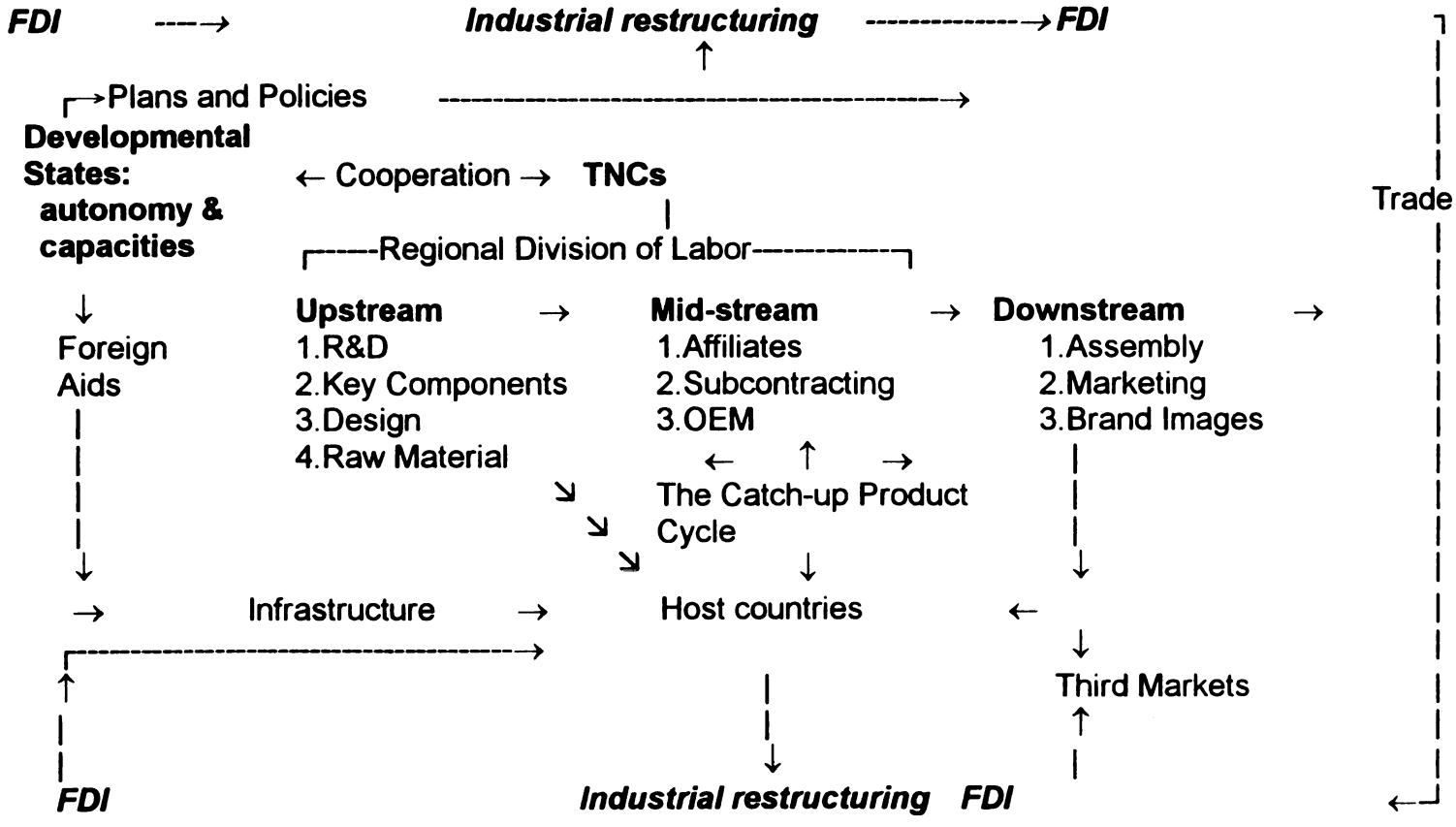
Since my dissertation is not based on the statistical method and because the comparative method is not based solely on the surface similarities and differences, the comparative method I used was based on the version defined by Ragin, who maintains that the comparative method in social research is designed to find similarities and differences in patterns or cases with a special emphasis on finding different causal links behind possible similarities and differences, which needs an analytical frame or theoretical framework to guide the research(Ragin, 1994: 105-6, 113-5). However, since Ragin's method

focuses mainly on constructing truth tables to explore different causal configurations, such as the factors(e.g., national wealth, degree of democratization, relationships with the USSR, and so on) which condition government reactions(e.g., friendly response or military repression to the social protests), the way of constructing truth tables is not appropriate in my research plan. For example, both Japanese and Taiwan firms have made FDI in the ASEAN and China, which gives both of them the value of "1" rather than "0," but one cannot find significant similarities and differences by constructing this kind of truth tables. Therefore, I formulated a comparison framework that is connected to my research strategy. The framework is shown in Figure 1-3.

The chapters are based on the research framework. First, in Chapter Two, I have combined major points in the debates about the flying geese model and constructed a Japan-led flying geese model that includes three dimensions: the patterns of FDI outflow and corresponding trade modalities, the dynamic regionalization of Japanese production networks, and the Japanese developmental state. The first dimension, which delineates the distribution of Japanese FDI in terms of amount, regions, countries, and sectors, is intended to be the preface to the subsequent discussion with regard to the relationships between FDI and international trade patterns, the connections between FDI and restructuring in both home and host countries, the production networks and value chains, resources transferring, as well as strategies of firm competition. The patterns of Japanese FDI and their corresponding trade modalities do not answer those questions automatically, but they are important starters.

After describing the patterns of Japanese FDI and trade modalities, I summarize the dynamic regionalization of Japanese production networks and the spatial spread of industrial value chains, such as the division and connection of up-, middle, and downstreams, which have been delineated by the pros and cons. This dimension uses the patterns of FDI and trade as a starter and focuses more on the frameworks of regional division of labor constructed by Japanese TNCs. The product life-cycle thesis and corresponding industrial restructuring are introduced because they are interrelated with the regionalization of Japanese cross-border production networks. The discussion about the product cycle thesis extends Hill and Fujita's delineation of the contrast between American and Japanese styles of product life-cycles. The description of Japanese industrial restructuring describes trajectories related to how a less advanced country(in Japan's case, a country needing reconstruction) has developed itself by connecting its industries to other countries within the region in particular and with the world economy in general.

Figure 1-3 The Research Framework



The regionalization of Japanese production networks has been mainly led by enterprises, the main thrust of the private sector, but the Japanese state has been making important contributions as a developmental state in terms of being a planner of industrial policies, an investor channeling capitals to strategic industries or promising firms, and a promoter setting specific measures and policies to stimulate national industrialization. In view of this, the third dimension of the Japan-led flying geese model would be the transforming roles and functions of the Japanese developmental state, with a special focus on Japan's promotion of outward FDI and foreign aid, which, as many commentators have pointed out, has close relationships with the FDI patterns and international production activities of Japanese TNCs. It is interesting to explore whether Japan's foreign aid extends the conventional definition and function of the developmental state or, as many critics claim, serves as a new tool for Japan's "neo-imperialism."

The function of constructing the contemporary flying geese model led by Japan is to establish a benchmark, through which one can compare Taiwan to Japan. In Chapter Three, I have demonstrated that the Taiwanese FDI patterns and corresponding trade modalities are similar to and different from those of Japan's in terms of regional, nation, and sectoral distribution, including possible causes.

Since many scholars have noticed that a number of Taiwanese manufacturers have made FDI and engaged in overseas production activities, I have compared the performance, strategies, and actions of Taiwanese and

Japanese firms in Chapter Four. I put special focus on whether the framework of regional division of labor and cross-border production networks constructed by Taiwanese firms are different from or similar to Japanese one, with possible causes indicated. In this context, I compared the actions and strategies of the Taiwanese and Japanese electronics industries by dividing them into three sub-sectors, i.e., consumer electronics, industrial electronics, and electronic components.

There are three reason to make this comparison. First, both Japan and Taiwan have substantial electronics industries and the trajectories of Taiwan's electronics industry have been closely connected to the Japanese(and American) electronics industries. Not only have Japanese electronics manufacturers invested in Taiwan since the sixties, but Japanese TNCs engaged in computer production have made substantial procurement in Taiwan at least since the late eighties.

Second, the Taiwanese electronics industry, especially the information technology(IT) industry within the industrial electronics, has demonstrated excellent performance in terms of its share in Taiwan's export structures and in the world market. According to one report, in 1995, Taiwan replaced Germany and became the world's third largest country producing computer hardware. Taiwan has been the leading producer of the world of eight computer products: monitors(57 percent), motherboards(65 percent), scanners(64 percent), mice(72 percent), keyboards(65percent), switching power suppliers(35 percent), notebooks(27 percent), and LAN cards(38 percent). Also, in 1995, the share of

IT, electronic, and communication products in Taiwan's total exports reached 24 percent(WTDB, 1996a). In 1996, Taiwan became the world's largest producer of four other IT products: notebooks(32 percent), desktop scanners(52 percent), sound cards(50 percent), and modems(See Chapter Four for details).

Third, according to the report of the Ministry of Economic Affairs(MOEA) of Taiwan, the share of overseas production has reached 24.46 percent of Taiwanese total IT industry production, a good point for the comparison to its counterpart in Japan. Not only so, but Taiwanese electronics and computer makers having made overseas investment have adopted certain strategies to implement their plans of regional division of labor, such as MiTAC's "global manugistics" and Acer's "global brand, local touch"(See Chapter Four for details). These regionalization strategies shed some light on the differences and similarities between Taiwanese and Japanese electronics or computer manufacturers in terms of frameworks of regional division of labor and spread of value chains. After description and analysis, the structural position of Taiwanese electronics manufacturers is discussed.

Finally, the Taiwanese developmental state is compared to its Japanese counterpart in Chapter Five. The chapter compares the similarities and differences, and the causes and contributing factors, by describing how the Taiwanese state has been playing the roles of economic planner, financier, and promoter.

To explore the three dimensions, I intend to use secondary analysis. The method of secondary analysis refers to analytical reading of documents and

interpretation of statistical data. *Documents* include publications, surveys, and records provided by official, semiofficial, and private organizations as well as report from news media. From official publications, one can learn the contents and directions of laws, regulations, policies, and official statements of a certain country. From reports of leading and authoritative news media, one can glean and collect relevant information about business and industrial activities as well as actions within and outside a country.

Statistical data were collected from official sources, such as governments, semiofficial organizations(e.g., the Japan External Trade Organization, JETRO), news media, and international non-governmental organizations, e.g., the World Bank, the United Nations, the World Trade Organization, and so on. Statistical data that were not available from original sources but recorded in secondary writings will be cited accordingly.

Also, thanks to the development of the Internet and the World Wide Web technology, many documents and statistical data were acquired from the Internet, especially from web sites established by governments and organizations. For example, the government of Taiwan has established many web sites for web users who want to explore all sorts of documents and data. The main challenge was how to harmonize data collected from the world wide web documents.

By reading statistical data provided by official and secondary writings, one can map out the patterns of Japanese and Taiwanese FDI outflow and trade modes. The JETRO has published a series of data report about (Japanese)FDI as well as trade patterns on the web, which can be analyzed. The Investment

Commission of Ministry of Economic Affairs(MOEA) in Taiwan publishes monthly and annual investment reports, which are good sources. Also, the data sets provided by various scholars or research institutes, such as the NRI, could be useful in filling in the blank left by official data.

To understand the dynamic regionalization of Japanese and Taiwanese TNCs, I relied on surveys conducted by the authorities and relevant organizations; field works by scholars are cited, too. For example, the MITI surveys the activities of overseas Japanese affiliates every year, which would offer a rough picture of how Japanese TNCs are doing. Since the regionalization of Japanese production networks has been extensively studied by many scholars, the Japanese part of my study would be a combinatory summary and my effort would be focusing on conducting interviews with informants in Taiwanese electronics firms that have made overseas investment and constructed cross-border production networks. There was also a backup plan in case no Taiwanese firms were willing to be interviewed. If I had not been able to interview them, I would have relied exclusively on surveys conducted by Taiwanese government agencies and scholars. For example, the MOEA has conducted several surveys on the outward FDI patterns and overseas production activities of Taiwanese firms in the manufacturing sector. Other Taiwanese governmental agencies have entrusted scholars to do surveys or studies on Taiwanese FDI patterns and overseas production activities; though they are written in Chinese most of the time, they are good sources. In addition, some semiofficial organizations connected to the Taiwanese state could provide

documentary sources. For example, the China External Trade Development Corporation(CETRA), an organization similar to the JETRO, has conducted numerous marketing surveys and reports. Also, the Information Industry Institute(III) has published numerous books and studies on the Taiwanese IT industry.

Finally, since the literature about the Japanese developmental state and the transformation of the Taiwanese state have been profuse and since the data as well as foreign aid policies of the two countries are easily obtained, comparing the development states in Taiwan and Japan was done by analyzing official and other documents.

In Chapter Six, I summarize the argument and description, present the theoretical and policy implications, and discuss the theoretical status of the flying geese model in contrast to other theories of regional economic integration. I also ponder whether the model provides useful points for making policies about national industrial development, industrial restructuring, regional division of labor, and other matters.

Chapter 2

The Contemporary Flying Geese Model

The main thrust of this chapter is to delineate the profile of the contemporary flying geese model led by Japan. As mentioned in Chapter One, the contemporary flying geese model consists of three components: the patterns of Japanese foreign direct investment(Japanese FDI) and trade, the dynamic regionalization of Japanese production networks, and the regional extension of the developmental state. Several questions are explored in this chapter: what are the geographical and sectoral distribution patterns of Japanese FDI? What are the structural characteristics of the trade between Japan and her partners? How have the regional production networks built by the Japanese transnational corporations(TNCs) evolved? How has the Japanese developmental state transformed and why? The following description and argument are trying to explore these questions.

I. The Patterns of Japanese Foreign Direct Investment and Corresponding Trade Structures

The patterns of Japanese FDI and their corresponding trade structures are the first set of components of the contemporary flying geese formation led by Japan. The investigation starts from the patterns of Japanese FDI from the late eighties to the first half of nineties, which is displayed in Table 2-1.

At first glance, the main target of Japanese FDI is North America, followed by Europe and Asia. The patterns regarding the role of Asia is not as significant as expected. However, taking another look, one can find important patterns.

Table 2-1 Patterns of Japanese Foreign Direct Investment(1989-1996, $ Million and Percentage)

	1989	1992	1993	1994	1995	1996
Total	67,542	34,138	36,025	41,051	50,694	48,019
	(43.6)	(-49.5)	(5.5)	(14.0)	(23.5)	(-5.3)
North America	33,572	14,572	15,287	17,823	22,761	23,021
	50.2%	*43%*	*42.4%*	*43.4%*	*44.9%*	*47.9%*
Europe	14,808	7,061	7,940	6,230	8,470	7,372
	22.0%	*20.7%*	*22.0%*	*15.2%*	*16.7%*	*15.4%*
Asia	8,239	6,425	6,637	9,699	12,264	11,614
	12.2%	*18.8%*	*18.4%*	*23.6%*	*24.2%*	*24.2%*
Manufacturing	**1989**	**1992**	**1993**	**1994**	**1995**	**1996**
Sub-total	16,284	10,057	11,131	13,783	18,623	20,258
North America	9,586	4,177	4,146	4,763	7,326	8,792
	58.9%	*40.9%*	*37.2%*	*34.6%*	*39.3%*	*43.4%*
Europe	3,090	2,101	2,041	1,855	1,995	2,871
	20.0%	*20.9%*	*18.3%*	*13.5%*	*10.7%*	*14.2%*
Asia	3,220	3,104	3,659	5,181	8,058	6,628
	19.8%	*30.9%*	*32.9%*	*37.6%*	*43.2%*	*32.7%*
Non-Manufacturing	**1989**	**1992**	**1993**	**1994**	**1995**	**1996**
Sub-total	50,515	23,720	24,627	26,887	31,121	26,741
North America	23,986	10,384	11,042	13,050	15,197	14,207
	47.5%	*43.8%*	*44.8%*	*48.5%*	*48.8%*	*53.1%*
Europe	11,459	4,889	5,885	4,375	6,406	4,376
	22.7%	*20.7%*	*23.9%*	*16.3%*	*20.6*	*16.4%*
Asia	4,915	3,150	2,860	4,232	3,658	4,221
	9.7%	*13.3%*	*11.6%*	*15.7%*	*11.8%*	*15.8%*

Source: JETRO, http://www.jetro.go.jp/WHITEPAPER/INVEST97/t09.html and http://www.jetro.go.jp/WHITEPAPER/Invest98/f32.html

Note 1: Data about Latin America, Middle East, and Oceania are not included in this table.

Note 2: Numbers in parentheses indicate the growth rate in comparison to the previous year's value.

Note 3: Asia here refers mainly to China, Asian NIEs, and ASEAN four(Malaysia, Indonesia, the Philippines, and Thailand)

First, Japanese FDI in North America reached the top in Fiscal Year(FY)[1] 1989 and FY 1996, with the shares of 50.2 and 47.9 percents, respectively. Note that North America's share has been increasing since the nadir in 1993. Perhaps the establishment of the North America Free Trade Agreement(NAFTA) in 1992 triggered the resurgence from 1994 to 1996.

Second, according to Table 2-1, while its flows to Europe declining, Japanese FDI has been increasing in Asia since the drastic appreciation of the yen in the mid-eighties, even though Japanese bubble economy crashed in the early nineties. The re-appreciation of the yen in 1993 might have contributed to the increasing of Japanese FDI, but the depreciation of the yen in 1996 did not decrease Japanese FDI to Asian and North America; the share of Asia in 1996 is roughly equal to that in 1995.

Third, Japanese FDI in the manufacturing sector of North America has been declining since the early nineties, with some resurgence in 1995 and 1996. The share has been decreasing steadily from 58.9 percent in FY 1989 to 34.6 percent in FY 1994 though it has risen to 39.3 percent in FY 1995 and to 43.4 percent in 1996. At the same time, Japanese FDI to the manufacturing sector of Europe has been declining steadily, too, with a more drastic change--from 20 percent in FY 1989 to 10.7 percent in FY 1995, except the re-increase in 1996.

---

[1] In Japan, the definition of a fiscal year starts in the April of the previous year and ends in the March of the next year. For example, FY 1996 begins in April of 1996 and ends in March 1997.

Fourth, in sharp contrast, the main thrust of Japanese FDI aiming at the manufacturing sector seems to have moved from North America and Europe to Asia, with the result that the share of Asian countries increased from 19.8 percent in FY 1989 to 43.2 percent in FY 1995, except that it declined to 32.7 percent in 1996, though North America has decreased from 58.9 percent in FY 1989 to 39.3 percent in FY 1995 with some small fluctuations. Japanese investors seem to have intensified investment in Asia during the second half of the eighties and the first half of the nineties. The protectionist regulations of the Europeans and the NAFTA might have some impacts on the flows of Japanese FDI, such as the "rules of origin," which gives preferential trade treatment to imported goods(e.g., textiles, automotive products, and consumer electronics appliances) that have undergone "substantial transformation"(certain ratios of value-added manufacturing processes) in the region of NAFTA.

Furthermore, looking at the Japanese FDI distribution in the sectors of non-manufacture and manufacture in Table 2-1, one can see clearly some interesting patterns. The flows of Japanese FDI seem to demonstrate a trend of division of labor in terms of region and industry during this period. Japanese FDI in Asia seems to have increased in the manufacturing sector and decreased in the non-manufacturing one steadily. The share of Asia in the manufacturing sector increased from 19.8 percent in FY 1989 to 43.2 percent in FY 1995 while the share of Asia in the non-manufacturing one merely increased from 9.7 percent in FY 1989 to 15.8 percent in FY 1996, with fluctuations between the two years. Other sources also confirm this trend with the discovery that two-thirds of

Japanese FDI flowing to East Asia are in the manufacturing sector and that less than one-fifth of Japanese FDI to the United States is aimed at the similar sector(Abegglen, 1994: 213). Of particular note is that this trend seems to continue the trend between 1978 and 1988 if Urata's reading of the statistical data is valid(Urata, 1991: 179).

Not only so, but it could be inferred that this trend is reflected in terms of the numbers and shares of Japanese overseas affiliates and their employees. For example, in FY 1995, almost 80 percent of the newly established overseas manufacture affiliates were concentrated in Asia(MITI, 1997). For another example, in 1993 and in Asia, the share of Japanese affiliates in the electrical machinery industry, the main thrust of Japanese FDI flows to Asia during the past ten years, was 59 percent and the share of employees working in Asian affiliates was 70 percent(Itoh and Shibata, 1995: 189; Table 9.1).

According to Table 2-2, which lists the results of calculating the sectoral(manufacturing and non-manufacturing) shares of Japanese FDI flows within each region, Japanese FDI flows to North America, Europe, and Latin America seem to have concentrated more on the non-manufacturing sector than on the manufacturing one. From FY 1989 to FY 1994, around 70 percent of Japanese FDI flows to North American have gone to the non-manufacturing sector, leaving another 30 percent to the manufacturing one. These patterns also appeared in Europe and Latin America. In FY 1989 and FY 1995, 96.3 and 91.7 percent of Japanese FDI flowing to Latin American have gone to non-manufacturing one. During the same period, 77.4 percent and 75.6 percent of

Table 2-2 Patterns of Japanese Foreign Direct Investment within Each Region(1989-1996, $ Million, Percentage by Industry)

Manufacturing and Non-manufacturing Total	1989	1992	1993	1994	1995	1996
North America	33,572	14,572	15,287	17,823	22,761	23,021
Europe	14,808	7,061	7,940	6,230	8,470	7,372
Asia	8,239	6,425	6,637	9,699	12,264	11,614
L. America	5,238	2,726	3,370	5,231	3,877	4,446
Manufacturing	**1989**	**1992**	**1993**	**1994**	**1995**	**1996**
Sub-total	16,284	10,057	11,131	13,783	18,623	20,258
North America	9,586	4,177	4,146	4,763	7,326	8,792
	28.5%	*28.7%*	*27.1%*	*26.7%*	*32.2%*	*38.2%*
Europe	3,090	2,101	2,041	1,855	1,995	2,871
	20.9%	*29.8%*	*25.7%*	*29.8%*	*23.6%*	*38.9%*
Asia	3,220	3,104	3,659	5,181	8,058	6,628
	39.1%	*48.3%*	*55.1%*	*53.4%*	*65.7%*	*57.1%*
Latin America	196	268	364	1,159	320	1,489
	3.7%	*9.8%*	*10.8%*	*22.2%*	*8.3%*	*33.5%*
Non-Manufacturing	**1989**	**1992**	**1993**	**1994**	**1995**	**1996**
Sub-total	50,517	23,720	24,627	26,887	31,121	26,741
North America	23,986	10,384	11,042	13,050	15,197	14,207
	71.4%	*71.3%*	*72.2%*	*73.2%*	*66.8%*	*61.7%*
Europe	11,459	4,889	5,885	4,375	6,406	4,376
	77.4%	*69.2%*	*74.1%*	*70.2%*	*75.6%*	*59.4%*
Asia	4,915	3,150	2,860	4,232	3,658	4,221
	59.7%	*49.0%*	*43.1%*	*43.6%*	*29.8%*	*36.3%*
Latin America	5,042	2,451	3,006	4,075	3,557	2,957
	96.3%	*89.9%*	*89.2%*	*77.9%*	*91.7%*	*66.5%*

Source: JETRO, http://www.jetro.go.jp/WHITEPAPER/INVEST97/t09.html
Note 1: Data about Middle East and Oceania are not included in this table.

Japanese FDI flows to Europe have gone to the manufacture sector, respectively. However, note that, like the patterns emerging in Table 2-1, the patterns in Table2-2 seem to have shown some changes in FY 1996, with the result that Japanese FDI has increased its flows to the manufacturing sectors of North America, Europe, and Latin America while the share of Asian manufacturing sector has declined.

To make further interpretation, "non-manufacture" should be anatomized. Basically, the category of "non-manufacture" includes the primary and tertiary(service) industries. According to Table 2-3, which records the accumulated Japanese FDI in main regions in the world from 1981 to 1993, one could see that the lion's share of Japanese FDI to North American, European, Latin American, and even African non-manufacturing sectors has actually been concentrating in the service industry. For example, 68.2 percent of Japanese FDI in North America from the eighties to the early nineties went to the service sector(mainly commerce, finance and insurance) while only 29.7 percent of Japanese FDI to the manufacturing sector. This unbalanced contrast reappears in the cases of Japanese FDI in Europe, Latin America, and Africa. During the same period, Japanese FDI in Asian manufacture and service sectors showed less distance, with the result that 41.2 percent went to the manufacturing sector and 43.6 percent to service one.

Since Japanese FDI flows to and in Asia seem to gain increasing significance over time, one might as well examine its distribution and change in Asia. Looking at Table 2-4, one could see four features.

Table 2-3 Accumulated Japanese FDI by Region and Industry(April 1981-March 1993, $ million and Percentage)

	Manufacturing	*Mining*	*Service*	*Total*
North America	50,367	2,484	115,596	169,580
	29.7%	1.5%	68.2%	
Latin America	6,913	1,751	37,828	46,547
	14.9%	3.8%	81.3%	
Asia	24,691	7,980	26,135	59,880
	41.2%	13.3%	43.6%	
Europe	17,331	1,811	54,201	75,697
	22.9%	2.4%	71.6%	
Africa	234	582	5,995	6,813
	3.4%	8.5%	87.9%	
Oceania	2,954	3,422	17,269	23,782
	12.4%	14.4%	72.6%	
Total	103,981	18,812	257,449	386,530

Source: Keizai Koho Center, *Japan--An International Comparison*, 1994, p. 55.

First, Japanese FDI to Asia has been highly concentrated in East Asia, i.e., China, East Asian NIEs(Taiwan and Korea, and so on), and the core ASEAN countries. From FY 1989 to FY 1996, the lion's share(over 90 percent) of Japanese overseas investment went to East Asia.

Second, the share of the ASEAN countries has been gradually rising since FY 1989 while that of the Asian NIEs has dropped from 59.5 percent in FY 1989 to 25.9 percent in FY 1995, with some fluctuations. However, the ASEAN's share has not always taken a predominant position since Japanese FDI to China has risen steadily from 5.3 percent in FY 1989 to 36.5 percent in FY 1996, which partially reflects China's advantages of land and labor[2] as well as her policies of inducing foreign investment.

Third, regarding the manufacturing sector, the share of the Asian NIEs has fallen dramatically from 41.8 percent in FY 1989 to 14.7 percent in FY 1995 while the ASEAN four and China have increasingly absorbed more Japanese FDI. Also, from FY 1986 to FY 1990, the bulk of Japanese FDI flows to Thailand, Malaysia, and Taiwan has concentrated in their manufacturing sectors, especially the electronics sector in Thailand and Malaysia(OECD, 1993: 56).

Fourth, unlike the mild fluctuations and gradual declines of Japanese FDI in North America and Europe, Japanese FDI in the non-manufacturing sector of

---

[2] According to Das(1996), the costs of labor and land in China's Shengzhen Special Economic Zone(SEZ) is forty percent lower than those of the ASEAN countries.

C

To

As

Ma

fac

Asi

E

Non

fact

Asia

Ea

Table 2-4 Japanese Foreign Direct Investment in Asia, Percentage Contrast by Industries (1989-1996, $ Million and Percentage)

Total	**1989**	**1992**	**1993**	**1994**	**1995**	**1996**
Asia	8,239	6,425	6,637	9,699	12,264	11,614
East Asia	98.6%	96.3%	98.1	96.7%	95.9%	94.7%
NIEs	59.5%	29.9%	36.5%	29.5%	25.9%	30.5%
ASEAN 4	33.8%	49.8%	36.1%	40.1	33.5%	42.6%
China	5.3%	16.7%	25.5%	26.4%	36.5%	21.6%
Manu-facturing	**1989**	**1992**	**1993**	**1994**	**1995**	**1996**
Asia	3,220	3,104	3,659	5,181	8,058	6,628
East Asia	96.5%	93.3%	98.0%	95.3%	96.3%	93.4%
NIEs	41.8%	14.1%	20.1%	16.3%	14.7%	18.6%
ASEAN 4	48.2%	58.2%	40.3%	43.3%	38.4%	47.6%
China	6.4%	20.9%	37.6%	35.8%	43.2%	27.2%
Non-Manu-facturing	**1989**	**1992**	**1993**	**1994**	**1995**	**1996**
Asia	4,915	3,150	2,860	4,232	3,658	4,221
East Asia	99.9%	99.0%	98.4%	95.3%	95.7%	96.8%
NIEs	70.6%	44.1%	58.6%	45.3%	48.5%	42.5%
ASEAN 4	24.7%	44.3%	31.4%	35.6%	22.9%	38.5%
China	4.7%	11.5%	9.4%	14.4%	24.3%	15.8%

Source: JETRO, http://www.jetro.go.jp/WHITEPAPER/INVEST97/t09.html
Note: Data in 1996 only include the first half of 1996.

East Asian NIEs has fluctuating dramatically, like a moving roller coaster. Moreover, during the second half of the eighties and the early nineties, the service sectors of Hong Kong and Singapore have taken the lion's share of Japanese FDI(OECD, 1993: 56). China's share has been still far less than those of the NIEs and the ASEAN four, which partially reflects the incompleteness of her liberal financial settings.

Fifth, the patterns seem to have shown changes in FY 1996, just like those which emerge from Table 2-1 and 2-2. Therefore, the tendencies of division of labor resulting from Japanese FDI flows apply only to the late eighties and early nineties.

The foregoing presentation has revealed the patterns of Japanese FDI and its underlying tendency in division of labor in terms of regions and sectors. The picture of regional division of labor described above would be reinforced by the JETRO's data that roughly 60 percent of Japanese FDI in the manufacturing sector went to East Asia in FY 1988 and the ratio has already risen to 90 percent by FY 1993. Besides, from FY 1988 to FY 1993, almost half of Japanese FDI in the manufacturing sector has flowed to electronics(Dieter, 1997).

II. The Significance of Japanese FDI

The patterns of Japanese FDI delineated above have been depicted by other scholars, too. Some compare the patterns of Japanese FDI before the eighties and during the eighties, finding that Japanese FDI to Asia in the fifties was to secure supply of natural sources, that in the sixties and seventies was to relocate labor-intensive and some capital-intensive industries to East Asia, and

that how the patterns of Japanese FDI differ from the previous ones(Stubbs, 1994: 371; Hatch and Yamamura, 1996: 20-1; Doner, 1993: 182-3; Bernard and Ravenhill, 1995: 181; Pempel, 1996/7: 18; Machado, 1995: 43-6, 50; Urata, 1991: 179-85). However, before accepting the description, one has to consider three sets of problems. First is the relative significance of Japanese FDI in various host countries. Second are technical issues of the statistical sources of Japanese FDI and the Japanese definition of FDI. Third, the ways of measuring the significance of Japanese FDI in comparison to other categories of Japanese capital movements, such as reinvestment and financial sources, call for considerations.

International Comparison

To begin with, it has been observed that, though Japanese FDI has been increasingly interested in Asia, especially East and Southeast Asia, during the second half of the eighties and the first half of the nineties, the share of Asia in Japanese FDI has been lower than the share invested in North America and Europe, especially those of the United States and the European Union(UNCTAD, 1995: 45-7). From Table 2-1, one can also see that, roughly and relatively speaking, the amount of Japanese FDI in North America and Europe was about two times higher than that in Asia from 1992 to 1996, which gives one a reason to suspect whether the patterns of regional division of labor underlying the flows and distribution of Japanese FDI are significant.

This suspicion might be resolved by examining three points. First, according to Table 2-5, one can see that, before 1980, the inflows of US FDI to major Asian

NIEs have always been higher than that of Japanese FDI. However, since the eighties, Japanese FDI has been catching up with US FDI and even overtaking US FDI since the late eighties.

Table 2-5 Leading Sources of inward FDI to Asian Industrializing Countries

	Before 1981*			***1981-1985***			***1986-1990***		
	US	*Japan*	*EC*	*US*	*Japan*	*EC*	*US*	*Japan*	*EC*
Taiwan	35.3	32.5	6.3	40.2	27.8	8.3	21.3	32.8	10.3
Korea	19.6	60.5	8.7	49.2	30.3	9.5	33.1	51.2	15.5
Thailand	32.8	19.8	15.9	31.7	26.9	15.9	11.3	44.3	7.9
Malaysia	14.3	12.8	21.8	9.5	24.1	13.7	4.8	25.6	13.0
Singapore	42.5	11.4	22.7	51.3	14.6	23.7	39.0	37.0	21.1

Source: OECD, 1993.
Note: In Taiwan's case, the data before 1981 indicate the sum of 1952 through 1980; in Korea's case, 1962 through 1980; in Thailand's case, 1970 through 1980; in Malaysia's and Singapore's cases, only 1980.

Not only did Japanese FDI occupy significant positions in many East and Southeast Asian industrializing countries during the latter half of the eighties, but by referring to Table 3-4(in Chapter 3), one could see that Japanese FDI occupied the leading position in Malaysia(22 percent, 1980-1992) and Thailand(36.5 percent, 1981-1992), leaving other major investing countries behind, such as Taiwan, United States, and Hong Kong. Though Japanese FDI did not surpass other major investing countries in China and Vietnam, note that, in Indonesia, the share of Japanese FDI has been following that of Hong Kong

closely(12.3 percent vs. 13.6 percent) and that a certain amount of FDI made in China under the name of Hong Kong has been from the subsidiaries of Japanese TNCs(Taylor, 1996: 59).

The Technical Issues

The technical issues include the definition of Japanese FDI and the ways of measuring Japanese FDI.

First, the data source of the Ministry of Finance(MOF) are flawed in that they tend to inflate actual values. As Bayoumi and Lipworth point out, there are two ways to calculating Japanese FDI. One is based on the notification received by the MOF, the other on data drawn from the balance of payment(BOP). The MOF data tend to inflate because they do not take into account withdrawals and other changes after notification. In contrast, the BOP data are more precise with regard to the actual amount. However, unlike the MOF data, the BOP data do not break down Japanese FDI into categories based on industry and region, which prevents researchers from making further interpretation. Besides, both the distribution trajectories of the MOF and BOP data are similar, except that the BOP data are smaller in scale. That is why they decide to study Japanese FDI by relying on the MOF data.[3]

---

[3] See the appendix of their article(p. 29). A copy of the article in PDF format is available at http://www.imf.org/external/pubs/CAT/longres.cfm?sk=2318.0. Nonetheless, the differences related to the coverage of the MOF and the BOP data are more complicated than what they have depicted. For instance, the MOF data do not include investment equal to and less than 30 million yen as well as

Second, as Sheridan points out, the definition of Japanese FDI has undergone several changes. Since 1964, its definition has required "majority ownership of foreign affiliates" and at least a "full time Japanese director" in an affiliate. In 1980, Japan adopted the definition of the Organization for Economic Cooperation and Development(OECD), which includes "acquisition of stocks by foreign subsidiaries and long-term money lending to overseas businesses" as FDI. However, since then, the Japanese definition of FDI has changed gradually to the point of emphasizing "effective influence of management," which downplays the importance of ownership(Sheridan, 1995: 480). Machado also observes that the reason why Japanese count loans as a part of FDI is not only to focus on ownership, but to manage foreign subsidiaries more effectively(Machado, 1995: 60).

In view of this, it seems that, to some extent, one has to make some reservation with regard to the time-series data of Japanese FDI, especially to data that cover more than three decades. Nevertheless, since the above-mentioned patterns of Japanese FDI are limited to the period from the latter half of the eighties to the first half of the nineties, and since the data are drawn

---

exclude purchase of real estate while the BOP data do not count investment under 5 million yen and include payments of real estate. For detailed differences and calculation methods of the two data sources, please refer to Matsuoka(1994). Also, one thing has to be added here. For the sake of convenience and standardization, which, of course, does not sacrifice validity and precision, the data presented above are directly and indirectly based on the MOF data. Different data sources have been compared and errors have been

mainly from sources directly or indirectly based on the Ministry of Finance(MOF) of Japan, which regards acquisition of stocks and equities, money loans, and establishment as well as extension of branch offices as parts of outward direct investment, the patterns described above are convincing enough. The problem resulting from the inconsistent definition could be avoided to a satisfactory degree.

The third technical issue that confounds the significance of Japanese FDI is also suggested by Sheridan. Examining the capital account balance of Japan, Sheridan indicates that the patterns of Japanese FDI might not be as significant as one observes by just describing the data of Japanese FDI. Drawing on the data of Japanese assets and liabilities, Sheridan argues that, in contrast to the outward Japanese portfolio investment, the outflow of Japanese direct investment appears less significant than what has been examined. For example, according to Table 2-6, the share of Japanese FDI in Japan's total assets by the end of 1975 was 14.3 percent, higher than that of portfolio investment(7.0 percent). However, by the end of 1980, the share of portfolio investment rose to 13.4 percent, higher than that of Japanese FDI(12.3 percent). And this trend of relative decreases and increases continued through 1995, with the results that the share of outward portfolio investment shot up to 30.6 percent and that Japanese FDI declined to 10.9 percent at the same time(Sheridan, 1995: 481-2).

---

corrected.

In view of this table, Sheridan's argument is clearly not invalid. However, there are many ways to measuring the significance of Japanese FDI. The first way is observing its time-series patterns by region, country, or industry, as has been presented above and been depicted by other scholars. The second way is similar to the one used by Sheridan. However, even Sheridan's method could be questioned. Her way of measuring the share is to divide the amount of outward direct investment by the total amount of assets, which tends to dilute the weight of outward direct investment. If one divides the share of outward direct investment by the "long-term assets" or the "private sector,"(numbers in the parentheses), then the percentages of the outward direct investment would increase though the shares of other categories, especially that of "overseas securities investment" would inflate, too. Even though the share of Japanese overseas investment in securities tends to be higher than that of Japanese FDI, it does not negate the patterns of Japanese FDI during the past decade.

The point is not to make relentless argument, but to suggest that there are many ways to measuring the significance of Japanese FDI(and those of other countries); that is, making international comparison with absolute value and the ratio of its value to GDP. For example, the value of Japanese FDI(stock) in 1967 was only 1.5 billion dollars, which was far fewer than those of other industrialized countries, such as the US(56.6 billion dollars). However, in 1992, the value of Japanese FDI rose to 250.4 billion dollars, higher than those of the United Kingdoms(221.2) and of Netherlands(131.7), two countries which,

Table 2-6 External Assets of Japan(1975-90, Percentage)

	End of 1975	***End of 1980***	***End of 1985***	***End of 1990***	***End of 1995***
Long-term Assets	55.5	55.1	68.8	59.0	61.6
Private Sector	42.0	41.7	60.4	52.4	43.1
Overseas direct investments	14.3	12.3	10.0	10.8	10.9 (21.3)
Trade credit on exports	11.7	6.1	5.4	2.5	1.5
Loans extended	8.5	9.3	10.7	7.0	5.9
Overseas securities investments	7.0	13.4	33.3	30.3	30.6
Other	0.5	0.5	1.0	1.7	2.0
Government Sector	13.4	13.4	8.4	6.6	10.7
Short-term assets	44.5	44.9	31.2	40.5	38.4
Private Sector	22.6	28.9	24.8	36.7	31.6
Government Sector	22.0	16.1	6.3	4.3	6.8
Total assets	100.0	100.0	100.0	100.0	100.0

Source: *Japan Statistical Yearbook*, various years.

traditionally, have been significant sources of FDI. Nevertheless, once one examines the ratio of the value of outward FDI to GDP, then Japan's performance has been lower(6.8 percent) than that of other industrialized countries, such as the United States(8.3 percent) and the UK(24.5 percent)(Dunning, 1995: 51). However, it also has been pointed out that, since 1985, the share of exports in Japan's GNP has been declining gradually while the ratio of FDI to GNP has been rising(Tokunaga, 1992a: 11).

In view of this issue, one might conclude that the significance of Japanese FDI depends on how one measures it, which casts doubt on the patterns described at the beginning of this chapter. However, outward direct investment is not an isolate capital movement, but one that triggers chain reactions. For one thing, outward direct investment with the purposes of finding cheaper labor, avoiding trade barriers, and developing local markets would activate corresponding trading patterns. For instance, establishing export platforms in several host countries might result in decreasing trade surplus with a certain country as well as inducing domestic relevant industries to produce and export capital goods to the host countries, which might increase trade surplus with the host countries. Also, many activities pertaining to outward direct investment could not be estimated by interpreting the data of a country's assets, such as the willingness of Japanese TNCs to accept minority-sharing investment and licensing, which could activate industrial upgrading in and transfer resources(management and technology) to the host countries. Besides, the overseas investment loans provided by the Export-Import Bank of Japan(JEXIM)

have been more and more substantial since the sixties(UNCTAD, 1995: 315, 317), which cannot be measured by examining the data about national assets, either, not to mention Japan's foreign aid which has been coordinated to support infrastructure investment in Asia. In other words, the significant patterns presented above should not be invalid if one considers the chain reactions triggered by Japanese FDI in particular and FDI from other countries in general.

The Reinvestment Patterns and Financial Sources of Japanese FDI

A related consideration pertaining to the significance of Japanese FDI, which also needs to be discussed, is the reinvestment patterns and financial sources of overseas affiliates of Japanese TNCs; they might also dilute the significance of Japanese FDI patterns described above. From Table 2-7, generally speaking, Japanese overseas affiliates have not relied solely on funds from their parent companies, but increasingly on reinvestment. The amount of reinvestment was 6.7 billion in 1989, far less than the direct investment in the same year. However, since then the gap has been gradually decreased, with the result that the amount of reinvestment(13.6) was slightly less than direct investment(13.8) in 1994. The increasing rates in Asian NIEs and the ASEAN four were even faster, with the results that the amount of reinvestment kept surpassing that of direct investment from 1992 to 1994. Does this mean that the significance of Japanese FDI has been overshadowed by the patterns and amounts of reinvestment?

Not necessarily. First of all, many factors and considerations underlie the patterns of reinvestment, such as profitability, financial environment, and firm

operation strategies. A firm is unlikely to reinvest if it has not been profitable in the host countries, if the financial environment has deteriorated, and if a firm does not have strategies to operate in a given country and the neighboring countries. Though the amounts of reinvestment surpassed those of Japanese FDI, it does not negate the fact that Japanese TNCs and their affiliates do view East and Southeast Asian countries as an important manufacturing base. One could even assert that the patterns might be an auxiliary support for the patterns of Japanese FDI presented above. As Ernst argues, the increase of reinvestment of Japanese overseas affiliates suggests the expansion of Japanese TNCs' regional production networks(Ernst, 1997b: 235). Moreover, according to the "Sixth Survey of Trends in Overseas Business Activities of Japanese Companies"(MITI, 1997), and Table 2-7, though the amount of Japanese FDI in China has been increasing and even higher than the Asian NIEs, the amount of reinvestment by Japanese overseas affiliates in the Asian and ASEAN NIEs has been far higher than the reinvestment made in China, which suggests that manufacturing activities are still important in these two groups of countries and that the financial environment is not as advanced as those of the Asian and ASEAN NIEs.

In addition, among the sources of reinvestment, the tendencies of financing locally are noteworthy. From Table 2-8, based on the survey of the JEXIM, one can see that Japanese overseas affiliates tend to rely more on their financial resources(e.g. loans and bonds, and so forth) than on the remittance of parent companies. For example, in 1989, 56.7 percent of Japanese affiliates in Asian

Tab
Indu

Wor
Di
R

Nort
Di
R

Euro
Di
R

Asia
Di
R

ASE
Di
R

Chir
Di
R

So
Not
see

Table 2-7 Trends in Total Investment by Japanese Affiliates(Manufacturing Industries, $ Billion)

	1989	*1992*	*1993*	*1994*
World				
DI	16.3	10.1	11.1	13.8
RI	6.7	12.5	11.8	13.6
North America				
DI	9.6	4.2	4.1	4.8
RI	3.0	4.1	4.4	4.3
Europe				
DI	3.1	2.1	2.0	--
RI	--	1.7	1.5	1.4
Asian NIEs				
DI	1.3	0.5*	0.6*	0.7*
RI	1.2	1.3	2.2	2.2
ASEAN 4				
DI	1.6	1.8	1.5	2.2
RI	1.1	4.3	2.8	3.4
China				
DI	--	--	1.4	1.9
RI	--	--	0.6*	0.9

Source: JETRO, http://www.jetro.go.jp/WHITEPAPER/INVEST97/f01.html
Note: numbers with asterisks are estimated since the source figure does not specify the exact numbers.

NIEs and 64.7 percent of their counterparts in the ASEAN countries obtained their capitals from local financial institutions. The contrasts in Europe and the United States are not that stark, but no less significant. In 1992, 58 percent of financial sources of Japanese overseas affiliates were raised outside the parent companies and the average share of obtaining capitals from financial institutions in host countries was 35 percent(UNCTAD, 1995: 142-3). These statistical data suggest that Japanese FDI patterns are not as significant as it has been described above.

Table 2-8 Financial Sources of Japanese Overseas Investment, 1989(Percentage)

	Sources		
Area	*Parent Companies*	*Overseas affiliates*	*Financial Institutions(branch)*
Asian NIEs	24.0	75.3(56.7)	0.7
ASEAN	17.3	81.5(64.7)	1.2
USA	28.4	65.3(45.6)	6.3
EC	22.0	66.8(50.2)	11.2

Source: Export-Import Bank of Japan, cited from Tokunaga, 1992b, pp. 159-62.
Note 1: Figures in parentheses indicate the percentages of "borrowing from local financial institutions."
Note 2: The survey was conducted in September-October 1989. Four hundred and thirty-seven questionnaires were sent out and 247 were completed and returned.

Nevertheless, as Tokunaga points out, there are many reasons why Japanese overseas affiliates tend to finance locally, rather than relying on remittance from parent companies. These include avoiding exchange loss and utilizing incentive policies provided by the host governments(Tokunaga, 1992b:

166). Also, in many cases, the affiliates obtain loans either from Japanese branch banks in host countries or under the guarantee of Japanese banks in Singapore or Hong Kong(Tokunaga, 1992b: 165-6).

Again, this phenomenon does not necessarily negate the above-mentioned patterns. First, according to the eighth survey of JEXIM, which includes the cases of Asian NIEs and the ASEAN countries, Japanese overseas affiliates seem to rely more on remittance from parent companies in 1996. For affiliates in Asian NIEs and the ASEAN counties, 53.3 and 43.3 percents of funds obtained by Japanese affiliates were channeled from parent companies, respectively. Japanese affiliates in China even obtained 83.9 percent of their funds from parent companies(Nakatani et. al., 1997: 7). These phenomena suggest a somewhat different picture from that provided by the 1989 survey. This does not mean that Japanese overseas affiliates have tended to rely on remittance from parent companies recently, but imply that the distribution of capital sources hinges on various conditions and factors year by year. As the 1996 survey reasons, the pattern of obtaining more funds from parent companies might result from the fact that they had more new projects in FY 1996 and that it was difficult to finance locally in China(Nakatani et. al. 1997: 8).

Second, from another perspective, the JEXIM survey are not always based on random sampling, but on intentional selection, designed to cover most sectors, regions, and scales of Japanese firms that have invested overseas. Therefore, it is hard to say whether the survey results represent all Japanese firms that have made overseas investment. Usually, the completed and returned

questionnaires are roughly a half of all the questionnaires sent out.[4] This is not to say that the survey results are not dependable, but to accentuate that they do not definitely contradict the Japanese FDI patterns described at the beginning of this chapter. Other evidence is needed to see if Japanese total overseas investment(reinvestment and direct investment) demonstrates the trend of establishing East and Southeast Asia as a major manufacturing base.

III. Trade Patterns

The conventional trade patterns in Asia-Pacific region, especially the patterns in the group constituted by Japan, Asian NIEs, Southeast Asian countries, as well as the United States, had been a triangular trade structure from the seventies to the early nineties. Generally, two features in the triangular trade patterns stand out. First, the main export destination of Asian countries has always been the United States, so much so that Japan and other Asian developing countries have run huge trade surpluses with the US and their exports have been extremely dependent on the U.S. market. Second, while promoting export-oriented and import-oriented industrialization, the inducement effect has made the Asian developing countries import intermediaries and capital goods from more industrialized countries, especially from Japan. According to the "Survey of Trends in Overseas Business Activities of Japanese Companies" of FY 1993, the export inducement effect has surpassed the total of

---

[4] The return rate of the 1989 survey is 56.5 percent and that of the 1996 survey

export substitution effect. That is, while the Asian industrializing countries have been exporting goods previously exported by Japanese domestic factories(export substitution), the ratio of capital goods exported for local firms to total capital goods exported increased from 30.6 percent in 1991 to 35.9 percent in 1995, with ups and downs from 1992 to 1994. It is also estimated that the inducement effect has been higher than the export substitution effect and indicated that Japan has absorbed the reverse imports of finished goods from Japanese overseas affiliates(MITI, 1994). This pattern and the fact that Japan has been very slow in absorbing exports from the US and Asian countries not only have made most trading partners of Japan run chronicle trade deficits with her, but also the Asian developing countries depend on Japanese technologies(Kwan, 1994: 106-8).

Has the conventional triangular trade structure changed because of the yen appreciation, the rise of protectionism in the United States and the increasingly integrated European Union, and, especially, the presumed substitution effect resulting from Japanese FDI in the manufacturing sectors in various host countries? Theoretically, the yen appreciation should have weakened the competitiveness of Japan's exports and decreased Japanese trade surplus as the strong yen should have made her more willing to import more; the rise of protectionism in the American and European markets should have decreased

---

59.8 per cent. See Tokunaga(1992b: p. 158) and Nakatani et. al.(p. 3).

the imports of goods made in Japan; and Japanese FDI to the manufacturing sectors in industrialized and industrializing countries should have increased the exports of these countries and have decreased the imports of similar products made in Japan.

The realities have not totally followed the paths prescribed by theoretical reasoning. Features and new facets from the latter half of the eighties have persisted into the first half of the nineties.

Continuance and Changes of the Triangular Trade Patterns

To begin with, the asymmetric trade deficit structure has not changed dramatically, but some facets are noteworthy. From Table 2-9, one can see that Taiwan, Korea, China, the ASEAN four, as well as the United States have been running trade deficits with Japan, except for the ASEAN four in 1988. Note that Indonesia has been running trade surplus(not shown in the table) with Japan because of her exports of natural resources to Japan. Even so, Indonesian trade surplus with Japan has not been able to slow down the pace of trade deficits of the ASEAN four. Taiwan, the ASEAN four, and Japan have been enjoying trade surplus with the United States as usual, but Korea's and Taiwan's trade surplus with the United States has declined since 1989; Korea even has begun to run deficits with the U.S. since 1991. Nevertheless, China's trade deficit with the United States has ameliorated since 1990; she even has begun to enjoy trade surplus with the United States since 1993, which partly reflects the fact that the trade surpluses experienced by Taiwan and Korea have been transferring to China(and the ASEAN countries) because of the FDI made by Taiwanese and

Tabl
Milli

1993
1993
199
199
199
199
199

1993
1993
199
199
199
199
199
Sou
Ser
Not
Tot

Table 2-9 Trade Balance of Developing Asian Countries(1988-1994, $ Million)

	Trade balance with Japan				
	Taiwan	*Korea*	*ASEAN 4*	*China*	*US*
1988	-6,053	-3,843	1,386	-3,016	-55,508
1989	-6,966	-4,000	-909	-2,139	-52,526
1990	-7,660	-5,936	-4,031	1,554	-44,485
1991	-9,699	-8,764	-6,333	220	-46,863
1992	-12,872	-7,859	-7,792	-1,987	-51,717
1993	-14,221	-8,452	-11,370	-7,521	-62,468
1994	-14,564	-11,867	-18,070	-4,829	-68,989
	Trade balance with US				
	Taiwan	*Korea*	*ASEAN 4*	*China*	*Japan*
1988	10,460	8,772	3,278	-3,234	47,978
1989	12,033	4,758	4,459	-3,450	45,701
1990	9,134	2,500	3,093	-1,277	39,858
1991	8,207	-296	2,914	-1,812	38,566
1992	7,800	-197	5,604	-304	44,023
1993	6,761	210	7,266	6,343	50,955
1994	6,294	-1,026	10,424	10,788	55,626

Source: IMF, Direction of Trade Statistics Yearbook, 1995; Taiwan's data are derived from CEPD, *Taiwan Statistical Data Book*, 1994.
Note 1: The ASEAN 4 refers to the Philippines, Malaysia, Thailand, and Indonesia.

Korean firms since the mid eighties. In other words, generally, the United States has been staying on an inferior status even though there have been some trade balance changes with individual trading partners. The constant features notwithstanding, some changes within the trade triangle are occurring, the most important of which is the decreasing export dependency of the East Asian NIEs, especially Taiwan and Korea, on the United States or North American market.

Some have argued that, in the triangular trade patterns, Japan and East as well as Southeast Asian NIEs depend on the U.S. market, causing deterioration of the trade imbalance between the United States and those countries. What is worse is that the triangular trade patterns have covered Japan's trade surplus with the United States because Japan has used other Asian industrializing countries as their export platform(Hatch and Yamamura, 1996: 189-91). Table 2-9 shows that both Taiwan and Korea have run decreasing trade surpluses with the United States, but Table 2-10 suggests that the intensities of Taiwan's and Korea's exports to the United States have been decreasing. In Taiwan's case, the intensity decreased from 38.7 percent in 1988 to 21.4 in 1994, with the exception in 1991(40.8 percent). The intensity of Korea's exports to the United States has declined gradually, too.

Certainly, it could be argued that this picture presented by the data is deceptive since it is influenced by the export substitution effects. That is, the loss of export amounts and intensity of Taiwan and Korea has been transferred to China and the ASEAN countries because Taiwanese and Korean firms have been making substantial FDI in these countries, which makes them increase

Tab
Co

| Ex
to | | |

Table 2-10 Intensity of Export Destination and Import Source of Asian Countries(1988-1994)

Export to	***Japan***				***US***			
	Taiwan	*Korea*	*China*	*ASEAN 4*	*Taiwan*	*Korea*	*China*	*ASEAN 4*
1988	14.5	19.8	16.9	23.7	38.7	35.4	7.1	22.3
1989	13.7	21.8	15.9	23.9	36.3	33.4	8.3	23.5
1990	15.2	19.4	14.6	23.7	32.2	30.0	8.5	22.7
1991	12.1	17.2	14.3	22.7	40.8	25.9	8.6	21.4
1992	10.9	15.1	13.7	20.1	28.9	23.6	10.1	23.3
1993	10.6	14.1	17.2	19.1	27.7	22.1	18.5	23.6
1994	11.0	14.1	17.8	19.0	26.2	21.4	17.7	24.9
Import From	***Japan***				***US***			
1988	29.8	30.6	20.0	23.2	26.2	24.5	12.0	16.3
1989	30.7	28.5	17.8	24.3	23.0	25.7	13.3	15.1
1990	29.2	26.6	14.2	24.4	23.0	24.3	12.2	14.7
1991	30.0	25.9	15.7	24.8	22.5	23.2	12.5	14.8
1992	30.2	23.8	16.7	24.6	21.9	22.4	10.9	14.9
1993	30.1	23.9	22.5	25.7	21.7	21.4	12.3	15.0
1994	29.0	24.8	22.8	27.2	21.1	21.1	10.1	14.1

Source: Calculated from IMF, Direction of Trade Statistics Yearbook, 1995; CEPD, Taiwan Statistical Data Book, 1994, 1996.
Note: Trade intensity is the ratio of bilateral trade to the total trade of a country.

exp

pla

11.

and

10

has

NE

ASE

pa

co

sc

he

Tab

exports of capital goods to those host countries and use them as export platforms, just like what Japan has been doing. However, according to Table 2-11, from 1985 to 1991, the export shares of the NIEs to the NIEs, the ASEAN, and the EC increased from 9.3 to 13.6 percent, from 7.5 to 9.0 percent, and from 10.7 to 15.8 percent, respectively, while the export share of the United States has declined from 34.8 to 24.6 percent. These patterns not only suggest that the NIEs have tried to diversify their export destination, but that the NIEs and the ASEAN countries have developed closer regional trade networks, a topic dealt with in Chapter Three.

In view of these phenomena, one could argue that the triangular trade patterns tend to increase trade imbalance between Japan and other Asian industrializing countries, on the one hand, and the US, on the other, is somewhat exaggerated. These patterns of change can be seen more clearly in the case study of Taiwan in the next chapter, which deals with the outward direct

Table 2-11 Destinations of NIEs exports and origins of NIEs imports(Percentage)

	NIEs		***ASEAN***		***Japan***	
	Ex.	*Im.*	*Ex.*	*Im.*	*Ex.*	*Im.*
1985	9.3	8.2	7.5	9.7	10.0	22.8
1991	13.6	10.8	9.0	8.6	10.5	22.8
	US		***EC***		***Other***	
	Ex.	*Im.*	*Ex.*	*Im.*	*Ex.*	*Im.*
1985	34.8	16.9	10.7	10.8	27.7	31.6
1991	24.6	16.5	15.8	12.1	26.5	29.2

Source: JETRO, *White Paper on International Trade*, 1993, p. 15.

investment and trade patterns of Taiwan.

Nevertheless, most trading partners of Japan still run serious trade deficits with her, which needs further reasoning.

Many factors, especially those pertaining to Japanese FDI, contribute to Japan's on-going trade surplus with most of her partners in the developing Asia and North America. Yen appreciation is probably be most direct cause for the trade deficits of the developing Asian countries since the appreciation has increased the prices of capital goods, intermediaries, and finished goods imported from Japan. However, it might not explain the worsening of the American trade deficit with Japan since the yen appreciated during 1993 and 1994, a trend that has not stopped the growth rate of the trade deficit. In addition, though Japan has been forced to set voluntary export restraint(VER) on many goods she exports to the United States, such as autos, VCRs, and semiconductors, and though the 1989 Structural Impediment Initiative(SII) intended to set barriers against Japanese exports, the protectionist measures adopted by the United States seemed to have collected few advantages.

Yen appreciation might have its positive effects since it would be cheaper to import finished goods, components, and parts from the Asian developing countries that have hosted many Japanese and local manufacturers. Hatch and Yamamura point out a time when Taiwanese and Korean products seemed to be able to raise the amount and value of their exports to Japan's domestic market, but the good old days were very short, not only because the New Taiwan Dollar and the Korean Won were forced to appreciate, too, but because of the

fundamental barrier; that is, most of the exports from the Asian developing countries to Japan have been exports of Japanese affiliates or related to Japanese firms. According to their sources, from the mid to late eighties, 70 percent of exports from the Asian NIEs were made by Japanese affiliates. Also, the World Bank estimated that "97.5 percent of electrical and electronic machinery exports" to Japan were made by Japanese affiliates located in Asia(Hatch and Yamamura, 1996: 181-2; Dobson, 1993).

The second cause contributing to the asymmetrical trade balance in the trade triangle would be the inducement effect. Many scholars who use input-output tables to analyze the correlation between the industrialization of the Asian developing countries and the corresponding output of Japan have indicated that the more the industrializing countries promote industrialization, the more they will need to depend on capital goods and intermediaries imported from Japan. The Korean shipbuilding industry is a good example(Hirata and Nohara, 1989: 437-9).

What made the trade deficits worse is the procurement and sales practices of Japanese TNCs and their affiliates as well as the technology dependency on Japanese firms. From Table 2-12, one can see that, Japanese foreign affiliates tend to import components and intermediaries outside while American ones tend to purchase needed parts and components locally. In both 1989 and 1992, the shares of local purchase of Japanese foreign affiliates maintained at 63 percent while the percentages of American foreign affiliates stayed around 90 percent.

Table 2-12 Purchases of Japanese and American TNC Parent and Foreign Affiliates(Percentage)

	Japanese		*American*	
	1989	*1992*	*1982*	*1989*
Parent Firms				
Imports	15%	12%	11%	14%
Local Purchases	85%	88%	89%	88%
Foreign Affiliates				
Imports	37%	37%	7%	8%
Local Purchases	63%	63%	93%	92%

Source: UNCTAD, *World Investment Report*, 1995, pp. 202-3.

From Table 2-13, one can also see that, though the share of local procurement by Japanese Asian affiliates was 49.8 percent in 1989, higher than the share(42.2 percent) in 1980, the shares of procurement sources actually vary by sectors. Usually the sectors that require higher technology capabilities and skills would source more from Japan than from local suppliers, such as iron and steel as well as various sub-sectors of machinery. In contrast, in the sectors that require lower skills and capabilities, need raw materials, or target local markets, the shares of local sourcing tend to be higher, such as food, textiles, and chemicals.

When Japanese foreign affiliates prefer to import needed parts and capital goods from parent firms because of the specifications of the products to be manufactured and when the firms in the host countries have encountered technical bottlenecks, then it certainly would cause deterioration to the trade balance of the host countries with Japan. Giant, a famous Taiwanese bicycle

maker, is a good example. Though capable of manufacturing high-value added bicycles, such as mountain bikes and sports bikes, Giant must import key components, such as selectors, from Shimano, a Japanese bicycle components supplier, because the customer demands the products to be made according to Japanese special specifications. As a result, Taiwan imported bicycle-related components and products valued at 13.4 million dollars, and the share of Japanese products in Taiwan's bicycle market reached 62.4 percent in 1996(Chu, 1997). Taiwan's notebook industry is also a good example. Though having the leading notebook computer manufacture sector, Taiwanese manufacturers of notebooks still need to import large quantities of liquid crystal displays(LCDs),[5] one of the most important key components of notebook computers, from Japan. The value of the import could reach 2.1 billion dollars(equal to one-sixth of Taiwan's trade surplus in 1996) in the year 2000 if Taiwanese manufacturers are unable to radically decrease the imports of LCDs(Wang, 1997b: 172).

---

[5] Taiwanese producers are already able to make STN LCDs, whose technology and quality are lower than TFT LCDs. They are also trying to promote mass production of TFT LCDs.

Tabl
Firm

Man
Food
Text
Woo
Pulp
Che
Iron
Non-
Meta
Gene
Mach
Elec
Mach
Tran
Mach
Prec
Mach
Petr
& Co
Othe

Table 2-13 Procurement and Sales of Asian Affiliates of Japanese Firms(1989, Percentage)

	Local Market		***Japan***		***Other Asia***	
	Procure-ment	*Sales*	*Procure-ment*	*Sales*	*Procure-ment*	*Sales*
Manufacture	49.8a	63.9	38.9	15.8	6.1	9.7
Food	87.7	66.9	3.3	16.1	4.3	9.8
Textiles	43.1	70.5	22.4	14.9	6.4	8.1
Wood and Pulp	92.8	34.4	2.3	35.9	4.4	20.2
Chemicals	56.3	78.1	34.7	10.3	1.9	8.8
Iron and Steel	36.0	87.7	56.1	4.2	4.3	4.2
Non-ferrous Metals	59.3	73.3	18.1	12.1	4.3	12.8
General Machinery	53.6	56.9	42.5	18.2	3.2	5.9
Electrical Machinery	42.4	37.4	44.6	26.9	12.5	16.7
Trans. Machinery	57.7	92.1	41.8	1.6	0.1	2.2
Precision Machinery	42.1	55.0	45.2	22.2	11.0	7.8
Petroleum & Coal	89.5	100.0	10.5	0.0	0.0	0.0
Other	36.0	78.5	48.4	12.1	7.3	4.3

Source: Urata(1993: p. 290.)
a. in 1980, it is 42.2%.

Nevertheless, a survey conducted by the NRI found that some progress has been made. In the electronics sector, the ratios of local content on many items are amazingly high(Table 2-14), though how these ratios are calculated would be questioned. Some argue that, even though sourcing locally, Japanese firms actually procure from other Japanese affiliates in the host countries(Borrus, 1993). For example, it is reported that 97 to 98 percent of components for radio-cassette players manufactured in Singapore were procured locally, but 80 percent of them were from Japanese subsidiaries(Ono, 1992: 41).

On the other side of the coin, the data available suggest that Japanese overseas affiliates tend to target local markets. From Table 2-15, which is based on the MITI's survey, one can observe that, in 1993, the primary target market of Japanese overseas affiliates in the NIEs, the ASEAN, and China, was local markets, followed by Japan's market. According to Table 2-13, the patterns were more salient in 1989. In most sub-sectors of the manufacturing sector(except that of wood and pulp), the shares of local sales were higher than those of Japan and other countries. This suggests that the sales patterns pertain more to the strategies of Japanese TNCs and that Japan has not been willing or unable to open her domestic market though the JETRO and other Japanese institutions claim that reverse imports from the host countries to Japan have been increasing(JETRO, 1996b).

Table 2-14 Local Content Ratios in ASEAN

Product	*Place of Production*	*Local Content Ratio*
Mini/Midi hi-fi stereo	Singapore/Malaysia	Over 90%
VCR(standard model)	Malaysia & Singapore	Around 80%
CD radio-cassette recorder	Malaysia & Singapore	Around 90%
Radio-cassette recorder(standard model)	Malaysia	Almost 100%
Radio-cassette recorder(standard model for export)	Indonesia	50%
Mini hi-fi stereo	Indonesia	Around 40%
Color TV	Malaysia	50 to 60%
	ASEAN	80 to 90%
Air-conditioner	Malaysia	Around 80%
	ASEAN	Around 90%
Electronic parts	Singapore/Malaysia	50 to 60%
	ASEAN	70 to 80%

Source: Nomura Research Institute(August 1993, December 1994), cited from Ohta et. al.(1995: p. 50.)

Table 2-15 Target Markets of Japanese Foreign Affiliates(1993, Percentage)

	Local Market	*Japan*	*Asia*	*Europe*	*North America*	*Others*
NIEs	57.0	17.9	10.9	5.0	8.8	0.4
ASEAN	50.3	17	9.8	5.4	15.8	1.9
China	33.3	28.9	15.5	8.5	11.2	2.8

Source: MITI, "Percentages of Sales of Locally Incorporated Enterprises in NIEs, ASEAN 4, and China, by Region." http://www.jef.or.jp/news/tab/gif/n33-1.gif. From " Summary of 'The 24th Survey of Trends in Overseas Business Activities of Japanese Companies.'" http://www.jef.or.jp/news/tab/N-96-20.html

The Catch-up Product Cycle

As important as the continuance and changes within the trade triangle is the trajectories of leading and catching up in the contemporary flying geese formation.

As has been specified by Akamatsu, the industrial development of a country could be observed by investigating her trade content. Yamazawa extends Akamatsu's specification, dividing the catch-up product cycle into five stages: introductory, import substitution, export, mature(declining domestic demands and exports), and reverse imports(importing products which have been produced domestically) stages. The last stage extends beyond Akamatsu's thesis, partially corresponds to a stage specified in Vernon's original thesis of product cycles, and draws from the contemporary Japanese experience(Yamazawa, 1990: 27-30).

Analysts can use a variety of ways to measure the catch-up product cycle. The simplest is to examine import and export changes. Using this measure, it could be argued that the catch-up product cycle in the contemporary flying formation begins from Japan, the leading country of the formation. From 1910 to the mid 1950s, the export of textiles made up one-third of Japan's total exports. Now its share in Japan's exports has declined to 3 percent(Abegglen, 1994: 214). Urata's account also indicates that the combined shares of food, textiles(labor intensive), and chemicals have declined since the peak in the fifties(over 30 percent) while the share of iron and steel industry exports(capital-intensive) had risen to the peak and then declined to 5.4 percent in 1987. Also, the shares of electrical machinery and transport equipment(human-capital intensive) rose when the iron and steel industry declined(Urata, 1991: 176-7).

The catch-up product cycle does not merely operate within one country; it also occurs in a group of countries. Table 2-16 shows that the share of Japanese textile exports was 9.3 percent in 1980, the second high in the world. Since then, Japan's share declined to 5.6 percent in 1990 and further down to 4.6 percent in 1996. In the meantime, Japan's importing of textiles has been slowly increasing while the export shares of both Taiwan and Korea have been rising during the same period. Taiwan's export share has increased from 3.2 percent in 1980 to 8.0 percent in 1996 while Korea's share from 4.0 percent in 1980 to 8.5 percent in 1996. This pattern suggests that Taiwan and Korea have been catching up with Japan and other advanced countries, such as Germany and the U.S., in textiles exports.

Table 2-16 Japan, Taiwan, and Korea as Leading Exporters and Importers in the Shares of the World(1980, 1990, 1996, Percentage)

	1980		1990		1996	
Textiles	*Ex.*	*Im.*	*Ex.*	*Im.*	*Ex.*	*Im.*
Japan	9.3	3.0	5.6	3.7	4.6	3.9
Taiwan	3.2	--	5.8	--	8.0	--
Korea	4.0	0.7	5.8	1.8	8.5	2.4
Clothing						
Japan	--	3.7	--	7.6	--	11.5
Taiwan	6.0	--	3.7	--	2.0	--
Korea	7.3	--	7.3	--	2.6	--
Iron & Steel						
Japan	--	--	4.4	--	3.7	--
Taiwan			1.3		2.2	
Korea			5.5		4.0	
Chemicals						
Japan	4.7	4.2	5.3	4.9	6.1	4.6
Taiwan	--	1.3	--	2.2	--	2.6
Korea	0.5	--	0.8	--	1.9	--
Mach. & Trans. equip.						
Japan	14.5	1.6	16.7	2.9	14.4	4.2
Taiwan	0.9	--	2.2	--	3.0	--
Korea	0.7	1.0	2.1	1.9	3.4	2.7
Office mach. & Telecom.						
Japan	21.1	2.6	22.4	3.6	15.0	6.7
Taiwan	3.2	1.4	4.7	2.4	5.7	2.9
Korea	2.0	1.3	4.8	2.5	5.1	2.9
Automotive products						
Japan	19.8	0.5	20.8	2.2	15.9	2.6
Korea	0.1	--	0.7	--	2.5	--

Source: World Trade Organization, 1997.

The catch-up product cycle has not limited to light or labor-intensive industries. On the part of machinery and transport equipment, Japan's share has been fluctuating from 14.5 percent in 1980, 16.7 percent in 1990, to 14.4 percent in 1996. Both Taiwan's and Korea's shares have been rising from less than 1 percent to over 3 percent. This contrast suggests that Japan's share of machinery and transport equipment has been maturing whereas Taiwan and Korea are catching up. The catch-up product cycle of Taiwan and Korea is even more salient in office and telecommunication equipment; both show steady growth while Japan's share has declined from 21.1 percent in 1980 to 15.0 percent in 1996.

As is specified by Yamazawa(1990), the last stage of the contemporary catch-up product cycle is reverse imports. Not only have the Asian industrializing countries caught up with Japan in the production of standardized goods, but they have exported those goods to Japan. Some indicated that Japan has been a net importer of refrigerators, color TVs, and others(Fukushima and Kwan, 1995: 30). Meanwhile, Japanese firms engaged in manufacturing information equipment have relied increasingly on importing IT goods from Taiwan through procurement, original equipment manufacture(OEM), and original design manufacture(ODM). Not only did the growth rate of Taiwanese-made computer products sold in Japan reached 220 percent from 1994 to 1995, but computer products have been the mainstay of Taiwanese exports to Japan since the early nineties(WTDB, 1996c; 1996b).

A more sophisticated way to calculate the specialization index of a certain

industry has been adopted by Kwan and others. To calculate the index, the first step is to derive the difference between the export and import values of a good. Then divide the difference by the sum of the values of import and export of the good in question.(index=exports-imports/exports+imports of a good in industry K)(Kwan, 1994: 84). Based on the indices in major industries, such as primary commodities, other manufactured items, and machinery, Kwan categorizes the industrial stages and status of major Asian countries.(See Table 2-17.)

Table 2-17 Major Products of Countries at Different Industrial Stages

Stage	***Sectors***					
1	Primary	>	Other	>	Machinery	***Indonesia, Thailand***
2	Other	>	Primary	>	Machinery	***Philippines***
3	Other	>	Machinery	>	Primary	***Hong Kong, Korea***
4	Machinery	>	Other	>	Primary	***Singapore, Japan***

Source: Kwan(1994: p. 85.)
Note 1 : 1 indicates developing country stage; 2 young NIEs stage; 3 mature NIEs stage; and 4 industrialized stage.

Using this reference table and the results of his calculation, Kwan finds that Japan has been a mature NIE since 1965, that Hong Kong and Singapore became mature NIEs in the sixties, that Taiwan and Korea have become mature NIEs since the eighties, and that the ASEAN countries(except Singapore) and China would step toward the status of young NIEs and become mature NIEs after the year 2000(Kwan, 1994: 89-90).

Skeptics might argue that, in addition to revealing the industrializing trajectories of the newly industrializing countries in catching up with Japan, the above-mentioned specialization indices do not explain the mutual relationships between Japan and other Asian industrializing countries. This doubt could be partially solved by calculating the intra-industry trade(IIT) indices of Japan with her trading partners.[6] To calculate the index for a type of good, first derive the difference of the exports and imports of an industry. Then divide the absolute value by the sum of the exports and imports of the good. Finally, compute the difference between 1 and the quotient. The formula is like this:

Intra-industry trade index for a good=1-|Xk-Mk|/Xk+Mk;

where Xk denotes the export of k good by Japan to a trading partner and Mk the import of k good from the trading partner(Kwan, 1994: 93).

According to this formula, the higher the end result, the more integrated the intra-industry trade of a good is between Japan and the trading partner in question. The reasoning is that, when the difference of the export and import of a good between Japan and the trading partner is small, it indicates that the trading of a certain good between Japan and the trading partner is balanced, which minimizes the value of the numerator and thus maximizes the final value.

Table 2-18 lists the intra-industry trade indices of Japan with her main

---

[6] Various economists have concocted different and complicated formulas to calculate IIT index. Here the author will only introduce the simplest one for the purpose of illustration.

trading partners. On the manufacturing part, Japan's intra-industry indices with Taiwan, Korea, the United States, and the European Community(European Union) show steady growth, except for China, which shows violent fluctuations, and, to a lesser extent, Korea. These patterns suggest that, generally, Japan's intra-industrial relationships with her main trading partners have been increasingly integrated.

When one changes focus to the sub-sectors of manufacturing segment, Japan's intra-industry trade indices with her main trading partners show interesting contrasts. In the textiles sector, Japan's indices with Taiwan, Korea, and the U.S. have been increasing while Japan's with the EC has been decreasing over fifteen years. Japan's indices with China show fluctuations but it finally grew to 0.95 in 1996. These patterns suggest that, while declining in Japan's manufacturing sector, Japan's textile industry is developing certain relationships of division of labor with Taiwan, Korea, the EC, and so on, so much so that the quotient(Xk-Mk) becomes lower(more balanced), which makes the indices higher.

With regard to machinery and transport equipment, the growth of the indices are even more salient. In China's case, it has risen from virtually 0 in 1980 to 0.71 in 1996. In electrical machinery, Japan's indices with Taiwan and China have been growing over the past one and a half decades while Japan's with the U.S. and the E.C. have been fluctuating. In Korea's case, the indices have been declining.

