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**A socioeconomic analysis of labor force development in Taiwan
(1950–1988)**

Liu, Chang-Hwai Wang, Ph.D.

University of Hawaii, 1992

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A SOCIO-ECONOMIC ANALYSIS OF LABOR FORCE DEVELOPMENT
IN TAIWAN (1950-1988)

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE
UNIVERSITY OF HAWAI'I IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN

SOCIOLOGY

AUGUST 1992

BY

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This dissertation is dedicated to my husband--Ta-Ching, for his love and many sacrifices during the past ten years.

ACKNOWLEDGMENTS

First, I would like to thank Dr. Stephen Yeh, my committee chair, for his intensive and patient guidance and advice for the entire period of my dissertation writing. His high standards and perfectionism in research have taught me the seriousness of the academic endeavor. Other committee members, Dr. Alvin So, Dr. William James, Dr. Seiji Naya, and Dr. Kiyoshi Ikeda also gave very valuable comments on the draft of my dissertation. Their suggestions have opened my eyes to the diversity and complexity of the issues in both Sociology and Economics.

During the development of this dissertation, I also benefited greatly from the courses and discussions with Dr. Edwin Fujii and Dr. John Bauer from the Economics Department at the University of Hawaii, Manoa. Their expertise in Labor Economics has inspired me to study the labor issues in developing countries.

I also want to thank Ms. Yu-lan Liu, Deputy Director, and Ms. Mei-Yang Chang, Manpower planning expert, of the Manpower Planning Department at the Council of Economic Planning and Development in Taipei for their generous assistance during my field work there for two summers. They provided me with many valuable documents and the manpower survey data for my dissertation.

Lastly, I would like to thank many friends from the Hawaii Chinese Gospel Fellowship for their emotional and

spiritual support during the process of dissertation writing. Their friendship and love have often sustained me.

Above all, my deepest thanks go to my husband, Ta-ching, for his complete support of my pursuit of a professional career. He has done so much to help me through the long and often frustrating years of the doctoral program. Without his selfless love, I could not have made it.

ABSTRACT

The main theme of this study is to answer the questions of how has Taiwan's labor force been transformed during its economic growth. What are the patterns, the consequences, and the socio-economic factors behind the transformations of the labor force between the 1950s and the 1980s? The findings show that Taiwan's labor force has changed rapidly from young workers to a relatively aging labor force, from having low education to a medium level of education, from mostly agricultural to more service workers, and from a pre-industrial to an industrial society within the past 40 years. These transformations were accompanied by a high level of labor utilization and rising per capita income.

This kind of success can be attributed to many socio-economic factors. The existence of Confucian work ethics and the government's manpower policies proved to be important. Confucian work ethics contributed both positively and negatively to the quality of labor. The government's manpower policies have been effective for reducing population growth, upgrading the education level and training of the labor force, and promoting positive work ethics. Because of Taiwan's high dependence on international trade and the world market, in facing the uncertainty of the world economy and its own economic and political future, Taiwan must continue to upgrade its production structure and labor force in order to survive.

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CHAPTER I
INTRODUCTION

The Taiwan Experience

The record of Taiwan's economic development has been very impressive and internationally known. As of 1991, Taiwan has accumulated more than 80 billion U.S. dollars in foreign reserves, the largest amount in any country (Central Daily News, overseas edition, Feb. 14, 1992). Its per capita income has risen from about US\$50 dollars¹ (in 1952) to more than US\$8,000 dollars² (in 1991). Real per capita income grew at an average of 8.8% annually from 1952 to 1988 (Taiwan Statistical Data Book, 1989, p.33).

Taiwan is a small island,³ with little natural resources, limited arable land, and a high population density.⁴ Moreover, since 1949, because of the military threat from Mainland China, Taiwan has burdened itself with a heavy defense budget (Tsiang, 1984). In the 1980s the defense budget was 57% of the total government expenditure (Central Daily News, overseas edition, Feb. 19, 1992). With only abundant human resources to rely upon,⁵ Taiwan has still managed to develop from an underdeveloped country to a nearly developed one in less than 40 years.

Taiwan's past economic development has been studied by some economists, sociologists, and political scientists (Amsden, 1979; Barrett and Whyte, 1982; Bienefeld, 1981;

Cline, 1982; Copper, 1990; Deyo, 1986; Feldman et al., 1988; Galenson, 1979; Griffin, 1973; Gates, 1979; Gold, 1985; Ho, 1978, 1979, 1980; Berger and Hsiao, 1987; Koo, 1982; Kuo, 1981, 1983; Lumley, 1976; Ranis, 1978; Winckler, 1981; Winckler and Greenhalgh, 1988). Many factors accounted for this rapid and equitable growth, some of which have been emphasized over others based on a different focus. Some of these factors, for example, are: historical factors, such as the Japanese colonial development of infrastructure and the bureaucratic system (Ho, 1971); external factors, such as a favorable world market, U.S. aid, dependent development, and the geopolitical position of the island (Barrett and Whyte, 1982; Koo, 1982); internal factors, such as the developmentalist state of the National government, export-oriented policies, labor-intensive industrialization, market forces, interest rate and exchange rate reforms (Ho, 1978; James et al., 1989; Kuo, 1981; Tsiang, 1984); cultural factors, such as the diligence of the people, high savings, and emphasis on education (Berger et al., 1984; Berger and Hsiao, 1987).

Although all factors are important, the investment in human resources has been given more weight in recent years. Human resources, not natural resources have provided the foundation for all objective factors to work during development. Indigenous high-level decision-makers in government to low-skilled workers in production lines have all contributed to the "Taiwan miracle."

Past literature on Taiwan has lacked a holistic approach to human resources development. Researchers have studied Taiwan's population, labor force structure, labor market, education, economic policies, or manpower policies separately as isolated entities (Chang, 1978; Chen, et al., 1983; Djang, 1977; Fei and Ranis, 1975; Galenson, 1979; Galenson, 1979; Hermalin, 1973; Ho, 1972; Hou and Hsu, 1976; Kuo, 1976; 1983; Lee, 1979; Lee and Chen, 1980; Li, 1977; Lin, 1973; Lin, 1982; Liu, 1985; Mueller, 1977a, 1977b; Shih, 1976; Sun, 1979). These studies focused more on issues during the take-off period of Taiwan's economic development in the 1960s and the 1970s. More recent development in human resources has been neglected despite rapid and important changes.

Furthermore, beginning in the early 1980s, Confucian work ethics are thought to relate to East Asian development (Berger and Hsiao, 1987; MacFarquhar, 1980). Several studies were carried out on the cultural aspects of development in Japan, Hong Kong, and South Korea (Bae, 1987; Wong, 1983), but none on Taiwan. Work ethics were also analyzed separately from labor force structure or government policies in these studies.

Therefore, an integrative framework is needed to incorporate different aspects of human resource development in Taiwan. Such an integration inevitably must be interdisciplinary. In the following section, I will introduce a framework from the tradition of human capital theory (Becker, 1962) that advocates the importance of human

resource development in the process of economic development. I intend to expand and modify this framework to include sociological variables, such as cultural and institutional factors into the study of labor force.

Theoretical Framework:

The Human Resources Development Approach

I derive my theoretical framework based on the "human resource development" (HRD) approach from Harbison (1973). The HRD approach regards human resources as the principal concern of development and emphasizes its relationship to development.

"Human resources," according to Harbison, are defined as "the energies, skills, talents and knowledge of people which are, or which potentially can or should be, applied to the production of goods or the rendering of useful services" (Harbison, 1973:3). The term "human resources" connotes people in relationship to their work. Such work includes all kinds of production and service in social, political, cultural as well as in economic development.

The goal of national development, according to the HRD approach, is the "maximum possible utilization of human resources in more production activity and fullest possible development of the skills and knowledge of the labor force which are relevant to such activity" (Harbison, 1973:115). The "maximum possible utilization" means "the fullest employment of human resources which is practically

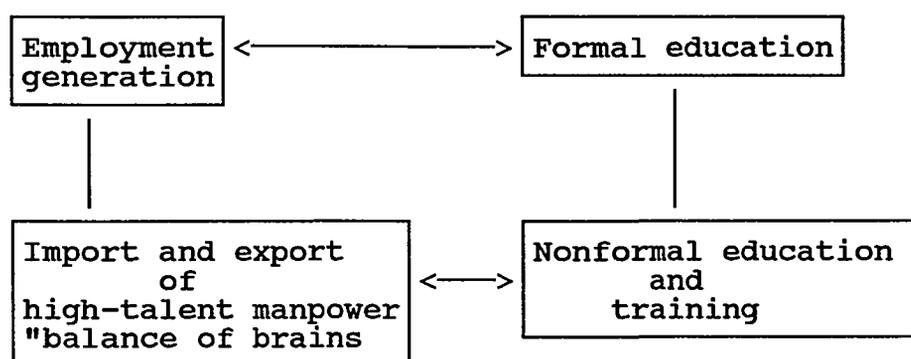
consistent with a country's level of development" (p.117). "The fullest possible development of the skills and knowledge of the labor force" means "the maximization of learning opportunities, which are relevant for labor force participation" (p.117). Therefore, increased production should be regarded as the natural consequence of human resources development, rather than the means to create employment.

The HRD approach is most relevant to developing countries because of its assumptions of human resources. First, human resources are the most plentiful of all resources in developing countries, but at the same time they are grossly underutilized. Secondly, the skills, knowledge, and capacities of the labor force can be developed almost limitlessly, but in most countries they are underdeveloped. Lastly, developing countries which lack natural resources and material capital can still develop and prosper by maximizing the utilization and development of their human resources (Harbison, 1973).

The HRD approach has several distinct features: first, it stresses development of the "entire" labor force in terms of their skills, knowledge, and capacities. Increases in education, health and work opportunities for all population is regarded as the priority result of national development. Secondly, the HRD approach is concerned with the effective interrelationship between employment opportunities and learning opportunities. The goal of the HRD approach is a

full-employment economy where reduction in unemployment is a central policy.

According to the HRD approach, human resource problems often fall into two categories: (1) those related to underdevelopment of skills, knowledge, and talent of human resources and (2) those which originated from the underutilization of their energies and capabilities (Harbison, 1973). Figure 1.1 shows the relationships among four major problems in human resources development.



Source: Harbison (1973), p.113.

Figure 1.1 The Problems of Human Resources Development

Four major problems of human resources are: (1) employment generation and utilization of labor force in productive activity; (2) development of skills, knowledge, and capacities of people through formal education system; (3) skill development through nonformal education and

training activities; and (4) internal and international migration of strategic high-talent manpower.

These four issues are interrelated. Decrease in employment generation may decrease output of formal education and increase migration of high-talent manpower. Development of formal education and availability of high-level manpower can also increase the speed and types of employment generation. A nonformal training system can supplement the function of formal education. Formal education and informal training are part of a nationwide learning system and can develop simultaneously. Loss of talented manpower may be a measure reflecting maladjustment between the employment generation system and formal and nonformal education.

The interrelationships between human factors and the development process touch upon the very essence of the development process. Unfortunately, the weakest sections in nearly all economic plans are those dealing with human resources. Therefore, a thorough understanding of a broader picture of human resources development is important for any country, especially for developing countries.

A Comprehensive Approach To Human Resources Development

This study attempts a socio-economic analysis of the labor force in Taiwan, because the labor force is the most important part of human resources and is directly related to production and economic development. A relatively

comprehensive and interdisciplinary effort is needed because of the complexity involved in its development process.

The main themes of this investigation is: How has the labor force been transformed during economic growth in Taiwan? What are the patterns? What are the results? and What are the socio-economic factors that have affected both the patterns and results of such a transformation between the 1950s and the 1980s?

Taking both the human resource development approach and Taiwan's characteristics into considerations, I will examine Taiwan's labor force development from four aspects: labor force transformation, labor force utilization, cultural factors, and role of government (see Figure 2.1).

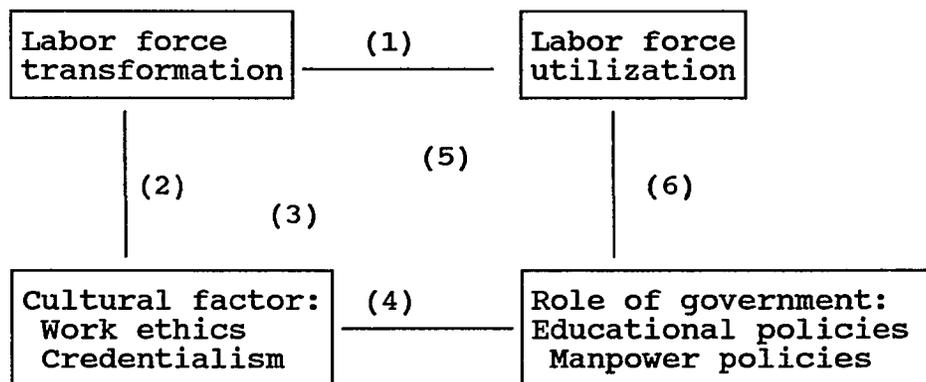


Figure 1.2 Relationships Between Factors of Labor Force Development in Taiwan

Since problems of employment generation will directly reflect in labor force transformation and utilization,

employment generation in Harbison's diagram is replaced by labor force transformation and labor force utilization in Figure 1.2. Both transformation and utilization refer to quantitative changes of the labor force in terms of sex, age, education, industry, and occupational structures.