Table 2-18 Intra-industry Trade Indices of Japan and Trading Partners(1980, 1990, and 1996)

Manufacture	***Taiwan***	***Korea***	***US***	***EC(EU)***	***China***
1980	0.42	0.61	0.47	0.54	0.31
1990	0.56	0.72	0.50	0.71	0.99
1996	0.62	0.60	0.64	0.81	0.31
Textiles					
1980	0.87	0.77	0.50	0.90	0.88
1990	0.83	0.97	0.70	0.76	0.70
1996	0.95	0.94	0.85	0.63	0.95
Machinery & Trans. equip.					
1980	0.21	0.26	0.32	0.32	0
1990	0.35	0.35	0.36	0.43	0.29
1996	0.60	0.47	0.51	0.57	0.71
Electrical machinery					
1980	0.21	0.48	0.67	0.49	0
1990	0.42	0.44	0.55	0.40	0.63
1996	0.47	0.35	0.69	0.48	0.98

Source: Calculated from WTO(1997) and GATT(1990-1)
Note 1: The data of EU in 1996 include fifteen member countries.

Before ending the discussion in this section, three points should be made clear here.

First, the data suggest that, at the same time the intra-industrial trade relationships between Japan and the middle countries within the flying geese formation have been strengthening, the same relationships between Japan and the U.S. have been no less strong, which indicates the connections between the U.S. and the leading goose, on the one hand, and the openness of the flying geese formation, on the other.

Second, the indices with the EC(EU) are aggregate values, which might not be dependable for making comparisons on country-specific bases. If one calculates Japan's indices with individual member countries of the community, then the values might be lower or higher, depending on each member's trading interaction with Japan. However, without detailed and comparable data sets, no further inferences could be made here.

Third, the data about the ASEAN are not listed here due to the unavailability of comparable data. However, according to the author's calculation, based on Japanese official statistical yearbook, Japan's indices with the ASEAN 5(the ASEAN four and Singapore) in the sector of machinery has risen from 0.16 in 1989 to 0.98 in 1995; her indices with the same groups in the textile industry has increased from 0.26 in 1989 to 0.99 in 1995. These figures might not be comparable to the data presented above, but they could be taken as reference.

In view of this evidence and related arguments, Japan, the Asian NIEs, and the ASEAN four not only demonstrate the picture drawn by Akamatsu, but also

display their group relations in the flying geese formation in terms of the changing trade contents, which, in turn, suggests their hierarchical industrial levels and the catch-up product cycle in the East Asian flying geese formation(Yamazawa, 1990: 35-6). Moreover, most of the East Asian and ASEAN industrializing countries, including young and mature ones, happen to be the main host countries of Japanese FDI in comparison to other developing countries.(Refer to Table 2-1, 2-2, and 2-5) Also, Japanese FDI happens to be significant in each of the countries in comparison to other sources of inflow FDI since the mid eighties.

IV. Dynamic Regionalization of Japanese Production Networks

Conceptual Framework

Not surprisingly, the pros and cons of the flying geese model hold opposite views regarding the dynamics of regionalization of Japanese production networks. Critics contend that the regionalization of Japanese manufacture firms has been just a copy or extension of Japanese production networks, namely, the *keiretsu*, Japanese-style enterprise groups revolving around core group banks, which provide financial resources and participate in management of group firms. Since the structural relationships within the *keiretsu* exclude outsider competitors and exploit suppliers by suppressing prices and by demanding product quality harshly, the regionalization of Japanese manufacture firms would simply extend these oppressive relationships to subcontractors and suppliers in other countries that have received substantial Japanese FDI(Bello, 1993; Hatch and Yamamura, 1996: 167-70; Hatch and Yamamura, 1997).

Supporters and sympathizers of the flying geese model argue that the regionalization of Japanese production networks has been a complementary and learning process. Investigating the overseas production patterns and frameworks of division of labor practiced by Japanese auto and electronics makers in Southeast Asia, Hill and Fujita conclude that the regionalization of Japanese manufacturing firms in East and Southeast Asia has been complementary and interdependent(Fujita and Hill, 1997: 328; Hill and Fujita, 1997). Ernst also states that the dichotomy of exclusive Japanese *keiretsu* and open American production networks only applies to the period of 1986-1992. During that period, Japanese manufacturing firms just began to learn how to transplant their production networks overseas in large scale. Therefore, they naturally tried to strengthen central control and follow their old practices. However, after accumulating experience in overseas investment and production, Japanese firms have begun to open their production networks, learn how to use different industrial settings, and utilize incentives and preferential treatment practiced in the host countries. In other words, the overseas production of Japanese firms has been characterized by evolving, learning, and adapting(Ernst, 1997b: 211, 215).

It is argued here that the regionalization of Japanese manufacturing firms has been like what the supporters and sympathizers have described. That is, it has been increasingly dynamic, evolving, and adapting because of subjective considerations of the TNCs and objective factors or pressures(the policies and incentives of the host governments, the growth of supplier networks and the

technical capabilities of the host economies, as well as the macroeconomic conditions), which is supported by the evidence available.

Generally, the levels of regionalization of firms and industries in question could be observed by investigating what parts of the production process have been relocated overseas and how those firms organize the value chains(Simon and Jun, 1995: 211; UNCTAD, 1993: 116, Box V.1), or commodity chains formulated by Gereffi(1994: 215-8; 1995: 121-32).

From Figure 1-3 in the first chapter and the Japanese overseas production patterns delineated by various scholars(UNCATAD, 1993: 115-77; UNCTAD, 1995: 191-264; Aoki, 1992: 89), one could distinguish three levels of regionalization of production networks. Depending on the sophistication and completeness of backward as well as forward linkages, the Japanese regionalization could be categorized as short-, middle-, and long-range cruise.

In short-range cruise, a specific firm sets up affiliates in host countries, which either situate inside or outside export-processing zones(EPZs), to manufacture goods for domestic, host, or the third markets. The considerations include cutting production costs for standardized products and circumventing protectionism of the host or the third countries. In the case of cutting costs, it could be either passively finding cheaper labor and materials, or actively taking advantage of incentives and preferential treatment. At this stage, forward and backward linkages are not established very well, either because key components and capital goods are imported from home country or a third country, or because host countries have not developed supporting industries.

However, under some circumstances favorable to the host countries, some forward and backward linkages could be built if firms in the host countries have managed to produce required components and capital goods and if local firms control domestic marketing channels. This development could trigger the beginning of middle-range cruise provided that affiliates set by a firm in a group of host countries begin to construct networks of division of labor in terms of procurement, manufacturing, and distribution.

Middle-range cruise is the upgrading of short-range cruise. Backward and forward linkages of the host industrial structures have been burgeoning thanks to the effort and cooperation of firms and governments of the host countries(R&D, incentives, and protectionist policies), on the one hand, and macroeconomic factors(the changes of exchange rates), on the other. Not only have the firms of host countries been able to provide certain key components, produce intermediaries, as well as deepen control on marketing channels, but some research and development functions have been transferred to host countries to utilize skilled labor of the host countries. Also, the overseas affiliates and plants established by the TNCs are no longer limited to separate host countries, but based on considerations of building regional division of labor, which incorporates overseas affiliates and plants in various host countries within a region or across regions to specialize in parts of a product and sections of the production process. At this stage, all or the majority of overseas affiliates and, to some extent, non-Japanese firms cooperating with Japanese TNCs are still directly or indirectly controlled or conditioned by the parent company and

headquarters situated in Japan.

Long-range cruise is a further integration of international production. Not only have TNCs and firms in the host countries developed a hybrid and combinatory production networks in terms of R&D and supply chains, but the TNCs of the home country have constructed regional division of labor based on economic connections among countries with regional headquarters dealing with specific product lines(e.g., the Asian headquarters of General Electronics), specializing in specific functions(e.g., Sony International in Singapore dealing with procurement), or coordinating production networks in each region or across regions(e.g., the headquarters of NEC in Singapore)(UNCTAD, 1993: 135-8). From the moment the TNCs establish regional headquarters to coordinate cross-border production networks and transfer part of R&D tasks to the host countries, the long-range cruise has successfully upgraded from the conventional multi-domestic strategy and hub-spoke models exemplified by short- and middle-range cruise, stepping toward a more complicated stage of regional division of labor and globalization(Baba and Hatashima, 1995: 82-3; Hatch and Yamamura, 1996: 23-5). Moreover, the firms in the host countries, which have been receiving FDI form advanced or developed countries, begin to make outward direct investment in other developed or less industrializing countries to utilize cheap labor, circumvent market protectionism, or access advanced technologies, thus constituting complex and interactive networks of investment, trade, and production with the regional networks constructed by the firms from advanced countries.

Two groups of points could be derived from the framework; that is, the limitation and application conditions of the regionalization framework as well as the distinguishing characteristics of the regionalization of Japanese TNCs.

To begin with, this framework of value chain, commodity chain, or regional(cross-border) production networks does not evolve automatically, but hinges on complex circumstances resulting from different factors, such as macroeconomic factors in home and host countries, government policies, firm strategies, international economic climate, and so on. Nor are the three levels divided by clear boundaries. Sometimes, they overlap to some extent, especially in terms of shaping backward and forward linkages. The incubation of backward linkages could begin in any of the three stages or transitions by equity(joint ventures with majority or minority shares) and non-equity investment(OEM, subcontracting, technical cooperation, as well as technology and skill transfer). The building of forward linkages would start when suppliers and partners are capable of progressing to the level of own brand manufacture(OBM)(Gereffi, 1995: 130-1). Furthermore, the regionalization dynamics shaped by firms also depend on the sectors in which they are situated. In other words, the evolving patterns might demonstrate variations in different sub-sectors of the manufacturing sector, such as the textile, electronics, or automobile industries.

For example, analysts have recognized that the eye-catching performance of the Taiwanese electronics industry could be traced to the seventies. At that time, Japanese and American electronics manufacturers established plants in Taiwan's EPZs, which have evolved from simple assembly to sophisticated

manufacturing, thanks to the backward linkages constructed by TNCs, the Taiwanese state's promoting policies, and the upgrading effort of Taiwanese electronics firms. In Gereffi's terms, this is an example of the producer-driven commodity chains(Gereffi, 1994: 216), which might help shape forward and backward linkages in time. In contrast to producer-driven commodity chains, the industries of clothing and footwear are under the rubric of buyer-driven commodity chains(Gereffi, 1994: 215), in which buyers(big retailers and distributors) make orders and provide product specification to subcontractors who could suppress labor costs as low as possible without compromising quality criteria. There are few possibilities, if any, for this type of commodity chains to shape backward and forward linkages. For example, Nike, an American sport footwear firm, specializes in design, uses East Asian countries which provide the lowest labor cost as its production base, and distributes products to American as well as European markets(Abegglen, 1994: 27, 31). Thus, Nike has not generated complete backward as well as forward linkages, but hop from some countries to others with the consideration of finding the locations that could provide the lowest labor cost(Clifford, 1992: 57).

Nevertheless, in capital- and technology-intensive industries(producer-driven commodity chains), this abstract framework could assist one to conceive the trajectories and dynamic regionalization of production networks built by firms from Japan and, to some extent, other countries. Also, it seems that Japanese TNCs have been shaping their linkages to East and Southeast Asian industrial structures, which will be seen in the following discussion.

It should be noted that, according to the account of the UNCTAD in the series of *the World Investment Report*(1993; 1995), the regionalization or integrated international production networks of Japanese TNCs is exemplified by the cases of American and European TNCs, which suggests that they are a part of the universal trends. It is not inappropriate to situate the regionalization of Japanese production networks as a part of the global picture. However, two characteristics in the Japanese case are distinguished from the regionalization of TNCs from other Western countries, especially the United States.

First, the industrial restructuring of Japan and other Asian countries that have received Japanese FDI seems to be interconnected and interdependent, with the picture that Japan takes the lead as East and Southeast Asian developing countries try to catch up with Japan. When the Japanese industrial structure was progressing from capital and technology-intensive industries to knowledge-intensive ones in the seventies, the Taiwanese and Korean ones were moving from labor-intensive to capital-intensive ones, on the one hand, and the ASEAN four were focusing on exports of primary products and stepping toward labor intensive ones, on the other. This hierarchy of industrial structures seems to have corresponded to the patterns of Japanese FDI in Asia. In other words, the gravity of Japanese FDI has moved from concentrating on labor-intensive industries in Asian developing countries to capital and technology-intensive ones, with an eye on the comparative advantages and skill levels of the host countries at the same time(Urata, 1993: 279). The regional hierarchy of industrial restructuring is demonstrated by Table 2-19.

Moreover, under certain circumstances, the Japanese product cycle has formed a triangular structure of manufacturing and trade. At first, Japan imported machines from the United States and exported products made in Japan to East and Southeast Asia. Then, with yen appreciation and other factors, the East Asian NIEs began import-substitution industrialization, importing machines from Japan(and the United States) and exporting simple manufactured goods to Southeast Asia and the U.S. market. To protect their overseas markets and stimulate domestic industrial upgrading, Japanese firms invested in East and Southeast Asia, contributing to labor-intensive industries in the host countries, domestic upgrading from labor-intensive industries to heavy industrialization, and machine production, which was stimulated by the need of machines from the host countries that received Japanese FDI. The American product cycle, formulated by Vernon and anatomized by Hill and Fujita(see follows), did not result in this type of interdependent and complementary structure with East and Southeast Asian industrializing countries.

The second characteristic pertains to the American and Japanese product cycles. As is well know, Vernon integrates Stephen Hymer's explanation of oligopolistic TNCs and trade theory of the neo-classical economics, developing the product cycle thesis, which divides the life of a product into three stages: innovation(oligopolistic profits), maturation(beginning of competition), and standardization(overseas production and reverse imports to the home country)(Vernon, 1966: 196-203). Vernon's product life cycle thesis has been criticized for its inability to explain new phenomena(Bernard and Ravenhill, 1995:

Table 2-19 Stages of Industrial Restructuring in the Asian Flying Geese Patterns

1950	***Japan***: ISI & light Industry; labor-intensive: textiles. ***Asian NIEs***: ISI. ***ASEAN***: primary products.
1960	***Japan***: EOI, light and heavy industries; capital-intensive: steel and machinery. ***Asian NIEs***: EOI; light industrialization. ***ASEAN***: primary industries; some labor intensive industrialization, such as textiles(Thailand, Malaysia, and Singapore); primary products.
1970	***Japan***: Hi-tech, EOI, relocation Investment; knowledge-intensive: auto & consumer electronics. ***Asian NIEs***: EOI, Secondary ISI, and promoting heavy industrialization; Labor-intensive; Consumer products. ***ASEAN***: EOI; Labor-intensive.
1980	***Japan***: Hi-tech, EOI, and relocation investment; higher-value added. ***Asian NIEs***: Export diversification, FDI & relocation; standardized components and machinery. ***ASEAN***: EOI & ISI; Labor-intensive; Consumer products
1990	***Japan***: Hi-tech & flexible Industry; higher value-added(HDTV, Laser printers, and so on). ***Asian NIEs***: Export diversification, relocation investment; Knowledge-intensive; color TVs and steel products. ***ASEAN***: EOI & ISI; capital-intensive; standardized components and products.

Source: Hill and Fujita, 1995: 102; Moon, 1991: 33; Gereffi, 1990: 18; Urata, 1991: 179.

175, 176-7). However, according to Hill and Fujita(1995), the biggest problem of Vernon's thesis is that it is based on the experience of American TNCs and therefore not able to comprehend the experience of Japanese TNCs. Hill and Fujita present two kinds of product cycles: the American and Japanese ones. Their differences could be seen from their evolutionary stages, frameworks of regional division of labor, and economic as well as industrial effects.

To begin with, as has bee briefly mentioned above, the sequences of American product cycle after WWII have been innovation aiming at domestic market, relocation to protect overseas market because of product standardization and competition, and re-exports to the US because of its low-price resulting from using overseas cheap labor. In contrast, the Japanese product cycle could be termed as the catch-up product cycle, which is based on the experience of a developing country recovering from war devastation, with the sequences of importing new products, domestic learning and production, importing technology and domestic market expansion, as well as forming scale of economies and exporting(Hill and Fujita, 1995: 94, 95-6). More importantly, the Japanese experience suggests that a latecomer could pursue industrialization by reversing the conventional product cycle. In other words, latecomers could industrialize by first cutting into the production process, increasing process efficiency and product qualities, grasping the upstream resources(such as core technologies, key components, and R&D), and constructing distribution channels as well as building brand images.

The other difference between American and Japanese product cycles is

demonstrated by the Japanese excellent capabilities of maintaining their status of a leader and competence by controlling the upstream(key components and core technologies) and downstream(e.g., product differentiation) linkages. On the one hand, firms in other industrializing countries usually complained that Japanese TNCs have always been reluctant to transfer core technologies to the host countries or business partners. Even though they are willing to do in some cases, they tend to pose unreasonable or serious limitations and conditions, so that the latecomer countries and firms will not be able to catch up with their Japanese counterparts(Hatch and Yamamura, 1996). However, it should be noted that technology transfer does not depend solely on the subjective wills of the foreign TNCs, but also on the technology capabilities of the host country(Hill and Fujita, 1995). Besides, the reluctance of TNCs in transferring technologies is not a nation-specific feature, but a prevalent behavior of TNCs(Evans, 1979). Taiwan's experience in PC standards(Acer versus IBM) and printed circuit boards(PCBs with the Ampex from the United States) are good examples.(See Chapter Four for details.)

On the other hand, Hill and Fujita say that the American product cycle tends to discard standardized products and move to other categories while the Japanese one does not discard them, but move the production of standardized products overseas and manufacture high-end or high-value added products within the same category domestically. The American product cycle tends to result in boomerang effects(e.g., industrial hollow-out and unemployment) while the Japanese one constructs complementary industrial structures between

Japan and the host countries(Hill and Fujita, 1995).

In view of the contrasts between the American and Japanese product cycles delineated by Hill and Fujita, critics of the flying geese model clearly ignore the differences between the two styles of product cycles and mix them together, thus developing their criticism with misconception. Bernard and Ravenhill argue that the product cycle thesis emerging from the flying geese model is not confirmed by the reality. Together with Hatch and Yamamura, Bernard and Ravenhill indicate the Japanese firms have not relinquished standardized products and have kept on incessant product differentiation and technology upgrading, which does not conform to the conception of the flying geese model and the product cycle thesis within it(Bernard and Ravenhill, 1995: 175-6; Hatch and Yamamura: 1995: 28-30). However, what they are describing is actually covered by the Japanese product cycle practices. In other words, they are criticizing the flying geese model, which is based on the Japanese product cycle, with the American product cycle in mind.

Moreover, as has been described, the flying geese model is not a simplistically unilinear, ahistoric, static, or state-centric theory. Nor is it intended to imply that the follower countries in the flying formation would or should replicate the Japanese experience(Bernard and Ravenhill, 1995: 186-7, 189, 206). What the model is trying to do is describe and analyze the evolving patterns and stage features of the regionalization of Japanese TNCs by exploring the developing, historic, dynamic, and extensive production networks crossing state boundaries.

Empirical Cases

Since the sixties, Japanese electronics firms have been investing in East Asia, with the Matsushita Electronic Industrial(MEI) as the pioneer, whose subsidiaries and local partners manufactured batteries in Taiwan and Thailand as well as home appliance in the Philippines(Itoh and Shibata, 1995: 194; Abegglen, 1994: 221-22). This roughly corresponds to the stage of simple regionalization.

Since the seventies, Japanese have begun to relocate production lines to Asian developing countries in large scale, assembling electronic components and testing semiconductors with wafer fabrication plants in Malaysia and Singapore. The motives were to use cheap labor of the Asian developing countries and to circumvent the protectionist measures of the US(Henderson, 1994: 264-5). This could be categorized as the stage of middle-range cruise.

After the middle-range cruise, comes the long-range cruise, exemplified by the Matsushita Electronic Industrial. Having been the most devoted Japanese electronics firms in the developing Asia, Matsushita has constructed a more complete framework for the division of labor. Matsushita allocated various parts of the production process to different Asian countries in view of their skill levels. Matsushita was also the first Japanese firm to establish regional headquarters along with international procurement centers in Singapore and Hong Kong(Itoh and Shibata, 1995: 195). Since the mid eighties, other Japanese electronic firms have been following Matsushita's suit, such as NEC and Hitachi(Abegglen, 1994: 224-5), though the scales of their regionalization differ.

The general patterns of the regional division of labor constructed by these Japanese electronics firms could be depicted in this way. First, in the upstream phase, Japanese firms control R&D and design, supply key components and machines, and provide raw materials by procuring locally or from the third country. Then, it goes through the mid-stream by transferring the supplies to the host countries and having them manufactured by affiliates, OEM, subcontracting, technical cooperation, and so on. Then the semi-finished products go downstream to be assembled in plants in the host country, the home country, or the third countries, depending on the final market target. Finally, to coordinate the sophisticated international production, regional headquarters are built to manage matters about procuring and sourcing, personnel training, and distribution as well as marketing, with the aid of computers or information networks connecting the nodes of the international commodity chains. It should be noted that this framework is not static, but dynamic. From the evidence and research at hand, the initial rigid division of labor has been increasingly flexible, which is exemplified by the following cases.

First, in Matsushita's case, the upstream part of manufacturing air conditioners, especially the R&D and design, usually situated in Tokyo, has moved partially to Malaysia. Hill and Fujita found that the work of product design has been shared by facilities in Osaka and Malaysia with the help of computer networks, on the one hand, and that Matsushita has established a research center responsible for R&D, design, and testing, in Kuala Lumpur in response to Malaysia's industrial upgrading policies, on the other. In the mean time, the more

labor-intensive part of production has been moved to India and China(Hill and Fujita, 1996).

Second, Malaysia is producing more and more compressors components(Ibid.), which reflects the growth of technology capabilities of Malaysian firms and, in Gereffi's terms, highlights the fact that the country is moving her from an export-processing or economic enclave to the status of component supplier(Gereffi, 1995: 126-7). Besides, Matsushita has planned to move the production of conventional TVs to Malaysia and develop high-value added TVs domestically, such as High definition and Wide-screen TVs(Hill and Fujita, 1996), which reflects Japanese style of product cycles.

Third, the downstream has undergone changes, too. The compressors originally aimed at the domestic market have gradually turned to target overseas markets, reflecting both Malaysian capabilities and the requirement of export-oriented policy of the host government.

Fourth, to coordinate these processes, Matsushita has established a regional headquarters in Singapore, whose government has implemented incentives and policies to attract TNCs' to set regional headquarters in Singapore. The headquarters manages functions of R&D, productivity increasing, technical training, and so forth. Not only so, but the parent company has restructured its organization to further integrate production and sales service(Hill and Fujita, 1996). In Sony's case, its regional headquarters in Singapore(SONIS, Sony International of Singapore) performs the functions of distribution warehouse and center for processing global logistics, which is based on the

systems of just-in-time and point-of-sale(POS), with the objective of zero inventory(Tokunaga, 1992a: 37-9).

While the structures and steps of regionalization are progressing, the Japanese style product cycle--differentiating the manufacturing of high-end products in home and of standardized ones in the host countries—is also demonstrating itself in the regionalization of Japanese production networks. This can be seen in Table 2-20.

The regionalization of Japanese auto-making TNCs has been slower than Japanese electronics TNCs, partly because of the capital-intensive nature of the industry, which requires close cooperation between final assemblers and myriad subcontracting suppliers, which tend to forge geographical clustering within the production networks(Hill and Lee, 1994: 297-8). Nevertheless, to circumvent trade barriers raised by other developed and developing countries, Japanese auto TNCs have been managing to transfer or replicate part of the commodity chain by cooperating with auto makers and governments in the host countries.

Table 2-20 The Electronics Product Cycle in the Flying Geese Formation

Audio-visual products

What Remains in Japan

Color TV (digital, high-definition), Wide-screen TV, S-VHS, LD-player, High-end hi-fi equipment

What Moves Out of Japan

Conventional color TV, including large-size conventional types; VCR (standardized, hi-fi); Audio-visual products for export (high-priced, standardized)

What Moves Out of Singapore

Color TV (small size), Audio-visual products (low-priced)

Computer electronics

What Remains in Japan

Display for computer (17/21-inch), Customized semi-conductor.

What Moves Out of Japan

Display for computer(14/15-inch), Computer peripherals, 16 MDRAM (mega-DRAM), 3.5 HDD (hard-disk drive), Semi-conductor (integrated production)

What Moves Out of Singapore

Assembly of computers FDD (floppy disk drive)

Home electronics

What Remains in Japan

Fully micro-computer-controlled automatic washing machine

What Moves Out of Japan

Air-conditioner (for export), Ceiling light

What Moves Out of Singapore

Two-tub washing machine Compressor

Table 2-20(cont'd)

Electronic devices

What Remains in Japan

Superconductivity Capacitors (e.g. for TV)

What Moves Out of Japan

Cathode-ray tube, Electronic devices/parts, coil, transformer, filter, resonator, spindle-motor, and so on), Compressor for refrigerator

What Moves Out of Singapore

Battery, Electrical parts, Capacitor (standard type), coil(standard type)

Telecommunication equipment

What Remains in Japan

Facsimile(office use)

What Moves Out of Japan

Cellular phone (standard type), Facsimile(standardized models)

Source: Nomura Research Institute, cited from Ohta, et. al. 1995, p. 45.

Hill and Lee observe that, back in the sixties, Toyota's overseas production was exporting completely knocked down(CKD) kits and other components to the host countries for final assembly in order to circumvent trade barriers built by developed countries in North America and West Europe. This could be classified as short-range cruise. Then, in the seventies, Toyota's parent company began investment in Indonesia, Thailand, Australia, and other countries, to take advantage of their auto development projects. Some first-tier suppliers followed suit to produce low-end components in the host countries. This could be termed as middle-range cruise. Then, after the yen appreciation in the mid eighties, Toyota and other Japanese auto-making TNCs have been promoting long-range cruise by having various parts and components made in different countries according to their industrial policies and skill levels(Hill and Lee, 1994: 298-99). The characteristics of the long-range cruise of Japanese auto makers can be highlighted with the following five points.

First, auto engines, one of the most important parts of an automobile, have been manufactured by auto makers in the ASEAN host countries. Though Mitsubishi still exports knocked-down(KD) parts to the Mitsubishi Motor Corporation(MMC) in Thailand, Asian Transmission in the Philippines, and Proton in Malaysia, on the one hand, and exports automatic transmission parts and engine parts to Hyundai in Korea, on the other, auto makers in the Philippines have been able to export diesel engines to the MMC in Thailand(Hatch and Yamamura, 1996: 34, Figure 2.3). Toyota has helped Taiwanese auto makers manufacture engine valves, which have been exported

to Japan(Hill and Lee, 1994: 299). Under the scheme of the Industrial Development Bureau(IDB), Guorui, i.e., Toyota's affiliate in Taiwan, exports forty thousand engines to Japan every year in exchange for a piece of production location in an industrial zone(Noble, 1996). Also, according to Toyota's production plan, auto makers in Thailand have been producing diesel engines and exporting them to Malaysia while their counterparts in Indonesia have been manufacturing gasoline-driven engines and exporting them to Malaysia(Abegglen, 1994: 220, Figure 9-1). Fujita and Hill also found that Proton, the representative of Malaysia's auto industrialization, has been capable of designing the three-door Proton-Satria passenger car without close help of Mitsubishi, though Proton has not been able to manufacture transmission and cylinder lids(Fujita and Hill, 1997: 314).

Second, regarding the mid-stream, not only have Japanese auto-making TNCs woven various sophisticated components and parts supply networks, which have penetrated traditional boundaries among various *keiretsu*, in Southeast and East Asia, but Taiwanese auto-parts manufacturers have followed Japanese final assemblers to Southeast Asian and even China to be a part of the production networks; that is, to be a part of the developing hybrid *keiretsu* of Japanese auto makers in Southeast Asia.

Fujita and Hill observe that the international production networks of Japanese auto makers in the ASEAN four have formed the post-keiretsu networks. That is, suppliers and subcontractors no longer find it prohibitive to produce and exchange beyond their own *keiretsu*, especially in Thailand. For

instance, Toyota, Isuzu, and Nissan are producing cylinder lids for diesel engines made in Thailand. The plants of Nissan and Isuzu in Malaysia procure cylinder lids made by Siam Toyota(in Thailand), which purchases electric components from Honda's Stanley Electronic Company(Fujita and Hill, 1997: 320-1). The hybrid *keiretsu* could take more complicated forms. For example, Nissan, Indomobil, and Marubeni Auto Sales(the latter two are Indonesian businesses) formed a joint venture to make engine parts in Indonesia for other Japanese auto makers, such as Nissan, Toyota, Suzuki, and Toyota, to assemble engines, which are exported to other production lines in other ASEAN countries(Kang, 1997). The phenomena of hybrid *keiretsu* and boundary-breaking practices of supply networks are not limited to Japan's auto industry, but are general trends among Japanese businesses(JETRO, 1996a).

Some Taiwanese auto-part makers have joined the forming post-*keiretsu* networks. Some Japanese auto TNCs, such as Nissan, have brought their suppliers in Taiwan to Southeast Asia to be a part of the production networks. Regarding the investment in China, Japanese auto TNCs prefer to use joint ventures, with Taiwanese auto makers as the agent. For example, the China Motor in Taiwan has decided to invest in Fujian Province of China for the production of small trucks(Varica and Delica)(Noble, 1996). Also, in the case of the Asian Car designed by Mitsubishi and manufactured by the China Motor Company in Taiwan, the company has planned that 75 percent of the parts will be sourced in Taiwan while the remaining 25 percent of parts will be imported from Indonesia and the Philippines(WTDB, 1996a).

Third, on downstream part, the overseas investment and production of Japanese auto makers are based on their motive to circumvent market barriers raised by developed and developing countries(Abegglen, 1994: 217). However, because of the progressively complicated regional production networks, the assertion that the overseas production of auto industry aims at local markets and that the overseas production of electronics industry at overseas markets seems to be no longer absolutely appropriate. Though Japanese auto makers have been dominating the auto markets of the ASEAN countries, Hong Kong, and, to a lesser extent, Taiwan, local markets where Japanese auto makers make investment and manufacture have not been the only target of the final assembled products. Not only have components and parts exchange become important markets, which correspond to the markets of final products, but Japanese cars made in the United States have been exported to Taiwan to circumvent the trade barriers against Japanese automobiles. Moreover, the regionalization of Japanese auto production networks has not been limited to isolated regions in Asia or North America. Accord produced by Honda in the United States has been exported to Japan while other models made in Japan have been exported to North America. Toyota's plants in Japan and the United States could export to both markets to take advantage of exchange rate fluctuation(UNCTAD, 1993: 151, Box VI.5).

Fourth, as in the case of the electronics industry, it is imperative to establish regional headquarters to coordinate and control regional production networks. Honda, Nissan, and Toyota have set up regional headquarters to integrate

functions of procurement, production, marketing, and so on(UNCTAD, 1993: 151, Box VI.5; Hill and Lee, 1994: 307).

Fifth, in 1996, Noble argued that, unlike Japanese electronics firms, Japanese auto makers did not prefer to differentiate their products according to the Japanese-style product cycle. That is, they did not constructed the division of producing high-value added products in Japan and standardized cars in the host countries(Noble, 1996). However, to further penetrate Asian automobile markets and preempt competition of American and European auto makers, Toyota and Honda have been promoting the "Asian Car." The Asian Car is cheaper because it is "standardized," which means it uses parts made in the ASEAN countries and discards some equipment, such as anti-lock brake system(ABS) and airbags(Kang, 1997). The Asian Car could be regarded as another demonstration of the practices of product differentiation of the Japanese product cycle though it could also be seen as a reaction to market competition.

Again, the empirical cases about Japanese electronics and auto manufacturers reveal the weaknesses of the critics of the contemporary flying geese model and practices. Bernard and Ravenhill as well as Hatch and Yamamura accuse the Japanese overseas investment and regional(or global) production networks of having ensured the dominant position of Japanese TNCs by strengthening and holding their technology capabilities, on the one hand, and suppressing their partners in the host countries to an inferior status, on the other, through various means, such as slowing the speed of transferring technology, expensive licensing fees, and harsh contractual conditions. As a result,

Japanese TNCs have been dominating their suppliers and subcontractors in the host countries and checking the formation of their backward linkages(Hatch and Yamamura, 1996: 98-110; Bernard and Ravenhill, 1995: 175-7). However, the above-mentioned cases suggest that, while not overestimating the Japanese advantages in holding a superior status in technology capabilities, they ignore the positive side of the cooperation between Japanese TNCs and their business partners in East and Southeast Asia as well as underestimate the growing potential of the firms in the Asian late industrializing countries. It is true that the Asian newly industrializing economies are still depending on their Japanese partners for certain key components and producer goods, but they have been learning and trying to catch up, with the result of being able to make engines and compressors, two of the most important components and parts of air conditioners and automobiles. In other words, from simple assembly to producing key as well as auxiliary components and from serving domestic markets to exporting to other countries, the manufacturers in the host countries receiving Japanese FDI have managed to forge backward and, to a lesser extent, forward linkages.

Moreover, the representative critics of the contemporary flying geese practices have ignored or mis-conceptualized the transformation of the Japanese regional production networks. The above-mentioned description shows that the Japanese regional production networks have not just been an extension of Japanese developmentalism, characterized by the suppression of subcontractors and suppliers by the parent companies or buyers, among others. Hatch and Yamamura contend that, since there has not been complete

subcontracting or supply networks between large as well as small and medium enterprises(SMEs) in Taiwan and other countries, Japanese TNCs have been incorporating Taiwanese SMEs and dominating them with the Japanese supply network practices, such as making harsh demands and suppressing supply prices(Hatch and Yamamura, 1996: 91-4). However, not only have supply networks usually existed in the sectors of the manufacturing industry, but, in Taiwan's case, it would be wrong to say that supply or subcontracting networks have not existed between large firms and SMEs in Taiwan, not to mention that the Taiwanese state has been promoting the cooperative industrial central-satellite networks between big and smaller firms since the early eighties.(See Chapter Five for details.)

V. The Regional Extension of the Japanese Developmental State

The classical definition of the Japanese developmental state is that it is dedicated to national economic development, that it has a pilot agency to navigate a country's industrialization by means of industrial policies and administrative guidance, and that it is based on close cooperation between private and public sectors(Johnson, 1982: 305-24; Önis, 1991: 116-7). In accordance with this definition, various state theorists have formulated theories about the developmental state, focusing on East Asian NIEs, especially Taiwan and Korea(Amsden, 1989; Evans, 1989; Wade, 1990; Jenkins, 1991; Douglas, 1994). They either illustrate the concept of the developmental state or coin terms to describe the roles of the state in national industrial and economic development, such as Amsden's "late industrialization" and Wade's "governing

the market"(GM theory). Though they use different labels to argue for the actions and effects of the states of the NIEs, they are basically focusing on the developmental state within one industrializing country and how they catch up with advanced countries in terms of economic growth and industrialization levels.

Nevertheless, while the discussion about the developmental state has taken on a semi-paradigm position, which has been challenged constantly by neo-classical economists, the Japanese state, i.e., the original model of the developmental state, has implicitly transformed from a state focusing exclusively on national economic growth and industrial development into the one trying to shape regional economic dynamics and strengthen the ties between Japan and her neighboring economies, on the one hand, and an important component of the contemporary flying geese model, on the other. The roles of being a planner, financier, and promoter with the intention of promoting industrialization within the boundary of a nation-state, i.e., the fundamental features of the classical developmental state, have been expanded by facilitating domestic industrial restructuring and industrialization of the host countries where Japanese FDI has occupied significant positions at corresponding steps. By formulating economic plans focusing on regional economic dynamics, promoting cooperation between Japanese enterprises and firms of the host countries, and financing through investment loans and foreign aid to the host countries, the Japanese state has extended from a classical developmental state narrowly operating in a nation-state to a new one being involved widely in the economic development and industrialization of countries within the region in which Japan is situated. In view

of this development, it is proposed that the regionalization, that is, the effort of shaping regional economic dynamics, of the Japanese developmental state has been an important component of the contemporary flying geese model. The regionalization of the Japanese developmental state could be observed by focusing on the transformation of its roles, such as planner, financier, and promoter.

The State As a Planner

Economic planning is one of the salient features of the East Asian developmental states in general and Japan in particular. The original function of economic plans formulated by the developmental state was not based on purely socialist thinking, but designed to allocate and mobilize limited resources to promote national reconstruction, to set guidelines for economic management, and to build industrial structures after the war. Thus, under the direction of the Economic Stabilization Board(ESB), established in 1946 and reorganized as the Economic Deliberation Board(EDB) in 1952, the Economic Recovery Plan(1949-53) and related measures were implemented to recover basic industries and allocate limited resources for reconstruction. During the process of reconstruction, the Ministry of International Trade and Industry(MITI) was established in 1949 to control resources and implement industrial policies while the EDB reorganized again as the Economic Planning Agency(EPA) in 1954. Both agencies and the Ministry of Finance(MOF) constitute the core economic bureaucracy of the Japanese developmental state(Masiero, 1997).

When national industrial structures were reconstructed and national

economy recovered, the next objective became shifting to sustained economic growth and industrial restructuring. Then came the Five-Year Economic Plan for Economic Self-Support(1956-60) and National Income Doubling Plan(1961-70), each of which aimed at economic stabilization and acceleration.

However, after two decades of high-speed economic growth(mainly the fifties and sixties), Japan's economic growth began to slow down in the seventies, especially after being hit by the first energy crisis. The developmental state as a planner became increasingly aware of the problems resulting from the fast growth of the previous twenty years and the need to adjust Japan's economic as well as industrial structures. This awareness first emerged in the "Vision for the 1970s," published in 1974 by the MITI, in which, in addition to the policies regarding the improvement of social investment and measures to correct the side-effects of industrialization, the direction of strengthening international cooperation by means of government and business action was revealed(Sheridan, 1993: 163). But no significant or consistent regionalizing actions or policies were pursued after the publishing of the plan. From the seventies to eighties, Japan formulated and implemented a series of economic and social plans, most of which focused on domestic social and economic problems. This does not mean that the thought about positioning Japan in regional contexts was discontinued. On the contrary, since the late eighties, Japan formulated another series of economic development plans based on regional dynamics again.

One of Japan's most famous (or notorious) economic plans which revealed

Japan's ambition to regionalize the practices of the Japanese developmental state is the so-called New Asian Industries Development Plan(New AID Plan) of 1987, which has never been publicly adopted because of external critiques and inter-ministerial conflict as well as competition.[7] However, some analysts said that the essence of the plan has permeated Japan's policies and actions pertaining to economic cooperation(Machado, 1995: 61-2; Terry, 1997a). According to Terry, the New AID Plan divides the task into three stages. The first is to formulate a five-year plan, the second to specify strategic industries each country should promote, and the third to send experts and offer training programs. The actions include providing loans to build infrastructures, sending experts for advising, and offering special loans to private businesses for promoting joint ventures(Terry, 1997a).

Though the AID Plan was not adopted officially, the evidence available seems to indicate that what Terry says is not far-fetched. A variety of official plans announced by the Japanese government seem to follow the thinking of the New AID Plan. For example, the Economic Management Promoting and Consolidating within a Global Context Plan(1988-92) situates national economic

---

[7] The Minister of MITI announced The New AID Plan when he was visiting Indonesia. See Orr(1987: p. 50). Almost at the same time, the MOFA established the ASEAN-Japan Development Fund, which gives the impression of competing with the MITI. See Terry, 1997b. Though the New AID Plan did not realize in itself, the competition between the MITI and the MOFA has not ended, which could be observed from the white papers submitted by the two ministries regarding regional economic integration and cooperation. See Terry, 1997a,

development in a more global-conscious manner(Masiero, 1997: Appendix 2). The "Vision for the Economy of the Asia-Pacific Region in the Year 2000 and Tasks Ahead," revealed in 1992, maintains that Japan should combine regional production networks with the Asia-Pacific Economic Cooperation(APEC) by means of Japanese FDI and other strategies. Specifically, this "Vision" proposes building Japan-led high-tech production networks, based on existing Japanese automobile and electronics subcontracting networks, by using Japanese technology and management practices. To accomplish this task, the Vision suggested that the Japanese government offer public funds for production, infrastructure, and training programs, on the one hand, and construct communication networks based on information technologies, on the other. In other words, the main point was to replicate production and industrial structures similar to Japan's in other Asian developing countries(Sheridan, 1995: 488-9).

Some might argue whether these plans are really realized or just official propaganda. To answer this doubt, two points should be noted. First is the mechanism of economic plans in Japan, and the second the concrete actions and policies implemented by the Japanese government and groups involved.

First, one of the salient features of the Japanese developmental state is close cooperation between government agencies and businesses through formal and informal channels, which has its historical origins back to the Meiji

---

note 37.

Reformation(Sheridan, 1993: 160-1, 201). Japan has preserved its tradition of public-private cooperation and communication during most of the postwar era and reinforced by the Japanese political and institutional structures in which the Liberal Democratic Party(LDP) obtained hegemonic status, aggregated the private interests, muted the labor opposition, and incorporated various factions into the LDP, with the result that no other political parties have been capable of competing with the LDP on an equivalent basis and that the LDP become a balanced grand coalition of interests and factions, thereby preventing politicians from interfering with the bureaucratic operation. Within these settings, the Japanese bureaucracy has improved institutions of cooperation and communication, characterized by amakudari(retired bureaucrats "descend," that is, transferred to private businesses and public corporations to serve as the bridge between the government agencies and the firms involved), numerous policy networks(public corporations, public enterprises, and semi-public organizations as the extended arms of the government agencies), industrial associations, and informal communication channels(personal relationships)(Okimoto, 1989: 152-71, 177-85, 225-6, 232, 236).

Japan's bureaucratic system has fully utilized the state autonomy and public-private cooperation. Being responsible for designing development strategies, the MITI derived detailed sectoral developmental plans from the Industrial Structure Council(ISC), which is chaired by the president of the Keidanren(Japanese Federation of Economic Organizations) and composed of members from the economic bureaucracy, academia, and business. The

Economic Planning Agency(EPA) provides long-term perspectives to guide the formulation of national economic plans. Since Japan's economic plans are based on close discussion and exchange between the government and business representatives, it would be more appropriate to say that their economic plans reflect the vision shared by the government and business, rather than the government's unilateral reasoning. After the plans are formulated and approved, the economic plans are implemented by activating the closely related action structure. The MITI and other economic ministries announce and guide the subsequent actions while the keiretsu, financial institutions(city banks, public corporations, and special programs of funding), and public enterprises interpret the plans and channel funds to the private firms, who actualize specific goals of the plans(Huber, 1994: 5-6). The connection between planning and implementation in Japan's case would be clearer if one takes into account the practices of how the Japanese government cooperates with and nudges private businesses, such as administrative guidance, implicit contracts between government and businesses, the self-control of private business when benefiting from given policies, and so on(Schmiegelow and Schmiegelow, 1989: 143-52). In other words, the Japanese state is a network state, or a societal state, in that its development strategies have been based on public-private cooperation and communication, rather than the unilateral action of the state.

Second, even if one does not examine the plans that intend to regionalize the practices of the Japanese developmental state, one could still see the traces of promoting regionalization by investigating how the Japanese government has

promoted outward FDI(the role transformation of the Export-and-Import Bank of Japan), how Japan's foreign aid has cooperated or, in the eyes of critics, conspired with Japanese firms to strengthen Japanese FDI and Japanese firms, and how the Japanese government has promoted a variety of actions that contribute to regionalizing the Japanese practices of managing industrial development. All of these issues are dealt within the following sections.

The State As a Financier

Being a financier has been the second salient feature of the East Asian developmental state. In Japan's case, in view of the need of reconstructing the economy and pushing re-industrialization, the state has to take the responsibility of allocating limited financial resources to public businesses, the private sector, and economic infrastructures through restrictive financial policies and regulation over financial institutions, controlling the inward FDI, and special funds aiming at strategic or important industries designated by the economic plans, which are based on the coordination and communication between the Japanese economic bureaucracy and the private business. Certainly, the fast recovery and growth of the Japanese economy must be attributed in part to American aid, which made certain contribution in generating financial resources.

While the Japanese economy recovered right after the war, grew at high-speed during the fifties and sixties, and stepped toward maturation as well as transformation in the seventies and eighties, the roles and actions of the Japanese developmental state have undergone substantial transformation. Japan continues to focus on national industrial upgrading and pump resources

to other countries within the same region. This could be examined from three aspects. The first is that the original mechanism and strategies of making original accumulation and allocating financial resources have adjusted from direct control to indirect assistance, partly because the state's power in distributing resources has been weakened, which, in turn, partly results from trade and financial liberalization. The second is that, while Japan has been discouraging the inward FDI, the Japanese economy has grown to the extent of exporting surplus capitals in terms of outward FDI, which has been promoted by the Japanese state. The third is that Japan has graduated from being an aid receiver and upgraded itself to be an aid donor. This became apparent when Japan joined the Development Aid Committee of the Organization for Economic Cooperation and Development(OECD) in 1961, using foreign aids as a means to serve different purpose under different circumstances and with various considerations, including the motive of helping other countries to obtain economic growth and industrial development. In other words, the Japanese state has not just been a developmental state specializing in managing and allocating financial resources to national economic and industrial development within the boundary of a nation-state, but a state that also tries to shape regional economic dynamics through promoting outward FDI and foreign aids, both of which obtain reinforcement of the Japanese financial system the endorsement of the Japanese state.

From High Regulation to Liberalization

The Japanese state has been controlling the financial system(institutions and markets) through highly regulated financial policies and controlling structures characterized by the financial ministries, especially the Ministry of Finance(MOF) and the Bank of Japan(BOJ).

The Japanese state's financial policies have been set to control inflation through controlling prices and encouraging savings, whether it was under the supervision of the Supreme Commander for the Allied Powers(SCAP), to cope with the energy crises, to keep the interest rate low, which combined state's control over the Japanese financial institutions to provide the private sector with cheap credits, and to manage the foreign exchange rate, with the purposes of controlling capital flows and promoting exports. In addition, the Japanese state restricted inward FDI until the eighties, which is in sharp contrast to the FDI policies and practices of many industrialized and industrializing countries.

The Japanese state's control over the financial system has focused on financial markets and institutions, thus shaping Japan's indirect financing structure, through which firms obtain capital from bank loans reinforced by the state, rather than from direct financing, especially the stock market, the typical financing way in Anglo-American systems. Within the indirect financing framework, the Ministries of Finance and, to a lesser extent, the Bank of Japan, had been regulating the monetary(bills) and capital(securities and bonds) markets, on the one hand, and monetary(various types of banks) as well as most non-monetary institutions(trust and insurance companies). One exception is the

post savings program, which has been under the jurisdiction of the Ministry of Post and Telecommunication. In addition, the foreign exchange market had been regulated and the allocation of foreign exchange reserves managed by the Minister of Industries and International Trade(MITI), which had obtained the power because of the transferring of the SCAP and related laws, such as the Foreign Exchange Law, and had lost the power since the sixties because of the liberalization pressures(Mabuchi, 1995: 292, 297; Johnson, 1982: 194).

Japanese indirect financing is mostly characterized by the state's structural control over the financial institutions, monetary and non-monetary. On the part of monetary institutions, the Japanese banking system has been constituted by city banks, regional banks, and credit banks. The Bank of Japan serves as the last lending resort. City banks have developed overloaning, banking keiretsu, and interlocking shareholding between banks and enterprises that the banks lend to while regional banks serve as the major financial resources for local development(Johnson, 1982: 202-4; Okazaki, 1995: 90-1, 97). In addition, credit banks provide capital-intensive industries with long-term loans(Okazaki, 1995: 91).

While the Ministry of Finance controlled the banking industry through restricting the number of branches, the establishment of new banks, the management performance of banks, and so on, which help to generate fierce competition among private banks, the Japanese state also set various public banks to implement specific policies and strategies, such as the Export-and-Import Bank of Japan as well as the Japan Development Bank(Johnson, 1982:

206; Okazaki, 1995: 98-9; Mabuchi, 1995: 291-2).

The Export Bank of Japan, established in 1950 by allocating part of the budgets of the Supreme Commander for the Allied Powers(SCAP) and the Japanese government, was renamed as the Export-and-Import Bank of Japan in 1952, expanding its loans from exporters to importers. As will be seen in the following discussion, not only has it fulfilled the task of promoting exports and imports, but the bank has been increasingly allocating substantial parts of its loans to promote Japanese overseas investment. The Japan Development Bank(JDB) was set in 1951 with the "counterpart funds"(the profit of selling American aid resources). By drawing funds from issuing debentures and post savings, not only did the JDB provide important projects and strategic industries with substantial loans during the fifties, but the loans made by the JDB had indicative effects to show other banks the directions and targets for making loans(Johnson, 1982: 208-11; Okazaki, 1995: 91).

The controlling power of the Japanese state is further reinforced by the Japanese post savings program, which has been the major part of Japanese non-monetary system and an important tool in attracting personal savings, suppressing inflation, and generating financial resources for industrialization and economic infrastructures. Under the jurisdiction of the Ministries of Post and Telecommunication(management) and of Finance(financial regulation and policies), the post savings program has exercised the effect of stabilizing the Japanese macroeconomic economy and served as the major source of the Fiscal Investment and Loan Program(FILP), i.e., the second budget or

investment budget, which has been used to make low-interest loans for firms in strategic industries to purchase capital goods and engage in R&D(Johnson, 1982: 210; Parker, 1995: 97; Masiero, 1997). As will be seen in the following discussion, too, the FILP has been increasingly used to finance Japan's foreign aid.

It is true that the Japanese highly regulated financial system has been increasingly liberalized because of the needs emerging from the incessantly transforming economy and foreign pressures, such as the protectionism of the United States and the requirement of abiding by the liberalization codes of the OECD, but note that the Japanese state has delayed the pace of liberalization and implemented strategies to deflect the shocks brought by trade and investment liberalization(Johnson, 1982: 76-8). It is true that, since the eighties, most of the Japanese financial system has been forced or pushed to liberalize, because of the growing global financial market, which escapes the control of a single or a group of states, because Japan's balance of payment has improved to the extent that high regulation is not justifiable, and because of the enterprises' need to manage global financial operation. However, it is not clear whether the financial liberalization could transform the Japanese credit-based system into something like the Anglo-American system and disembody the interlocking shareholding structure between banks and firms(Ogata, 1996: 174-5). It is also true that, since April 1998, the Hashimoto government has designed and implemented a series of financial liberalization policies, designed to deregulate the establishment of holding companies by enterprises, relax the

Foreign Exchange Law, and liberalize the stock market to cope with the problems triggered by the financial crisis starting 1997(Lin, 1998); the effects remain to be seen.

Promoting Overseas Investment

Following the practices of prewar policy directions, the Japanese state set complex policy frameworks and demanding requirements to limit the inward FDI until the early seventies. From the late forties to the sixties, the state developed sophisticated institutions, such as governmental bodies(the Bank of Japan, the Ministry of International Trade and Industries, the Foreign Investment Deliberation Council, and the Ministry of Finance) and the Foreign Investment Law of 1950, to limit the inward FDI seen as intended to penetrate the Japanese economy and encourage technology transfer. Though Japan was required to liberalize her regulation over the inward FDI because of her becoming a member of the OECD in 1964, the systematic liberalization policies did not begin until the early seventies, which was followed by the rescission of the Foreign Investment Law in 1980(Graham, 1996: 72-5).

Despite the liberalization policies, the inward FDI to Japan has not been stimulated or speeded up; it even gradually declined. For example, Table 2-21 shows that the inward FDI to Japan amounted to 1,780 million dollars in 1990 and it dropped to 120 and 910 million dollars in 1993 and 1994, respectively, far less than the US received(48,990 and 45,680 million dollars in 1993 and 1994, respectively). Moreover, not only has Japan received far less inward FDI than other industrialized countries, such as the United States, but Japan has

absorbed far less inward FDI than some Asian industrializing countries in certain years. For instance, Singapore consistently absorbed more FDI than Japan during the early nineties and Taiwan more than Japan in 1993 and 1994. The case of Japan is more peculiar if one examines the Japanese FDI. Depending on what measures one uses, the significance of Japanese FDI could be shown in different ways. In terms of absolute value, Japanese FDI surpassed many industrialized countries in 1990 and 1991, not to mention Taiwan and Korea. Certainly, the significance of Japanese FDI tends to diminish as Japanese FDI reached the apex in 1990 and gradually subsided after 1991. However, by calculating the ratio of outward FDI to inward FDI, Japanese FDI is more significant again in that Japanese FDI was usually around twenty multiples of inward FDI in the early nineties while the outward FDI of other countries one, two, or three factors of the inward FDI.

The above-mentioned significance of Japanese FDI has not been due to just the market forces, but stimulated by the government's pushing. Observers have pointed out that, among the countries which promote outward FDI, Japan might be the most aggressive, partly because she has eight government agencies sponsoring outward Japanese FDI(UNCTAD, 1995: 315). The most notable of these agencies would be the Export-Import Bank of Japan(JEXIM). The JEXIM, established in 1950 as the Export Bank of Japan and changed to the present name in 1952, was set to promote export and import mainly by offering loans to Japanese firms. In the fifties, the JEXIM began to provide loans to Japanese firms making overseas investment and the charter of the JEXIM was

Table 2-21 The FDI Outflow from and Inflow into Selected Countries(1990-1994, $ Million)

Outflows					
Countries	*1990*	*1991*	*1992*	*1993*	*1994*
US	29,950	31,380	42,660	77,950	69,260
	0.625	**1.425**	**2.377**	**1.591**	**1.516**
UK	19,320	16,310	18,990	26,580	33,800
Germany	24,200	23,720	19,670	15,260	17,180
Japan	50,500	31,620	17,390	13,830	18,090
	28.37	**24.51**	**6.3**	**115.25**	**19.879**
Taiwan	5,249	2,054	1,967	2,611	2,640
	3.946	**1.616**	**2.237**	**2.847**	**1.92**
Korea	1,056	1,500	1,208	1,361	2,524
Singapore	2,034	526	1,317	2,020	3,746

Inflows					
Countries	*1990*	*1991*	*1992*	*1993*	*1994*
US	47,920	22,010	17,940	48,990	45,680
UK	32,430	16,210	16,140	15,540	9,180
Germany	2,530	4,110	2,640	1,950	1,680
Japan	1,780	1,290	2,760	120	910
Taiwan	1,330	1,271	879	917	1,375
Korea	788	1,180	727	588	809
Singapore	5,575	4,887	2,204	4,686	8,368

Source: JETRO, *White Paper on Foreign Direct Investment,* http://www.jetro.go.jp/WHITEPAPER/Invest98/index.html, Figure 1 and 5.
Note: Numbers with decimals refer to the ratios of outward FDI to inward one.

revised later to meet the operation requirement(UNCTAD, 1995: 315; JEXIM, 1996). In 1989, the focus of the JEXIM changed from promoting trade to promoting Japanese FDI(Machado, 1995: 63). As of 1996, in addition to loans of export, import, and overseas investment, the operation framework of the JEXIM also included untied loans to foreign governments, financial institutions, and foreign corporations for important projects and economic restructuring programs in developing countries, equity investment by Japanese firms conducting overseas investments, as well as guarantees to Japanese firms borrowing from other financial institutions(JEXIM, 1996).

The data also support the role of the JEXIM as a financier contributing to Japanese FDI, especially Japanese FDI in Asia. It is estimated that, in FY 1992 and 1993, 40 percent of the JEXIM loans were devoted to Japanese FDI, two times that of either export or import loans(UNCTAD, 1995: 315). It is said that 38 percent of the JEXIM loans targeted Asian countries in 1992(Machado, 1995: 63). It is also reported that, in FY 1996, the untied loans and investment loans constituted 81 percent of the JEXIM financial flows in that year, that the growth rate of investment loans was 67 percent, and that general investment promoting Japanese firms to transfer production facilities overseas increased 29 percent(JEXIM, 1996). Not only so, but the JEXIM loans seem to have distributed more to East Asia. Though loans to other regions have increased and though loans to Southeast Asia has slackened, loan commitments of the JEXIM to East Asia has increased by 85 percent, most of which went to China for resource expropriation, infrastructure projects, and China's eighth five-year

development plan, all of which seem to correspond to the increasing Japanese FDI to China and match the general patterns of Japan's foreign aid dedicated to infrastructure projects in Asian developing countries. Besides, though decreasing in comparison to previous years, loans to Southeast Asia manufacturing sectors showed growth, which also seems to support the patterns of Japanese FDI which has set East and Southeast Asia as the production base of Japanese firms(JEXIM, 1996).

In addition to loans promoting Japanese FDI provided by the JEXIM, the MITI also provides insurance for overseas investment to cover non-commercial(Overseas Investment Insurance) and commercial risks(after 1987), in addition to various investment schemes. The Japanese government also joined the Multinational Investment Guarantee Agency(MIGA), established in 1988, and signed bilateral investment guarantee agreements with other countries(Tokunaga, 1992a; Sakuri, 1995: 81-2).

Some might argue that the investment loans and other related insurance schemes are not particular features of the developmental state of Japan because other developed countries, especially the United States, a country said to be dedicating to encouraging the liberalization of international investment and trade, also established the Overseas Private Investment Corporation(OPIC) to provide investment insurance, investment insurance, and information service to American investors(UNCTAD, 1995: 314, Box VII.3). To some extent, the investment promotion and insurance practiced by the United States, by other developed countries, and by developing countries would weaken the argument

made above with regard to their relation to the regionalization of the developmental state. However, this need not be a total or devastating negation because it has been shown that the Japan's investment promotion has been corresponding to the patterns of Japanese FDI and Japan's foreign aid, on the one hand, and because of the direction and distribution patterns of the JEXIM loans described above, on the other.

Japan's Foreign Aid

Japan used to receive foreign aid(U.S. aid) for her postwar reconstruction. As her economy made high-speed growth in the late fifties and early sixties and as she joined the OECD in 1964, Japan has squeezed into the line of developed countries and begun the enterprise of providing foreign aid, so much so that the Japanese aid has become one of the major features of the contemporary Japan-led flying geese model, which differs from Akamatsu's original thesis. The reason why the Japanese foreign aid has become one of the features of the contemporary flying geese model lies not only in its geographical and sectoral distribution patterns, but also in its motives and rationales, which have explicitly and implicitly linked Japan's industrial development and FDI patterns to developing countries, especially the industrializing countries in East and South East Asia.

It has been recognized that Japan has already been one of the top donor states in the world and that the growth rate as well as the volume of Japan's contribution to the official development assistance(ODA) have been expanding by leaps and bounds(Ling, 1992: 31; Orr, 1987: 46), though critics point out that

the ratio of her ODA to her GNP has been lower than the average ratio of other countries in the Development Assistance Committee(DAC).[8]

The DAC is a branch organization of the Organization for Economic Cooperation and Development(OECD). While the forms of ODA include grants, loans, and technical aids, the channels of which can be divided into bilateral and multilateral. The former usually involves the donor and the recipient countries, in which the recipient country submits requests and construction projects to the latter, who reviews the request and, if feasible, channels funds through various means. The multilateral ODA is the contribution or subscription of the donor countries to international organizations, such as the World Bank, the International Monetary Fund(IMF), and the Asian Development Bank(ADB). The ODA system of Japan is shown in Figure 2-1.

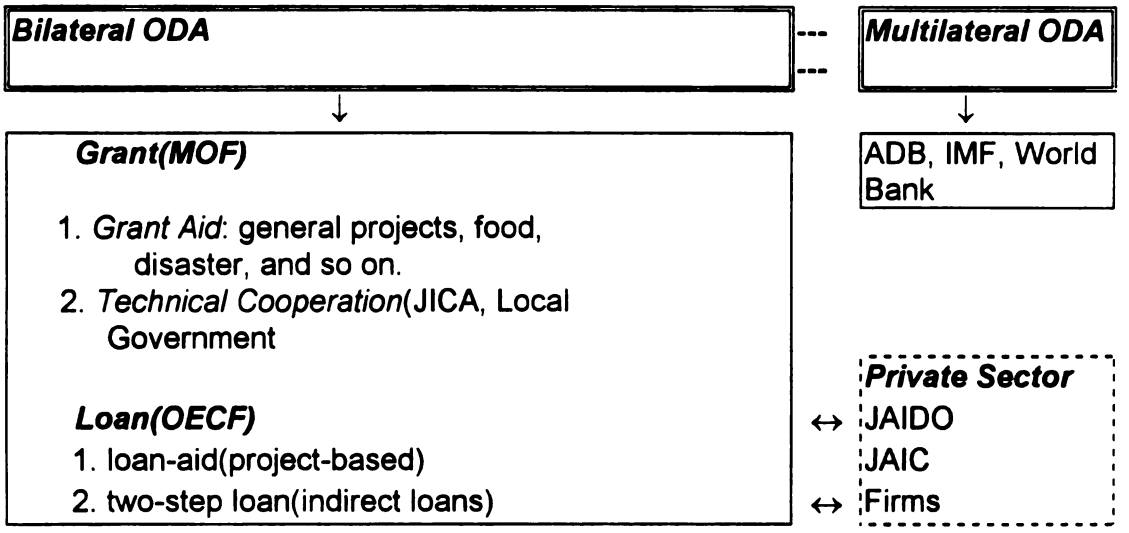
It is noteworthy that Japan's bilateral ODA has been highly concentrated in Asia, especially in East and South East Asia though the share of Asia has been declining recently because of internal considerations and external pressures. From Table 2-22, one can see that in the three periods, i.e., the 1970-71, 1980-81, and 1994-95 periods, a large part of Japan's bilateral ODA has always been centered in Far Eastern Asia though the share of the region has declined from 68.1 percent in the 1970-71 period to 48.4 percent in the 1994-95 period. The

---

[8] According to Rosario's report, from 1987 to 1992, Japan's ratio stayed around 0.31 percent, which is lower than the average ratio of the DAC countries(0.35 percent) but higher than the ratio of the United States(0.18 percent). See

lost share of the region has been transferred to other regions, especially Latin America and Middle East, and countries that can actualize specific aid purposes for the recipient countries or contribute to Japan's own interests.

Figure 2-1 The ODA System of Japan



Source: Ministry of Foreign Affairs, "A Guide to Japan's Aid," http://www2.nttca.com: 8010/infomofa/oda/grantaid/intoro.html

From Table 2-22, one can see that the lion's share of Japan's bilateral ODA has concentrated in Asia, with a focus on the Asian NIEs, especially South Korea and the ASEAN countries(54.9, 30.0 and 31.6 percents in the three periods, respectively), except that both Taiwan and Singapore have dropped off from the table since the 1980-81 period. Note that, because of the sampling bias

---

Rosario(1992).

Table 2-22 Regional Distribution of Japan's Bilateral ODA(Percentage)

1970-71		1980-81		1994-95	
Europe	0.0	Europe	1.5	Europe	0.8
North of Sahara	0.1	North of Sahara	5.0	North of Sahara	2.5
South of Sahara	2.2	South of Sahara	10.0	South of Sahara	11.6
N. and C. America	0.1	N. and C. America	1.5	N. and C. America	5.0
South America	0.5	South America	5.3	South America	5.6
Middle East	1.8	Middle East	1.8	Middle East	4.8
South Asia	27.3	South Asia	25.8	South Asia	20.0
Far East Asia	**68.1**	**Far East Asia**	**48.3**	**Far East Asia**	**48.4**
Total Bilateral	100	Total Bilateral	100	Total Bilateral	100

Source: OECD, "DAC Statistics," http://www.oecd.org:80/dac/htm/42japan.htm

Table 2-23 Major Recipients of Japan's ODA(Percentage)

1970-71	*share*	*1980-81*	*share*	*1994-95*	*share*
Indonesia	22.9	Indonesia	11.2	China	9.8
Korea	**19.8**	**Korea**	**6.9**	**Indonesia**	**8.3**
India	10.2	Thailand	5.9	India	5.4
Pakistan	7.9	Bangladesh	5.0	Philippines	5.1
Philippines	4.4	Philippines	4.7	Thailand	4.5
Myanmar	3.5	Myanmar	4.1	Pakistan	2.4
Thailand	2.9	Pakistan	3.6	Bangladesh	2.3
Taiwan	**2.5**	Egypt	2.7	Sri Lanka	1.8
Iran	1.4	Malaysia	2.3	Mexico	1.6
Sri Lanka	1.3	India	2.2	**Korea**	**1.6**
Malaysia	1.3	Sri Lanka	1.4	Syria	1.5
Singapore	1.1	Zaire	1.3	Egypt	1.3
Nigeria	1.1	Tanzania	1.1	Malaysia	1.3
Cambodia	0.9	Turkey	0.9	Kenya	1.1
Viet Nam	0.9	Nepal	0.8	Myanmar	0.9
Total Above	82.2, 54.9	Total Above	54.2, 31.0	Total Above	48.9, 30.6
Multilateral ODA	14.9		31.5		23.4
Total ODA($ million)	555.0	3592.0		16,572	

Source: OECD, "DAC Statistics," http://www.oecd.org:80/dac/htm/42japan.htm

of Table 2-23, China was not a significant recipient of Japan's ODA until the early nineties. However, according to one source, China has been a major recipient of Japan's ODA since 1982, taking 12 to 15 percents of Japan's bilateral ODA on average every year(Orr, 1987: 39). Interestingly, most of the recipient countries that have received huge Japanese ODA have received substantial Japanese FDI(Abegglen, 1994: 66, 260).

The second characteristic of Japan's bilateral ODA distribution patterns is that the share of grants is lower than that of loans, which is different from other countries in the DAC(Tabb, 1994: 35). Södeberg indicates that, on average, the share of grants in the ODA of the DAC countries is 77.1 percent, which is higher than that of Japan(43.8 percent). That is, the main form of Japan's ODA is loan-aid, which needs to be repaid by the recipient though it is characterized by low interests and long-term of repayment. If the element of grant is subtracted, she contends, Japan will no longer be the largest donor state in the world(Södeberg, 1996a: 37-8). Other analysts have pointed out that, though Japan has been increasing the share of grants under criticism, the share of loan-aid with the focus on infrastructure construction projects still reached 38 percent and that of grant only 32 percent of Japan's ODA in 1988. Meanwhile, the shares of loans and grants based on humanitarian considerations offered by the other DAC countries were 15 and 54 percent, respectively(Kosai and Matsuyama, 1991: 63-5).

Some commentators have pointed out that the phenomenon of concentrating ODA in one or some regions is not special. The ODA of the United

States has been focusing on countries with strategic values, such as Egypt and Israel, and regions dominated by the United States(e.g., Latin America). The ODA of France has been directed to her former colonies while that of Britain to the Commonwealth countries(Orr, 1987: 42; Kosai and Matsuyama, 1991: 63; Ling, 1992: 31; Tabb, 1994: 35). Tying foreign aids to commercial interests in the donor country is not peculiar in Japan's case since Britain and France have been making this a practice(Orr, 1987: 46). However, Japan's foreign aid or her ODA is still peculiar because of her rationales and motives of giving foreign aid.

Generally, there are three motives of foreign aids: humanitarian, political, and economic motives. In Japan's case, it seems that the economic motive has been overshadowing the other two(Orr and Koppel, 1993: 11-2). This does not mean that Japan's foreign aid is just a simple cover for Japan's economic expansion and domination. Nor does it mean that humanitarian, and, especially, political motives, are not important to Japan's practices of ODA. For example, the reason Japan increased her ODA to countries in Latin America was to gain support for pushing her to the seat of the UN Security Council(Sugita, 1994). In addition, the distribution patterns of Japan's ODA have been evolving from a tool for promoting exports in the fifties and sixties to a part of Japan's concept of "comprehensive security" in the seventies, to policies responding to international politico-economic situations(e.g., the international debt crisis and the collapse of East European communist block) in the eighties(Koppel and Orr, 1993: 342-51), and to the actions supposed to follow the 1992 ODA Charter, which sets the guidelines of Japan's ODA, such as environmental protection, promotion of

democratization, and keeping aid money from military use.

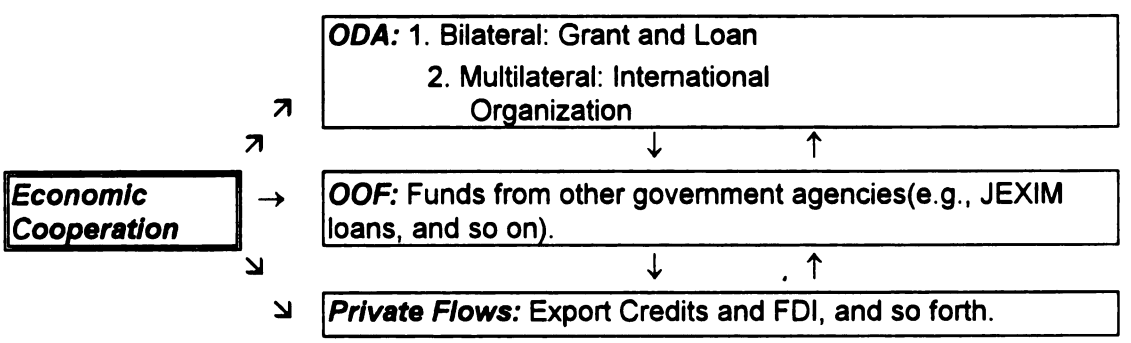
While the evolving patterns and other motives other than economic one are recognized, the corresponding patterns between Japanese FDI and Japan's foreign aid do not pale in comparison. This could be inferred from some statistical data. For example, in FY 1992, 40.8 percent of Japan's ODA went to bilateral loans, leaving the remaining 25.1 percent to the multilateral ODA. In that year, most of the bilateral ODA, which was supposed to be repaid by the recipient countries, was devoted to projects of infrastructure construction by distributing 34.1, 15.3, and 18.8 percent to bilateral grants, grant aid, and technical cooperation, respectively. Regarding sectoral distribution of Japan's bilateral ODA, in FY 1992, 27.3 percent went to economic infrastructure and 27.0 percent to production sectors while 27.1 percent was used to finance other things, such as structural adjustment assistance, debt, and reorganization, most of which was directly and indirectly connected to economic matters(JICA). In 1995, 44.5 percent of Japan's ODA was devoted to constructing economic infrastructures(MOFA, 1996).

Not only so, but the main reason why economic considerations predominate Japan's foreign aid is that it is situated in a more comprehensive framework; that is, the concept of economic cooperation and global interdependence. As the report of the Economic Planning Agency(EPA) suggests, the objective of practicing ODA should not just recycle Japan's trade surplus under pressures from trading partners, nor should it be implemented under the direction of narrowly defined commercial interests. The fundamental policy of Japan's

foreign aid should be focusing on helping those developing countries that help themselves by means of constructing social and economic infrastructures, which would attract private capitals to vitalize their economies. Thus, a favorable international political and economic environment will be formed and consolidated. In so doing, Japan's economic development will sustain its vitality and efficiency within the comprehensively healthy environment(EPA, 1997).

Though it is not the only government agency managing relevant business about Japan's foreign aid and though its power regarding implementation of Japan's foreign aid is smaller than the other ministries dealing with Japan's foreign aid, the EPA's report is not just a suggestion of its own, but reflects the practices and conceptions of Japan's foreign aid. ODA has been put into the conceptual framework of economic cooperation for many years. According to official sources, Japan's conception of economic cooperation contains three parts: ODA, private flows(mainly FDI), and other official flows(OOF)(Figure 2-

Figure 2-2 The Japanese Concept of Economic Cooperation



Source: Economic Cooperation Bureau,
http://www2.nttca.com:8010/infomofa/JP_Aid/index.html

2)(ECB; OECF; Orr and Koppel, 1993: 3).

Since the lion's share of Japan's ODA goes to bilateral channel, the focus should naturally be put on it.[9] Nevertheless, even the contribution to international multilateral organizations, especially the ADB, has been a part of Japan's comprehensive development and aid strategy with the purpose of recycling Japan's surplus capitals since the late eighties(Yasutomo, 1993: 311-3).

The bilateral ODA is further divided into two categories: grant, which includes grant aid and technical cooperation, and loan. Loans are managed by the Overseas Economic Cooperation Fund(OECF), a semi-governmental financial institution, established in 1961 and dedicated to providing low-interest as well as long-term loans to developing countries for constructing economic infrastructures. The part of technical cooperation is offered by the Japan International Cooperation Agency(JICA). This loan-aid compliments private flows, especially Japanese FDI, and other official flows, which include financing provided by the JEXIM and other government agencies. The rationale is that, since many developing host countries have encountered the problems of insufficient infrastructures, which not only hampers the action of those countries to industrialize and develop, but also imposes constraints on Japanese

---

[9] For example, in FY 1992, only 25.1 percent of Japan's ODA went to the multilateral channels while the rest to the bilateral channels. See the report of Japan International Cooperation Agency(JICA) on the web site:

investors(Abegglen, 1994: 67), the loan-aid in the bilateral ODA, which usually takes the share of 40 percent(OECF), is set to overcome the problem, thus facilitating Japanese FDI and, of course, FDI flows from other countries. Also, the JEXIM has expanded from providing export credits to offering investment loans to the private sector described above. Therefore, the bilateral ODA, especially the loan-aid(foreign aid on a government basis), together with the private flows and OOF, based on the interests of private sectors, shape and promote the comprehensive framework of economic cooperation. This economic cooperation not only facilitates the industrialization or industrial restructuring of other developing countries, especially that of East and South East Asian countries since most bilateral ODA has gone to these countries, but also makes Japan fulfill its responsibility as an advanced country which used to be an aid recipient country, on the one hand, and enhances the comprehensively defined economic interests of Japan, on the other.

In addition, Japan's foreign aid has not been just limited to narrowly-defined official assistance, but has been taking on the form of public-private sector cooperation, like the conventional practices of the Japanese developmental state. For example(refer to Figure 2-2), the Japanese International Development Organization(JAIDO) was established by the Keidanren in 1989 and obtained financial support from the government, especially the OECF. It is dedicated to

---

http://www.jica.go.jp/E-jica/lp001.html.

providing financial assistance to investment projects in the recipient countries(Machado, 1993: 63; Stopford, 1995; Söderberg, 1996: 5). Another example is the Japan ASEAN Investment Company(JAIC), established by the OECF. It is devoted to equity investment, especially venture capitals, and to assisting unlisted firms in ASEAN countries, which not only helps enterprises of the countries, but also reinforces the inflow of Japanese FDI and the economic growth of the host countries(Tokunaga, 1992a: 24-5). Also, the two step-loan is offered by Japan to the industrial development banks in the recipient countries, which, in turn, lend money to joint ventures of Japanese firms and the host/recipient countries, thus helping Japanese firms identify appropriate companies for joint ventures. These examples suggest that, though Japan's loans in bilateral ODA are request-based and thus give the impression of passivity, the flows of Japan's ODA are not as passive as they might appear(Orr and Koppel, 1993: 8-9). Arase's institutionalist research on Japan's foreign aid also shows how the state and the private sector have been coordinating their effort in planning and implementing Japan's economic cooperation with her recipient countries(Arase, 1995).

The results seem to confirm the effectiveness of Japan's ODA and the idea of interdependence as well as cooperation. According to the MOFA source, Japan's ODA to Southeast Asian countries contributed to the economic growth of those countries during the past two decades(1.8 percent in Malaysia, 5.4 percent in Thailand, and 2.8 percent in Indonesia)(MOFA, 1996). On the other hand, it has been recognized that, since 1974, Japan has been transplanting

declining and energy-intensive industries overseas due to energy crisis and industrial strategies(Orr, 1987: 45). Also, the MITI has helped domestic petrochemical businesses move excess production capacities to China by means of ODA and technical cooperation(Fukushima and Kwan, 1995: 33). To some extent, these practices have facilitated industrialization in developing countries.

Thus, it is no longer appropriate to define the Japanese developmental state as a state dedicated to the economic development of a country by means of a pilot agency that navigates a country's national industrialization and of promoting public-private sector cooperation within the boundary of a nation-state. It could be argued that the Japanese developmental state has been regionalizing to the East and South East Asia, taking the economic environment and industrial structures of the host and recipient countries as extensive industrial and economic settings for Japanese and other countries' firms through regionally oriented economic plans, outward direct investment promotion, provision of foreign aids, and promotion efforts.(See follows).

Nevertheless, two points need to be made clear.

First, it seems that Japan's firms related to or involved in projects resulting from Japan's ODA have gained significant interests, thanks to Japan's foreign aid. Not only has Japan's ODA attracted Japanese investors(Machado, 1993: 63), but Japan has been criticized that its foreign aid is just the mask of pumping more profits into the Japanese government and firms. Commentators say that the original purpose of the OECF was to promote Japan's export because

Japan's aid was on the condition that the recipient countries should purchase Japanese goods(Johnson, 1982: 252; Orr, 1987: 39; Rosario, 1992: 60). In refuting, Kosai and Matsuyama argue that, though it was tied to purchase Japanese goods, Japan's ODA has been increasingly untied, with the results that the share of untied loans has increased from 10 percent in 1977 to 72 percent in 1988 and that the procurement opportunities brought by general untied loans have been open to all contractors and firms in the world, not just to Japanese businesses(Kosai and Matsuyama, 1991: 66). However, on balance, Söderberg states that, on the one hand, Japanese firms have been losing interests in procurements resulting from loan-aids since the yen appreciation has weakened their ability to bid projects and that the untying policy has prevented Japanese contractors from getting favorable treatment, except for Japanese engineering companies, which can gain business opportunities because of the technical needs of projects. On the other hand, she also points out that, since most projects under the JICA are tied, the activities of JICA still offer abundant opportunities for Japanese firms, especially trading houses(Söderberg, 1996c: 79).

Second, the argument that Japan's foreign aid has been facilitating Japanese FDI and the infrastructure construction in the host countries does not suggest that there has been a "conspiracy" or a master plan consistently formulated and implemented by a holistic government of Japan, as has been alluded by critics when they mention the notorious "New AID Plan"(Machado, 1993; 63; Terry, 1997a). Rather, it would be more appropriate to describe the

corresponding patterns of Japanese FDI and Japan's foreign aid as the result of a long process of learning and evolving, sometimes under the pressures from other countries and conditioned by internal critiques. This can be seen from the cooperation and conflict among the ministries, agencies, and organizations involved in Japan's foreign aid.

Commentators who have been studying Japan's foreign aid have pointed out that at least four government agencies are involved in Japan's foreign aid, among others. The Ministry of Foreign Affairs(MOFA), which consists of the Economic Cooperation Bureau(ECB), has jurisdiction over the JICA and is the channel through which the potential recipient countries submit aid request. The Ministry of Finance(MOF) manages financing sources regarding Japan's foreign aid. The MITI promotes the idea and practices of economic cooperation. The EPA formulates policies of economic cooperation and nominally manages the OECF, which has been co-administrated by the other three ministries(Söderberg, 1996a: 47-8; Orr, 1987: 40; Orr and Koppel, 1993: 5-6). These ministries or agencies often have conflicts on issues of the nature, amount, and direction about Japan's foreign aid. Some officials of the MOF taking interviews in 1989 criticized that Japan has been spending money in large quantity without a directing strategy or policy(Yasutomo, 1993: 311). Not only so, but there has not been a specialized agency responsible for the total management of Japan's foreign aid and it has been complained that the aid administration structures have been complicated, which decreases efficiency and effectiveness(Orr, 1987; 40-1; Rosario, 1992: 60; Orr and Koppel, 1993: 8-9; Terry, 1997a). The

insufficiency of institutional resources is more significant as Japan's foreign aid is increasingly diversifying or globalizing to other developing countries outside Asia(Yasutomo, 1993: 320).

In addition, during the last four decades, Japan was propelled by internal considerations and external pressures to provide foreign aid. Japan's foreign aid began as war reparations, which was succeeded by export promotion with the assistance of tied aids, by motives of securing natural resources, and then by strategies of facilitating Japanese FDI as well as the infrastructure construction in the recipient countries(Orr, 1987: 41; Kosai and Matsuyama, 1991: 67-8). Regarding the external driving forces, one of them was the consideration to recycle Japan's trade surplus with the United States. Sometimes Japan was under pressure to give because of foreign policy and Cold War strategies of the United States(Ling, 1992: 31; Sugita, 1994), or other factors under some circumstances(Koppel and Orr, 1993: 351-60).

Nevertheless, the patterns explored above are undeniably salient, such as geographical(concentrating in Asia) and sectoral patterns(loans to infrastructure projects), the practices of intermingling public and private sectors, as well as the concept of offering aid with the notion of economic cooperation, which has been shared by the four major ministries to varying degrees. These all confirm that Japan's foreign aid has not only facilitated Japanese FDI and the infrastructure projects in the recipient countries, but has been regionalizing Japanese practices of managing industrial development, which could be counted as a salient feature of the contemporary flying geese model.

The State As a Promoter

The Japanese developmental state's role as a promoter covers a variety of actions and strategies. First, the state accumulates national technology capabilities through semiofficial or public R&D organizations, transfers R&D achievement to the private business, and provides firms with financing assistance, such as low-interest loans and special subsidies. Second, the Japanese state issues administrative guidance, mostly in the form of notification, to demand the firms involved to follow the action principles or strategies to develop certain industries and products or to cope with problems and crises. Third, the Japanese state has shaped and encouraged cooperative relationships between large enterprises as well as small and medium enterprises, i.e., the keiretsu, so that the effects and efficiency of industrial division of labor could be actualized and expanded. Fourth, public enterprises and corporations have been established to perform specific tasks that could not rely on or force firms in the private sector to do. Fifth, the state has been promoting investment or export through fiscal policies, tax measures, and special semiofficial organizations.

In pursuing reconstruction and re-industrialization, the Japanese state has been promoting national technology capabilities by formulating and implementing national R&D projects(e.g., the Fifth Generation Computer Project), which indicates the state's direction and forges the consensus of the government and business, by supporting and disseminating the R&D achievement and laboratory resources of the Nippon Telegraph and Telephone(NTT) as well as its relational firms, by providing enterprises with low-interest loans to diminish their

financial burdens, and by offering special subsidies from the ministries of Finance and Post and Telecommunication as well as the Defense Agency with performance requirements. The Japanese state has also tried to accumulate national technology capabilities by constructing industrial/science parks, so that the clustering effect could be generated, the pressures of urban imbalance could be mitigated, and the MITI could send young officials to local governments for the implementation of industrial policies and develop their future political careers(Okimoto, 1989: 67-82, 96).

The second way Japan promotes industrial development is to issue administrative guidance. Known as the official notification without legal basis, administrative guidance spells out the ways firms involved should follow to promote certain industries and coordinate the industrial competition within the framework set by the national economic plans and industrial policies(Johnson, 1982: 236-7; Okimoto, 1989: 93-4; Yamamura, 1995: 122). Nevertheless, analysts have pointed out that the effects of administrative guidance should not be exaggerated. There have been cases in which certain private enterprises refused to follow the government's direction. Others have said that administrative guidance was extremely useful in the sixties, but has been waning since the seventies(Johnson, 1982: 265-8), though it is still important in assisting the transformation of the sunset industries and adjustment about foreign trade(Okimoto, 1989:).

The third way the Japanese state promotes industrial development is to help forge industrial division of labor, characterized by the keiretsu and the

corresponding subcontracting networks. Though the zaibatsu was disbanded by the Supreme Commander for the Allied Powers(SCAP), the keiretsu was reinvigorated and reorganized by the MITI and the Japanese financial system; the former helped forge the cooperation of the general trading companies(the *sogo shosha*) while the latter's structures, such as overloaning and interlock shareholding, generated close relationships between core banks and the enterprise to which they lend(Johnson, 1982: 205-6). Moreover, utilizing the foundation of subcontracting networks, which originated during the twenties and developed in the thirties and forties, the MITI, especially the subcontracting division within the ministry, promoted the establishment and operation of subcontracting networks between satellite and central manufacturers through formulating related laws, encouraging information interchange and sharing, allocating financial resources, and setting a public organization, which specializes in relevant affairs and receives money from the central and local governments. The promotion of central-satellite or subcontracting networks reached the peak from the fifties to seventies and began to transform to a more flexible system after the early seventies(Wang, 1994: 16-9; Yae, 1993;).

The fourth way is to establish public enterprises and corporations to implement specific economic and social tasks. According to Sheridan's categories and description, public enterprises belong to various ministries and agencies and obtain their budgets from the special government budget while public corporations are owned by the government with more independent management jurisdiction. Public corporations could be sub-divided into financing

and non-financing ones; the former consists of the Japanese Development Bank and the Import-and-Export Bank of Japan whereas the latter is funded and monitored by the central or local governments(Sheridan, 1993: 181-5). One of the foremost public corporations is the Japan External Trade Organization(JETRO), established in 1954(the original one was founded by an Osaka businessman in 1951). The JETRO's budget comes from the central government. The director as well as most overseas personnel are sent by the MITI. The JETRO's actions and special organizations set by the MITI have helped Japanese firms avoid blind trade and promoted Japanese exports through information collection and dissemination as well as other types of assistance(Johnson, 1982: 230-2).

The fifth way through which the Japanese state promotes industrial and economic development is to utilize policy networks(public enterprises, public corporations, and industrial associations) and special task organizations. The function of policy networks is to use public enterprises as the government's extensive limbs and industrial associations as communication channels, which are based on informal contacts and negotiation as well as on the amakudari, through which retired officials are transferred to firms in the private sector(Okimoto, 1989: 153-66).

The regionalizing trend of Japan's developmental state being a promoter is not a simple transplantation or copy of the Japanese system, but a diffusion as well as reorganization. Through formulating economic plans based on regional perspectives and specific foreign aid strategies, the practices of the Japanese

state being a promoter have been extended to cover the targeted countries, which is illustrated by two incidents. The first is the Japanese proposals to support SMEs in Asian developing countries and the second the disputes between Japan and the World Bank regarding the dynamics of East Asian economic miracles.

On the part of the proposal, the MITI used to investigate the factors impeding the continuing economic growth of the ASEAN countries and found that the two most salient features were insufficient infrastructures and weak SMEs structures. Drawing on Japan's experience, Yamazawa emphasized that the ASEAN countries should incubate SMEs to be the support industries of auto and electronic industries, which have seen the significant presence of Japanese FDI, or it will obstruct the further improvement of local industries and worsen their trade deficits with Japan as they have to continue importing key components from Japan(Yamazawa, 1994: 18). Since he is one of the zealot of the flying geese model, the coordinator in an expert group in the MITI, and one of the member of the APEC's Eminent Persons Group(as of 1994), Yamazawa's suggestion could reflect Japan's official thinking to a certain extent.

Moreover, the regionalizing trend of being a promoter has not been limited to proposing. The MITI has sent numerous advisor groups to Southeast Asian developing countries, trying to find the most appropriate industries to be developed by each country, which is facilitated by foreign aid for constructing infrastructures, macroeconomic assistance, and Japanese FDI or joint ventures made by Japanese and local firms(Das, 1996: 154). Hill and Fujita's research

reveals that the MITI has been promoting the "Asia Supporting Industry Action Program"(Asia Program), which sends Japanese retired engineers to East Asian countries to assist nurturing their SMEs as supporting industries for manufacturing components and parts(Hill and Fujita, 1996). In addition, since the disappointing Miracle Report published by the World Bank, not only has the Japanese government conducted various plans aiming at the way of extending Japan's experience of promoting national industries and economy in terms of industrial policies, but it has set up training programs, with China and Vietnam as two most enthusiastic countries trying to learn from Japan(Terry, 1997b).

Leaving the proposal aside, Japan's ambition of extending her experience of industrial policies could be witnessed by the disputes between the World Bank and Japan regarding the factors contributing to the East Asian economic miracles. Wade has described the interaction process between the two. Japan has been a major contributor to the World Bank and wants the latter to study Japan's experience, with the hope that the World Bank would recognize the assisting roles played by the state, particularly contributions made by industrial policies. However, the strong ideology of the Bank, the organizational culture within the Bank shaped by Anglo-American liberal-minded economists, and the backing of the United States behind the Bank make the report largely downplay the positive roles played by the state in East Asia, especially in Japan(Wade, 1996). Though not happy, the Japanese government and semiofficial organizations still promote the extension or regionalization of Japan's experience(Wade, 1996).

VI. Summary

This chapter includes important arguments that delineate the profile of the contemporary flying geese model, so that one could use the model as a benchmark to compare Japanese to Taiwanese practices in subsequent chapters.

In constructing the flying geese model, three lines of argument have been made in this chapter.

First, since the late eighties, the flows of Japanese FDI have demonstrated a tendency of division of labor in terms of regions and industries. The flows of Japanese FDI have been increasingly targeting the manufacturing sector of East and Southeast Asian industrializing countries as well as non-manufacturing sector, especially service industries, of American, European, and even Latin American countries. The definitions of Japanese FDI and ways to measuring it, on the one hand, and other financial sources(including reinvestment) used by overseas affiliates of Japanese TNCs, on the other, have been discussed to demonstrate that the patterns of Japanese FDI described in this chapter, and, to some extent, by others, are valid and convincing.

Corresponding to the flow patterns of Japanese FDI in the past decade are a triangular trade structure and new facets emerging in the trade triangle. It is shown that, while the triangular trade structure connecting the United States, Japan, and Asian industrializing countries continues to be unbalanced and asymmetric in that both the United States and Asian industrializing economies keep running chronicle trade deficits with Japan, that Japan and the newly

industrializing economies keep depending on the United States market, and that the Asian developing countries still depend on Japanese, and, to a lesser extent, American technologies, the Asian industrializing countries, especially Taiwan and Korea, have decreased their export intensities with the United States. Moreover, it is argued in this chapter that the catch-up product has displayed itself in the process of Japanese postwar industrialization, and reappeared in the middle and follower countries within the flying geese formation based on East and Southeast Asian region.

Second, the regionalization of Japanese production networks has been evolving, dynamic, and diffusive under some circumstances. Using the conceptual frameworks of short-, middle-, and long-range cruise, the regional division of labor and relevant structures constructed by Japanese electronics and auto-making firms are explicated. In addition, the regionalization of Japanese production networks has been corresponding and complementary to the industrial upgrading and consolidation of the host countries.

The third point is that the developmental state of Japan has been regionalizing its conventional practices of managing industrial structures and implementing industrial policies by making economic plans with an eye on regional economic dynamics and the comparative advantages of the host countries which have received substantial Japanese FDI, by promoting overseas investment through investment insurance and foreign aid, especially bilateral ODA in the form of loan-aid, to infrastructure projects in targeted host countries, and by promoting industrial settings favorable to the cooperation of big and

small manufacturing firms in the host countries receiving large amounts of Japanese FDI.

Chapter 3

The Patterns of Taiwanese Foreign Direct Investment and Foreign Trade

In Chapter Two, the patterns of Japanese FDI and trade structures were described and the possible causes explored. Japanese FDI has been making Asia a manufacturing base and it has been making the non-manufacturing sectors in North America, especially the United States, Europe, and Latin America an investment target. The triangular trade structure revolving around Japan has been transformed, but with some characteristics left, such as Japan's chronicle trade surplus and the catch-up product cycle.

In this chapter, the performance of Taiwanese foreign direct investment(Taiwanese FDI) and the trade structure revolving around Taiwan are explored and compared to those of Japan. Specific questions include: what are the geographic(inter-regional and intra-regional) and sectoral distribution patterns? What factors might cause the patterns and what differences and similarities are emerging between Taiwanese as well as Japanese FDI? How significant is Taiwanese FDI? Are there any technical issues regarding the data of Taiwanese FDI? What are the characteristics of the trade structure revolving around Taiwan and why does the structure display those features? Is there any traits of the catch-up product cycle emerging in the Taiwan-centered trade structure?

To discuss these questions, aggregate statistical data about Taiwanese FDI and trade are collected and interpreted. The results of interpretation are divided into two parts. The first part describes regional and sectoral distribution patterns

of Taiwanese FDI and the relative significance of Taiwanese FDI patterns. The second part delineates the trade triangle revolving around Taiwan. This includes its shift in center of gravity, the shaping factors of the triangle, and the catch-up product cycle of Taiwan.

I. The Patterns of Regional and Sectoral Distribution of Taiwanese FDI

Like the case of Japanese FDI, Taiwanese FDI is not a new phenomenon; the first Taiwanese FDI project occurred in 1959 and was aimed at Malaysia. However, the total value of Taiwanese FDI was not significant until 1977. In that year, the value of Taiwanese FDI surpassed ten million dollars for the first time, which was a milestone in the history of Taiwanese FDI. Nevertheless, this record pales in comparison to the surge of Taiwanese FDI since 1987. Since then, the total value has surpassed one hundred million dollars. From the middle eighties to the early nineties, the scale of Taiwanese FDI was upgraded from concentrating in light and labor-intensive(food and beverage processing as well as textile) industries to capital- and technology-intensive industries(chemicals, precision instruments, and transport equipment), on the one hand, and stretched to the tertiary industry, and, to a lesser extent, the primary industry, on the other.

As the surge of Taiwanese FDI since the mid eighties has roughly corresponded to the third wave(or the fourth wave, depending on how one demarcates the stages) of Japanese FDI during the same period under similar macroeconomic pressures(e.g., the appreciation of the New Taiwan(NT) Dollar, the rising production costs, as well as the trends of economic liberalization). As Taiwan has transformed from a novice NIE mainly absorbing inward FDI to a

salient NIE reaching a higher industrial level as well as becoming a significant home country of FDI, it would be interesting and worthy to examine differences and similarities in their regional and sectoral distribution patterns as well as the factors shaping the patterns.

Table 3-1 displays the distribution patterns of Taiwanese FDI.

From Table 3-1 and other sources of official statistical data, one can discuss the following patterns in Taiwanese FDI.

First, prior to 1987, the lion's share of Taiwanese FDI flowed to North America(the United States and Canada). From 1959 to 1986, the United States received 163.1 million dollars of Taiwanese FDI whereas the Asian countries received only 87.8 million dollars. This pattern continued through 1989. However, since 1990, this pattern has changed. The share of North America kept on declining whereas that of Asian countries increasing. Starting from 1990, the Asian share has surpassed that of North America; the former hosted 601.3 million dollars while the latter 428.5 million dollars. This pattern continued until 1996 and it might not quickly reverse to the old pattern prevalent in the former three decades. This seems to be a sharp contrast to the Japanese FDI patterns during the same period as Japanese FDI devoted more funds to North America in absolute terms.(See Table 2-1.) In other words, Taiwanese FDI has been more Asia-oriented since the end of the eighties than Japanese FDI.

Table 3-1 Taiwanese Overseas Investment, by Area and Industry (1987-1996, $ Million and Percentage)

	1987	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*
Total	89.6	542.9	925	1545.2	1826.3	1127.1	4824.1	2572.4	2437.7	3380.7
Asia	13.1	59	276.5	601.3	1100.5	612.5	3826.6	1517.2	1549.2	1883.6
		10.9%	*29.9%*	*38.9%*	*60.3%*	*54.3%*	*79.3%*	*59%*	*63.6%*	*55.7%*
North	70	122.9	508.5	428.5	297.5	190.7	529	143.8	248	266.1
America	78.1%	22.6%	55%	*27.7%*	*16.3%*	*16.9%*	*11%*	*5.6%*	*10.2%*	*7.9%*
Latin America	--	--	--	240.2	71.3	9.0	210.9	842.7	538.8	1170.5
								32.8%	*22.1%*	*34.6%*
Europe	--	--	--	260.9	350.1	292.7	255.8	22.1	59.7	11.8
				16.9%	*19.2%*	*26%*	*5.3%*			
Others	6.5	36.1	140	14.3	6.9	22.2	1.8	46.6	42	48.7

Secondary	***1987***	***1988***	***1989***	***1990***	***1991***	***1992***	***1993***	***1994***	***1995***	***1996***
Sub-total	71.5	85.9	649.7	915.1	1058.7	624.6	3832.8	1441.8	1567.2	1764.6
Asia	9.2	54.9	258.8	548.2	879.7	552	3325.2	1211.3	1341.1	1557
	12.9%	*63.9%*	*39.8%*	*59.9%*	*83.1%*	*88.4*	*86.8%*	*84%*	*85.6%*	*88.2%*
North	57.8	27.2	386.6	298.7	101.6	52.6	297.5	70.2	113.5	108.5
America	*80.8%*	*31.7%*	*59.5%*	*32.6%*	*9.6%*	*8.4%*	*7.8%*	*4.9%*	*7.2%*	*6.1%*
Latin America	--	--	--	41.2	20.7	5.7	14.1	122	82.9	89.3
Europe	--	--	--	14	52.2	14.2	195.6	14.8	28.3	0.9
Others	4.5	3.8	4.3	13	4.5	0.1	0.4	23.5	1.4	8.9

Tertiary	***1987***	***1988***	***1989***	***1990***	***1991***	***1992***	***1993***	***1994***	***1995***	***1996***
Sub-total	18.1	131.4	275	625.2	757.9	501.3	957.3	1113.8	864.4	1578.7
Asia	3.9	3.7	17.4	48.2	211.1	59.3	467.4	292.1	202.3	302.7
					27.9%	*11.8%*	*48.8%*	*26.2%*	*23.4%*	*19.2%*

Table 3-1(cont'd)

North America	12.2 *67.4%*	95.7 *72.8%*	121.9 *44.3%*	129.8 *20.8%*	195.9 *25.8%*	138.1 *27.5%*	231.5 *24.2%*	73.6 *6.6%*	134.2 *15.5%*	157.6 *10%*
Latin America	--	--	--	199 *31.8%*	50.6 *6.7%*	3.3	196.8 *20.6%*	717.7 *64.4%*	455.9 *52.7%*	1078.2 *68.3%*
Europe	--	--	--	246.9 *39.5%*	297.9 *39.3%*	278.5 *55.6%*	60.2 *6.3%*	7.3 *0.7%*	31.4 *3.6%*	10.9 0.7%
Others	2	32	135.7 *49.3%*	1.3	2.4	22.1	1.4	23.1	40.6	29.3

Source: Compiled and calculated from Investment Commission of MOEA, *The Statistics on Overseas Chinese & Foreign Investment, Outward Investment, Outward Technical Cooperation, Indirect Mainland Investment, and Guide of Mainland Industry Technology of the Republic of China*. Various issues.

1. The category of "others" before 1990 includes Latin American and European countries. Starting from 1990, the category of "others" incorporates data about Oceania, African and other countries.
2. The category of "North America" before 1993 only includes the United States.
3. The data about Asia before 1991 do not include those about Mainland China.

Second, what is noteworthy is that the data about Asia since 1991 include Taiwanese "indirect investment" in Mainland China. Even though one does not count Taiwanese investment in the mainland as "foreign direct investment" and subtracts it from the data sets, the Asian share still surpasses that of North America. For example, in 1991, Asia(excluding China) received 926.5 million dollars of Taiwanese FDI while North American merely 297.5 million dollars.

Third, in comparison to the Japanese FDI patterns through the late eighties and the early nineties, the trends of division of labor emerging from Taiwanese FDI are more salient in terms of geographic and sectoral concentration than those of Japanese FDI since the nineties. In 1987, 80.8 percent of Taiwanese FDI in the secondary industry concentrated in the United States while 12.9 percent in East and Southeast Asia. However, this regional pattern has changed since 1988. In that year, 63.9 percent of Taiwanese FDI aiming at the secondary industry flowed to Asian countries while only 31.7 percent to North America. Though regaining dominance in 1989 and sharing 59.5 percent of Taiwanese FDI, the North American secondary industry has been losing Taiwanese FDI gradually to Asian economies since the early nineties. Its share even declined to 4.9 percent in 1994 while that of Asian countries had been over eighty percent through the first half of the nineties. In contrast, by referring to Table 2-1, one finds that North America had always shared most(around fifty and forty percent) Japanese FDI than other regions from the late eighties to the early nineties. The Asian share increased from 12.2 percent in 1989 to 24.2 percent in 1996; however, it keeps falling far behind the North American share.

In comparison to Japanese FDI, Taiwanese FDI seems to be more interested in the manufacturing sector than in the tertiary one of the Asian countries during the same period. Since 1991, over eighty percent of Taiwanese FDI has flowed to Asia every year whereas only thirty or forty percent of Japanese FDI flowed to Asia during the early nineties.(Refer to Table 2-1.) These patterns suggest that Taiwanese FDI has been viewing Asian countries as a main base for manufacturing activities than Japanese FDI since the mid eighties.

Moreover, according to the author's calculation, which is based on the same source of Table 3-1, 87.9 percent of the FDI made by Taiwanese firms in the electronic and electric appliance industry in 1987 went to the United States while only 11.3 percent to the Asian industrialized and industrializing countries. However, the Asian share reached 59.7 percent in 1993 whereas the United States received only 17.8 percent. A survey of the Taiwanese MOEA also reveals that the Taiwanese FDI has been focusing on the electronic and electric appliance industry of the Asian-Pacific countries. For firms investing mainly in the ASEAN five, Mainland China, and the United States, the electronics industry has been the foremost target. Around 22 percent of Taiwanese investment in the mainland flowed to the electronic industry while 22.67 percent and 47.06 percent to the ASEAN five and the United States, respectively. Even in Japan, where Taiwanese made more investment in the plastic and metal industries(18.18 and 18.18 percents, respectively), 13.64 percent of Taiwanese investment in Japan flowed to the electronics industry, which is not insignificant in comparison to Taiwanese FDI in the former two industries(MOEA, 1995: 55).

Fourth, in contrast to the Japanese FDI patterns, which tend to devote more capitals to North American non-manufacturing industries(mainly the tertiary industry; see Table 2-1 and 2-2), it seems that Taiwanese FDI has not been very interested in the tertiary industry in North America. In terms of attracting Taiwanese FDI, the gap between the secondary and tertiary industries in North America has not been substantial. In 1996, the North American tertiary industry did attract more Taiwanese FDI(157.6 million dollars) than the secondary industry(108.5 million dollars), but in 1987, 1989, and 1993, the shares of the secondary industry were higher than those of the tertiary one. Moreover, since the nineties, more Taiwanese FDI has flowed to the tertiary industry in Asian countries(except in 1992). In other words, it is not clear whether Taiwanese FDI has viewed the North American tertiary industry as a main target.

Fifth, with the exception of 1992, Taiwanese FDI devoted more funds to the tertiary industry in Latin America. Taiwanese FDI flowing to the Latin American tertiary industry rose from 199 million dollars in 1990 to 1078 million dollars in 1996 while that to the secondary one only increased from 41.2 million dollars to 89.3 million dollars during the same period. Also, more than half of Taiwanese FDI aiming at the tertiary industry flowed to Latin America from 1994 to 1996. The patterns of Taiwanese FDI in Europe were swinging from concentrating in the tertiary industry(from 1990 to 1992 and from 1995 to 1996) to focusing on the secondary one(from 1993 to 1994) while more Taiwanese FDI interested in the tertiary industry has shifted from Europe to Asia since the early nineties. In contrast, the Japanese FDI patterns are more salient in that they seem to be more

interested in the non-manufacturing sectors of Europe, North America, and Latin America.(See Table 2-2)

The above-described data and patterns suggest that a set of regional and sectoral distribution patterns of Taiwanese FDI has been emerging from the late eighties to the early nineties. The foremost features are that the lion's share of Taiwanese FDI has shifted from concentrating in North America to focusing on Asia and that Taiwanese FDI in Asia has tended to view the Asian countries as a manufacturing base and the Latin American and, to a lesser extent, the Asian economies, as major locations for exploring the tertiary industry.

Table 3-2 adds more details to the picture emerging from Table 3-1, describing the distribution patterns of Taiwanese FDI in terms of sub-regions and sub-sectors.

First, during the first half of the nineties, Taiwanese FDI in the secondary industry demonstrated a radical transformation in terms of sub-regional distribution. In 1991, over 70 percent of Taiwanese FDI concentrated in the ASEAN five countries while nearly 20 percent to Mainland China. The share of the Northeast Asian countries(Japan and South Korea) was too small to be recorded in the same year. However, in the next year, the share of the ASEAN five countries abruptly dropped to 46.7 percent and further fell to only 5.8 percent in 1993. In the mean time, the shares of China and Vietnam skyrocketed. In the case of China, her share increased from 19.7 percent in 1991 to 88.7 percent in 1993, hovering around seventy percent from 1994 to 1996.

Table 3-2 The Taiwanese Overseas Investment in Asia(1991-1996), (1991-1996, Million Dollars and Percentage)

	1991	1992	1993	1994	1995	1996
Total	***1100.5***	***612.5***	***3826.6***	***1517.2***	***1549.2***	***1883.6***
Secondary	879.7	552	3325.2	1211.3	1341.1	1557
Industry	**80%**	**90.1%**	**86.9%**	**79.8%**	**85.6%**	**88.2%**
NE Asia	--	0.3%	0.2%	0.2%	0.2%	0.5%
ASEAN 5	76.8%	46.7%	5.8%	17.5%	12.7%	20.9%
China	19.7%	44.6%	88.7%	73.0%	73.8%	71.6%
Vietnam	--	--	4.1%	8.7%	8.0%	6.3%
Tertiary	211.1	59.3	467.4	292.1	202.3	302.7
Industry	**19.2%**	**9.7%**	**12.2%**	**19.3%**	**13.1%**	**16.1%**
NE Asia	1.5%	6.2%	12.0%	7.1%	4.1%	1.7%
ASEAN 5	7.4%	21.1%	17.9%	25.8%	9.7%	50.2
China	--	--	38.2%	20.8%	43.0%	30.9%
Hong Kong	91.3%	72.5%	32.0%	41.7%	42.3%	16.5%
Vietnam	--	--	--	0.9%	0.7%	0.1%

Source: Investment Commission, *Statistics on Overseas Chinese & Foreign Investment, Outward Investment, Outward Technical Cooperation, Indirect Mainland Investment, and Guide of Mainland Industry Technology of The Republic of China*, various issues.

Note 1: NE Asia means Northeast Asia, which includes Japan and Korea.

Note 2: ASEAN 5 includes Thailand, the Philippines, Singapore, Malaysia and Indonesia.

The growth rate of Vietnam's share was not as astonishing as that of China, but her share had been larger than the average one of the ASEAN five since 1993. Actually, from 1988 to 1991, the value of Taiwanese FDI amounted to 784 million dollars, which constituted 20 percent of inward FDI to Vietnam during the period and made Taiwan the largest source of FDI in Vietnam(Chu, 1995: 194).

Second, Taiwanese FDI is similar to the performance of Japanese FDI in that both have concentrated in East and Southeast Asia. Referring to Table 2-4, one can find the average share of the East and Southeast Asian countries to be 96.72 percent(1989 and 1992-96). Also, more than ninety percent of Japanese FDI flowed to the manufacturing sectors of East and Southeast Asian economies in every year during the period. In the case of Taiwanese FDI, not only have East and Southeast Asian countries always received nearly ninety percent of Taiwanese FDI, but over ninety percent of Taiwanese FDI flowing to the secondary industry in Asia has gone to East and Southeast Asian countries. In other words, both Taiwanese FDI and Japanese FDI are seeing the East and Southeast Asian countries as a manufacturing base.

Third, with regard to the tertiary industry, the patterns of Taiwanese FDI are similar to Japanese FDI in that its sub-regional distribution has shown fluctuations. The share of Hong Kong dropped from 91.3 percent in 1991 to 16.5 percent in 1996, the lowest point in six years, possibly because of the expectation of uncertain future of Hong Kong after 1997. The share of Japan and Korea increased from 1.5 percent in 1991 to 12 percent in 1993, but it fell to 1.7 percent in 1996, returning to the original level. At the same time, the shares of China and

ASEAN have been increasing, with abrupt rise and fall, which is similar to the performance of Japanese FDI in the non-manufacture during the same period.

Moreover, from Table 3-3, it is noteworthy that, in different periods and host countries, the thrust of Taiwanese FDI tended to focus on the manufacturing sector of the Asian host countries than FDI from other countries. For example, from 1981 to 1993, 94 percent of Taiwanese FDI flowed to the manufacturing sector in the Philippines while only 32 percent of the inward FDI from other countries to the same sector in that host country. The data show that Taiwanese FDI is more inclined to focus on the manufacturing sector of the Asian host economies, which have been the main target of Taiwanese FDI since the mid eighties, than FDI from other countries.

Table 3-3 The Percentage Comparison of Inward FDI to the Manufacturing Sectors(Unit: Percentage)

		Thailand 1985-93	*Indonesia* 1967-93	*Philippines* 1981-93	*China* 1985-93
Percentage of Manufacture	*Taiwan*	53	89	94	73
	Others	44.1	58	32	58

Source: Lee(1994).

The reasons why Taiwanese FDI is more Asia-oriented than Japanese FDI and why both Japanese FDI and Taiwanese FDI take East and Southeast Asia as the main manufacturing bases could be attributed to the following factors.

Firstly, compared to Japan, Taiwan is a young provider of FDI and thus

Taiwanese manufacturers would prefer to make overseas investment in neighboring countries to decrease the costs of cross-border coordination and risks. In contrast, the concentration of Japanese FDI in Asia was an earlier phenomenon in the sixties, with the motive of finding cheap labor and securing raw material. As older providers with accumulated experience and large scales of economies, Japanese manufacturers have shifted more funds to advanced economies to consolidate their major markets, to circumvent the American and European protectionism, and to access newer technologies(Fukushima and Kwan, 1995: 9-10). The Japanese bubble economy in the late eighties also drew Japanese firms to the tertiary sector of the United States, especially real estate and financial markets. All these factors have been instrumental to the phenomenon that the lion's share of Japanese FDI has been in the United States and Europe.

Secondly, the increasing Japanese FDI in East Asia since the mid eighties was activated by the macroeconomic pressures, such as the Yen appreciation and rising labor costs, like the ones in the early seventies. In the face of the pressures, independent small Japanese firms were either bankrupt or forced to relocate to find cheap labor and lands while larger Japanese firms implemented rationalization and relocated low-end products overseas to save costs. Moreover, small suppliers were forced or coaxed by their buyers to make overseas investment to keep their clients or to follow the buyers' strategy of cross-border production(Yue, 1995: 234-5; UNCTAD, 1995: 240).

Similar to the case of Japanese FDI since the mid eighties, the tide of

Taiwanese FDI during the late eighties was triggered by the macroeconomic conditions, too, such as the appreciation of the NT dollars and the increasing production costs. Taiwanese small and medium enterprises(SMEs), the majority of Taiwanese producers, were under particularly serious pressures to move out to find cheaper labor and avoid the exchange rate loss. Note that, in contrast to the Japanese mode in which the overseas investment of larger firms activated the FDI of smaller suppliers within their keiretsu, the Taiwanese pattern was characterized by the phenomenon that larger Taiwanese manufacturers, including material providers(petrochemical) and components suppliers(automobiles and electronic products), make overseas investment in the economies where their downstream buyers, who usually do not have keiretsu-like relationships with them, have made investment and built plants to consolidate their clients and explore more markets(Leng, 1996: 90). However, this contrast of investment sequences between Japanese and Taiwanese firms is a line of relative description, not an absolute principle. As will be seen in Chapter Four, the overseas investment of larger Taiwanese electronics firms also pulled some of their suppliers to the host countries. Also, as time passes and more experience accumulates, they might make overseas investment in farther economies to explore new markets. For example, since 1995, a number of Taiwanese makers of PC components(CRTs and power suppliers, and so on) have made substantial investment in Scotland. Chunghwa Picture Tube, a subsidiary of Tatung Group and the largest producer of CRTs in the world, has invested 250 million pounds to build plants in Scotland and to service the European market. The share of non-

Asian economies might not reverse the recent pattern, but it is noteworthy.

Thirdly, the protectionist pressures not only prompted Japanese firms to use Asian countries as exporting bases, but pulled some of them to invest in the United States to circumvent trade barriers, such as Japanese FDI in the products of color TVs and microwave ovens during the seventies and of car assembly, copiers, and printers during the eighties(Wen, 1991: 41). Though they are under the protectionist pressures, too, Taiwanese manufacturers choose to invest more in neighboring countries, partly because of the smaller sizes of Taiwanese firms. Those Taiwanese firms capable of investing in the United States are mostly larger firms. For example, in 1987, the average value of Taiwanese FDI(value/no. of project) flowing to the United States was 3.3 million dollars while that to Southeast Asia 1.2 million dollars. In 1993, the average scale of Taiwanese FDI in the US is 6.1 million dollars while that in the ASEAN five is 3.1 million dollars. Certainly, depending on how one calculates the scales, this type of difference or gap would shorten or reverse in some single years, but the general pattern does not show great variations. Also, the average scale of Taiwanese FDI might increase because of the pattern in the second point mentioned above.

Fourthly, the economic reform and increasingly liberalized policies of East and Southeast Asian countries also exerted the effect of attracting Japanese FDI and Taiwanese FDI, which, together with cheaper production costs, were clearest in the cases of China and Vietnam. Referring to Table 2-4 and 3-2, one can see that, large quantities of Japanese FDI and Taiwanese FDI have flowed to China and Vietnam since the early nineties, partly because of the opening economies of

these two countries and partly because of the increasingly saturated ASEAN economies(e.g., rising labor and land costs).

While Japanese FDI and Taiwanese FDI demonstrate similar patterns within East and Southeast Asia; that is, from concentrating in Southeast Asia to focusing on China and Vietnam because of some common factors, there might be contrasting dimensions in the pattern. Japanese investment in China during the late eighties was mostly try-on by SMEs because the economic policies of the Chinese authorities were not open and the economic potentials were not clear enough though both sides did sign the Chinese-Japanese Investment Protection Agreement in 1988 and set up organizations in 1991 to promote Japanese investment in China(Taylor, 1996: 58). Nevertheless, not until the early nineties did large Japanese firms make sufficient investigation to consider large-scale investment projects in China, after viewing the gradual and small-scale liberalization as well as the realization of the mutual economic agreements between Japan and China(Ono, 1992: 19-24).

On the other hand, the economic interaction and exchange between China and Taiwan has been insufficient openness, which set various limits on matters of bilateral trade, remittance, and other economic affairs, thus forcing numerous Taiwanese SMEs to invest in the mainland without the permission of the authorities and without detailed studies on the economic settings of the mainland. In contrast to the Japanese cases, which were mostly based on economic consideration and less on political motives, the investment by Taiwanese in the mainland during the late eighties had to survive within a politically distorted

atmosphere. However, since the early nineties(1991 and 1993), Taiwanese authorities have understood the impossibility of stopping the trends of Taiwanese investment in the mainland, thus promulgating various sorts of regulation to control the flows of Taiwanese funds to China and limit the trading of certain goods as well as technical cooperation with the mainland to protect Taiwan's national security.[1] Though with substantial restrictions, Taiwanese manufacturers are still trying to invest in China to utilize the cheap labor, the policy incentives, and the international economic status enjoyed by China(e.g., Most Favored Nation status in Sino-US trade). They also want to take advantage of the convenience of communication resulting from similar cultural and linguistic backgrounds.

In the case of Vietnam, the picture seems to be turning around. Japanese investment in Vietnam was not substantial until the early nineties, when the Japanese government reopened its official relationships with Vietnam in view of the changes of the U.S. foreign policy toward the country(Islam, 1993: 337; Tabb, 1994: 37). Taiwanese investors have already made astonishing investment in Vietnam since the end of the eighties, becoming the largest source of FDI in

---

[1] Resorting to the Regulations on Taiwanese Investment and Technical Cooperation in Mainland China and the revised version, the MOEA demanded the Taiwanese businesses investing in the mainland report their previous investment in and technical cooperation projects with China to the authorities in 1991 and 1993. In 1996, the Taiwanese authorities promulgated a new piece of regulation, typifying the Taiwanese investment projects in the mainland into three kinds: allowed, disallowed, and special approval. Basically, the larger the firm is, the lower is the allowed value of the projects, which results from the fears that Taiwanese industries would be hollowed out and that the Chinese government would utilize Taiwanese investment to force Taiwan to participate in political

Vietnam.

II. The Significance of Taiwanese FDI

Though the history of Taiwanese FDI is shorter than that of Japanese FDI and though the accumulated amounts and scales of Taiwanese FDI are lower and smaller than those of Japanese FDI, the significance of Taiwanese FDI is still noteworthy in terms of its relative importance, the reinvestment patterns, and the financial sources of Taiwanese FDI.

International Comparison

According to one source of the Taiwan Institute of Economic Research(TIER), in terms of accumulated FDI(from the sixties to the early nineties), the value of Japanese FDI reached 34.89 billion dollars, which is far higher than that of Taiwanese FDI(14.584 billion dollars) and of Korean FDI(1.18 billion dollars)(Huang, 1994). However, it is noteworthy that, though the contemporary surge of outward FDI of Taiwan and Korea happened at the same time, the value of Taiwanese FDI is around thirteen times higher than that of Korean FDI, which is astonishing when considering the sizes of the two economies. Note also that it is not clear whether the source includes the data of Taiwanese investment in Mainland China. If not, then the value of Taiwanese FDI would be higher than that of Korean FDI when adding up the data according to the records of the Taiwanese government or the Chinese authorities.(The Taiwanese official data about Taiwanese investment in China tend to underestimate the actual value. This issue will be discussed later.)

---

negotiation that could be disadvantageous to Taiwan. See Lian(1997: p. 146).

The reasons why the value of Taiwanese FDI is far higher that of Korean FDI could be attributed to the following factors.

First, though both countries kept rigorous regulation over capital flows as of the mid eighties, Taiwan started gradual relaxation as early as in the seventies while the Korean government did not start large-scale liberalization until 1986, when Korea finally obtained satisfactory balance-of-payments and domestic wages began to rise sharply.

Second, Taiwan is known to be enjoying huge foreign exchange reserves, so much so that, during the early nineties(1991-96), the foreign exchange reserve of Taiwan was mostly higher than some advanced and developing countries. For example, in 1991, Taiwan's foreign exchange reserve was 82.41 billion dollars, higher than those of the United States(66.66 billion), Japan(68.98 billion), Germany(630 billion), and Korea(13.7 billion)(DOS, 1997: 79, Table M-11). The foundation of foreign exchange reserve one country accumulates would certainly influence the action of their investors.

Third, the extent of dependence on exports(viewed in terms of the ratio of exports to GDP) of an economy might also influence the speed and scale of outward FDI of an economy. When an economy encounters the appreciation of its currency and feels the pressure of protectionism, overseas investment would be a reasonable choice to keep market competitiveness and circumvent market barriers. For example, the degrees of export dependence of Taiwan in 1980, 1990, and 1992 are 47.8, 42.6, and 39.7 percents, respectively, while those of Korea in the same three years are 27.9, 25.6, and 24.9 percents, all of which are relatively

lower than those of Taiwan. In other words, Korea's lower export dependence, which could lead firms to engage in domestic rationalization rather than overseas investment, might be one of the reasons causing Korea's lower outward FDI than Taiwan's. Certainly, this does not constitute a determining factor because Japan's export dependence(12.2, 9.8 and 9.3 percent) is far lower than that of Taiwan and Korea and Japan's FDI is far higher than Taiwanese and Korean FDI(APEC Economic Committee, 1995: Attachment Table 2).

After conjecturing the reason why Taiwanese FDI has been higher than Korean FDI, the significance of Taiwanese FDI within the Asian area could be underscored further by examining Table 3-4, which summarizes the inward FDI to the ASEAN four, Vietnam, and Mainland China.

First, Taiwan has clearly been a leading home country of FDI in Malaysia, Vietnam, and China in terms of values, with the rank of second, first, and second, respectively. The table also shows that the target industries of Taiwanese FDI in these host countries are mainly light industries, such as textiles and papers, but some sectors of heavy industry(chemicals and basic metals) are no less important. This pattern indicates that, to some extent, the sectoral structures of Taiwanese FDI reflect the corresponding industrial structural changes in Taiwan. Seeing the disappearance of the comparative advantages in light industries, some Taiwanese manufacturers were forced or are planning to relocate their production overseas. Some sectors of the Taiwanese heavy industry have been relocated overseas, too, with a view to accessing raw material, such as metal and

Table 3-4 Aspects of Inward FDI to the ASEAN Four and Vietnam(Percentage)

	Leading Home Countries	*The Ranks of Taiwanese FDI*	*The Target Industries of Inward FDI*	*The Target Industries of Taiwanese FDI*
Malaysia	Japan, 22	2	E. & E., 20	Basic Metals, 30.9
1980-1992	Taiwan, 19.1		Basic Metals, 17.1	E. & E., 18.7
	Others, 11.8		Chemicals, 12.4	Metal Products, 11.2
Thailand	Japan, 36.5	4	E. & E., 15.5	Chemicals, 30.1
1981-1992	Hong Kong, 21.4		Chemicals, 5.6	E. & E. 17.7
	US, 10.7		Basic Metals,	Textiles, 15
Philippines	US, 22.6	4	--	--
1980-1992	Japan, 21.3			
	UK, 9.8			
Indonesia	Japan, 20.7	3	Chemicals, 19.9	Papers, 64.8
1967-1993(FEB)	Hong Kong, 8.3		Metal products, 8.8	Textiles, 20
	Taiwan, 6.2		Papers, 7.2	Metal Products, 5.8
Vietnam	Taiwan, 21	1	Heavy industry, 25	Non-metal products
	Hong Kong, 17		Light industry, 11	Textiles
	Korea, 8		--	Paper
China	Hong Kong, 68	2	E. & E., 8	E. & E., 11
1985-1993	Taiwan, 9		--	Food, 7
	US, 6			Metal products, 6

Source: Huang, 1994.
Note 1: E. & E. means electronics and electrical machinery.
Note 2: The data about China are drawn from Lee, 1994, pp. 50-3.
Note 3: The calculation of percentages is based on the value of the FDI projects.
Note 4: The 1992 data about Indonesia only include the data of the first two months.

rubber products.(Not shown in the table.)

Second, according to Table 3-5, which is based on the records of the Chinese government, Taiwanese investment in Mainland China is far higher than many industrialized countries. In around fourteen years, the investment in China by American and Japanese firms reached 14.4 and 8.8 billion dollars, respectively, but Taiwanese firms devoted 18.4 billion dollars during the same period, which is astonishing when considering the following points. The first is Taiwan's status as a NIE and her short history as an international investor. The second is that Taiwanese investment in China did not really begin until 1987, when the New Taiwan dollar was forced to appreciate and when production costs(wages and land prices) began to rise. The third is that the Taiwanese government did not permit "indirect investment" in Mainland China until 1991, but Table 3-4 shows that Taiwanese investment in China already started in 1985. The fourth is that, like the case of Japanese FDI, many projects of Hong Kong FDI in the mainland were made by Taiwanese firms because the Taiwanese government's regulation requires that Taiwanese firms to invest in the mainland through a third country. The fifth is that the Taiwanese authorities have not permitted completely open investment; the government has merely allowed Taiwanese to invest in labor-intensive industries in the mainland(by using a positive list) and has prohibited investment projects in heavy and technology-intensive industries, infrastructure, and certain sectors of the service industry(Chung, 1997: 206, note 15). Moreover, in June 1997, the Taiwanese government promulgated a set of new regulations regarding investment in the

mainland aimed at further control of Taiwanese investment in Mainland China.(See Note 1.) To sum up, though Taiwanese investment in China is eight years later than other countries and though the Taiwanese government has set numerous sorts of limitation and regulation on Taiwanese investment in the mainland, the total value of Taiwanese investment is still far higher than many Eastern and Western industrialized countries.

Table 3-5 Inward FDI to Mainland China(1979-1993)

Home Country	***Cases***	***Value (billion)***	***Average Per Case (million)***
Hong Kong & Macao	114,147	150.9	1.3
US	12,011	14.4	1.2
Taiwan	20,982	18.4	0.8
Japan	7,180	8.8	1.2
Germany	569	1.4	2.5
Singapore	3,122	4.8	1.5
UK	616	3.0	4.9
Thailand	1,399	2.0	1.4
Australia	1,309	1.2	0.9
Canada	1,540	1.8	1.1

Source: Editor(1994: p. 6).

Nevertheless, one should be aware that the average scale of Taiwanese investment is smaller than that of other countries, even smaller than the investment made by firms from Hong Kong and Macao, which suggests that the majority of Taiwanese investors are small- and medium-sized enterprises(SMEs). To some extent, this is similar to the Japanese investment trends in Mainland China during the late eighties, which was dominated by SMEs and labor-intensive

industries(Ono, 1992: 21).

Technical Issues Regarding the Data Recording

The significance of Taiwanese FDI would be more salient by considering some technical issues. Chapter Two reports that the Japanese FDI data provided by the Japanese MOF tend to inflate the actual investment made by Japanese firms because they are based on notification, which ignores withdrawals and changes. In sharp contrast, the Taiwanese data compiled by the Investment Commission of the Ministry of Economic Affairs(MOEA) tend to underestimate the actual scale and value because, under the Taiwanese government's restriction, Taiwanese firms often make overseas investment through other channels to avoid the government's scrutiny. The government's surveys have found four reasons why Taiwanese investors tend to evade official approval procedures: investment in personal terms is not defined as overseas investment by the government; no incentives are given to register overseas investment; the time required for the application and approval tends to be too long to meet the needs(catching market opportunities) of the firms; and the application forms are too complicated and confusing(IDIC, 1997).

This situation usually happens in the cases of Taiwanese overseas investment made by SMEs and, to a lesser extent, large firms, both of which, in view of the macroeconomic changes, seek to utilize the cheap labor of, find new markets in, and enjoy policy incentives offered by Mainland China as well as Southeast Asian countries, so much so that it is estimated that, on average, the cases and values of the investment projects approved by the host countries are

five times higher than those by the Taiwanese government(Chen et. al. 1995a: 89). In some special cases and depending on the statistical sources cited by the commentators, the differences are far higher. For example, in 1988, the value recorded by the Indonesian government was around one hundred times higher than that by the Taiwanese government(Schive, 1992: 115). Also, the Malaysian data show that during the 1986-1990 period, Taiwanese FDI was the largest investor country with the value of 1.4 billion dollars(Abegglen, 1994: 116).

Table 3-6 shows the data recorded by the governments of Taiwan and the host countries. A glimpse at the table reveals that the data differences between the home and host countries are extremely astonishing. For example, in 1988, the Malaysian figure was one hundred sixteen times higher than the Taiwanese official data.

The technical issue regarding the Chinese data sources should be mentioned here. According to Kao and others, three reasons account for why Chinese official data about Taiwanese investment are usually higher than those of the Taiwanese government. First, the two governments have been using different definitions. The Chinese government deems the value of imports and exports induced by Taiwanese investors in the manufacturing sector as a part of Taiwanese investment, but the Taiwanese government regards the same activities as a part of the trade between the mainland and Taiwan.
Second, to take advantage of the incentives provided by the Chinese government, some Taiwanese businessmen prefer to overestimate the costs of capital goods needed for production. Third, the Chinese authorities tend to report

Table 3-6 The Data Contrasts between the Taiwanese Government and the Host Countries($ Million)

	Malaysia	*Thailand*	*Philippines*	*Indonesia*	*Vietnam*	*China*
1987	69(5.8)	300(5.3)	0(2.6)	8(0.9)	--	--
1988	313(2.7)	842(11.8)	110(36.2)	914(1.9)	--	420
1989	815(158.6)	871(51.6)	149(66.3)	157(0.3)	1	500
1990	2392(184.8)	761(149.3)	141(123.6)	618(61.8)	104	1000
1991	1339(442.0)	568(86.4)	21(1.3)	1057(160.3)	458(17.1)	1310(174.1)
1992	602(155.7)	290(83.2)	9(1.2)	563(39.9)	531(20.1)	5561(246.9)
1993	347(64.5)	209(109.1)	5(6.5)	131(25.5)	436(158.3)	5200(168.4)

Source: Tsai(1994: p. 45, Table 1).

Note 1: Figures without parentheses are the official data of the host countries and figures in parentheses those of the Taiwanese government.

Note 2: The data of China in 1993 only include the data of the first three months of that year.

the contract amount, rather than the actual realization of investment projects made by Taiwanese firms, on the one hand, and they add projects that were withdrawn, on the other. However, in some cases, the Chinese government might underestimate the investment made by Taiwanese firms as it has not investigated whether investors from a third country(usually Hong Kong) are actually Taiwanese, who are required to make their investment under the regulation of the Taiwanese government(Kao, 1997; Kao and Hsu, 1996: 16).

The aforementioned technical issues indicate that, to some extent, the official data of Taiwanese FDI provided by the Taiwanese and Chinese authorities are not absolutely reliable. Thus, the interpretation of them should be made with more caution; one should be aware of data limitations. However, the reliability of the data of Taiwanese FDI need not constitute a serious flaw of interpretation as two considerations would mitigate the problem. For one thing, the technical issues are presented to highlight the reality that the scale and value of Taiwanese FDI in East and Southeast Asia are more salient than the Taiwanese official sources; that is, the geographic, and, to a lesser extent, sectoral(manufacturing sectors) concentration might be stronger than what is suggested by Table 3-1. For another thing, in view of and concerned about the rush of Taiwanese investment in Mainland China, the Taiwanese authorities have set and promulgated various regulations to control and scrutinize Taiwanese investment in Mainland China, and, to a lesser extent, other countries. The action of the Taiwanese government has diminished the gap between the official data between the home and host countries, according to the estimation of the Taiwanese

government and the academia. Not only has the government been aware of the ways Taiwanese investors make overseas investment to avoid the official review(Liang, 1997: 150), but scholars have observed that the data of the Central Bank of China and the Investment Commission are increasingly similar to each other, an indication that the official data have been approaching reality since the nineties. This is so because the data of the Central Bank of China always record the total value of outward remittance application and does not require investors to specify investing target areas. Therefore, its data more approximate reality than those of the Investment Commission, especially before the nineties(Lin, 1997: 46, 50). Certainly, the official data will never coincide with the actual investment values, but as long as the data are approximately the same, one can have a reasonable level of confidence, or at least a tolerable margin of error.

Finally, another technical issue needs to be discussed; that is, how much Taiwanese FDI is actually Japanese FDI, i.e., investments made by subsidiaries of Japanese transnational corporations? Indeed, this issue is very difficult to tackle because the aggregate data of FDI do not permit researchers to identify the real source of FDI from a specific country. Taiwan's case is especially difficult because numerous Taiwanese manufacturing firms have developed various relationships with Japanese partners, such as joint ventures and technical cooperation. However, some data could still allow one to make some lateral inference about the significance of Taiwanese FDI.

Table 3-7 shows the sectoral distribution of Taiwanese FDI(the manufacturing industry) in Mainland China(1991-1996) and other

Table 3-7 The Sectoral Distribution of Taiwanese FDI in Mainland China and other Countries(Percentage)

	Mainland China (1991-96)	*Other Countries(1987-96)*
Food & Beverage	12.2	5.7
Textile	6.5	9.3
Garment & Footwear	2.8	1.4
Leather & Fur	1.2	0.1
Lumber & Bamboo	3.6	1.8
Paper Products	2.6	3.7
Chemicals	7.6	19.2
Rubber	3.9	3.6
Plastic	10.1	5.1
Non-metallic Minerals	5.7	6.5
Basic Metals	9.6	10.5
Machinery	3.1	0.7
Electronic & Electric Appliances	18.2	31.5
Transport Equipment	6.2	3.6
Precision Instruments	6.6	0.6

Source: Calculated from Investment Commission, *The Statistics on Overseas Chinese & Foreign Investment, Outward Investment, Outward Technical Cooperation, Indirect Mainland Investment, and Guide of Mainland Industry Technology of the Republic of China*, 1997.

countries(1987-1996). This table shows that the investment of Taiwanese electronics firms(electronic and electric appliances) has been a main force of Taiwanese FDI from the late eighties to the early nineties. In the 1991-1996 period, 18.2 percent of Taiwanese FDI flowed to the Chinese electronics industry and 31.5 percent to the same industry in other countries. These figures could not help one identify how much Taiwanese investment is actually hidden Japanese FDI or FDI from other TNCs, but note that, as of 1995, Japanese electronics firms located in Taiwan constituted only 1.1 percent of the whole electronics firms in Taiwan. Even if one adds the firms of joint ventures by Taiwanese and Japanese, it only reaches 2.9 percent(Taiwan Industry Net, 1996). In other words, since Taiwanese national electronics manufacturers are the absolute majority in Taiwan and since the electronics industry has been the main target of Taiwanese electronics firms making FDI, the "purity" of Taiwanese FDI is at least secured in the electronics industry.

To a certain extent, similar conclusions could be made in the cases of the rubber, chemicals, plastic, textile, and garment industry. Various data sources suggest that, in the projects of FDI made by Taiwanese petrochemical firms(rubber, chemicals, and plastic) and textile manufacturers, Taiwanese national firms have been the majority. Table 3-8 lists the Taiwanese petrochemical manufacturers that have made or have been planning to make overseas investment since the early nineties. Most of them are either private businesses or state-owned(or public) companies.

Table 3-8 The FDI by Taiwanese Petrochemical Manufacturers in the Early Nineties($ Billion)

Firms	*Products*	*Host Countries*	*Value*
Formosa Plastic	ethylene	Texas	5
(Taiwanese, private)	PTA	Thailand	11
	PTA	Pakistan	3.2
Tongtis Group	cracker	Thailand	2.9
(Taiwanese, private)	PET fiber	Thailand	0.2
China Petroleum(state-owned), Union Petrochemical Corp., & Orient Union Chemical Corp.	cracker	Indonesia	0.4
Union	DOP	China, Shanghai	5.6*
Petrochemical Corp.	PA	Austria	--
(private)	chloro-ethylene	Indonesia	--
Chi-Mei Group	Styrene	US	0.1
(Taiwanese, private)	Styrene	Korea	6*
	ABS	China	9.45*
	PS		
	ABS	Malaysia	0.13
Taiwan Synthetic	rubber	Thailand	2.4*
Rubber Corporation	rubber	China	70*
(public company)			
Chinese Petrochemical	ABS	China	80*
Orient Union Chemical Corp.	ethyl hydroxide	Indonesia	--

Source: Ye(1997).
Note: The asterisks represent "million."

Most Taiwanese textile makers investing in China are Taiwanese native capitals, such as Chung Shing Textile(38.57 million dollars and ten plants), Formosa Taffeta(more than 0.1 billion dollars), Chia Heir Group(22.6 million dollars, a joint venture with another Taiwanese textile maker), and so on(Fen, 1998). In addition to the sites in China, Taiwanese textile manufacturers have established plants in Southeast Asia(e.g., Hua Long in Thailand) and Latin America(e.g., Nien Hsing Textile in Nicaragua and Mexico).

To be sure, this inference could not help one conclude that all projects of Taiwanese FDI recorded by the authorities are made by purely Taiwanese manufacturers, but it could offer a lateral support for the argument that most projects of Taiwanese FDI in the industries mentioned above are made by Taiwanese native capital though it is still difficult to identify how many cases or the ratios of hidden investment are made by TNCs or their affiliates from Japan and other countries.

The Reinvestment Patterns and Financial Sources of Taiwanese FDI

The significance of Taiwanese FDI could be highlighted further by discussing the financial sources and reinvestment patterns of Taiwanese FDI.
Chapter Two covers reinvestments made by the Japanese overseas subsidiaries that increasingly match the importance of the Japanese FDI in the main groups of countries in the world(North American, European, as well as the Asian and ASEAN countries), with the exception of China.(See Table 2-7.)

Unfortunately, regarding the comparison of the direct investment and reinvestment of the Taiwanese manufacturing firms, a set of similar data or layout similar to Table 2-7 is not available. Nevertheless, through indirect contrasts and reasoning, based on various survey results, the importance of Taiwanese FDI and the reinvestment patterns of Taiwanese overseas subsidiaries can be highlighted.

Table 3-9 demonstrates that, for the secondary industry, the leading sources of Taiwanese in 1991 were exporting machinery and equipment, reinvestment based on overseas profits, and loans (in terms of the numbers of firms). In view of this, it seems that the significance of Taiwanese FDI is challenged by the reinvestment of Taiwanese overseas subsidiaries. However, note that the lion's share of their reinvestment was accounted for by electronics firms(16 firms or 73 percent). In other words, the significance of reinvestment is limited to the category of electronics firms, not a prevalent trend of Taiwanese FDI in other sub-sectors in the manufacturing industry though reinvestment might become an important financial source in the future under certain circumstances, such as the increasing localization(in the host countries) of the enterprises making overseas investment.

Table 3-9 The Financial Sources of Taiwanese Overseas Investment, (1991, Number of Firms)

	Primary	*Secondary*	*Tertiary*
Loans	0	21(7)	17
Exporting Machinery and Equipment	0	28(10)	8
Exporting Materials and Semi-finished Goods	0	17	3
Exporting Patents or Technologies	0	6	5
Reinvestment(Profits)	0	22(16)	7
Overseas Bonds	0	2	1
Others	0	15	21

Source: MOEA, *The 1993 Survey on the Manufacturing Firms Making Overseas Investment*, p. 45, Table 4.
Note: Figures in parentheses denote the numbers of electronics firms.

The significance of Taiwanese FDI could be indirectly highlighted by the data in Table 3-10, which is based on a survey published by the Taiwanese government in 1997 and shows how Taiwanese manufacturing investors handle the profits resulting from their overseas investment. The table shows that Taiwanese investors tend to devote a large share of their profits to reinvestment in the manufacturing industry in their host countries, except in the case of Hong Kong(data about Thailand in the category is not reported by the source), in which Taiwanese firms investing in Hong Kong prefer to remit profits back to Taiwan(43 percent).

However, this survey is not based on random sampling and thus is not

conclusive. When examining another survey done by another sub-unit of the MOEA and based on random as well as sophisticated sampling, one finds out that the significance of reinvestment might not be so salient as to challenge that of Taiwanese FDI.(See Table 3-11.) To begin with, regardless of firm sizes, 50.37 percent of the firms tend to remit their profits of overseas investment back to Taiwan while 49.38 percent is left for reinvestment. The gap between remittance and local investment does not appear to be large, but note that the category of local investment is further divided into reinvestment in the original projects and local diversification. Thus, more profits have been remitted back for further processing(bonus for stock holders and funds for future FDI) and less left for the expansion of the original projects. In other words, the significance of reinvestment as a source of Taiwanese overseas investment has not been challenging that of Taiwanese direct investment.

Table 3-10 The Taiwanese Investors' Ways of Handling Profits of Overseas Investment, by Host Countries(Percentage)

	Indonesia	*Hong Kong*	*Thailand*	*Malaysia*	*Philippines*
Reinvestment	41	35	--	52.2	45
Remittance Back to Taiwan	32	43	28.5	37.3	38.6
Local Diversification	20	--	25.7	18	34
Dividends for Stock Holders	--	--	28.5	12	25
Investing in a Third Country	--	--	8.5	4.5	--
Returning Rate of Questionnaires	25(98/400)	5.8(23/400)	11.7(70/600)	16.5(66/400)	20.7(44/213)

Source: IDIC, 1998, pp. 12-21.
Note: Figures in parentheses denote the numbers of questionnaires returned and sent out by the MOEA.

Table 3-11 The Taiwanese Investors' Ways of Handling Profits of Overseas Investment, by Firm Size and by Host Countries(Percentage)

	Remit-tance	*Local Investment*			*Dividends*	*Investing in a Third Country*	*Others*
			Reinvestment	*Local Diversification*			
Total	50.37	49.38	39.59	13.28	10.91	2.00	10.66
Firm Size							
Large	40.59	56.11	48.84	11.55	10.23	2.64	15.84
Middle	51.01	46.98	35.57	13.42	11.74	3.02	8.05
Small	53.14	48.06	37.99	13.76	10.87	1.5	9.87
Host Countries							
US	42.68	42.68	36.94	8.28	8.92	1.27	16.56
Hong Kong	43.64	40.00	34.55	7.27	10.91	3.64	10.91
China	55.51	47.36	35.68	15.75	9.58	1.1	9.58
Japan	50	40.91	36.36	4.55	4.55	0	9.09
Malaysia	39.34	65.57	59.84	8.2	18.03	4.1	6.56
Singapore	23.08	61.54	61.54	0	23.08	23.08	7.69
Thailand	43.48	60	54.78	7.83	10.43	1.74	9.57
Indonesia	44.9	51.02	42.86	12.24	18.37	2.04	18.37
Philippines	26.47	55.88	44.12	17.65	17.65	2.94	17.65
Vietnam	46.81	46.81	25.53	23.4	8.51	0	10.64

Source: Department of Statistics of the MOEA, *The 1995 Survey on the Diversification and Internationalization of the Manufacturing Industry*, 1995, p. 66.

Note: The interviewee could choose more than one answer; therefore the sum of the percentages is not equal to 100 percent.

However, in terms of firm size and country, the significance of reinvestment cannot be ignored. It appears that large Taiwanese overseas subsidiaries prefer to devote much more of their profits to local investment(56.11 percent), rather than remittance(40.59 percent). Moreover, Taiwanese subsidiaries in Southeast Asian countries have allocated a large part of their profits to local reinvestment, especially in Singapore and Malaysia, while the affiliates in China, Japan, and Hong Kong tend to remit more profits back to Taiwan for further management. No clear signs show that the patterns pertain to the industrial and economic development levels of the host countries, but what is sure is that they are related to firm strategies, regulation of remittance and incentives on reinvestment, and the general macroeconomic and financial environments.

Nevertheless, the pictures just presented merely demonstrate how Taiwanese overseas firms handle their profits, but they do not constitute serious challenges to the significance of Taiwanese FDI, which has been highlighted at the beginning of this chapter.

III. Trade Patterns

Chapter Two covers how Japan, the United States, and the Asian first- as well as second-tier NIEs have constituted a trade triangle for at least three decades. With the United States(or North America) as a main export market absorbing industrial products from Japan and the Asian NIEs, not only has the United States run enormous trade deficits with the Asian countries reaching various levels of industrialization, but the Asian industrializing countries have also run chronic trade deficits with Japan, partly because of the inducement effect,

which stimulates the Japanese export of capital goods and intermediaries to those NIEs pursuing industrial development.

As a quickly industrializing NIE, Taiwan has been incorporated into this structural trade triangle along with other Asian industrializing countries, sharing the chronic problems of trade imbalance. However, Chapter Two covers some new facets in the triangular trade structure, such as the decreasing significance of the United States as a main export destination of Japan and Asian NIEs. Therefore, it would be valuable to investigate Taiwan's trade performance and her status in the trade triangle. Specifically, has Taiwan's status within the trade triangle deteriorated or ameliorated in terms of trade balance? Has Taiwan developed any significant trade sub-structures with Mainland China and the ASEAN countries as a large amount of Taiwanese FDI has concentrated in the manufacturing sectors of these two areas? What factors and practices have contributed to the emerging trade structure revolving around Taiwan?

The Fulcrum Shift of the Taiwan-Centered Trade Triangle

Taiwan's trade structure in terms of destination of exports and imports is displayed in Table 3-12.

Based on Table 3-12, one could make two observations.

First, in Taiwan's trade structure, the conventional trade triangle has not been as serious as some might expect. In regional terms, North America(the United States and Canada) was not the foremost export destination of Taiwan until the mid sixties. In 1967, North America was just the second largest export

Table 3-12 Taiwan's Trade Structure--Export Destinations and Import Sources(1967-1995, Percentage)

	Asia		***North America***		***Latin America***		***Europe***	
	Ex.	*Im.*	*Ex.*	*Im.*	*Ex.*	*Im.*	*Ex.*	*Im.*
1967	53	49	30	32	1	1	11	9
1970	38	53	42	25	1	3	10	10
1975	32	40	38	29	2	1	15	13
1980	29	37	36	25	4	1	16	9
1985	27	39	51	25	2	3	10	12
1990	38	44	35	25	2	2	2	18
1995	53	49	25	22	2	2	14	18

Source: Calculated from Department of Statistics, *Economic Statistics Annual*, 1996, Taiwan Area, China.

market of Taiwan and shared 30 percent of Taiwanese export while Asia absorbed 53 percent of Taiwanese export in the same year. Though North America became the largest export market again in 1970 and its share reached the climax in 1985(51 percent), it soon fell to 25 percent in 1995. Theses figures show that, in terms of export destination and after inclining to the North American market for about three decades, the fulcrum of Taiwan's trade structure has stepped toward the side of Asia(mainly Northeast and Southeast Asian countries) since the mid eighties, which indicates the increasingly integrated trade relationships between Taiwan and her neighboring countries.

Second, the table also shows that the structure of Taiwan's imports source has undergone stable changes. At the same time when absorbing fewer imports from North America, Taiwan imports more from the Asian countries, and, to a lesser extent, the European countries since 1980. The North American share

declined from 32 percent in 1967 to 22 percent in 1995 while that of Asia rose from the bottom in 1980(37 percent) to 49 percent in 1995. These figures partially correspond to findings in Chapter Two. In other words, while its shape is not disfigured, the fulcrum of the Asian-Pacific trade triangle revolving around Taiwan has moved from the East Pacific side to the West side.

Not only has the gravity center of Taiwan's trade structure shifted, but, like the case of Japan in its early phase(the fifties, sixties, and seventies) of the Asian-Pacific trade triangle, in which Japan imported capital goods and technologies, manufactured simpler products, and exported them to the United States and to the Asian developing countries(Hill and Fujita, 1996a). Taiwan has forged her trade sub-triangle with Mainland China and the ASEAN countries. In addition, Taiwan is playing a role similar to Japan(that is, importing capital goods from the United States and Japan, manufacturing products, and exporting them to industrialized as well as industrializing economies), but in some ways different from the triangle revolving around Japan.

Three observations can be made by examining Table 3-13.

First, as has been presented in Chapter Two, Taiwan has run chronic trade deficits with Japan, partly because of Taiwan's dependence on importing Japanese-made key components(e.g., LCDs) and capital goods(e.g., semiconductor machinery), on the one hand, and decreasing trade surplus with the United States, on the other. Note that Taiwan has run trade deficits with South Korea since 1990 and the imbalance is increasingly serious.

Second, as presented in Table 3-2, Taiwanese firms have made substantial

Table 3-13 Taiwan's Trade Balances with Main Trading Partners(1960-1995, $ Thousand)

	Japan	*Korea*	*China*	*US*	*Hong Kong*
1960	-43,089	5,916	--	94,255	15,932
1970	-437,158	12,767	--	200,335	108,615
1980	-3,179,790	57,995	--	2,086,814	1,300,689
1985	-2,087,902	67,202	--	10,027,100	2,220,041
1990	-7,660,713	-130,830	-293,248*	9,134,026	7,110,376
1995	-17,109,153	-1,755,608	-271,469	5,635,996	24,262,982
	Indonesia	***Malaysia***	***Philippines***	***Singapore***	***Thailand***
1960	-14	2,051	-1,201	2,518	1,809
1970	20,713	-17,453	-4,408	20,618	-15,750
1980	-61,367	-254,917	77,739	323,451	86,356
1985	-132,890	-286,598	134,959	609,292	89,296
1990	324,224	100,529	575,166	797,621	975,676
1995	-281,548	-55,126	1,030,330	1,447,012	1,586,434

Source: DGBAS, *Databook, Taiwan Area*, 1996; *Economic Statistics Annual*, 1996, Taiwan Area, China.

Note: * denotes the 1991 data.

investment in China, the ASEAN countries, and other Asian countries or areas, with a special focus on the manufacturing sectors in these economies. However, the inducement effect of Taiwanese FDI has not always led Taiwan to enjoy sweeping trade surpluses with the Asian host countries. In the cases of Singapore, Thailand, and the Philippines, Taiwan has had trade surpluses, but in the cases of Malaysia and Indonesia from the eighties to the early nineties, Taiwan ran trade deficits. Taiwan even ran trade deficits with China, which has received substantial Taiwanese investment.

The data presented by the table result in one puzzle: Why has Taiwanese FDI not resulted in sweeping trade surplus for Taiwan as has Japanese FDI for Japan?

To resolve the puzzle, one should first be aware that the tripartite data regarding Hong Kong, Taiwan, and China emerging from the table are deceptive if one does not consider the bilateral trade between Taiwan and China which has been mostly conditioned by the political limitation posed by the two governments, on the one hand, and by the hidden trade connections among them, on the other. It is well known that Taiwan has been disallowing direct trade with and investment in China, which prevents one from making valid interpretation on the economic interaction between Taiwan and China. Therefore, to calculate the actual bilateral trade between the two sides, one should compare the trade data of the three authorities and measure the validity of different official sources.

One way to find out the most approximate data is to investigate the official data of the Hong Kong government, which are partly presented in Table 3-14, as

a substantial part of Taiwan's exports to Hong Kong is actually destined to Mainland China and other countries, which is not shown in the general Taiwanese official data.

Table 3-14 Hong Kong as a Transhipping Center between Taiwan and China(1979-1995, $ Million and Percentage)

	Imports from Taiwan		***Exports to Taiwan***		
	value	*of which: re-export to China*	*value*	*of which: re-export to Taiwan*	*balance*
		value		***value***	
1979	1,207	21.5(2)	346	56.3(16)	-34.8
1985	2,679.2	986.9(37)	554.5	115.9(21)	871
1990	7,446.7	3,278.3(44)	2,724.1	765.4(28)	2,512.9
1995	16,572.6	9,882.8(60)	4,580.6	1,574.2(34)	8,308.6

Source: MAC, 1997.
Note: Figures in parentheses represent the percentage of re-export to China.

To interpret Table 3-14, two background statements should be mentioned. To begin with, in 1979, the year when the Chinese government began to promote economic reform, Taiwan already ran trade deficits with Mainland China. However, in the next year, Taiwan quickly ran trade surplus with China and the surplus was rising steeply, which reflects the effort of the Chinese government to encourage economic interaction between the two sides and the Taiwanese government's regulation to limit imports from the mainland. The Chinese government formulated and adjusted its trade policies regarding economic interaction with Taiwan in particular and other countries in general. Generally, the mainland's trade policy has been based on fine-tuning economic dynamics lest it

become too heated or slack. For example, in 1979, the Chinese government provided incentives to encourage Taiwanese businessmen to trade with the mainland, but the custom preferential treatment for Taiwanese businesses was cancelled in 1981 and imports from Taiwan were regulated in 1982 with the purpose of controlling inflation and overheated economy. Nevertheless, since the eighties, Taiwan's exports to the mainland have been encouraged because of the increasingly accumulated foreign exchange of China, the decentralization of trade policies from the central government to local authorities, and the intention to control the Taiwanese economy(MAC, 1994: p.62). The Taiwanese government did not make active responses to the bilateral trade issues until 1985, when the "Noninterference Principle of Indirect Exports to the Mainland" was formulated by the government(Chiu, 1995: 146-8). Besides, Taiwan did not permit the imports of some intermediaries from the mainland until 1991.

The second background statement pertains to the importance of Hong Kong as a transhipping center with increasing percentages of re-exports to Taiwan or to the mainland from the late seventies to the early nineties. In 1979, only 2 percent of Taiwan's exports to Hong Kong were re-exported to China while 16 percent of China's exports to Hong Kong to Taiwan. The two percentages of re-exports climbed to 60 and 34 percents, respectively, in 1995, which, again, reflects Taiwanese regulation and limitation on imports from the mainland.