Formal education, nonformal education and training, and migration of talented workers all are results of a national learning system, thus they are represented by educational and manpower policies to illustrate role of government. Cultural factor refers to labor force quality on two dimensions: work ethics and credentialism. Work ethic is defined as attitudes and behavior of workers. Credentialism implies the value system of pursuing credentials as an end in itself, not as a means to increase knowledge, ability or employment opportunities.

The relationships among the four aspects of labor force development are presented in Figure 1.2:

(1) Between transformation and utilization: Patterns of labor force transformation will affect patterns of labor force utilization, an adequate transformation implies better utilization. On the other hand, patterns of utilization will affect future transformation; for example, if unemployment rises in certain industries, then the speed of labor force transformation will slow down in these sectors.

(2) Between the cultural factor and transformation: The work ethic will affect labor quality and credentialism will cause the educational level of the labor force to rise. Both factors can influence the speed and success of labor force

transformation. On the other hand, a successful labor force transformation will bring changes in technology and work relations; thus both the work ethic and credentialism need to be modified.

(3) Between the cultural factor and utilization: A positive work ethic can facilitate utilization, while excess credentialism may hurt utilization by causing a mismatch between education and jobs. On the other hand, changes in labor utilization may cause people's attitudes and behavior toward work and credentials to change.

(4) Between work ethics and the role of government: Changes in work ethics and credentialism may invite government to revise their educational and manpower policies. However, government can also induce changes in work ethics and credentialism through school curricula as society modernizes.

(5) and (6) Between transformation, utilization, and the government's role: Smooth transformation and utilization in the labor force will reduce government's role for intervention. The role of the government is usually to monitor and control. Government policies can also influence the process of the labor force transformation and utilization to prevent unnecessary costs.

Taiwan as a good example to study HRD

The essence of Taiwan's successful economic development is related to how government sets up policies to maximize comparative advantages of cheap labor through trade expansion, to the extent that, negative elements of surplus labor have been overridden.

Taiwan's expansion of trade has drastically changed the demand of both the quantity and quality of its labor force. Exports grew to the highest level in 1986 and contributed to 57% of domestic earnings (Quarterly National Economic Trends, Taiwan Area, The Republic of China, vol. 55, Nov. 1991, p.43). Averaged growth of export was about 22% from 1953 to 1988 annually (Taiwan Statistical Data Book, 1989, p.2). Not only did export quantity change, but more importantly was the quality upgrade of commodities. In the 1950s, shares of industrial products in exports were about 10% (Taiwan Statistical Data Book, 1989, p.213), but in 1990, the percentage rose to 95% (Quarterly National Economic Trends, Taiwan Area, The Republic of China, vol. 55, Nov. 1991, p.14).

Overall labor productivity also grew progressive during this export expansion and economic growth. Its annual labor productivity growth was estimated to be 2.8% in the 1960s, while it averaged 2.5% in the 1970s, and 1.8% annually during the first half of the 1980s (Lin, 1990).

Even such successful expansion and growth, an interdisciplinary, systematic study of Taiwan's experiences in general--and especially of its human resources--is

lacking.⁶ This study is an attempt to bridge this gap. Taiwan is a good example for studying human resources development, its experiences can provide insights for both theoretical and policy implications.

Research Designs And Methodology

The design of this study is to use each chapter to address a different aspect of labor force development. The major themes of this study is: How has the labor force been transformed during economic growth in Taiwan? What are the patterns? What are the results? and What are the socio-economic factors that have affected both patterns and results of such transformations between the 1950s and the 1980s?

To answer such broad questions, this study is divided into three main parts. The first deals with labor force transformation and utilization. It includes a look at supply of labor force (Chapter II), industrial structure of the labor force (Chapter III), occupational structure of the labor force (Chapter IV), and labor force utilization (Chapter V). The second part of the dissertation examines labor force quality, which includes work ethics (Chapter VI), and education (Chapter VII). The final part is the role of government through manpower policies (Chapter VIII).

Each chapter examines different questions. In Chapter II, focus is on the supply structure of the labor force from

the 1950s to the 1980s, and its possible structure until the year 2011.

Chapter III describes the pattern of Taiwan's sectoral transformation in relation to the Fisher-Clark thesis (Fisher, 1935; Clark, 1940). The Fisher-Clark thesis assumes stages of structural changes during economic growth. Micro-level transformation is also included to confirm macro-level changes. Growth and source of employment in service sector are also examined for the 1980s.

Chapter IV examines how far Taiwan is from the "post-industrial" stage in terms of its industrial and occupational transformation. Micro-level mobility is conducted to describe sources of labor supply and reasons for job changes.

Chapter V seeks to find Taiwan's general pattern of labor force utilization during the 1980s. The "mismatch" problem will be investigated in details in terms of its definition, composition and consequences in the labor market.

Chapter VI discusses the cultural dimension of Taiwan's labor force. In analyzing the prevalence of the Confucian work ethic in Taiwan, interactions of the Confucian work ethic with institutional factors will be emphasized.

Chapter VII empirically describes the upgrade of labor quality by education over the past four decades. In addition, factors contributing to this upgrading will be

identified. The government's effort is addressed by four major policies related to educational expansion.

Chapter VIII evaluates the role of government by manpower policies and focuses on policies of population, education, vocational training, and employment service during different stages of economic development.

The last Chapter IX concludes the study and discusses future trends. A summary of findings and policy implications from each chapter will be provided. Discussions include future problems and uncertainty in human resources development, as well as suggestions for further research.

Methodology and sources of data

Although each chapter has its own methodology and data sources, the main analytical approach here is the statistical analysis of the labor force data. I have obtained two sets of survey data from the Office of the Directorate-General of Budget, Accounting and Statistics (DGBAS) of the Executive Yuan in Taipei, Taiwan. One set is on manpower survey data, and the other is on vocational training survey data. Both surveys are conducted annually by DGBAS, with a sample size of 0.4% of total households in the Taiwan area and are equivalent to about 50,000 subjects. The manpower survey data are from 1978 to 1987; vocational training survey data are from 1979 to 1985.⁷ The manpower survey basically contains information regarding a worker's employment history, job seeking experiences, and income. The vocational training survey includes types of vocational

training received, its usefulness, expectation of highest education levels, and educational expenditure.

In the summer of 1987, I spent three months at the Manpower Planning Department of Council for Economic Planning and Development, Executive Yuan, to study manpower planning, to interview people, and to obtain the data tapes. In the summer of 1989, I returned for further interviews and discussion of new problems of labor and manpower planning after the abolition of martial law in 1989 in Taiwan.

In general, the major source of data in this study is based on manpower survey data (used in Chapter II through IX). The second source of data is the vocational survey data (used in Chapters VI and VIII). Other sources such as government statistics, textbooks, interviews, empirical studies, and government documents are also included in the study.

In Chapter II, an overview of labor force characteristics from 1951 to 1988 will be based on aggregate data published by government statistics and supplements by manpower and vocational survey data. In Chapters III and IV, industrial and occupational structures of the labor force will be based on both government statistics and manpower survey data. The individual level of mobility will be based mainly on the manpower survey data. Chapter V is entirely based on manpower the survey data to calculate labor utilization. Chapter VI will make use of secondary studies on modern work ethics in Taiwan, and supplement materials

with the manpower survey data and content analyses of textbooks from vocational high schools. Chapters VII and VIII are based on interviews done in field work, survey data as well as government documents on educational policies and manpower policies.

Chapter I--Notes

¹The per capita income in 1952 was \$NT1,913. (Taiwan Statistical Data Book, 1989, p.35) We assumed the exchange between \$U.S. and \$NT was 1:40 at that time. Therefore, \$NT1,913 is equivalent to \$47.8 U.S. dollars.

²Quarterly National Economic Trends, Taiwan Area, The Republic of China, vol. 55, Nov. 1991, p.4.

³I.e., 36,000 square kilometers.

⁴I.e., 565.5 people per square kilometer, The Statistical Report of Ministry of Interior, 1991, Taipei, Taiwan, p.9.

⁵8 million population in 1952, and 10 million population in 1960, Taiwan Statistical Data Book, 1989, p.4.

⁶Dr. Michael Oksenberg stated it was hard to understand why there were no systematic study of "Taiwan experiences" in the American universities (Central Daily News, Feb. 29, 1988).

⁷The vocational training survey stopped after 1985.

CHAPTER II

THE SUPPLY STRUCTURE OF THE LABOR FORCE IN TAIWAN

Introduction

The abundant supply of available labor in Taiwan has been important to its economic growth in the past. Basically, Taiwan's labor supply has gone from labor surplus to labor shortage from 1950s to 1980s. As Taiwan's economic growth continued in the 1980s, and its capital formation remained at high rates, demand for labor continued to increase. Would the supply of labor be sufficient to meet such a demand? In this chapter, the focus on an examination of the supply structure of the labor force from the 1950s to the 1980s, and its possible structure on to the year 2011.

The size of the labor force of a population is determined jointly by the size of the population of working age and the labor force participation rate. The size of the working age population is a function of the natural population growth rate and immigration (Hou and Hsu, 1976; Hou, 1978; You and Yeh, 1971). However, the effects of immigration is negligible in Taiwan.¹

In the total population in most countries only those above 15 years old are considered possible for employment. Therefore, age structure of a population also affects the availability of possible labor supply. One of the major factors which affect the age structure is the fertility

rate. A high fertility rate will produce a younger population with higher dependency rate and a larger inflow of young and entry-level workers. On the other hand, a low fertility rate will result in an aging population and an aging labor force.

The labor force participation rate (LFPR) measures the percentage of population engaged in or seeking gainful employment (Hamermesh and Rees, 1988). LFPR can be affected by gender, marriage, age, and culture. For example, females have a lower participation rate than the males, especially after marriage. In the course of economic development, LFPR of females gradually decreases initially due to the increase of males' LFPR; then it increased, due to a greater demand of workers that could no longer be supplied by men. This is the so called "U-shaped" pattern of LFPR in economic development (Standing, 1978; Hauser, 1982).

In this chapter, the demographic and the socio-economic factors affecting Taiwan's labor supply will be examined. They include size of the population, age structure of the population, birth and death rates, and rates of labor force participation.

Population Changes in Taiwan

Taiwan's total population will triple in 60 years from 1950 to 2011 (see Table 2.1). Taiwan's population was about 8 million in 1950, and based on medium projection, it will become 24 million in 2011.² The increase was mostly due to

natural population growth. For example, the average annual population growth was 2.53%, similar to the 2.37% average annual natural rate of increase between 1953 and 1988.³ Migration was not a significant factor since Taiwan had a virtually closed population (Kuznets, 1979).

Table 2.1
The Population in Taiwan, 1950-2011

1950	1960	1970	1980	1988	2001	2011
Total population (x1,000)						
7,553	10,800	14,679	17,949	19,904	22,191a	23,476a
Population 15+ (x1,000)						
4,425	5,795	8,115	11,378	13,696	17,617b	19,126b
Median age						
-	-	18.4	22.5	26.1	2.5 ^c	36.7 ^c

(a) based on medium projection, Projections of the population of the Taiwan area, Republic of China, 1986 to 2011, Manpower Planning Department, Council for Economic Planning and Development, Executive Yuan, 1988, Taipei, Taiwan, ROC., p.13.

(b) Ibid., p.24.

(c) Ibid., p.47 and p.49.

Sources:

Total population from Statistical Yearbook of the Republic of China, 1975,1990; population over 15 from Taiwan Statistical Data Book, 1989; and median age calculated from Statistical Yearbook of the Republic of China, 1975, 1990.

Mortality

Taiwan's death rate had been very low before the 1950s (Kuznets, 1979; Mueller, 1977). Mortality rates declined steadily between 1920 and 1945 under Japanese colonization (Lin, 1982). Before World War II, the annual mortality rate in Taiwan was about 20 per thousand, and it dropped to only 9.9 per thousand in 1952 (Hou and Hsu, 1976). After the early 1950s, the decline in the death rate was not as rapid as before, however, it continued to fall to 5.2 per thousand in 1988 (Table 2.2). Therefore, the changes in population growth in Taiwan were mainly caused by the decline of the birth rate after the 1950s (Kuznets, 1979).

The success in reducing the death rate in the very early period of economic development had at least two advantages. In general, the increased longevity produced a net increase in years of working life, which meant more productive workers (Durand, 1975). More specifically, it allowed Taiwan to concentrate on reducing fertility rates alone as an efficient strategy to control population growth.

Fertility

The greatest change for Taiwan's population growth occurred in the birth rate. The decline of the crude birth rate began even before the effects of economic growth or family planning programs could have been realized (Hou and Hsu, 1976; Mueller, 1977; Kuznets, 1979). The peak of its crude birth rate was 50 per thousand in 1951, since then it

declined sharply especially after 1963. The crude birth rate dropped to 17.2 per thousand in 1988 (Table 2.2).

The total fertility rate was 7.04, i.e., about 7 children per mother. This rate dropped to 5.6 in 1961, 3.7 in 1971, and 2.5 in 1981. It further decreased to 1.7 in 1987 (Social Indicators in Taiwan Area of the Republic of China, 1987, p.82).

Table 2.2

The Crude Birth Rates, Death Rates and Natural Population Growth in Taiwan, 1947-1988

	1947	1951	1960	1965	1970	1975	1980	1988
Death rate	1.81	1.16	0.70	0.55	0.49	0.47	0.48	0.52
Birth rate	3.83	5.00	3.95	3.27	2.72	2.30	2.34	1.72
Natural growth	2.02	3.84	3.26	2.72	2.23	1.83	1.86	1.20

Source: Statistical Yearbook of The Republic of China, 1975, p.3 and 1989, p.4.