The figures compiled by the Hong Kong authorities(Table 3-14) reveal the invalidity and inaccuracy of the data provided by Table 3-13. However, what Table 3-14 demonstrates does not approximate the precise trade interaction,

either, because it does not take into account illegal trade and other forms of trade interaction. According to Sung, two types of "indirect" direct trade occur under the regulation framework, in addition to illegal trade, which is hard to estimate and usually small in comparison to other forms of trade. The first type of "indirect" direct trade is based on "switching of trade documents," in which Taiwanese exporters claim that the goods are to be exported to Hong Kong, but they are actually sent to the mainland without passing through the customs of Hong Kong. This form of trade is not recorded by the authorities of the transhipping center and Taiwanese exporters adopting this strategy save customs in doing so(Sung, 1995: 75; 1997: 61). The second type results from the emerging adjustment and compromise of the two sides. Since 1988, the Taiwanese government has permitted cargo ships with the flags of a third country to sail between the mainland and Taiwan with the proviso that the ships must pass by Hong Kong before shipping to Taiwan so that the "direct shipping" between the two sides takes an "indirect" form, termed by the Hong Kong authorities as "cargo in transit"(Sung, 1995: 76).

In view of the statistical data flaws, various scholars have submitted formulas or made estimation to correct the errors. Some guess that the Taiwanese official data miss at least 20 percent of the real trade value(Islam and Chowdhury, 1997: 178). Sung suggests the "trade partners' statistical technique," which is supposed to obtain the real value of Taiwan's exports to the mainland by first adjusting the fees of c.i.f.(cost, insurance, and freight) and f.o.b.(free on board) and then by subtracting the import values of Hong Kong from Taiwan's export values to Hong

Kong. Kao claims that, by using this technique, he and Sung found the custom data of the Hong Kong account to be only half of the most approximate values of the bilateral trade between Taiwan and the mainland(Kao and Hsu, 1996: 15). However, Sung reports that the technique could not be used vice versa because the mainland's exports to Taiwan could go through other countries by purchasing fake certificates of origin(Sung, 1997: 62, 64). In other words, trade data about the bilateral trade between Taiwan and the mainland remain approximate even if one tries to correct the data flaws.

Nevertheless, one could still use these approximate data to discuss the puzzle emerging from the aforementioned depiction. In the case of the Taiwan-China bilateral trade, it is clear that, whether by using the data provided by the Hong Kong government or derived from the "trade partners' technique," Taiwan has actually run a trade surplus with the mainland that has been increasing, which, apparently, results from the inducement effect and Taiwan's restriction on imports from the mainland. On the surface, this pattern seems to put Taiwan in an advantageous position, but it should be noted that this means Taiwan is increasingly dependent on China's market, a dangerous situation either in view of purely economic reasoning or political considerations(national security). According to the data available from the Mainland Affairs Council(MAC) of Taiwan, Taiwan's trade surplus with China has overtaken Taiwan's overall trade surplus with the world(12 billion dollars versus 7 billion dollars in 1993) and the trend shows no signs of stopping. If China stops or imposes extreme restriction on trading with Taiwan, then Taiwan's trade balance could turn into serious deficits,

thereby increasing China's chips in political negotiation with Taiwan.

Taiwan's trade dependency on China notwithstanding, the puzzle is resolved only partially through the above-mentioned calculations since the previous discussion does not reveal why Taiwan runs both trade deficits and surpluses with the countries where Taiwanese firms have made substantial investments. To solve this puzzle, one must explore the shaping factors of the trade triangle revolving around Taiwan.

The Shaping Factors of the Taiwan-Centered Trade Triangle

The first factor that might have contributed to Taiwan's trade performance was the appreciation of the NT Dollar during the late eighties. Theoretically, NT Dollar appreciation would hurt the export performance of Taiwanese firms, but the appreciation could also cut production costs(imported capital goods and intermediaries), which presumably tends to ameliorate Taiwan's trade deficits with some countries(e.g., Japan). Besides, Taiwan's trade deficits with some trading partners began before the appreciation and continued when the appreciation effect was supposed to have amended the deficits. Therefore, it is argued here that Taiwan's trade deficits with Japan and some of the Asian industrializing countries are more than a short-term problem; it is also the result of deep-seated structural dynamics, which will be explored later.

The second factor pertains to the inducement effect, procurement strategies, and market targets, which help to explain why Taiwan has enjoyed trade surplus with the mainland and some host countries. As has been argued in Chapter Two, the inducement effect as well as Japanese practices of procurement and

marketing resulting from Japanese FDI might have made a great contribution to the trade imbalance of Japan's trading partners because Japanese TNCs prefer to import needed capital goods and key components to the host countries, on the one hand, and target local markets rather than the third market as well as Japan(reverse imports), on the other. In view of this, it would be interesting to ask a question: are the inducement effect, procurement practices, and marketing targets of Taiwanese FDI different from those of Japanese FDI? Are these similarities and differences the causes of Japan's sweeping trade surplus and the cause of Taiwan's trade deficits with some of her major trading partners, the leading host countries of Taiwanese FDI?

Examining the changes in Taiwan's export structures from the mid eighties to the early nineties makes it clear that the inducement effect does exist. In 1986, the share of intermediaries in Taiwan's exports was 33.4 percent while that of machinery and equipment was 10.8 percent. The shares of these two types of goods have been increasing since then, reaching 54.7 and 16.8 percents, respectively(Hsiao, 1995: 26). However, analysts have hardly done any specific calculations about the inducement effect triggered by Taiwanese FDI in terms of areas, countries, or industrial sectors, except that about the Taiwanese investment in the mainland. A survey conducted by some Taiwanese scholars found that 75.4 percent of machinery used by all Taiwanese firms investing in the mainland was imported from Taiwan while only 14.5 percent was procured locally. It is also calculated that, in 1991, the value of the bilateral trade induced by the Taiwanese investment in the mainland was 1.27 billion dollars, or 36 percent of

the bilateral trade value between Taiwan and the mainland(3.5 billion dollars) in that year(Kao, Lee, and Lin, 1992: 149-50, 181-2). This explains why the mainland runs trade deficits with Taiwan, but it still does not reveal why Taiwan runs trade deficits with Korea, Malaysia, and Indonesia.(Note that Taiwanese FDI has not been significant in South Korea.)

To overcome this difficulty, it might be helpful to see the ways Taiwanese investors obtain needed components and intermediaries in different countries. From Table 3-15, two patterns emerge.

First, like their Japanese counterparts, Taiwanese investors tend to import more components, intermediaries, as well as technologies to the host countries, instead of sourcing locally. In some host countries, such as in East Europe, Taiwanese investors depend extremely on importing technologies from Taiwan(100 percent), but in some host countries, the percentage of technology importation from Taiwan is not that high, such as in Japan. Moreover, no clear pattern shows whether Taiwanese investors tend to import intermediaries and components to host countries that demonstrate weaker capabilities. For example, in the United States(industrialized) it was 54.86 percent in 1995, higher than the percentage for Indonesia, Malaysia, or Thailand(industrializing). All one could reason is that the degree of sourcing from Taiwan might depend on whether the host countries have developed sufficient capabilities and complete supplier networks to raise the levels of localization(procuring from local Taiwanese and non-Taiwanese firms), on the one hand, and other factors(such as

Table 3-15 The Sources of Components, Intermediaries, and Technologies of Taiwanese Overseas Production(1995 and 1996, Percentage)

	Taiwan	*Local Firms —Taiwanese*	*Local Firms --non-Taiwanese*	*Third Countries*
US(72.22)	54.86(95')	9.68	26.76	8.71
	51.93(96')	12	27.6	8.48
Latin America(75)	56.67	40	3.33	0
	62.5	35	2.5	0
West Europe(87.50)	82.5	2.5	5	10
	78.57	2.14	4.29	15
Hong Kong(88.24)	61.26	13.33	6.11	19.3
	61.52	11.3	7.22	18.96
China(94.11)	56.26	18.16	18.78	6.8
	50.75	21.2	21.08	6.97
Japan(30)	44	4	16	36
	46	4	14	36
Malaysia(91.04)	53.02	16.82	18.32	11.84
	51.28	18.7	18.43	11.59
Thailand(88.41)	41.41	17.56	29.49	11.54
	34.32	19.46	30.51	15.71
Indonesia(97.37)	42.33	5.21	47.46	5
	39.52	10	44.24	6.24
Philippines(86.36)	61.67	4.33	11.5	22.5
	56.42	4.58	11.08	27.92
Vietnam(93.33)	58.68	27.47	10.16	3.68
	62.86	17.21	8.68	11.25
Others(100)	65.11	11.56	21.11	2.22
	72.75	13.5	12.5	1.25

Source: MOEA, *The 1996 Survey of the Overseas Investment of the Manufacturing Industry*, 1997, pp. 95, 98, 102-3.
Note: Figures in parentheses indicate the percentages of technologies imported from Taiwan while those without parentheses the percentages of components and intermediaries from Taiwan in 1995 and 1996, respectively.

policy incentives and macroeconomic conditions), on the other.

Second, since Taiwanese investors tend to import components, intermediaries, and technologies from Taiwan to the host countries, it could be reasoned that this is one cause of Taiwan's long-term trade surplus with most of the host countries; but it is still not clear why Taiwan keeps on running trade deficits with Malaysia and Indonesia even though Taiwanese have made substantial investment in these two countries.

In addition to the appreciation of NT dollars and the inducement effect, a third factor might contribute to Taiwan's trade surpluses: the way Taiwanese firms set their market targets. Several surveys conducted by Taiwanese authorities suggest at least three findings, illustrated by Table 3-16.

First, similar to Japanese practices, Taiwanese manufacturing firms making overseas investment tend to set the third countries and local markets as the major sale targets. Regardless of firm size, the third countries are the preferred market targets of Taiwanese firms and the host markets the second choice. Exporting back to Taiwan or reverse imports have not been the most important target.

Second, before 1986, the significance of third countries as a target market was lower than that of the host markets; it increased during the late eighties, but decreased through the early nineties. The share of the host markets declined as that of the third markets increased, but it also peaked in the early nineties and then began to decrease. Furthermore, the share of reverse imports underwent fluctuations through the eighties and then rebounded to 16.9 percent. This could be attributed to the realization of previous FDI projects in contrast to Japan's

Table 3-16 Target Markets of the Taiwanese Overseas Subsidiaries(Percentage)

	Third Countries	*Domestic Markets*	*Exporting to Taiwan*
Firm Size			
Total	48.2	40.5	11.3
Big	46.5	44.4	9.1
Medium	52.2	35.5	12.4
Small	47.5	40.8	11.7
Periods			
Before 1986	39.7	47.0	13.3
1987-1991	51.3	40.0	8.7
1992-1994	44.3	46.1	9.6
after 1995	40.0	43.1	16.9
Industrialized			
US	23.5	66.9	9.7
Japan	28.9	65.6	5.6
EU	15.7	83.6	0.7
Industrializing			
China	49.9	40.2	9.9
Indonesia	32.5	48.6	18.7
Malaysia	47.9	45.5	6.6
Vietnam	48.4	28.5	27.2
Others	24.0	60.9	15.0

Source: Department of Statistics of MOEA, *The 1995 Survey on the Diversification and Internationalization of the Manufacturing Industry*, p. 73.(in Chinese); The 1996 Survey of the Overseas Investment of the Manufacturing Industry, p. 146.

performance, which also experienced slow growth of reverse imports(refer to Table 2-12 and 2-13). In addition, it seems that, on average, Japanese TNCs prefer to choose the host markets as the leading target in comparison to Taiwanese firms.

Third, one could reason that Taiwanese FDI in industrialized countries tend to aim at the host markets, which suggests that Taiwanese FDI is aiming at them to either passively consolidate the markets of industrialized economies(to circumvent protectionism), or to actively search for more market opportunities. On the other hand, Taiwanese FDI in industrializing countries has shown bipolar trends; that is, in more advanced industrializing economies, such as Malaysia and Thailand, the shares of local and third markets are roughly equivalent while in newer industrializing countries, i.e., Vietnam and the Philippines, the third markets are the leading targets. China is a special case in that her large domestic market is regarded as a land full of opportunities, especially after the early nineties.

In view of the aforementioned discussion, it could be inferred that Taiwan's trade deficits with Korea, Indonesia, and Malaysia are caused by none of the shaping factors of the trade triangle revolving around Taiwan. In other words, the deficits are made by other factors and the reverse imports are not the cause because the data show that exports back to Taiwan are not particularly high from Malaysia, Indonesia, and Korea. The first reason why Taiwan has run trade deficits with Indonesia and Malaysia is the sampling choice, which tend to highlight Taiwan's deficits in some years and cover Taiwan's surpluses with

Indonesia in other years. The second one pertains to protectionism and technology dependence, which is exemplified Taiwan/Korea bilateral trade data. On the one hand, Korea has set more tariff taxes on the imports of petrochemical and electronic products. On the other hand, because of the need resulting from the implementation of the Six-Year National Construction Plan in the early nineties and because of the fast developing electronics industry in Taiwan, Taiwan needs to import more heavy industrial products and electronic components(e.g., diodes and cold cathode, and so on) from Korea(BOFT, 1998a). The third one is connected to relative comparative advantages and pure trading practices. For example, not only has Taiwan been importing more mineral products from Malaysia and Indonesia, but in total value Taiwan has imported more electronic products from Malaysia than she has exported to, which contributes to Taiwan's trade deficits with Malaysia.

The Catch-up Product Cycle: the Taiwanese Experience

As argued in Chapter Two, the catch-up product cycle(CPC) of Japan could be measured in various ways. The first one is to examine the export shares of certain industrial goods. This method shows that, not only has the share of textile products in Japan's export undergone the process of rise and fall from the beginning of this century to the nineties, but the mainstay of Japanese industrial structures changed from labor-intensive to capital- and technology-intensive industries.

Using the same method, one could examine Taiwan's export structures to see if Taiwan, a member of the East Asian flying geese formation, has been

catching up with Japan, the leading goose, in the export of certain industrial goods.

From Table 3-17, one can see that the export share of textile products accounted only 5.6 percent in 1965, increased to 13 percent in 1970, and reached 27.8 percent in 1975. Then it has declined since the early eighties, falling down to 14 percent in 1995. Seeing these patterns, it could be inferred that both Japan and Taiwan have undergone the same process of rise and fall regarding the significance of their textile products and that the export cycle of Taiwan's textile industry has been falling behind that of Japan for about two decades.

Both Japan and Taiwan have undergone similar cycles with time lags. Both of them have made overseas investments after the maturation of the industry. When the exports of Japanese textile products reached the peak and gradually declined(around the late sixties and the early seventies), Japanese overseas investment in the textile industry began to heat up, with the result that the lion's share of Japanese FDI in the industry flowed to East Asian and the ASEAN developing countries(74 percent in the period of 1965-69 and 70.6 percent in the period of 1970-74)(Yamazawa, 1990: 85).

When Taiwan's exports of textile products began to decline in the early eighties, Taiwanese FDI in the textile industry became increasingly significant with the lion's share concentrated in industrializing Asian countries. From Table 3-18, three patterns are apparent.

Table 3-17 The Evolution of Taiwan's Export Structure(1965-1995, Percentage)

	Primary	*Chemicals*	*Textiles*	*Toys, etc.*	*Basic Metals*	*Electronics & Machinery*	*Transportation Equipment & Precision instruments.*
1965	14.9	--	5.6	--	3.6	4	2.5
1970	6.3	2.5	13	--	4.6	12.8	8.7
1975	5.2	10.4	27.8	--	2.3	33	4
1980	2.5	13	22.6	--	2	40.1	5
1985	3.2	6.6	19.5	15.7	7.7	24.2	6
1990	2.5	8.5	15.3	10.4	7.8	34.4	7.7
1995	2.8	10.1	14	4.2	10	43.7	7.1

Source: DOS, *Economic Statistics Annual*, 1996, Taiwan Area; MOF, *Monthly of Imports and Exports*, various issues.

Note 1: "Chemicals" include chemical, plastic, and rubber products, and "toys" toys, footwear, and other labor-intensive products.

Note 2: Due to the inconsistencies of categorization of the statistical sources during the past three decades, there might be some errors in the percentages, but probably not more than one percent.

Table 3-18 Taiwanese FDI in the Textile Industry(1987-1996, $ Million & Percentage)

	Asia	*America and Europe*	*China*	*Total*
before 1987	--	--	--	10.6
1987	0.6	0	--	0.6
1988	3.7	0	--	3.7
1989	35.5	2.1	--	37.6
1990	45.4	4.8(E)	--	50.2
1991	17.6	30(E), 4.4(A)	13.6	52
1992	77.9	0	23.3	77.9
1993	86.5	0.2(A)	178.5	86.7
1994	46.2	0	41.9	46.2
1995	86.3	20(E), 12(A)	60.9	118.3
1996	58.8	0	96.8	58.8
Total	458.9(86%)	73.4(14%)	415.1	532.3

Source: Investment Commission, *Statistics on Overseas Chinese & Foreign Investment, Outward Investment, Outward Technical Cooperation, Indirect Mainland Investment, and Guide of Mainland Industry Technology of The Republic of China*, various issues.

First, though it began before 1987(the first project was made in 1962), Taiwanese FDI in the textile industry was not active until 1989. In that year, Taiwanese FDI in the industry skyrocketed to 35.5 million dollars, a level far higher than the accumulation of the past two decades.

Second, similar to Japanese FDI in the industry, the textile industries of Asian developing countries have been the main target of Taiwanese FDI. From 1987 to 1996, the Asian textile industry received the lion's share of Taiwanese FDI, sharing 86 percent. Individually speaking, only in 1991 have the combined shares of American and European textile industries overtaken that of the Asian countries.

Third, relatively speaking, the textile industry of China has been a priority choice of Taiwanese FDI according to the Taiwanese official data. In certain years, such as 1993 and 1996, China's share even surpassed the combined shares of the Southeast Asian countries, not to mention the American and European countries. Note that these are the Taiwanese official data, which might either miss the investment projects that have not been reported to the authorities or projects completed before 1991.

Though Taiwanese textile firms made substantial overseas investment, the share of the industry in Taiwan's export structure has not declined to a level as low as Japan's. Table 3-17 shows that, until 1995, textile products still gained 14 percent of Taiwan's total exports. This pattern not only reveals that the stage of reverse imports has not been significant, but that the reason why the declining trend has not been that swift is that Taiwanese FDI in overseas textile industries

has induced Taiwanese textile firms to upgrade and export more upstream products to meet the industrial needs of the downstream(garments production) and the mid-stream(cloth manufacturing). For example, garment was dominant in Taiwan's textile exports(over 50 percent), but its share has been overtaken by cotton yarns and fabrics(65 percent in 1996). Moreover, not only has the main export destination of Taiwan's textile products switched from North America to Mainland China and Southeast Asian countries, but Hong Kong has been the leading export market of Taiwan's textile products. The Taiwanese authorities calculated that 60 percent of Taiwan's textile products exported to Hong Kong has been re-exported to the mainland(Taiwan Industry Net, 1996). Thus, unlike the case of Japan's textile industry, which has reached the stage of reverse imports, Taiwan is still a net exporter in textile products.

In addition to the changes of export shares in Taiwan's textile products, the share of electrical machinery and apparatus has been sharply increasing, except in 1985, from 4 percent in 1965 to 43.7 percent in 1995, while other industries have either grew slowly, or fluctuated. The fast increase of its share is actually prompted by a swiftly developing electronics industry, including information technology(IT) products. The combined shares of electronic and IT products have represented over half of the general category(electrical machinery and apparatus). In 1985, the combined share was 14.2 percent, around half of the general share(24.2 percent). And in 1995, it rose to 23.5 percent, still around half of the general share(43.7 percent). Since the general category includes sub-categories of electronic products, machinery, electrical machinery, and IT goods,

not only has Taiwan upgraded from specializing in light industry(the textile industry), but Taiwan has been devoting herself to capital- and technology-intensive industries, as substantiated by Table 3-19. Note especially the percentage changes of textiles, apparels, and electronics.

Leaving the method of calculating export share of certain goods aside, it has been described that the catch-up product cycle not only demonstrates itself in terms of the export structure of a country, but also displays among a group of countries. It is also pinpointed that Taiwan and Korea have caught up with the leading goose in some product categories, such as textile products, on the one hand, and office machinery as well as telecommunication equipment, on the other. Here it could be added that Taiwan has been the leading exporter in the subcategories of textile and IT products. For example, though it has been regarded as a light and labor-intensive industry, the textile industry actually contains capital- and technology-intensive parts, such as yarn spinning(UNCTAD, 1995: 244). Not only has she been the second leading producer of chemical fibers, but Taiwan has been excelling in manufacturing man-made fibers and yarn formation, both of which belong to the up-stream phase of the industry(NITC).

For another example, it is demonstrated in Chapter Two that though both Korea and Taiwan have been trying to catch up with Japan in the categories of office machines and telecommunication equipment and though the gaps are not narrowing fast enough, Taiwan's performance in the production and export of IT products has performed well. Not only has she been running a trade surplus with Japan in terms of PC-related products, but Taiwan has been a leading

Table 3-19 The Evolution of Taiwan's Export Structure and Industrial Upgrading(1981-1994, Percentage)

	1981	*1987*	*1991*	*1993*	*1994*
Labor Intensive	61.8	54.0	47.5	40.2	39.9
Food & Beverage	5.2	4.6	3.8	3.7	3.7
Textiles	**8.2**	**6.6**	**9.2**	**10**	**11.6**
Apparels	**14.6**	**10.3**	**7.1**	**5.9**	**5.1**
Lumber & Bamboo	5.5	4.2	2.7	1.2	1.0
Rubber & Plastic	8.7	8.7	7.2	7.3	7.3
Capital- & Technology-Intensive	38.1	45.9	52.4	59.7	60.0
Chemicals	1.6	1.8	3.3	4.0	4.8
Basic Metals	2.2	1.4	1.9	2.5	2.7
Metal Products	4.7	6.1	6.7	8.0	8.3
Machinery	4.2	4.4	6.9	8.8	8.6
Electronics	**18.9**	**25.5**	**28.7**	**27.3**	**27.9**
Transport equipment	3.3	4.5	5.4	6.2	5.1
Precision Instruments	2.1	2.0	2.5	2.5	2.3

Source: Hsiao, 1995, p. 34.

exporter of IT products. Table 3-20 shows that Taiwan has been a leading producer and exporter of many IT products, ranging from technical-intensive, such as scanners, to labor-intensive, i.e., mice and keyboards. According to the 1996 data, seven out of ten computer users are using computers with motherboards manufactured by Taiwanese firms. Also, over 50 percent of computer users have monitors, keyboards, mice, and other products made by Taiwanese firms.

Chapter Two points out that, besides examining the export structure of a country and the world shares of a country's export in certain goods, the second and third ways to measuring the catch-up product cycle of an economy are to calculate the specialization index of a country and the intra-industry trade index among a group of economies. Regarding the former, Table 3-21 presents the specialization index of Taiwan in the past three decades and shows two patterns.

First, Taiwan has been a young NIE since the seventies and a mature one since the early eighties, lagging behind Japan, which has been a mature NIE since 1965 and stepping toward an industrialized economy since the seventies. The gap between Japan and Taiwan is ten to twenty years in terms of industrial specialization.

Table 3-20 The World Shares of Taiwan's IT Products(1991, 1994, and 1996; Percentage)

	1991	*1994*	*1996*
Monitors	39.7	56	53.4
Mini Computers	10.1		
Motherboards	67.4	80	74.2
Switching Power Suppliers	19.6	31	55.3
Scanners	69.9	61	52(Handy: 95)
Terminals	17.5	22	24.6
Graphic Cards	35.5	32	38.3
Mice	70	80	65
Keyboards	18	52	61
Network Cards	19.4	34	
Portable Computers		28	32(Notebook)
Desktop Computers		8	10.2
Sound Cards		11	50
Switches		18	
Video Cards		24	55
CD-ROMs		1	

Source: IDB, *Annual Report of Industrial Development*, 1991(p184) and 1996(p. 312); Huang, 1995a, p. 28.

Table 3-21 Taiwan's Specialization Indices(1965-1995)

1965	Manufactures 0.03 >	Primary -0.15	>	Machinery -0.84
1972	Manufactures 0.29 >	Primary -0.67	=	Machinery -0.67
1985	Manufactures 0.39 >	Machinery -0.07	>	Primary -0.63
1995	Manufactures 0.11 >	Machinery -0.11	>	Primary -0.44

Source: Calculated from MOF, *Monthly Report of Imports and Exports.* Various issues.

Second, since becoming a mature NIE, no clear signs have indicated that Taiwan has been following Japan's steps in making steady progress toward an industrialized economy; Taiwan is characterized both by chronic trade deficits in machinery and by a decreasing index in "other manufactures." This suggests that Taiwan has been encountering structural problems in exports and production; that is, Taiwan has not been able to strengthen her machinery industry and thus has to import more machinery than she exports.

In addition to investigating the export structure and calculating the specialization index of an economy in question, the third way to measure the catch-up product cycle(CPC) is to compute the intra-industry trade index.

Table 3-22 displays Taiwan's intra-industry trade(IIT) indices with her major trading partners. Before discussing the table, caution is needed with regard to the data sets. For one thing, the data sets are based on different sources. The data for 1990 and 1995 were drawn from the sets compiled by the CIER; those about

the textile industry before 1990 came from data computed by the Taiwan Textile Federation(TTF). Furthermore, other data before 1990(mostly electronic products) were calculated from the monthly report of the MOF of Taiwan, which list only trading goods that are significant. Thus, they are only approximates and not precise data to be compared to the data after 1990.

According to Table 3-22, three observations could be underlined.

Firstly, in Chapter Two, it is indicated that Japan's intra-industry trade(IIT) indices with most of her major trading partners have increased. In comparison to Japan's performance, Taiwan's IIT relationships with her major trading partners seem to be more significant(refer to Table 2-18); they increased from 1990 to 1995. With the exception of Japan, Hong Kong/Mainland China, and the Philippines, Taiwan's IIT relationships with the United States, the EU, and most of the ASEAN countries seem to be more integrated than those of Japan. For instance, Japan's IIT relationships with both Korea and Taiwan, both second tier economies of the flying geese formation, were hovering around 60 percent(on average) during the early nineties while Taiwan's IIT relationships with the third tier of economies, i.e., the ASEAN countries, was more integrated, ranging from around 80 to 90 percents. However, note that between two trading partners, the higher the index, the narrower the national income gaps between the partners and the more similar the two partners' trade structures are(Kwan, 1994: 95). Thus, Taiwan's import/export structures have been more similar to her partners' and the national income gaps between Taiwan and those partners are narrower. Though Taiwan's IIT indices with the great West European countries are also high, it

Table 3-22 The Intra-Industry Trade Indices of Taiwan and Major Trading Partners(1975-1995)

	Manufacture	*Textiles*	*Electronics*	*Electric Machinery*	*Trans. Equipment*	*Info. & Telecom.*	*Machinery*
US							
1975	--	0.44	--	--	--	--	--
1985	--	0.13	0.34	0.65		--	--
1990	0.73	--	0.71	--	0.89	--	0.95
1995	0.88	0.21	0.80	--	0.89-	--	0.88-
Japan							
1975	--	0.77-	--	--	--	--	--
1985	--	0.28	0.41-	0.49-	--	--	--
1990	0.69-	0.98*	0.42-	--	0.39-	--	--
1995	0.61-	0.99-	0.35-	--	0.39-	--	--
EU							
1990	0.86	0.68	0.26	--	0.79-	--	0.54-
1995	0.93-	0.88	0.74	--	0.56-	--	0.33-
Singapore							
1980	--	--	0.88	--	--	--	--
1990	0.75	--	0.59	0.21	0.84	0.71-	0.40
1995	0.79	--	0.74	0.33	0.71	0.90-	0.70
Hong Kong and Mainland China							
1985	--	<0.3	--	--	--	--	--
1990	0.29	0.13	0.48	0.44	--	--	--
1995	0.31	0.10	0.34	0.56	--	--	--

Table 3-22(cont'd)

Indonesia							
1990	0.85	0.07	0.06	--	--	--	--
1995	0.93	0.47	0.36	--	--	--	--
Malaysia							
1980	--	--	0.97-	--	--	--	--
1990	0.95-	0.09	0.65-	0.35	--	0.22	0.07
1995	0.98-	0.44	0.71-	0.60	--	0.66-	0.21
Philippines							
1990	0.45	0.03	0.75	0.34	--	0.87-	--
1995	0.55	0.06	0.70-	0.42	--	0.38-	--
Thailand							
1990	0.48	0.19	0.47	0.37	--	0.95-	0.05
1995	0.65	0.57	0.81	0.51	--	0.81	0.13

Source: BOFT, *The Quarterly of Trade Forecast*, 1998b; Taiwan Textile Federation(TTF). *Statistics on Taiwan Textile & Apparel Industries*, various issues, and MOF, *Monthly Report of Imports and Exports*, various issues.
Note 1: European countries include Belgium, France, Germany, Italy, and Netherlands.
Note 2: The asterisks denote the 1991 data.
Note 3: The figures with single minus attached refer to Taiwan's trade deficits in the items; two hyphens mean that the data are not available.

should be noted that the total values in the bilateral trading are far lower than most of Taiwan's Asian trading partners. For instance, the total bilateral trading values between Taiwan and the European countries(five) were 13.5 billion dollars while Taiwan's bilateral trading values with Hong/Kong reached 10 billion dollars in the same year(not shown in the table).

Secondly, regarding the sub-sectors, the content of the picture depends on how one observes it. Individually speaking, Taiwan's IIT relationships with the United States and Japan, two of the most relevant countries in and by the flying geese formation, are more stable than hers with EU. On the other hand, Taiwan's IIT relationships with the ASEAN countries, the third tier economies, are mostly increasing(except those with the Philippines), which is similar to Japan's IIT relationships with second tier economies in the formation. Thus, it could be inferred that, at the same time when Japan has been establishing firm FDI and IIT relationships with second and third tier economies in the flying geese formation, Taiwan, one of the second tier economies, has been developing FDI and IIT relationships with the third tier economies, especially Singapore, Indonesia, and Malaysia, three of which have growing IIT relationships with Taiwan in their major trading sectors.

Thirdly, it could be reasoned that, though she is following Japan, serving as a locomotive in terms of FDI, and developing integrated IIT relationships with her trading partners in the formation, Taiwan differs from Japan in that she has not run sweeping trade surplus with her major trading partners. For instance, from 1990 to 1995, Taiwan ran trade deficits with Malaysia(electronic products), the

Philippines(IT and telecommunication products), as well as EU(transportation equipment and machinery), which shows that Taiwan has been weak in some sub-sectors.

IV. Summary

To compare the performance of Taiwanese FDI and the structure of Taiwan's trade, this chapter uses aggregate statistical data to fulfill the task of description and interpretation. Similarities, differences, and the possible causes are presented. The close and complicated investment and trade relationships between Taiwan and China as well as Taiwan and Southeast Asian countries suggest that, instead of focusing solely on whether the contemporary flying geese formation led by Japan is beneficial or harmful to the member countries in the formation, scholars who are interested in regional economic dynamics and national economic development could shed some light on the following countries in the formation if one wants to derive more sophisticated pictures. The necessity of this task is based on the findings described and argued in this chapter.

Firstly, regarding the regional and sectoral distribution patterns of Taiwanese FDI, it is indicated in Chapter Two that, in absolute terms, the amounts of Japanese FDI to the U.S. are far higher than those to East and Southeast Asia. However, the emerging trend of Japanese FDI in the past decade suggests that Japanese investors tend to reinforce their investment in East and Southeast Asian countries, such as Taiwan, Korea, Thailand, and so on. At the beginning of this chapter, it is also pointed out that, not only has Taiwanese FDI been more Asia-oriented than Japanese FDI in that the lion's share of Taiwanese FDI has

been concentrated in certain Asian countries, rather than in North America, since the late eighties, but that the main thrust of Taiwanese FDI in the Asian countries has been focusing more on the manufacturing sector. The possible factors contributing to the Taiwanese FDI and Japanese FDI patterns within East and Southeast Asia include their experience of being FDI providers, macroeconomic economic pressures and the relocation patterns, protectionism, and the economic reform as well as policy incentives offered by the newly opened economies.

Moreover, the significance of Taiwanese FDI is discussed by making international comparison, discussing technical issues, and exploring the financial sources of Taiwanese FDI. It is argued that Taiwanese FDI is significant in that it has been one of the leading inward FDI in East and Southeast Asian industrializing countries and in that it has been devoted more to the manufacturing sector of the host countries than other sources of inward FDI. Some technical issues are discussed, too, and the foremost one is that, in contrast to the case of Japanese sources of data compiled by the MOF, which tends to inflate the real values of Japanese FDI, the Taiwanese official source tends to be underestimated because Taiwanese investors intend to circumvent the bureaucratic procedures to catch business opportunities. Besides, it has been shown that, the reinvestment resulting from the profits of overseas businesses is also a source of Taiwanese overseas investment, but it does not constitute a serious challenge to the important status of Taiwanese FDI.

Secondly, the trade triangle revolving around Taiwan has been delineated. Taiwan's export market dependence on the United States is declining, which

suggests that the gravity center of the Taiwan-centered trade triangle has been shifting from North America to Taiwan's Asian trading partners, but Taiwan is increasingly dependent on China for her trade surplus. The reasons why Taiwan has run trade deficits and surpluses with the host countries are pondered and it is argued that, while the inducement effect does assist Taiwan in gaining trade surplus with some of the host countries, structurally cyclic trade dynamics render Taiwan run trade deficits with some of the host countries which have received substantial Taiwanese FDI. Also, the dynamics of the sub-trade triangle led by Taiwan and the catch-up product cycle of Taiwan have been discussed. It is argued that, though not without the effects of increasing Taiwan's trade surplus, the appreciation of the NT dollars, the inducement effect, as well as the practices of procurement and market targets have not made Taiwan enjoy sweeping trade surpluses with her trading partners as has Japan. It is also indirectly pointed out that the preferences to import capital goods and key components into the host countries as well as to set the host markets as targets are not a Japanese trait. Taiwanese firms making overseas investment also show the tendencies, which suggests that the practices of procurement and sale targets have been influenced by a variety of subjective and objective factors.

Lastly, by using the methods of examining export structures, the specialization index, as well as the IIT index, it has been shown that, in many cases, Taiwan has been catching up with Japan in the export of certain goods as well as the specialization process, on the one hand, and developing firm IIT relationships with her major trading partners, on the other.

MICHIGAN STATE UNIV. LIBRARIES
31293017711866

THESIS

FLYING TOGETHER?--TAIWAN AND THE FLYING GEESE DEVELOPMENT MODEL

VOLUME II

BY

Chia-Huang Wang

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Sociology

1999

Chapter 4

From Start-up to Cruise--The Dynamic Development and Regionalization of Taiwanese Electronics Firms

In Chapter Two, the regionalization of Japanese TNCs is described and discussed. The discussion shows that the cross-border production networks of Japanese transnational corporations in the electronics and automobile industries have evolved through three stages. Because of the industrial policies of the states and the efforts of the firms in the host countries, the backward as well as forward linkages of the industries of the host countries have been built gradually.

This chapter will compare the Japanese and Taiwanese experience in regionalization by exploring the development of Taiwanese electronics firms, describing their performance and examining their structural positions in the electronics industry.

Several specific questions will be posed: What is the conceptual framework based on the Taiwanese experience in the electronics industry? What Taiwanese electronics firms could be presented for meaningful discussion and comparison? How have the selected Taiwanese manufacturers developed their upstream resources, expanded their downstream activities, and built their regional production networks? What are the differences and similarities in regionalization between Taiwanese and Japanese manufacturers in the electronics industry? What factors might have caused the differences?

To answer these questions, this chapter is divided into two parts. The first part depicts the conceptual framework of the catch-up formation based on the

experience of Taiwanese latecomer firms in the electronics industry. By categorizing the ways in which they start their businesses, the ways they construct their backward as well as forward linkages, and the division of labor emerging from their cross-border production networks, the framework will show readers the basic dynamics and development of Taiwanese latecomer firms. The framework will provide concepts before the discussion of details and it will serve as the foundation of an ideal type capable of describing and analyzing the experience of other East Asian latecomer firms in the electronic industry in particular and other manufacturing industries in general. Moreover, this framework could be used in contrast to the conceptual framework of the regionalization of Japanese TNCs in terms of the sequences of development phases and types of controlling cross-border production networks. The applicability as well as the limitations of this framework will be discussed, lest it become a rigid formula.

The second part of this chapter will examine the empirical cases supporting the theoretical catch-up formation and will discuss the development and overseas investment/production of several Taiwanese electronics manufacturers, who are situated in different sectors of the industry. Using the categories of the electronics industry set up in Chapter One, the text is divided into three sections: consumer electronics/home appliances, IT products, and electronic components. Two or more Taiwanese electronic manufacturers who have achieved substantial growth and made overseas investments are selected in each category. In consumer electronics sector, Tatung Corporation and Action Company are the main cases discussed. This arrangement is intended to demonstrate how an enterprise group

with a long history developed during the whole postwar period of Taiwan's economic development and how a small maker of consumer electronics grew to be a large manufacturer specializing in video gadgets and capable of constructing cross-border production networks. In the industrial electronics sector, Acer and MiTAC, two large Taiwanese PC makers, Jimbau and Inventec, two Taiwanese notebook PC manufacturers who started as calculator producers, as well as KYE, a PC peripheral maker, are chosen as examples of how Taiwanese PC manufacturers have made swift growth by taking advantage of market opportunities and trying to control backward as well as forward linkages. Finally, the author chooses three sub-sectors of electronic components to examine the ways the significant Taiwanese manufacturers of semiconductors(ICs), printed circuit boards(PCBs), and passive components(resistors) incubate their backward/forward linkages as well as how they construct overseas production networks.

I. The Conceptual Framework of Catch-up

The industrial development of East Asian flying geese could be analyzed by constructing a conceptual framework, the catch-up formation, in which the development stages of latecomers roughly correspond to the phases of the evolving regionalization of Japanese TNCs.

Recall that, in Chapter Two, the process of Japanese regionalization is divided into three stages: short-range, middle-range, and long-range cruise. From the first to the third stage, the forward and backward linkages were constructed gradually, depending on firm strategies, the macroeconomic situations of the

home and host countries, and the industrial policies of the host countries. Not only have the management and operation of Japanese overseas affiliates developed from isolated bridgeheads to networked nodes directed by the parent companies or by headquarters in the home country during the first two stages, but the industries and firms of the host countries have been able to import new products, learn new technologies for domestic production, and export the products in question, so much so that they are even able to compete with the TNCs and their home countries in some industries and product mixes. Moreover, the third stage, i.e., sophisticated regionalization or long-term cruise, starts when some firms in the host countries follow the suit of the TNCs by making overseas investment and production, which are based on modest or sophisticated division of labor. This conceptual framework has been confirmed by empirical cases of Japanese electronics and automobile TNCs.

Corresponding to the three regionalization stages of the Japanese TNCs are three dynamic stages of the developmental process for the "follower geese" in the electronics industry of the follower geese, especially that of Taiwan. Before the corresponding developmental phases of the follower geese are discussed, however, this point should be made: While the conceptual framework of the progressive regionalization constructed in Chapter Two focuses solely on Japanese practices, the corresponding framework built here underlines the contribution made by the electronics producers from Japan, the leading goose, and the United States, the eagle which has been flying at the side of the flying geese formation, which will be mentioned in the following empirical discussion.

Three stages constitute the East Asian catch-up formation: start-up, takeoff, and cruise. Specifically, in the start-up phase(beginning in the fifties), the backward and forward linkages of the latecomer firms were not complete or strong enough to compete with TNCs. Therefore, the follower countries started up their industrial development by cutting into the production process directly and incubate their forward and backward linkages gradually; that is, rather than follow the development sequences of the TNCs which started by innovation and proceeded to mass production, the development of latecomer firms and industries reversed the Western experience by starting midstream and then moving to upstream(R&D and supply networks) and to downstream(marketing, distribution channels, and brand images).

The latecomer firms cut into the production process in various ways. Some of them started by being sales agents for American or Japanese TNCs, importing novel goods, learning how to promote domestic production, and exporting products to the home countries of these TNCs. Others entered the industries by assembling imported components and material and become important players in the industries when domestic and overseas markets were capable of absorbing their products, when they adopted appropriate strategies, and when latecomer states provided incentives and assistance facilitating their production and sales(domestic marketing and exports). Usually, because of insufficient industrial technologies and inadequate economic environments, latecomers acted as junior partners in joint ventures with the TNCs, manufactured products by importing technologies from the senior partners(technical cooperation), served as suppliers

of foreign buyers, engaged in original equipment manufacture(OEM) production, or became subcontractors under the technical direction of the TNCs. On the other hand, the products manufactured by Asian firms in industrializing economies were either exported back to the United States and to other countries from producers inside and outside the export processing zones(EPZs) or sold to domestic markets to meet the needs of the host countries. In most cases, the latecomer firms in the host countries were not able to completely control marketing channels, particularly when they were situated in inferior positions, such as those of junior partners needing technical imports and financial sources, suppliers and subcontractors, or sales agents aiming at domestic markets. In other words, this was the start-up stage, which meant that, though the latecomer firms had begun to construct their backward and forward linkages either by cutting into the production process directly or by learning how to market goods, they were not able to lead industrial development actively.

In the second stage or takeoff phase(roughly from the mid-seventies to the mid-eighties), the latecomer firms were able to manipulate the process to reduce costs, enhance efficiency, and strengthen R&D, on the one hand, and learn to develop marketing channels and shape brand images, on the other. They may also became subcontractors or engaged in OEM. In some cases, they were able to catch up with the home countries and the TNCs in manufacturing similar products which, previously, were either imported or dependent on the technical directions of the TNCs and foreign investors. Some of them could compete with the TNCs, their former and current mentors, in some product categories by

suppressing product prices, adding more features and functions, or by other means of non-price competition (building brand images and strengthening after-sale services). Although the production and industrial structures are mostly similar to the ones of the precedent phase, they differed from the first stage in that the technology capabilities of the producers were more sophisticated and the levels of product development more advanced. Moreover, they might focus more on consumer tastes and market fashions. These differences indicate that the latecomer firms were able to grasp more parts of the backward and forward linkages. Nevertheless, since TNCs would not easily give up their technology lead and they would continue upgrading their capabilities in R&D and marketing, whether or not latecomer firms could obtain key components and core technologies depends on their firm strategies and the industrial development in their countries, among other factors. In view of the combination of strengths(process efficiency and price advantages) and weaknesses(technology levels, key components, and marketing channels), the term "takeoff" would be appropriate because it indicates the possibility of climbing or hovering.

The third or the "cruise" stage, which began from the mid eighties, is characterized by two types of further advancement by the latecomer manufacturers.

In the first, some latecomer firms tried to form backward and forward linkages in their industries, on the one hand, and implement their strategies for overseas investment and cross-border production networks, on the other. To be more specific, not only have they consolidated their positions in their industries by

forging their capabilities for making key components, actively managing their supplier networks, fabricating distribution channels, shaping brand images(own brand name manufacturing, OBM), collecting market intelligence, and providing after-sales service, but those larger manufacturing firms have begun to build regional division of labor and even global operations, as well, which, in some cases, set various regional headquarters responsible for managing matters pertaining to procuring components, assembling products, or accessing higher technologies. Those latecomer firms that made overseas investments and constructed regional division of labor might or might not have transferred some of their backward linkages to the host countries, which depended on the strategies and styles of the investing firms, the incentives and policies of the host and home countries, the industrial structures and technology levels of the host countries, and so on.

The second type refers to other manufacturers who have not built regional networks as comprehensive as their counterparts in the first type, but have extended their production overseas and enhanced their control of their cross-border production networks. In contrast to the offensive and aggressive overseas investment and production practiced by firms of the first type, the second type could be viewed as defensive one, since their most important reason for overseas production was to cut costs. The first type could be depicted as global cruise because they usually located their plants and production in major markets all over the globe, while the second type as regional cruise because they usually set their international production within a specific region, often in neighboring

industrializing countries with modest industrial settings, weaker technological capabilities, and cheaper production costs(e.g., labor and land).

The conceptual framework is indicated by Figure 4-1.

Given this conceptual framework, five points should be underlined here.

First, as in the regionalization of the more advanced TNCs delineated in Chapter Two, the boundaries between the stages are not rigid and clear-cut. Though the cruise stage is characterized by substantial overseas investment in terms of production values and numbers of projects, this does not mean that no latecomer manufacturers have engaged in overseas investment and production in the first two stages, but that outward FDI and overseas production are more significant in the third stage.

Secondly, the applicability of the conceptual framework varies with each country, industry, and sector. Based on the experience of the more advanced NIEs which have substantially incubated domestic industrial manufacturers, such as Taiwan, it does not fit every goose member in the formation. To explain the cases of Singapore and Hong Kong would require revising the catch-up framework to a lesser or greater extent because they have passed along somewhat different routes. As open economies that always welcome TNCs and inward FDI with fewer restriction, neither Singapore nor Hong Kong have developed local manufacturing firms with international recognition or scales of economies as significant as those of Korea's Samsung or Taiwan's Acer. On the other hand, because of their geographic positions and government strategies, Hong Kong and Singapore have become special operation centers managing

Figure 4-1 **The Conceptual Framework of Catch-up**

	Backward Linkages ----------		***the Process*** ----------		***Forward Linkages***
Start-up (1950-60)		← technical cooperation ← joint ventures	assembly suppliers & OEM	→ → → ← sale → → →	domestic markets exports
↓	↓		↓		↓
Takeoff (1970-80)	R&D & reverse engineering	technical cooperation ← joint ventures	assembly, suppliers, OEM, & subcontracting rationalization	→ → → sale → → →	exports & domestic markets distribution channels & brand images
				product development →	
↓	↓		↓		↓
Cruise (1990-)	R&D, key components, supply networks	strategic alliances, M&A, and technology transfer	OEM/ODM, subcontracting, regionalization(aggressive and defensive)	product development →	exports & domestic markets; distribution channels, brand images(OBM), & after-sales services

international production and financial activities, either by relocating manufacturing activities to neighboring areas and countries(Hong Kong and Mainland China, especially the Guandong Province), or by serving as a business post with complete infrastructures for headquarters and financial institutions as well as a manufacturing base for the TNCs making semiconductor products and hard disk drives(Singapore). Moreover, the framework does not apply to every industry. The framework is based on the Taiwanese electronics industry, which makes it difficult to apply to the petrochemical, steel, and automobile industries without substantial revisions, because Taiwan has performed differently in those industries. In addition, even in the electronics industry, caution should be used in applying the framework because, as is shown in Chapter One, the electronics industry generally includes three sectors(consumer electronics, industrial electronics, and electronic components) and each of the three sectors contains sub-sectors and various product categories. For instance, the time frame(evolutionary stages) of Taiwanese consumer electronics extends from the fifties to the nineties while that of Taiwanese industrial electronics, especially the PC sector, is compressed because it did not begin until the seventies. In other words, whereas it took Taiwanese consumer electronics three decades to develop significant scales, it took less than twenty years for Taiwanese industrial electronics to enter the cruise stage.

These variations in countries, industries, and sectors imply that the conceptual framework should be made more flexible to include diversities and to meet the challenge of deviant cases. They also imply that more studies about how

the latecomer firms have accumulated and incubated their forward as well as backward linkages, and how they have made overseas investments and constructed cross-border production networks should be conducted to find any significant similarities, differences, and the dynamics behind them. In other words, while based on the Taiwanese experience, the conceptual framework of catch-up should be treated as an ideal type for further revision, research, and discussion, with the awareness that the gist of the conceptual framework is to grasp the evolving patterns of latecomer firms, the diffusion of technology capabilities, and expansion of forward linkages under certain circumstances, which result from firms' strategies, macroeconomic conditions, national industrial policies, and so forth.

Third, while consolidating their advantages in the production process and backward linkages, on the one hand, and making overseas investment, constructing regional production networks, and competing with the TNCs from industrialized countries, on the other, many of the latecomer manufacturing firms still depend on the advanced TNCs because they still have to compete for OEM/ODM orders of the TNCs, because they need certain key components and core technologies controlled by the TNCs, and because they rely on the distribution channels and marketing capabilities of the TNCs. In other words, while catching up with advanced countries and TNCs in terms of controlling production costs and process efficiency, latecomer firms still fall behind their mentors in more complex backward linkages represented by the achievement of basic R&D and aggressive forward linkages exemplified by global distribution channels and brand

images, though some latecomer manufacturing firms have made progress. Nevertheless, the case studies of several Taiwanese firms contradict this thesis in some respects.

Fourth, though this framework focuses mainly on the progress of latecomer manufacturing firms, the roles of latecomer states should not be ignored. In Taiwan's case, the state has provided various kinds of assistance, including industrial planning, financial support, and technology transfer, which have made substantial contributions to the forging of backward linkages of the latecomer firms. The performance of the states will be mentioned in the discussion.

Fifth, in contrast to the combination of vertical and horizontal division of labor emerging from the conceptual framework and practices of Japanese TNCs, the framework and experience of the Taiwanese firms in the following discussion demonstrate more horizontal division of labor and fewer cases of regional headquarters, which reveals the smaller scale economies of Taiwanese latecomer firms and their incessant catch-up moves.

II. Case Studies

General Development

The textile and electronics industry have been the most important sectors in the Taiwanese manufacturing industry. Since the early nineties, however, the former has been overshadowed by the latter in terms of export shares and values. As can be seen in Table 4-1, the export share of the electronics industry(excluding information technology and telecommunication) in 1992 was 10.7 percent(8.7 billion dollars), which is less than that of the textile industry(14.5 percent; 11.8

billion dollars). In 1997, the export share of electronics products grew to 14.7 percent(18 billion dollars), surpassing that of the textile industry(13.7 percent; 167 billion dollars). Note that this contrast does not take into account the export shares of information technology(IT) and telecommunications products, which were 7.9 and 11.9 percent(6.4 and 14.5 billion dollars) in 1992 and 1997, respectively.

The dynamics behind these data, however, are not based on balanced development in sectors and industrial structures. The Taiwanese manufacturers of electronics and electric machinery are mostly small and medium enterprises(SMEs), which account for 85 percent of all such firms.(Note that local capital accounts for 95 percent of the electronics firms located in Taiwan).[1] Although the electronics industry(including IT and telecommunication products) has shown significant growth, some of its sub-sectors, particularly consumer electronics, are shrinking. The shares of consumer electronics in production values have diminished, degrading from 16.4 percent in 1989 to 6 percent in 1994. The same trend appears in the shares of export values; the portion of the Taiwanese consumer electronics industry decreased from 18.2 percent in 1989 to 4.3 percent in 1994. Corresponding to these changes is the increasing share of domestic marketing; the portion of domestic marketing increased from 17 percent in 1990 to 40 percent in 1994(Huang, 1995c: 47-8).

---

[1] Please see the Worldwide Web pages of the Taiwanese government: Taiwan Industry Net, http://www.psd.iii.org.tw/expo96/top-20.htm(in Chinese).

Table 4-1 The Export and Import of Taiwanese Products(1992 and 1997, $100 Million)

Export	*1997*		*1992*		*Import*	*1997*		*1992*	
	Value	*Share*	*Value*	*Share*		*Value*	*Share*	*Value*	*Share*
Total	1,221	100	815	100	*Total*	1,144	100	720	100
Electronics	180	14.7	87	10.7	*Electronics*	187	16.3	91	12.6
Textiles	167	13.7	118	14.5	*Basic Metals*	117	10.2	84	11.7
IT and Telcom.	145	11.9	64	7.9	*Machinery*	115	10.1	73	10.1
Basic Metals	115	9.4	65	8.0	*Chemicals*	114	10.0	71	9.9
Machinery	97	7.9	75	9.2	*Minerals*	103	9.0	64	8.9
Plastic etc.	77	6.3	55	6.7	*Precision*	64	5.6	23	3.2
Transportation Equipment	56	4.6	42	5.2	*Transportation Equipment*	54	4.7	60	8.4
Electric Machinery	48	3.9	28	3.4	*Electric Machinery*	38	3.3	21	2.9
Chemicals	33	2.7	18	2.2	*Textiles*	37	3.2	27	3.8
Precision	28	2.3	22	2.7	*IT and Telcom.*	35	3.1	19	2.6
Toys etc.	24	2.0	33	4.0	*Plastic*	31	2.7	19	2.6
Others	251	20.6	208	25.5	*Others*	249	21.8	168	23.3

Source: the Director of the Directorate-General of Budget, Accounts, and Statistics(DGBAS) of the Ministry of Finance. Please see http://140.129.146.80/dgbas03/bs3/analyse/new87112.htm(in Chinese), 1998a.

In contrast to the shrinking consumer electronics sector, the sectors of information technologies, especially personal computers and related products, as well as electronic components have been showing swift growth. In 1994, the export shares of electronic components and IT products(excluding IT components) were 42.9 and 26.7 percent, respectively. The significance of electronic components should not be surprising since 43.6 percent of Taiwanese electronics manufacturers make components. The importance of IT products, especially PCs, is more noteworthy when one considers two facts: as of 1994, only 16.5 percent of electronics manufacturers were engaged in the production of computers and related products(refer to the source specified in Note 1) and Taiwan has inundated the majority of the world markets with PC products, including monitors, notebook PCs, palmtop scanners, casings, desktop scanners, sound cards, graphic cards, video cards, keyboards, mother boards, mice, and so on(See Tables 4-2 and 3-20). In 1995 and 1996, it was the third largest PC producer country in the world in terms of production values(behind the United States and Japan).

However, behind the dazzling performance, there exists a structural difficulty. The growing exports of the Taiwanese electronics industry have triggered import expansion, which results from the need for key components and capital goods. Although the electronics industry has overtaken the textile industry in production and export values, the textile industry is still the main source for generating substantial foreign exchange, while the electronics industry creates trade deficits. The development data about the Taiwanese electronics industry show that the

Table
Taiwa

Produ

Table 4-2 The Ratios of Overseas Production and World Shares of Taiwanese IT Manufacturers(1995 and 1996, Percentage)

Products	***Overseas Production Ratio in 1995***	***Overseas Production Ratio in 1996***	***Share of World Market in 1996***
Monitors	48.7	49.1	53.4
Notebook PCs	0	0	32
Desktop PCs	8.8	14.4	10.2
Motherboards	44.4	39.9	74.2
Switching Power Suppliers	77.4	82.7	55.3
Desktop Scanners	0	0	52
Graphic Cards	47.1	40	38.3
CD-ROMs	24.7	31.8	15
Keyboards	85	93	61
Sound Cards	15	12	50
Mice	34	68	65
Terminals	0	0	24.6
Handy Scanners	0	0	95
Video Cards	0	32	55

Source: Industrial Development Bureau, *The Annual Report of Industrial Development*, 1996, p. 312.(in Chinese)

various sectors have developed at different paces.

To begin with, the start-up stage of consumer electronics/home appliances began in the fifties and sixties. After the start-up phase, this sector moved into the takeoff stage, establishing scale economies and promoting product development during the seventies and the first half of the eighties. At the end of the eighties, Taiwanese manufacturers of consumer electronics and home appliances began to relocate overseas.(Electric fans were located in 1987; VCRs and TVs in 1989.) This relocation resulted from the saturated domestic market, the loss of competitive advantages for the mature products, the fierce competition from imported products, and the new market opportunities emerging from newly rising economies(e.g., China).

Although Taiwan cut into the sectors of consumer electronics/home appliances and components in the fifties, this did not mean that Taiwanese makers in these sectors had developed more complete capabilities in backward or forward linkages than their counterparts in industrial electronics sector. Taiwanese makers were able to assemble various consumer electronics products, such as vacuum tube radios(1948), transistor radios(1961), TVs(black-and-white, 1963), VCRs(1982); but they were weak in constructing backward linkages, especially for key components. For example, in 1986, the ten largest producers/exporters of radios and tape recorders, respectively, were still dominated by Japanese subsidiaries or joint ventures, such as Matsushita Taiwan, Hitachi, and Funai(IDB, 1986: 189). Another example is that, in the early nineties, i.e., after four decades of Taiwanese development in consumer electronics/home appliances, the players

in the field and commentators were still discussing the importance of and difficulties regarding Taiwan's capabilities and autonomy in controlling key components and developing core technologies. In 1991, Sample Company, a big player in the Taiwanese market of consumer-electronics/home appliances sector, and other Taiwanese electronics firms entrusted the Industrial Technology Research Institute(ITRI), a semiofficial R&D association, with developing the technology for compressors, the most important component of air conditioners, so that they could overcome their dependence on Japanese firms(e.g., Toshiba).

The predicament of Taiwanese makers in the field could be attributed to two factors. First, Japanese TNCs have been reluctant to transfer technology, lest their junior partners compete with them in the future. Second, the government did not fine-tune the protectionist policy and local makers were accustomed to domestic markets and ignored the importance of developing the capabilities for making key components.[2] Moreover, the Taiwanese government's plans and policies for promoting the electronics industry in the early eighties were not integrated perfectly. Rather than coaxing foreign firms to increase the rates of local content and the substance of technology transfer, the policies encouraged numerous Japanese firms to establish assemblies in Taiwan through technical cooperation or joint ventures.

Nevertheless, the difficulties are not insurmountable. Indeed, Japanese are not interested in transferring technologies that could enhance the competence of

---

[2] To ameliorate Taiwan's trade deficits with Japan, the authorities announced a series of regulations, which discouraged the import of Japanese goods and encouraged Taiwanese to purchase European and American products.

their partners; rather, as an employee in Hitachi Taiwan said, Japanese TNCs are Social Darwinists by nature. In other words, to demand that Japanese transfer technologies, the junior partners must show strong capabilities, demonstrating that they are capable of developing or absorbing technologies(Cheng, 1991: 22). For example, in view of the determination of some Taiwanese firms to develop compressors, Toshiba agreed to a joint venture with two Taiwanese firms in 1991. Toshiba Precision, the achievement of the joint venture, not only produces compressors and owns an independent R&D unit in Taiwan, but also promises to transfer the design technology for air conditioners to this Taiwanese partners within five years(Lee, 1990: 97, 99).

Furthermore, it is not fair to say that Taiwanese players in the field merely waited to see what would happen. Chunghwa Picture Tube, a subsidiary of Tatung Corporation, is a good example of a firm that took action.(See the case studies in the next section of this chapter). Before they had fully developed the capabilities for making key components, however, Taiwanese firms in consumer electronics/home appliances are still falling behind the leading Japanese electronics manufacturers, being challenged by the newer Asian NIEs who are able to produce standardized products, and facing the saturated domestic market. Therefore, some of the ways of surviving seem to be enhancing the process to cut costs, developing newer product mixes to attract consumers, strengthening domestic distribution channels through complete after-sales service, or finding new markets, such as China, through relocation. Another alternative is to transform into IT goods manufacturers, as Tatung Corporation has been since the

eighties.

The start-up and takeoff phases of the Taiwanese electronic components sector roughly correspond to those of consumer electronics/home appliances, but this sector has more varieties, partly because of the multitude of its sub-sectors. The production of resistors and capacitors began in the fifties, while production in the semiconductor sector did not really begin until the seventies, after American TNCs had built transistor-packaging plants in the sixties. At present, not only have electronic components accounted for more than half of Taiwanese exports of electronic products, but Taiwanese have performed excellently in numerous sub-sectors of components, such as resistors, printed circuit boards(PCBs), and semiconductors(especially wafer fabrication and ICs), in terms of their scale economies, ability to develop consistent and systematic value chains, as well as their overseas investment and regional division of labor.

The Taiwanese semiconductor industry started in the sixties, took off in the seventies and eighties, and entered the cruise stage in the nineties. In the sixties, foreign TNCs, such as General Instruments and Phillips, established IC packaging plants in Taiwan, which built the foundation of the industry. The Taiwanese semiconductor industry entered the takeoff stage in the seventies and eighties because of the promotion of the government. This promotion resulted in the establishment of Electronics Research and Service Organization(ERSO, 1974) under ITRI,[3] the introduction of various plans and incentives, as well as the

[3] ERSO was established in 1974 as a branch of ITRI. Its function is to do intensive R&D and help the industry to upgrade technologies through licensing and other contractual means.

establishment of United Microelectronics Corporation(UMC, 1979) and Taiwan Semiconductor Manufacturing Company(TSMC, 1986), two large wafer fabs and IC foundry companies in Taiwan. Within the framework of governmental policies, which designated the semiconductor industry as one of the strategic industries, provided financial support, encouraged preferential investment in UMC and TSMC, and so forth, ERSO set up demonstration plants, introduced technologies from foreign firms(RCA and International Material Research), and transferred ERSO technicians and engineers to UMC and TSMC to share their skill and knowledge.

Thanks to the relocation of labor-intensive sub-processes(testing and packaging) of TNCs, the government's promotion plans and policies, the assistance of semiofficial R&D organizations, the commitment of private makers, and public-private cooperation, the semiconductor industry in Taiwan overcame the entry barrier(capital- and technology intensive) and developed upstream(wafer fabrication and design houses), midstream(IC foundry), and downstream(IC packaging and testing) value chains with growing capacities and technology levels during the late eighties and early nineties. Some IC manufacturers were even able to make overseas investments and organize regional division of labor, either to access overseas markets or to relocate labor-intensive parts overseas, so that the parent companies could upgrade their technology capabilities and develop more products.

In addition to semiconductor firms, other Taiwanese firms in the electronic components sector, especially in the sub-sectors of PCBs and passive

components, are highly successful, too. As will be shown in the discussion of empirical studies, some Taiwanese PCB makers and resistor producers, through autonomous R&D, joint ventures, and technical cooperation, have been able to continually enhance production efficiency and develop product mix. They have also been able to make overseas investments and achieve horizontal as well as vertical division of labor. Some of them are even able to export their technologies and management practices to firms in advanced industrialized countries.

Nevertheless, it should be noted that, despite these success stories, some sub-sectors, such as capacitor manufacturers, are still weak or dominated by foreign firms.

In contrast to the sectors comprising consumer electronics/home appliances and electronic components, Taiwanese industrial electronics, especially the IT sector, did not start until the seventies, far late than the other two, but this did not hamper its swift development. The industrial electronics sector was not able to set industrial standards and it was often interrupted by American firms who exercised their intellectual property rights(IPR). Acer's attempts at developing IBM compatible computers in the early eighties are a good example. They could, however, overcome the entry barriers set by the advanced firms by strengthening process efficiency, by constructing complete supplier networks situated in Taiwanese social networks, which compensated for the insufficiency of scale economies, and by making quick responses to market demands. Because of some opportunities(the government's prohibition on computer games and the openness of IBM compatible computer standards), the commitment of Taiwanese

PC firms, and the government's promotion, the Taiwanese computer industry quickly jumped from the start-up phase in the seventies to the takeoff stage in the eighties, flying into the cruise stage in the nineties by constructing cross-border production and distribution networks, which are based on the logic of division of labor and global logistics, and by promoting both original equipment/design manufacturing(OEM/ODM) and own brand name manufacturing(OBM).

The general development of the Taiwanese electronics industry is summarized in Table 4-3. Most of the cells indicate the start-up timing, significant strategies of accumulating backward linkages and expansion of forward linkages, and representative products during the three stages.

Consumer Electronics

Tatung Corporation

In comparison to other Taiwanese electronic manufacturers, Tatung Corporation is an enterprise with a much longer history and a wider range of business. Starting as a construction firm at the beginning of the twentieth century, Tatung entered the electronics industry in 1949 and was a familiar manufacturer in Taiwan for five decades. It is also a rising IT manufacturer, and an enterprise group comprising thirty-seven core subsidiaries as well as numerous types of reinvestment.[4]

[4] The following discussion is based on the annual reports and homepage information provided by Tatung Corporation, unless otherwise noted.

Table 4-3 The Development Trajectories of the Taiwanese Electronics Industry

	Start-up	***Takeoff***	***Cruise***
Consumer Electronics	*1950'-60'* import, assembly technical cooperation. *vacuum tube radios(50'); electric fans, B & W TVs, color TVs air conditioners(60')*	*1970'-late 80'* scales of economies product development assembly, & imports. ***transistor radios(70') ; color TVs, VCRs, LD players(80')*	*late 1980' to 90'* overseas investment & production
Electronic Components	*1950'-60'* semiconductor (introductory) IC packaging & testing for TNCs. ***ICs, capacitors, & transistors(50'); motors, batteries, PCBs(60')*	*1970'-80'* UMC(1979) & TSMC(1986) ,RCA and IMR(technology transfer). ***IC design, DRAMs & wafer(80')*	*1980'-90'* overseas investment & production for the relocation of labor-intensive parts, domestic upgrading, accessing advanced technologies, and grasping overseas markets
Industrial Electronics	*1970'* assembly, imports, & sales ***Telephones & exchangers CRT monitors(60')*	*1980'* manufacturing(OEM) rationalization flexible, & swift response strategic alliances, joint ventures, & M&A. ***telephones(touch tone), printers, scanners*	*1990'* OEM/ODM/OBM overseas investment & production regional division of labor and production networks global and regional logistics. ***most types of IT products, including telecommunication products*

Table 4-4 The Scale and Scope of Tatung Corporation

Parent Company			
Electrical Machinery	*IT Products*	*Consumer Electronics*	*Home Appliances*
Motors, Robots, Transformers, etc.	PCs, Monitors, CRTs, wafer,	TVs, VCRs, Stereos, etc.	Refrigerators, Air conditioners, etc.

Overseas Investment

U.S.
Tatung U.S.(production & sale of consumer electronics and home appliances)
TATUNG Science and Technology Inc.(IT products)
Tatung Telecommunication Co.(production & sale of payphones)

UK
Tatung, U.K.(production & sale of consumer electronics and home appliances)

Australia
Tatung International Co.(production & service in Europe)

Japan
Tatung Japan(equipment procurement & IT/consumer electronics sales)

Indonesia
Tatung, Indonesia(production & sale of motors)

Singapore
Tatung Singapore(production & sale of Tatung's goods)
Malaysia

Thailand
Tatung Thailand(production & sale of CTVs, monitors, & PCBs),
Tatung Fujitsu Co., Thailand(magnet)

Malaysia
CRT plants for Chunghwa Picture Tube

China
electric machinery
CRT plants for Chunghwa Picture Tube

Note: This table does not include all businesses of Tatung

The Start-up Stage(1918-1963)

In 1918, Shan-Chih Lin founded Shan-Chih Business Association, which engaged in the construction business. This company was the forerunner of Tatung Corporation.

During this period, S. C. Lin was already aware of the value of human capital and the importance of promoting industrialization. In 1941, he donated 80 percent of his assets to found the Hsieh-Chih Association for the Development of Industry and used that association to establish awards, scholarships, Tatung Schools-Company, Tatung Institute of Technology, and so on. Through education funds and the combination of the company and the schools, Tatung incubated numerous technicians and engineers for itself and the society.

The investment in developing human capital finally paid off in the forties. In 1949, Tatung entered the electronics industry by independently producing electric fans with the brand name "Tatung." Within five years, Tatung managed to export its electric fans to the Philippines and, in 1954, it began to make motors through technical cooperation with the Westinghouse Electrical Company.

During the early sixties, Tatung quickly stepped into the manufacturing of white goods and electrical machinery through technical cooperation and simple assembly. On one hand, Tatung produced automatic steamers and refrigerators to serve the domestic market. On the other, in addition to exporting to the Philippines(1960), it began to build the Heavy Electric Apparatus Plant(1960) and a magnet factory with the assistance(technical cooperation) of Toshiba Corporation in 1961.

The Takeoff Stage(1964-1979)

Tatung's TV and air conditioner plants were completed in 1964, which prefaced its devotion to brown goods. In this phase, Tatung's management scope included three divisions: consumer electronics and PCs, electrical machinery, and overseas investment.

During the late sixties, Tatung established subsidiaries through reinvestment or other means of entering various territories of the consumer electronics and PC industries. First, Taiwan Telecommunications Co. and Tatung Electronics Company were established to gain and control the markets. Second, through Forward Electronics Company(1970), Chunghwa Picture Tubes, Ltd.(1970), and San-Chih Chemical Company, Tatung intended to secure control of the upstream chains, such as CRTs and passive/functional components. Third, TVs(including color TVs in 1969), electric fans, and stereo sets were produced in domestic and overseas(Los Angeles and Singapore) plants to serve different markets. Fourth, Tatung Chinese Character Processing Computer Company was established in 1973 to capture the sprouting computer processing market.

Tatung's business in electrical machinery was mainly based on technical cooperation with the Japanese, and, to a lesser extent, American firms. In 1966, Tatung extended technical cooperation with Westinghouse to produce a new type of motor. After that, Tatung's technical cooperation focused on projects with Japanese firms: Toshiba(marine-used motors, generators and blowers in 1968, as well as motor plants in 1969), Kubota Corporation(Iron Casting Center in 1974), Sumitomo Special Metals Corp.(Magnet Center in 1975), Okamoto

Corporation(Machine Tool Center in 1975), and so forth.

It is noteworthy that, Tatung deviated from the picture depicted by the above-mentioned conceptual framework by making overseas investments during this phase. Tatung's FDI at this stage was located in the U.S., Singapore, and Japan, and most subsidiaries were set up for sales. The subsidiaries in the US developed much faster, however. In 1974, they established plants in Los Angeles, which first produced electric fans and assembled TVs with the name "Audiocolor."

The Cruise Stage(1980-)

Since 1980, Tatung has made progress toward the cruise stage, making further advancement in FDI and cross-border production networks, trying to consolidate its business of consumer electronics and home appliances, and strengthening competence in the manufacturing of IT products.

Tatung has made steady progress in electrical machinery in terms of R&D and OEM, thanks to the slower product cycles in that sector. In the consumer electronics and home appliances, however, Tatung has been similar to other Taiwanese firms in the sector in that it has stagnated as the result of fierce competition and various difficulties in producing key components and developing core technologies.(Chunghwa is an exception.) The comparative advantages of Tatung in particular and other firms in the industry in general lie in the ability to cut costs, improve process efficiency, and speed the development of product mixes. For example, Dr. T. S. Lin, S. C. Lin's son and the president of Tatung Group, developed a method of cutting costs at every stage of production or in the value chains. Procurement of machinery and equipment that cost more than one

thousand NT dollars requires his personal approval(Yo, 1994: 163). Tatung also promoted organization reforms and continued to produce more kinds of white and brown goods with more features despite the difficult challenges of controlling key components and the fierce competition. VCRs and TVs are two examples of such products.

Tatung was able to produce and sell high- as well as low-end VCRs in 1982 under the government's protection, but not because of the contribution of its Japanese partners. Rather, this success was the result of Tatung's painstaking R&D with the assistance of a retired Japanese engineer who was hired by Tatung(Cheng, 1991: 17). TVs was once one of Tatung's major product categories; however, like other Taiwanese TV producers, Tatung encountered serious problems in domestic and overseas markets from 1979 to 1982, as the result of the protectionist measures by the US and the dumping of Korean and Japanese manufacturers. Although the overseas markets were opened in the early eighties after the recovery of the American economy, Taiwanese TV makers were squeezed again by the import liberalization promoted by the Taiwanese authorities. Under these circumstances, Chunghwa Picture Tube has promised to cooperate with the ITRI by allowing its laboratories to be used for the development of large-size(more than 37 inch) CRTs for the production of High Definition TVs(HDTVs), in order to find a market niche and upgrade its product mix(Lee, 1990: 58-9).

Tatung has been in predicament in consumer electronics and key components, but its investment in the production of CRTs met with success and

failure. Established in 1970, Chunghwa was a joint venture of Tatung, RCA, and some other Taiwanese firms. Under the direction of engineers from RCA, Chunghwa tried to produce tubes, electron guns, and other key components of TVs, but their quality and scale could not compete with those of Japanese firms. RCA withdrew its investment in 1975 and was followed by other Taiwanese partners. Facing the prospect of Chunghwa's heavy losses, Tatung decided to keep Chunghwa by purchasing more than 90 percent of its stocks. To enhance its control of backward linkages, Chunghwa purchased Toshiba's techniques and cooperated with Zenith Taiwan to obtain TV production technologies, on one hand, and strengthened its R&D capabilities, on the other(Wong, 1997: 25-6; Wu, 1997: 41-3). Finally, after becoming profitable in 1986, not only did Chunghwa develop autonomous technologies for CRTs and electron guns, but, with the assistance of Tatung's capabilities in the fields of electrical machinery and automation, it was able to design and build machinery that make CRTs. This enhanced efficiency and cut costs significantly, and Chunghwa overtook Hitachi in 1993 to become the largest CRT producer in the world(Wong, 1997: 26). Moreover, with its strength in making 14-inch monitors(Japanese and Korean firms specialize in larger sizes of CRTs, and this gave Chunghwa a market niche) and its substantial overseas investment(see below), Chunghwa also tried to expand its product mix by producing various components of displays and CRTs, such as 29-inch CRTs for TVs(for which it received subsidy funds from the Industrial Development Bureau, IDB) and 19-inch CRTs for monitors, TFT LCDs(through technical cooperation with Mitsubishi), plasma displays, and TV projectors(Wu, 1997: 43-4).

Regarding FDI and cross-border production networks, in 1980, Tatung established Tatung International Corporation in Europe, which was set up to serve the European market. Tatung also invested in Britain(through acquisition) to establish a subsidiary(Tatung, U.K., 1980), which absorbed the R&D/production assets of the original company and developed Einstein, a type of micro computers, in 1984, and built a color TV plant in Bridgnorth. Moreover, a new plant was built in Atlanta(1981), to complement production and sales in North America. Tatung also invested in several electrical machinery plants located in China during the early nineties.

Since Tatung has transformed from a conventional manufacturer of white and brown goods into an IT producer(see the following discussion), its cross-border production networks are more salient. In view of the standardization of numerous PC components and unstable markets, Tatung has developed its global logistics networks to enhance its competence in the PC industry. Firstly, Tatung estimated the market demands(upstream and downstream) through Electronic Data Interchange(EDI) to shorten the circulation time of stock and decrease turnaround pressures. Secondly, to cope with the pressures of build-to-order(BTO), Tatung has established global configuration and assembly centers with the aim of sending products to the customers within two days(Chan, 1998). Moreover, Chunghwa, the most important source of profits among Tatung's subsidiaries, has made substantial FDI and constructed overseas assemblies in Malaysia, Fuzhou(China), and Scotland. Most of these assemblies are based on the principle of horizontal division of labor. Specifically, Chunghwa relocated the

manufacture of low-end monitors(smaller sized) to Malaysia and Fuzhou to utilize local cheap labor and serve local markets. The plants in Taiwan still produce both low-end and high-end(larger sizes) monitors in Taiwan, while the assemblies in Scotland are located in the electronics clusters of Europe and aim at serving European markets.(See Table 4-5.)

To cope with the fierce competition in consumer electronics and home appliances and to take advantage of the growing market opportunities of the PC industry, Tatung developed strategies and transformed into an IT goods manufacturer since the late seventies and early eighties. To strengthen backward linkages, Forward Electronics Co., which was established in 1970, shifted the focus of its business from passive components to PC peripherals, such as keyboards and mice, and joined ITRI's cable modem project for early technology transfer. Shan-Chih Semiconductor Company, a new subsidiary, was set in 1998 to produce material(wafers) for the manufacturing of various semiconductor products(e.g., diodes and ICs) as well as to recycle used wafers. Moreover, Chunghwa has been Tatung's most profitable company, so much so that, without the profits earned by Chunghwa, Tatung would have encountered red ink in 1996(Wu, 1997: 40-1). With regard to forward linkages, not only has Tatung become IBM's largest OEM supplier of color monitors in 1985, but it is clear that IT products have been dominating Tatung's product categories, which are displayed in Table 4-6.