With such a successful record of fertility control, there were several factors at work at different stages of economic development for different groups of women. In the 1950s, for example, the decline in birth rate was somewhat voluntary. It was not because of modernization or government intervention, but to a larger extent a change in people's

attitudes. They believed that fewer children are better for social and economic status for both the parents and the children. The change in attitude caused a massive reduction in the birth rate in the 1950s (Kuznets, 1979).

During the 1960s, fertility decline was mainly a result of the increased practice of birth control among older women, but not among the younger women. At this stage, the traditional values of larger family size and a strong preference for sons prevented the younger women to actively seek birth control methods (Freedman et al., 1973).

As the economy developed further, industrialization and urbanization affected the desired family size. At the same time, rising marriage age and employment opportunities for women also lowered the birth rates. Finally, change in tastes and attitudes, as well as sex stereotypes during economic development have further pushed down the fertility rate of younger women. The traditional values of strong reliance on children as a source of security in old age and the strong preference for sons are the last to change, which affected the fertility behavior of the younger women most (Freedman et al., 1973; Yamanaka et al., 1982).

Natural population growth

Taiwan reached the goals of family planning programs in the late 1980s and successfully brought down the natural population growth. The annual natural growth rate declined from 3.84 in 1951 to 1.20 in 1988 (Table 2.2).

Taiwan prevented massive population growth in the course of economic development. Demographic development is only one of the reasons, the preconditions for successful economic development in Taiwan were many. Among them, the reliance on market forces to determine the cost of labor and capital caused the disadvantage of high population growth and high population density in Taiwan to disappear. Instead, the abundant labor supply was put to productive use by responding to world market demand (Liu, 1973; Mueller, 1977).

Age and sex composition of the population

The supply of labor is closely related to the size and age structure of population over 15 years old. From Table 2.3, it can be seen that age and sex compositions have changed significantly from 1970 to 1988. In terms of absolute numbers, all age groups have increased, except for those under 15 years old. The size of population under 5 years old has decreased the most (14%), which reflects the lower fertility rates in the late 1980s.

One significant increase of population centered around the age-group 25-34. Their numbers doubled from about 1.8 million in 1970 to about 3.7 million in 1988.⁴ The proportion of prime age groups increased, which could supply the labor market with more middle-age workers.

The greatest increase occurred in the age-group above 65 years old, an increase of about 180%. The age-group 60-64

also had about 140% growth. The aging of the population was clearly indicated and was especially true for males.

Consequently, the population pyramid changed significantly from 1950 to 1988 (Figure 2.1). Between 1970 and 1988, the proportion of people aged 65 and above has doubled, and those between 20 and 39 or above 50 years old have increased. But the proportion of people aged 0-19 has decreased by one-fourth to one-third. These trends indicated the future supply of labor will have fewer young people but more middle-age and old-age workers.

The median age of population also reflected aging of the population. Table 2.1 shows the median age of Taiwan's population as 18.4 in 1970, 22.5 in 1980, and 26.1 in 1988. The median age in 2001 was estimated to be between 32.5 and 36.7 in 2011.

Even though Taiwan's population is aging, but it is still relatively young when compared to other developed countries. For example, Taiwan's proportion of people age 15 or less has decreased from about 40% to 28% between 1970 and 1988, (Statistical Yearbook of the Republic of China, 1975), but this proportion was already 21.5% in Japan (1985) and 21.6% in the U.S. (1987) (Taiwan Statistical Data Book, 1989, p.324). An aging population is thus a natural result of economic prosperity and fertility decline.

Table 2.3

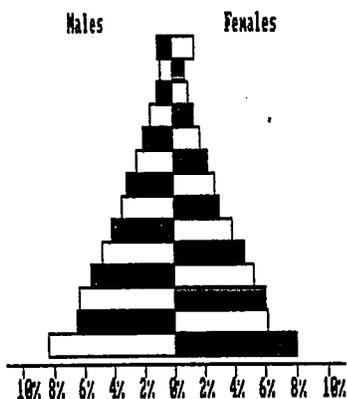
The Growth Rates of Population by Age and Sex
Composition in Taiwan, 1970-1988

(%)

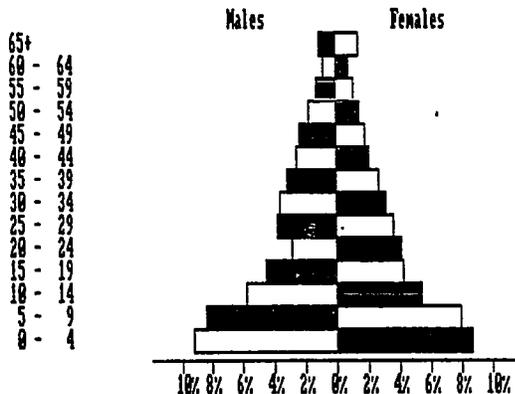
Age-group	Total	In numbers	
		Male	Female
Total	35.6	34.2	37.1
0-4	-13.5	-13.0	-13.9
5-9	- 3.5	- 2.8	- 4.2
10-14	- 2.9	- 2.6	- 3.2
15-19	2.8	2.4	3.2
20-24	64.2	65.2	63.1
25-29	118.8	121.6	116.0
30-34	103.1	107.7	98.7
35-39	80.7	73.7	88.6
40-44	12.7	- 2.6	34.8
45-49	32.2	13.0	60.1
50-54	62.1	41.5	90.5
55-59	90.4	88.3	93.3
60-64	136.7	165.1	105.1
65+	179.9	229.5	139.6

Age-group	Total	In proportion	
		Male	Female
0-4	-36.4	-35.4	-37.4
5-9	-29.1	-27.4	-29.9
10-14	-28.1	-27.3	-29.7
15-19	-24.6	-24.2	-24.2
20-24	21.1	23.1	18.1
25-29	62.3	66.1	56.2
30-34	49.2	53.4	43.7
35-39	32.8	31.0	39.3
40-44	-17.5	-26.6	- 2.0
45-49	- 2.1	-15.1	17.5
50-54	23.5	5.3	40.0
55-59	39.3	40.0	44.0
60-64	70.0	95.0	45.0
65+	111.1	136.0	75.0

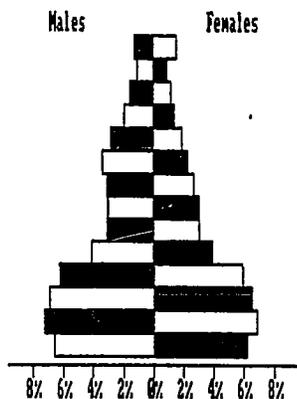
Source: Calculated from Statistical Yearbook of the ROC, 1990, p.8-13.



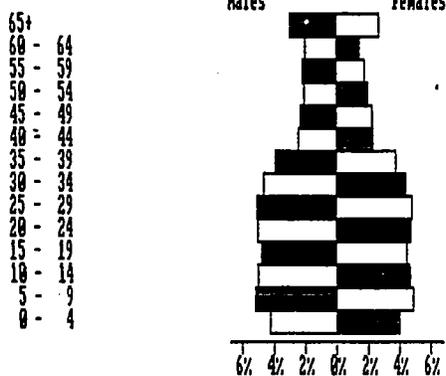
Total Population: 7,553,000 1950 TAIWAN POPULATION



Total Population: 10,800,000 1960 POPULATION IN TAIWAN



Total Population: 14,680,000 1970 TAIWAN POPULATION



Total Population: 19,904,000 1980 TAIWAN POPULATION

Source: Statistical Yearbook of the Republic of China, 1975 and 1990.

Figure 2.1 The Population Pyramids of Taiwan, 1950-1988

Labor Force Changes in Taiwan

The supply of potential labor force is declining in Taiwan. The population over 15 has grown at an average annual rate of 3.8% between 1970 and 1988 in Taiwan. The rate was estimated to be 2.2% average per annum between 1988 and 2001, and 0.9% between 2001 and 2011 (Table 2.1).

The high birth rate and low death rate in the early 1950s increased the proportion of potential workers aged 15-19 in the late 1960s and early 1970s. This group supplied the labor market with abundant unskilled labor for labor-intensive industries (Liu, 1975; Lin, 1982).

On the other hand, the continued decline in the fertility rate after the 1970s resulted in an aging labor force and rising female employment. The rising age at marriage and smaller family size contributed to the increase of female participation rates in the labor market in Taiwan (Mueller, 1977; James, et al., 1989).

Labor force size

Taiwan's labor force size has grown 1.28 times in less than 30 years from 3,617,000 in 1960 to 8,247,000 in 1988 (Table 2.4). It is estimated to increase another 25% from 1988 to 2011. The total labor force size could reach 11,463,000 by 2011. The growth of the labor force slowed down after the 1980s, mainly due to the decline in the fertility rate and reduction of young people entering into the labor market.

Another factor which also affects the growth of labor supply is the participation rate. Overall labor force participation rate in Taiwan was 60%. The LFPR was 62.42% in 1960, which may be related to a larger share of agricultural employment and higher underemployment. In the 1980s, the increase of female participation and the decline of male LFPR may even out (Figure 2.2). Thus, the total LFPR remained slightly above 60% in 1988.

Age and sex composition of the labor force

The increase of the labor force is not evenly distributed among age groups. All age groups have increased in their labor force size, except for the age-group 15-19 (Table 2.5). Younger workers aged 15-19 had the largest decline of more than 40%; 45% of males versus 39% females. Although population of age-group 15-19 has increased at about 3% between 1970 and 1988 (Table 2.3), its labor force supply decreased by 40%. More schooling may be one of the most important reasons for labor force decline in this age group, especially for males.

Table 2.4
The Labor Force in Taiwan, 1960-2011

Year	1960	1970	1980	1988	2001	2011
Size (x1,000)	3,617	4,654	6,629	8,247	10,283 ^a	12,454 ^d
Participation rates (%)	62.42	57.35	58.26	60.21	59.6 ^b	65.1 ^d
Median age	-	32.3	32.0	33.6	37.5 ^c	40.13 ^e

(a) Table 12, "The analysis and projections of the labor force growth in Taiwan area," The Research Report of Manpower Planning, Vol.4, 1984, Manpower Planning Department, Council for Economic Planning and Development, Executive Yuan, Taipei, Taiwan, ROC., p. 38.

(b) Ibid., p.37.

(c) Calculated from Table 12, op.cit..

(d) It is considered the maximum figure, see Appendix A, Table A.4.

(e) Calculated from Appendix A, Table A.4.

Source:

Labor force size from Taiwan Statistical Data Book, 1989; participation rates calculated by $(1)/(\text{pop over 15 yrs}) \times 100$, in Table 2.1; and median age calculated from Yearbook of Manpower Statistics, Taiwan area, ROC, 1988, pp.18-20.

The largest increase of labor force size occurred in the age groups 60 and above. The increase was more than three times for men, and five times for women (Table 2.5). The aging of the labor force in Taiwan was obvious.

Another indicator for an aging labor force is the median age. The median age of the labor force in Taiwan increased from 32.3 in 1970 to 33.6 in 1988. It was estimated at 39.6 in 2011 (Table 2.4). The labor force

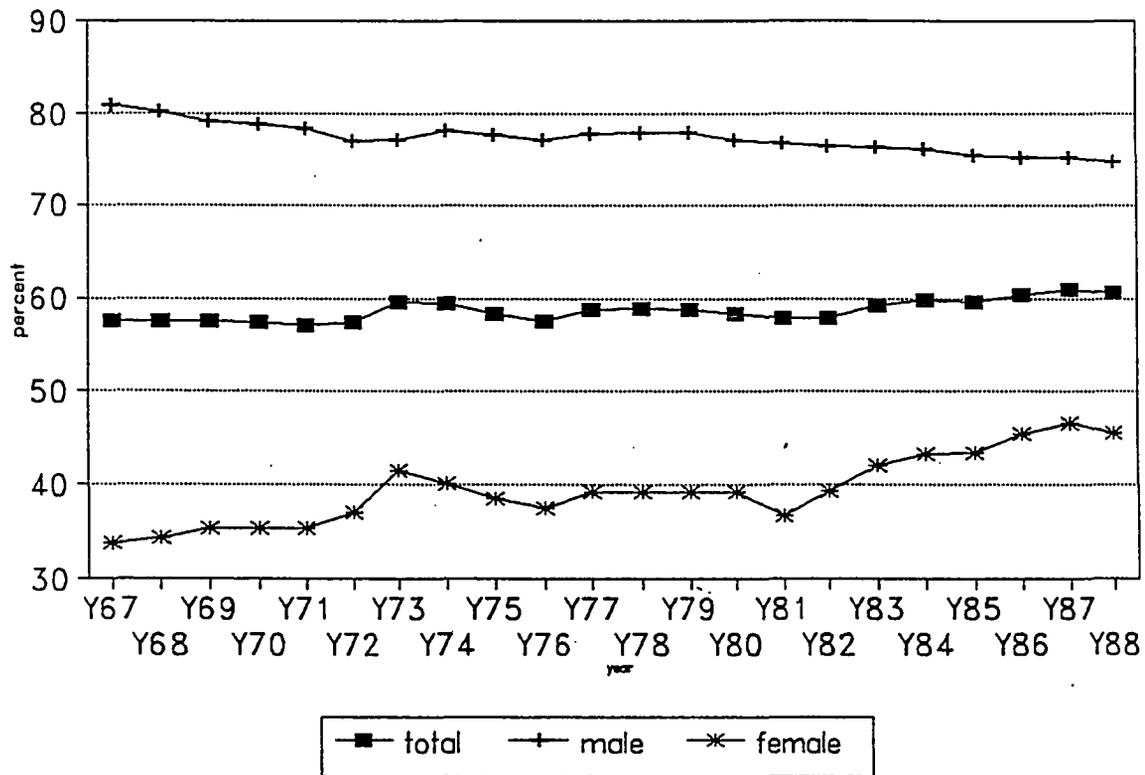
pyramids (Figure 2.3) have shown significant structural change from 1950 to 2011.

Sex ratios of the labor force

One other change in the labor force is its sex ratio. The proportion of women in the labor force has increased significantly in Taiwan. In every age group, the male/female ratio decreased greatly from 1970 to 1988 (Table 2.6). The number of females in the labor force even exceeded that of the males in age groups 15 to 24. The sex ratio for workers between 15 and 19 was 0.94 and for age group 20-24, 0.69. Schooling and military obligations for males contributed mainly to this difference. Moreover, the increase of female workers in all age groups is expected to continue into the year 2011, as the estimated sex ratio showed continues to decline.

The Factors Contributing to Labor Force Changes

The changes of labor force size can be further differentiated into changes of the demographic and the socio-economic factors. The demographic factor denotes changes in population age structure and the socio-economic factor changes in labor force participation rates through a method called standardization.



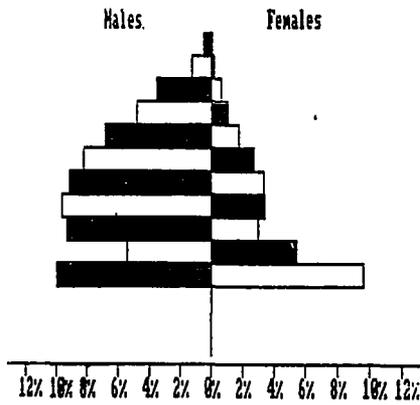
Source: Yearbook of Manpower Statistics, 1988.

Figure 2.2 Labor Force Participation Rates in Taiwan,
1967-1988

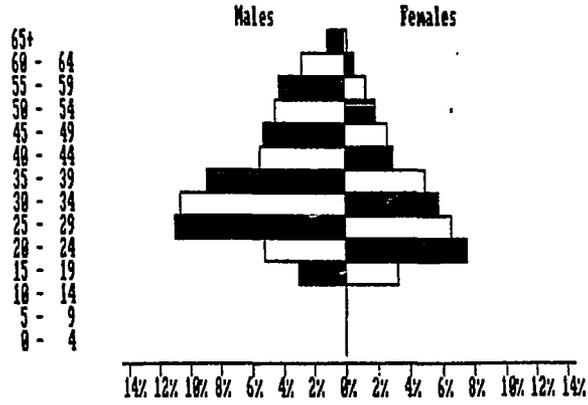
Table 2.5
The Growth Rates of Labor Force by Age and Sex
Composition in Taiwan, 1970-1988
(%)

Age-group	Total	In numbers	
		Male	Female
Total	79.0	62.1	116.4
15-19	- 41.9	-44.7	-38.9
20-24	111.2	72.8	149.4
25-29	155.7	110.9	296.4
30-34	123.5	97.3	196.9
35-39	97.9	73.9	163.2
40-44	39.1	20.7	93.0
45-49	65.7	39.2	169.1
50-54	94.8	66.7	225.0
55-59	135.8	111.5	278.6
60-64	316.4	284.7	550.0
65+	328.0	304.5	500.0
		In proportions (%)	
	Total	Male	Female
15-19	-67.3	-65.8	-71.8
20-24	17.4	6.3	15.5
25-29	43.1	30.1	83.2
30-34	24.4	22.1	37.3
35-39	10.4	7.5	21.3
40-44	-22.0	-25.4	-11.2
45-49	- 7.0	-14.0	25.0
50-54	8.5	2.9	51.5
55-59	31.0	30.8	78.9
60-64	126.7	131.6	183.3
65+	160.0	142.9	200.0

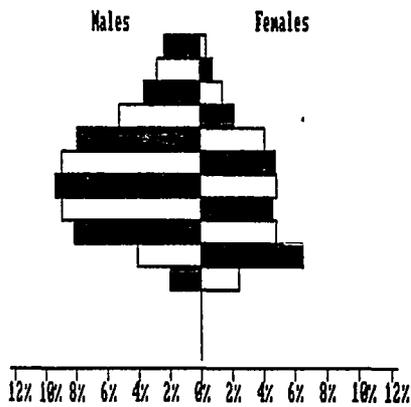
Source: Calculated from Statistical Abstract of ROC, 1971, p.573 and Yearbook of Manpower Statistics, Taiwan Area, ROC, 1988, pp.18-20.



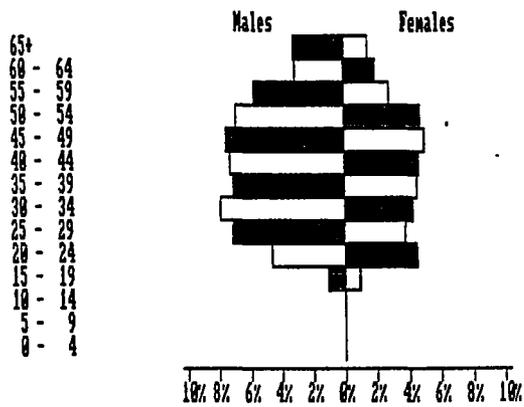
Total Population: 4,606,000 1970 LABOR FORCE IN TAIWAN



Total Population: 8,247,000 1988 LABOR FORCE IN TAIWAN



Total Population: 10,283,000 2001 LABOR FORCE IN TAIWAN



Total Population: 12,521,000 2011 LABOR FORCE IN TAIWAN

Source: Statistical Abstracts of Republic of China, 1971, p.573; Yearbook of Manpower Statistics, 1988; and Appendix Tables A.1, and A.4.

Figure 2.3 The Labor Force Pyramids of Taiwan, 1970-2011

Table 2.6
Sex Ratios of Labor Force by Age and Sex in Taiwan,
1970 to 2011

	1970	1988	Male/Female 2001	2011
Total	2.20	1.65	1.70	1.93
15-19	1.04	0.94	0.82	0.86
20-24	1.00	0.69	0.62	1.06
25-29	3.14	1.67	1.66	1.75
30-34	2.79	1.86	1.92	1.97
35-39	2.72	1.79	1.90	1.96
40-44	2.94	1.84	1.85	1.90
45-49	3.90	2.02	1.91	1.96
50-54	4.63	2.37	2.40	2.41
55-59	5.89	3.29	2.55	2.51
60-64	7.38	4.37	3.33	3.38
65+	7.33	4.94	6.60	5.83

Source: for 1970 and 1988, as Table 2.5; for 2001 and 2011, from Appendix A, Tables A.1 and A.3.

The base year's (1970) labor force participation rate (LFPR) is applied to the end year's (1988) population to create a standardized population of 1988. Then the total change between the actual 1988 population and the 1970 population is divided into two parts: the difference between the actual 1970 population and the standardized 1988 population is called the "demographic effect," the difference between the actual 1988 population and the standardized 1988 population is called the "socio-economic effect" (You and Yeh, 1971; Liu, 1984).

The demographic factor

Overall, the demographic factor was the dominant factor affecting labor force growth in Taiwan; it accounted for 85% change of labor force size from 1970 to 1988 (Table 2.7). The socio-economic factor explained only 15% of the changes. The male labor force changes could be explained by the demographic factor alone, except for the age group of 15-19. The males had a 112% demographic effect, but a negative 12% socio-economic effect. The increase in male population was solely responsible for the increase of the male labor force; but the decrease in male participation rates caused male labor force to reduce.

Both demographic and socio-economic factors affected the female labor force more evenly. Their demographic factor accounted for 55% of labor force growth and 45% of the socio-economic factor. In general, the demographic factor was still dominant in explaining changes in labor force size, with exceptions for younger groups.

Males aged 15-19 had a negative labor force growth of 45% between 1970 and 1988 (Table 2.5). This decrease was mainly due to the decline of their labor force participation, which explained 106% of the decrease. But the demographic factor contributed to the increase of its labor force by 6%. The situation was similar for females aged 15-19. The decrease of LFPR in this age group resulted from the increase of schooling for the young people (Lin, 1982).

For males between the ages of 20 and 59, the labor force increase was about 100%, caused by population growth.

For those males 60 years old and above, the demographic effect accounted for more than 60% of the labor force growth. For females aged above 25, increase in labor force size was caused less by the increase in population, the demographic effects ranged from 16% to 53%.

The socio-economic factor

Overall, the change in labor force participation rate accounted for only 15% of the total labor force change from 1970 to 1988 in Taiwan. Its effect was positive for females but was negative for males. Males had a negative socio-economic effect of 12%, whereas females had a positive effect of 45%. This implied male workers decreased their participation in the labor market, while female participation increased.

The males had either a negative or zero socio-economic effect for age-groups 20-44. For those above age 45, socio-economic effects gradually increased to more than 30% for age group 60 and above.

All female age groups had positive socio-economic effects ranging from 47% to 108%. The age group 15-19 had the highest socio-economic effect of 108%, which implied the decline of the female labor force in this age group was entirely due to the decline of its LFPR. The increase in the female labor force above aged 25 was accounted for more by the increase of the socio-economic effect than by demographic effect. Thus, LFPR is far more important for women than for men in explaining the labor force growth.

Table 2.7

The Demographic and Socio-economic Factors in
Explaining Labor Force Changes in Taiwan, 1970-1988
(%)

Age-group	Demographic factor	Socio-economic factor
Total	85	15
Males		
Sub-total	112	-12
15-19	-6	106
20-24	123	-23
25-29	104	- 4
30-34	101	- 1
35-39	101	- 1
40-44	100	0
45-49	93	7
50-54	95	5
55-59	95	5
60-64	62	38
65+	69	31
Females		
Sub-total	55	45
15-19	-8	108
20-24	53	47
25-29	39	61
30-34	39	61
35-39	44	56
40-44	29	71
45-49	37	63
50-54	42	58
55-59	29	70
60-64	16	84
65+	27	73

Source: Calculated from Appendix A, Table A.5.

The male LFPR reached more than 95% for the prime age groups of 25-50, while the female LFPR was only about 55% for the same age groups (Appendix A, Tables A.6 and A.7).

There are more opportunities for the females to increase their participation rates than the males. Therefore, the socio-economic factor played a more significant role in female labor force growth.

The labor force participation rate (LFPR)

Between 1970 and 1988, female LFPR increased by 32%, but the male LFPR decreased by 5% (Table 2.8). The growth of female LFPR ranged from 40% to 250% for all age groups, except for the age group 15-19 with -41% growth. Women aged 20 and above all have increasing LFPR from 1970 to 1988, the growth was even higher for older women aged 55 and above. As for men, all of their participation rates have decreased from -0.5% to -46% between the ages of 15 and 39. However, male LFPR increased more than 30% for those aged 60 and above.

Taiwan's labor force participation rate is similar to that of other Asian NICs, such as Hong Kong and Singapore and approaches that of developed countries, such as Japan and the U.S. For example, LFPR rose to 60.93% in Taiwan, which is not far from 62.7% in Singapore, 64.8% in Hong Kong, 62.6% in Japan, and 63.7% in the U.S. for 1987 (Yearbook of Manpower Statistics, Taiwan Area, ROC, 1988, p.296).

Table 2.8

The Changes of Labor Force Participation Rates in
Taiwan, 1970-1988

(%)

Age group	Total	Male	Female
15-19	-43.5	-46.2	-40.7
20-24	15.1	- 9.1	38.9
25-29	18.8	- 2.2	84.4
30-34	19.5	- 0.3	67.5
35-39	14.4	- 0.5	53.5
40-44	12.5	0.0	52.1
45-49	11.7	2.1	65.3
50-54	10.1	2.1	67.7
55-59	20.9	2.5	107.5
60-64	80.4	38.4	252.1
65+	64.8	31.3	170.0
Total	7.3	- 4.6	31.9

Source: Calculated from Appendix A, Tables A.6 and A.7.

Female LFPR in Taiwan should be raised further when comparing between Japan and Taiwan. Taiwan's female LFPR was smaller in almost every age-group, except for the age groups of 15-19 and 30-34 (Table 2.9). Taiwan had more females in the labor market between the ages of 15 and 19 than Japan. This means that fewer females continued their education after junior high education in Taiwan than in Japan. Between the ages of 25 and 39 the difference in female LFPR was not great. This implies that married women with children tended to stay out of the labor force in both countries.

Taiwan's female LFPR is lower than that of Japan's for older women. Japan's females aged 40 and above returned to the labor market 25% to 350% more than those in Taiwan. The older the age, the larger the differences between these two

countries. The largest difference was in aged group 65 and above, with about 16% LFPR in Japan, and only 3% in Taiwan. Therefore, the ways to increase female LFPR for those aged 40 and above should be specially emphasized in Taiwan.

To encourage those married women returning to the labor market after childbearing years, there may be some factors that are specially important.⁵ The list includes increase in job opportunities for older female workers, rising wages, rising educational levels, availability of modern labor-saving household appliances, and rising expectations (Hsu, 1982). The government should attend to these factors more to increase the female labor supply, especially in times of labor shortage.