Table

Parts

OPTI
Balan

OPTI
Weigh
Balan

OPTI
Drea

OPTI
Learn

OPTI
Ways

OPTI
Writi
Sche
the C
Less

Table 4-5 The Global Production Sites of Chunghwa Picture Tube

	Original Assemblies	***New Assemblies***	
Plants	*Products*	*Products*	*Beginning in*
CPTT, Taoyuan, Taiwan	14" CDTs, Electron Guns, 14"/15"/17" CDT, LCDs	14"/15/17"/ 28"/29" CDTs,	1996 & 1997
CPTY, Yangmei, Taiwan	20"/21" CPTs; 14"/15"/17" /20" CDTs	--	--
CPTF, Fuzhou, China	Electron Guns, Monochrome CRTs	14"/15 CDTs	1998
CPTM, Shah Alam, Malaysia	14"/20"/21" CPTs	14"/15 CDTs	1996
CPTK, Kampar, Malaysia	CPTs & CDTs, Electron Guns	--	--
CPTUK, Scotland	--	14" CPTs, 14"/15" CDTs	1997

Source: Chunghwa Picture Tube.
Note: CDT(color display tubes) are used for monitors and CPT (color picture tubes) for TVs.

The data in Table 4-6 indicate that, while the shares of white and brown goods in Tatung's sales are decreasing, those of IT products are growing fast. Although the shares of electrical machinery and other products are also increasing, their growth rates are slow in comparison to those of IT goods. In view of this trend and the growing markets for 3C(computer, communications, and consumer electronics) products, Tatung has integrated various units dealing with IT businesses, such as multimedia, telecommunications, and home appliances, within the parent company, thereby further transforming it.

Table 4-6 Product Categories and Sales of Tatung(1988 and 1997, Percentage)

	IT goods	*White and Brown Goods*	*Electrical Machinery*	*Others*
Tatung Group	53.5, 71.6	24.6, 6.9	12.8, 11.6	9.1, 9.9
Tatung, Parent Co.	32.8, 41.7	35.9, 19.4	19.5, 26.7	11.8,12.2

Source: Tatung 1997 Annual Report.(in Chinese)
Note: In the cells with two figures, the first one denotes the data in 1988, and the second the data in 1997.

Action Corporation

In contrast to other Taiwanese consumer electronics makers, who began their production in the fifties and sixties, Action started up its business really late, but its performance and achievement could not be ignored.

Action was established in 1976 by two brothers; one had earned an MBA degree and the other was a technician. From the seventies to the nineties, the

product categories of Action ranged from simple consumer electronics, such as clock radios and portable audio equipment, to more complex products, such as mini TVs(black-and-white and color), and monitors(CRTs and LCDs). Moreover, Action developed from a small manufacturer of consumer electronics to a medium enterprise capable of making overseas investment and establishing cross-border production networks, which cover Mainland China, Taiwan, and Malaysia.

The Start-up Stage(1976-1984)

At the start-up stage, Action was like other typical Taiwanese electronics manufacturers, specializing in making and exporting simple consumer electronics products. The products made during this phase included clock radios, mini-cassette recorders, portable audio equipment, multifunction telephones, and so on. Some of these products were made and exported to overseas markets while others(e.g., portable audio equipment) were made for the OEM orders of Telefunken.

After a period of expanding the numbers of its employees and its financial assets, Action was trying to secure its upstream chains by reinvesting in two companies; one provided components and the other specialized in plastic molding.

It is noteworthy that, at this stage, Action perceived the importance of securing the North American market and establishing warehouses with other Taiwanese electronics manufacturers to speed up their moves to the market.

The Takeoff Stage(1985-1990)

Since the mid-eighties, Action has gone beyond the status of a manufacturer

solely specializing in various electronic gadgets and has entered the major field of consumer electronics; that is, the video field, with significant product design and development capabilities. Not only did Action successfully develop a gadget combining the functions of radios and TVs in 1985, but it began to manufacture mini-B&W TVs(for the US market) and miniature color TVs in the following two years. The capabilities to produce mini-TVS are particularly significant in that, according to the conventional wisdom on competition in the TV market, the product cycle of TVs develops from those whose features are small size, black-and-white images, and modest functions, to large, color TVs with numerous or novel functions. As a late starter with insignificant capital and modest R&D capabilities in comparison to advanced TNCs and competitors, Action had few, if any, opportunities to coexist with those leaders, and almost no chance of competing successfully with them and reaping substantial profits. Therefore, partly because it observed the rising fashion of mini-TVs for leisure in Japan and other countries, and partly because it had to find ways to survive, Action aimed at niche markets, which were not yet filled with strong competitors and could provide breathing space for smaller manufacturers. This strategy proved to be successful, and, in 1989, Action achieved another success in developing palm-top sports TVs with LCDs, which were then imported but now are increasingly sourced from domestic suppliers.

At this phase, while continually expanding plants and developing niche markets for its video products, Action made a further move toward internationalization by investing in Malaysia(video products) in 1988 and in

Shenzhen(monitors and video products) in 1993; that is, Action's internationalization advanced from establishing overseas sales points in the start-up stage to establishing production bridgeheads in host countries. In addition, Action produced and exported black-and-white monitors for the first time in 1990. This corresponded to the industrial trends of some major Taiwanese consumer electronics manufacturers who, during the late eighties, crossed the fields of consumer electronics and industrial electronics, especially the PC industry, to find more opportunities to reap profits.

The Cruise Stage (1990-)

In the early nineties, Action made aggressive moves in overseas investment, cross-border production, and marketing. In 1993 and 1994, it established two subsidiaries dealing with sale and distribution in Hong Kong and Shanghai, respectively, with an eye on the mainland market in particular. Presently, the company has set up six manufacturing bases in Taiwan(for LCD TVs, VCDs, and color monitors and TVs), in Malaysia(for miniature color TVs and TV-VCRs), and Shenzhen, China(for monitors). It also has six points for distribution and marketing in the U.S., Germany, Hong Kong, and so forth. Moreover, Action plans to develop more markets in the third and fourth(e.g., Russia) worlds(Cheng, 1998).

Action's overseas investment and production are characterized more by horizontal than by vertical division of labor. A survey by the scholars at the CIER revealed that Action has upgraded its plants to produce high value-added products, such as LCD TVs and VCDs, while low value-added products, e.g., TVs

and monitors, are made at overseas production sites. Action even has motherboards for TVs produced in the mainland and imports them back to Taiwan for further assembly. Moreover, Action has R&D teams in the mainland for product development and gives training classes in Malaysia to enhance the skill of local employees. In addition, the company brings some of its Taiwanese suppliers to Malaysia and helps them deal with matters of investment in that country(Chen, et. al., 1997: 344).

While building cross-border production and sale networks, which are controlled by the parent company in Taiwan, Action has not relinquished its effort to secure backward linkages(supplier networks and R&D) and forward linkages(product development and mixes). Action has been relying on outsourcing key components, such as CRTs and LCDs, from domestic and foreign suppliers. Moreover, with the financial support of the government and under the supervision of the Industrial Development Bureau, the company has been developing GPS, a type of satellite navigating system that features receivers and miniature color LCDs(4 inches). The aim of this development is to provide substitutes for similar systems imported from the U.S. and Japan as well as to stimulate further application of the technology. Moreover, by means of licensing or contracting, Action, along with other Taiwanese electronics firms, has received the technology for audio and video disk players from the ITRI.

On the other hand, the major profit sources of Action are monitors, LCDs, and other video/audio products. Most monitors (71 percent) made by Action carry the brand name "Axion" while only 10 percent of the company's video and LCD

products have the Action brand. Moreover, it is reported that in some advanced countries, the miniature LCD TVs produced by Action have taken up more than 30 percent of the markets. With regard to market distribution, Action's market targets have spread to three regions with the result that America accounts for 36 percent, Asia 35 percent, and Europe 29 percent of the company's market(Cheng, 1998). This is well balanced, in contrast to the conventional perception that the electronic products of latecomer firms have always depended on the North American market.

Industrial Electronics--PCs and Peripherals

Acer Group

In regard to latecomers to the electronics industry, especially East Asian NIEs, the conventional wisdom maintains that the latecomer manufacturing firms specialize only in OEM/ODM business, because they are capable of controlling the process to enhance efficiency, to cut production costs, and to respond to market demands flexibly, and because few of them have been able to develop complete control of both upstream linkages(core technologies and key components), and downstream linkages, including distribution channels and brand images(Gereffi, 1995: 131). This perception is not totally wrong, but there are some exceptions, the most salient of which is Acer Group.[5]

Acer was founded in 1976 by Stan Shih and his partners, a group of

---

[5] For the sake of convenience and fluent discussion, two Chinese books about the development of Acer Group will not be noted in the text. The first is Stan Shih's *Reengineering Acer,* and the second *The Computer Legend of Stan Shih*. The following discussion and descriptions draw heavily from these two books. Other sources will be noted whenever it is appropriate.

engineers who graduated from leading Taiwanese universities.[6] In contrast to other Taiwanese IT firms, Acer did not start its business by cutting directly into production through OEM, subcontracting, or other types of contractual manufacturing, but by product design/development and trading. Nevertheless, Acer finally entered the production process in the early eighties and quickly grew to be a group having subsidiaries and reinvests in various businesses ranging from software to hardware products. At the same time that it enhanced process efficiency, Acer also tried to increase its control of backward linkages(merger and acquisition, strategic alliances, and R&D) and forward linkages(constructing distribution channels and building brand images) linkages. In less than two decades, Acer developed from a small company having little capital and specializing in design and trading to an internationally recognized business group. It is now capable of controlling backward linkages(DRAMs and ICs), the production process, and forward linkages(product mix, distribution channels, and brand images); but it is also capable of making overseas investments, and its production is supported by a framework of global logistics. The general organization of Acer Group is presented in Table 4-7.

The Start-up Stage(1976-80)

Acer's design/development capabilities were salient from the beginning. As a small company lacking sufficient capital and scale economies, Acer, in addition to

---

[6] The original English name of the company was not Acer, but Multitech, which was the creation of Shih. However, since "Multitech" was similar to the title of an American corporation and since Shih and his partners wanted to promote the internationalization of their company, "Multitech" was replaced by "Acer" in 1989. Here "Acer" will be used through the texts.

Table
Dolla

Manu
Ace
Ace AP Ace Inc
Tex Ace Th Ser
Distr
Ace S-
Ace Ar
Ace
Ace
Othe
C C
F C
A
Ce Ce

Table 4-7 The Organizational Structure of Acer Group(Unit: New Taiwan Dollars)

Manufacturing	***Sales***	***Products and Businesses***
Acer Inc, 1981	575.2	PCs, motherboards, *Internet communication equipment
Acer Peripherals, AP; 1984	274.6	monitors, peripherals, *LCD, *plasma TVs, and *PC components
Acer Laboratories Inc. ALI, 1986	27.4	chipsets(ASIC), IT equipment
Texas Instrument-Acer Incorporated (TI-Acer), 1989		DRAMs, ICs
Sertek, 1976	99.1	IT services, *IC packaging and testing,
Distribution		
Acer International(Singapore), AI, 1992	211.6	Regional Business Unit(RBU)
Acer Computec Latin America, ACLA, 1994	110.6	RBU
Acer Europe, AE,		RBU
Acer North America, ANA		RBU
Others		
Continental Venture Capitals, 1984	-	Reinvestment in high-tech firms
The Third Wave Publishing Co., 1983		Publishing and sale of computer-related books
Acer Fund, 1997		Financial support for joint ventures and investment in software businesses

Source: Yen, 1993; Yang, 1997c.
Note: The asterisks denotes the reinvestment businesses.

developing its trading businesses, fully utilized its advantages, namely, human capital in terms of engineering capabilities and technological know-how.
On the one hand, Acer devoted itself to trading businesses, focusing on microprocessors. To compete with Intel's sole Taiwanese agent, Acer tried to be the Taiwanese agent for Zilog, an American start-up firm making microprocessors. Acer did very well and made decent profits, so that Intel recruited it to be an Intel agent in Taiwan. Moreover, because computer games were very popular in Taiwan from the late seventies to the early eighties, Acer had the opportunity to be the only Taiwanese agent of Texas Instruments, and it imported semiconductor components for domestic computer-game manufacturers.

On the other hand, Acer's real advantages have always been its technological capabilities. The company did reverse engineering on Japanese circuit boards in computer games(Program Logic Array, PLA) for Taiwanese computer-game manufacturers. This helped Acer's engineers learn the basic design and brought them business opportunities in the designing of the structures of computer games. Nevertheless, the main thrust of Acer's capabilities was revealed by its design of electronic products, including circuit boards for palm-top electronic game gadgets, plugs and sockets for telephone lines for its clients. But its most important order, as well as its first, was the automatic bridge-dealing machine, which not only underscored the designing capabilities of Acer, but also brought it the needed financial resources for survival.

In addition to this automatic dealing machine, which was not commercialized in the end, the representative products of Acer's design capabilities are

exemplified by the Dragon Chinese-Language CRT(1980), which was designed through cooperation between Acer and Bahn-Fu Chu, a Taiwanese enthusiast for developing Chinese input/output software, as well as by a series of EDU-80 Micro-Professor(Type I in 1981 and Type II in 1982), a type of small computer for education. These two products not only helped Acer earn significant profits, but also led it to the manufacture of PCs.

The Takeoff Stage(1981-90)

After the appearance of the Dragon-Chinese Language computers and Micro-Professor home computers, Acer officially cut into the manufacturing of PCs through Acer Inc., the first reinvestment of the original Acer(Multitech), which was renamed Sertek. Acer continued to increase its capabilities for obtaining core backward linkages and for establishing distribution channels. This management pattern corresponds to Shih's Smiling Curve Theory, which uses a U-shaped curve to describe the value chain in the IT business. According to Shih, the left side of the "Smiling Curve" represents the upstream chains, such as design, key components, and production, while the right side represents marketing, distribution, and brand images. Both higher sides of the curve represent high value-added parts of the value chain, whereas the middle, that is, the bottom of the curve, denotes simple assembly, which adds few, if any, values to products. It could be said that, since the early eighties, Acer has run its business by following the theoretical configuration, although its specific content was described by Shih later.[7]

---

[7] For a specific introduction to Shih's theory of the "Smiling Curve," pleas browse

An example of the strategies represented by the lower part of the left side of the curve is that, Acer, after the success of Micro-Professor II in 1983, paid ERSO to explore the basic structures of IBM compatible PCs, obtained the technology, and produced the first IBM compatible PCs(XT) in the next year. The export of the product was checked by IBM, however, on the grounds that its basic I/O system infringed on IBM's IPR. Then Acer developed the prototype of 32-bit PCs in 1986, earlier than IBM. This achievement confirmed Acer's technological capabilities and contrasts with the stereotype that latecomer manufacturing firms are only able to follow leaders and rely exclusively on the OEM/ODM orders of advanced TNCs. Nevertheless, IBM initiated litigation against Acer in 1987 on the grounds that Acer's controller program in keyboards infringed upon IBM's IPR. The dispute was resolved through negotiation.

In this stage, apart from balancing OEM/ODM and OBM, Acer had grown large enough to spin off independent firms that kept management/manufacturing relationships with the parent company. Acer Peripherals, which manufactures monitors, keyboards, and other peripheral products, was established in 1984. In the same year, Continental Venture Capitals was founded, through the joint venture of Acer and the Continental Engineering Corporation. Acer Peripherals was even capable of making overseas investments in Malaysia in 1989 for assembling monitors and keyboards, two examples of labor-intensive computer products.

Acer was not content, however, to be a leader only in manufacturing newer

---

the homepage of Acer Group: http://www.acer.com.tw//ai/profile/.

PCs. Shih led Acer's climb toward the higher part of the smiling curve through M&A, forming joint ventures, and establishing new companies. In 1986, Acer founded Acer Laboratories Incorporated(ALI), whose purpose was designing application specific IC(ASIC), and invited three Taiwanese specialists working in Silicon Valley back to Taiwan. Then in 1987, with the hope of accessing minicomputer technologies, Acer acquired Counterpoint Computers, a California firm specializing in developing and manufacturing minicomputers. This firm had business relations with Acer.(Acer was its agent and OEM manufacturer.) This project failed, however, because minicomputers were soon overshadowed by the new 32-bit PCs. Unfortunately, this was not the only unsuccessful case of M&A in Acer's development. In 1990, Acer acquired Altos Computer Systems, an American manufacturer and distributor of networking and multiuser computers. Acer hoped to access the company's technologies and international distribution networks, but this plan also failed because of the incompatibility of the two companies' cultures and the fast-changing industrial environment.

Nevertheless, the setbacks that Acer encountered at this stage did not discourage Shih from upgrading the company's technological capabilities. In 1989, Acer formed a joint venture with Texas Instruments, an American semiconductor leader, to found Texas Instruments-Acer Incorporated(TI-Acer), which made dynamic random access memory(DRAM) and fabricated wafers, both of which are capital- and technology-intensive. This project proved to be successful. It not only secured Acer's upstream sources of DRAMs,[8] but also helped Acer absorb

[8] For the details of the TI-Acer project, see the report of Lewis H. Young,

semiconductor technologies and provided surplus profits, which were used to subsidize the loss of other subsidiaries of Acer Group(Engardio and Burrow, 1996).

In addition to managing the left side of the smiling curve, Acer noticed the need for building marketing and distribution channels. In 1984, two subsidiaries were established in Japan and West Germany, respectively, to establish market presence. In 1989, Acer formed a joint venture with Sumitomo Corporation to penetrate Japan's market, a market with structural barriers to foreign businesses, partly because of the peculiar specifications of AX Japanese-language computers. To compete with the established market leaders, Acer raised the price and quality of its products and provided complete after-sales service(Japanese Abstract, 1989). In 1985, AcerLand, a type of chain store selling computer products, was established to secure the domestic market.

These measures, however, do not represent Acer's core strategy, which was constructing international distribution networks. Acer's main strategy for building marketing and distribution channels is exemplified by the slogan "global brand, local touch." The first tenet of this strategy was to develop the third world market while maintaining the North American market. In the early eighties, Acer began to cultivate the Latin American market by first finding sale agents in major countries, such as Mexico and Chile, to promote Acer's brand image. It then established assemblies in the countries where Acer's products had obtained substantial market share, usually around 30 percent. The second tenet was to utilize local

---

"Electronics Business Today,"

talent to manage local marketing, distribution, and production by giving local representatives economic incentives(usually stocks) and full responsibilities, in addition to providing them with financial and technical assistance at appropriate times. The result of these strategies was significant; not only has Acer become a leading brand in Latin America, but local talent and resources have been fully utilized(Elaine Chen, 1997). The strategy using "global brand, local touch" has been extended to other regions of the globe, consolidating the foundation of Acer's global operations and making Acer either number one or two in Asia, Africa, Latin America, and even the former Soviet Union(Business Week, 1996). These achievements of Acer further challenge the conventional wisdom that latecomer firms doing OEM/ODM manufacturing will not be able to develop marketing, distribution, and brand images. It should be added here, however, that, while trying to internationalize its production and marketing, Acer encountered serious deficit problems because of the burden of its M&A projects(Counterpoint and Altos) and because of the fierce competition of Packard Bell, Dell, and Compaq in the North American market.

The Cruise Stage(1991-)

During the takeoff stage, Acer had already made overseas investments and constructed international marketing and distribution networks, which tended to transform local sale points into assemblies. The group's comprehensive and strategic globalization did not commence, however, until the early nineties. To solve its deficit problem, Acer sold assets and laid off four hundred employees. To

---

http://www.ebtmag.com/registrd/issues/9706/06acer.htm.

strengthen the group's global operation, Acer strengthened its "global brand, local touch" strategy, decentralized the group by reorganizing in accordance with a client-server framework, and implemented the "fast food" mode, which speed up the production and marketing of its products.

According to the "client-server" framework,(see Figure 4-2) the parent company is like the server(a mainframe or minicomputer), which is responsible for providing assistance and consulting to subsidiaries, rather than focusing on central control. To extend this analogy, all units and subsidiaries act like the PCs or terminals of a computer network, implementing their own policies and strategies. Using this idea, Shih divided Acer into two groups: the strategic business unit(SBU) and the regional business unit(RBU); the former secures key components and coordinates production while the latter extends marketing, establishes local assemblies, and provides services. SBUs include Acer Inc., Acer Peripheral, TI-Acer, and ALI, while RBUs include Acer North America, Acer Europe, Acer Latin America, and Acer International. Some of this units have become be quasi-regional headquarters. For example, Acer International, which has been based in Singapore since 1992, deals with the marketing and after-sales service of computer products in the Asian-Pacific region, Africa, Latin America, the Middle East, and the Commonwealth of Independent States(Hiebert, 1995: 62). It has also served as an international purchasing office(IPO) since 1995.

Figure 4-2 Acer's Client-Server Organization

Acer Group

SBUs		***RBUs***
Acer Inc. Acer Peripherals TI-Acer Acer Laboratories Inc.		Acer North America Acer Europe Acer International Sertek Acer Computec Latin America
Components	**Assembly**	**Marketing & Distribution**

Source: Chou(1996: p. 301).

Acer also adopted the "fast food" mode, including OEM/ODM and OBM, to accelerate the assembling and selling of its computers. Since the product cycles of PCs are far shorter than those of other electronic products, such as consumer electronics, and since the fierce competition in the PC industry pressures PC manufacturers to respond to orders with quick delivery time and to offer quality goods at low prices, Acer developed its "fast food" capabilities to respond to these market pressures. The strategy has three elements: First, components that are low value-added and whose product cycles are not fast changing, including power suppliers, PC housings, and floppy disk drives, are sent to Acer's Uniload sites or Uniload Configuration Centers, which are upgraded from thirty-seven assemblies around the world. Parts that are high value-added and whose product cycles are changing frequently, e.g., motherboards, DRAMS, and hard disk drives, are delivered to the markets by air transportation. Third, CPUs are procured locally by

the regional subsidiaries.[9]

To facilitate the "fast food" strategy, which is intended to make marketing computers similar to selling hamburgers, Acer developed Chip-Up technology, which simplifies the upgrading of PCs, and screwless housing, which takes only thirty seconds to assemble a PC. It also engaged in extensive overseas investment and production, based on the client-server framework. In 1995, Acer Inc. established plants in the Subic Bay industrial park in the Philippines to manufacture motherboards. The Subic plants will assemble computers and make notebook computers as well as CD-ROMs. In 1998, Acer Inc. planned to establish plants in Mexico for accessing the North American market and plants in Mainland China's Chung-Shan County to take advantage of China's cheap labor and to cultivate local markets.(Acer Peripherals has built plants in Suchow on the mainland and the plants began manufacturing in 1996.) In addition, Acer has asked its suppliers to build warehouses in its forty Uniload sites around the world to secure quick supplies of components and parts(Chu, 1997). In this "fast food" strategy, Taiwan is used as the "central kitchen" and regional RBUs as the chain stores. The "central kitchen" will be expanded to East Asia(China, Taiwan, Malaysia, and the Philippines) and other major markets, with the aim of making Taiwan the command center for developing new components and designing new menus.

While internationalizing its production, Acer continues accumulating its upstream linkages, opening new markets, and pursuing product diversification.

---

[9] For a short introduction to the "fast-food" strategy, please browse

The company is even capable of transferring core technologies to market leaders; this is astonishing to persons who have stereotypical impressions about latecomer manufacturers.

For the purpose of accumulating technology capabilities, Acer first formed a joint venture with Temic, a subsidiary of the Benz Group(Germany), in 1991, and established a company doing design and manufacturing of microelectronic systems. In the same year, Acer successfully developed Chip-Up technology, which simplifies the upgrading of computers through changing chips. This company obtained patents in Taiwan(1992) and the U.S.(1995), and transferred the technology to Intel in 1993. Also in 1991, Acer made huge investments in developing Reduced Instruction Set Computing(RISC) technology, which processes millions of instructions per second(MIPS). In addition, after having acquired semiconductor technology from TI, Acer Display Technology, a subsidiary of Acer Group, will obtain TFT-LCD technology from IBM(Kovar, 1998), which signed a licensing contract in 1998 to transfer the technology of manufacturing logic ICs to Acer Semiconductor Manufacturing Inc.(ASMI), which was formerly TI-Acer(Chen, Sandy: 1998).

Having become a market leader in the third world under Shih's strategy of "encircling the cities from rural areas," Acer has continued to build global marketing and distribution channels during this stage, in addition to implementing the "fast food" strategy. In Asia, Acer recruited more agents to cultivate the mainland market. In Africa, Acer formed a joint venture with Persetel

---

http://www.acer.com.tw//ai/profile/.

Holdings(South Africa, 1994), which deals with the production and sale of Acer's products in South Africa and other English-speaking African countries. In Europe, Acer set up a subsidiary in Austria(1992) and agreed to grant the Ericsson Group(Sweden) the right to sell Acer's products in North Europe(1995). Acer also formed a joint venture with its Mexican partner and established Acer Computec Latin America(1994), which has the goal of become the biggest PC company in Latin America.

With regard to product diversification, Acer has persisted in trying to be an integrated manufacturer and distributor of 3C products. In addition to doing OEM/ODM for Japanese and American buyers and to selling finished products and components(DRAMs, motherboards, monitors, and so forth), Acer also pushed Aspire(1995), a type of multimedia home PC. Aspire is mainly the achievement of Acer America, which was responsible for the concept, interface, and promotion, and of Acer Peripherals and Acer Inc., which were responsible for manufacturing. These subsidiaries worked within the framework of the decentralized client-server organization and without the direct supervision of the parent company. It is noteworthy that Acer North America spent only nine months to actualize the idea, finish the design, and start mass production, and that Aspire caused the revenue of Acer North America to jump by 62 percent in 1995. Aspire received the Editor's Choice Award from PC Magazine, even though Aspire inventory quickly accumulated because of the pressures of market competition(Business Week, 1996). Moreover, Shih has gone beyond the conventional impression of PCs, formulating various product concepts, the most

notable of which are Acer Basic, PCs for the poor, XCs(various types of computers with single or few functions, such as computers for word processing or surfing the Internet), as well as Eden, a gadget for children's entertainment, word processing, education, and so forth. Shih's basic premise is to make computers simple for users and to transform personal computers into cheap and usable information appliances. This would certainly increase business opportunities.

While performing well in the PC sector, trying to promote newer computer hardware, and investing through joint ventures in software-developing firms (with ComputerAssociates, MicroSoft, and Nippon Investment Finance Co.), Acer has been determined to step into the field of consumer electronics since 1995. It has promoted the production and marketing of plasma displays, wide-screen TVs, and digital versatile disk(DVD) players, on the one hand, and set-top boxes, Internet appliances, GSM cellular phones, and image-phones, on the other. In other words, Acer has been transforming from a PC maker into an integrated manufacturer and distributor of 3C products.

MiTAC Group

MiTAC Incorporated was established in 1974 by a group of engineers. Then it was acquired by Feng-Chian Miau, the president of Lien-Hwa Industrial Corporation(LHIC) and who has been a chip designer/engineer at Intel. In less than twenty years, MiTAC has become an enterprise group(Table 4-8) capable of producing and distributing PCs, components, and other IT products, and also capable of implementing the strategy of global logistics. This strategy requires substantial financial resources, solid capabilities for integrating global division of

Table 4-8 The Structure of MiTAC Group

Company	*Major Business*	*Notes*
MiTAC Inc., 1974	agent of Digital and Intel	
MiTAC International Corp., 1982	PCs and peripherals	
Synnex Technology International, 1988	distribution	joint venture with Lex Service
Getac Corporation, 1989	defense electronics & equipment, military notebook computers, etc.	joint venture with General Electronics
MiTAC Communication Co., 1990	computer networking, telecommunication, & telephony	
Synnex Information Technologies(USA), 1992	distribution	acquiring Compac
ComputerLand, 1997	distribution channels	acquisition by Synnex U.S.A.

Source: collected from Hwang(1997) and other news sources, including the homepage of the group: http://www.mitac.com.hk/mitacgroupintro.html

labor, and sophisticated distribution channels. All of this was achieved through Miau's two intertwining strategies: joint ventures/reinvestment and strategic alliances.

The Start-up Stage(1974-1980)

MiTAC Inc. was founded in 1974 and reinforced by the capital and management of LHIC in 1976. At this stage(during the seventies), MiTAC Inc. was the Taiwanese agent of Digital's computers as well as Intel's microprocessors, electronic switching boards, and components; but MiTAC's business did not focus only on the trading of electronic products and computers. It was the first Taiwanese firm capable of manufacturing commercial Chinese terminals(Hwang et. al, 1997: 211-2).

The Takeoff Stage(1981-1990)

Since the eighties, because of the appearance of Apple II and the Taiwanese government's ban on computer games, a variety of Taiwanese game makers have been forced to turn to manufacturing PCs. It was this that led MiTAC to step into the field and establish MiTAC International Corporation in 1982. The initial products made by MiTAC were Apple II compatible PCs(1983). Although IBM opened the technology licensing of IBM PCs, MiTAC International did not make IBM compatible PCs until the mid-eighties(Hwang et. al., 1997: 212).

The major achievements of MiTAC during the eighties were increasing investment, engaging in reinvestment, and expanding plants as well as assemblies. Apart from doing OEM for ITT and promoting OBM after ITT canceled its orders in 1986, MiTAC International was trying to expand overseas markets

with significant performance, but MiTAC Inc., which had focused on the domestic market, was not doing very well during this period(Hwang, 1997: 212).

It seems that, in this stage(and in the cruise stage), MiTAC International relied on outsourcing, supplier networks, and automation(MiTAC International promoted automation in the mid eighties and introduced surface mounting technology in 1989) to enhance production efficiency. In contrast to the development strategy of Acer, the group has not made significant attempts to develop core technologies and key components(e.g., LCDs and CRTs). From Table 4-9, it is clear that MiTAC International has been outsourcing most key components from industrialized and industrializing countries while only a few low value-added parts are procured in Taiwan, such as chipsets and PCBs.(CD-ROMs are made by assembling imported key components.)

There were, however, two actions that are noteworthy. First, in 1988, MiTAC Group formed a joint venture with Lex Service, a British distributor--the largest one in Europe at that time-- to establish Synnex, which dealt with the distribution of electronic products in Taiwan and Southeast Asia(Ou, 1997: 71). This is significant, not only because managing distribution through joint ventures is different from Acer's strategy of "global brand, local touch," but because the joint venture foreshadowed the future development strategy of MiTAC Group in the cruise stage and contradicts the idea that latecomer firms always focus exclusively on OEM/ODM.

Table 4-9 Component Sources of MiTAC International

Components	*Sources*	*Suppliers*
CPUs	US	Original
HDDs	Japan, US, Singapore	Original
DRAMs	Japan, Korea, Taiwan	Original
PCBs	Taiwan	Original
LCDs	Japan, Korea, Taiwan	Original
Chipsets	US, Taiwan	Original
CD-ROMs	Taiwan, Korea, Japan	Original
MODEMs	Taiwan, Singapore	Original

Source: MiTAC International, *1997 Annual Report MiTAC International*, p. 13.

Second, although it did not aggressively develop core technologies and key components during this stage, MiTAC International managed to export turnkey facilities to Multipolar Corporation, a subsidiary of the Indonesian Lippo Group. This technical cooperation not only earned MiTAC International royalties, but also strengthened its market position and presence in Indonesia and other countries, because every PC assembled by Multipolar carried the MiTAC brand name(Hsiu, 1989: 206).

The Cruise Stage(1991-)

With the exception of the performance of MiTAC Inc., everything seemed to be going very well for MiTAC International in the early nineties. In 1990, it was even able to cooperative a joint venture with General Electronics to form a firm called Getac Incorporated, which made military and notebook computers.

MiTAC International, however, faced deficits in 1992. Miau then began to make significant reforms by simplifying the manufacturing process for computers through the assembly of modules, by making overseas investments for production

in Mainland China and Britain, and by discharging employees(Hwang et. al., 1997: 213).

After this financial crisis and management reform, MiTAC Group began to enter the cruise stage by actualizing Miau's strategy of global manugistics[10], which controls the processes of production and distribution through three groups: the Manufacturing Group, the Global Manugistics Group, and the Distribution Group.(See Figure 4-3.)

Using this framework, MiTAC has established Taiwan and Mainland China as two major manufacturing bases; the plants in the former make high-end or high value-added products, such as motherboards and notebooks, while those in the latter(established in 1993) make low-end or labor-intensive products, such as casings, keyboards, and power suppliers(Taiwaninternet). The quantities and types of products that will be manufactured are based on the estimation of MiTAC's business units around the world. The headquarters in Taiwan then activates the manufacturing process and delivers the products whose prices do not fluctuate violently or whose product cycles are steady to the global configuration centers(GCCs). GCCs first purchase high-value added products, e.g., CPUs, DRAMs, and HDDs, which can be procured in local or neighboring areas, and then assemble as well as test them. The final products are sent to buyers and to the distribution channels built by MiTAC Group.

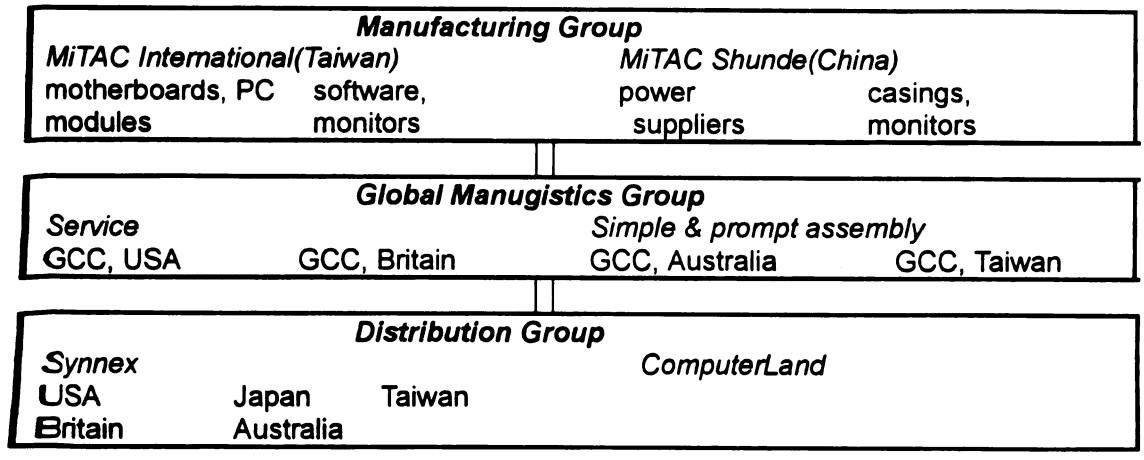
---

[10] "Manugistics" was coined by Miau. The meaning of the term is similar to "logistics," but Miau invented it to emphasize the close connection between production management centered in Taiwan and Mainland China, on the one hand, and prompt assembly lines as well as quick delivery to customers around the world, on the other.

Figure 4-3 The Framework of Global Logistics of MiTAC Group

MiTAC Inc.: Industrial Computers

Getac Corp.: Military Computers & Notebook PCs



Source: Ou, 1997, p. 74.
Note: GCC = global configuration center.

The construction and operation of this framework are based on Miau's strategies of joint ventures/reinvestment and strategic alliances.

It has been mentioned that, during its takeoff stage, MiTAC Group absorbed defense technology(Getac) and knowledge of managing distribution networks(Synnex Taiwan and Synnex International), thanks to Miau's joint venture strategy, which was not limited to the manufacturing and distribution of computer products. As the president of the Union Petrochemical Corporation(UPC), he also promoted various joint ventures with Mosanto to learn newer technologies in the petrochemical industry and with the British BOC Gases to access their industrial-gases technologies(Ou, 1997; 72-3). At first glance, these joint ventures do not seem relevant to the PC industry. According to an interview with, however, some

of the profits obtained from the joint ventures will be reinvested in the upstream of the computer industry, including the semiconductor industry(DRAMs); but most of the products require special petrochemical material, which can be obtained from UPC and other chemical companies under Miau's command and used to manufacture wafers and LCDs(China Times, 1998).

In addition to securing upstream sources, MiTAC Group has been actively constructing distribution networks, which sell both MiTAC's and other manufacturers' electronic/IT products. The group acquired Compac(not related to Compaq), a major American distributor of computer products and components, in 1992, to form Synnex USA, whose goal is to build distribution networks in North America and neighboring areas. Then in 1997, MiTAC USA Inc., a subsidiary of MiTAC International, acquired ComputerLand, an American distributor of computer products, from Merisel Inc., the second largest IT products distributor(Ou, 1997: 70).

Moreover, since 1995, apart from promoting OBM(PC servers, Web servers, and PCs) and exploring some niche products, such as Internet computers(MiTAC International, 1997: 13). MiTAC International has formed a strategic alliance with Compaq to secure further cooperation in OEM/ODM(desktops, notebooks, and monitors) and other businesses. In 1998, Miau revealed his plan to form a larger strategic alliance with world market leaders, such as Compaq and Dell, to secure more markets and to find opportunities to integrate numerous dealers in do-it-yourself (DIY) computers, thereby avoiding pressure from both leaders and followers(Chu and Liu, 1998).

Thus, Miau's strategies involving joint ventures and strategic alliances, on the one hand, and his global manugistics framework, on the other, have secured upstream sources, established cross-border production and delivering networks, and consolidated downstream distribution channels, which sell both MiTAC's and competitors' products. The policy expressed by the slogan "global reach, serving local needs" has finally been implemented.

Jimbau Electronics and Inventec

Jimbau Electronics was established in 1973 as a small enterprise with fifty employees and six million NT dollars. Specializing in making calculators during its start-up stage(1973-80), Jimbau's major achievement in product development was its successful production of calculators with LCD screens, card-sized calculators, and electronic cash registers. In addition, Jimbau began to computerize its management and production.

In the eighties, Jimbau entered its takeoff stage. Its strategy was to enhance automation production, such as surface mounting technology(SMT) equipment and computer-aided design(CAD) system, and to develop various types of calculators as well as communications products, e.g., PC peripherals and fax machines. Jimbau tried to develop PC peripherals with the assistance of ERSO in 1984 and to develop fax machines in 1986 by receiving the support and subsidy of the Industrial Development Bureau(IDB). Jimbau's effort to develop fax machines finally paid off in 1989 when mass production began(Chang, 1991: 170). In 1984, Jimbau established Compal Electronics, a subsidiary that produces PC peripherals, such as monitors and keyboards. During this stage, Compal

gradually focused on the OEM/ODM of monitors and notebook PCs.

Jimbau entered the cruise stage at the end of the eighties. In view of macroeconomic pressures(NT appreciation and rising labor costs) in the mid-eighties, Jimbau decided to invest in Thailand(Cal-Comp Electronics Ltd.) in 1989 to produce calculators. In contrast to Inventec(see the subsequent discussion), Jimbau persuaded just four many suppliers to cooperate with it and the local content ratio was not high(Chang, 1991: 168-9). Jimbau's calculator plant in China is an export-processing assembly, which imports equipment and exports all products to foreign markets(Japan in particular) with the intention of utilizing China's material, which results in 20-percent savings. The assembly began mass production in 1996(Hong, 1996). Thus, Jimbau established two production enclaves, one in Thailand and one in China during this stage.

Compal's investment in China did not deviate from the norm, although some changes are emerging. Because monitors are labor-intensive products, Compal relocated the production of small-sized(14- and 15 inch) monitors to Thailand and China. This not only motivated certain component suppliers to invest in China, but also triggered Jimbau's decision to shift part of its basic R&D and the assembly of larger-sized monitors to the plant in China in the late nineties. Nevertheless, motherboards are still procured from Taiwanese firms and LCDs from Hitachi in Japan (Chen, et. al. 1997: 354-5). While the production in China is limited to simple assembly, Compal plants in Taiwan manufacture notebook PCs, which require more intensive R&D and enhanced process technologies. This is attested to by Compal's achievement in developing ultra-thin, large-sized, and multimedia

notebook PCs as well as by the recognition Compal's high quality by international industrial standards(ISO 9001) and by well-known PC magazines(Chen, et. al.: 1997: 351).

In addition to overseas investment and production, Jimbau tries to strengthen its backward linkages by reinvesting in businesses dealing with automation and components, by amplifying R&D, and by expanding product mix. On the one hand, Jimbau invested in two Taiwanese electronic-component makers(power suppliers and resistors) in 1996 and in a firm providing industrial material in 1992 to pave the way for controlling upstream chains. On the other hand, Jimbau usually spends 1.5 to 2 percent of its sales income for R&D, and, in 1998, the original three hundred personnel of R&D will be expanded into a group consisting of six hundred researchers and engineers. Moreover, Jimbau began mass production of cellular phones and printers under an OEM framework in 1997 and of scanners in 1996, expanding its original product mix of calculators, monitors, fax machines, and electronic organizers.

Jimbau is not the only Taiwanese calculator producer that has successfully upgraded and become a diversifying manufacturer with a larger business scope. Inventec also made a successful transformation.

Inventec was established in 1975 as a small firm(with seven employees and one million NT dollars, or 25 thousand U.S. dollars), that made calculators. Within twenty years, Inventec has grown to be an international enterprise, whose business scope covers notebook PCs, calculators, and communications products, and whose production networks have spread into Taiwan, China, and Malaysia. It

had eighty thousand employees and sales of 50 billion NT dollars in 1997.

Inventec specialized in the production of calculators during its start-up stage(1975-85). In the mid-eighties(1985-88), Inventec entered the takeoff stage, but it entered the cruise stage(1988-) after a very short period. In view of the pressures of exchange-rate appreciation and rising labor costs, Inventec decided to make systematic overseas investments by relocating the production of calculators to Penang, Malaysia. It is noteworthy that this relocation not only moved the process(midstream) overseas, but also relocated the upstream(R&D and supplier networks) and downstream(distribution and sale) chains(Lyu, 1998b: 52-3). Inventec persuaded stable and excellent suppliers to make overseas investments and chose and constructed sites for its plants and suppliers to form clustering settings(Peng, 1997: 52). In addition, it invited Seiko Epson, a Japanese electronic component maker, to establish a plant in Malaysian to provide LCDs for Inventec. In the early nineties, 95 percent of Inventec's Malaysian products were already sourced locally(Chang, 1991: 168), and the firm designed courses about product qualities and process efficiency to train employees in Malaysian plants and their suppliers(Liu, 1995: 57-8).

As in the case of Jimbau, Inventec was not satisfied with the production of calculators or relocation of plants producing calculators and telephone sets, that is, standardized and labor-intensive products for which Taiwanese makers have lost comparative advantages. Because of its strengths in making calculators and its various engineering teams in product development, Inventec has been upgraded and now manufactures notebook PCs, miniature IT gadgets(e.g., electronic

language dictionaries and personal digital assistance, PDAs), as well as fax machines.

Inventec began to produce notebook PCs in 1989 and became one of the OEM/ODM suppliers of Compaq, the most important buyer of Inventec's notebook PCs, in 1994. Moreover, Inventec formed a joint venture with Toshiba in Malaysia, establishing TIM Electronics in Malaysia to make fax machines under Toshiba's brand name, with the intention of absorbing Toshiba's optoelectronic technology(Chang, 1997: 170). In addition, Inventec's electronic dictionaries, with the brand name Besta, not only dominate the Taiwanese domestic market, but are increasingly prevalent in China(WTEC, 1997).

To maximize its strength in backward and forward linkages, Inventec has promoted a series of organizational reforms, which focus on the reengineering of organization, quality, information, and R&D, so that it can enhance the efficiency of corporate management and the production process(Lyu, 1998: 54-6). In addition, in the late eighties, Inventec had already established an Electronic Data Interchange(EDI) system to communicate with its clients more quickly(Wang, 1997a: 188). Inventec also built surface mounting technology(SMT) lines to enhance the efficiency of production. According to an American research team's report, Inventec was more advanced than other sites visited in Asian industrializing countries at the time(WTEC, 1997).

KYE Systems Corporation

KYE Systems Corporation was established in 1983 as an exporting assembler of PCs. After a very short start-up stage, KYE entered the takeoff stage

by launching the production and distribution of computer mice, which are labor-intensive PC peripherals with low entry barriers, under its own brand name, Genius, in 1985. In 1986, KYE set up an office, KYE International Corp., in the U.S. to develop markets.

The speedy growth of production and distribution resulted in the enlargement of the company and the attempt to control backward as well as forward linkages. KYE expanded into a corporation in 1988 and acquired Mouse Systems Corporation(MSC) in 1990. This action not only changed the American firm from one with heavy losses into one making substantial profits, but helped KYE to absorb optics technology for computer mice and to develop American distribution channels(Chang, 1992: 58). In 1989, mice with the brand name Genius were the most popular PC input device among European users.

KYE entered the cruise stage in 1991 by setting up overseas companies, by expanding product mix, and by constructing cross-border production networks, which were based on clear regional division of labor.

Firstly, KYE set up subsidiaries in the UK(KYE Systems UK Ltd., 1991), Germany(KYE Systems Europe GmbH, 1993), and Hong Kong(KYE Systems H.K. Corp. Ltd., 1995) to develop forward linkages, i.e., brand images and distribution channels for Genius mice. Now KYE is planning to set up more overseas subsidiaries to build its strengths in brand images and distribution channels, its major competitive advantages.

Secondly, KYE continues to develop various types of mice with special features(e.g., 3-dimensional mice) to attract users and take the lead in the

standardized product category, whose low entry barriers could bring in many competitors capable of providing cheap labor. The strategy involving pure product differentiation, however, will not keep competitors away and consolidate KYE's leading status indefinitely. Therefore, KYE has determined to develop opto-electronic, multimedia, and communication products. KYE launched Chinese OCR handwriting systems in 1992, high-definition scanners in 1992 and 1993, and computer add-on cards(video cards, sound cards, and combo cards) in 1991 and 1993. KYE also tried to develop multimedia products(e.g., CD-ROMs) by setting up a division dealing with multimedia businesses in 1993 and, in 1996, merging the divisions of multimedia and communication to develop its multimedia businesses. Following these lines of development, KYE released various types of products, including printers, CD-ROMs, fax-modems, LAN cards, and Ethernet hubs, because it was planning to become a high-tech firm and producer.

Thirdly, KYE established a plant in Shenzen(China) in 1995 as a major production site to complement production and management in Taiwan. This plant, which was expanded in 1997, produces scanners and standardized mice. A new plant in Dogguan(Guangdong Province) was established in 1998 to expand the original assemblies in Shenzen. Moreover, a software development center will be established in China to provide drivers for KYE products made in China. All of these lines of development are intended to establish China as the production base of KYE while the parent company deals with R&D and international sales. Thus, KYE's cross-border production networks are based on vertical and horizontal division of labor.

Electronic Components

The electronic components sector includes various sub-sectors, such as passive components(capacitors, resistors, and so on), active components(semiconductors, monitors, and so on), mechanical components(e.g., PCBs), and functional components (e.g., connectors). The following discussion and description will focus on semiconductor products(ICs), PCBs, and resistors, thereby covering the major sub-sectors.

Semiconductors--Integrated Circuits(ICs)

The semiconductor industry produces two types of components: separate components, such as diodes and transistors, and ICs, which include varieties of logic and memory ICs. Here the focus will be on the IC sector and two Taiwanese IC manufacturers, who were established with the government's support.

The semiconductor industry of Taiwan began in the seventies, thanks to the FDI of foreign TNCs. At first, Taiwan was situated in a lower segment of the value chains of TNCs and specialized in low-value added packaging and testing services. Within three decades, Taiwan has become a major player in the industry, and has developed complete value chains for ICs, which include upstream(wafer fabrication and IC design), midstream(IC manufacturing), and downstream(testing and packaging).(See Table 4-10.)

Table 4-10 Production and Sales of the Taiwanese IC industry(1987-1996, $100 Million NT Dollars)

	1987	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*
Production Value	275	423.7	509	605	910	1,327	2,143	2,307
Annual Growth Rate	--	54	20	18.9	50.4	45.8	61.5	7.7
Design	9	59	73	87	118	124	193	218
Manufacturing	38	90.7	168	236	419	700	1,193	1,256
Wafer Fabrication	--	--	37	83	154	244	399	560
Packaging	228	423.7	268	281	373	503	757	833
Export Value	24.3	31.9	250	429	632	1,000	1,181	1,482
Import Value	37.5	61.4	818	718	1,018	1,338	1,854	2,094

Source: DGBAS, http://www.dgbasey.gov.tw/dgbas03/bs3/analyse/new86412.htm; IDB, *Annual Report of Industrial Development,* 1991, pp. 241-2.

The Start-up Stage(1966-1974)

The semiconductor industry of Taiwan started when General Instruments(U.S.) set up MicroChip, an IC packaging plant, in the Kaohsiung Export Processing Zone(Kaohsiung EPZ), to export products back to the parent company. General Instruments was followed by Phillips of the Netherlands(Phillips Taiwan) and Texas Instruments, both of which set up plants in the same EPZ.

During this period, the major businesses in the industry in Taiwan focused on packaging, and no substantial technology transfers or industrial upgrading occurred.

The Takeoff Stage(1974-1990)

The takeoff stage of the IC industry in Taiwan really began when the Electronic Research Services Organization(ERSO) was established within ITRI in 1974. Following the "Plan of the IC Model Plant"(1975-79) formulated by MOEA, ERSO introduced the technology for manufacturing ICs from RCA by sending engineers to the U.S. to receive training and absorb shadow-masking technology of from International Material Research(IMR) in California. In 1979, United Microelectronics Corporation(UMC), a spin-off of ERSO, was established. It was capable of making 4-inch wafers. The state-owned Bank of Communication, a substitute for the national industrial bank, and the MOEA were two major stock holders in the company(Clifford, 1993). The commitment of UMC stimulated the rise of national firms in packaging services and, in contrast to the in-house packaging of foreign TNCs, these national firms focused mainly on

subcontracting(Wen, 1997: 209).

The establishment of UMC represents the takeoff of the semiconductor industry in Taiwan, but Taiwan's performance in the industry was not significant until 1987, when Taiwan Semiconductor Manufacturing Corporation(TSMC) was established. TSMC is the result of the Project of Very Large Scale ICs(VLSI, 1983-87) promoted by the Executive Yuan, and of a joint venture involving the Taiwanese government, Phillips, and some large Taiwanese large firms(e.g., Formosa Plastics). Morris Chang, the president of TSMC, had worked at Texas Instruments and was able to achieve significant gains in competing with large American players in the field. Before the mid-eighties, the total production value of the Taiwanese semiconductor industry was only one billion NT dollars, and the industry was confined to UMC's making chips for consumer-electronics products. After the establishment of TSMC, however, the Taiwanese semiconductor industry, including domestic design houses in the upstream and packaging and testing plants in the downstream, was energized by the business opportunities provided by TSMC. After ten years, in the mid-nineties, the total production value skyrocketed to around 240 billion NT dollars(Yang, 1997a: 123; Ernst and O'Connor, 1992: 214). This achievement was the result of two factors: the nature of the semiconductor industry and the TSMC stratagem created by Morris Chang.

Firstly, the semiconductor industry, especially the IC sector, is very capital- and technology-intensive, thus increasing the difficulties of overcoming the entry barrier. An estimate made in 1992 showed that, in 1995, a plant producing 64 megabyte DRAMs, including clean rooms and automation, was worth at least one

billion dollars(Ernst and O'Connor, 1992: 216). Moreover, because the process is lengthy and complicated, highly skilled engineers as well as operators are required to activate and maintain production, or it will blemish the products and create heavy losses.

Secondly, the conventional wisdom holds that marketing products with familiar brand names is the linchpin in controlling forward and backward linkages. On the one hand, large firms, such as Compaq, cut their procuring costs by pressuring suppliers to lower prices. On the other hand, with the advantages of owning brand names and distribution channels, these firms secure markets by promoting low-priced products and taking in profits from valued-added activities, such as after-sales services. In this regard, OEM is inferior to OBM in that OEM suppliers usually depend on the orders of buyers and are suppressed by the fierce competition in the market. In contrast, the semiconductor industry, especially IC foundry and wafer fabrication, does not depend on brand names as much as do the producers of consumer electronics and PCs. The players in the industry survive and compete in the market by securing long-term business relationships with their clients, that is, by depending on pure OEM, which is based on the strong technological capabilities of semiconductor makers.

Morris Chang, the president of TSMC, is very familiar with the industrial structure and knows how to cut into the market by utilizing one of Taiwan's great advantages, high-quality engineers and operators. He is aware that, in the IC-designing industry, the most important factors are designing ability and the accompanying issues of IPR. Without the capability to construct expensive plants,

the products of independent design houses have to be protected by sending them to dependable plants, so that their intellectual property and product qualities will be secured. In view of this, TSMC has insisted on doing OEM for clients without designing their own products; thus their clients do not have to fear that their ideas will be copied by the manufacturers and that the makers will compete with them. This strategy seems to be correct. At first, the clients of TSMC were domestic design houses. Then, in 1994, the share of domestic clients accounted for merely 30 percent(Chen, 1994a: 67).

Certainly, in the semiconductor industry, as in other sectors of the electronics industry, the development of forward linkages is based on strong backward linkages, including core technologies, process technique, and human capital(engineers and operators). By paying licensing fees to Phillips, one of TSMC's stock holders, the engineers of TSMC(sixty or seventy of whom were transferred from ITRT to the company) not only learned core technologies from the foreign company, but also invented hundreds of patented products resulting from their intensive effort in R&D. Within five years(1987-1992), Phillips even sent engineers to TSMC to learn ways of improving process technique. In addition, the experience of building semiconductor plants also incubated a group of technicians who mastered the construction details and thus made contributions to the building of semiconductor plants owned by Macronix International, and so on(Yang, 1997b: 124-5).

The Cruise Stage(1990-)

In the beginning of the nineties, the semiconductor industry of Taiwan entered

the cruise stage, thanks to the government's promotion and support and to the Taiwanese players' efforts to enhance R&D.

In 1990, the Legislative Yuan passed the Five-Year Semiconductor(Sub-Micron) Project, the largest technology development project in Taiwan. Following the project, MOEA entrusted ERSO with building a laboratory for sub-microns. This laboratory is responsible for developing advanced process techniques for semiconductors. The framework of financing and technology transfer is based on working and user strategic alliances. The working alliance, which comprises TSMC and UMC, pays licensing fees to ERSO and the government for instant technology(know-how) transfer to catch market opportunities. The user alliance, which consists of other Taiwanese firms in the industry, such as Macronix International, and so forth, obtains information about R&D as well as the specifications of design by paying fees to the government for mass production. This project upgraded the capabilities of Taiwanese firms, so that they were able to make 8-inch wafers, rather than only 6-inch wafers(Loo, 1997: 203-4), thanks to the Micron Laboratory's achievement in developing 8-inch wafers in 1992. The data provided by ITRI show that, in 1995, approximately eighty new 8-inch wafer fabrication plants were planned, and the world share of Taiwan would rise from 2 percent to 5 percent in the year 2000(Su, 1995: 78). The data provided by DGBAS show that Taiwan has been the largest source of wafer fabrication in the world since the mid-nineties and accounts for 30 percent of the world's output.

With the government's support, TSMC continues to improve process efficiency, develop product mix, and enhance backward linkages through R&D

and reinvestment(joint ventures). Moreover, it invites capable CEOs from recognized TNCs to manage the company and its reinvested or acquired businesses. TSMC has expanded its business scope from wafer fabrication to other ICs, such as nano-SRAMs. TSMC also formed a joint venture in 1994 with other Taiwanese firms by reinvesting in the Vanguard International Semiconductor Corporation(VISC), the privatized Sub-Micron Laboratory. This investment project was not only intended to utilize Vanguard's autonomous DRAM-making technology, but also to incubate engineers specializing in semiconductor design, so that Vanguard and TSMC serve as the backbone of the Taiwanese semiconductor industry(Yang, 1997b: 134).

In addition to utilizing the support of the government, UMC implemented the strategy of diversification without giving up its core business and tried to construct an enterprise group making key electronic components. The first step was to follow the pure OEM strategy and practices established by TSMC, that is, devoting to IC foundry for customers. The second step was to reinvest and form joint ventures with domestic and foreign firms. Following the plan of Robert Tsao, the president of UMC and a former engineer at ITRI, the core business devolved to three subsidiary plants, which made 8-inch wafers and secured client sources by persuading American design houses to become partners in the three plants. Furthermore, the design department within UMC became an independent design house, so that the customers did not have to suspect that their works would be stolen by the manufacturer. Finally, UMC also made reinvestments in LCDs and circuit boards, which, together with UMC's strengths in IC manufacturing,

constitute the foundation of its business group(Kuo, 1997a: 295-6).

Some Taiwanese semiconductor manufacturers have made overseas investments by relocating labor-intensive divisions of the process to Asian industrializing countries. They have also upgraded plants in Taiwan to make high value-added products. For example, Orient Semiconductor Electronics, Ltd.(OSE) invested in the Philippines in 1995 to set up IC packaging plants. ASE(Advanced Semiconductor Engineering Inc.) Group relocated labor-intensive parts, i.e., assembly and testing, to Malaysia in 1991 while upgrading its plants in Taiwan to develop and make high value-added products. MicroChip invested in Thailand in 1995 to manufacture semiconductor products and upgraded its plants in Taiwan to create an Asian management center, which takes orders and makes high-end products(Chien and Hong, 1998: 168). In other words, these manufacturers have constructed simple cross-border production networks, whose features are by horizontal and vertical division of labor. WaferTech, one of TSMC's subsidiaries and a joint venture with several American design houses in Silicon Valley, is set to search for new customers, provide services, and transfer process technique.

Moreover, the technology capabilities of some firms are particularly salient that they are capable of transferring technologies to firms of industrialized countries. For instance, Macronix International, which had invited talented engineers from the U.S. back to Taiwan, was transferring advanced technologies for semiconductor manufacturing to NKK Corp., a Japanese steel maker, in 1993(Clifford, 1993). Since the early nineties, UMC has transferred various wafer-fabricating technologies to German firms. UMC first transferred 0.8 micron-

process technology to Thesys Company and 0.5 micron-process technology to ITT Intermetal of Freiburg in 1997(UMC, 1997). Moreover, in 1996, TSMC formed a joint venture with five American chip design houses to establish WaferTech, a semiconductor plant producing SRAMs, in the State of Washington and transferred process technique there(Yang, 1997a: 121).

Although the Taiwanese semiconductor industry has entered the cruise stage with complete industrial structures and strong technological capabilities, there are two peculiarities or weaknesses in the industry, one of which is similar to the situations encountered by the Taiwanese electronics firms in other sectors. The other challenges the thesis of the flying geese model. First, Taiwanese semiconductor manufacturers still depend on machinery and equipment from Japanese and American makers, including Applied Materials and Nikon. In other words, the achievements of the Taiwanese semiconductor industry have not yet activated the large-scale production of machinery pertaining to the industry. Second, contrary to the thesis illustrated by the flying geese model, which holds that an industry will upgrade from import substitution to export expansion, Taiwan has been a net importer of IC products.(See Table 4-10.) This has occurred because Taiwanese manufacturers need large amounts of general ICs and because Taiwanese IC makers have focused on application-specific ICs(ASICs) as a result of their smaller scales. This is in contrast to both Japanese keiretsu, which mass produce various ICs) and Korean chaebols, which mass produce only a few types of Ics.(Clifford, 1993: 53).

Yageo Corporation

Yageo Corporation was established in 1977 with the name "Yageo Company Limited." It produced thin-film resistors for domestic and foreign clients. Within two decades, not only has Yageo grown from a sales agent of components to a world leader in making resistors and other passive components, but it has been able to develop its upstream chains through intensive R&D and to construct a framework for regional division of labor, which aims mainly at the Asian market, in accordance with its strategy of "Yageologistics."[11]

The Start-up Stage(1977-1981)

As is explained above, Yageo Corporation started up as a manufacturer of thin-film resistors. It should be underlined, however, that, contrary to the stereotypes about component makers in latecomer countries, Yageo not only made passive components, but was already planning to design and manufacture machines making resistors during its early phase. Furthermore, Yageo began to sell resistors under its own brand name in 1981. In other words, Yageo's performance in backward and forward linkages during this stage contravenes the general impression that starters are always weak in R&D and brand images.

The Takeoff Stage(1982-1990)

In its takeoff stage, Yageo not only continued to manufacture resistors, but also tried to control upstream chains, that is, to develop the capabilities to produce high-quality machinery for the production of resistors. In 1987, Yageo established

---

[11] The following discussion is based on the homepage contents and documents(annual report, and so on) provided by Yageo Corporation, unless otherwise noted.

Table 4-11 The Scale and Product Mix of Yageo Corporation

	Number of Employees	*Production Sites*	*Just-in-Time Warehouses*	*Direct Clients*
Taiwan	1,923	4	2	1,057
China	215	2	2	125
Singapore	124	1	1	157
Hong Kong	15	-	1	78
Malaysia	82	1	1	121
Thailand	57	1	1	115
Germany	-	-	-	-
Total	2,416	9	8	1,653

	1994	*1995*	*1996*	*1997*
Chip Resistors	9,300	15,718	20,705	31,989
Chip Arrays	43	232	715	2,023
Resistor Networks	4,586	4,869	4,253	3,658
Carbon Film Resistors	3,198	3,837	4,398	6,337
Metal Film Resistors	916	1,198	1,301	2,205
Total	18,043	25,824	31,372	46,212

Source: Yageo Corporation.

a R&D unit in Sunnyvale, California, and, after employing twenty-five technicians and spending three years, successfully developed two kinds of patented machinery for the manufacturing of resistors. The first was the laser trimming system, and the second was the vacuum sputtering coating machine. Both devices radically enhanced process efficiency. For example, using the laser trimming machine, Yageo workers can process 6,400 0603 IC resistors per minute. According to the annual report, this is 30 percent faster than Yageo's Asian competitors.

In 1989, Yageo Company Limited merged with Taiwan Resistance Corporation, which was established by another Taiwanese businessman, to form Yageo Corporation. It used the latter's Kaohsiung plant, which was constructed in 1987, as the major production base for thin-film resistors. Through this acquisition, Yageo expanded its scale economies. This was necessary because to compete in the passive components industry and gain narrow profit margins with heavy investment, manufacturers should be able to reduce costs and enhance process efficiency substantially, both of which require capital- and technology-intensive capabilities.

The Cruise Stage(1991-)

In the cruise stage, in addition to strengthening its upstream chains(e.g., securing the sources of substrate and ceramic rods), Yageo increasingly developed and implemented the strategy of "Yageologistics," which consists of three parts: Globalogistics, Chinalogistics, and Culturallogistics.

The concept of Globallogistics is based on acquiring or re-investing in other

makers(domestic and overseas) that not only produce passive components, but have production capabilities, distribution channels, and brand images; this is a clever way of expanding scales and obtaining assets within a short period of time(Kuo, 1997b: 304). In 1993, Yageo acquired 40 percent of the stock of Scan Technology Pte. Ltd.(Singapore), thus controlling ASJ, Pte. Ltd., a subsidiary of Scan Technology, and absorbing ASJ's production of thin-film resistors. This helped Yageo access Southeast Asian markets. In 1995, Yageo acquired Vitrohm, a German firm and one of the largest resistor makers in Europe, thus expanding product mix(by adding high-power wirebound resistors) and obtaining the technology for producing high-power ceramic resistors. In a related action, Yageo established a just-in-time(JIT) warehouse to serve its European markets. In other words, this acquisition helped Yageo obtain more technologies for producing resistors and amplified its markets at one stroke. In 1996 and 1997, Yageo invested in two Taiwanese passive component makers(Teapo Electronics Corp. and Chilisin Electronic Corp.), which make capacitors and inductors, to implement horizontal integration and expand product mix. In addition, Yageo investigated several acquisition projects in the U.S.

The focus of Chinalogistics is on the local markets in Mainland China and based on the principle of "one center, three operations." First, Yageo established a plant in Dongguan, Guangdong(in South China), to serve local Taiwanese electronics systems manufacturers. Then it built plants and a management center in Suzhou(near Shanghai and the Yantze River Delta) to serve local markets, and, to a lesser extent, Taiwanese manufacturers(e.g., Acer Peripheral). This center is

important in that it provides one-stop shopping services; it makes a variety of passive components, such as resistors, capacitors, and inductors, on the one hand, and coordinates the activities of Yageo's manufacturing bases in other parts of China, on the other.

In addition to the plants in Dongguan and Suzhou, which are already in place, Yageo is also planning to construct bases in Southwestern China, which has been designated by the Chinese authorities as the location for making consumer electronics and communication equipment. Yageo also plans to invest in Northern China, the future location for developing high-tech industries.

Chinalogistics is set up to reinforce Yageo's Globalogistics, which aims at expanding its global market shares from 5 percent to 10 percent and enlarging the company's scale economies. This, however, is based on Yageo's core competence, that is, Culturalogistics, which stresses speed, efficiency, and cost reduction.

Since its establishment, Yageo has been building its core competence with these three goals. In view of the narrow profit margins and fierce competition in the industry, Yageo has insisted on developing core competence through developing machinery and equipment that make passive components and on securing raw material, both of which saved Yageo 6 to 12 percent of costs in comparison to its competitors and increased its production output by fivefold or tenfold(Chen, 1994b: 82). According to other statistics provided by Yageo, from 1992 to 1995 the production output of Yageo increased more than six times and Yageo became the largest producer in this industry in the world.

Yageo's emphasis on process efficiency demonstrated its advantages with the acquisition of ASJ and Vitrohm. Yageo's M&A not only saved the two old firms, but replaced their equipment with Yageo's production facilities, increased their efficiency, and engendered fast growth.

Yageo's speed in sending products to market is reinforced by its increasing efficiency, in addition to being accelerated by its JIT system. As has been mentioned above, with its patented equipment, Yageo can process resistors 30 percent faster than its Asian competitors. With the help of the JIT system, which was constructed in 1994, Yageo can transport its products to places like Tel Aviv or Rotterdam within seventy-two hours and notify its clients through Electronic Distribution Information System(EDIS). Moreover, to save customers trouble in searching for other passive components, Yageo provides one-stop shopping services, procuring components that are not produced by Yageo for its customers(Kuo, 1997b: 303). This is a clever way to attract customers and prevent them from being drawn to its competitors.

Printed Circuit Boards(PCBs)[12]

The PCB industry of Taiwan started in 1969, when Ampex(U.S.) established assemblies in Taoyuang, a county situated in the northwestern part of Taiwan.

---

[12] A PCB is a board with circuits, which connect various electronic components to facilitate the working and communication of those components. Therefore, PCBs are very important components of an array of electronic gadgets and products, including home appliances, PCs and related peripherals, as well as high-end computers. PCBs can be categorized either by their number of layers(single-, double-, or multi-layer) contains or by hardness(soft and hard). Generally, the more layers a PCB contains, the higher the production technology required. Therefore, single-layer PCBs are used to make consumer electronics products, double-layer to make computer peripherals, and multi-layer to make PCs and

Within two decades, the Taiwanese PCB industry had developed systematic value chains, which included upstream chains(raw material), mid-stream chains(laminates), and downstream chains(products, i.e., PCBs). The industry also formed a bipolar industrial structure consisting of approximately one hundred fifty firms, in which smaller makers aimed at niche markets and larger makers competed for OEM orders from domestic and overseas buyers.[13] In addition to being the third largest PCB producer(following the U.S. and Japan) in 1993, Taiwanese PCB makers constructed overseas production networks in the early nineties, most of which are located in Mainland China to serve their downstream buyers, who have made investments in China, and to develop local markets.

In this section, the general structures of the whole Taiwanese PCB industry will be illustrated by outlining the development experience of two Taiwanese makers of PCBs, Nantze and Compeq Manufacturing Company(not related to Compaq or Compac).

The Start-up Stage(1969-1980)

Ampex, an American firm, established PCB plants in Taiwan in 1969, and the products were exported back to the U.S. for further processing. After that, Hsin-Hsin Electronics Company, a KMT-owned firm, and Hitachi Taiwan were set up to make PCBs; one was a captive shop(belonging to a large company), and the other a job shop(doing OEM).

---

semiconductor testing equipment.

[13] In accordance with Lee and Chen's categories, here larger Taiwanese PCB makers are those whose sales surpass one billion NT dollars; those makers whose sales are less than one billion dollars are categorized as small PCB makers.

Ampex was not interested in transferring PCB production technology to Taiwanese firms. The Taiwanese PCB industry did not begin until some former employees at Ampex opened their own businesses, such as Compeq Manufacturing Corporation(1973)(Yang, 1994: 41-2). Following these forerunners, numerous Taiwanese makers of PCBs established their plants by providing raw material, making laminates, and manufacturing PCBs during the seventies, thus forming the basis of the PCB industry and a cluster in northwestern Taiwan.

The Takeoff Stage(1981-90)

During this stage, the typical mode of development of larger Taiwanese makers was to secure upstream chains and construct forward linkages by taking orders from TNC buyers and developing new products. To form their upstream linkages, the manufacturers developed stable supply relationships with their upstream suppliers of raw materials, such as glass composite and epoxy, as well as semi-finished goods, such as copper-clad laminates. The clustered industrial settings compensated for the disadvantages of the small scale of Taiwanese PCB makers, on the one hand, and provided complete industrial supplies and service, on the other. Moreover, through reinvestment, technical cooperation, and R&D, larger Taiwanese PCB makers continued to enhance process efficiency through automation and newer techniques. For example, after producing multi-layer PCBs in 1984, Nantze cooperated with Ciba Geigy, a West German firm, and developed a system for producing PCBs; another was followed by Nantze's development of surface mounting technology(SMT), a type of automatic production technique, in 1988. Another example is Compeq, which, in addition to forming a joint venture

with Matsushita to secure high-quality laminates, cooperated with Dupont to develop the first automatic production system. Compeq also cooperated with ITRI in developing a new recipe.

Since most forward linkages are job shops specializing in producing PCBs in accordance with the specifications and designs of TNC buyers, Taiwanese PCB makers must be able to interpret blueprints, adjust the process to meet the deadline, and produce high-quality PCBs, or the orders would flow to other PCB makers. As long as PCB makers obtain long-term supply-making contracts, market opportunities would be in their hands and profits would be easier to reap. In other words, high-quality and quick response to orders, rather than general brand images, are the most important way to compete with other makers. For instance, Compeq became the qualified supplier for IBM in 1982 and for Fujitsu in 1987 while, Nantze was designated by Intel as one of its major suppliers. Moreover, since the nineties, other Taiwanese PCB makers have become the suppliers of Compaq, providing PCBs for the production of motherboards for Compaq's desktop computers and, to a lesser extent, notebook PCs. These examples show that several Taiwanese PCB makers are competent in producing quality products and in responding quickly. This helps them to cope with the pressures of built-to-order(BTO), an increasingly prevalent trend among TNCs because it is a means of cutting costs by using the productivity of specialized makers.

Certainly, smaller firms or firms without the ability to win substantial orders could survive, either by serving local or niche markets, or by becoming

subcontracting plants for larger firms.

The Cruise Stage(1991-)

Since the early nineties, larger Taiwanese PCB makers have entered the cruise stage, which is characterized by strengthening R&D and competing for orders, on the one hand, and by making overseas investment, on the other. Moreover, the Taiwanese government has designated PCB manufacturing as a strategic industry with the goal of establishing the Taiwanese PCB industry as the world leader. The government encouraged the establishment of the Taiwan Printed Circuit Board Association(TPCA), and allowed the firms to be publicly listed, so that they could absorb more funds(Lee and Cheng, 1998: 224).

In contrast to the global logistics frameworks constructed by Taiwanese IT and consumer electronics makers, Taiwanese PCB makers concentrate most of their overseas investment in Mainland China to cut production costs, to serve local Taiwanese investors, and to utilize the incentives offered by the Chinese authorities, Compeq also set up plants in the U.S. in 1990, however; these are intended to develop and serve local markets.

Large PCB makers continued to strengthen R&D to form backward linkages. For example, Nantze developed PCMCIA cards and tab tapes for IC cards in 1993 as well as OLB techniques(for the assembly of PCBs) in 1995. Moreover, Nantze singed a contract with Sumitomo to develop the T-BGA technique.

To form forward linkages, larger PCB makers have developed various products pertaining to the production of PCBs, obtained numerous orders, and become major suppliers of TNCs. Nantze was recognized by Motorola and Intel

as a qualified supplier in 1991 and 1992, respectively. Seventy percent of Intel's Pentium II SECC cards are currently supplied by Compeq; it is significant that there are only two suppliers of this product(Wealth Magazine, 1998: 277, 282-3).

With regard to investment and production in China(see Table 4-12), the company has two general motives: to cut production costs by utilizing cheap labor and by producing standardized PCBs(double- and four-layer products), on the one hand, and to serve local Taiwanese and foreign investors, on the other. This is clear from the concentration of Taiwanese PCB makers in areas around Shanghai, a location with substantial electronics firms and clusterings. Certainly, some makers are using China's incentives and its privileged status in international trade. For example, all of Compeq's products made in China are exported so that it can enjoy the advantage of tax-reductions on raw material and machinery(Wealth Magazine, 1998: 279). Nantze's investment is based on the consideration that companies exporting PCBs from China to the U.S. are not required to pay customs, while those exporting from Taiwan will be taxed thirty percent of the price of the goods(Liu, 1997: 47).

Table 4-12 The Investment and Production of Taiwanese PCB Makers in Mainland China

Firms	***Location***	***Time of Investing***	***Products***
Compeq	Guangdong	1996	four- & six-layer
Nantze	Shanghai	1993	four-layer(70%), double-layer(30%)
Unitech	Shanghai	1997	double- & four-layer
Yaowen	Shanghai	1998	double- & four-layer
Chinpoon	Shanghai	1998	double- & four-layer

Source: Lien, 1998, p. 72.

Two features of the investment of Taiwanese PCB makers in China should be highlighted here. First, since China has not developed complete industrial settings and supply networks for PCB production, most Taiwanese investors have to import machinery and equipment, train Chinese workers from the outset, and use the parent companies in Taiwan as operation centers for dealing with clients and orders, all of which are signs of vertical division of labor. Whether this mode of operation will limit or trigger local industrial networks remains to be seen. Second, within the investment and production framework, PCB production in China and Taiwan is also based on horizontal division of labor; that is, lower-end or standardized PCBs are produced in China while high-end or multi-layer PCBs are developed and made in Taiwan(Liu, 1997: 47-8).

Wintelism, Cross-border Production Networks, and the Taiwanese Experience

Tracing the experience of the Taiwanese electronics industry from its start-up to its growth period and from growth period to its establishment of overseas production networks leads us to the discussion of the argument put forward by the scholars who formulated Wintelism and commentators who criticized the Japanese cross-border production networks, one of the major components of the contemporary flying geese model.