Table 2.9

The Comparison of Female Labor Force Participation Rates in Taiwan and in Japan, 1988

(%)

Age-group	(1) Taiwan	(2) Japan	(3) Difference
Total	45.56	48.9	7.3
15-19	29.94	16.5	-44.9
20-24	66.14	73.7	11.4
25-29	56.77	58.2	2.5
30-34	54.02	50.9	- 5.8
35-39	56.39	61.3	8.7
40-44	54.86	68.1	24.1
45-49	48.85	69.3	41.9
50-54	39.47	63.3	60.4
55-59	30.90	50.9	64.7
60-64	19.05	38.6	102.6
65+	3.43	15.7	357.7

Source: (1) see Appendix A Table A.7. (2) p.27, Labor Statistics of Japan, 1989, Statistical Bureau, Management and Coordination Agency, Japan. (3) is $(2)-(1)/(1) \times 100$.

Labor Force Projections

The main task here is to project labor force size for Taiwan in the next 20 years. The accuracy of labor force projection depends on accurate projections of both population and labor force participation rates.

Population projections usually carry a high, medium, and low growth assumption. In Taiwan, the high projection assumes total fertility rate will gradually decline to 1,600 in the year 2011. The medium projection assumes total fertility rate will decline to 1,600 in the year 1991 and remain constant afterward. The low projection assumes total fertility rate will decline to 1,400 in the year 1991, and then grow to 1,600 in the year 2011 (Manpower Planning Department, 1988).

The assumption of constant fertility after 1991 is assumed here. For potential workers aged 15 and above in 2011 have already been born. Fertility should not affect the working population size. Therefore, medium population projection is used to estimate labor force size in the year 2011.

There are four different methods to project age-specific labor force participation rates. One is to project it by appropriately extrapolated from past trends. The second method is to take current rates and assume them to be constant in the future. The third method is to assume LFPR

to be the same as other advanced countries. The last method is to project LFPR by estimating changes in related factors such as manpower needs, school enrollment, the growth of urban population, development of the pension system, marriage and fertility rates and etc. (Saw, 1984).

The labor force projection in 2001 has been done by the Manpower Planning Department (1988) in Taiwan. They used the first method to project LFPR. They calculated LFPR of 2001 by regression equations for each sex and age group based on previous trends.

Here, three sets of labor force projections are computed based on three sets of LFPR assumed for the year 2011. They are: the averaged LFPR of 1983-1988 in Taiwan, the projected LFPR of 2001 in Taiwan, and the LFPR of 1988 in Japan. The population base is the same for all three projections using the medium assumption.

The reason to use the averaged LFPR of 1983-1988 is because LFPR will not fluctuate too much in the next twenty years, for Taiwan's LFPR stabilized after 1983 (Figure 2.2). Therefore, the average LFPR from 1983 to 1988 was used as an estimate for LFPR in 2011.

The reason to use the second set of LFPR projected by the Manpower Planning Department is because it is the latest official figures. One can assume economic growth in Taiwan will be more or less stabilized after 2001, so the changes in the participation rate will be small.

One can assume that Japan's economic development is ahead of Taiwan by about twenty years. Thus, the 2011 labor

force participation rate in Taiwan should be quite similar to the 1988 LFPR in Japan. Japan's data will represent the ceilings for Taiwan's future LFPR.

Total labor force will range from 11.3 million to 12.5 million based on different LFPR assumptions. The male labor force will vary from 7.4 million to 7.7 million and the female labor force from 3.8 million or 4.8 million in 2011 (Table 2.10).

Table 2.10

The Projection of Labor Force Size in 2011, by Three Different Assumptions of LFPR in Taiwan (in Millions)

Different Assumptions of LFPR	Total	Male	Female
(1) 1983-88 LFPR	11.2	7.4	3.8
(2) 2001 LFPR	11.4	7.5	3.9
(3) 1988 LFPR (Japan)	12.5	7.7	4.8

Source: (1) Population projection data are based on medium projection, Projections of the population of the Taiwan area, Republic of China, 1986 to 2011, Manpower Planning Department, Council for Economic Planning and Development, Executive Yuan, 1988, Taipei, Taiwan, ROC. (2) The ave. LFPR of 1983-88 is calculated from Yearbook of Manpower Statistics, Taiwan Area, ROC, 1988, pp.24-26. (3) The Japanese 1988 LFPR is from p.27, Labor Statistics of Japan, 1989, Statistical Bureau, Management and Coordination Agency, Japan.

The projection based on the Japanese LFPR of 1988 was the maximum estimation. The projection based on averaged

1983-88 LFPR yielded a minimum estimation. The differences between these two estimations were 0.3 million more male labor force, and one million more female labor force. The increase of female LFPR is greater by using Japanese data than by using the other two.⁶

Female LFPR showed a fluctuating pattern during rapid economic development in Taiwan (Figure 2.3). The extrapolated regression line based on such trends would underestimate the future female LFPR. Thus, labor force projections based on averaged female LFPR in 1983-1988 or projected LFPR in 2001 would be lower than if using 1988 Japanese LFPR.

The age-specific labor force will grow between 37% and 51% from 1988 to 2011. Both maximum and minimum projections predicted proportions of workers aged under 30 will decrease. Younger workers between ages 15 and 19 will be further reduced by 10% to 53% (Table 2.11). Lower fertility rates and higher education for younger workers should be the main reasons.

On the other hand, the major growth of the labor force will be workers over 65, the size of the labor force aged 45-60 will double, and distribution of workers between ages 30 and 60 will be more even as the labor force grows old (Figure 2.3).

Male age groups will grow between 63% by minimum projection, and 50% by maximum projection. Female age groups will increase by 21% to 56%. The maximum projection resulted in more total labor force because of a larger female labor

force. The minimum projection yielded more male labor force and less female labor force. The difference is because of different LFPRs. The growth of a female labor force can range from one to nine times between maximum and minimum projections. In the future, the greatest increase of labor force in Taiwan will be for females, which is mostly due to their increasing participation rates.

Table 2.11

The Projected Growth of Labor Force, Age and Sex
Composition in Taiwan, 1988-2011
(%)

Age-group	Total	Male (Max./Min.)*	Female
Total	51/37	50/63	56/21
15-19	-53/-7	-50/-4	-57/-9
20-24	7/1	34/39	-10/-22
25-29	- 5/-9	- 3/-4	-13/-17
30-34	10/10	13/14	12/5
35-39	25/20	21/22	39/15
40-44	117/99	100/100	136/93
45-49	142/109	113/111	188/103
50-54	171/125	133/119	281/121
55-59	146/103	106/ 79	239/119
60-64	109/60	68/38	377/85
65+	417/112	351/99	948/123

* Maximum projection is the result of using Japanese 1988 LFPR to calculate labor force size; the minimum projection is based on the averaged LFPR in Taiwan between 1983 and 1988.

Source: Calculated from Yearbook of Manpower Statistics, Taiwan area, ROC, 1988, pp.18-20, Yearbook of Manpower Statistics, Taiwan Area, ROC, 1988, pp.24-26, Appendix A, Tables A.2 and A.4.

Summary and Discussion

Trends in labor force size is a function of natural population growth and labor force participation rates. After the 1950s, Taiwan's natural population growth was mostly due to an increase in the birth rate, rather than a decline in death rates. Fertility rates have declined continuously in Taiwan since 1950s, except in 1976,⁷ and total fertility rate reached the replacement level of 2.0 in the late 1980s. Demographic changes accounted for 85% of total labor force changes from 1970 to 1988 and socio-economic factors accounted for only for 15%. The latter was more important for females than for males in explaining labor force growth in Taiwan. Male workers had decreasing LFPR from 1970 to 1988.

In the future, labor supply will slow down in Taiwan as in many developed countries. The average annual growth of the labor force between 1970 and 1988 was 4.3%,⁸ but its growth is estimated to be only 1.9% between 1988 and 2001 and 1% to 2% between 2001 and 2011.⁹ The future labor force supply will increase mainly by higher female LFPR.

Taiwan's overall LFPR is still lower than many other developed countries, because of lower female participation rates. There is still some labor reserves to be drawn upon for the labor force participation rate can be raised further, especially for married and older women.

There are at least three ways to increase the overall LFPR in Taiwan. For example, the agricultural sector can

release more workers with more mechanization, nonpaid family workers in small businesses can be attracted to work outside the family and part-time workers can be given better opportunities to work full-time (Hsu, 1982).

There are also some ways to increase female LFPR in Taiwan, such as higher wages, higher education, more availability of modern household appliances, and changes of sex roles and female status. These trends are happening in Taiwan and are expected to continue in the next century.

Another prevalent trend of future labor supply in Taiwan is the aging of the labor force. Labor force aging may affect productivity, mobility, labor costs, and the relative economic status of young workers (Bauer, 1990). The median age of the labor force will increase from 33.6 in 1988 to 39.6 in 2011. But compared with advanced countries Taiwan's population is still relatively young.

Finally, the decreasing labor supply and aging population indicate an urgent need for Taiwan to upgrade its production structure away from labor-intensive and into technical-intensive and skill-intensive industries. These high-tech jobs will require less young workers, but workers with more education and experience. On the other hand, the upgrade and expansion of the service sector, such as restaurant, travel, finance and insurance, can provide more jobs for older and female workers, which will surely be in greater supply in Taiwan.

In order to achieve such a transition in the future, there are at least two requirements: (1) a highly educated

labor force and (2) a high rate of investment. Taiwan is considered to have both. Its labor force is one of the most highly educated in Asia, and gross domestic saving in 1987 was 38% of gross domestic product. In addition, Taiwan's government promoted production by subsidizing entrepreneurs in high technology areas (Bauer, 1990). Upgrading of industries is happening slowly in Taiwan.

However, restructuring to high technology will increase demand for highly skilled labor, but it may create unfavorable terms of earnings for disadvantaged groups. The income inequality between workers with different levels of education may be widened (Bauer, 1990; Colclough & Tolbert II, 1992). Therefore, public vocational training centers should provide more vocational training to unskilled, older, and female workers in order to help them make the transition to service jobs or higher level skilled jobs. The middle-aged, married women, re-entering the labor market should also be given priority in training and employment services.

Due to labor scarcity, importation of workers from Asia has been implemented. The pressing needs of the Fourteen Major Construction Plans and the Six-year National Plan,¹⁰ plus increasing illegal immigrants from Southeast Asia,¹¹ forced the Taiwan government to open six industries for imported labor.¹² Guidelines for importation of labor and efficient ways to control illegal immigrants are yet to be established. In the future, imported labor is going to increase and problems of labor supply will become even more complicated in Taiwan.

Chapter II--Notes

¹The annual net migrants was about 0.01% of the total population between 1961 and 1986 (Manpower Planning Department, 1988).

²The medium projection of population in Taiwan assumes that total fertility rates will decline to 1,600 in 1991 and remain constant afterward (Manpower Planning Department, 1988).

³Calculated from Taiwan Statistical Data Book, 1989, p.2 and Statistical Yearbook of the Republic of China, 1975, p.3 and 1989, p.4.

⁴See Statistical Yearbook of the Republic of China, 1990.

⁵The common factors that affect changes in female LFPR are: declining fertility, increase in marriage age, increase in education and equality, increase in percentage of unmarried women, decline of extended family and overall sex role changes. These may be more relevant to LFPR of young and single women.

⁶See Appendix A, Tables A.2, A.3 and A.4.

⁷It increased from 2.8 to 3.1, which partly reflected the baby boomers reaching child-bearing age (Lin, 1982).

⁸Calculated from Yearbook of Manpower Statistics, Taiwan area, ROC, 1988, pp.18-20.

⁹Calculated from Appendix A, Tables A.2, and A.4.

¹⁰The Six-year National Plan covers 1991 to 1996, and has four major themes: the goals of macro-level economic development, the upgrading of industrial development, the balance of regional development and the improvement of quality of life.

¹¹See Chapter VIII for details.

¹²They are: textiles, basic metal, fabricated metal products, machinery and equipment, electrical machine and equipment, and construction (Central Daily, News, July, 13, 1991).

CHAPTER III
LABOR FORCE TRANSFORMATION IN TAIWAN:
INDUSTRIAL STRUCTURE (1952-1988)¹

Introduction

Sociologists usually pay more attention to occupational structure than to industrial structure in a society. However, occupational structure and industrial structure are closely related. It is estimated that two-thirds of all changes in occupational structure resulted directly from differential growth of industries (Singelmann, 1978b). On the other hand, one of the most obvious structural change during economic development is the change of the industrial structure of the labor force. Recent growth of service industries has important implications for sociological analysis as well. For the absence of a tangible product and little physical strength in the service economy may require different organization of work and increase the accessibility of women and old people to the labor market (Singelmann, 1978a). Therefore, an analysis of industrial structure provides an important understanding of social change as a whole.

Most studies on Taiwan's labor force transformation relied on data from the 1960s and 1970s and focused on applications of the Lewis-Ranis-Fei's "surplus labor" model (Fei and Ranis, 1975; Ho, Y.M. 1972; Kuo, 1976; Lee, et al.,

1980; Lee & Hwang, 1979; Oshima & Lai, 1976; Shih, 1979) to explain the transformation from agricultural to industrial sectors. According to such a model, Taiwan had reached the turning point and full employment in the early 1970s.

During that period, the major concern was on agricultural and industrial sectors, and little attention was given to the service sector, even though the service sector always had more workers than the industrial sector before 1972. There are three possible reasons to explain such neglect. One reason the service sector was ignored was because of the booming of industrial sector after the mid-1970s. Second, the Lewis-Ranis-Fei model did not differentiate between the goods and the service sectors within the modern sector. Third, the service sector could not be considered modern sector in the past because of its more traditional and low-skilled jobs.

The main purpose of this chapter is to examine the whole spectrum of labor force transformation from primary sector to tertiary sector in Taiwan from the early 1950s to the late 1980s. The findings should provide important implications for development and utilization of the labor force in the future.

The Fisher-Clark Thesis

Allan G.B. Fisher (1935) and Colin Clark (1940) were among the first to notice changes of the industrial structure of its labor force in the course of economic

development. They divided industries into three sectors: primary, secondary, and tertiary sectors.² The heart of their thesis is that nations evolve into service societies because of the increase in per capita income. Two generalized observations are: (1) an increase of per capita income leads to the employment out of primary industries into secondary industries, and subsequently from the secondary sector to tertiary industries; and (2) a high level of tertiary employment required a high level of per capita income (Singelmann, 1978b). Over the years, this theory has been generalized into a theory of stages of economic development: that is, society moves from predominantly agricultural economy, to a industrial one, and then to a predominantly service economy (Shelp, 1981).

The Fisher-Clark thesis has been criticized for two reasons: one, decline of agricultural employment is not always accompanied by major increases in secondary industries, rather it can result in a direct increase in tertiary industries. Secondly, the relationship between tertiary employment and per capita income lacks a theoretical base because of the heterogeneity of tertiary sector (Singelmann, 1978b).³

By using a new category of service sector,⁴ Browning and Singelmann (1975) found out that the U.S. had two major sectoral transformations in the last century, one was the movement out of agriculture, the other was the growth of services. In order to identify different paths of sectoral transformation across countries, Singelmann (1978b) compared

seven developed countries for their labor force structure between 1920 and 1970. He found that there were three different patterns in terms of growth rates.

The first pattern is the decline of agriculture employment that resulted primarily in the growth of secondary sector, only four European countries, Italy, Germany, England and France, fit into this pattern.

The second pattern is the decline of agricultural employment resulting in a concomitant growth of labor force in secondary and tertiary sectors. The U.S. and Canada represented this pattern. The third pattern is the decline of agriculture that led directly to expansion of a tertiary sector. This is represented by Japan.

A re-examination of their data showed that, in all seven countries the shares of employment of the tertiary sector were always larger than those of the secondary sector, and the decline of agricultural employment has led to a simultaneous increase of employment share in both the secondary and tertiary sectors. Only growth rates were different between the secondary sector and the tertiary sector. For the U.S., most of the time, growth of employment in the service sector exceeded that of the secondary sector, except between 1940 and 1950.⁵ However, in Japan, there was no consistent pattern of growth between these two sectors.

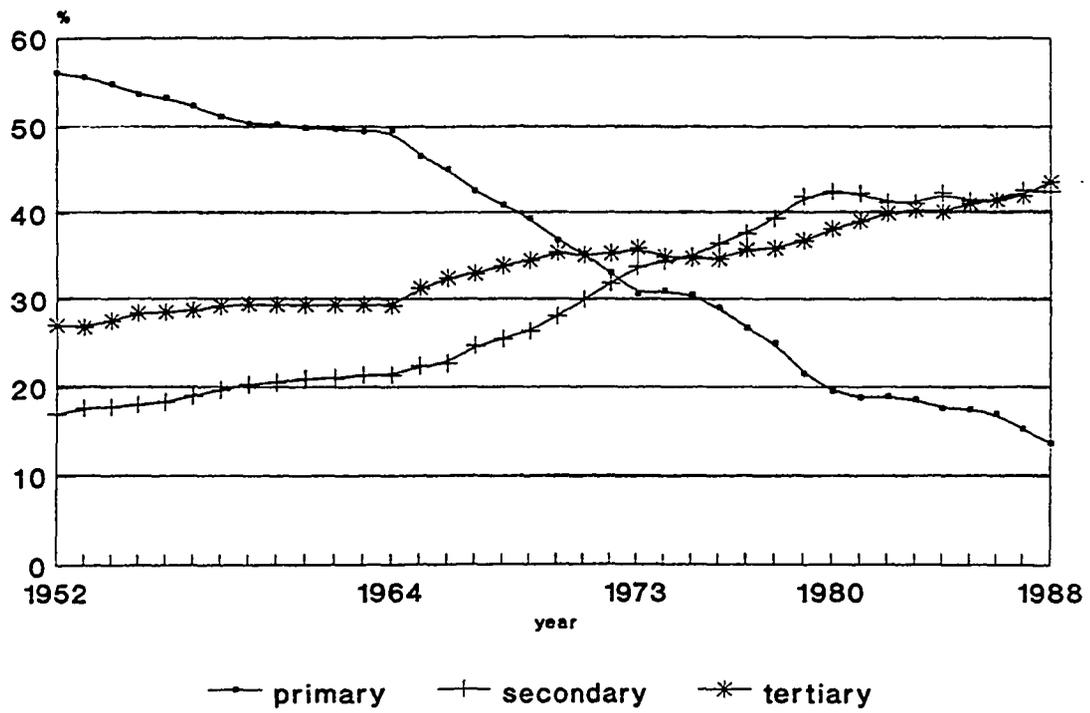
In relation to the Fisher-Clark thesis, first, patterns of Taiwan's sectoral transformation will be examined; then, Taiwan's service sector in the 1980s will be further analyzed in terms of its growth and source of employment.

These analyses may provide suggestions for future development of labor force in Taiwan.

Macro-level Labor Force Transformation (1952-1988)

Taiwan's economic development can be divided into five periods according to its GNP growth. The first period, from 1946 to 1952, one of economic reconstruction after the war. The second period, from 1953 to 1964, is one of stable economic growth. The third, from 1965 to 1973, is a period of rapid growth. The fourth, from 1974 to 1980, is a time of unstable growth, and the fifth period, from 1981 to 1990, is a period of slow growth.

In the first two periods, industrial structure remained predominantly agriculture before 1964. During the third period of rapid growth, Taiwan's labor force had two transformations within two years. One was agricultural employment falling below tertiary employment after 1971, and the other was agricultural employment declining further and falling below secondary employment after 1972. In the fourth period, the third transformation took place after 1975, when secondary employment exceeded that of tertiary employment for the first time in Taiwan. During the fifth period, the fourth transformation occurred after 1986, when secondary employment declined, and tertiary employment became the dominant form again (Figure 3.1).



Source: Taiwan Statistical Data Book, 1989.

Figure 3.1 Labor Force by Sector in Taiwan, 1952-1988

For industrial transformation, it took Taiwan only 15 years to finish structural changes from a predominantly agricultural country to a predominantly service-oriented country. Moreover, this extremely rapid transformation was accompanied with a very low unemployment rate, equitable income distribution and little rural-urban migration of the labor force. This transformation implied both quantity and quality changes. One major reason may be attributed to proper policy with proper human resources quality.⁶ Therefore, institutional and cultural aspects of human resources development are crucial in studying labor force transformation.

Sectoral transformation occurred because of differential growth among sectors. Secondary employment grew faster than tertiary employment after the decline of the agricultural sector. Growth rate in the secondary sector was 4.4%, 12.4%, and 8.7%, as compared to 2.2%, 6.6%, and 2.3% in the tertiary sector for the three periods from 1952 to 1980 (Table 3.1). Only in the 1980s did employment of the tertiary sector grow faster (5.6%) than that of secondary sector (0.4%).

Therefore, Taiwan's sectoral transformation has followed Fisher-Clark's prediction that decline of the primary sector directly led to the growth of the secondary sector first, and then to the growth of the tertiary sector. There were only 12 years between these two transformation in Taiwan. The pattern was also similar to that of industrial countries in a way that a concomitant growth of employment

in the secondary and tertiary sectors occurred after the decline of the primary sector. On the other hand, Taiwan's labor force transformation was not like that of developing countries, which usually had a large, and low-productivity urban service sector without first developing a large industrial sector (Galenson, 1979).

Table 3.1
The Distribution and Growth of Employment by Sectors,
1952-1988
(%)

Year	Total	Primary	Secondary	Tertiary
1952	100.0	56.1	16.9	27.0
1964	100.0	49.1	21.3	29.2
1973	100.0	30.5	26.6	35.8
1980	100.0	19.5	42.4	38.1
1988	100.0	13.7	42.6	43.7
Growth rates				
Periods	Primary	Secondary	Tertiary	
1952- 64	-6.6	4.4	2.2	
1965- 73	-19.0	12.4	6.6	
1974- 80	-11.0	8.7	2.3	
1981- 88	- 5.1	0.4	5.6	

Source: Calculated from Taiwan Statistical Data Book, 1989.

The Fisher-Clark thesis also predicts that as per capita income increases over time, people will consume more services than goods (Shelp, 1981). Taiwan also followed such a pattern. Since 1964, per capita GNP was positively correlated with service employment in Taiwan (Figure 3.2).

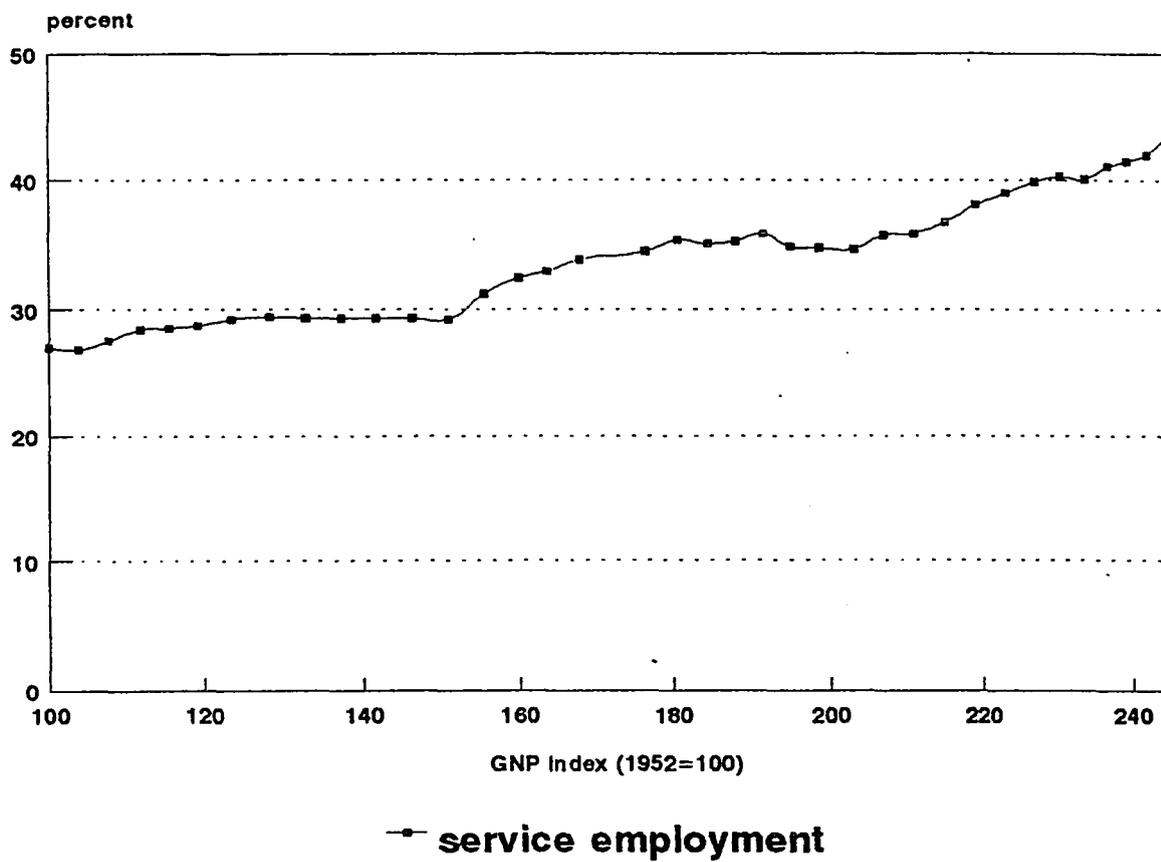
The growth of service consumption (10%) was even faster than that of per capita income (6.6%) from 1961 to 1985 (Wu, 1986).

Industrial growth will indirectly increase service employment and resulted in the concomitant pattern of employment growth of both sectors. For Galenson (1963) pointed out that a 1% increase in manufacturing employment yielded a 0.6% increase in tertiary employment in the U.S. In Taiwan, those service industries, which particularly related to the industrial sector, had a higher percentage share and higher growth rates in output and in employment. They include commerce, transportation, banking and insurance (Wu, 1986).

After examining macro-level transformation, a look at micro-level mobility between industries will follow in order to understand the sources of employment in recent years.

Micro-level Labor Force Transformation in the 1980s

The first labor force transformation from agriculture to industry occurred because of massive inter-industry mobility between sectors. The second transformation from the secondary to the tertiary sector was because of a large inflow of new workers, especially female workers (Urquhart, 1984).



Source: Taiwan Statistical Data Book, 1989.