According to Borrus and Zysman, Wintelism represents the increasingly prevalent principle of competition in the electronics industry in particular and other industries in general. While the competitive advantage prior to the era of Wintelism lay in vertical technology control and final assemblers, the edge in the

Wintelism epoch comes from the ability to define and dominate product standards, i.e., technical specifications describing system frameworks and stipulating the integrative operation of various sub-systems. The word "Wintelism," the combination of "Windows"(the software operation system) and Intel, was coined by Borrus and Zysman to highlight the new competitive edge in the electronics industry and other industries. It also highlights the leading status of firms capable of setting market standards(e.g., Microsoft and Intel), and the resurgence of the American electronics industry since the late eighties. Borrus and Zysman attribute the rise of Wintelism to American economic policies(deregulation) and laws(antitrust and intellectual property right, IPR), which forced IBM to open the system architecture of computers and helped to shape the environment in which some firms strive to dominate the definition of product standards under the protection of IPR laws. Within the "open-but-owned" framework, market leaders make product standards open to facilitate manufacturing and ease R&D cost burdens but keep their customers through the prevalent use of products based on their own technical specifications. In turn, Wintelism moved the focus of competition from vertical technology control and integrative assembly to product standards and generated opportunities for competition by setting product standards on numerous nodes of the value chain in the electronics industry. Wintelism necessarily shifts the manufacturing task from final assemblers to latecomer countries and firms and stimulates the construction of cross-border production networks. In other words, it consolidates the international division of labor by placing American market leaders in a commanding position and giving

latecomer firms the task of implementation(Borrus and Zysman, 1997).

To a certain extent, the thesis of Wintelism is persuasive in its emphasis on the influence of product-standards definition, but other assertion in Borrus and Zysman's argument are less convincing. Examples of weakness in their theory are their contrast of the flexible American and the rigid Japanese cross-border production networks, the "postmodernist" division of Fordism and Wintelism, and, more importantly, their inadequate discussion of the cross-border production networks constructed by Asian latecomer firms. This limitation is the inevitable consequence of their thesis.

Borrus and Zysman do mention the existence of Asian latecomer firms and cross-border production networks, but they focus exclusively on the origin, dynamics, and results of Wintelism and on the correspondent cross-border production networks shaped by American market leaders. Therefore, they tend to downplay the strategies and flexibility of certain Asian latecomer firms and their cross-border production networks. The findings about selected Taiwanese firms discussed above suggest two conclusions that challenge some points in the Wintelism argument.

First, the argument creates the impression that cross-border production networks are largely the by-product of Wintelism; but the description and discussion of some Taiwanese electronics manufacturers suggest that the development of cross-border production networks constructed by latecomer firms have not been totally determined by Wintelism. It is true that their development is conditioned by the product standards set by market leaders, but they cut into the

process and built their cross-border production networks by using their own advantages, such as sophisticated supporting industries and flexible response, to cope with the demands and pressures of industrial dynamics and major buyers. They also tried to accumulate upstream resources and expand downstream linkages. In other words, they are not passive entities waiting to be shaped and determined.

Second, the Wintelism thesis describes the rise of a new epoch of industrial development based on the ability to define product standards and on the gradual disappearance of the early competition principle, i.e., vertical technology control and integrative final assembly. However, the discussion in the previous sections suggests that this dichotomy is too simplistic and does not correspond to reality. From the development experience of selected Taiwanese manufacturers in the electronics industry, it is clear that vertical technology control, final assembly, and, more importantly, the ability to manage global logistics are still important for latecomer firms. In other words, in the upcoming Wintelist era, not only the ability to set product standards, but also vertical technology, final(global) assembly, and product development or differentiation will be the main constituents of the electronics industry in particular and of other industries in general.

It is not only Wintelism, however, that downplays the cross-border production networks built by Asian latecomer firms. In criticizing the flying geese model, Bernard and Ravenhill underscore the control by the Japanese regional production networks and disregard the coping strategies of Asian latecomer firms. Bernard and Ravenhill situate Jimbau Electronics in the Japanese cross-border

production networks, emphasizing the Japanese domination over their Asian partners. The discussion of Jimbau and other Taiwanese manufacturing firms suggests that, while depending on key components and core technologies of Japanese and American firms, Taiwanese manufacturers have been trying to overcome their weaknesses in upstream resources and downstream linkages, on the one hand, and to build their own cross-border production networks, on the other. Thus, although it sounds like a cliché, one could say that the arguments made by Bernard and Ravenhill as well as by Borrus and Zysman are based on Japan-centric and America-centric viewpoints.

Moreover, contrary to the conventional wisdom, which holds that OEM and ODM are the signs of technology dependency, firms in industrialized and industrializing countries could use them as an important development strategy. For firms in industrialized countries, OEM could expand the market acceptability of their products and save production costs in machinery and equipment. For example, Sharp entrusted Matsushita and Hitachi with manufacturing its electronic personal assistance gadgets, and Sony consigned the production of its 8 mm VCR to eight Japanese manufacturers, thus recovering its R&D costs and expanding mass production. Japanese electronics manufacturers even developed OEM relationships with American firms, such as Motorola and Toshiba as well as Matsushita and Sun Micro(Lee, 1991: 116-119).

Latecomer firms could also use OEM/ODM to gain advantages. The orders for OEM lead them to focus on production and delay concerns about core technologies, key components, and marketing. With the profits gained from OEM

business, they could strengthen their design capabilities, i.e., upgrade to the status of ODM, and try to incubate their R&D capabilities and make key components. Some of these firms could try to explore market acceptability by contacting new buyers and promoting their own brands through price competition and other means. Some of the Taiwanese electronics firms described above are good examples of the use of these strategies. Thus, there is no absolutely negative side to OEM or ODM; the outcome depends on how firms utilize them.

III. Summary

To compare the performance, status, and structural position of Taiwanese firms in the electronics industry, this chapter first constructs the conceptual framework of catch-up. This conceptual framework may serve as the foundation of an ideal type that can be generalized to create a theory about the development of other latecomer firms in the electronics industry in particular and other industries in general. Then the development experiences of selected Taiwanese electronics firms are presented to illustrate the catch-up framework.

The conceptual framework divides the development of several representative Taiwanese manufacturers in the electronics industry into three stages: start-up, takeoff, and cruise, each of which roughly corresponds to the three cruise stages of the Japanese TNCs in the electronics industry. The first stage starts when latecomer firms import novel goods and begin domestic production, which is promoted by the government, activated by inward FDI, or based on contractual supply relationships, and so forth. In the takeoff stage, the latecomer firms start to incubate backward and forward linkages through various means, such as serving

as OEM suppliers, promoting R&D, or hiring engineers and technicians who once worked in TNCs or graduated from universities. The most salient feature of the takeoff stage is the effort and ability to cut costs and enhance process efficiency. The third stage is called the cruise stage, because the latecomer firms are able to make overseas investment and construct cross-border production networks, which are characterized by regional or global division of labor. The limitation and weaknesses of this conceptual framework are also mentioned, lest it become a rigid theoretical construct.

The second part of this chapter comprises empirical case studies, which are abstractly delineated by the conceptual framework. The first section describes the general development of the electronics industry of Taiwan by dividing the industry into three sectors: consumer electronics, industrial electronics, and electronic components. The second section comprises the further description and discussion of specific case studies of Taiwanese manufacturers in the industry. Not only have these firms overcome entry barriers in various sectors, but they have been able to accumulate capabilities in backward as well as forward linkages, on the one hand, and make overseas investment as well as construct cross-border production networks, on the other. The discussion highlights a variety of important developments and achievements of Taiwanese firms, these achievements contradict several stereotypical impressions of latecomer firms.

The descriptions and discussion should provide evidence for two arguments about the status and structural position of Taiwanese electronics firms:

First, Taiwanese firms in the electronics industry are catching up with their

Japanese counterparts in some sub-sectors and falling behind in others. In consumer electronics, Taiwanese firms have not been able to catch up with their Japanese counterparts and leading firms from other advanced countries. Because they have not been able to develop core technologies and make key components, all they can do to survive is to turn to domestic markets, relocate assemblies to Mainland China(e.g., Sample Group), transform into information technology manufacturers(e.g., Tatung Corporation), or find niche markets(e.g., Action Corporation).

Other sectors of the Taiwanese electronics industry appear to be more promising. As has been shown, Taiwan has been a leading PC hardware producer country. This is highlighted by the general statistical data, development trends, and the strategies of regional production networks built by the leading Taiwanese PC manufacturers, such as Acer and MiTAC. While depending on OEM as their major profit source, the leading Taiwanese PC makers have been upgrading to ODM and even OBM, on the one hand, and increasingly securing their upstream resources and downstream linkages, on the other. Moreover, numerous Taiwanese firms in the sub-sectors of the electronics industry, especially semiconductors, passive components, and PCBs, have been performing well. Like their Taiwanese companions in the PC industry, some of them are even able to transfer technologies to firms in advanced countries, such as Japan and the U.S.

Although many scholars have argued that latecomer manufacturers are structurally situated in the middle of value chains and face difficulties in incubating

upstream resources and expanding downstream linkages, the strengths of the Taiwanese electronics industry and firms lie in their OEM/ODM capabilities. They can maximize the effects of OEM/ODM through extracting profits from OEM and by other means(e.g., joint ventures, technology alliances, and the policy incentives of the state), on the one hand, and incubate core technologies, develop key components, construct distribution channels, and shape brand images, on the other. Because of the penalty of late development, the limited size of domestic markets, the restricted scales of most firms(the majority of Taiwanese manufacturers are small and medium enterprises), and the speed of the technological evolution, Taiwanese electronics firms might not be able to set market standards and dominate the world market. They have been important, and even indispensable, however, to their Japanese and American buyers as well as partners, because of their swift response and flexible manufacturing capabilities. Moreover, their strategies and management of overseas investment and production have triggered the development of the electronics industry and related supporting industries in some of the host countries.

It should be noted that OEM and ODM are not just signs of technological dependency, but strategies used by firms in industrializing and industrialized countries. For technology leaders, OEM and ODM are ways of expanding the market acceptability of the specifications of their products and saving production costs. For technology followers, OEM and ODM are easier ways of gaining profits and learning advanced technologies; the Taiwanese firms described above are a case in point.

The second argument one could make after reviewing the above descriptions and discussions is that, while Taiwanese firms are similar to their Japanese counterparts in that they have started up by cutting into the process(OEM and ODM) and expanding upstream as well as downstream linkages to survive and compete on the market, they differ from each other in their styles and strategies of constructing regional production networks. It is true that, the regionalization of Taiwanese firms tends to be more horizontal in principle and has less restriction on technology transfer, partly because of their catching up status. The regionalization of Taiwanese firms, however, has demonstrated more varieties in the relocation of subcontractors and suppliers, the means of transferring technologies, and the scales of global operation. These differences could be roughly categorized as regional and global cruise and could be attributed to the loosely-knit Taiwanese industrial structures, in which small and medium enterprises are in the majority and no keiretsu relationships exist among firms.

Moreover, the Taiwanese experience in developing the electronics industry and cross-border production networks suggests that, although Borrus and Zysman mention the development and cross-border production networks of latecomer firms, their views are America-centric. For similar reasons, Bernard and Ravenhill's criticism of the flying geese model is Japan-centric. These theorists tend to downplay the coping strategies of, and the cross-border production networks built by, latecomer firms in general and Taiwanese manufacturers in particular.

Chapter 5

Reorganizing the Taiwanese Developmental State

Chapter 2 explains how the Japanese developmental state has reorganized. It formerly focused exclusively on national industrial development and economic growth but then regionalized to include its neighboring countries, thereby complementing the regional division of labor by formulating economic plans for utilizing their comparative advantages and controlling regional dynamics. Japan offered incentives for outward FDI, provided foreign aid, and transplanted Japanese strategies for promoting industrial development to its neighboring countries.

This chapter will describe the Taiwanese developmental state within the East Asian flying geese formation and compare the performance of the Taiwanese and Japanese states by exploring the following questions: How has the Taiwanese developmental state been playing the roles of planner, financier, and promoter? What are the differences and similarities between the Taiwanese and Japanese developmental states in their institutional trajectories and reorganization when facing domestic and external politico-economic changes and challenges? What factors have caused those differences and similarities? Will the Taiwanese state evolve into a type of network state similar to or different from the Japanese type? What roles have been assigned to Taipei, a world city, by the Taiwanese economic bureaucracy, which formulated the Asia-Pacific Regional Operational Center(APROC) plan, and by the Taipei city government? Is Taipei more similar to Tokyo or to New York, which represent the bifurcated types(liberalism and

developmentalism) of world cities that Hill and Kim categorized(1998)?

After doing preliminary exploration and viewing the evidence at hand, it will be argued that, although the Taiwanese state is aware of regional dynamics operating in East and Southeast Asia as well as other regions(e.g., flow of trade and investment and forming structures of division of labor among nations and enterprises) it still adopts conventional practices of the developmental state in trying to strengthen national competitiveness by being a planner, financier, and promoter. This performance is in sharp contrast to that of its counterpart in Japan, which has been extending the practices of the developmental state by formulating economic plans that aim at forming structures for regional division of labor, facilitating direct investment, providing foreign aid, and promoting needed measures. The Japanese developmental state is regionalizing its industrial policies by applying them to neighboring countries having historical, political, and economic ties to Japan; that is, it is trying to shape and lead the East Asian flying geese formation. The Taiwanese developmental state, however, is trying to find a niche in the international division of labor. In other words, the Taiwanese state is gearing up for economic growth and industrial development by following the formation leader, on the one hand, and leading the other members in the formation, on the other, with the hope that Taiwan can catch up with the leader in certain aspects in the future.

The following lines of argument are divided into three parts. The first part traces the institutions and trajectories of Taiwan's economic plans, introduces Taipei's roles in the APROC plan, and describes its status as a world city. The

second discusses how the Taiwanese developmental state manages national financial systems, inward and outward direct investment, as well as foreign aid. The third part demonstrates how the state still uses its policy instruments to promote Taiwan as a prospective center of regional division of labor. Comparisons with the Japanese state will be introduced whenever there are salient points to be made.

I. The State As a Planner

Like those of Japan and other East Asian NIEs, Taiwan's development trajectories after World War II started from reconstruction and passed through the sequences of high-speed growth as well as transformation. In view of the failure in Mainland China and the urgent need to survive, the Taiwanese developmental state has been determined to promote economic reconstruction and industrial development, with the reinforcement of U.S. aid(Gold, 1986: 67-70).

To promote economic reconstruction and industrial development, the government formulated and implemented a series of four-year(mid-term) and long-term economic plans with specific goals and executive procedures, which were conducted and facilitated by an evolving planning agency as well as by the larger economic bureaucracy.[1]

According to the formulation of the Economic Stabilization Board(ESB), the

---

[1] The earliest planning agency was the Council on United States Aid(CUSA), which was established in 1948 for the coordination and allocation of U.S. aid. It was succeeded by the Economic Stabilization Board(ESB), which was formed in 1953. CUSA was absorbed by the newly established Council for International Economic Cooperation and Development(CIECD) in 1963. CIECD was reorganized as the Economic Planning Council(EPC) in 1973, and, finally, as the

basic goals of the first two four-year plans(1953-56 and 1957-60), which roughly corresponded to the era of import-substitution industrialization(ISI), were promoting production, stabilizing the economy, and improving balance of payments. By the time the third and fourth economic plans(1961-64 and 1965-68) were drawn up and implemented, Taiwan was promoting export-oriented industrialization(EOI) and transforming its agriculture-based economy to an industrial economy, with the goals of enlarging industrial structures and promoting economic modernization. The fifth and sixth plans(1969-72 and 1973-76) overrode the first EOI and the secondary ISI, and set the goals of promoting infrastructure construction, encouraging exports, modernizing agriculture, and accelerating industry modernization. Furthermore, the first energy crisis in the early seventies not only prompted the state to formulate the seventh economic plan(1976-81) to cope with the crisis, but also led it to continued to promote heavy-chemical industries and expand the construction of economic infrastructures. The "Ten Major Construction Projects," which infused major energy in the heavy industry and economic infrastructures, exemplified the effort and thrust of the six and seventh plans.

During the early eighties, after the shock of the second energy crisis, the eighth, ninth, and tenth four-year economic plans moved their foci from promoting economic development to sustaining industrial structures and to transforming economic structures as the government tried to deal with the pressures of liberalization and internationalization, the piling up of foreign exchange reserves,

---

Council for Economic Planning and Development in 1977.

and new macroeconomic conditions. Thus, at the same time that the last three four-year economic plans were implemented, the "Ten-Year Economic Development Plan" was formulated and the tenth four-year plan was replaced by the "Six-Year National Development Plan," which, in turn, was succeeded by the "Asia-Pacific Regional Operations Center(APROC) Plan" in 1995.

There are three features of the economic plans of the Taiwanese developmental state, each of which makes Taiwan's economic plans similar to or different from those of Japan.

First, like those of the Japanese developmental state and unlike those of the socialist states, the economic plans of the Taiwanese state are indicative plans, which are market-conforming or strengthening, rather than market-suppressing. In other words, the economic plans of the Japanese and Taiwanese developmental states do not try to replace the market mechanism with state intervention, but utilize or augment the market mechanism by concentrating limited resources in potential industrial sectors and calculating the comparative advantages they are able to utilize, on the one hand, and avoid vicious competition, on the other(Wah and Jomo, 1995: 38, 45-6). Nevertheless, the Taiwanese state's economic plans differ from those of the Japanese state in that the former is the unilateral work of economic bureaucracy while the latter is based on close communication and consensus of the economic bureaucracy and the private sector.

Second, since the sixth four-year plan was implemented, the economic plans of the Taiwanese developmental state have emphasized infrastructure

construction, especially transportation networks that link internal and external nodes. This reflects the importance of infrastructures in the process of economic development as well as the similar trajectories of Japan and Taiwan. As Johnson has pointed out, the MITI, and especially the Enterprise Bureau within it, promoted the construction of economic infrastructures, such as railways, ports, highways, electric power supplies, which laid the foundation for the high speed growth mechanism by reducing potential production costs(Johnson, 1982: 218). Partly because of the Japanese experience and partly because of the emerging needs expected by the economic bureaucracy, the Taiwanese state has stressed the construction of economic infrastructures. This policy is exemplified by the Twelve New Development Projects(1978), the Ten-Year Economic Development Plan, and the 1985 Fourteen Major Construction Projects(Rimmer, 1995: 219-20). As will be seen in the following argument, the emphasis on infrastructure construction has continued to be an important part of the regionally oriented APROC plan.

Third, in contrast to the economic plans of Japan, which have been trying to shape a framework for regional division of labor since introducing its New AID Plan in the late eighties, the APROC plan, while it seems to be regionally oriented, is actually intended to create a niche in the international division of labor in the Asian-Pacific area. The scope and scale of the plan, however, are larger than those of the New AID Plan.

The reasons that the Taiwanese state differs from its Japanese counterpart in this regard may be its policy heritage and state structures/dynamics. To begin

with, the Japanese have long been worried about being colonized, in view of their limited resources and Western threats before and since the Meiji period. This led the Japanese state to both strengthen its economic and political power, on the one hand, and colonize neighboring countries, which serve as buffers against Western imperialism and provide Japan with resources for production, on the other(So and Chiu, 1995: 88-111). The historical relationships built before the end of World War II have led the Japanese to develop economic relationships with their former Asian colonies. Therefore, it should not be surprising that the triangular trade structure within the postwar flying geese formation, a structure that resulted from the Cold War, has contributed to the Japanese policy of extending Japanese development practices to a regional scale. This policy results from the close communication and cooperation between the government and the private sector; that is, from their consensus mechanism(Sheridan, 1995: 201). In contrast, although it also had limited resources, the Taiwanese state focused on national industrial development during the postwar years, partly because of nationalist ideology, which was a main part of the Three Principles of the People, the official doctrine of the Taiwanese state(Wade, 1990: 243-6), and partly because of the Taiwanese economic policy mechanism, which was characterized by the dominance of the economic bureaucracy over the private sector.(See the discussion about Taiwan and the network state.)

The Asian-Pacific Operational Center(APROC) Plan

In 1995, the APROC Plan was designated as one of the core plans for Taiwan's economic and social development for the next century. Formulated by

the Council for Economic Planning and Development(CEPD), which was established in 1977, the APROC Plan consists of two parts: macroeconomic adjustment and six specialized centers. The main tasks to be accomplished by macroeconomic adjustment are to prepare appropriate settings for the centers and itemize the liberalization of investment, trade, foreign exchange, and personnel entry. The six specialized operation centers are the Manufacturing Center, the Sea Transportation Center, the Air Transportation Center, the Financial Center, the Telecommunications Center, and the Media Center. The macroeconomic adjustment is the basis for the six operation centers, which are intended to enhance national competitiveness. The six operation centers are described below:[2]

1. The Manufacturing Center, the core of the APROC Plan, is intended to build Taiwan as a technological island that specializes in producing high value-added goods, engages in high-tech industries, builds information-based industrial parks, and upgrades export-processing zones. The final goal is to set up regional division of labor with Mainland China and Southeast Asian countries by means of cross-border manufacturing structures.
2. By using the Kaohsiung Harbor as the central international hub and two other ports as auxiliary ones, the Sea Transportation Center is intended to take advantage of the regionally market opportunities of regionally burgeoning sea

---

[2] For the sake of concision, the sources of the description obtained from the Worldwide Web are listed here. For a brief description of the APROC Plan, visit http://www.roc-taiwan.or.jp/info/asia-pacific/aproc.html and http://www.taipei.org/current/apre109a.htm. For the general and updated

transportation and facilitate the operation of the Manufacturing Center.

3. The Air Transportation Center is to use the CKS International Airport as its basis and develop an "aviation city," which not only is intended to gain profits from the cargo and passenger transportation flow, but to combine neighboring areas under a comprehensive urban plan.
4. The Financial Center is intended to liberalize various financial flows, thus attracting domestic and foreign financial institutions to set operation headquarters or international offices in Taiwan in managing cross-border financial activities.
5. The Telecommunications Center is intended to liberalize telecommunication services with the goal of facilitating the operation of domestic and foreign firms that have established offices in Taiwan or intend to choose Taiwan as their management centers.
6. With an eye on the Chinese market(Taiwan, Mainland China, and overseas Chinese in Southeast Asia) for TV programs and movies, the Media Center is intended to become the core for production and post-production of media business by building media parks and relevant facilities.

To actualize these projects, the APROC Plan identifies three phases of implementation. The first stage(1995-97) focuses on macroeconomic adjustment and small-scale construction of the centers. In the second stage(1997-2000), large-scale building of the centers will begin and further adjustments will be made.

---

information about the APROC, visit http://www.aproc.gov.tw/eindex.html.

Finally, in the third phase, achievements made in the first two stages will be consolidated and full liberalization will be implemented. The specific time frames of the projects are listed in Table 5-1.

Like the Japanese economic plans that have appeared since the mid-eighties, the APROC Plan is regionally oriented, but it differs from them in several respects. First, the New AID Plan and other Japanese regionally oriented economic plans are intend to devise regional division of labor by extending the Japanese experience and by considering the comparative advantages of the major host and recipient countries that have received large amounts of Japanese FDI and aid. The concept that is the basis for the APROC plan is to find a niche in the regional division of labor. Second, the APROC Plan is more ambitious than the New AID Plan in that it covers both manufacturing and service sectors. The goals of the plan are that Taiwan catch up with Japan in high-tech and high value-added manufacturing sectors and be able to compete with Singapore in attracting the headquarters of TNCs and with Hong Kong in becoming a major regional financial center.

The characteristics of Japan's and Taiwan's regionally oriented plans can be more clearly discerned by comparing two metaphors emerging from these plans. The New AID Plan and similar Japanese plans are intended to shape a framework for the regional division of labor in the manufacturing sector by ensuring that Japan is in the leading position, by establishing an "Asian Brain" organization to coordinate trade, direct investment, and foreign aid within the flying geese formation, as well as by realizing or creating new comparative

Table 5-1 The Time Frame of the APROC Plan

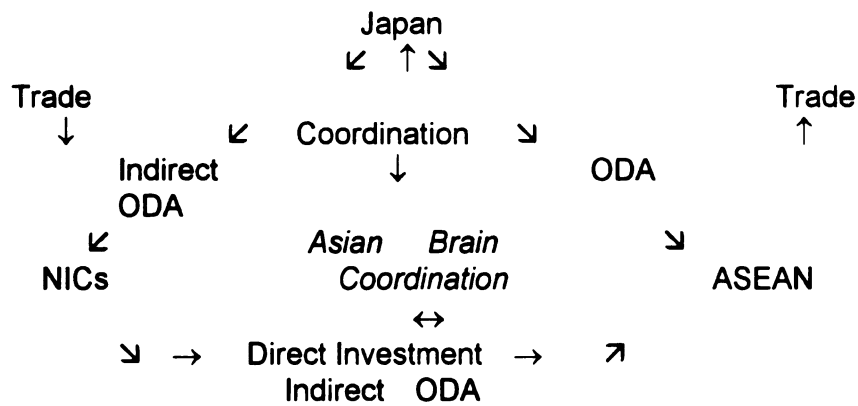
Projects	*1995*	*1997*	*2000*	*2005*
1. Macroeconomic Adjustments	25%	50%	100%	100%
#Promoting trade and investment liberalization				
#Reducing entry and exit regulations				
#Easing restrictions on inflow and outflow of capital				
#Improving legal environment suited to information society				
2. Manufacturing Center	25%	50%	75%	100%
#Improving environment for strengthening sophistication of manufacturing industries				
#Establishing "intelligent" industrial parks and turning Taiwan into a "science and technology island"				
3. Sea Transportation Center	25%	75%	75%	100%
#Improving management of software, construction of hardware, and expansion of cargo shipping business				
#Improving and overall expansion of port facilities in Kaohsiung				
4. Air Transportation Center	75%	100%	100%	100%
#Building fast delivery cargo centers				
#Building passenger transport centers				
#Building an "air-city"				
#Planning construction of new international airports				
5. Financial Center	0%	25%	50%	75%
#Developing comprehensive foreign exchange market, financial options market, and foreign currency market				
#Developing the financial derivatives market				
#Developing the gold market				
#Expanding and internationalization of the bond market				
#Developing a sound international stock market				
6. Telecommunications Center	0%	50%	75%	75%
#Promoting telecommunication liberalization and developing the Internet Management Center				
#Expanding cable networks and formation of telephone relay centers and customer service centers				
#Adjusting overall framework for telecommunication management and liberalization of the telecommunication market				

Table 5-1(cont'd)

#Integrated planning of the NII in coordination with the telecommunication sector				
7. Media Center	0%	50%	75%	100%
#Improving environment for developing media industry				
#Establishing high-technology mass media parks				
Source: CEPD, cited from Kitamura and Tanaka, 1997, p. 19.				

advantages of each country in the region(Hatch and Yamamura, 1996: 119-21; Arase, 1995: 252, 255-6). In other words, this framework establishes Japan as the head and other developing countries within the region as the body and limbs.(See Figure 5-1.)

Figure 5-1 Japan as the Asian Brain



Source: Arase, 1989, p. 479. Cited from Hatch and Yamamura, 1996, p. 120.

In contrast, Chian Ping-Kuen, the chairman of the CEPD, illustrates the structure of the APROC Plan by drawing a human's body: the Manufacturing

Center is the core(head) of the plan while the Telecommunications Center serves as the nerve system and the Financial Center as arteries. The Sea and Air Transportation centers serve as the limbs and the Media Center as the eyes and ears(APROC Letter). This metaphor suggests that, while planning to take advantage of regional dynamics, the APROC plan devotes most of its energy to establishing Taiwan as a high-tech and high value-added manufacturing center and helping it take a leading position in the regional division of labor.

Some might wonder how the Manufacturing Center project will form a framework for regional division of labor among Taiwan, Mainland China, and Southeast Asian countries. From the evidence available, it seems that the Taiwanese developmental state has not specified detailed working projects or outlines for the proposed framework, except for the research projects funded by the MOEA and conducted by scholars affiliated with the Chung-Hua Institute for Economic Research(CIER).

Since 1991, a group of economists at the CIER have been doing studies on the industrial division of labor between the manufacturing sectors of Taiwan and the mainland with funding from the MOEA. Investigating the comparative advantages and industrial development levels of the main regions of the mainland, Taiwanese investment on the mainland, as well as bilateral trade patterns, these economists review the effects of the strategies implemented by Taiwanese manufacturers and formulate policy suggestions for consolidating or expanding the framework of the division of labor between Taiwan and the mainland. It is unclear, however, whether or not these policy suggestions have been seriously

considered or adopted by the MOEA or the higher decision-makers, because the author has no access to the latter. The President of ROC established the policy of restricting Taiwanese investment in, and trade with, the mainland. Because this policy is followed and implemented by the Taiwanese economic bureaucracy, it is difficult to determine whether those suggestions are implemented systematically or not.

Although the Taiwanese government has formulated and implemented the Southward Policy, its political motives are far stronger than its economic motives(see the following discussion), and there is no regional division of labor in the blueprints of the policy as specific as that in the Japanese plans.

The APROC Plan and Taipei As a World City

According to the APROC plan, Taipei, the "temporary" capital of the Republic of China since 1949, occupies an important position. Not only are the Financial, Media, and Telecommunications centers located in Taipei, but it has been set up by the state and the city government as a modernized location providing business services for the headquarters of TNCs and as an area for a sub-sector of the information technology industry.

It is not surprising that Taipei has assumed such important responsibilities and tasks when one examines the data about it. First, because it is the capital of the Republic of China, all ministries and agencies of the Executive Yuan are located in Taipei. The headquarters of most national media and nearly 80 percent of leading Taiwanese manufacturing, service, and financial firms in Taiwan, including affiliates of foreign firms, are also located in Taipei. Twenty universities

and colleges(almost 40 percent of the total) in Taiwan are in this capital city. Second, Taipei's annual budget reaches 160 billion NT dollars, far more than those of Kaohsiung City and Taipei County(each with 60 billion dollars). Third, according to the government's survey, in 1969, 35 percent of Taipei's residents were in the manufacturing sector, while 63 percent were in the service sector; but the share of the manufacturing sector dropped to 22 percent and that of service sector rose to 78 percent in 1998(Yo, 1998: 93-4).

In view of the above data and information, it is no wonder that Taipei concentrates on providing settings for producer services, especially for the financial sector. To begin with, the foremost project for Taipei is the Financial Center. Following the guidelines set by the APROC plan, the city government is implementing a series of measures. The first project is to construct the International Financial Building, which will provide infrastructures(telecommunications networks and office spaces) for financial business and firms engaging in business services(accounting, investment, and market information) after the revision of land zoning regulations. The second is to designate a special business area for financial institutions and firms, so that it can foster the growth of financial activities through clustering effects. The third is to revise the regulation of land zoning and building, thus easing the restriction on the establishment of financial institutions in more areas.

In addition to building business infrastructures through constructing the International Financial Building, the special Financial Zone, and the second special business area in Nankang(in the eastern part of Taipei), Taipei city is also

participating in the Manufacturing Center project by designating a special zone for the software industry(also in Nankang). The second special business area, in which a new World Trade Center will be located, is intended to complement the already crowded Hsin-Yi Business Area. It will serve the needs arising from the growth of Taipei as a regional financial center, while the software industrial park will be based on the considerations of Taipei's comparative advantages and the future development of the Taiwanese IT industry.

Finally, Taipei is engaging in projects involving media as well as telecommunications centers by zoning an area for the buildings and infrastructures of media institutions, such as the National Broadcasting Building, by revising the land zoning of a specific area for the buildings of national telecommunications institutions, and by constructing teleports to support the operation of the software industrial park and the business areas.

It is unclear whether or not the planners and experts in the economic bureaucracy were thinking of the concept of world cities when they drew up the APROC Plan. When one considers the concept of world cities formulated by Friedmann(1995b), however, it becomes apparent that their motivation was to transform Taipei into a world city that will be integrated with the world economy and will become a base for international capital. They intended to strengthen Taipei's global control capabilities by providing producer services and complete economic infrastructures, both of which require planning and designing by the state. The planner's hope was that Taipei's status within the urban hierarchy could be transformed from that of a secondary city in a semiperipheral country to

that of a primary metropolis, i.e., a city situated in the East Asian development corridor and regionally important for finance and transportation.

The concept of world cities is more salient in the development strategies of the Taipei city government than in the central government's plans. Shui-Bian Chen, the mayor of Taipei city since 1995 and a member of the Democratic Progress Party, [3] the largest opposition party in Taiwan, has been trying to upgrade Taipei from a municipality under the jurisdiction of the Executive Yuan, the highest administrative body in Taiwan, to an internationally recognized city, which is influenced by his political ideology and that of some members of his brain-trust specializing in the affairs of urban development. Most brain trust members are professors and graduate students from the Graduate Institute of Building and Planning at National Taiwan University. The belief that he has been aware of the importance of Taipei's urban development can be confirmed by his appointing a professor from the graduate institute as Director of the Department of Urban Development.[4]

Specifically, Mayor Chen and his team presented six strategies to realize their goals:

---

[3] Because he is a member of the Democratic Progress Party, Mayor Chen's political position is the same as that of his party; that is, he regards Taiwan and China as two different countries and believes that, whenever it is possible, Taiwan should be recognized as an independent nation-state called "The Republic of Taiwan," or another name unrelated to China, rather the "Republic of China."

[4] Nevertheless, Mayor Chen's relationships with the graduate institute have been tense because the scholars and students from the institute regard some of Mayor Chen's policies and measures as destructive to the life of Taipei residents living in the lower social strata, even though these scholars and students expressed

1. Transnational Linkages, which include participating in international campaigns(human rights, environmental protection, and so on), promoting city diplomacy and interaction, assisting the private sector in various activities(meetings, cultural communication, tourism, and so on).
2. Attractive Urban Life achieved by shaping the urban images that emphasize Taipei's characters and history as well as reinforcing cultural and entertainment facilities.
3. Internationally Competitive Infrastructures, e.g., overhauling Taipei's transportation system, providing information in foreign languages(especially in English), and constructing living spaces for foreigners(schools for foreign children).
4. Profitable Business Environment; that is, attracting foreign skilled labor and speeding land rezoning for producer services.
5. Effective Governance, which depends on increasing administrative efficiency and encouraging the participation of foreigners.
6. An Intelligent City, based on the construction of Taipei Information Infrastructures.

The initials of the first word of the six points spell "Taipei," and Mayor Chen and his team use "TAIPEI" as the catchword for their development strategies. These strategies indicate that they are trying to create a more balanced urban regime that will attend to the needs of migrant labor and develop a sound urban

---

different opinions before the city government took action.

living environment, in addition to echoing the central government's APROC plan, upgrading Taipei's status within the world urban hierarchy, and making Taipei an ideal node for international capital to concentrate and accumulate.

While the central and city governments focus more on the economics and the effects of developing Taipei as a leading world city, some Taiwanese scholars interested in urban development tend to highlight the negative side of urban regimes resulting from the formation of world cities, and they formulate policies to cope with them. Again, the scholars and graduate students from the Graduate Institute of Building and Planning have been playing pivotal roles in discussing or propagating the concept of world cities and in participating in international organizations. Chu-Joe Hsia, a leading professor from the graduate institute, has introduced the concept of world cities and tried to incorporate it into his theoretical framework, which analyzes the status of Taiwanese cities, society, and their surrounding structures of the global economy(Hsia, 1995). Others from the same institute have translated some representative essays by leading scholars, such as John Friedmann and Saskia Sassen, in related academic journals.

On the other hand, certain Taiwanese scholars and graduate students(not only those in the graduate institute) have participated in the Asia-Pacific Inter-city Network, which was promoted by the Royal Melbourne Institute of Technology's(RMIT) Department of Planning, Environmental Policy, and Landscape Architecture. In view of the rise of world cities and increasingly close global economic relationships, the organization's goals are to build new forms of

regional governance, strengthen Asian-Pacific inter-city linkages, and make city-regions conducive to human living,(three of which were presented by Friedmann) with the hope that appropriate policy suggestions can be formulated and implemented to cope with new issues and solve problems.[5]

From the above discussion, one can infer that presently there are no extensive studies focusing on the concept of world cities in Taiwan when compared to the studies of other primary and secondary cities, including New York and Singapore.[6] By referring to Hill and Kim's framework comparing two major types of world cities, however, one could make some preliminary observations about Taipei.

First, the development of Taipei is similar to that of Tokyo and Seoul in that it has been based on developmentalism, rather than on liberalism. Therefore, the global control capabilities have been more in the hands of the state and economic bureaucracy, rather than in those of privately owned firms, and the Taipei city government has cooperated with the central government. Even though the mayor is not a member of Kuomindang (KMT or the Nationalist Party), the ruling party, and thus has ideological conflicts with the central government, the Taipei city government is willing to cooperate with the central government because part of its budget is still controlled by the central government under the law.[7]

---

[5] Most of this paragraph is based on the description in the Chinese Web pages set up by the Taipei group in the inter-city networks.
[6] For a list of recent studies, please refer to Friedmann, 1995a.
[7] Mayor Chen lost the election to In-Jiau Ma, the KMT candidate, in the 1998 campaign. Ma will be more willing to cooperate with the central state, and he has declared that he will try to shape Taipei's future with a more completely

Second, Taipei is similar to New York and other world cities based on liberalist development in that the share of the manufacturing sector has been shrinking while that of the service sector continues to increase. This, however, is not only the result of the market mechanism, but is also influenced by the state's industrial policies, which located science-based industrial parks and export-processing zones outside Taipei.

Third, it is undeniable that income inequality has existed in Taipei and there are social(classes) and spatial(living) lines, but they have not developed segregation and polarization as extreme as those in some world cities, such as New York. Marsh's longitudinal study indicates that there was no social polarization in Taipei as of the early nineties. It is true that the number of Taipei residents whose income depends totally on salaries/wages increased from 35.4 percent in 1963 to 42.8 percent in 1991, and that of Taipei residents whose income is completely derived from profits, interests, dividends, and rents decreased from 38.8 percent in 1963 to 35.4 percent in 1991. Note, however, that there are residents whose incomes result from both sources and this diminishes the impression of polarization. Moreover, the number of blue-collar workers among Taipei's residents has declined from 17 percent in 1963 to 9.9 percent in 1991 and the number of white-collar employees from 30.1 to 21.4 percent, whereas the share of managers has increased from 3.1 to 24.7 percent. In other words, the residents in Taipei city have not been extremely polarized(or

---

international vision. How Ma will lead the development of Taipei, however, remains to be seen.

proletarianized) either in their sources of income or in their occupations(Marsh, 1996: 54-7, Table 3-11 and 3-17).

Furthermore, it has been pointed out that, although the upper class(comprising residents with high incomes and prestigious occupations) has been concentrated in the area between the old core and the peripheral area, this concentration does not create clear-cut fault lines which augment class segregation(Chang, 1987).

Thus, in view of this brief discussion, one could regard the types of world cities formulated by Hill and Kim as the two poles of a continuum with a middle ground and then try to situate Taipei on this continuum, which is illustrated in Table 5-2.

Toward a Network State?--The Taiwanese Experience

As is explained in Chapter Two, the mechanism of economic management within the Japanese developmental state has been based on a network state structure, which is characterized by bureaucratic autonomy shaped by the political settings, on the one hand, and by close cooperation and communication between the state and business as well as among economic ministries in both planning and implementation, on the other. Through the network state structure; that is, through the hegemonic status of the Liberal Democratic Party(in Wade's terms, the soft authoritarianism), which smoothes the political and administrative process, through adequate policy instruments, and through the cooperation of the state and business, the Japanese state has been promoting industrialization and high technology industries. It has also protected and aggregated business

Table 5-2 Taipei and the Representative World Cities

	Market-Centered Bourgeoisie	*Middle Ground*	*State-Centered Political-Bureaus*
1. Prototypical City	New York		Tokyo; Taipei
2. Regional Base	West Atlantic		East Pacific(**Taipei**)
3. Leading Actors Group Organization	TN capitalist class Finance TNCs vertically integrated firms		bureaucratic elite(**Taipei**) State ministries & government-business relations(**Taipei**)
Economic Ideology	liberalism		developmentalism (**Taipei**)
4. Economic Relation to the World	market rational		plan rational(**Taipei**)
Prime Objective	private wealth profit maximizing	profit- and employee-augmenting(**Taipei**)	national power market share, employment maximizing
5. Global Control capabilities via	private producer & service complex		government ministries policy networks(**Taipei**)
6. Industrial Structure	manufacturing HQ's & production dispersed	**Taipei**(both manufacturing & hi-tech)	manufacturing HQ's & high tech production concentrated
7.Occupational Structure	polarized, missing middle high inequality high segregation		compressed missing extremes low inequality & segregation(**Taipei**)
8. Foreign Immigration	weak controls	intermediate control(**Taipei**)	strong controls
9. Culture	consumerist	**Taipei**	productionist
10. City/Central State Relation	separation	variable of DPP	integration(**Taipei**)
11. Source of Urban Contradictions	short-term profits, market volatility, polarization	**Taipei**(in transforming): deregulation, partisan politics, & ethnic contradictions	state capital controls, over-regulation, centralization
12. Competitive Advantages	fluidity & mobility	**Taipei**(combining mobility and	stability planning

Table 5-2(cont'd)

planning)

Source: Adapted from Hill and Kim, 1998, Figure 1.
Note: DPP is the abbreviation for the Democratic Progress Party, the largest opposition party, which is ambitious to become the ruling party of Taiwan in the near future.

interests and tolerated certain inefficiencies at the expense of some groups who have no clout in the system. In other words, the Japanese network state has been a societal state, with the result that it has intermingled with the Japanese society through relationships and exchanges(Okimoto, 1989: 226). The actualization of economic plans and policies has been easier because they are based on consensus rather than on the unilateral planning and action of the government.

In contrast to the Japanese network state, the Taiwanese state is characterized by centralization of political power, by an economic bureaucracy that revolves around a pilot agency and follows the direction of the political center, i.e., the KMT, and by the partial networks in the economic bureaucracy and between the bureaucracy and the private sector. The repressive and ideological state apparatuses have insured the autonomy of the bureaucracy, protected it from the invasion of the private sector, and maximized the economic bureaucracy's power over the business interests, so much so that the economic and industrial plans or policies have been more the unilateral achievement of the economic bureaucracy than the result of close communication and consensus. The government and that the government-business relationships have

constituted unbalanced sub-networks, in which the economic bureaucracy occupied the leading position.

However, the Taiwanese state has been forced to cope with the pressures of liberalization, privatization, and democratization. State autonomy has been circumscribed by democratization since the late eighties, and this gives the Democratic Progress Party the opportunity to gain executive and legislative power at different governmental levels. Democratization also reveals the entry points through which big business could influence the sub-units of the political system through elections and other means(such as political contributions). Will the change in state autonomy affect the state's capacities, especially the operation of the economic bureaucracy? What might be the consequences of the new government-business relationships? Will the state become a type of network state, with characteristics similar to or different from the Japanese type? Does the pilot agency's shrinking power during the seventies mean that the economic bureaucracy has been decentralizing?

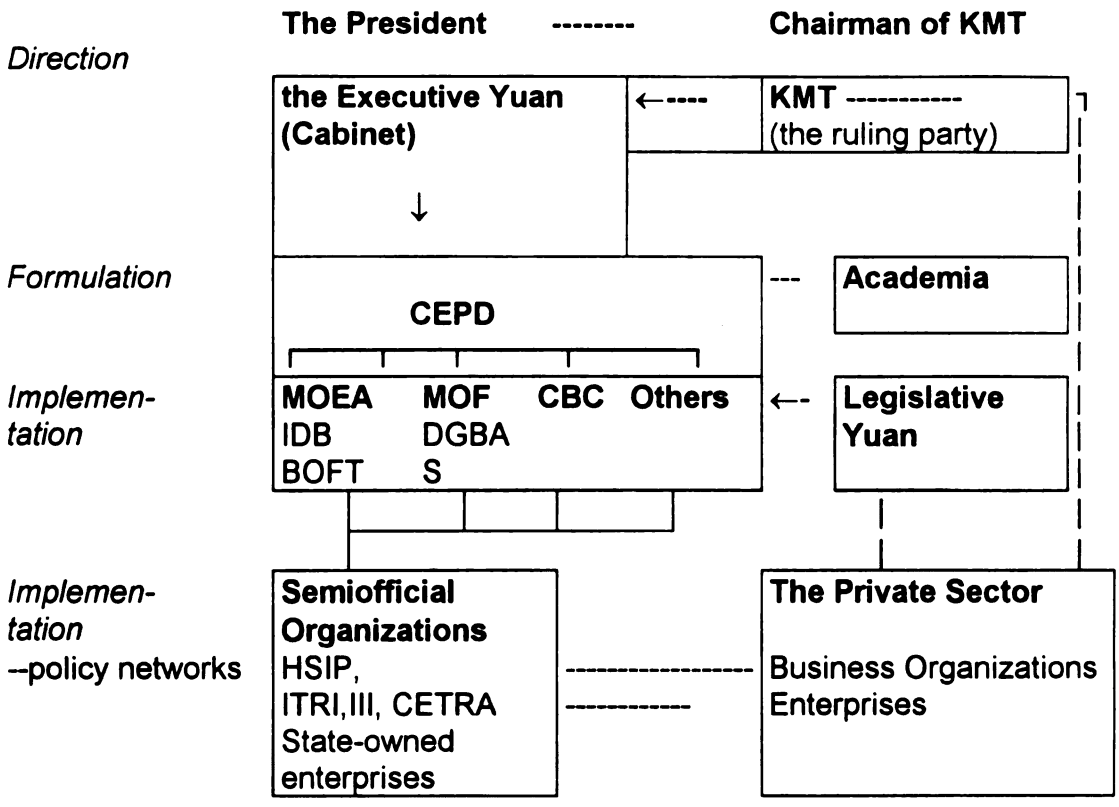
To answer these questions, it is necessary to examine the trajectory of government-business relationships and the mechanism of the economic bureaucracy, which is diagramed in Figure 5-2.

As illustrated in Figure 5-2, the organizational mechanism of the Taiwanese economic bureaucracy can be described as having three levels: direction, formulation, and implementation.

The Directional Level

At the directional level, the Executive Yuan as the cabinet is responsible for

Figure 5-2 The Organization and Mechanism of the Taiwanese Developmental State and Economic Bureaucracy



setting the general direction of economic, political, and social policies under the rule of the President and the ruling party(Kuomindang, KMT). During the authoritarian era, the planning and policy directions were dominated by the ruling party and the economic bureaucracy, leaving little, if any, room for the private sector.

As Okimoto has explained, economic bureaucracy's autonomy in Japan, which deflects the pressures of the private sector from the bureaucrats and provides them with room for formulating visions and for rational calculation, has been kept at a satisfactory level, thanks to the hegemonic status of the LDP, the factional politics of the LDP, the design of the election system, and the respect of the ruling party for the economic bureaucracy(1989: 180-1, 209-11).

The Taiwanese economic bureaucracy enjoyed relatively high autonomy, similar to that of its counterpart in Japan, during the authoritarian era. However, the bureaucratic autonomy in Taiwan resulted from a different political setting, that is, from the dominance of the ruling party and the Taiwanese party-state over society. This is different from the Japanese societal state, which is characterized by the grand interest coalition organized by the LDP.

Specifically, before the democratization and liberalization of the mid-eighties, the Taiwanese developmental state had been an authoritarian state, enjoying a relatively high degree of autonomy from the significant components of the private sector, especially capitalists, the working class, and big landlords. The Taiwanese state has been a party-state, in which the KMT not only controlled the organizational structures and personnel by incorporating almost all governmental

officials and bureaucrats into the party machine through indoctrination, intimidation, and rewards, but also penetrated every level of society by establishing business and industrial associations, setting up party branches in all types of organizations(e.g., schools, the military, and state-owned enterprises), and forming clientlism, through which the state allocated limited resources(e.g., American aid, policy subsidies, and preferential loans) to landlords and capitalists, on the one hand, and provided opportunities for rent-seeking to local factions, on the other. Thus, the state incubated the private sector(particularly big capitalists), which came to depend on and support the state, and secured local support and loyalty by providing local factions with profits resulting from government procurement, and by granting them the privilege of monopolizing local public utilities, credit unions, and transportation(Chu, 1994: 116-7).

Within this politico-economic setting, capitalists, influential social groups, and significant local interests have hardly any power to participate in the formulation of economic plans and policies. The capitalists did, however, form prominent peak organizations, such as the Chinese National Federation of Industries(CNFI), the General Chamber of Commerce of the Republic of China(GCCRC), and the National Association of Industry and Commerce(NAIC); but they were established as a result of the design of the party-state to strengthen the legitimacy of the government and support the state's policies. They were not being autonomous organizations trying to represent the business sector in communicating with the state and aggregating business interests(Chu, 1994: 119; Leng, 1996: 83-4).

This does not mean, however, that the private sector has always been excluded from the process. Prominent business organizations could manage to communicate with the economic bureaucracy and aggregate business interests on a limited scale. Academia could influence the process by being "secret consultants" to the President or the Premier, by serving as recruited members of the CEPD staff, and by doing research projects funded by the CEPD and other ministries or agencies within the economic bureaucracy. Nevertheless, the effects of these accesses were limited and conditional.

The influence of big business over economic plans and policies has been improving since the late eighties, thanks to the democratization starting then. The pressure of democratization gradually diminished the state's control over society and resulted in various institutional breaches that could be penetrated and widened by powerful social groups, particularly big business.

There are many ways for big business to penetrate the mechanism of economic decision-making. The first way is to make political contributions, thus acquiring the opportunity to influence legislators at local and central levels. By expressing concerns or providing contributions, big business nudges those legislators to "take care of" certain projects(e.g., procurement) for the interests of the business involved, thanks to the increasingly open and large-scale elections(Leng, 1996: 90). In addition to their access to legislators, some firms have even been accused of using their leverage over President Lee and reaping profits from the relaxed economic policies toward Mainland China(Hsiao, 1995: 81-4, 90-5). The second way is to participate in politics directly, either by working

in elections at local and higher levels(local assemblies and the Legislative Yuan, i.e., the Congress), or by becoming members of the Central Standing Committee of the KMT, the decision-making center of the party-state. The third way is to form strategic alliances or form joint ventures with KMT-owned businesses, which include stock-holding companies and numerous investment projects. The fourth is to support prominent business associations or establish new ones, such as the National Association of Industry and Commerce(NAIC) and the Research Association of Industry and Commerce(RAIC), both of which have constructed communication channels with the state(Leng, 1996: 86-9). These aspects of the development of state-business relationships are in sharp contrast to the structures of the past four decades(1949-1987).

Although big business has managed to penetrate the state, this does not mean that it can systemically manipulate the whole process of economic planning and change the fundamental structure and mechanism of the economic bureaucracy. Big business does have enough leverages to influence the content and direction of some policies and projects. For example, it used its connection to national political leaders, who decided that the government should continue to promote industries that consume huge energy, such as cement and steel industries. This obstructed the economic bureaucracy's effort to promote industrial upgrading and society's demand of protecting environment(Cheng, I-Chin, 1998: 160). Nevertheless, in overall economic planning, its influences tend to be weakened as the decision-making process is based on inter-ministerial coordination, bureaucratic formulation, and the blueprints of political leaders. In

other words, the Taiwanese developmental state has maintained its style and mechanism for making and implementing economic plans and policies, even though strict hard authoritarianism has been phased out, and the leverage of the big business has improved. This can be seen further in the following discussion of how the state has been playing the roles of financier and promoter in constructing Taiwan as a regional economic center.

The Formulation Level

The direction set by the master economic plans must be translated and formulated into concrete and feasible sectoral plans and policies. Thus, the responsibility of the CEPD(and its forerunners before 1977) is to formulate economic plans and general policies within the parameters set by the Executive Yuan. It also depends on the studies and analyses conducted by its staff consisting of economists and experts(engineers, accountants, statisticians, and so on).

The main functions of the CEPD are advising and planning, as well as coordinating interaction and conflicts among economic ministries. Its directing committee consists of the President of the Central Bank of China, the Ministers of Finance, of Economic Affairs, and of Communication, non-portfolio members, as well as others within the Executive Yuan, such as the Secretary-General of the Yuan and the Director of the Directorate-General of Budget, Accounts, and Statistics of the MOF(DGBAS). By including ministries relevant to economic plans and polices, the organizational design can facilitate communication and cooperation among the ministries involved.

Unlike the MITI in Japan, which is the main pilot agency mobilizing the organizational dynamics of the economic bureaucracy by means of formulating "visions" and manipulating policy instruments, the CEPD's main task is to formulate economic plans that translate and specify the general directions of the higher decision makers. Moreover, unlike the Economic Planning Agency(EPA) in Japan, which merely specializes in drawing up plans, the CEPD also takes responsibility for coordinating interaction among the ministers involved in implementing economic plans and policies. In other words, the CEPD is situated somewhere between the MITI and the EPA(Wade, 1990: 196-8).

Nevertheless, this contrast should be viewed with caution. At first glance, the CEPD seems to be an aggregating and coordinating node connecting the professional reasoning and political considerations of other sections within and outside the economic bureaucracy, while the MITI is an active pilot agency that enjoys powerful status and can use policy instruments without the task of coordination. However, it is noteworthy that the power(allocating financial subsidies and forming antirecession or rationalization cartels) of the MITI has been narrowed because of the changes in internal and external settings(inter-ministerial competition and the increasing autonomy of the private sector). Moreover, the MITI has been negotiating with other economic ministries to formulate economic plans and policies, thanks to institutional designs. For example, the MITI's tax measures and budgets are dependent on MOF's decisions; the monetary policies are managed by the MOF and the Bank of Japan, which sets limitations on the MITI's planning and decision-making(Okimoto, 1989:

19-20, 232). In other words, the MITI has not been able to formulate economic plans and implement industrial policies by itself, excluding other economic ministries and agencies. Rather, it also has had to perform the task of coordination and generate policy consensus.

Moreover, before 1997 and the appearance of the CEPD, the central planning agency enjoyed a higher position and more power. The ancestors of the central planning agency are the Council on United States Aid(CUSA) and the Taiwan Production Board(TPB); the former was established in 1948 to coordinate the interaction between the Taiwanese government and the U.S. aid agency regarding the utilization of U.S. aid and other economic policies, while the latter was established in 1949 to stabilize the postwar economy. It had the power to control public enterprises, national production, and material supplies(Wade, 1990: 199). In 1953, the TPB was absorbed by the Economic Stabilization Board(ESB), which had been established in 1951 and organized various committees to manage trading and banking policies, allocation of U.S. aid, price stability, and so forth. The first four-year economic plan was mainly the achievement of the ESB(Gold, 1986: 68). In 1958, the planning responsibility was disintegrated and reassigned to the Ministry of Economic Affairs, the Ministry of Communication, and so on, within the Taiwanese economic bureaucracy (Wade, 1990: 199).

In 1963, CUSA was reorganized as the Council for International Economic Cooperation and Development(CIECD), which absorbed the personnel of the ESB, in view of the imminent disruption of U.S. aid and the need for coordinating and controlling the burgeoning economy. In addition to formulating four- and ten-

year economic plans(1965-74), the CIECD dominated the economic bureaucracy, especially the MOEA and MOF(Wade, 1990: 1990-200; Gold, 1986: 78), partly because most of the leaders of the CIECD had sufficient knowledge of economic policy-making.

The status and power of the CIECD reached a climax after Chiang Ching-Kuo, the son of Chiang Kai-Shek and the future successor to the state apparatus, assumed the chairmanship. However, the influence of the CIECD began to diminish when he left the council, which was reorganized as the Economic Planning Council(EPC) in 1973. Though the EPC was renamed the CEPD and gained some strength in economic planning, it never acquired the status and power of the central planning agencies of the earlier two decades(Wade, 1990: 199-201). In other words, the power of the central planning agencies during the fifties and sixties was comparable to that of their Japanese counterparts(the ESB, MITI, and so on), but their power and influence diminished faster than those of the MITI.

The Implementation Level

Once the directions are set, the plans drawn, and the relevant budgets approved by the Legislative Yuan, which had been a rubber stamp during the authoritarian era, the implementation process of the economic bureaucracy begins, The MOEA, the Ministry of Finance(MOF), the Ministry of Communication(MOC), and the Central Bank of China(CBC), constitute the implementation team.

The Central Bank of China formulates monetary and fiscal policies, adjusts

the foreign exchange rate and the interest rate and governs the activities of domestic and foreign banks. The execution of monetary and fiscal policies is assigned to the Ministry of Finance, which reviews the policies of preferential tax treatment and tariff reduction. Among the industrial policies implemented were the reduction of high tariff rates. In the fifties high tariff rates helped suppress the import of consumer goods, and the new lower rates encouraged the import of capital goods, which were components of import substitution industrialization. The fine-tuning of foreign exchange rates facilitated the import of capital goods and material, on the one hand, and suppressed the import of consumption or luxury goods, on the other, as the foreign exchange reserve was limited. The banking policies and the adjustment of interest rates were carefully controlled during the economic startup and takeoff phases, so that strategic industries could obtain cheaper loans from banks and inflation could be controlled.

The Ministry of Communication(MOC) is relevant to industrial policies and to the economic bureaucracy because it controls the Bank of Communication(BOC, or the Chiao-Tung Bank), which is equivalent to a national industrial development bank. The loans of the BOC and various items of industrial and development funds(e.g., the post savings program) serve as the sources for capital for firms in the private and public sectors.

The ministries or agencies mentioned above are important, but the Ministry of Economic Affairs(MOEA) is more relevant when discussing Taiwanese industrial policies and development. In a limited sense, it could be compared to the MITI.

The MOEA consists of four branches: staff units, administrative bodies, state-owned enterprises(SOEs), and overseas units. The main administrative bodies include the leading Industrial Development Bureau(IDB), the Board of Foreign Trade(BOFT), the Small and Medium Enterprise Administration(SMEA), the Industrial Development and Investment Center(IDIC, which attracts inward foreign direct investment), the Investment Commission(reviewing projects of inward FDI), as well as bodies managing export processing zones, SOEs, trade, and so on.

The IDB could be regarded as the most influential body within the MOEA. Its task is to promote industrial development by the following means: formulating industrial policies for further consideration, listing items for tariff reduction, controlling imports, organizing exports, reviewing loan projects sent by the Bank of Communication and funding requests, disseminating subsidies, promoting specific industrial products(this is similar to the administrative guidance in Japan), and sending engineers to visit the factories of private manufacturers(Wade, 1990: 202-7).

The Commission of State-Owned Enterprises(CSOE) supervises the management of state-owned enterprises(SOEs), which do monopoly businesses and activities in which private firms are not willing or able to engage and form relationships of division of labor with private business by providing upstream parts or material for a variety of industries. The relationships between the China Petroleum Corporation(CPC) and the private firms situated in the midstream and downstream of the petrochemical industry in Taiwan are a good example of

this(Simon, 1992: 134-5).

Under the guidelines of the economic plans, the MOEA also assists domestic private firms by collecting and disseminating information and by transferring technology through semiofficial organizations, such as the Industrial and Technology Research Institute(ITRI) and the Institute for Information Industry(III), which aims at promoting the Taiwanese software industry.

At first glance, the MOEA seems similar to the MITI in two respects. For one thing, both of them have specific branches to tackle wide-ranging economic and industrial affairs, such as incubating specific industries, promoting foreign trade, assisting small and medium enterprises, subsidizing R&D, setting up semiofficial R&D organizations, managing state-owned enterprises, and so forth. Second, both of them have developed sophisticated policy networks comprising intermediary organizations to complement or facilitate the implementation of their policies. By using the definition of Okimoto(1989: 152-8), which specifies the policy networks as a combination of formal(public corporations and enterprises under state management) and informal(relatively autonomous public organizations promoted by the state), it could be argued that, similar to the MITI, the Taiwanese MOEA has developed policy networks to facilitate its implementation of policies, too. The MOEA has been managing a group of state-owned enterprises to monopolize important economic resources and actualize specific assignments for industrial development(e.g., developing the heavy industry in the seventies). The MOEA has also established or promoted various public organizations to serve as the arms and legs of the economic bureaucracy

for several projects, such as strengthening R&D capabilities(the ITRI), expanding overseas markets and collecting market intelligence(through the Chinese External Trade Development Council, CETRA, which was established in 1970 and has tasks similar to the Japanese External Trade Organization). The MOEA also established other organizations for specific assignments(e.g., the development of the software industry by the Information Industry Institute, the heightening of productivity and quality by the China Productivity Center, as well as the import of technology and export to Japan by the Sino-Japanese Economic and Trade Foundation, SJETF, which was established in 1993).

However, there are also institutional differences. The MITI's tremendous power during the high speed growth(1955-70) resulted from the peculiar combination of historical factors. First, the Japanese state's effort in raging war concentrated most resources in the hands of the Ministry of Munitions(MOM), reserving the means of controlling economic resources for the MITI. Second, the occupation by the Supreme Commander for the Allied Powers(SCAP) and the Dodge Line, both of which were to stabilize the Japanese economy, laid the foundation of Japanese financial systems through policies of reconstruction. Third, the SCAP gradually turned over its control of the economy to the Japanese economic bureaucracy, especially the MITI, and disbanded the zaibatsu. The powerful zaibatsu, which even the Japanese government was not able to fully control during the war, was weakened, with the result that the Japanese state became stronger than the private sector during the postwar era. Fourth, during the first half of the fifties, the MITI increasingly accumulated its controlling power

through its influence over loans for industrial development, its active moves in designing preferential tax treatment for strategic industries, its extensive control over the Economic Planning Agency(EPA), its administrative guidance, its effort to build the keiretsu, and other administrative leverages. Its power and instruments helped the Japanese economy achieve high-speed growth during the late fifties and the sixties(Johnson, 1982: 165-6, 173, 190-1, 194, 198-9, 201, 215-8, 221).

In contrast, the Ministry of Economic Affairs(MOEA) did not have status or power equivalent to those of the MITI before the appearance in 1973 of the Economic Planning Council, which was the descended pilot agency, whose forerunners included the powerful Taiwan Production Board(TPB, 1949-53), Economic Stabilization Board(1951-58), Council on United States Aid(CUSA, 1949-63), and Council for International Economic Cooperation and Development(CIECD, 1963-73). The MOEA did gain strength when some economic planning was delegated to it from CUSA, and its status did rise when the CIECD was reorganized as the Economic Planning Council, but it would be hard to imagine that, within the organizational design, the MOEA would have any chances to be powerful enough to control the Council for Economic Planning and Development(CEPD, 1977-), except through the minister's personal status and relationships. Certainly, the MOEA, especially its Industrial Development Bureau, has been able to influence the formulation of industrial policies, allocation of foreign exchanges, preferential taxes, bank loans to strategic industries, and management of state-owned enterprises(Wade, 1990: 201-8). However, the

degree of its influences is not comparable to the MITI. The MITI's power has been shrinking since the seventies because it has lost the powers of foreign exchange allocation, permission for inward FDI, and technology licensing)(Okimoto, 1989: 145). Its diminished power is the result of domestic and foreign pressures calling for economic liberalization and privatization, as well as of inter-ministerial competition and the growth of the private sector. This does not necessarily imply, however, that the MOEA has been growing stronger in comparison to the MITI; it has to face similar pressures of liberalization and privatization, too. The pressures of liberalization and privatization are so strong that the number of state-owned enterprises within the heavy industry and those enjoying monopoly status under its jurisdiction have been decreasing.[8] The MOEA is still a resourceful ministry in that it is still able to implement economic policies, but it had not been a dominating governmental body during Taiwan's postwar industrial development.

II. The State As a Financier

To reconstruct the economy and encourage industrialization, the Taiwanese state had to take the responsibility for accumulating capital and incubating private capitalists because the private sector was not able to perform these tasks.

The Taiwanese state has been assuming the responsibility of promoting original accumulation through three channels: managing domestic financial systems, controlling inward FDI, and utilizing foreign(U.S.) aid. As the Taiwanese

---

[8] Presently, the state-owned enterprises under MOEA's jurisdiction include only the Taiwan Sugar Corporation, the China Petroleum Corporation, and other firms

economy has become self-sustaining, and industrialization has developed from labor-intensive to capital- and technology-intensive levels, the task of the Taiwanese developmental state is no longer focused solely on facilitating domestic capital accumulation. It now is promoting industrial upgrading and liberalizing the financial market, on the one hand, and calibrating outward FDI and participating in international aid, on the other.

From Sophisticated Regulation to Step-by-Step Liberalization

As is well known, East Asian developmental states have strictly regulated their financial institutions and markets, with the purpose of stabilizing their economies and allocating limited capital resources to promising or strategic industrial sectors.

Taiwanese financial policies could be divided into three groups. On monetary policies, the Taiwanese state has always been careful of suppressing the inflation rate through three means: controlling the mobility of money supply by issuing new currencies(the New Taiwan Dollar) in 1949, by encouraging domestic savings through setting up preferential savings programs and reopening the post savings program,[9] and by adjusting interest as well as foreign exchange rates. Interest rate policies have been formulated by the Central Bank of China since 1961.(The Taiwan Bank was in charge from 1945 to 1961.) The tasks of interest rate policies had been suppressing the inflation rate by setting high interest rates to absorb surplus money on the market, encouraging industrial development through

---

in the primary industry, except for one firm in the aviation industry.

[9] The post savings program of the Republic of China was established as early as

setting low interest rates for firms to cut down their burdens in purchasing capital goods(the import-substitution industrialization in the fifties), stimulating exports(the export-oriented industrialization in the sixties), and coping with the inflation brought on by the energy crisis in the seventies. The state's control over the interest rate has gradually diminished as the banking sector has been increasingly liberalized, with the result that interest rates were finally liberalized in 1989 when the revised Banking Law had been passed. The foreign exchange rate policies focused on promoting industrialization through differentiating the exchange rates. From 1949 to 1955, the foreign exchange rate system was based on a dual scheme; the higher exchange rate was applied to the import of capital goods and material to decrease the production costs of manufacturers, while the lower rate was applied to general products. The dual rate system evolved into the multi-rate system in 1955 as the government centralized the management of foreign exchange rates and applied them to different industrial sectors and to the market. The exchange rate of the NT Dollar was pegged to the U.S. dollar in 1958, and the single rate system was established. During the seventies, the foreign exchange rate was based on a floating system, and the Taiwanese market was set up in 1979 with five Taiwanese banks as agents. Finally, the restrictions on holding foreign exchange reserves was deregularized in 1987, and the foreign exchange market was totally liberalized in 1990.

The liberalization of the financial policies mentioned above indicates that the Taiwanese state has increasingly loosened its control over the Taiwanese

---

in 1919. For details, see the following discussion.

financial market and institutions since the late eighties. On the part of Taiwanese financial markets, not only was the foreign exchange market largely liberalized, but the direct finance market, which includes the capital(stocks and corporate bonds or long-term financial resources) and monetary markets (short-term transaction instruments, e.g., treasury bills and commercial papers), has been growing since the late eighties, thanks to the revised Banking Law of 1989 and financial liberalization policies.[10] According to the data provided by the DGBAS, the share of direct finance increased from 12.7 percent in 1992 to 22.4 percent in 1997, while that of indirect finance decreased from 87.3 percent in 1992 to 77.6 percent in 1997(DGBAS, 1998b).

The liberalization of financial policies and markets seems to indicate that, to a certain extent, the Taiwanese state's control over the financial sector has weakened. In other words, the state is no longer able to implement its industrial policies through its allocation of financial resources. The state cannot allocate foreign exchange reserves to designated sectors as the regulations on holding foreign exchange reserves have been relaxed. The state is not able to adjust the foreign exchange rate to lower the costs of manufacturers who plan to import new capital goods and essential material. The incentives for, and the supervision over, promising manufacturing firms are no longer salient because firms can obtain funds from the direct finance market.

Nevertheless, this does not mean that the Taiwanese developmental state is

---

[10] The Banking Law was revised in 1989; the government liberalized the setting of new stockbrokers in 1988; the establishment of new banks was allowed in 1990;

becoming a minimal state. On the contrary, while some of its means of generating and allocating financial resources to reinforce industrial policies and promote industrialization have been curbed, the Taiwanese state has developed more indirect means to finance industrial upgrading and further development. Its influence on Taiwanese financial institutions has not completely disappeared, as Table 5-3 makes clear.

Table 5-3 The Structure of Taiwanese Financial Institutions(1971-1995, Percentage)

	1971	*1981*	*1991*	*1995*
Monetary Institutions	61.3	59.9	64.6	70.2
Domestic Banks	22	19	18.4	26.1
Foreign Banks(branches)	0.37	0.78	1.1	1.1
SME Banks	6.2	6.4	7.1	8.3
Credit Unions	12	9.4	11.9	11.7
Credit Departments (fisheries and agricultural associations)	20.7	24.4	26.1	23.1
Non-monetary Institutions	38.7	40.1	35.4	29.8
Trust & Investment Companies	0.42	1.0	1.7	1.0
Post Savings	34.1	33.5	28.9	23.6
Insurance Companies	4.21	5.5	4.3	4.4
Bonds and Bills	--	0.2	0.6	0.73
Stockbrokers	--	0.03	0.02	0.11

Source: Bureau of Monetary Affairs(MOF), *1996 Annual Report*, p. 9.(in Chinese)

This table shows three patterns. First, the share of monetary institutions maintained steady growth, rising from 61.3 percent in 1971 to 70.2 percent in 1995, while that of non-monetary institutions declined during the same period, with the exception of 1981. The main impetus for the growth of monetary

---

and new bond agencies were permitted in 1995.

institutions was the increase of domestic and local institutions(credit departments), and, to a lesser extent, the increase in branches of foreign banks. The major factor causing the decrease of the non-monetary institutions' share could be attributed to the decline of post savings and rigid policies and narrowed means of maneuvering that made them unable to meet the fierce competition from new banks and other financial institutions. Third, although the share of non-monetary institutions is declining, that of capital market(bonds and stock markets) within this sector has been demonstrating radical growth. The capital market, however, is not as significant as the sub-sectors of the monetary sector.

The patterns emerging from Table 5-3 lead a discussion of how the Taiwanese state continues to play the role of financier by indirect means.

First, Table 5-3 shows at least a partial picture of the financial system constructed by the Taiwanese state. By integrating the financial institutions left by the colonial government with newly established banks or those revived after the war, the government built a dual financial system: the central structure comprised the Central Bank of China(and the Taiwan Bank as the central bank prior to 1961) and a group of banks owned by Taiwan provincial government; the structure comprised credit unions and credit departments in farmers' as well as fishermen's associations, which were led by the Cooperative Bank. In other words, as in Japanese practices, the Taiwanese state's control over the financial system has been systematic, structural, and credit-based.(That is, enterprises received funds from the state-controlled banking system.) This is different from an equity-based system in which enterprises obtain capital from the stock market, as is exemplified

by the Anglo-Saxon system. Even though privately owned banks continued to grow from the seventies to the nineties, state-owned banks could still lend to designated manufacturing sectors and specific types of firms. The steady growth of domestic banks does indicate that privately owned banks have been making progress, but it also means that state-owned banks might not be shrinking.

This point could be reinforced by considering two trends. Taking advantage of the tide of financial liberalization, the KMT, which owns at least seven stock-holding companies and has made cross-investment with state-owned enterprises and large firms(local and foreign), has established three to four commercial banks to take advantage of market opportunities. While conforming to market principles, these banks could support the state's policies by consensus with (or taking orders from) the Finance Committee of the KMT. Moreover, prior to establishing funds for small and medium enterprises(SME) in 1991, the state established a group of small and medium enterprises banks as early as 1977 to assist SMEs and provide preferential loans for them. This suggests that the Taiwanese state's influence has not completely disappeared.

Second, Taiwan, like Japan and other industrialized countries, has a post savings program under the governance of the Directorate General of Postal Remittances & Saving Banks(DGPRSB) in the Ministry of Communication. The program started in 1919 and was closed between 1950 and 1961. Since it was resumed in 1962, this program has been responsible for absorbing private savings, to lessen inflation pressures, and depositing them in the central bank as

well as in special banks for further use.[11] Usually the re-deposited savings are used to build economic infrastructures(electricity and transportation systems), support national construction projects, and, since 1992, purchase government or treasury bonds. Although its share and significance have been overshadowed by domestic banks, it is still a major player in the Taiwanese financial system and offers funds to support national economic plans, and macroeconomic adjustment policies,. It also provides special funding to stabilize the stock market.

Third, the Taiwanese state still has other sources of funds that do not appear in Table 5-3. They enable the state to act as a financier even when the financial system has been adjusted to include the equity-based system. Through a project similar to that of Japan, the Taiwanese state has established various funds to promote economic and industrial development. The Sino-American Fund for Economic and Social Development, set up in 1965, the Strategic Industry Fund established in 1982, and the Development Fund are three salient examples.[12] By drawing resources from U.S. aid(the Sino-American Fund), from the profits of privatizing state-owned enterprises(the Development Fund), or from the

---

[11] The four special banks are the Bank of Communication(BOC), the Chinese Farmer Bank, the Land Bank of Taiwan, and the Taiwan SME banks. The BOC, as has been mentioned, is like an industrial bank; the Chinese Farmer Bank of Taiwan assists and lends to farmers; the Taiwan SME Bank assists small and medium enterprises; and the Land Bank reinforces the government's agricultural, land, and housing policies.

[12] The Development Fund was initiated in 1973 by K.T. Li, the Minister of Finance at that time by applying the Statute for Encouragement of Investment, which serves as the legal basis of the fund. The Development Fund draws from the income of a privatized state-owned bank, other special funds, and the Treasury. It is supposed to invest in industries in which the private business is not willing or able to invest, in technical-intensive industries, as well as in projects that

government budget, the state can assist in the development of domestic capital goods producers, the high technology sector, or socioeconomic projects(Wade, 1990: 168-9).

The Development Fund of the Executive Yuan has been playing a significant role in constructing high technology industries by cooperating with preferential loans. For example, to promote high-tech industries, the Development Fund and the Chiao-Tung Bank have allocated funds to projects creating, introducing, or using high-tech industries. This preference can be confirmed by the loans provided by the Industrial Development and Investment Center(IDIC) of MOEA, and by the main projects financed by the Development Fund, the Chiao-Tung Bank(Bank of Communication), and other national banks:

1. Preferential Loans to Firms Purchasing Domestically-Produced Automation Equipment

Target: general manufacturers, SMEs, & warehouse firms

National banks involved: the Chiao-Tung Bank & Taiwan Business Bank

2. Loans for Assisting SMEs Upgrading

Target: small and medium enterprises

National banks involved: Taiwan Business Bank

3. Loans for Purchasing Anti-Pollution Equipment by Private Business

Targets: private plants

National banks involved: the Chiao-Tung Bank, and so on

4. Mid- and Long-Term Investment Loans by the CEPD

---

introduce important technologies.

Targets: major government projects & private investment projects over 200 million dollars

National banks involved: 34 national banks and 8 local banks for SMEs.

5. *Foreign Currency Financing by the Central Bank of China*

Targets: overseas investment by public and private business, the Ten Emerging Industries Projects, and major investment projects approved by the government, etc.

National banks involved: designated foreign exchange banks

6. *Foreign Exchange Loans*

Targets: technology-intensive industries and major export industries

National banks involved: designated foreign exchange banks

In general, the Taiwanese state's control over the Taiwanese financial market and institutions has been loosened to cope with the needs of fast developing domestic and global financial markets, on the one hand, and the pressures of liberalization and privatization, on the other. However, this does not indicate that the state has completely lost its influence on its domestic financial system. The Taiwanese state can still utilize the policy instruments at hand and its remaining control over the financial system(state- and KMT-owned banks and the post saving program) to reinforce the implementation of industrial policies aimed at industrial upgrading and high technology industries.

Some aspects of the Taiwanese financial system are similar to those of the Japanese system. Both economies have been credit- rather than equity-based

and both have had to face liberalization, which increases the significance of the equity-based relative to the credit-based system. The Taiwanese state has been using the post savings program to absorb inflation pressures and redirect them for infrastructure construction and specific industrial development. This is also similar to Japanese practices.