Figure 3.2 Per Capita GNP Index and Service Employment
in Taiwan, 1952-1988

Taiwan also demonstrated similar patterns (see Table 3.2). Most workers remained in the same sector, while new entrants were a major source of mobility. In 1980, the secondary sector only had 0.7% workers who came from the primary sector, 2.2% from the tertiary sector, but there were 17% new entrants. For tertiary sector, 0.4% workers came from the agricultural sector, 2.2% from the secondary sector, but 10.6% were new workers. The shift of labor from the primary sector to other sectors was limited in 1980. Surplus labor in the agricultural sector has disappeared at this time. Workers became less mobile in 1988 (Table 3.3), but new workers still contributed more to the expansion of the secondary and tertiary sectors than workers from other sectors.

The proportion of female new workers was twice as large as the proportion of new male workers in 1980, 23.9% versus 13.3% (secondary sector) and 16.7% versus 7.4% (tertiary sector). There were still a higher proportion of female new workers than of male ones in 1988.

There was a slightly increased mobility from 2.8% to 2.2% in 1988 between the secondary and tertiary sectors. This was similar to the situation in the U.S. in 1978. Urquhart (1984) showed that, "There was a relative shift from the goods sector to the service sector. But from the actual labor flow, . . . the primary source of new employees in the service sector, was the employment of women who had not worked previously" (p.21).

Table 3.2
Employment Distribution by Previous Sector, 1980
(%)

Previous E.*	1980 employment		
	Primary	Secondary	Tertiary
Total (x1000)	1,537	2,854	2,435
Percent	100.0	100.0	100.0
Primary	90.0	0.7	0.4
Secondary	4.3	80.0	2.2
Tertiary	1.3	2.2	86.8
Did not work	4.4	17.0	10.6
Males	100.0	100.0	100.0
Primary	89.8	0.9	0.5
Secondary	4.4	83.6	2.1
Tertiary	1.5	2.2	90.0
Did not work	4.3	13.3	7.4
Females	100.0	100.0	100.0
Primary	90.6	0.6	0.2
Secondary	4.1	73.3	2.3
Tertiary	0.8	2.3	80.8
Did not work	4.5	23.9	16.7

* within a one-year period.

Source: Computed from Taiwan Manpower Survey Data, 1980.

Taiwan's results were consistent with Urquhart's observation that employment shift to services was not caused by actual migration of workers from one sector to another, but rather resulted from the expansion of the labor force, especially the increasing participation of female workers.

One reason for absorbing many new workers in non-agricultural sectors in Taiwan is the existence of many small firms, which makes it easier and cheaper for workers to find new employment (Scitovsky, 1988).

Table 3.3
Employment Distribution by Previous Sector, 1988
(%)

Previous E.*	1988 employment		
	Primary	Secondary	Tertiary
Total (x1000)	1,237	3,471	3,554
Percent	100.0	100.0	100.0
Primary	95.1	0.9	0.4
Secondary	1.3	87.0	2.8
Tertiary	0.6	1.9	89.5
Did not work	3.0	10.2	8.3
Males	100.0	100.0	100.0
Primary	95.1	1.1	0.6
Secondary	1.5	89.5	2.9
Tertiary	0.6	1.8	90.7
Did not work	2.8	7.6	5.8
Females	100.0	100.0	100.0
Primary	95.1	0.6	0.2
Secondary	0.9	82.6	2.8
Tertiary	0.4	2.1	85.2
Did not work	3.6	14.7	11.8

* within a one-year period.

Source: Computed from Taiwan Manpower Survey Data, 1988.

Another reason is economic prosperity, higher economic growth demands more labor. In both 1980 and 1988, growth of GNP was about 7% in Taiwan (Taiwan Statistical Data Book, 1989). Therefore, the percentage of new workers in the labor force was large.

The high proportion of new female workers in the non-agricultural sector may be related to two factors: one is higher growth of female labor force participation rates (LFPR) due to reduced labor supply and the other is the

higher proportion of females as "marginal workers," moving in and out of the labor market often, depending on economic conditions (Liu, 1984). Moreover, labor-intensive, low-skilled manufacturing and service jobs attracted female workers easily to labor market.

Therefore, Taiwan's labor market expansion in the 1980s did not depend on the absolute outmigration of agricultural workers, but rather on new workers in each sector, especially for women. The secondary sector attracted more new entrants than other sectors. Over an eight-year period, the tertiary sector caught up with the secondary sector in absorbing new workers. The micro-level analysis of labor force transformation also confirms the Fisher-Clark thesis that employment will shift to services sector as economy grows.

The Service Sector in the 1980s

The purpose of this section is to focus on the service sector in order to analyze sources of employment in different service industries.

It has been pointed out before that the heterogeneity of service industries has made it difficult to explain the overall growth of the tertiary sector. Therefore, the tertiary sector needs to be re-categorized into subgroups. According to Singelmann (1978a), Taiwan's service sector can be divided as:

1. Distributive services: which include wholesale trade, retail trade, international trade, transportation, storage, and communication.
2. Producer services: which include banking, insurance, real estate, legal services and machinery renting.
3. Social services: which include public administration and national defense, environmental and health services, international and diplomatic services, and miscellaneous social services.
4. Personal services: which include culture and entertainment, eating and drinking, hotels and tourism, and miscellaneous personal services.

From the analysis, distributive services had the largest share of employment within the service sector, followed by social services, personal services, and producer services. Between 1980 and 1988, only distributive services decreased by an average 4% annually, while others increased employment shares. The producer services had the largest growth by 5.6% annually. Male producer workers increased 4.6%, less than female growth of 7.4% (Table 3.4).

On the whole, growth rates of female service workers were higher than those of males in all services, except for personal services industries. The fastest growing industry for females was producer services, and the slowest one was personal services. For males, the fastest growing service employment also occurred in producer services, but the slowest one was social services.

In Singelmann's (1978b) study, the expansion of the service sector in seven industrialized countries was primarily due to the growth of producer and social services. In Taiwan, the largest increase in the service sector was

also in producer services, but the second largest growth was in personal services, not social services.

Table 3.4
Distribution of Labor Force by Industry
According to Singelmann's Scheme in Taiwan
(%)

Sectors	1980	1988	(1980-88) Ave. Annual Growth
A. Total (x1000)	6,843 (100.0)	8,045 (100.0)	2.2
Extractive	22.5	15.4	-4.0
Transformative	42.7	43.1	0.1
Distributive services	16.3	18.7	1.9
Producer services	2.0	2.9	5.6
Social services	8.6	10.3	2.5
Personal services	7.8	9.6	2.9
B. Males	(100.0)	(100.0)	
Extractive	23.7	17.3	-3.4
Transformative	42.2	43.5	0.4
Distributive services	17.8	19.5	1.2
Producer services	1.9	2.6	4.6
Social services	8.0	9.1	1.8
Personal services	6.4	8.0	3.1
C. Females	(100.0)	(100.0)	
Extractive	20.2	12.1	-5.0
Transformative	43.7	42.3	-0.4
Distributive services	13.6	17.3	3.4
Producer services	2.2	3.5	7.4
Social services	9.7	12.6	3.8
Personal services	10.6	12.2	1.9

Source: Computed from Taiwan Manpower Survey data, 1980, and 1988.

One of the reasons producer services will grow fast is because of increased use of external services (Greenfield,

1966), such as advertising, finance, legal service, maintenance, and accounting. In other words, fast growth is due to changes in business practices, the "unbundling" hypothesis, which means, "a manufacturing company which previously provided its own producer services activities, but which now purchases these activities" (Tschetter, 1987:34).

Unbundling can increase efficiency and reduce cost and risk in providing industry-related services. Other factors such as government expenditures, changes in technology, and increasing urbanization will also affect the growth of producer services (Tschetter, 1987).

The lower growth in social service industries in Taiwan may be due to less government expenditure in this area. The Taiwanese government in the past was more concerned with economic infrastructure than with social welfare systems. For example, the share of net domestic product of government services declined from 25.2% to 23.7% between 1980 and 1988, as the total GDP increased (Taiwan Statistical Data Book, 1989). The public services industries, such as education, medicine, social security systems, and public health have not increased as fast as the growth of the overall economy (Wu, 1986).

In short, Taiwan's expansion of service employment concentrated on producer service and personal service, and to a lesser extent on social service industries. Their future development will be discussed in the next section.

Future Labor Force Structure and Policy Implications

As per capita income reaches a certain level, consumption of services will exceed that of goods. Since many service industries are labor-intensive, future service industries will become the main source of employment (Wu, 1986). For example, the proportion of service employment is estimated as 51.5% of the total labor force, while 39.4% was for secondary employment between 1986 and 2000. The domestic product of service industries is estimated to reach 50.5% of GDP by the year 2000, as compared to 46.5% for the goods-producing industries. The service sector will grow even faster than average GDP growth by the year 2000. Total GDP is estimated to grow 6.5% annually, while annual growth in domestic product is 7.4% for the service sector, as compared to 6.0% for the industrial sector (Wu, 1986).

Within the service sector, commerce is expected to have the highest share, followed by the governmental service sector. In terms of growth in output, the fastest growing service industries will be producer services, followed by distributive services. In terms of employment growth, producer services will have the highest growth, followed by personal services.

Producer services industries tended to have higher proportions of professionals and earnings than the labor force as a whole (Greenfield, 1966). Taiwan's future labor supply will have an increase of educated workers. However, producer service industries in Taiwan now have not been

highly professional, employing mostly vocational high school graduates, rather than college graduates in the 1980s.⁷ In the future, Taiwan will need more high-level producer service workers.

In the past, Taiwan has had a surplus in college-educated liberal arts and business graduates (Wang, 1987). Taiwan needs more high-level technical and scientific manpower for industrialization. The future growth of the service sector, especially for producer service, can absorb these liberal arts and business college graduates by upgrading skill levels in that sector. For example, modernization of the financial market may facilitate this transformation.

Taiwan's future economic growth will be closely linked to the ability to transform the labor force to the service sector. Economic development will not be defined in terms of 'industrialization' alone any more. 'Servicization' is the trend (Riddle, 1987). With more economic liberalization in the post-Chiang Ching-Kuo era, Taiwan's market should be opened to more foreign services industries in order to speed up modernization. Similar to export-oriented policies, Taiwan should also consider exporting its services to other countries in the future. This goal can only be reached after further development of its domestic service sector in the 1990s.

Chapter III--Notes

¹A previous version of this paper was presented to the Conference of Asian Studies on Pacific Coast, 1990 (ASPAC' 90) Stanford University, Stanford, California, 29 June- 1 July 1990.

²The primary sector includes industries such as agriculture, fishing, forestry, and mining. The secondary sector includes industries such as manufacturing, construction and utilities. The tertiary sector includes industries like commerce, transportation, communication, and services.

³Some researchers found that high percentages of output and employment of the service sector were correlated with low levels of per capita income in developing countries (Shelp, 1981; Leontief, 1977; Sabolo, 1975; Blades et al., 1974). They provided some explanations for that, including: urbanization (Blades et al., 1974; Sabolo, 1975), growth of manufacturing (Galenson, 1963), low productivity in the service sector (Fuchs, 1964), and non-economic factors such as the role of the state, learning effects, income inequality in developing countries (Katouzian, 1970).

⁴Browning and Singelmann (1975) divided the service sector into four categories: distributive services, producer services, social services, and personal services. The distributive services include transportation, communication, wholesale trade and retail trade. The producer services include real estate, engineering, accounting, miscellaneous business services and legal services. The social services include medical, health service, hospitals, education, welfare, religious services, nonprofit organizations, postal service, government, and miscellaneous social services. The personal services include domestics, hotels, eating and drinking places, repair services, laundry, barber and beauty shops, entertainment, and miscellaneous personal services.

⁵The growth of industrial employment was 13.8% as compared to 5.8% for the service sector.

⁶Taiwan's policies based on labor-intensive industrialization in the early 1960s created many employment opportunities in the manufacturing industries, so that the surplus labor from the agricultural sector was smoothly absorbed (Fei and Ranis, 1975).

⁷There were 39% vocational high school graduates, while only 15% were college graduates in producer services in 1988 (based on calculations from Manpower Survey data).

CHAPTER IV
LABOR FORCE TRANSFORMATION IN TAIWAN:
OCCUPATIONAL STRUCTURE (1952-1988)

Introduction

In the preceding chapter, it was observed that Taiwan's industrial structure has moved from agriculture to service in the late 1980s. Bell (1972) proposes that occupational transformation can also change a society from a "pre-industrial" to an "industrial" and then to a "post-industrial" stage.

The "post-industrial" societies can be defined by an occupational structure, as Bell originally proposed, or by industrial structure (Gartner and Riessman, 1973). Bell describes it as primarily information-producing instead of goods-producing; and the motivating force behind it is information power instead of machine power. He focuses on transformation of occupational structure more than on industrial structure and contends that rapid expansion of professional and technical occupations will represent the uniqueness of this new society (Montagna, 1977).

Gartner and Riessman (1973), on the other hand, criticized Bell's ignorance of the role of human service industries since he only elaborated the importance of engineers and scientists as the new "professional elites," but ignored real human service providers, such as teachers, doctors, and psychologists. Therefore, they proposed a

similar concept called the "service society," which they defined as (1) number of people employed in services-producing sector are larger than goods-producing sector, and (2) there is enormous expansion in production and consumption of human services, which include education, health, welfare services and government employment. In short, Gartner and Riessman emphasized transformation of industrial structure in a "post-industrial" society.