There are, however, some differences that are relevant to the themes of this dissertation. The first is the time lag. While the Japanese financial system witnessed the emergence of the capital market in the early seventies, the Taiwanese system did not face the explosion of financial activities and the pressures of financial liberalization until the late eighties. The second is that, while both states have been losing control of the banking system, the Taiwanese state has been able to maintain its influence through controlling various funding sources, such as the Development Fund and KMT-owned firms engaged in financial business. The latter is especially significant. For example, the China Development Corporation, a KMT-owned holding company, has developed cross-shareholding relationships with state-owned enterprises and large firms and may pioneer or reinforce the ruling party's industrial and financial policies. A case in point is that the company has decided to cooperate with the central banks of various Southeast Asian countries to establish development banks for the purpose of implementing the Southward Policy(see below) and of helping these countries cope with the financial crisis that began in 1997(Hung, 1998). It is unlikely that the Liberal Democratic Party would have similar party-owned businesses to assist the economic bureaucracy. The third difference is that, while

the Japanese state has assigned part of the Fiscal Investment and Loan Program(FILP) to finance Japan's foreign aid, the Taiwanese state is still concentrating post savings in national industrial development, macroeconomic adjustment, and stock market stabilization. This reflects the contrast between Taiwan's national and Japan's regional orientation, the causes of which are spelled out in the first part of this chapter.

From Absorbing Inward FDI to Calibrating Outward FDI

Taiwan did not receive substantial FDI during the fifties, partly because of its unstable status at that time and partly because of its reliance on the U.S. aid. However, in view of the imminent cutback of U.S. aid, the Taiwanese state tried to attract the investment of American and Japanese TNCs by imposing fewer restrictions and offering more incentives. The state's policies toward inward FDI became more selective during the sixties as it put various limitations on inward FDI, with the purpose of promoting exports and establishing a domestic industrial foundation. During the seventies, the basic aim of the state's policies on inward FDI was to deepen Taiwanese industrialization by discouraging labor-intensive and welcoming technology-intensive industries. The keynote of the state's policies did not change in the eighties and nineties; that is, the state has been selective in attracting and reviewing the projects of inward FDI, with the purpose of continuing to upgrade Taiwanese industries, and, to a lesser extent, of stabilizing Taiwan's situation in international diplomatic politics. The latter was true especially in the late seventies(Wade, 1990: 149-55).

Unlike Korea and Japan, both of which have discouraged inward FDI through

government policies and through domestic economic structural barriers, Taiwan has formulated and implemented a series of laws and regulation to attract and manage inward FDI. Examples are the regulation of foreign investment made by foreigners(starting in 1954) and overseas Chinese(starting in 1955). The total amount of inward FDI has been more than one billion dollars since then, sometimes surpassing two billion dollars in certain years(1989, 1990, 1995, and 1996).

In the late eighties, when Taiwan had been attracting inward FDI for three decades, the Taiwanese FDI and the regime governing it began to change.

First, Taiwanese FDI began to experience substantial growth in 1989, surpassing one billion dollars in 1990 and even overtaking the inward FDI in 1993(1.6 versus 1.2 billion dollars). Though its leading status did not continue, the amount of Taiwanese FDI has been following that of inward FDI closely. Note, moreover, that the above data for Taiwanese FDI do not include Taiwanese investment in Mainland China. If these data were included, the amount of Taiwanese FDI would overtake that of inward FDI.(See Chapter 3.)

Second, Taiwan's experience is like Japan's with regard to regulation of outward direct investment. Both countries' policies evolved from more regulatory to more encouraging when the balance of payments(capital accounts and current accounts) improved and when domestic industrial structures grew and began relocating overseas to adapt to changing macroeconomic conditions and to implement firms' strategies. To nudge industries that have lost comparative advantages to relocate overseas, and in view of Taiwan's swelling foreign

exchange reserves, which, in 1992, amounted to more than 85 billion dollars and were the second largest in the world, Taiwan's legal and policy frameworks have been gradually loosening and increasingly promoting outward investment. The goals of these changes are to prevent the surplus of foreign exchange reserves from negatively impacting the domestic economy and to upgrade the national industries to be more capital, technical, and knowledge-intensive ones.

The government's policies on outward direct investment were based on the Regulations Governing the Screening and Handling of Outward Investment and Outward Technical Cooperation Projects, which was promulgated in 1962. The policies changed from imposing complete restriction without incentives in the sixties and seventies to decreasing restrictions(except on investment in Mainland China) and offering a variety of incentives in the late seventies and eighties. Depending on the policy's goals, such as securing natural resources(1979-84), consolidating diplomatic relationships(1984-86), or acquiring advanced technologies, the incentive packages ranged from simply giving five-year tax exemption to inclusive tax exemptions, overseas investment insurance and financing, as well as information collection and dissemination by means of booklets and seminars(UNCTAD, 1995: 324-6).

Third, just as the Export and Import Bank of Japan(JEXIM) evolved from promoting trade to promoting outward investment and providing loans to specific projects, the Export-and-Import Bank of China(CEXIM) has been promoting outward investment since the eighties. Its financing policies range from general investment, to investment insurance for plants exports projects aimed at Central

and South American countries, as well as loans to projects that plan to invest in countries maintaining diplomatic relationships with Taiwan. However, no comparable data are available for making extensive comparisons. What we have is some partial data for lateral reference, which are presented in Table 5-4 and 5-5.

Table 5-4 Credit Commitments of the CEXIM, by Type of Credit(1987-1995, Percentage)

	1987	*1989*	*1990*	*1995*
Medium & Long-Term Export Credits	6.9	12.6	66.3	9.1
Fixed-Rate Relending Facilities	2.9	12.6	5.8	42.9
Overseas Construction Credits	10.4	-	3.9	-
Medium & Long-Term Import Credits	27.8	58.1	15.0	11.8
Shipbuilding Credits	1.1	9.7	-	9.6
Short-Term Export Credits	0.9	6.5	3.8	5.2
Overseas Investment Credits	--	0.5	5.2	17.5

Source: CEXIM, *Annual Report of The Export-Import Bank of the Republic of China*, various issues.
Note: The years are fiscal years of Taiwan(from July 1 of the preceding year to June 30 of the next year).

Table 5-4 shows that, as in the experience of its counterpart in Japan, the Export-and-Import Bank of China has witnessed the growth of overseas investment credit through its processing, with the result that the share of overseas investment credits jumped from 0.5 percent in 1989 to 5.2 percent in 1990 and skyrocketed to 17.5 percent in 1995. However, the share of the overseas investment credits has not been able to replace the status of those for exports and imports; that is, their share is still falling behind those of exports and imports.

This is different from the Japanese experience and could be attributed to Taiwan's higher export intensity.(See the section on international comparisons in Chapter Three.) Indeed, the share of fixed rate relending rose sharply from 2.9 percent in 1987 to 42.9 percent in 1995; but it was used to encourage buyers to procure machinery and other industrial products manufactured by Taiwanese firms, and thus should be categorized as credits for exports.

Table 5-5 Credit Commitments of the CEXIM, by Area(1987-1995, Percentage)

	1987	*1989*	*1990*	*1995*
Southeast Asia	14.4	9.6	17.8	***43.8***
Northeast and South Asia	10.0	18.6	--	(Asia)
North America	1.6	30.8	6.0	***38.2***
Latin America	1.5	17.3	11.8	(America)
Oceania and Australia	-	12.3	-	0.5
Europe	4.8	10.8	4.1	14.4
Africa and the Middle East	67.7	0.6	48.9	3.1(Africa)
Republic of China	--	--	10.8	--

Source: CEXIM, *Annual Report of The Export-Import Bank of the Republic of China*, various issues.
Note 1: The years are fiscal years of Taiwan.
Note 2: Two numbers in the column of 1995; that is, 43.8 and 38.2, are the sum of Asian and American areas, respectively.

Table 5-5 shows the unstable, even sharply fluctuating, patterns of credit commitment of the Export-and-Import Bank of China regarding area distribution. Asia was not the major target of credit commitments processed by the bank until 1995. In 1987, the Asian share(24.4 percent= 14.4+10.0) was overshadowed by that of Africa and the Middle East. In 1989, the Asian share(28.2 percent=

9.6+18.6) overtook that of Africa and the Middle East, but it fell far behind that of America(48.1 percent= 30.8+17.3). The Asian share in 1990 was again overshadowed by that of Africa and the Middle East. The Asian share finally reached its apex in 1995; but note that it is very hard to determine whether the major part of the share was focused on credits for export and imports or on overseas investment loans.

Though the Taiwanese government and related semiofficial organizations have not been as active as their counterparts in Japan regarding overseas investment credits or loans, it is unfair to say that they have ignored these financial activities. The Export-and-Import Bank of China has been dealing with loan guarantees and insurance for overseas investment, though the shares are quite low.[13] Moreover, if they planned to make overseas investments that would contribute to domestic economic development, private firms could get financing from designated banks that channel funds from the Central Bank of China. In accordance with the government policies for strengthening economic relationships with Southeast Asian countries by investing in those countries, small and medium enterprises(SMEs) could also apply for low-interest loans from the Development Fund for the SMEs.

Fourth, in comparison to its counterpart in Japan, the Taiwanese regime

---

[13] In 1995, the share of financing guarantees was 1.8 percent, which was lower than those of overseas construction(40.0 percent) and export guarantees(21.6 percent). In the same year, the share of overseas investment insurance was 3.3 percent, which was far lower than that of export insurance(91.5 percent). For details, see the 1995 annual report of the Export-and-Import Bank of China(in Chinese).

governing outward FDI has been motivated more by political considerations. Recently, to cope with China's increasing efforts to isolate Taiwan on the international political stage and to disperse the flow of Taiwanese investment in China, the Taiwanese state has persuaded certain business leaders to participate in government's projects of strengthening political and economic relationships with Central American countries, most of which have maintained diplomatic relationships with Taiwan and have been facing China's offers attempting to seduce them to break away from Taiwan, on the one hand, and with Southeastern Asian countries, the most convenient alternatives of outward FDI targets, on the other. Not only has Taiwan decided to participate in the Central American Common Market and Community, but the state has cooperated with certain business leaders who have good relationships with the government to establish holding and investment companies, which take responsibility for promoting Taiwanese investment in those countries. Moreover, under the guidance of the Southward Policy, some state- and KMT-owned companies have made several investments in Southeast Asian countries, such as the Philippines and Indonesia.[14] In contrast to the Japanese practice of directing the flow of outward FDI, which has the purpose of constructing regional division of labor and integration, the Taiwanese practices are often intended to resist China's pressures and ensure political survival(UNCTAD, 1995: 345).

---

[14] For the details of the Southward Policy and its action in directing Taiwanese FDI, please see the discussion in the third section of this chapter.

From Receiving Foreign Aids to Providing Aids

During the postwar era, the Taiwanese foreign aid system developed into four institutions, each of which has different responsibilities and tasks. The first is the Central Bank of China, which allocates part of its budget for the contribution to international multilateral development organizations, such as the Asian Development Bank(ADB), of which Taiwan is a full member. The second is the Ministry of Foreign Affairs(MOFA), whose budgets for international activities, humanitarian aid, and technical cooperation constitute the major types of foreign aid. The third is the Committee of International Technical Cooperation, which deals with technical assistance aid and comprises the ministries of Foreign Affairs, Economic Affairs, and others pertaining to agriculture. The fourth is the International Economic Cooperation and Development Fund, a semiofficial organization dealing with affairs related to allocating Taiwan's foreign aid. It was renamed the International Cooperation and Development Fund(ICDF) in 1996(Chan, 1997: 45-6). Here the focus will be on the ICDF and bilateral aid, because multilateral aid is less than bilateral aid and results in part from international pressures(e.g., the Brady Plan of the U.S.).[15] Moreover, the budget of MOFA for foreign aid, especially that related to "international activities" has been kept confidential for the purpose of strengthening Taiwan's diplomatic

---

[15] According to Chan(1997: 42), the amount of Taiwan's contribution to multilateral development organizations, such as the Asian Development Bank, the World Bank, and so forth, for co-financing reached 86.8 million dollars as of 1994. From 1988 to 1995, however, the twenty loans made by the IECDF amounted to 331.1 million dollars(cited from http://www.ruf.rice.edu/~rta/un-roc.htm) .

situation and preventing Mainland China from undermining Taiwan's effort, and the Committee of International Technical Cooperation has been incorporated to the ICDF.

Unlike Japan and some OECD countries, Taiwan is not a member of the Development Assistance Committee(DAC). However, at the time when Taiwan was accepting U.S. aid, it had been offering foreign aid since 1959, most of which was in the form of agricultural technical assistance(mission teams) aimed at developing countries in Asia, Africa, and Latin America, with the objectives that they could get sustained agricultural development, that the recipient countries would support Taiwan's seat in the United Nations(before 1971), and that the US would appreciate Taiwan's aids to Latin American countries(after 1971) and support Taiwan in international politics(Cheng, 1994: 172-5; Karp, 1991).

Since the eighties, however, the leading position of agricultural assistance has been gradually replaced by preferential loans funded by the International Economic Cooperation and Development Fund(IECDF), which was established in 1988 under the jurisdiction of the Ministries of Economic Affairs(MOEA) and Foreign Affairs(MOFA). The goals of IECDF are strengthening economic cooperation between Taiwan and friendly countries that maintain official diplomatic relations or intend to keep wide-ranging relationships(except for politically-sensitive issues), with Taiwan, on the one hand, and assisting them to develop economy as well as industries, on the other. The ways of achieving the objectives include providing direct and indirect loans, participating in direct and indirect investments, guaranteeing investment and loans, providing technical

assistance, and cooperating with multilateral international organizations, most of which seem to be based mainly on economic considerations(Schive, 1993: 119).

In view of the diplomatic situation confronting Taiwan, however, its foreign aid has been concentrated in Central American and Oceania countries. Table 5-6 shows that, from 1988 to 1991, 38.8 percent of the loans offered by the IECDF were concentrated in Central American and Caribbean countries, most of which maintained diplomatic relations with Taiwan during this period and received less Taiwanese FDI than Southeast Asia and China.(Refer to the discussion in Chapter 3.) Only 14.5 percent of the loans were allocated to a Southeast Asian country, namely, the Philippines.

Table 5-6 Loan Grants by the IECDF(1988-91, $ Million)

Country	***Project***	***Amount***
Costa Rica	Export processing zone	9.0(6.5)
Panama	Export processing zone	7.8(5.6)
Ireland	Industrial zone	20.0(14.5)
Dominican Republic	Products processing zone	2.5(1.8)
Bahamas	Fish breeding zone	5.0(3.6)
Papua New Guinea	Community development plan	15.0(10.8)
Saint Vincent	Domestic construction	8.0(5.8)
Malawi	Transportation construction	27.0(19.5)
Honduras	Highway maintenance	20.0(14.5)
Philippines	Waterworks	20.1(14.5)
Bahamas	Vegetable and fruit Growing project	3.9(2.8)
Total		*138.3(100)*

Source: Cheng(1994: p. 178). Figures in parentheses are percentages.

Table 5-7 shows that the distribution of technical assistance was even more concentrated than that of the loans provided by the IECDF. While 56.1 percent of technical assistance was devoted to Central American and Caribbean countries(excluding Mexico, which has not maintained diplomatic relations with Taiwan), only 8.8 percent was allocated to Southeast Asia.

These patterns are in sharp contrast to those of Japan. As has already been indicated, the geographical distribution of Japan's bilateral ODA has been concentrated in Far Eastern Asian countries, especially those in East and Southeast Asia countries, which have been receiving increasing Japanese FDI and more than other developing countries in the world. In Korea's case as well, most of the funds provided by the Economic Development Cooperation

Table 5-7 Technical Assistance Funded by the IECDF(1988-91, $ Million)

Country	***Project***	***Amount***
The Philippines	On-job training center at De La Salle University	0.3(4.8)
United States	Transfer of milkfish Breeding technology for USAID	1.530(24.6)
Thailand	Tax reforms	0.25(4.0)
Venezuela	Export processing zone	0.35(5.6)
Guatemala	Export processing zone	0.94(15.1)
Paraguay	Alloy iron project	0.17(2.7)
Papua New Guinea	Small & medium Enterprises development	0.5(8.0)
Costa Rica	Small & medium Enterprises development	1.5(24.1)
Mexico	Feasibility studies on export processing zone	0.1(1.6)
Bahamas	Spiral shell processing industry	0.579(9.3)
Total		*6.219(100)*

Source: Cheng(1994: p. 178). Figures in parentheses are percentages.

Fund(EDCF) have gone to Asia.[16] For example, in 1995 and 1996, 57.7 and 71.7 percent of EDCF funds were allocated to Asian developing countries(KEXIM, 1995; KEXIM, 1996), some of which(e.g., China since the late eighties) have received more Korean direct investment than other developing countries outside the region.[17]

In contrast, Taiwan's foreign aid that is embodied in the form of loans and provided by the IECDF has been focused on Central American and Caribbean countries, most of which have not received large amounts of Taiwanese FDI.(See Chapter Three.)

This contrast in geographical distribution patterns results from different motivations and considerations. While Japanese bilateral official development assistance(ODA) has focused on constructing social and economic infrastructures in the developing countries that hosted large amounts of Japanese FDI to facilitate Japanese investment, trade, and relocation of Japanese industries that were declining or losing comparative advantages, as has been indicated in Chapter Two and mentioned by other commentators(Arase, 1995: 252-6), Taiwan's bilateral foreign aid has been based on the motive of ensuring survival in the face of Mainland China's isolating pressures, which were intended

---

[16] The ECDF was established by the Korean government in 1987 and managed by the Export-and-Import Bank of Korea(KEXIM) as well as by the Ministry of Finance and Economy.

[17] For example, in 1989, China received 6 million dollars of Korean FDI, which was higher than other developing countries in Latin America and Africa. In 1990, China hosted 16 million dollars of Korean FDI, which not only surpasses other developing countries in other regions, but is even higher than some Asian countries, such as Hong Kong and Singapore. See OECD, 1993, p. 139, Table 4.

to force the reunification of Taiwan with the People's Republic of China when Taiwan has lost substantial official diplomatic relationships completely. Taiwan's situation and foreign aid practices seem more peculiar if one considers that the Economic Development Cooperation Fund(EDCF) of Korea intended to use the bilateral ODA programs in the forms of loans and equity investments to finance development projects in the developing recipient countries, on the one hand, and to assist Korean manufacturing firms in investing in the host countries and facilitate Korean exports, on the other(KXIM, 1996; KITA). This shows the significance of economic considerations in Korea's foreign aid practices and is in sharp contrast to Taiwanese practices.

It is not implied, however, that Japanese official development assistance(ODA) does not have any political motives. It has been indicated that Japan intends to use her ODA to generate support for her bid for a seat in the UN Security Council and that Japan does use ODA as an instrument for foreign policy(Arase, 1995: 203-31; Koppel and Orr, 1993: 341-66). Nor is it implied that Taiwan's foreign aid has never been based on economic considerations. A source from the ICDF told the author that Taiwan's foreign aid formerly had economic motives. Here it is argued that, while political motives are not as dominant as economic ones in Japan's case, the motive of surviving in the face of the isolating pressures of the People's Republic of China(PRC) is the main consideration of Taiwan's practices in foreign aid.

This motive is apparent in the aid of the Ministry of Foreign Affairs(MOFA) provided for developing countries in Latin America and Africa. It is reported that,

by establishing diplomatic relations with Taiwan after President Lee Teng-Hui assumed his position, eight countries received various aids from Taiwan, and at least four of them recognized Taiwan as a result. It is also reported that the seven countries in Central America that recognize Taiwan have received Taiwanese aid worth 9 million dollars, or 33 percent of the MOFA budget(Karp, 1991: 34). The war of attracting friends between Taiwan and the PRC has been no less intense in Africa. This gives some African countries opportunities to take advantage of aid offered by both sides at the same time(Economist, Sept 14, 1996: 44).

The second feature that differentiates Taiwan's foreign aid from Japan's bilateral official development assistance(ODA) is that the former has not developed a concept similar to the concept of Japanese economic cooperation. It has been argued that Japan's bilateral ODA in the form of loan-aid corresponds to Japanese FDI, and that the concept of economic cooperation lies at the center of Japan's practices of ODA. There are no comparable concepts of economic cooperation underlying Taiwan's foreign aid practices, nor does Taiwan's foreign aid correspond to Taiwanese FDI. From Table 5-6 and 5-7, it is clear that the major types of Taiwan's foreign aid are the construction of infrastructures and export processing zones. Together with technical assistance, these practices generate the impression that one of the purposes of Taiwan's foreign aid is to transmit Taiwan's economic experience, especially export processing zones and the small and medium enterprise(SME) system, to the recipient countries. In other words, Taiwan's foreign aid has a significant economic rationale.

However, since the main motive of Taiwan's foreign aid is to survive in the

unfavorable international environment and since there have been struggles between the Ministries of Foreign Affairs and Economic Affairs with regard to the use of foreign aids, the economic rationale is overshadowed by political motives. Moreover, there are no government-led projects intended to transfer industries that have lost comparative advantages in Taiwan to the recipient countries. Most of the declining industries initiated their relocation by themselves. For instance, the government did not calibrate large-scale investment projects in China and, to a lesser extent, Southeast Asian countries until the late eighties and the early nineties; but before the Taiwanese state begin to take actions regarding outward investment, Taiwanese manufacturers making clothes and footwear have already made investment in Mainland China and Southeast Asia since the mid-eighties(Leng, 1996: 126).

More importantly, Taiwan's organizational mechanism for practicing foreign aid is not as sophisticated as that of Japan. In Japan's case, it has been shown that the ministries of Foreign Affairs, (MOFA), of International Trade and Industry(MITI), of Finance(MOF), as well as the Economic Planning Agency(EPA) are the major ministries and that the Overseas Economic Cooperation Fund(OECF) and the Japan International Cooperation Agency(JICA) are major semi-governmental organizations responsible for channeling funds to, and providing technical assistance for, aid projects. There are inter-ministerial conflicts, to be sure, but the general effects of promoting infrastructure construction and facilitating Japan's national industrial restructuring have not encountered serious institutional obstacles resulting from intra-bureaucratic

conflicts. In contrast, Taiwan's foreign aid has been dominated by the Ministry of Foreign Affairs(MOFA), whether the aid is in the form of the humanitarian grants, low-interest loans, or international technical assistance. Though the IECDF was initiated by the Ministry of Economic Affairs(MOEA), the complaint that MOFA has been trying to dominate the operation of the IECDF is common(Cheng, 1994: 180-2). Furthermore, no new budget has been allocated to the IECDF since 1991. This means that the IECDF has not been very active for six years, although it has approved loans to the Philippines for constructing the Subic Bay Industrial Park, on the one hand, and to Vietnam for building an export processing zone, for constructing the Hanoi-Haiphong highway, and for funding small and medium enterprises, on the other(Liu, 1995: 136; Mekong Digest, 1993). In addition, from the beginning, the existence of the IECDF has lacked a substantial legal framework or basis, although it is implemented under executive orders. Not until January 1996 was the Statute of the International Economic and Development Cooperation Fund passed by the Legislative Yuan(the Congress). And, according to the new law, jurisdiction over the IECDF will be given to MOFA, which is likely to use the funds and resources of the IECDF as additional instruments for its foreign policies, rather than constructing a comprehensive framework of economic cooperation similar to that of Japan.

Nonetheless, some changes in Taiwan's foreign aid seem to be emerging. In view of the insufficiencies in the mechanism and resources for implementing foreign aid policies, the International Cooperation and Development Fund(ICDF) was established in 1996 after the Establishment Statute of the International

Cooperation and Development Fund was passed by the Legislative Yuan and after it absorbed the IECDF.[18] In 1997, the international financial crisis devastated Korea and Southeast Asian countries(e.g., Indonesia and Thailand). This crisis helped to activate the re-allocation of the budget to the ICDF. The ICDF is directed by the government to evaluate the possibility of reinvesting in the construction of two export processing zones in Indonesia(Lyu, 1998a), in addition to routine projects, such as technical assistance, training technicians, and providing refinancing. Although the ICDF has gained some importance, its future operation and whether or not it will develop its own way of "economic cooperation" remain to be seen, because its financial resources are still limited.

III. The State As a Promoter

Like its counterpart in Japan, the Taiwanese developmental state has been playing the role of promoter in incubating and developing its industries. Depending on the institutions and policies of each country, the specifics of promotion vary, but the most common strategies include the following: First, the state tries to strengthen the technological capabilities of industries by subsidizing and establishing semiofficial R&D organizations, which transfer their R&D results to the private sector through licensing and other means(entrusted by manufacturers). Second, the state encourages or persuades manufacturers to develop and make certain types of products in view of the market and the technological potential of those products. Third, the state forges industrial

[18] According to some political commentators, the ICDF represents the victory of the Ministry of Foreign Affairs over the Ministry of Economic Affairs in the struggle

division of labor by promoting cooperative relationships between state-owned enterprises and private manufacturers or by providing incentives to attract foreign firms, which are usually required to assist domestic manufacturers in learning technologies. Fourth, the state forges industrial networks, which connect small and medium-sized makers with large manufacturers, and creates relationships for division of labor. Fifth, the state designs and implements tax/tariff incentives as well as statutes that promote investment and export.

Strengthening the technological capabilities of the private sector through the state's policies and resources is one of the foremost strategies adopted by the capitalist developmental state. This is reasonable because, as newly industrialized economies with fewer technological capabilities and weaker private sectors, developmental states must concentrate all their available resources to assist manufacturers, whose economies of scales are not large enough to do R&D, and obtain achievement within a short period of time.

The Taiwanese state has been committed to forging technological capabilities and transferring them to the private sector since the seventies as the strategy of importing technologies through technical agreements and FDI was not sufficient during the sixties and seventies. In 1974, the Industrial Technology Research Institute(ITRI) was established by the economic bureaucracy. Its assignment was to specialize in industrial R&D, so that research results could be transferred to the private sector and specific policy objectives could be met under the direction of industrial development projects, such as the Electronics Industry

---

to reorganize the IECDF. (See Cheng, 1994 and Chang, 1996.)

Development Plan(1980-89). Not only has the ITRI developed into a large R&D organizations, whose budget comes from government subsidies, licensing fees, and business transactions, but many of its engineers and technicians have left the organization to form private enterprises(spin-offs) or other public industrial organizations specializing in technology services, such as testing and quality control. In the former cases, Taiwan Semiconductor Manufacturing Company(TSMC), which is discussed in the fourth chapter, is a good example of an ITRI spin-off; in the latter case, the Electronics Testing Center, which was a spin-off of the testing section of the ITRI in 1983, became an independent organization providing testing services for Taiwanese electronics and electric machinery manufacturers.

As the ITRI became a complex R&D organization with six thousand employees and an annual budget of 15 billion NT dollars, it focused on various industries, such as electronics, machinery and automation, textiles, metal. The state also became aware of the importance of software technologies, and this led to the establishment of the Institute for Information Industry(III), whose task is to promote the production and commercialization of computer software. As in the case of ITRI, III has had spin-offs that made contributions to the software industry. The ITRI, especially the Electronics Research and Service Organization(ERSO) within it, and III laid the foundation for the Taiwanese electronics industry, contributing to its growth in the late eighties and the nineties.(See the discussion in Chapter 4.)

The ITRI and III represent R&D organizations promoted by the Taiwanese

state, but their achievements would not have been significant if the National Science Council, the highest government agency in charge of the formulation of technology policies, had not established the Hsinchu Science-Based Industrial Park(HSIP) in 1980. This organization was assigned the task of attracting domestic and foreign high-technology manufacturers with its complete industrial infrastructures, which would generate the clustering effect. The clustering effect is to connect the upstream, midstream, and downstream manufacturers and strengthen the market efficiency by saving time in searching and communication. Thanks to the clustering effect resulting from the industrial park facilities and to the engineers provided by National Tsinghua University and National Chiaotung University, both of which specialize in training engineers and are located near the park, the science-based industrial park constitute one of the pillars of Taiwanese high-technology development with the ITRI and III under the state's supervision(Wang, 1995-6: 562-70; Simon, 1992: 140; Wade, 1990: 98-9).

The second way the Taiwanese state promoted industrial development was to select promising private manufacturers and assist them in developing designated products, with the hope that certain process technologies could be obtained through the learning process. For instance, with the assistance of ITRI and the Industrial Development Bureau(IDB), a branch promoting national industrial development under the command of the MOEA, Guangyang and Sanyang, two main motorcycle makers in Taiwan, have developed the capacity to manufacture all the parts of motorcycles as well as environmentally sound technology. Not only so, but the ITRI and some Taiwanese auto makers have

formed a joint venture to develop a common engine for automobiles made by domestic producers either in Taiwan or in new plants built in Mainland China(Noble, 1996).

The third way the state encouraged development was to form relationships for division of labor between state-owned enterprises and private manufacturers. Because it owned the Chinese Petroleum Corporation and controlled upstream material supplies, the state could force private makers in the midstream and downstream value chains to depend on the state's provision. Because it set up and owned China Steel, the state supported the basic metals industry and other industries that needed steel, such as automobile manufacturers and shipbuilders(Wade, 1990; 91-2, 99-100). To complement domestic accumulation of technology capabilities, the Taiwanese state continued to attract FDI to the manufacturing sector, in addition to importing technologies through licensing and other means(e.g., content requirements). In the fifties, the state brought together an American synthetic fibers manufacturer and several Taiwanese makers to form a joint venture(Wade, 1990: 80). This strategy has continued into the nineties. Moreover, through signing letters of will, the economic bureaucracy has solicited many TNCs to transfer technologies, such as IBM(software technology development), Digital(Video-on-Demand and 32 bit chips), Lockheed Martin(Industrial Cooperation Agreement, ICA; components and maintaining works of airplanes), and so forth. The government also encouraged Taiwanese as well as foreign firms to form joint ventures(e.g., Carpenter Technology with Walsin Technology Corporation to make special steel).

The fourth way is related to the Japanese experience. When reconstructing the financial system, the MITI reassembled the elements of the zaibatsu that had been dispersed by the Supreme Commander for the Allied Powers(SCAP) and forged the keiretsu. The keiretsu is constituted by banks, the *sogo shosha*(the general trading company), and by specific manufacturers with different scales(Johnson, 1982: 205-6). These firms form relationships for division of labor characterized by stable subcontracting networks. In view of the achievement of the Japanese subcontracting networks in the manufacturing sector and the lack of stable cooperative relationships between Taiwanese small and medium as well as large manufacturers, the Ministry of Economic Affairs(MOEA) formed a special team to promote the industrial central-satellite factory system. This system adopted some cooperative relationships emerging from the Japanese system and tried to persuade private manufacturers to participate. In 1990, the special unit was spun off from MOEA and became an independent as well as public organization, with the name "Corporate Synergy Development Center(CSDC)." Through training, seminars, visiting, publishing, and technical assistance, the CSDC has successfully shaped many central-satellite factory systems in various manufacturing sectors, such as the electronic, automobile, and high technology industries, with the purpose of transferring technologies from large makers to small and medium manufacturers, controlling and increasing product qualities, and assisting smaller makers to develop marketing channels(Inoue et. al., 1993: 184).

The fifth way was to provide domestic and foreign manufacturers with

investment incentives, which were based on tax reduction and special statutes. The state promulgated the Statute for Encouragement of Investment(1960-90), which provided Taiwanese manufacturers with tax incentives and specified performance standards. The statute has been adapted to deal with the changing environment by incessant revision and adjustment(Wade, 1990: 182-4). Following its expiration, the Statute for Industrial Upgrading(1991-98) has been used to promote the upgrading of Taiwanese industries. It includes investment in automation, anti-pollution equipment, recycling, and R&D personnel training through tax and non-tax incentives(tax reduction and product development), low-interest loans for the purchase of capital goods, and the government's participation in investment(high technologies).

These special incentives and statutes are not limited to encouraging private investment. The government established export-processing zones, which were under the jurisdiction of the Ministry of Economic Affairs, to attract TNCs during Taiwan's early industrialization; those zones have developed close industrial connections with the Hsinchu Science-based Industrial Park(HSIP).[19] The state also provided export incentives(rebates and export credits, and so forth) and organized the China External Trade Development Council(CETRA), which collects and disseminates business information for Taiwanese firms and builds overseas trade channels and points(Wade, 1990: 145-7).

---

[19] For example, in 1995, roughly 84.63 percent of the products made in the three Taiwanese export processing zones were "exported" to the HSIP while 88.89 percent of the products made in the park and transported to the export processing zones were wafers. These data are cited from Chien and Hong(1998).

Several points about comparison could be made here. On the one hand, many characteristics of the Taiwanese state as a promoter resemble those of the Japanese developmental state. First, the Taiwanese state has been instrumental in the accumulation of national technological capabilities by formulating and implementing national R&D projects, providing low-interest loans for firms, offering subsidies, constructing industrial parks, sharing R&D achievements with private firms through semiofficial R&D organizations or laboratories, most of which are similar to Japanese practices, such as national R&D projects, the spillover of laboratory resources of the Nippon Telegraph and Telephone(NTT) and related firms, government financing(budget), and research subsidies(Okimoto, 1989: 66-83). Second, the ways in which the Taiwanese economic bureaucracy, especially the Industrial Development Bureau(IDB) assists targeted or potential firms in developing key or strategic industrial sectors are similar to the Japanese experiences in administrative guidance, although the technical procedures and political implications are different. While administrative guidance is losing its indispensability and significance in Japan, however, the IDB is still relying on its administrative resources to promote the development of high-technology and transformation of other old-line industries. Third, since the end of its high-speed growth period(1970), the Japanese government has not actively pursued the division of labor between state-owned enterprises(SOEs) and private firms because it has not had SOEs as huge and various as those of the Taiwanese state and because the Japanese keiretsu has formed a complete framework of division of labor between larger and smaller firms. Nevertheless, the

Taiwanese state has learned specific practices from the keiretsu system and promoted cooperative relationships between large and small firms by establishing various central-satellite factory systems. Fourth, in view of the small domestic market and lack of investment, the Taiwanese state has been extremely active in promoting investment by domestic and foreign firms and in encouraging exports through semiofficial organizations. This is similar to the Japanese state, although the specific mixes of policies and instruments are different.

On the other hand, few, if any, of the above-mentioned actions and measures of being a promoter have been systematically transplanted or regionalized to countries where Taiwanese firms have made substantial investments. It is true that, similar to its counterpart in Japan, the Taiwanese state has not been interested or active in teaching the host countries that have received substantial Taiwanese FDI to incubate and accumulate technological capabilities. It is also true that, like its counterpart in Japan, the Taiwanese state has entrusted research organizations and scholars with studying the conditions of the host countries and identifying the best opportunities for phasing out the industries in which Taiwan has lost comparative advantages.(See the following discussion), Its rationale, however, is based more on how Taiwan should upgrade its industries than on forging regional division of labor, which is one of the primary objectives of the Japanese state. The Taiwanese state has permitted or encouraged several state-owned enterprises(SOEs) to invest in Asian countries; but, as will be seen in the description below, most Taiwanese SOEs that have made investment overseas are in the primary industry, such as the Taiwan Sugar Corporation. This

indicates that the goal of regional division of labor between firms from Taiwan and in host countries is not salient. Furthermore, according to the author's conversation with an official at the Corporate Synergy Development Center(CSDC), the organization has no plans for constructing regional division of labor by extending the central-satellite factory system into the international arena. One focus of Taiwan's foreign aid to friendly Central American countries, however, is assisting them in developing small and medium enterprises.(See the following discussion). Finally, the state has been planning to provide tax incentives and easy financing for firms that have made overseas investments. However, the whole system and its effects remain to be seen as the recent global financial crisis has not yet ended, and the crisis could diminish the effects of these incentives and even the will to offer them.

Thus, using the evidence at hand, it is argued here that, unlike the Japanese developmental state, the Taiwanese state has pursued a conventional strategy of strengthening national industrial structures when facing new politico-economic realities. There have been some efforts to regionalize Taiwan's experience of economic and industrial development, to be sure; but these actions have not been managed under the direction of a comprehensive plan. Rather, they are dominated by the political motive of coping with the isolating pressures of the PRC.

The most salient policy that could characterized as the regionalizing effort by the Taiwanese developmental state is the Southward or "Look South" Policy, which was formulated by the government in 1993. According to the statement

submitted by the Ministry of Economic Affairs(MOEA), the basic consideration of the Southward Policy is to promote economic cooperation with Southeast Asian countries, especially the ASEAN countries. To realize the goals, it is suggested that

1. the government encourage Taiwanese firms to make more investments in Southeast Asia lest Taiwanese investment flow overwhelmingly to mainland China;
2. the government take advantage of the natural resources and potential of the ASEAN Free Trade Area(AFTA);
3. Taiwan strengthen realistic relationships with the ASEAN countries by helping them promote economic growth(Chen, 1994: 4).

Based on the "Outline of Strengthening Economic and Trade Relationships with Southeast Asian Countries," the Southward Policy includes the following strategies:

1. To negotiate and sign economic accords with Southeast Asian countries for investment guarantees and to avoid double taxing.
2. To establish industrial development zones by providing preferential loans funded by the International Economic Cooperation and Development Fund(IECDF).
3. To encourage agricultural and fishery cooperation.
4. To make indirect investment in Hainan Island(south of Guangdong province).

5. To set up bank branches to facilitate relevant financing for Taiwanese and other investors.
6. To provide overseas investment and trade insurance, which is funded by the Development Fund and the Export-and-Import Bank of China(CEXIM).
7. To use state-owned enterprises and KMT firms as the pioneers of investment and to facilitate national industrial restructuring by assisting the ASEAN countries in promoting industrialization.
8. To encourage Taiwanese firms in constructing business relationships with overseas Chinese firms and to encourage the interaction between Taiwanese small and medium enterprises(SMEs) and firms in the ASEAN countries(Chen, 1994: 13-24; MOEA, 1994).

To activate the Southward Policy and to demonstrate that Taiwan is capable of increasing its visibility even when being isolated by the PRC, President Lee Teng-Hui began his "vacation diplomacy" in 1994 by visiting the main members of the ASEAN, such as the Philippines, Thailand, and Indonesia(Baum, 1994: 18). The results are listed below(Liu, 1995):

1. the Philippines

The China Development Co.(KMT-owned), the Century Development Co.(KMT-owned), and the Philippines government supported the construction of the Subic Industrial Park by distributing a loan from the International Economic Cooperation and Development Fund(23.5 million dollars) for the first stage of construction.

2. Vietnam

a. Taiwan Sugar Corporation(an SOE) established a sugar plant with 66 million dollars worth of fund;

b. the Chinese Petroleum Corporation(CPC, an SOE), the Chifon(Taiwanese) Group, and the Vietnam government formed a joint venture to invest in a facility for importing liquefied natural gas worth 11 million dollars;

c. the Chinese Petroleum Corp, the Vietnam government, and a French petroleum firm co-invested in an oil refinery project worth1 billion dollars;

d. the Hanoi export processing zone was constructed by using an IECDF loan of 12 million dollars for the first stage of building;

e. and a cement plant in Haiphong was built with the investment of 288 million dollars.

3. Indonesia

Taiwan Sugar Corporation established a sugar plant by investing 70 million dollars.

At first glance, the Southward Policy and the projects listed in the outline above seem to suggest that the Taiwanese state has been interested in extending its managing capabilities to other countries, just as its Japanese counterpart has done. The former not only directs Taiwanese investment to the ASEAN countries, but apparently also intends to transplant certain elements of the Taiwanese experience, such as industrial parks and export processing zones, to the host countries. However, the paces of the Southward Policy slowed down right after

the vacation diplomacy.

Because he was concerned about skyrocketing Taiwanese investment in Mainland China and its hollowing-out effect, President Lee ordered the economic bureaucracy to reevaluate the Southward Policy and establish new regulations regarding Taiwanese investment in Mainland China. Accordingly, the MOEA disallowed the new overseas investment projects of SOEs, permitted the overseas investment of several small and medium enterprises that had lost comparative advantages in Taiwan, and began promoting the "Investment in Taiwan" program, with the hope that these actions could delay the speed and reduce the scale of outward investment. As a result, the Southward Policy has actually been inactive recently. During the promotion of "Investment in Taiwan" the plan of Formosa Plastics to build a power plant in Fujian Province and the project of President Enterprise to construct a power plant in Wuhan City(in Hupei Province) were canceled to abide by the government's order(Lee, Kuan-Jen, 1996). Furthermore, in June 1997, the government promulgated new regulations regarding Taiwanese investment in Mainland China. The regulation categorizes three investment types: permission, prohibition, and special review. It specifies that the amount of a single project should not exceed 50 million dollars, on the one hand, and that the ceiling of investment made by an enterprise in the mainland is based on the size of the enterprise, on the other. Basically, the larger the enterprise is, the more restricted the investment must be(Lian, 1997: 146).

Nevertheless, in 1997, when the international financial crisis swept East Asia(South Korea, Hong Kong, and Taiwan) and Southeast Asia(Indonesia,

Malaysia, and Thailand), the Southward Policy regained its importance. The government thought that Taiwan could utilize the opportunity to strengthen its relationships with Southeast Asian countries by providing financial assistance and encouraging Taiwanese investment and acquisition of assets in the region. For example, the Southeast Asia Investment Company was established in 1998 by the China Development Corporation(a KMT-owned firm). However, the feasibility of these plans and how the developmental state would act remain to be seen.

Although the government claims that the Southward Policy is a comprehensive policy and not a countermeasure aimed solely at Mainland China(Baum, 1994: 18), it is undeniable that the political consideration of balancing Taiwanese outward investment is still dominant. That is, it is feared that China will absorb the lion's share of Taiwanese outward investment and augment its economic leverage over Taiwan by taking advantage of the economic effects of Taiwanese investment in Mainland China. This political consideration is apparent in Taiwan's relations with friendly countries in Central and South America.

In view of the PRC's effort of seducing Central American countries to withdraw their recognition of Taiwan, President Lee visited Central America in 1997 and offered substantial aid and funds worth 320 million dollars.(See Table 5-8.) The formula for this aid is similar to that of the Southward Policy; that is, it is based on preferential loans, with the projects for infrastructure construction, building industrial development zones, and provides funds for developing the

SME system of recipient countries. In addition, not only did the government prompt the International Bank of China and the Chinatrust Commercial Bank to set up branches in Central American countries, but it also offered incentives for Taiwanese investors who were willing to invest in countries having diplomatic relationships with Taiwan.[20](Central American countries are the main group of nations that recognize Taiwan.)

Table 5-8 Aids and Funds Provided by President Lee to Central American Friendly Countries in 1997($ Million)

Country	*Item*	*Amount*
Panama	Industrial development zone	56 million
Honduras	Industrial development zone	15 million
Panama	Low-interest loans to develop Small and medium enterprises	10 million
Honduras	Low-interest loans to develop Small and medium enterprises	10 million
Paraguay	Low-interest loans to develop Small and medium enterprises	20 million
Paraguay	Construction of a new bridge	
	Central American Development Fund(80%)	192 million
Paraguay	Technical Cooperation Project	0.6 million
Others		--
Total		320 million

Source: Baum(1997, p. 29); Huang(1997).

It is not entirely fair to say that the economic bureaucracy of the Taiwanese state has not made any efforts similar to the regionalizing practices of its

[20] The government will finance 20 percent of the investment up to NT 10 million dollars and the remaining 80 percent could be obtained from the preferential loans of the Export-and-Import Bank of China(CEXIM).

counterpart in Japan. Actually, the Industrial Development Bureau(IDB) has planned to construct a framework for division of labor for the manufacturing of automobiles and motorcycles by combining the resources and assets of Taiwan and Mainland China. This framework consists of vertical and horizontal division of labor as well as product development. The vertical division of labor transfers the production of low value-added, simply assembled, and non-important parts to the mainland while leaving the manufacturing of high value-added parts and components that need precision work in Taiwan. The horizontal division of labor assigns quality control and relevant coordination works to Taiwan, allocating after-sales service and the mainland's domestic marketing to the units established in the mainland. Finally, Taiwan specializes in the design and manufacturing of key components and parts, or they might be sourced from the third country(Lin, 1996).

Nevertheless, no evidence or document has shown that this type of policy has been applied to Southeast Asian countries or that it is based on a comprehensive plan aiming at constructing a regional framework for division of labor. Rather, the IDB and the entire Ministry of Economic Affairs(MOEA) have devoted most of their energy to conventional strategies and policies. That is, they are still trying to enhance Taiwan's competitive capabilities and find a niche in the international division of labor. Not only are this strategy and action suggested by the APROC plan, but they are also confirmed by the action of the economic bureaucracy, which is exemplified by the project of "Developing Taiwan as an Asian-Pacific Manufacturing Center." According to this document, which was

drawn up by MOEA and IDB, the government is to implement the following guidelines:

1. To strengthen the R&D system and specific R&D projects by increasing expenditures for R&D and by promoting cooperation between private firms and semiofficial research organizations.
2. To promote the construction of high-tech and high value-added industries, such as the Ten Emerging Industries and key components projects.
3. To plan and establish intelligent(information-based) industrial parks for the clustering of high-tech firms, which would help shape a system of division of labor.
4. To adjust the function of export-processing zones by turning them into warehouse areas, which would be a basis for the APROC plan.
5. To promote the transferring of defense technologies to private firms and facilitate commercializing technologies transferred.
6. To promote inward foreign direct investment and simplify administrative procedures, with a view to encouraging them to establish regional operations headquarters in Taiwan.

From this plan, it is clear that the Taiwanese developmental state as a promoter is following conventional practices. It is noteworthy that the task of shaping a framework for international industrial division of labor is left to private business. The Taiwanese state does not have influential packages of incentives and policies that could dictate private firms to follow regionalization plans in the

face of economic liberalization and political democratization. Certainly, it could direct state-owned enterprises and KMT-owned business to lead investment trends in the case of the Southward Policy, but this is based on peculiar political and economic institutions, which give the ruling party the opportunity to build its own party-owned business group and make connections with big business and state-owned enterprises. It is also based on President Lee's personal ties, authorities, and powers. As the president of Taiwan(Republic of China), the chairman of the ruling party, and the native Taiwanese leader, who symbolizes the resistance against Chinese pressures and represents the brave Taiwanese who have overcome the domination of the KMT regime, he could use his personal ties with big firms and encourage them to invest in Central American and Southeast Asian countries(Baum, 1997: 29). These mechanisms are in sharp contrast to those of the Japanese(especially the non-governmental organizations in the policy networks), which are characterized by close and institutional communication and cooperation between the state bureaucracy and private groups.

IV. Summaries

Like its counterpart in Japan, the Taiwanese developmental state has played the roles of planner, financier, and promoter during Taiwan's postwar economic development. It has formulated indicative economic plans, which guide industrial policies and related measures. It has regulated the national financial system(institutions and markets) with restrictive financial policies and measures. It has allocated and channeled limited financial resources to strategic industries

deemed by the state as important to national industrialization, thus incubating competitive agents, which not only gained profits on domestic and international markets, but also became the locomotives of national industrial development under government assistance and pressures. It has promoted national industrial development through various strategies and means, such as establishing semiofficial R&D organizations to enhance national technological capabilities, subsidizing the R&D of private firms, and forming a system for industrial division of labor between state-owned enterprises and private firms.

However, just when its counterpart in Japan is regionalizing its conventional practices by promoting Japanese FDI in certain countries, by channeling aid resources to construction projects in the recipient countries, and by extending public-private cooperation as well as the system of small and medium enterprise to the ASEAN countries to cope with changes and pressures brought by globalization, protectionism, and fierce competition of the newly industrializing countries, the Taiwanese developmental state seems to limit its actions to conventional practices, with some modest efforts to regionalize, which is dominated by the political motive of ensuring survival.

In the case of economic plans, it has been shown that Taiwan's new plans, particularly the APROC plan, do not try to shape regional division of labor in the manufacturing sector, but to find a niche, and this requires the state to keep strengthening national competitiveness. This kind of performance is in sharp contrast to the New AID Plan, the 1993 vision, and other similar policies of the Japanese economic bureaucracy. It is under these circumstances that the state

and the Taipei city government are trying to build Taipei as a finance- and service-oriented world city, which is more similar to the Japanese type of world city, with few differences. Last, but not least, it should be noted that the New AID Plan concentrates on the manufacturing sector, whereas the intention emerging from the APROC plan is to cover both the manufacturing and the service sectors. It is intended to follow the formation leader closely and, if possible, catch up with the leader in some sectors(e.g., the high-tech sector). It has been argued that the Taiwanese state has been evolving from a hard authoritarian state with partial network structures into a network state reflecting the Taiwanese style. It reveals certain institutional breaches that allow big business to exert power, but it could keep its relative autonomy in making rational plans and policies. Moreover, the factors that cause the differences in regional and national orientation are attributed to policy heritage and state structures.

In the case of being a financier, it has been shown that, like its Japanese counterpart, the Taiwanese developmental state has used regulation to shape a credit-based national financial system, so that the state could stabilize macroeconomic conditions, control financial activities, and infuse limited resources to strategic or important industries. It is argued that, though Taiwan is increasingly loosening its regulation of the financial system, the Taiwanese developmental state could still influence Taiwanese industrial development through its remaining control of the financial system and the KMT-owned businesses, which makes the Taiwanese state different from that of the Japanese.

Moreover, not only has the Taiwanese state been increasingly loosening its restrictions on inward and outward investment, but it has been proffering incentives and assistance to national firms making outward investment, except for policies about Taiwanese investment in Mainland China. It is salient because the state imposes strict regulations on economic interaction between Taiwan and the mainland, and promotes its Southward Policy. Furthermore, it has been indicated that, in contrast to the Japanese practices, which are mostly based on utilitarian economic considerations, Taiwan's foreign aid has been dominated by the political motive of ensuring survival through providing preferential loans as well as technical aid to countries having, or intending to establish, diplomatic relations with Taiwan. This has resulted in the patterns of concentrating aid resources in Central American, and, to a lesser extent, African countries, both of which have hosted less Taiwanese FDI since the mid-eighties than have Mainland China and Southeast Asia.

Finally, from the promotional efforts of the economic bureaucracy, especially the MOEA and the IDB, it is clear that, by using its conventional policy instruments and strategies, most of which are similar to those of the Japanese, the Taiwanese developmental state is still trying to transform Taiwan into an Asian-Pacific high-tech manufacturing center under the guidelines of the APROC plan. It has been claimed by certain scholars and some members of the economic bureaucracy that a framework of regional division of labor should be constructed by giving Taiwan the task of producing high value-added goods and making it a leader in high-tech industries. Taiwan, however, is still only paying lip service to

regional division of labor and its achievements cannot compare with Japan's.

In general, while its counterpart in Japan is regionalizing the managing practices of the developmental state to neighboring countries, the Taiwanese developmental state is still concentrating its energy and resources on strengthening Taiwan's national competitiveness.

Chapter 6

Conclusion

I. Summaries of the Chapters

Summary of Chapter One

The first chapter introduces the purpose of this dissertation; that is, to construct the contemporary flying geese model and explore Taiwan's structural position in the flying geese formation.

Then the original thesis of the flying geese model proposed by Akamatsu and the debate between the pros and cons are presented. Their contrasting views and the differences between the original thesis and the contemporary conception are discussed in the author's preliminary review.

Given these differences and contrasts, the next step was to formulate analytical questions about the profile of the contemporary flying geese model and the structural position of Taiwan. Research methods and strategies were set up to resolve the questions. The methods and strategies included the comparative method, documentary research, and data analysis, which resulted in the research framework and the corresponding chapters of this dissertation.

Chapter Two is the structural core of this study because the three dimensions of the contemporary flying geese model constructed in this chapter are compared in the subsequent three chapters, which focus on the Taiwanese experience. Chapter Three explores the patterns of Taiwanese FDI and the trade structure involving Taiwan. Chapter Four conceptualizes and discusses the Taiwanese experience in the development and regionalization of the

electronics industry. Chapter Five examines the structure and transformation of the Taiwanese developmental state. Finally, Chapter Six summarizes the findings of each chapter and discusses the theoretical and policy implications of the arguments made earlier.

Summaries of Chapter Two

Three major findings emerged from the construction of the contemporary flying geese model led by Japan. These major findings are discussed in Chapter Two:

1. The patterns of Japanese FDI have demonstrated regional and sectoral division of labor with increasing flow to the manufacturing sector in East and Southeast Asian developing countries. The flow patterns of Japanese FDI have been matched by a corresponding and changing triangular trade structure, in which Japan has been enjoying trade surpluses with her partners because of the inducement effect and market practices.
2. The conceptual framework and empirical cases indicate that through the regionalization of Japanese production networks Japan has been constructing a framework for complementary regional division of labor, which combines the comparative advantages of Japan and her neighboring countries. Not only is this regional division of labor led by Japanese firms based on the continuing industrial upgrading of Japan and other countries within the framework, but it demonstrates the catch-up product cycle in terms of industrial and technological gaps. It is also emphasized that the cross-border production networks built by Japanese TNCs have been evolving

from the close combination of vertical and horizontal control to those that are cooperative and complementary one.

3. The Japanese developmental state has gone beyond the conventional boundaries of nation-states and extended the practices of the developmental state to a regional scale by expanding its roles of planner, financier, and promoter. The Japanese state formulates economic plans with the intention of utilizing and shaping regional dynamics, subsidizes Japanese firms to encourage their overseas investment, provides development assistance to facilitate the construction of socioeconomic infrastructure in the host countries, and tries to help the targeted host countries to fully utilize their comparative advantages, with the hope of weaving networks of regional division of labor between Japan and her neighboring countries.

Summaries of Chapter Three

The argument of Chapter Three focuses on the distribution patterns of Taiwanese FDI and the trade triangle revolving around Taiwan. The findings are compared to the patterns of Japanese FDI and the trade structures discussed in the first part of Chapter Two.

The first part of Chapter Three discusses the patterns of Taiwanese FDI and presents three major findings:

1. Taiwanese FDI is more Asia-oriented than is Japanese FDI because of the smaller scales of Taiwanese firms and the shorter history of Taiwanese FDI. However, they are similar in that both of them show strong interests in the manufacturing or secondary sector of the Asian host countries.

2. While Japanese FDI has concentrated more in the non-manufacturing sectors of North America, Europe, and Latin America, Taiwanese FDI has been merely involved in the tertiary industry in Latin America. It seemed to lose interest in the North American and European tertiary industries in the early nineties.
3. Within East and Southeast Asia, the center of gravity of Taiwanese FDI shifted from Southeast Asia to China and Vietnam. This is similar to the patterns of Japanese FDI. Furthermore, the distribution of Taiwanese FDI in the tertiary industries of Asian economies has not demonstrated stable changes. This, again, is similar to the patterns of Japanese FDI.

The second section of Chapter Three examines the significance of Taiwanese FDI by making international comparisons, discussing technical issues about the statistical data, and comparing the relative weights of Taiwanese FDI and other financial sources of Taiwanese overseas affiliates. Two major findings emerge in this section:

1. International comparisons demonstrate that Taiwanese FDI was a leading FDI source in countries such as Vietnam, China, and Malaysia from the end of eighties to the early nineties. Moreover, the main targets of Taiwanese FDI are the labor-intensive industry. This pattern is in sharp contrast to other inward FDI, which aims mostly at capital-intensive industries. The pattern also reveals that Taiwan has been restructuring its industrial structures by relocating labor-intensive industries overseas. In addition, the average scale

of Taiwanese FDI projects is smaller than that of other inward FDI. This reveals that the main agents of Taiwanese FDI in Southeast Asia and, especially, in China, have been SMEs.

2. In contrast to the MOF data about Japanese FDI, which always overestimate its actual value, the data of Taiwanese FDI made public by the Taiwanese authorities tend to underestimate actual cases and values. The data gaps between the records of the host countries and the Taiwanese authorities tend to be large, ranging from five-folds to one-hundred fold, although the gaps have been shrinking, partly because of the government's effort. The factors contributing to the data gaps are indicated. Furthermore, the statistical data collected and surveys conducted by the government seem to challenge the significance of Taiwanese FDI; but for various reasons, such as sampling methods and data formats, the challenges are not conclusive or definitely contradictory.

The third section of Chapter Three discusses Taiwan's trade patterns. Three major findings are listed here:

1. The trade triangle revolving around Taiwan, which has been characterized by extreme dependence on the US market for both imports and exports, is changing. The center of gravity is shifting from the U.S. to Asian economies.
2. Unlike Japan, which has been enjoying a trade surplus with its trading partners because of Yen appreciation, the inducement effect, and other structural trading factors, Taiwan not only keeps running trade deficits with

Japan, but suffers deficits in trading with Korea, Indonesia, and Malaysia, the latter two of which have hosted substantial Taiwanese FDI, and gradually depends on China for its trade surplus. The possible factors are discussed.

3. As in the Japanese experience, Taiwan's export structures show that Taiwan has been upgrading from labor-intensive to capital- and technology-intensive industries. As it was catching up with Japan in office machinery and telecommunication equipment, Taiwan became one of the leading producers and exporters of IT goods, especially PCs and related products. According to the specialization index, Taiwan has upgraded from a young NIE to a mature NIE. However, it has not been able to become an industrialized economy. Finally, according to the intra-industry trade index, Taiwan's IIT relationships with her trading partners, i.e., the U.S. and Japan, on the one hand, and the ASEAN countries, which have received substantial Taiwanese FDI, on the other, are closer than those of Japan with her partners, though this conclusion should be made with caution because the quality of the data is not perfect.

Summaries of Chapter Four

Chapter Four explores the performance, experience, and structural position of the Taiwanese electronics industry.

First, the conceptual framework of catch-up is constructed to describe how latecomer electronics firms start their businesses, achieve substantial growth, and engage in overseas investment as well as production, on the one hand, and

incubate their forward and backward linkages, on the other. The limitations and potential weaknesses of this framework are also mentioned, lest it should be misunderstood as a universal formula.

Then the general development trends of, and data about, the Taiwanese electronics firms are presented. Representative Taiwanese electronics manufacturers, such as firms in consumer electronics, industrial electronics, and electronic components, are selected to empirically substantiate the conceptual framework of catch-up and to extend the general description.

Three findings emerge from the argument presented in Chapter Four:

1. The experience of the selected Taiwanese firms suggests that starting businesses and pursuing growth by reversing the American product cycle, i.e., by cutting into the process and gradually incubating upstream resources as well as downstream linkages, is a feasible approach. This strategy could help latecomer firms to catch up with the market leaders, or follow closely behind them, and outpace new entrants.
2. The thesis of Wintelism and criticism of the contemporary flying geese model are either America-centric or Japan-centric views because their assumptions and argument have led them to downplay the potential and the effective coping strategies of latecomer firms. Moreover, OEM and ODM should not be regarded as indisputable signs of technology dependence. Rather, whether the strategy of OEM and ODM is beneficial or addictive depends on how latecomer firms utilize it.
3. The cross-border production networks built by the Taiwanese electronics

manufacturers show more features of horizontal than vertical division of labor. Moreover, although Taiwanese electronics firms display more varieties than their Japanese counterparts, their regionalization could be divided into two types: global cruise and regional cruise. Global cruise is based on global logistics and sophisticated planning, while regional cruise concentrates on neighboring countries; the causes of which could be attributed to their scale economies, industrial features, and buyers' demands.

Summaries of Chapter Five

Chapter Five compares the Japanese and Taiwanese developmental states in their roles as planners, financiers, and promoters. It is indicated that, while both developmental states performed similarly in these roles during the postwar period of reconstruction and high-speed growth, the Taiwanese state differs from its Japanese counterpart in its coping strategies when facing new situations and challenges. Three differences should be highlighted:

1. The Japanese state has formulated and actualized economic plans that try to control and shape regional economic dynamics, whereas the Taiwanese state has focused on conventional economic plans that try to situate Taiwan in a better position in the framework for international division of labor.
2. The Japanese state has financed specific firms making overseas investment in, and providing official development assistance for, targeted countries. This policy is based on the concept of economic cooperation and concentrated on neighboring countries. In contrast, while the Taiwanese state has implemented similar policies, its motives have been political

because of its isolated situation and the threat to its survival.

3. The Japanese state has been expanding its industrial practices to neighboring countries through various means while the Taiwanese state is still trying to enhance Taiwan's competitive capabilities by promoting national industrial development.

In addition, Taipei as a type of the world city is discussed by drawing upon the conceptual framework of Hill and Kim. They point out the limitations of the conventional wisdom about world cities by highlighting the peculiar status and conditions of Tokyo and Seoul. It is argued that Taipei is more similar to Tokyo and Seoul than to the original type of world cities.

II. Theoretical and Policy Implications

Three theoretical implications emerge from the descriptions and arguments in this dissertation.

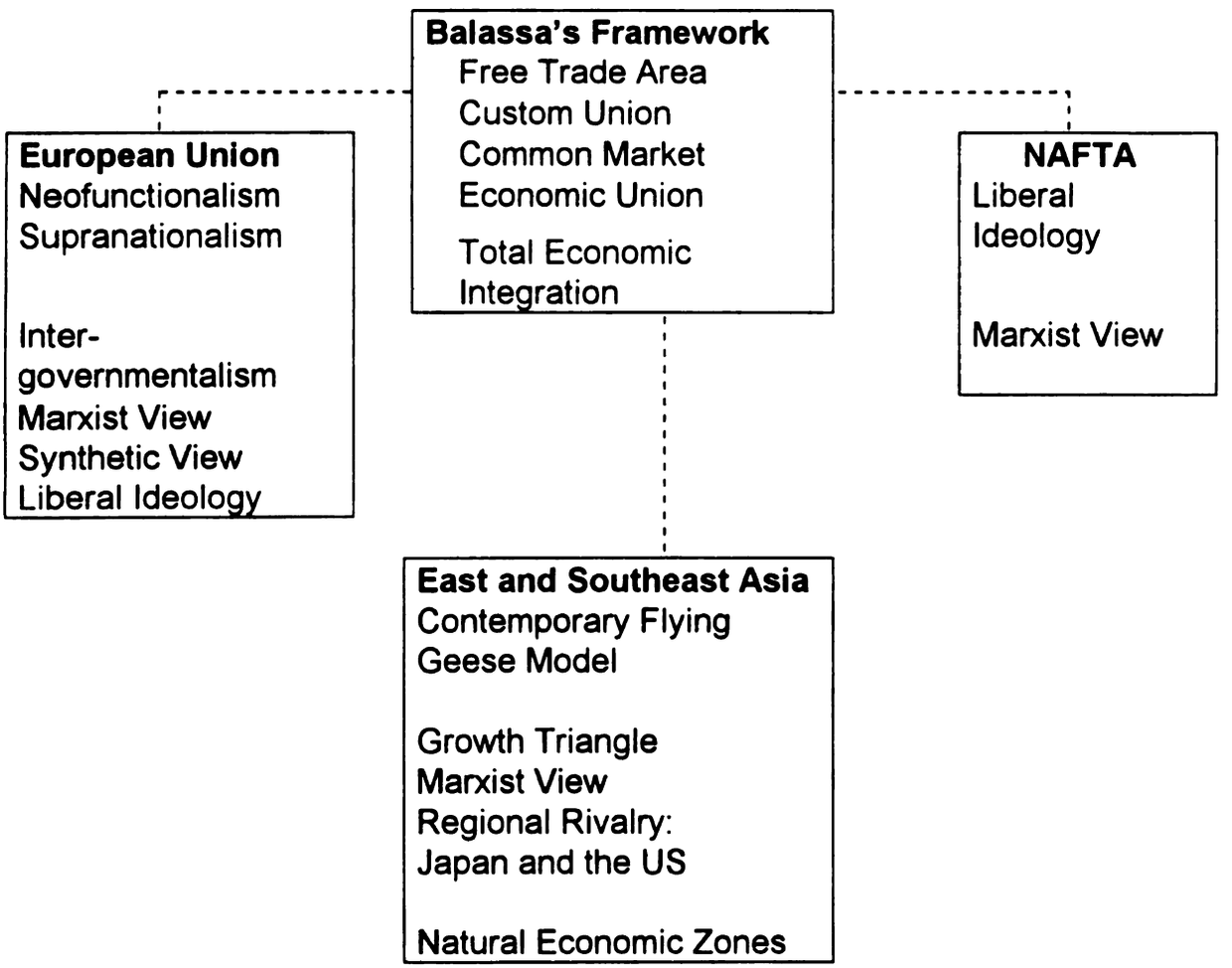
First, the contemporary flying geese model constructed in the preceding chapters revises and enriches the original thesis proposed by Akamatsu. While the original model focuses solely on the changes in trade patterns and national industrial restructuring in terms of the sequences of import substitution and export orientation, the contemporary flying geese model built in the preceding chapters incorporates FDI patterns, triangular trade structures, the cross-border production networks of firms, and the developmental state into the original framework by drawing the findings and critiques of the contemporary studies and debates. Therefore, critics of the flying geese model should first identify the

version of the model they have in mind; they could use the model developed in this dissertation for a debate about the descriptive and explanatory power of the contemporary flying geese model.

Second, by means of the contemporary flying geese model constructed in the preceding chapters, the performance and structural position of Taiwan can be explored and compared to that of Japan(and of other member countries) in the flying geese formation. This has not been done before. Moreover, the contemporary model can serve as the most suitable theory of regional economic integration for East and Southeast Asian countries. This is further illustrated by Figure 6-1, which shows the theories of regionalism represented by the general Triad, that is, NAFTA, the European Union, and East as well as Southeast Asia, on the one hand, and the general regional integration theory formulated by Balassa, on the other(Balassa, 1961).

The function of Balassa's general theory is to provide a frame of reference for the discussion of regional integration operating in the Triad areas. As is well know and documented, the sequence of free trade areas, custom unions, common markets, economic unions, and political unions is based on the combination(absence and presence) of several elements, such as abolishing tariffs for partners, common external tariffs, free movement of factors, harmonization of economic policies, and political system integration. Though this theory has been criticized for being too rigid to satisfactorily explain the actual integration process(Gambari, 1991: 6-8), it can still serve as a frame of reference for the discussion of the theoretical status of the flying geese model in

Figure 6-1 Theories of Region Economic Integration of the General Triad



contrast to integration theories focusing on the European Union(Community) and NAFTA.

A series of regional integration theories attempt to better explain the structure and process of the European Union(Community) and/or prescribe the best program for its further integration, as is shown in Figure 6-1. The foremost theory explaining and prescribing a program for European integration is neofunctionalism, the paradigm and mainstream theory in the fifties and sixties. It is characterized by the spillover concept(integration in one policy area will trigger integration in other adjacent policy areas), the tendency to downplay the role of national states and emphasize the objective of building a regional(supranational) state, and the pro-integration action of interest groups(Groom, 1994: 115, 121-2; O'Brien, 1995: 696-7; Corbey, 1995: 256).

In view of the flaws of neofunctionalism, such as its inability to explain or solve the problem of spillover stagnation, which results from the resistance of states protecting their national interests and sovereignty, other theories of European integration, such as intergovernmentalism, supranationalism, dialectic functionalism, and institutionalism(a synthetic view) emerged to explain what neofunctionalism failed to explain. Supranationalism covers both the roles and powers of the European Commission and the state, focusing on the decision-making system. Based on (neo)realism and stressing inter-state negotiation, intergovernmentalism reasserts the role of the state as the guard of sovereignty and nationalism(Corbey, 1995: 258-9; O'Brien, 1995: 700-1). Corbey formulates dialectic functionalism to explain the stop-and-go rhythm of European integration,

covering the interaction of supranational, inter-state, and domestic politico-economic processes(Corbey, 1995). Keohane and Hoffman propose a synthetic view, which integrates the strengths of intergovernmentalism, supranationalism, and neofunctionalism, and formulates the theses of sovereignty-pooling networks, the supranational political process, and negotiations among states(Keohane and Hoffman, 1994). Moreover, Marxists participate in this theoretical and empirical contest. According to the Marxist view, the European capitalist states promote regional economic integration because the state is no longer able to facilitate the operation of capitalism by maintaining the system of welfare state and Keynesian economic policies and because the increasingly global economic competition has seriously challenged the managing capabilities of the state and enterprises. By promoting regional economic integration, the liberal movement of capital and labour would strengthen European competitive capabilities, and preserve the state's legitimacy could be preserved(Cocks, 1980).

On the surface, the theoretical framework of Balassa seems to fit the case of the European Community. The community has increasingly strengthened its economic integration by establishing a common market, a single market, and a monetary union, as well as by harmonizing the economic and even the foreign and defense policies of the member states. However, Balassa's theory is too abstract to appropriately explain the complicated political, economic, and even social processes, such as the stop-and-go rhythm, the interaction among the European Commission and the member states, and interest groups from each

country during the past decades.

NAFTA has not stimulated theories as varied as those originating from the European case. While Marxist also attempt to explain the North American case(Michalak, 1994: 47-9), the liberal tone has been dominant in the three member countries. Liberal ideology exists either in the states that pursued liberalization to resolve debt problems in the early eighties and to bolster investors' confidence as in the case of Mexico, or in the efforts of government-designated committees and big business as in the case of Canada(O'Brien, 1995: 710-3).

Balassa's theory also fails to satisfactorily explain NAFTA. The concepts of trade diversion and creation could be used to illustrate the advantages and disadvantages that the member states will obtain. However, it is difficult to find an appropriate way to calculate their exact benefits and losses(Mayes, 1997). The theory also fails to analyze the political considerations, such as issues of labor and environmental protection, in the formation process of the free trade arrangement.

In contrast to theories about European and North American economic integration, the theoretical landscape about Asia has been difficult to define. There have been few theories trying to explain the regional integration occurring in East Asia and Southeast Asia/Asia-Pacific, with the result that no theories or views attain a dominant or paradigmatic position. As is mentioned in Chapter One, while supporters try to explain the regionalization(the cross-border production networks built by Japanese TNCs) by using the flying geese model,

critics with different backgrounds attempt to abolish the model by making serious attacks on it and by proposing their own theories or views.

The realities in Asia in particular and Asia Pacific in general are too complicated to be covered by a single theory or view. The Asian Pacific Economic Cooperation(APEC), which advocates "open regionalism," has been involved in political struggles among the powers, on the one hand, and the complicated policy issues among the member states, on the other. To this one could add the burgeoning of other types of regional economic integration, such as the growth triangle promoted by Singapore, the natural economic zones(the Japan Sea Rim Economic Zone, the Yellow Sea Rim Economic Zone, the South China Economic Zone, and so on)(JETRO, 1996d), and the great Chinese Economic Area. All of these complications make it difficult to borrow the theories used in the cases of NAFTA and the European Union, not to mention Balassa's mechanistic theory, which cannot capture and comprehend the complicated realities within the Asian Pacific region.

Even if one narrows the range of discussion and focuses exclusively on the cross-border production networks built by the TNCs in East and Southeast Asia, there is still no theory dominant or representative enough to serve as the basis for explaining and analyzing the structure and dynamics of Asian regional economic integration. Some theorists argue that the regional production networks built by Japanese are evolving, activating domestic industrial restructuring, facilitating the industrialization of the host countries, and increasing technology transfer. The critics of Japanese cross-border production

networks, however, whether they have the flying geese model in mind or not, often regard Asian regionalization as a structure dominated by Japanese TNCs, who leave their Asian partners in harsh and rigid situations.

Nevertheless, it will be argued here that the contemporary flying geese model constructed in this dissertation could serve as a tool for discussing Asian regional economic integration in a limited sense. That is, it does not explain all the regional economic integration occurring in Asia, but it focuses on the economic patterns of East and Southeast Asia as well as on the development strategies of the state and the firms within and around the region. The reconstructed model is more inclusive and complete than other alternative theories or views, such as those of Bernard(1996), and Borrus(1997). It clarifies the nature and structure of the regionalization of Japanese TNCs, thereby challenging the critics of the model. Moreover, it expands the field of vision of the original thesis and the contemporary debates in that it covers detailed analysis of FDI and trade patterns, on the one hand, and the state's roles and firms' strategies, on the other.

The third theoretical implication is related to the second; namely, not only could the contemporary flying geese model be used to analyze and explain the regional economic integration operating in East and Southeast Asia, but it could also be adapted to examine the processes and structures in other regions. That is, to what extent does the model anatomize the structures and dynamics of FDI and trade patterns, cross-border production networks, and the roles of the state in NAFTA and the European Union? This theoretical implication does not mean

that the model should be used as a simple recipe. On the contrary, it is meant to test the applicability of the model in regions other than Asia, and to determine whether or not this text will provide any meaningful insights not explored by the theories that have often been used to explain European and North American regional economic integration. This task is intriguing and original because, while the applicability of neofunctionalism and liberal ideology to Asia has been entertained by some scholars, the use of the flying geese model in American and European regions has not been tried. For the author of this dissertation, this could be a project for postdoctoral research or advanced study in the future.

The contemporary flying geese model exemplified by the Japanese and Taiwanese experience also has policy implications for commentators and decision makers. On the one hand, the Japanese practices could be analyzed by the decision makers of Taiwan and other countries which try to catch up with leading countries and cope with the pressures of globalization. On the other hand, the Taiwanese practices could also be analyzed and learned by other follower countries with economic and industrial potential.

First, the Japanese experience suggests that there is an alternative way of achieving regional economic integration and bypassing the complicated politico-economic process of institutional or formal economic integration, especially in East and Southeast Asia or the Asian Pacific. Deng argues that Japan has not been able to gain regional leadership within the framework of the APEC, because of the ambition of the U.S. to control the process and structure of the organization, because of the potential suspicion and animosity about Japan's

attitude and action, and because of the regional political contradictions among the three powers(the U.S., Japan, and China), and among other countries within the APEC(Deng, 1997). However, contrary to Deng's argument, the author's research finds that the contemporary flying geese model could serve as an alternative way to promote regional economic integration. This does not mean that it will solve the problems of APEC and other issues, such as the lack of institutional and multilateral security systems within and around the region(Funabashi, 1996-7). It only means that the contemporary flying geese model and the Japanese experience could help countries escape from the entanglement of formal integration characterized by agreements and treaties. It could also shed some light on other possibilities of facilitating regional economic integration through state planning and public-private or state-business cooperation.

Moreover, the Japanese experience of reorganizing the developmental state in terms of state capacities and coping with the pressures of global economic competition could help Taiwanese decision makers consider Taiwan's situation and problems from a different angle.

As has been mentioned, Taiwan's economic plans focused more on strengthening national competitive capabilities by situating Taiwan in a niche of the international division of labor than on trying to shape regional economic dynamics. The Taiwanese state's encouragement of outward direct investment, provision of foreign aid, the Southward Policy, and so on, are primarily formulated and implemented to cope with China's isolating pressures and

threats. While these strategies are understandable, this does not mean that they are definitively effective and efficient. From Chapter Three, it is clear that, even though the Taiwanese government has been regulating Taiwanese investment in the mainland and encouraging firms to invest in Southeast Asian and other diplomatically friendly countries, the tide of Taiwanese investment in China has rarely receded significantly. Decreased Investment results more from the Chinese regulations and international economic dynamics than from the Taiwanese state's restrictions. Moreover, it is pointed out in Chapter Five that Taiwan's foreign aid strategy and China's countermeasures have become a relentless war involving throwing resource at target countries. This results in the waste and depletion of the economic resources of both sides, while some targeted countries take advantage of the struggle by reaping benefits without costs. Finally, the Southward Policy demonstrates that the sustainability of these kinds of policies depend more on complete planning than on purely political considerations. It is important for Taiwan to escape being trapped in a resource-wasting war, to ensure the effectiveness and efficiency of industrial and economic policies, to cope with economic pressures, and to avoid China's harassment within formal organizations, such as APEC and the World Trade Organization. It would seem, therefore, that the Taiwanese authorities should investigate the Japanese experience within the contemporary flying geese model and formulate more comprehensive economic plans and projects which not only incorporate the APROC Plan and try to control regional economic dynamics, but to serve as guidelines for the state's roles as financier and promoter.

The second policy implication is that the Taiwanese experience has some valuable elements, which could be imitated by the follower countries. The description and argument in Chapter Five suggest that, in the process of promoting economic growth and industrial development, the state in developing countries could play and has played significant roles. Drawing upon the Japanese experience and on its own bureaucratic capabilities, the Taiwanese state has been formulating indicative plans to allocate limited resources to important or strategic industrial sectors, regulating and controlling the financial system, and promoting national industrialization through various means, such as accumulating national R&D capabilities, providing subsidies for ISI and EOI, forging relationships for division of labor between small and medium and large manufacturers, and so forth. While certain conditions and situations, such as the settings of the world economy, the power structures of the state, and state-society relationships, could not be replicated, most of the elements of the Taiwanese(and Japanese) promotion efforts and strategies could be tested and tried by other industrializing countries.

BIBLIOGRAPHY

ENGLISH BIBLIOGRAPHY

Abegglen, James C. 1994. *Sea Change--Pacific Asia as the New World Industrial Center.* New York: Free Press.

Amsden, Alice. 1989. *Asia's Next Giant: South Korea and Late Industrialization.* New York: Oxford University Press.

Aoki, Takeshi. 1992. "Japanese FDI and the Forming of Networks in the Asia-Pacific Region: Experience in Malaysia and Its Implications." In Shojiro Tokunaga. Ed. *Japan's Foreign Investment and Asian Economic Interdependence--Production, Trade, and Financial System.* Tokyo: University of Tokyo Press. Pp. 73-110.

APEC Economic Committee. 1995. *APEC Economic Outlook.* Singapore : APEC Economic Committee.

APROC Letter. [Online] Available http://www.aproc.gov.tw/news/e_n6-1-1.htm.

Arase, David. 1989. "Japanese Foreign Aid: The State, the Polity, and the International System." PhD Dissertation, University of California, Berkeley.

Arase, David. 1995. *Buying Power--The Political Economy of Japan's Foreign Aid.* Boulder and London: Lynne Rienner Publishers.

Baba, Yasunori and Hiroyuki Hatashima. 1995. "Capability Transfer of Japanese Electronics Firms to the Pacific Rim Nations: Towards Open Global Manufacturing?" In Eileen M. Doherty. Ed. *Japanese Investment in Asia—International Production Strategies in a Rapidly Changing World.* Berkeley: BRIE. Pp. 81-7.

Balassa, Bela. 1961. *The Theory of Economic Integration*. Homewood, Ill: Richard Irwin, Inc.

Baum, Julian. 1994. "Looking South--Aid and Trade Are New Foreign Policy Planks." *Far Eastern Economic Review*. Vol. 157, No. 10 (March): p. 18.

Baum, Julian. 1997. "Let's Tango--Taipei Asks Investors to Back Its Diplomatic Goals." *Far Eastern Economic Review*. Vol. 160, No. 41 (October): 29-30.

Bayoumi, Tamim and Gabrielle Lipworth. 1997. "Japanese Foreign Direct Investment and Regional Trade." *Working Paper of the International Monetary Fund*. Pp. 1-28.

Bello, Walden. 1993. "Trouble in Paradise: The Tension of Economic Integration in the Asia Pacific." *World Policy Journal*. Vol. X, No. 2 (Summer): 33-39.

Bernard, Mitchell and John Ravenhill. 1995. "Beyond Product Cycles and Flying Geese--Regionalization, Hierarchy, and the Industrialization of East Asia." *World Politics*, No. 47 (January): 171-209.

Bernard, Mitchell. 1996. "Regions in the Global Political Economy: Beyond the Local-Global Divide in the Formation of the Eastern Asian Region." *New Political Economy*. Vol. 1, No. 3, Pp. 335-53.

Bloom, Martin. 1992. *Technological Change in the Korean Electronics Industry*. Paris: Development Center of Organization for Economic Cooperation and Development.

BOFT(Bureau of Foreign Trade of MOEA). 1994. "Analyzing Foreign Investors' Action in Mainland China." *The Study on China's Economy and Foreign Trade. Chung Kung Tui Wai Ching* Mao Yen Chiu. No. 440. Pp.???(in Chinese)

BOFT. 1998a. [Online] Available http://www.moeaboft.gov.tw/boftnet2/4/498002.htm.(in Chinese)

BOFT(Bureau of Foreign Trade of MOEA). 1998b. *The Quarterly of Trade Forecast*. No. 6 (January 31).

Borrus, Michael. 1993. "The Regional Architecture of Global Electronics: Trajectories, Linkages, and Access to Technology." Berkeley Roundtable on the International Economy, University of California. [Online] Available http://www.brie.berkeley.edu/BRIE/pubs/wp/wp53

Borrus, Michael and John Zysman. 1997. "Wintelism and the Changing Terms of Global Competition: Prototype of the Future?" Berkeley Roundtable on the International Economy, University of California. [Online] Available http://www.brie.berkeley.edu/BRIE/pubs/wp/wp96b.html

BMA(Bureau of Monetary Affairs). 1996. *1996 Annual Report*. Taipei: BMA.

CEPD(Council for Economic Planning and Development). APROC Letter. [Online] Availablehttp://www.aproc.gov.tw/news/e_n6-1-1.htm

CEPD. 1994. *Taiwan Statistical Data Book*. Taipei: CEPD.

CEPD. 1995. *Taiwan Statistical Data Book*. Taipei: CEPD.

CEPD. 1996. *Taiwan Statistical Data Book*. Taipei: CEPD

CEXIM(The Export-Import Bank of the Republic of China). *Annual Report of The Export-Import Bank of the Republic of China*.

Chan, Gerald. 1997. "Taiwan as an Emerging Foreign Aid Donor: Developments, Problems, and Prospects." *Pacific Affairs*. Vol. 70 (Spring): 37-56.

Chan, Pao-Run. 1998. "Tatung's Two-Phase Global Logistics." *Learning and Development(Neng Li Tsa Chih)*. No. 507 (May): 34-7.(in Chinese)

Chang, Yu-Wen. 1991. "Value Chains and Cellular Division." *The Common Wealth Magazine(Tien-Hsia)*. No. 119. (April): 168-72.(in Chinese)

Chang, Yu-Wen. 1992. "KYE's Strategy of Expansion." *The Common Wealth Magazine(Tien-Hsia)*. No. 130 (March): 58.(in Chinese)

Chang, Wen-Chuan. 1996. "The Inside Story of the Struggle between the MOFA and the MOEA on the Foreign Aid Control." *The Journalist*. No. 429. [Online] Available http://supertag.com.tw/business/html/429-26.htm(in Chinese)

Chang, Ying-Hwa. 1987. "The Internal Structure of Taipei Municipality: An Ecological and Historical Analysis." *Bulletin of the Institute of Ethnology Academia Sinica*. No. 63 (Spring): 1-62.(in Chinese with an English abstract)

Chen, Chun-Chon. 1994a. "The Effort and Achievement of TSMC. *The Common Wealth Magazine(Tien-Hsia)*. (February): 66-70.(in Chinese)

Chen, Chun-Chon. 1994b. "Yageo--Excellent Taste and High Quality." *The 1994 Special Edition of the Commonwealth Magazine(Tien-Hsia)*. 81-2.(in Chinese)

Chen, Elaine. 1997. "Global Reach--Acer Makes Its Mark in Latin America." *Sinorama*. (October): [Online] Available http://www.sinanet.com///sinorama/1097/english/5_1.html

Chen, Hurng-Yu. 1994. "Southward Policy and Regional Economic Integration." *Journal of Sunology--A Social Science Quarterly*. Vol. 8, No. 3 (Autumn): 1-37.(in Chinese)

Chen, Lee-In, Hui-Min Lyu, and Chun-Chin Lin. 1997. *An Evaluation of the Policy of Division of Labor between Taiwan and Mainland China.* Taipei: Industrial Development Bureau and Chinese Institute of Economic Research.(in Chinese)

Chen, Sandy. 1998. "Acer Expands Beyond DRAM, Licenses IBM's Logic Technology." *TechWeb News*. (June 29): [Online] Available http://www.techweb.com/se/directlink.cgi?EBN19980629S0011.

Chen, Tain-Jy, Yi-Ping Chen, and Ying-Huang Ku. 1995a. "Taiwan's Outward

Direct Investment: Has the Domestic Industry Been Hollowed Out." *The New Wave of Foreign Direct Investment in Asia*. Compiled by Nomura Research Institute and Institute of Southeast Asian Studies. Singapore: Institute of Southeast Asian Studies. Pp. 87-110.

Cheng, Hsiu-Hsien. 1991. "The Way to Technology Autonomy." *The Commonwealth Magazine(Tien-Hsia)*. No. 123 (August): 12-23.(in Chinese)

Cheng, Tuan Y. 1994. "Foreign Aid in ROC Diplomacy." In *Contemporary China and the Changing International Community*. Eds. Bih-Jaw Lin and James T. Myers. Columbia: University of South Carolina Press. Pp. 170-84.

Cheng, Show-Wen. 1998. "Action's Report." *Digital Times*. (May 26th) [Online] Available http://www.digitimes.com.tw/a13/980526/9805263.htm(in Chinese)

Cheng, I-Chin. 1998. "The Pressure of Environmental Protection and the Future of Taiwan's Industries." *The Commonwealth Magazine(Tien-Hsia)*. No. 203 (April 1): 154-64.

Chien, Hsiu-Chung and Rei-Kuo Hong. 1998. "The Transformation of Taiwan's Economic Zones in the Nineties--A Case Study on the Performance of Export Processing Zones in 1995." *The Economic Situations and Review(Ching Chi Ch'ing Shih Chi P'ing Lun*). Vol. 3, No. 4 (February): 152-77.

China Times. 1998. "Getting Advantage in Down- and Upstream." Online version(April 7).

Chiu, Chen Lee-In. 1995. "The Pattern and Impact of Taiwan's Investment in Mainland China." In Summer J. La Croix, Michael Plummer, and Keun Lee. Eds. *Emerging Patterns of East Asian Investment in China--From Korea, Taiwan, and Hong Kong*. Armonk, New York and London, England: M.E. Sharpe. Pp. 143-65.

Chiu, Yu-Chan. 1996. "Japanese Businesses Invest in Taiwan's Semiconductor Industry." *The Common Wealth*. No. 187. (Dec 1): 118-23.(in Chinese)

Chou, Chen-Hsien. 1996. *The Computer Legend of Stan Shih*. Taipei: Lien-Chin

Publishing.(in Chinese)

Chu, Chi-Chun, 1997. "Acer Constructs Global Production Networks." *China Times*. (December 14). Online Version.(in Chinese)

Chu, Chi-Chun and Liu Tzai-Wu. 1998. "Forming Strategic Alliances with the Four Largest Market Leaders to Strengthen Power." *China Times* (April 1st).(in Chinese)

Chu, J.J. 1995. "Taiwan: A New Regional Centre in the Making." In Ky Cao. Ed. *The Changing Capital Markets of East Asia*. London and New York: Routledge. Pp. 170-201.

Chu, Wei-Chen. 1997. "The Study of Trade Deficit with Japan and the Strategy to Cope with It." Web site of the Ministry of Economic Affairs. [Online] Available http://www.moeaboft.gov.tw/boftnet2/4/403024.htm(in Chinese)

Chu, Yun-Han. 1994. "The Realignment of Business-Government Relations and Regime Transition in Taiwan." In Andrew MacIntyre. Ed. *Business and Government in Industrialising Asia*. Ithach, New York: Cornell University Press. Pp. 113-41.

Clifford, Mark. 1992. "Spring in Their Step." *Far Eastern Economic Review*, Vol. 155, No. 44. (Nov 5): 56-7.

Clifford, Mark. 1993. "Taiwan's Chip Blitz." *Far Eastern Economic Review*. Vol. 156, No. 12 (March 23): 52-4.

Cocks, Peter. 1980. "Towards a Marxist Theory of European Integration." *International Organization*. No. 34, Pp. 1-40.

Commerce Times. 1996(December 12). Online Version.(in Chinese)

Corbey, Dorette. 1995. "Dialectic Functionalism: Stagnation as a Booster of European Integration." *International Organization*. Vol. 49, No. 2 (Spring): 253-84.

Das, Dilip K. 1996. *The Asia-Pacific Economy*. New York: St. Martin Press.

Deng, Yong. 1997. "Japan in APEC—The Problematic Leadership Role." *Asian Survey*. Vol. 37, No. 4. (April): 353-67.

DGBAS(the Directorate-General of Budget, Accounts, and Statistics). 1996. *Databook, Taiwan Area*. Taipei: DGBAS.

DGBAS(the Directorate-General of Budget, Accounts, and Statistics). 1997. http://www.dgbasey.gov.tw/dgbas03/bs3/analyse/new86412.htm

DGBAS(the Directorate-General of Budget, Accounts, and Statistics). 1998a. "The Development of Direct and Indirect Finance." [Online] Available http://www.dgbasey.gov.tw/dgbas03/bs3/analyse/new87151.htm(in Chinese)

DGBAS(the Directorate-General of Budget, Accounts, and Statistics). 1998b. "The Development of Direct and Indirect Finance." [Online] Available http://www.dgbasey.gov.tw/dgbas03/bs3/analyse/new87151.htm(in Chinese)

Dieter, Ernst. 1997. "From Partial to Systemic Globalization: International Production Networks in the Electronics Industry." BRIE(Berkeley Roundtable on the International Economy) Working Papers. [Online] Available http://brie.berkeley.edu/BRIE/pubs/wp/wp98.html

Dobson, Wendy. 1993. *Japan in East Asia--Trading and Investment Strategies*. Institute of Southeast Asia Studies.

Doner, Richard F. 1993. "Japanese Foreign Investment and the Creation of a Pacific Asian Region." In *Regionalism and Rivalry--Japan and the United States in Pacific Asia*. Edited by Jeffrey A. Frankel and Miles Kahler. Chicago and London: The University of Chicago Press. Pp. 159-244.

DOS(Department of Statistics). 1995. *The 1995 Survey on the Diversification and Internationalization of the Manufacturing Industry*. Taipei: Ministry of Economic Affairs. (in Chinese)

DOS(Department of Statistics). 1996. *Economic Statistics Annual. Taiwan Area, ROC*. Taipei: Ministry of Economic Affairs.(in Chinese)

DOS(Department of Statistics). 1997. *Domestic & Foreign Express Report of Economic Statistics Indicators*. No. 160.

Douglass, M. 1994. "The `Developmental State' and the Newly Industrialised Economies of Asia." *Environment and Planning*. Vol. 26. Pp. 543-66.

Dunning, John H. 1995. "The Role of FDI in a Globalizing Economy." In Carl J. Green and Thomas L. Brewer. Eds. *Investment Issues in Asia and the Pacific Rim*. New York: Oceania Publication Inc., Pp. 43-64.

ECB(Economic Cooperation Bureau). "A Guide to Japan's Aid." [Online] Available http://www2.nttca.com:8010/informofa/JP_Aid/index.html

Economist. 1996.(September 14th). "Hallo, China-or Is It Taiwan: Africa and Asia.(China, Taiwan compete for recognition in African countries with economic, military aid). Vol. 340, No. 7983. p. 44.

Editor. 1994. "An Analysis on the Inward FDI to Mainland China." *Studies on Chinese Economy and Trade(Chung Kung Tui Wai Ching Mao Yen Chiu)*. No. 440 (November): 3-8.

Engardio, Pete and Peter Burrow. 1996. "Acer: A Global Powerhouse(international edition)." *BusinessWeek*. (July 1): http://www.businessweek.com/1996/27/b3482113.htm

EPA(Economic Planning Agency). 1997. "Committee on Economic Cooperation Policy." [Online] Available http://entrance.epa.go.jp:70/0h/e-e/doc/e1997bg11.html

Ernst, Dieter. 1997a. "From Partial to Systemic Globalization: International Production Networks in the Electronics Industry." BRIE(Berkeley Roundtable on the International Economy) Working Papers. [Online] Available http://brie.berkeley.edu/BRIE/pubs/wp/wp98.html

Ernst, Dieter. 1997b. "Partners for the China Circle? The East Asian Production Networks of Japanese Electronics Firms." In Barry Naughton. Ed. *The China Circle--Economics and Electronics in the PRC, Taiwan, and Hong Kong.* Washington, D.C.: Brookings Institution Press. Pp. 210-53. [Online] Available http://brie.berkeley.edu/BRIE/pubs/wp/wp91.html

Evans, Peter B. 1989. "Predatory, Developmental, and Other Apparatuses: A Comparative Political Economy Perspective on the Third World States." *Sociological Forum.* Vol. 4, No. 4. (Dec): 561-87.

Fei, C.H. John. 1988. "A Bird's Eye View of Policy Evolution on Taiwan: An Introductory Essay." In K.T. Li, *The Evolution of Policy Behind Taiwan's Development Success.* New Haven and London: Yale University Press. Pp. 26-46.

Fen, Chi-Ru. 1998. "The Taiwanese Investment in the Textile Industry of China." [Online] Available http://www.dfmg.com.tw/dasp/itis/紡織產業資訊/071bb56aae69530e482565fd0013bf11-OpenDocument.htm.(in Chinese)

Friedmann, John. 1995a. "Where We Stand: A Decade of World City Research." In Paul Knox and Peter J. Taylor. Eds. *World Cities in a World-System.* Cambridge: Cambridge University Press. Pp. 21-47.

Friedmann, John. 1995b. "The World City Hypothesis." In Paul Knox and Peter J. Taylor. Eds. *World Cities in a World-System.* Cambridge: Cambridge University Press. Pp. 317-31.

Fujita, Kuniko and Richard Child Hill. 1997. "Auto Industrialization in Southeast Asia: National Strategies and Local Development." *ASEAN Economic Bulletin.* Vol. 13, No. 3 (March): 312-33.

Fukushima, Kiyohiko and C.H. Kwan. 1995. "Foreign Direct Investment and Regional Industrial Restructuring in Asia." In *The New Wave of Foreign Direct Investment in Asia.* Compiled by Nomura Research Institute and Institute of Southeast Asian Studies. Singapore: Institute of Southeast Asian Studies. Pp. 3-39.

Funabashi, Yoichi. 1996-7. "Bridging Asia's Economics-Security Gap." *Survival.*

Vol. 38, No. 4. (Winter): 101-16.

Gambari, I.A. 1991. *Political and Comparative Dimensions of Regional Integration: The Case of ECOWAS. Atlantic Highlands*. NJ: Humanities Press International.

GATT(General Agreement on Tariffs and Trade). 1990-1. *Annual Report*. Geneva: GATT.

Gereffi, Gary. 1990. "Paths of Industrialization." In *Manufacturing Miracles--Paths of Industrialization in Latin America and East Asia*. Ed. Gary Gereffi and Donald L. Wyman. Princeton, New Jersey: Princeton University Press. Pp. 3-31.

Gereffi, Gary. 1994. "Capitalism, Development, and Global Commodity Chain." In Leslie Sklair. Ed. *Capitalism and Development*. London and New York: Routledge. Pp. 211-31.

Gereffi, Gary. 1995. "Global Production Systems and Third World Development." In Barbara Stallings. Ed. *Global Change and Regional Response--The New International Context of Development*. Cambridge and New York: Cambridge University Press. Pp. 100-42.

Gold, Thomas B. 1986. *State and Society in the Taiwan Miracle*. Armonk, New York and London: M.E. Sharpe, Inc.

Graham, Edward M. 1996. "What Can the Theory of Foreign Direct Investment Tell Us about the Low Level of Foreign Firm Participation in the Economy of Japan?" In Masaru Yoshitomi and Edward M. Graham. Eds. *Foreign Direct Investment in Japan*. Cheltenham, UK and Brrookfield, US: Edward Elgar. Pp. 64-93.

Groom, A.J.R. 1994. "Neofunctionalism: A Case of Mistaken Identity." In Brent F. Nelsen and Alexander C-G Stub. Eds. *The European Union: Readings on the Theory and Practice of European Integration*. Boulder, Colo.: L. Rienner. Pp. 111-23. Originally appeared in *Political Science*, Vol. 30, No. 1 (1978): 15-28.

Hatch, Walter and Kozo Yamamura. 1996. *Asia in Japan's Embrace--Building a Regional Production Alliance*. Cambridge: Cambridge University Press.

Hatch, Walter and Kozo Yamamura. 1997. "A Looming Entry Barrier: Japan's Production Networks in Asia." [Online] Available http://www.nbr.org/pub/analysis/vol8no1doc.html

Henderson, Jeffrey. 1994. "Electronics Industries and the Developing World." In Leslie Sklair. Ed. *Capitalism and Development*. London and New York: Routledge. Pp. 258-88.

Hiebert, Murray. 1995. "Close to You--Acer Computer Takes on Southeast Asia from Sales Base in Singapore." *Far Eastern Economic Review.*" Vol. 158, No. 41 (October 12): 62-3.

Hill, Richard and Yong-Joo Lee. 1994. "Japanese Multinationals and East Asian Development--The Case of the Automobile Industry." In Leslie Sklair. *Capitalism and Development*. London and New York: Routledge. Pp. 289-315.

Hill, Child Richard and Kuniko Fujita. 1995. "Product Cycles and International Divisions of Labor: Contrasts between the United States and Japan." in David Smith and József Böröcz. Eds. *A New World Order?--Global Transformations in the Late Twentieth Century*. Westport, Connecticut and London: Greenwood Press. Pp. 91-108.

Hill, Richard Child and Kuniko Fujita. 1996. "Economic Governance & Flexible Production: Matsushita in Southeast Asia." Paper presented at the workshop on Economic Governance & Flexible Production in East Asia." October 4-6. To be incorporated in Richard Doner and Fred Deyo. Eds. *Economic Governance and Flexible Production in East Asia.*

Hill, Richard C. and Kuniko Fujita. 1996a. "Flying Geese, Swarming Sparrows or Preying Hawks? Perspectives on East Asian Industrialization." *Competition and Change--The Journal of Global Business and Political Economy*. Vol. 1, No. 3 (March): 285-97.

Hill, Richard C. and June-Woo Kim. 1998. "Global Cities and Developmental

States—with Special Attention to Seoul, Korea." Prepared for presentation at the Workshop on Globalizing Asian Cities, Nordic Institute of Asian Studies, Helsinki, Finland, May 23-4, 1998. [Online] Available http://www.uta.fi/laitokset/sospol/seminars/cities/seoul.htm

Hirata, Akira and Takashi Nohara. 1989. "Changing Patterns in International Division of Labor in Asia and the Pacific." In Miyohei Shinohara and Fu-Chen Lo. Eds. *Global Adjustment and the Future of Asian-Pacific Economy*. Tokyo, Japan : Institute of Developing Economies. Pp. 434-62.

Hong, Kuo-Chi. 1996. "The Investment of Three Large Taiwanese Calculator Manufacturers in China." *Commerce Times*.(in Chinese web pages)

Hsia, Chou-Joe. 1995. "Taiwanese Cities and Society in the Global Economy." *Taiwan: A Radical Quarterly in Social Studies*. No. 20 (August): 57-102.(in Chinese)

Hsiao, Hsin-Huang Michael. 1995. "The State and Business Relations in Taiwan. in The State and Economic Development--Lessons from the Far East. London: Frank Cass. Pp. 76-97.

Hsiao, Feng-Hsiung. 1995. "The Taiwanese Industrial Transformation, FDI, and International Division of Labor Since the Seventies." *Taiwan Economy Monthly(T'ai Wan Ching Chi)*. No. 233. (July): 15-36.(in Chinese)

Hsiu, Shiao-Hui. 1989. "MiTAC's New Action?" *The Commonwealth Magazine(Tien-Hsia)*. No. 101. (October 1st): 198-206.(in Chinese)

Huang, Rei-Chi. 1994. "The Comparative Study of the FDI of Taiwan, Japan, and Korea in Southeast Asian Countries." Taiwan Economic Research Monthly, T'ai Wan Chin Chi Yen Chiu Yueh K'an), Vol. 17, No. 8 (August): pp. 49-56.(in Chinese)

Huang, Chuan-Hsia. 1997. "Lee Teng-Hui Gives Two Twenty Billion NT Dollars to Central and Southern American Countries." *The Journalist*. [Online] Available http://ww3.sinanet.com/thejournalist/548/findex.html(in Chinese)

Huang, Shu-Ching. 1995a. "The Development and Outlook of Taiwan's Information Industry(Part 1)." *Industries and Economies(Ch'an Yeh Ching Chi)*. No.165. (May): 8-40.(in Chinese)

Huang, Shu-Ching. 1995b. "The Development and Outlook of Taiwan's Information Industry(Part 2)." *Industries and Economies(Ch'an Yeh Ching Chi.* No.167. (July): 1-50. (in Chinese)

Huang, Shu-Ching. 1995c. "The Development of the Taiwanese Consumer Electronics Industry." *Industries and Economies(Ch'an Yeh Ching Chi.* No.167. (October): 36-57. (in Chinese)

Huber, Thomas M. 1994. *Strategic Economy in Japan*. Boulder/San Francisco/Oxford: Westview Press.

Hung, Wen-Chin. 1998. "The China Development Corporation Wants to Assist Southeast Asian Countries Hurt by the Financial Crisis." [Online] Available http://w3.ttnn.com/cna/980103/f12_b.html(in Chinese)

Hwang, Chin-Yeong, et. al. 1997. *Trade Wars of Information Age into the Twenty-first Century*. Taipei: The Commonwealth Publishing Co., Ltd.(in Chinese)

IDB(Industrial Development Bureau of MOEA). *Annual Report of Industrial Development*. Various Issues.(in Chinese)

IDIC(Industrial Development and Investment Center of MOEA). 1998. "A Survey on the Business Practices of Southeast Asian Taiwanese Investors." *Kung Yeh T'ou Tzu Chien Hsun*. No, 175. (February): 12-21.(in Chinese)

IMF(International Monetary Fund). 1995. *Direction of Trade Statistics Yearbook*. Washington, D.C.: The IMF.

Inoue, Ryuichiro, Hirohisa Koham and Shujiro Urata Eds. 1993. *Industry Policy in East Asia*. Tokyo: JETRO.

Invest Commission(of MOEA). 1997. *The Statistics on Overseas Chinese &*

Foreign Investment, Outward Investment, Outward Technical Cooperation, Indirect Mainland Investment, and Guide of Mainland Industry Technology of the Republic of China.

Islam, Iyanatul and Anis Chowdhury. 1997. *Asia-Pacific Economies--A Survey.* London and New York: Routledge.

Itoh, Motoshige and Jun Shibata. 1995. "A Study of the Operations of Japanese Firms in Asia: the Electrical Machinery Industry." In Edward K. Y. Chen and Peter Drysdale. Eds. *Corporate Links and Foreign Direct Investment in Asia and the Pacific.* Pymble, NSW: Harper Educational. Pp. 187-202.

Japanese Information. 1989. "Acer Attacks Japan." *Japanese Information.* (August 1): 93-5.(in Chinese)

Jenkins, Rhys. 1991. "The Political Economy of Industrialization: A Comparison of Latin American and East Asian Newly Industrializing Countries." *Development and Change.* Vol. 22. Pp. 197-231.

JETRO. 1996a(November). "Keiretsu Supplier System Changing." *Focus Japan.* [Online] Available http://www.jetro.go.jp/JETROINFO/FOCUSJAPAN/96-11.html

JETRO. 1993. *White Paper on International Trade.* Tokyo: JETRO.

JETRO. 1996b. *White Paper. On International Trade.* "Changes in Structure of Imports Surfacing Both Macro and Micro-Economically." [Online] Available http://www.jetro.go.jp/WHITEPAPER/Trade96/t32.html).

JETRO. 1996c. "Table 16: Number of Regional Economic Unions by Decade." [Online] Available http://www.jetro.go.jp/WHITEPAPER/Trade96/t16.html

JETRO. 1996d. "Table 19: Naturally Occurring Regional Economic Zones." [Online] Available http://www.jetro.go.jp/WHITEPAPER/Trade96/t16.html

JETRO. 1997a. *White Paper on Foreign Direct Investment.* [Online] Available

http://www.jetro.go.jp/WHITEPAPER/Invest97/t09.html

JETRO. 1997b. *White Paper on Foreign Direct Investment*. [Online] Available http://www.jetro.go.jp/WHITEPAPER/Invest97/f01.html

JETRO. 1998. *White Paper on Foreign Direct Investment*. [Online] Available http://www.jetro.go.jp/WHITEPAPER/Invest98/index.html

JEXIM(The Export-Import Bank of Japan). 1996. *Annual Report*. [Online] Available http://www.japanexim.go.jp/96annualreport/

JICA(Japan International Cooperation Agency). "Activities of JICA." [Online] Available http://www.jica.go.jp/E-jica/Index.html

Johnson, Chalmers. 1982. *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975*. Stanford: Stanford University Press.

Kang, I-Chi. 1997. "Japanese auto parts industry--New Challenges and Business opportunities Created in Southeast Asia." [Online] Available http://www.cetra.org.tw/mars/mkrpt/jpnauto.htm(in Chinese)

Kao, Charles H. C., Joseph S. Lee, and Chu-Chia Steve Lin. 1992. *An Empirical Study of Taiwan Investment on Mainland China*. Taipei: Commonwealth Publishing Co., Ltd.(in Chinese)

Kao, Charng. 1993. "Economic Interdependence between Taiwan & the Mainland and It's Effect on Taiwan's Economy. *The National Chengchi University Journal*. Vol. 66, No. 2. Pp. 129-56.(in Chinese)

Kao, Charng. 1994. "The Transforming Taiwanese Industries and the Division of Labor between Taiwan and the Mainland." *Taipei Bank Monthly Journal*(*T'ai Pei Yin Hang Yueh K'an*). Vol. 25, No. 3. (March): 2-18.

Kao, Charng. 1996. "The Investment of Taiwanese Manufacturers in the Mainland and the Division of Labor between Taiwan and the Mainland." *Taipei Bank Monthly Journal*(*T'ai Pei Yin Hang Yueh K'an*). Vol. 26, No. 11. (November)

23-38.(in Chinese)

Kao, Charng. 1997. "The Trends of Taiwanese Investment in Mainland China and the Impacts on the Mainland's Economy." *The Economic Situations and Review*(*Ching Chi Ch'ing Shih Chi P'ing Lun*). Vol. 3, No. 1.(May): [Online] Available http://www.moea.gov.tw/~ecobook/season/ss203.htm(in Chinese)

Kao, Charng and Tung-Hai Hsu. 1996. "The Economic Interaction among Taiwan, Hong Kong, and the Mainland as well as Its Prospects." Taipei Bank Monthly Journal(T'ai Pei Yin Hang Yueh K'an). Vol. 26, No. 9. (September): 12-29.

Karp, Jonathan. 1991. "Funds for Friends--Taiwanese Aid to Friendly Foreign Countries." *Far Eastern Economic Review*. Vol. 154, No. 46 (November 14): 34.

Keizai Koho Center. 1994. *Japan: An International Comparison*. Tokyo, Japan : Keizai Koho Center.

Keizai Koho Center. 1995. *APEC 1995--A Statistical Compilation*. Tokyo, Japan : Keizai Koho Center, Japan Institute for Social and Economic Affairs.

Keohane, Robert O. and Stanley Hoffman. 1994. "Institutional Change in Europe in the 1980s." In Brent F. Nelsen and Alexander C-G Stub. Eds. *The European Union: Readings on the Theory and Practice of European Integration*. Boulder, Colo.: L. Rienner. Pp. 237-55. Originally appeared in Williams Wallace. Ed. *The Dynamics of European Integration*. London: Pinter Publishers, 1990.

Ker, Hung-Zei. 1994. "The Development of the Taiwanese PCB Industry." *Industries and Economies(Ch'an Yeh Ching Chi)*. (November): 35-50.(in Chinese)

KEXIM(the Export-and-Import Bank of Korea). "A Guide to EDCF." [Online] Available http://www.koreaexim.go.kr/exim/english/activ2/guide.htm

KEXIM. 1995. "EDCF Activities--Development Assistance" [Online] Available http://www.koreaexim.go.kr/exim/english/activ2/da.htm

KEXIM. 1996. "EDCF Operations." [Online] Available http://www.koreaexim.go.kr/exim/english/96annual/edcf.htm

KITA(Korea International Trade Association). [Online] Available http://www.kita.or.kr/ktp/ec10.htm

Kitamura, Kayoko and Tsuneo Tanaka. 1997. *Examining Asian's Tigers: Nine Economies Challenging Common Structural Problems*. Tokyo: Institute of Developing Economies.

Koppel, Bruce M. and Robert M. Orr, Jr. 1993. "Power and Policy in Japan's Foreign Aid." In Bruce M. Koppel and Robert M. Orr, Jr. Eds. *Japan's Foreign Aid Power and Policy in a New Era*. Boulder/San Francisco/Oxford: Westview Press. Pp. 341-68.

Kosai, Yutaka and Kenji Matsuyama. 1991. "Japanese Economic Cooperation." *The Annals of the American Academy of Political and Social Science*. Vol. 513 (Jan): 62-75.

Kovar, Joseph. 1998. "Acer Gets a Little Help from IBM on Display Technology." *Computer Reseller News*. [Online] Available http://www.techweb.com/wire/story/TWB19980319S0010

Kuo, Tin-Yu. 1997a. "The Strategy of UMC." *Wealth Monthly*. No. 180 (March): 295-7.

Kuo, Tin-Yu. 1997b. "The Grand Strategy of Yageo." *Wealth Monthly*. No. 180 (March): 303-5.(in Chinese)

Kwan, C.H. 1994. *Economic Interdependence in the Asia-Pacific Region—Towards a Yen Bloc*. London and New York: Routledge.

Lee, Chung-Bahn. 1991. "The Advantages of OEM." *Japanese Information*. Vol. 6, No. 6 (July): 115-9.(in Chinese)

Lee, Kuan-Jen. 1996. "Keeping Investors in Taiwan." *Sinorama*. [Online] Available

http://www.sinanet.com/sinorama/1296/article4/index.html

Lee, Ray-Chun and Chiu-Hung Cheng. 1998. "Industrial Clusters and Competitive Advantages--An Analysis of the Development and Competitiveness of the Taiwanese PCB Industry." *The Economic Situations and Review(Ching Chi Ch'ing Shih Chi P'ing Lun)*. Vol. 3, No. 4 (February): 209-29.(in Chinese)

Lee, Ming-Shuan. 1990. "Promoting HDTVs." *The Commonwealth Magazine(Tien-Hsia)*. No. 114 (November): 58-64.

Lee, Yu-Trun. 1994. "The Status and Outlook of Taiwanese Overseas Investment." *Taiwan Economic Research Monthly(T'ai Wan Chin Chi Yen Chiu Yueh K'an)*. Vol. 17, No. 7 (August): 50-3.(in Chinese.)

Leng, Tse-Kang. 1996. *The Taiwan-China Connection--Democracy and Development Across the Taiwan Straits*. Boulder, Colorado: Westview Press.

Lian, Chung-Wei. 1997. "Could Prohibition Regulate China Fever Effectively?" *The Common Wealth Magazine(Tien-Hsia)*. No. 194. Pp. 146-50.(in Chinese)

Lien, Ling-Yu. 1998. "The Market and Strategy of the Emerging PCB." *Capital*. No. 32 (April): 58-73.(in Chinese)

Lin, Shi-Che. 1996. "The Industry Development Bureau Decided to Construct a System of Division of Labor for the Automobile and Motorcycle Industries of Taiwan and Mainland China." Commerce Times. Web Version.

Lin, Shiou-Chen. 1998. "Deregulating the Financial System to Revitalize the Economy." *The Common Wealth*. No. 204. Pp. 182-6.(in Chinese)

Ling, Hou. 1992. "Foreign Aid Policy in the USA, Japan, and Germany." *Beijing Review*. Vol. 35, No. 46 (Nov): 31-3.

Lin, Yuh-Jiun. 1997. "An Analysis of the Statistical Data for Taiwanese Investment in Mainland China and Its Development." *Mainland China Studies*. Vol. 40, No. 11 (November): 40-67.(in Chinese)

Liu, Philip. 1995a. "Avoiding the Crossfire." *Far Eastern Economic Review*. Vol. 158, No. 41 (October 12): 134, 136.

Liu, Wu. 1995b. "Six Points of Inventec's Overseas Investment and Production." *Strategic Productivity Monthly(Chan Lueh Sheng Ch'an Li)*. No. 472. (June): Pp. 56-8.(in Chinese)

Liu, Tsai-Ling. 1997. "The Resurgence of Nantze." *China Expert*. No. 84 (June): Pp. 45-8.(in Chinese)

Loo, Chih-Yuan. 1997. "The Development of the Taiwanese IC Industry." *Micro-Electronics*. No. 139 (October): 198-208.(in Chinese)

Lyu, Men-Wen. 1998a. "Re-strengthening the Southward Policy--the IECDF Obtains New Resources." *Commerce Times*, Jan 26, 1998.

Lyu, Yu-Chuan. 1998b. "The Leading Reform of Inventec." *Learning & Development(Neng Li Tsa Chih)*. No 508 (June): 52-6.(in Chinese)

MAC(Mainland Affairs Council). 1994. *Annual Report of the Cross-Strait Economy*. Taipei: Mainland Affairs Council.

MAC(Mainland Affairs Council). 1997. *Monthly Report of the Cross-Strait Economy*. (March): No. 55.

Machado, Kit G. 1995. "Japanese Foreign Direct Investment in East Asia: The Expanding Division of Labor and the Future of Regionalism." In *Foreign Direct Investment in a Changing Global Order*. Edited by Steve Chan. New York: St. Martin's Press. Pp. 39-66.

Marsh, Robert M. 1996. *The Great Transformation--Social Change in Taipei, Taiwan Since the 1960s*. Armonk, New York and London, England: M.E. Sharpe.

Masiero, Gilmar. 1997. "Comparative Planning Strategies in East Asia and Latin America." Paper Presented at the Conference Regional Integration in the

Americas and the Pacific Rim. [Online] Available http://orpheus.ucsd.edu/las/prrpg.htm

Matsuoka, Mikihiro. 1994. *The DIR Guide to Japanese Economic Statistics*. Oxford and New York: Oxford University Press.

Mayes, David G. 1997. "The Problems of the Quantitative Estimation of Integration Effects." In Ali M. El-Agraa. Ed. *Economic Integration Worldwide*. New York: St. Martin's Press. Pp. 74-134.

Mekong Digest, The. 1993. Vol. 6, No. 15. [Online] Available http://www.mekongdigest.com/16apr93.htm

Michalak, Wieslaw. 1994. "The Political Economy of Trading Blocs." In Richard Gibb and Wieslaw Michalak. *Continental Trading Blocs—The Growth of Regionalism in the World Economy*. Chichester, England and New York: J. Wiley. Pp. 37-72.

MiTAC International. 1997. *1997 Annual Report MiTAC International*.

MITI(Ministry of International Trade and Industry). 1994. "Summary of the 24th Survey of Trends in Overseas Business Activities of Japanese Companies." *News from MITI*. [Online] Available http://www.jef.or.jp/news/tab/N-96-20.html

MITI(Ministry of International Trade and Industry). 1997. "Highlights of 'The 6th Basic Survey of Overseas Business Activities (Preliminary Report)'." [Online] Available http://www.jef.or.jp/news/970508.html

Mody, Ashoka. 1990. "Institutional and Dynamic Comparative Advantage: The Electronics Industry in South Korea and Taiwan." *Cambridge Journal of Economics*. Vol. 14, No. 3 (September): 291-314.

MOEA(Ministry of Economic Affairs). 1993. *The 1993 Survey on the Manufacturing Firms Making Overseas Investment*. Taipei: MOEA.

MOEA(Ministry of Economic Affairs). 1994. "Outline of Strengthening Economic

and Trade Relationships with Southeastern Asian Countries." [Online] Available http://www.moea.gov.tw/~meco/EcoDev_c/a182.htm(in Chinese)

MOEA(Ministry of Economic Affairs). 1997. *The 1996 Survey of the Overseas Investment of the Manufacturing Industry*. Taipei: MOEA.(in Chinese)

MOF(Ministry of Finance). *Monthly of Imports and Exports*. Taipei: Ministry of Finance.

MOFA(Ministry of Foreign Affairs). "A Guide to Japan's Aid." [Online] Available http://www2.nttca.com:8010/infomofa/oda/grantaid/intoro.html

MOFA. 1996. "ODA Summary 1996." [Online] Available http://club.jpn.net/infomofa/oda/sum1996/

Moon, Chung-in. 1991. "Managing Regional of Economic Rivalry." *Pacific Focus*. Vol. 6, No. 2 (Fall): 23-47.

Nakatani, Keiji, Hiroyuki Nakashima, Hiroki Sekine, and Yuriko Moritani. 1997. "EXIM Japan FY 1996 Survey--The Outlook of Japanese Foreign Direct Investment(FDI)." *EXIM Review*. Vol. 17, No. 1 (June): 1-64.

NITC.(National Investment Trust Company, Ltd.) [Online] Available http://www.nitc.com.tw/textile.htm.(in Chinese)

Noble, Gregory. 1996. "Trojan Horse or Boomerang?--Two-Tiered Investment in the Asian Auto Complex." The BRIE Working Paper. [Online] Available http://brie.berkeley.edu/BRIE/pubs/wp/wp90.html

O'Brien, Robert. 1995. "North American Integration and International Relations Theory." *Canadian Journal of Political Science*. (December): 693-724.

OECD. 1993. *Foreign Direct Investment Relations Between the OECD and the Dynamic Asian Economies*. Paris: OECD.

OECD. 1996. "DAC Statistics." [Online] Available http://www.oecd.org:80/dac/htm/42japan.htm

OECF(Overseas Economic Cooperation Fund). "What is ODA?" [Online] Available http://www.oecf.go.jp/gaiyo/gaiyo0e.htm.

Ogata, Shijuro. 1996. "Financial Markets in Japan." In Suzanne Berger and Ronald Dore. Eds. *National Diversity and Global Capitalism*. Ithaca and London: Cornell University Press. Pp. 171-8.

Ohta, Hideaki, Akihiro Tokuno, and Ritsuko Takeuchi. 1995. "Evolving Foreign Investment Strategies of Japanese Firms in Asia." In *The New Wave of Foreign Direct Investment in Asia.* Compiled by Nomura Research Institute and Institute of Southeast Asian Studies. Singapore: Institute of Southeast Asian Studies. Pp. 43-63.

Okazaki, Tetsuji. 1995. "The Evolution of the Financial System in Post-War Japan." *Business History*. Vol. 37, No. 2 (April): 89-106.

Okimoto, Daniel. 1989. Between MITI and the Market—Japanese Industrial Policies for High Technology. Stanford, California: Stanford University Press.

ö**nis**, Ziya. 1991. "The Logic of Developmental State." *Comparative Politics*. Vol. 24, No. 1 (October): 109-126.

Ono, Shuichi. 1992. *Sino-Japanese Economic Relationships--Trade, Direct Investment, and Future Strategy.* Washington, D.C.: The World Bank.

Orr, Robert M. Jr. 1987. "The Rising Sun: Japan's Foreign Aid to ASEAN, the Pacific Basin, and the Republic of Korea." *Journal of International Affairs*. Vol. 41, No. 1. (Summer-Fall): 39-62.

Orr, Robert M. Jr. and Bruce M. Koppel. 1993. "A Donor of Consequence: Japan as a Foreign Aid Power." In Bruce M. Koppel and Robert M. Orr, Jr. Eds. *Japan's Foreign Aid--Power and Policy in a New Era*. Boulder/San Francisco/Oxford: Westview Press. Pp. 1-18.

Ou, Si-Chan. 1997. "Miau Declares the War on Controlling the Distribution Channels." *The Common Wealth*. No. 191. (April 1): 69-78.(in Chinese)

Parker, Paul. 1995. "Japanese Structures: Integrating State and Corporate Strategies." In Richard Le Heron and Sam Ock Park. Eds. *The Asian Pacific Rim and Globalization--Enterprise, Governance, and Territoriality*. Pp. 87-105.

Pempel, T.J. 1996/7. "Gulliver in Lilliput—Japan and Asian Economic Regionalism." In *World Policy Journal*. (Winter): 13-26.

Peng, Lien-Yi. 1997. "The Transformation and Overseas Investment of Taiwanese IT producers." *The Common Wealth Magazine(Tien-Hsia)*. No. 194, Pp. 44-53.

Rimmer, Peter J. 1995. "Taiwan's Future as a Regional Transport Hub." In Gary Klintworth. Ed. *Taiwan in the Asia-Pacific in the 1990s*. St. Leonards, NSW, Australia: Allen & Unwin. Pp. 217-43.

Rosario, Louise do. 1992. "Help Those Who Help Themselves." *Far Eastern Economic Review*. Vol. 155, No. 24 (June 18): 58, 60.

Sakuri, Masao. 1995. "Japan's Foreign Investment in Southeast Asia: Facts and Legal Problems." In Carl J. Green and Thomas L. Brewer. Eds. *Investment Issues in Asia and the Pacific Rim*. New York: Oceania Publication Inc., Pp. 65-88.

Schive, Chi. 1992. "Taiwan's Emerging Position in the International Division of Labor." In Denis Fred Simon and Michael Y.M. Jau. Eds. *Taiwan--Beyond the Economic Miracle*. Armonk, New York and London, England: M.E. Sharpe, Inc. Pp. 101-21.

Schmiegelow, Michèle and Henrik Schmiegelow. 1989. *Strategic Pragmatism—Japanese Lessons in the Use of Economic Theory*. New York/Westport, Conneticut/London: Praeger.

Sheridan, Kyoko. 1993. *Governing the Japanese Economy*. Cambridge: Polity

Press.

Sheridan, K. 1995. "Japan's Direct Investment, Its Development Pattern and Future Direction." *Journal of Contemporary Asia*. Vol. 25, No. 4. Pp. 473-491.

Shih, Stan and Wennie Lin. 1998. *Reengineering Acer*. Taipei: Tien-Hsia.(in Chinese)

Simon, Denis Fred. 1992. "Taiwan's Emerging Technological Trajectory: Creating New Forms of Competitive Advantage." In Denis Fred Simon and Michael Y.M. Jau. Eds. *Taiwan--Beyond the Economic Miracle*. Armonk, New York and London, England: M.E. Sharpe, Inc. Pp. 123-47.

Simon, Denis Fred and Yongwook Jun. 1995. "Technological Change, Foreign Investment and the New Strategic Thrust of Japanese Firms in the Asia Pacific." In Edward K. Y. Chen and Peter Drysdale. Eds. *Corporate Links and Foreign Direct Investment in Asia and the Pacific*. Pymble, NSW: Harper Educational. Pp. 203-26.

Söderberg, Marie. 1996. "Introduction: Japanese Aid in Practice." In Marie Söderberg. Eds. *The Business of Japanese Foreign Aid*. London and New York: Routledge. Pp. 1-14.

Söderberg, Marie. 1996a. "Japanese ODA What Type, for Whom, and Why?" In Marie Söderberg. Ed. *The Business of Japanese Foreign Aid*. London and New York: Routledge. Pp. 31-50.

Söderberg, Marie. 1996c. "Japanese ODA the Business Perspective." In Marie Söderberg. Ed. *The Business of Japanese Foreign Aid*. London and New York: Routledge. Pp. 72-88.

Stopford, John M. 1995. "The Impact of the Global Political Economy on Corporate Strategy." [Online] Available http://www.gsia.cmu.edu/afs/andrew/gsia/bosch/work/stopford/stopford.html

Stubbs, Richard. 1994. "The Political Economy of the Asia-Pacific Region." In Richard Stubbs and Geoffrey R.D. Underhill. Eds. *Political Economy and the Changing Global Order*. Pp.366-77.

Su, Yu-Chi. 1995. "The Profitable Semiconductor Industry." *The Common Wealth Magazine(Tien-Hsia)*. No. 173 (October): 76-86.(in Chinese)

Sugita, Nozomu. 1994. "Japan's Changing ODA Strategy." [Online] Available http://www.smn.co.jp/keyword/0008k01e.html

Sung, Yun-Wing. 1995. "Subregional Economic Integration: Hong Kong, Taiwan, South China and Beyond." In Edward K. Y. Chen and Peter Drysdale. Eds. *Corporate Links and Foreign Direct Investment in Asia and the Pacific*. Pymble, NSW: HarperEducational. Pp. 56-86.

Sung, Yun-Wing. 1997. "Hong Kong and the Economic Integration of the China Circle." In Barry Naughton. Ed. *The China Circle--Economics and Electronics in the PRC, Taiwan, and Hong Kong*. Washington, D.C.: Brookings Institution Press. Pp. 41-80.

Tabb, William K. 1994. "Japanese Capitalism and the Asian Geese." *Monthly Review*. Vol. 45, No. 10 (March): 29-40.

Taiwan Industry Net. 1996. [Online] Available http://www.psd.iii.org.tw/expo96/top-21.htm.(in Chinese)

Taiwaninternet. http://www.taiwaninternet.com/taiwan/weekly news/b061496.htm

Tatung Corporation. 1997. *Annual Report*. Taipei: Tatung Corporation.

Taylor, Robert. 1996. *Greater China and Japan--Prospects for an Economic Partnership in East Asia*. London and New York: Routledge.

Terry, Edith. 1997a. "The East Asian Miracle--One Paradigm or Too Many." The International Relations Research Archive. [Online] Available

http://www.irra.org/ebt/biblio.html

Terry, Edity. 1997b. "How Asia Got Rich: World Bank vs. Japanese Industrial Policy." The Japan Policy Research Institute(JPRI), Working Paper. No. 10. [Online] Available http://www.nmjc.org/jpri/public/wp10.html

Tokunaga, Shojiro. 1992a. "Japan's FDI-Promoting Systems and Intra-Asia Networks: New Investment and Trade Systems Created by the Borderless Economy." In Shojiro Tokunaga. Ed. *Japan's Foreign Investment and Asian Economic Interdependence--Production, Trade, and Financial System.* Tokyo: University of Tokyo Press. Pp. 5-47.

Tokunaga, Shojiro. 1992b. "Moneyless Direct Investment and Development of Asian Financial Markets: Financial Linkages Between Local Markets and Offshore Centers." In Shojiro Tokunaga. Ed. *Japan's Foreign Investment and Asian Economic Interdependence--Production, Trade, and Financial System.* Tokyo: University of Tokyo Press. Pp. 257-71.

Tsai, Hung-Ming. 1994. "The Interaction between and Trends of Southward and Westward Investment." *Taiwan Economic Research Monthly*, T'ai Wan Chin Chi Yen Chiu Yueh K'an. Vol. 17, No. 8. Pp. 43-8.(in Chinese)

TTF(Taiwan Textile Federation). 1979, 1985, 1993, 1996. *Statistics on Taiwan Textile & Apparel Industries.* Taipei: TTF.

UMC(United Manufacturing Corp.). 1997. "UMC Transfers 0.5 Micron Process Technology to ITT Intermetal." [Online] Available http://www.umc.com.tw/itt.htm]

UNCTAD. 1991. *World Investment Report--The Triad in Foreign Direct Investment.* New York and Geneva: United Nations.

UNCTAD. 1993. *World Investment Report--Transnational Corporations and Integrated International Production.* New York and Geneva: United Nations.

UNCTAD. 1995. *World Investment Report--Transnational Corporations and Competitiveness.* New York and Geneva: United Nations.

Urata, Shujiro. 1991. "The Rapid Increase of Direct Foreign Investment Abroad and Structural Change in Japan." in Eric D. Ramstetter. Ed. *Direct Foreign Investment in Asia's Developing Economies and Structural Change in the Asia-Pacific Region.* Boulder/San Francisco/Oxford: Westview Press. Pp. 175-99.

Urata, Shujiro, 1993. "Changing Patterns of Direct Investment and Implications For Trade and Development." In C. Fred Bergsten and Marcus Noland. Eds. *Pacific Dynamism and the International Economic System.* Washington, D.C: Institute of International Economics.

Wade, Robert. 1990. Governing the Marker--*Economic Theory and the Role of Government in East Asian Industrialization.* Princeton, N.J.: Princeton University Press.

Wade, Robert. 1996. "Japan, the World Bank, and the Art of Paradigm Maintenance: The *East Asian Miracle* in Political Perspective." *New Left Review*, No. 217. Pp. 3-37.

Wang, Chen-Chin. 1997a. "The Crisis Triggered by The Speeding Growth of Taiwanese High Technology Industries." *The Common Wealth Magazine(Tien-Hsia).* No. 197 (October): 180-8.(in Chinese)

Wang, Chen-Chin. 1997b. "The Challenge of LCD: Crisis and Opportunity." *The Common Wealth Magazine(Tien-Hsia).* No. 198 (September): 172-3.(in Chinese)

Wang, Chien-Chuan. 1994. "The Central-Satellite System and the Strategy of Promotion." Industries and Finance Quarterly. No. 84 (September): 14-21.(in Chinese)

Wang, Vincent Wei-Cheng. 1995-6. "Developing the Information Industry in Taiwan: Entrepreneurial State, Guerrilla Capitalists, and Accommodative Technologists." *Pacific Affairs.* Vol. 68, No. 4 (Winter): 551-76.

Wealth Magazine. 1998. "An Exclusive Interview with the Leader of Compeq." *Wealth Magazine.* No. 196. (July): 276-86.

Weng, Chao-Dong. 1991. "FDI: The Catalyst of Japanese Industrial Upgrading." *Japanese News*. Vol. 6, No. 6 (July): 40-2.(in Chinese)

Weng, Chi-Hong. 1997. "The Prospering IC Packaging Industry of Taiwan." *Micro-Electronics*. No. 139. (October): 209-16.(in Chinese)

WTDB(World Trade Data Base). 1996a. *Taiwan's Economic Daily News*. April 17, 1996. "China Motor to Make 'Asia Car' Mitsubishi Model to be Produced at Taoyuan Plant for Sale on Domestic Market." (April 1996). [Online] Available http://www.wtdb.com/twnews/tw0417.htm.

WTDB.(World Trade Data Base). 1996b. *Taiwan's Economic Daily News*. (June 22): [Online] Available http://www.wtdb.com/twnews/tw0622.htm#1.

WTDB.(World Trade Data Base). 1996c. "Japanese Firms Boost IT Sourcing." *Taiwan's Economic Daily News*. (October 18): [Online] Available http://www.wtdb.com/twnews/tw1018.htm#2.

Wong, Ming-Hui. 1997. "The Revived Chunghwa Picture Tube." *The Excellent*. No. 159, Pp. 24-7.(in Chinese)

Wah, Tan Kock and Jomo K.S. 1995. "Economic Theory and Industrial Policy in East Asia." In Robert Fitzgerald. Ed. *The State and Economic Development--Lessons from the Far East*. London: Frank Cass. Pp. 17-54.

WTEC(World Technology Evaluation Center). 1997. "Electronics Manufacturing in the Pacific Rim." [Online] Available http://itri.loyola.edu/em/toc.htm; http://itri.loyola.edu/em/05_04.htm)

WTO(World Trade Organization). 1997. *Annual Report*. Geneva: WTO.

Wu, Won-Yu. 1997. "Tatung's New Sprint" *The Commonwealth Magazine(Tien-Hsia)*. No. 198. (November): 38-46.(in Chinese)

Yamazawa, Ippei. 1990. *Economic Development and International Trade--The*

Japanese Model. Honolulu: East-West Center.

Yang, Ai-Li. 1997a. "The Stratagem and Legend of Morris Chang." *The Commonwealth Magazine(Tien-Hsia)*. No. 190 (March): 116-40.(in Chinese)

Yang, Ai-Li. 1997b. "The Stratagem and Legend of Morris Chang." *The Commonwealth Magazine(Tien-Hsia)*. No. 191 (April): 113-44.(in Chinese)

Yang, Ai-Li. 1997c. "Acer's New Challenge and Strategy." *The Commonwealth Magazine(Tien-Hsia)*. No. 198 (November): 60-78.(in Chinese)

Yang, Ron-Chian. 1994. "The Development of The Taiwanese PCB Industry." *Industries and Economies(Ch'an Yeh Ching Chi)*. No. 149 (November): 35-50.(in Chinese)

Yae, Liu-Yen. 1993. "The Development of the Japanese Central-Satellite System." *Taiwan Economic Research Monthly(T'ai Wan Chin Chi Yen Chiu Yueh K'an)*. Vol. 16, No. 3. (March): 100-2.(in Chinese)

Yasutomo, Dennis T. 1993. "Japan and the Asian Development Bank: Multilateral Aid Policy in Transition." In Bruce M. Koppel and Robert M. Orr, Jr. Eds. *Japanese Foreign Aid--Power and Policy in a New Era*. Boulder/San Francisco/Oxford: Westview Press. Pp. 305-40.

Ye, Hui-Chuan. 1997. "The Prospect of Taiwan being the Asian Petrochemical Manufacturing Center." [Online] Available http://www.shgsh.tpc.edu.tw/html/Chinese/itisitri/021204.htm.(in Chinese)

Yen, Ru-Yu. 1993. "The Big Family of Acer Group." *The Wealth Magazine.* , No. 180, Pp. 298-9.(in Chinese)

Yo, Chan-Shan. 1994. "Tatung's Silent Revolution." *The Commonwealth Magazine(Tien-Hsia)*. No. 159 (August): 160-8.

Yo, Chan-Shan. 1998. "The Aurora is Emerging in Taipei." *The Commonwealth Magazine(Tien-Hsia)*. No. 206. (July): 90-100.(in Chinese)

Young, Lewis H. 1997. "The Dragon's Dream." *Electronics Business Today.* (June) [Online] Available http://www.ebtmag.com/registrd/issues/9706/06acer.htm.

Yue, Chia Siow. 1995. "The International Procurement and Sales Behavior of Multinational Enterprises." In Edward K. Y. Chen and Peter Drysdale. Eds. *Corporate Links and Foreign Direct Investment in Asia and the Pacific.* Pymble, NSW: Harper Educational. Pp. 227-61.

CHINESE BIBLIOGRAPHY

大陸委員會(Mainland Affairs Council, MAC)，《兩岸經濟年報》，(北市：行政院陸委會，民國八十三年)。

王正勤(Wang, Chen-Chin)，〈高成長引爆科技業危機〉，《天下雜誌》，197 期，1997 年 10 月 1 日，頁 180-8。

王正勤(Wang, Chen-Chin)，〈LCD 大戰:危機與轉機--電腦業迎戰六百億差〉，《天下雜誌》，198 期，1997 年 9 月 1 日，172-3 頁。

王健壯(Wang, Chien-Chuan)，〈中衛體系及其推動策略之探討〉，《產業金融季刊》(Industries and Finance Quarterly)，84 期，民國 83 年月，頁 14-21。

中國時報(China Times)，〈下游取得優勢，神通力爭上游〉，《中國時報》，1998 年 4 月 7 日。

日本文摘(Japanese Information)，〈宏碁進軍日本！〉，《日本文摘》，(Japanese Information)，1989 年 8 月 1 日，頁 93-95。

朱紀中(Chu, Chi-Chun)，〈宏碁建構全球生產網路〉，《中國時報》，199 年 12 月 4 日。

朱紀中與劉在武(Chu, Chi-Chun and Liu Tzai-Wu)，〈積極與四大品牌盟，提昇戰力〉，《中國時報》(China Times)，1998 年 4 月 7 日。

李中邦(Lee, Chung-Bahn)，〈OEM 合綜連橫好處多多〉，《日本文摘》，第 6 卷第 6 期，1991 年 7 月 1 日，頁 115-9。

李玉春(Lee, Yu-Trun)，〈我國對外投資的現況及展望〉，《臺灣經濟研究月刊》(Taiwan Economic Research Monthly, T'ai Wan Chin Chi Yen Chiu Yueh K'an)，第 17 卷第 7 期，民國 83 年 8 月，頁 50-3。

李明軒(Lee, Ming-Shuan)，〈家電業合力爲高畫質電視點睛〉，《天下雜誌》，114 期，1990 年 11 月 1 日，頁 58-64。

李瑞中與陳秋宏(Lee, Ray-Chun and Chiu-Hung Cheng)，〈產業群聚與競爭優勢我國印刷電路板產業發展與競爭力之分析〉，《經濟情勢與評論》(Ching Chi Ch'ing Shih Chi P'ing Lun)，第三卷第四期，頁 209-29。

呂玉娟(Lyu, Yu-Chuan)，〈英業達的變革之路始終跑在環境、潮流變化前端〉，《能力雜誌》，508 期，1998 年 6 月，頁 52-6。

汪名輝(Wong, Ming-Hui)，〈中華映管浴火重生〉，《卓越雜誌》(The Excellent)，159 期，1997 年 11 月，頁 24-7。

吳琬瑜(Wu, Won-Yu)，〈大同寶寶衝刺新戰場〉《天下雜誌》，198 期，1997 年 11 月 1 日，頁 38-46。

林世哲，〈工業局決推動建立汽機車兩岸分工體系〉，《工商時報》，1996 年 12 月 16 日，網路版。

林秀貞(Lin, Shiou-Chen)，〈金融解禁，解救低迷景氣〉，《天下雜誌》，204 期，1998 年 5 月 1 日，頁 182-6。

林昱君(Lin, Yuh-Jiun)，〈論台商對大陸投資統計問題寄發展趨勢〉，《中國大陸研究》，第 40 卷第 11 期，民國 86 年 11 月，頁 40-67。

林鴻儒(Lin, Hung-Rue)，〈外資廠商在我國電子工業發展歷程中之角色探討〉，《新電子》(Micro-Electronics)，85 期，1993 年 4 月，頁 167-77。

周正賢(Chou, Chen-Hsien)，《施振榮的電腦傳奇》，(臺北市：聯經出版事業股份

有限公司，1996 年）。

建弘證券投資信託股份有限公司(National Investment Trust Company, Ltd., NITC)，〈根留臺灣花開四海的臺灣紡織業〉，http://www.nitc.com.tw/textile.htm)

施振榮(Shih, Stan)，《再造宏碁》，（臺北市：天下文化出版股份有限公司，1998 年 3 月第一版）。

洪玟琴(Hung, Wen-Chin)，〈錢進東南亞，中華開發願扮小央行〉，《中時晚報》，民國八十七年一月三日。http://w3.ttnn.com/cna/980103/f12_b.html

洪國基(Hong, Kuo-Chi)，〈電算機三大廠，登陸築新巢〉，《工商時報》(網路版)，1996 年 10 月 13 日。

柯宏澤(Ker, Hung-Zei)，〈台灣印刷電路板工業發展概況〉，《產業經濟》，民國 83 年 11 月，頁 35-50。

高長(Kao, Charng)，〈臺灣產業轉型與兩岸產業分工〉，《台北銀行月刊》，(Taipei Bank Monthly Journal, T'ai Pei Yin Hang Yueh K'an)，第二十五卷第三期，民國 83 年 3 月，頁 2-18。

高長(Kao, Charng)，〈製造業台商赴大陸投資與兩岸產業分工〉，《台北銀行月刊》，第 26 卷第 11 期，民國 85 年 11 月，頁 23-38。

高長(Kao, Charng)，〈台海兩岸貿易相互依賴對台灣經濟發展的影響〉，(Economic Interdependence between Taiwan & the Mainland and It's Effect on Taiwan's Economy)，《政治大學學報》(The National Chengchi University Journal)，第 66 卷第 2 期，頁 129-56。

高長與徐東海(Kao, Charng and Tung-Hai Hsu)，〈台港大陸兩岸三地經濟互動現況與展望〉，《台北銀行月刊》(Taipei Bank Monthly Journal, T'ai Pei Yin Hang Yueh K'an)，第 26 卷第 9 期，民國 85 年 9 月，頁 12-29。

高長(Kao, Charng)，〈台商在大陸投資趨勢及其對大陸經濟之影響〉，《經濟情勢暨評論》(The Economic Situations and Review, Ching Chi Ch'ing Shih Chi P'ing Lun)，第三卷第一期，民國 86 年 5 月。
http://www.moea.gov.tw/~ecobook/season/ss203.htm

高希均、李誠、林祖嘉(Kao, Charles H. C., Joseph S. Lee, and Chu-Chia Steve Lin)，《臺灣突破--兩岸經貿追蹤》，(臺北市，天下文化，1992 年)。

徐曉慧(Hsiu, Shiao-Hui)，〈神通準備顯神通？〉，《天下》，101 期，民國 78 年 10 月 1 日，頁 198- 206。

財政部關稅總局(Directorate General of Customs)，《進出口貿易統計月報》，臺北市，財政部。

財政部金融局，《民國八十五年財政部金融局年報》，(臺北市，財政部金融局，民國八十五年)。

財訊(Wealth Magazine)，〈獨家專訪華通電腦領導人〉，《財訊》，196 期，1998 年 7 月，頁 276-86。

夏鑄九(Hsia, Chou-Joe)，〈全球經濟中的臺灣城市與社會〉，《臺灣社會研究季刊》，第二十期，1995 年 8 月，頁 57-102。

章英華(Chang, Ying-Hwa)，〈臺北市的內部結構—區位的與歷史的探討〉，《中央研究院民族學研究所集刊》，第 63 期，民國 76 年，頁 1-62。

章寶鷺(Chan, Pao-Run)，〈大同兩階段運籌全球市場〉，《能力雜誌》，507 期，1998 年 5 月，頁 34-7。

梁中偉(Lian, Chung-Wei)，〈戒急用忍擋得住香港九七？〉，《天下雜誌》，194 期，1997 年 7 月 1 日，146-50 頁。

游常山(Yo, Chan-Shan)，〈大同無聲起革命〉，《天下雜誌》，159 期，1994 年 8 月，

頁 160-8。

游常山(Yo, Chan-Shan)，〈曙光在台北初露〉，《天下雜誌》，206 期，1998 年 7 月，頁 90-100。

張玉文(Chang, Yu-Wen)，〈價值串聯、細胞分裂〉，《天下雜誌》，119 期，1991 年 4 月 1 日，頁 168-72。

張玉文(Chang, Yu-Wen)，〈昆盈借力使力〉，《天下雜誌》，130 期，1992 年 3 月 1 日，頁 58。

蕭峰雄(Hsiao, Feng-Hsiung)，〈我國七０年代以來產業結構變動、對外投資及國際產業分工〉，《臺灣經濟》(Taiwan Economy Monthly, T'ai Wan Ching Chi)，第 223 期，1995 年 7 月，頁 15-36。

鄭一青(Cheng, I-Chin)，〈台灣產業大地震--綠色風暴烏雲壓境〉，《天下雜誌》，第 203 期，一九九八年四月一日，頁 154-64。

鄭琇文(Cheng, Show-Wen)，〈憶聲行銷觸角伸向歐美以外事業主力擺在光電及資訊，建立運籌體系〉，《電子時報》，1998 年 5 月 26 日，http://www.digitimes.com.tw/a13/980526/9805263.htm。

連玲玉(Lien, Ling-Yu)，〈新興 PCB 市場機會與策略〉，《群益投資資訊》，32 期，1998 年 4 月，頁 58-73。

黃創夏(Huang, Chuan-Hsia)，〈李登輝帶了兩百億元大紅包到中南美〉，《新新聞》，548 卷，1997 年 9 月 5 日，http://magazines.sinanet.com/thejournalist/548/findex.html

黃淑卿(Huang, Shu-Ching)，〈台灣資訊工業之現況與展望〉(上)，《產業經濟》，第 165 期，民國 84 年 5 月，頁 8-40。

黃淑卿(Huang, Shu-Ching)，〈台灣資訊工業之現況與展望〉(下)，《產業經濟》，

第 167 期，民國 84 年 7 月，頁 1-50。

黃淑卿(Huang, Shu-Ching)，〈我國消費性電子工業概況〉，《產業經濟》，170 期，民國 84 年 10 月，頁 36-57。

黃欽勇等著(Hwang, Chin-Yeong, et. al)，《跨世紀資訊商戰》，(臺北市，天下文化出版股份有限公司，1997 年 1 月 30 日第一版第一次印行)。

黃瑞祺(Huang, Rei-Chi)，〈中、日、韓對東南亞國家投資現況與比較〉，《臺灣經濟研究月刊》，第十七卷第八期，民國 83 年 8 月，49-56 頁。

陳修賢(Chen, Hsiu-Hsien)，〈拼出台灣技術自主路〉，《天下雜誌》，123 期，1991 年 8 月 1 日，頁 12-23。

陳俊仲(Chen, Chun-Chon)，〈台灣積體電路精耕矽田〉，《天下雜誌》，1994 年 2 月 1 日，頁 66-70。

陳俊仲(Chen, Chun-Chon)，〈國巨高品味高品質〉，《一九九四天下一千大特刊》，1994 年 6 月 10 日，頁 81-2。

陳麗瑛、呂慧敏、林宗慶等(Chen, Lee-In, Hui-Min Lyu, and Chun-Chin Lin)，《兩岸產業政策分工政策執行成效評估》，(臺北市，經濟部工業局與中華經濟研究院，民國 86 年 6 月)。

溫肇東(Weng, Chao-Dong)，〈海外直接投資〉，《日本文摘》，第 6 卷第 6 期，1991 年 7 月 1 日，頁 40-2。

溫啓宏(Weng, Chi-Hong)，〈台灣封裝業欣欣向榮〉，《新電子科技雜誌》(Micro-Electronics)，第 139 期，1997 年 10 月，頁 209-16。

郭庭昱(Kuo, Tin-Yu)，〈千億生意比百億還單純--聯電「世紀豪賭」值得一看〉，《財訊》，180 期，1997 年 3 月，頁 295-7。

郭庭昱(Kuo, Tin-Yu)，〈陳家兄弟攻入世界市場--國巨敲定跨世紀戰鬥目標〉，《財訊》，180 期，1997 年 3 月，頁 303-5。

彭漣漪(Peng, Lien-Yi)，〈資訊業搶進全球市場最前線〉，《天下雜誌》，194 期，1997 年 7 月 1 日，頁 44-53。

葉律言(Yae, Liu-Yen)，〈日本中衛制度發展之歷程〉，《臺灣經濟研究月刊》(Taiwan Economic Research Monthly, T'ai Wan Chin Chi Yen Chiu Yueh K'an)，第 16 卷第 3 期，民國 82 年 3 月，100-2 頁。

楊艾俐(Yang, Ai-Li)，〈張忠謀的策略傳奇(上)〉，《天下雜誌》，190 期，1997 年 3 月，頁 116-40。

楊艾俐(Yang, Ai-Li)，〈張忠謀的策略傳奇(下)〉，《天下雜誌》，191 期，1997 年 4 月，頁 113-44。

楊艾俐(Yang, Ai-Li)，〈宏碁施振榮又臨策略轉折戰(上)〉，《天下雜誌》(The Commonwealth Magazine, Tien-Hsia)，198 期，1997 年 11 月，頁 60-78。

楊榮強(Yang, Ron-Chian)，〈台灣印刷電路板工業發展概況〉，《產業經濟》，149 期，民國 83 年 11 月，頁 35-50。

楊雅惠(Yang, Ya-Hui)、杜英儀(Du, In-Yi)，〈東南亞及大陸臺商之資金活動〉，《經濟前瞻》(Economic Outlook Bimonthly, Ching Chi Ch'ien Chan)，第 10 卷第 4 期(40)，民國 84 年 7 月 5 日。

經濟部投資業務處(Industrial Development and Investment Center of MOEA, IDIC)，〈對東南亞台商投資經營狀況調查報告〉，《工業投資簡訊》(Kung Yeh T'ou Tzu Chien Hsun)，175 期，民國 86 年 2 月，頁 12-21。

經濟部投資業務處(Industrial Development and Investment Center, IDIC)，〈對東南亞台商投資經營狀況調查報告〉，《工業投資簡訊》(Kung Yeh T'ou Tzu Chien Hsun)，第 175 期，民國九十七年二月，頁 12-21。

經濟部投審會(The Investment Commission, the Ministry of Economic Affairs)，《對外投資事業營運狀況調查分析報告》(They 1993 Survey on the Manufacturing Firms Making Overseas Investment)，民國 83 年五月。

經濟部國際貿易局，〈外商在大陸投資之剖析〉，《中共對外經貿研究》(The Study on China's Economy and Foreign Trade, Chung Kung Tui Wai Ching Mao Yen hiu)，總四四O期，民國八十三年十一月一日，頁 6。

經濟部國際貿易局(The Bureau of Foreign Trade, the Ministry of Economic Affairs)，《貿易趨勢預測季刊》(The Quarterly of Trade Forecast)，第六期，民國 87 年 1 月 31 日。

經濟部統計處(Department of Statistics, the Ministry of Economic Affairs)，中華民國經濟統計年報，(臺北市，經濟部，民國八十五年)。

經濟部統計處(Department of Statistics, the Ministry of Economic Affairs)，《製造業多角化暨國際化調查報告》(The 1995 Survey on the Diversification and Internationalization of the Manufacturing Industry)，民國八十四年調查。

經濟部統計處(Department of Statistics of the Ministry of Economic Affairs)，《製造業對外投資實況調查報告》(The 1996 Survey of the Overseas Investment of the Manufacturing Industry)，民國八十六年三月。

劉武(Liu, Wu)，〈英業達產業移植六關鍵〉，《戰略生產力雜誌》，(Strategic Productivity Monthly, Chan Lueh Sheng Ch'an Li)，472 期，1995 年 6 月，頁 56-8。

劉在霖(Liu, Tsai-Ling)，〈楠梓電翻身難救吳禮淦〉，《中國通》，84 期，1997 年 6 月，頁 45-8。

編輯部，〈外商在大陸投資之剖析〉，《中共對外經貿研究》，總四四O期，民國八十三年十一月一日，頁 3-8。

蔡宏明(Tsai, Hung-Ming)，〈南向與西進投資活動之互動關係與趨勢〉，《臺灣經濟

研究月刊》(Taiwan Economic Research Monthly, T'ai Wan Chin Chi Yen Chiu Yueh K'an)，第 17 卷第 8 期，民國 83 年 8 月，頁 43-8。

歐錫昌(Ou, Si-Chan)，〈三小時管理搶攻千億市場，苗豐強掀起通路戰〉，《天下雜誌》，191 期，1997 年 4 月 1 日，頁 68-78。

簡旭仲與洪瑞國(Chien, Hsiu-Chung and Rei-Kuo Hong)，〈九〇年代臺灣經濟特區之轉變以一九九五年加工出口區爲例〉，《經濟情勢暨評論》，第 3 卷第 4 期，民國 87 年 2 月，頁 152-77。

盧志遠(Loo, Chih-Yuan)，〈台灣 IC 產業來時路--半導體產業研究計畫之落實〉，《新電子科技雜誌》，139 期，1997 年 10 月，頁 198-208。

顏如玉(Yen, Ru-Yu)，〈多子多孫打天下〉，《財訊》(Wealth Magazine)，180 期，1993 年，頁 298-9。

蘇育琪(Su, Yu-Chi)，〈半導體點矽成鑽〉，《天下雜誌》，173 期，1995 年 10 月 1 日，頁 76-86。

MICHIGAN STATE UNIV. LIBRARIES
31293017711874