Taiwan is already an industrial society with the majority of its labor force in the industrial sector. However, how far is it from the "post-industrial" stage? Has more than half of the labor force been transferred to service industries? Has its occupational structure possessed more professional and technical jobs than other types? In order to answer these questions, both the industrial and occupational structures in Taiwan will be examined, first according to "post-industrial" criteria; a micro-level analysis of occupational transformation will follow in terms of job-mobility rate, inflow and outflow of workers, and reasons for quitting. Together with macro-level analysis, this chapter intends to provide a detailed analysis of occupational transformation from 1952 to 1988 in Taiwan.

The Transformation into Post-Industrial Society

This section will empirically describe shares of service-producing industries and macro-level occupational changes in order to evaluate Taiwan's status of development.

Industrial composition

Observing trends in Table 4.1, Taiwan's goods-producing sector still had a higher percentage of employment (56%) than that of the services-producing sector (44%). There was a continuous decline of employment in the goods-producing sector from 73% to 56%, and a continuous increase of employment in the services-producing sector from 27% to 44% between 1952 and 1988. But Taiwan's services-producing sector has not exceeded that of goods-producing sector, even though the trend is clearly moving toward a service economy.

However, not counting the agricultural sector since 1988, employment in the service sector in Taiwan has already become larger than that of industrial sector (Table 3.1).

Therefore, Taiwan needs to further reduce agricultural employment in order to enter the "post-industrial" stage. The size of industrial sector can not be reduced infinitely, for the elasticity of demand of manufactured goods is more elastic than that of agricultural products (Heilbroner, 1973). But the size of agricultural sector can be reduced more by increasing agricultural productivity through mechanization. Taiwan's bottleneck in agricultural mechanization is small land ownership resulting from land reform. On the other hand, expansion of the service sector will also depend on rising productivity in the industrial sector (Bell, 1973). From this angle, Taiwan can speed up its structural transformation by moving away from

labor-intensive technology, and further release workers into service sector.

In short, the success of further reducing employment in both the agricultural and industrial sectors in Taiwan will determine its pace to enter "post-industrial" society.

Occupational composition

Taiwan's occupational structure has changed from predominantly agricultural to predominantly production-related occupations within four decades. From Table 4.2, agriculture-related occupations is the only category losing workers, while all other occupations increased their workers from 1952 to 1988.

Blue-collar occupations replaced agricultural ones and became the largest occupational category (40.3%) in 1988. Clerical-related occupations were the second largest (15.1%), and sales-related jobs were the third (14.3%). The fourth largest group was agricultural jobs (14%) and the fifth is service-related jobs, 8.9%. Professional and technical (6.8%) and administrative and managerial (0.9%) workers remained as the two smallest groups since 1952. On the whole, proportions of white-collar workers never exceeded those of blue-collar workers.

Table 4.1
Sector Distribution of Employment by Sex in Taiwan,
1952-1988
(%)

Sector	1952	1964	1973	1980	1988
Goods-producing*	73	71	64	62	56
Service-producing	27	29	36	38	44
Male					
Goods-producing	75	71	64	63	59
Service-producing	25	29	36	37	41
Total	100.0	100.0	100.0	100.0	100.0
Female					
Goods-producing	68	69	64	60	52
Service-producing	32	31	36	40	48
Total	100.0	100.0	100.0	100.0	100.0
Proportion of females					
Goods-producing	26	27	34	33	35
Service-producing	34	29	35	35	41

* Goods-producing sector include agriculture, mining, manufacturing, utility and construction, the rest of industries belong to service-producing sector.

Source: computed from Table 12 and Table 96, Yearbook of Manpower Statistics Taiwan Area, Republic of China, 1988.

Blue-collar work grew 107% slightly more than white-collar occupations (96%) between 1952 and 1988. But high-level white-collar occupations more than doubled during this period. For example, administrative and managerial occupations grew 200%, professional and technical, 161%, and

clerical, 160%. This clearly indicated trends toward "post-industrial" society.

Table 4.2
Distribution of Occupational Groups in Taiwan,
1952-1988

Occupations	1952	1964	1973	1980	1988	(U.S.) (1988)
White-collar						
Prof. and Tech.	2.6	4.2	5.0	5.5	6.8	15.8
Admin. and Manag.	0.3	0.4	0.6	0.9	0.9	11.5
Clerical	5.8	7.6	10.5	12.9	15.1	16.2
Sales	10.2	8.9	12.1	12.4	14.3	12.1
Subtotal	18.9	21.1	28.2	31.7	37.1	55.6
Blue Collar						
Production, transport, operator and laborers	19.5	23.6	34.7	41.9	40.3	27.9
Service	6.2	6.4	6.8	7.1	8.9	13.4
Agricultural	55.5	48.9	30.2	19.2	13.6	3.1
Total*	100.0	100.0	100.0	100.0	100.0	100.0

* percentage may not round out exactly as 100.0%.

Source: computed from Table 97, Table 124, Yearbook of Manpower Statistics Taiwan Area, Republic of China, 1988.

By comparing Taiwan with other post-industrial societies, such as Singapore,¹ one can realize why Taiwan has not entered the post-industrial stage; Taiwan has a much larger share of agricultural workers. Both Taiwan and

Singapore had similar shares in blue-collar occupations, 36% in Singapore and 40% in Taiwan (1988). The size of Taiwan's white-collar jobs is about 20% smaller than that of Singapore, 37% vs 47%.² The difference between Singapore and Taiwan on occupational structure is in agricultural occupations, 13.6% vs 1.9%.

Compared to the U.S., Taiwan had 3.4 times more agricultural workers, 44% more blue-collar workers, and 18% more sales-related workers (Table 4.2). On the other hand, Taiwan had 11.8 times less administrative and managerial workers, 1.3 times less professional and technical workers, 50% less service workers and 7% less clerical workers.

The greatest difference between the U.S. and Taiwan is in administrative and managerial occupations, 0.9% versus 11.5% (1988). Moreover, Taiwan only had 6.8% professional and technical workers as compared to 15.8% in the U.S.

In short, If Taiwan wants to enter the post-industrial stage, a further decrease of agricultural workers, and a further increase of professional and technical and administrative and managerial personnel are needed. Proportions of blue-collar workers, agricultural workers, and sales workers have to be reduced in order to enlarge shares of professional occupations.

How is the occupational structure changed? This is a complicated and difficult task. One way is by education, especially by expanding higher education at graduate levels. The other method is to increase the demand for professional and technical workers. Upgrading technology in all sectors

is needed, particularly in the agricultural and industrial sectors.

Concentration of professions by industries

Bell (1973) writes that in a post-industrial society "technical elites" of corporations will be at the core of decision-making elites, tied in closely with the executive branch of federal government. The implication is that professional and technical workers in the goods-producing sector will be more important than those in the services-producing sector, in terms of decision-making processes of national matters. In this section, Taiwan's concentration of professional workers in industry will also be examined.

Table 4.3 showed Taiwan's professional and technical as well as administrative and managerial workers were over-represented in services-producing industries, such as producer services (17.8%) and social services (42.9%) when compared to the total labor force (6.5%). Manufacturing industries had only 2.7% professional and technical workers and 1.2% administrative and managerial workers.

Since Taiwan has relied mainly on labor-intensive, and low-skilled technology for economic development, it did not require many professional workers in the past. More professional and technical manpower needs to be recruited into goods-producing industries in order to facilitate the transformation to a post-industrial society. The obstacles to upgrade production structure will also become a hindrance

to increase the number of professional and technical workers in goods-producing sector.

Table 4.3
Occupations by Industry in Taiwan, 1988 (%)

	Goods-producing industry		Service-producing industry			
	E	T	D	P	S	Per.
White-collar						
Prof. and Tech.	0.4	2.7	0.7	17.8	42.9	2.6
Admin. and Manag.	0.1	1.2	0.3	2.5	1.1	0.2
Clerical	10.7	14.0	9.5	58.2	29.3	4.1
Sales	0.1	1.9	67.0	14.2	1.0	1.2
Blue-collar						
Production, operator and laborers	1.5	78.7	21.0	3.7	5.8	27.1
Service	0.2	1.5	1.4	3.6	19.5	64.7
Agri-culture	97.1	0.0	0.0	0.0	0.4	0.0
Total*	100.0 (4,995)	100.0 (14,121)	100.0 (6,114)	100.0 (977)	100.0 (3,360)	100.0 (3,146)

* percentage may not round out exactly as 100.0%.
E: extractive, T: transformative, D: distributive service,
P: producer service, S: social service, Per.: personal
service.

Source: Calculated from Manpower Survey data, 1988.

Gender differences in occupations

Bell (1972) has predicted that large numbers of white-collar workers would be women in lower clerical or sales jobs, while men would concentrate in professional and technical and administrative and managerial occupations. Taiwan's occupational transformation also confirmed such trends.

As the economy developed, the percentage of female professional and technical workers declined, from 45% to 32% between 1952 and 1973, then it grew from 32% to 42% between 1973 and 1988 (Table 4.4). Its growth rate for males was higher (186%) than that of females (142%). The number of male professional and technical workers increased 6.6 times from 42,000 to 321,000, while females only increased 5.7 times, from 35,000 to 233,000.³ Percentages of female administrative and managerial workers also declined sharply from 38% in 1952 to only 3% in 1973, then increased to 8% in 1988. On the other hand, female clerical workers grew continuously from 16% (1952) to 52% (1988), and sales workers from 22% to 38%.

As the economy developed, more males than females entered professional and technical jobs. Even though the total number of female professional and technical workers have increased yet their share in the labor force declined. Economic development has created favorable terms for men but relatively unfavorable terms for women to enter professional jobs in Taiwan.

Taiwan's labor market is still dominated by men in all occupations. Within white-collar occupations, 44% were women, and 56% men; only exception was in clerical jobs, with 52% women in 1988.

Table 4.4

Proportion of Females in Occupational Groups in Taiwan,
1952-1988
(%)

Occupations	1952	1964	1973	1980	1988
White collar					
Prof. and Tech.	45	33	32	37	42
Admin. and Manag.	38	14	3	5	8
Clerical	16	24	40	43	52
Sales	22	30	36	33	38
Blue Collar					
Production, operator and laborers	18	21	30	30	32
Service	59	43	49	41	49
Agricultural	30	29	35	31	30

Source: computed from Table 14 and Table 97, Yearbook of Manpower Statistics Taiwan Area, Republic of China, 1988.

On the other hand, proportions of females entering professional and technical jobs in Taiwan were always higher than that of males, 4.2% versus 2.0% in 1952. As the economy developed, the gap narrowed, 7.6% for women but 6.4% for men in 1988 (Table 4.5).

The higher proportion of female professional and technical workers might indicate a selection process. More

females with higher education would choose to enter the labor force, while others may elect to stay out of it. Therefore, the proportion of female professional and technical workers in the total female labor force tended to be higher since most men enter labor force anyhow.

As the economy progressed, more men and women acquired the same qualifications for professional jobs. The opportunity for entering better high-paid professions is better for men than for women. Therefore, the proportion of male professional and technical workers increased faster.

Pavalko (1988) explained sex segregation of occupations in terms of interaction between employers' decisions and labor market characteristics. Employers may hire less women into the primary sector⁴ because of their assumptions of lack of commitment by women due to child-rearing and family responsibilities. Hence, women tend to concentrate more in the secondary sector and lower-tier primary sector jobs, such as service, sales and clerical occupations.

In summary, Taiwan has not entered post-industrial society because (1) its goods-producing sector still employed more workers than its services-producing sector; (2) its occupational structure still lacks large numbers of professional and technical as well as administrative and managerial workers; and (3) its goods-producing sector lacks high-level technical-elites to influence government decision-making. The sex segregation pattern has already resembles a post-industrial society with men concentrated in

high-level white-collar jobs, while women are concentrated in lower-level clerical and service jobs.

Table 4.5
Distribution of Occupation by Sex in Taiwan,
1952-1988

(%)

Occupations	1952		1988	
	Male	Female	Male	Female
White collar				
Prof. and Tech.	2.0	4.2	6.4	7.6
Admin. and Man.	0.2	0.4	1.4	0.2
Clerical	7.1	3.4	11.6	20.9
Sales	11.5	7.8	14.3	14.4
Blue-Collar				
Production, operator and laborers	21.9	12.2	43.7	34.7
Service	3.5	12.9	7.3	11.5
Agricultural	54.0	59.1	15.3	10.7
Total*	100.0	100.0	100.0	100.0

* percentage may not round out exactly as 100.0%.

Source: computed from Table 97, Yearbook of Manpower Statistics Taiwan Area, Republic of China, 1988.

Micro-level Occupational Transformation (1980-1988)

Mobility and flexibility are necessary for a labor market to be competitive and efficient in labor allocation. Therefore, the ease with which workers can move from one

occupation to another is an important factor in finding solutions to unemployment, job training needs, and economic growth (Saben, 1967). This is why we include micro-level mobility in this chapter. Patterns of occupational mobility can provide information on manpower needs in the future.

Occupational mobility can be categorized into three types--vertical, horizontal, and spatial mobility (Caplow, 1954). Vertical mobility means a change of status; horizontal mobility, a change of functions of work; and spatial mobility, a change of distance of workplace. These three types of mobility can occur together as individuals change occupations.

Change in occupational category is horizontal mobility.⁵ Vertical and spatial mobility may also accompany the change of occupational categories. We will discuss spatial mobility later under reasons of job change, but not vertical mobility in this study.

The following discussion of occupational mobility will include mobility rates, outflow and inflows patterns and reasons for job change.

Job mobility rates

Job mobility rate is defined here as proportion of workers in the total labor force who have changed jobs at least once in the past year. It includes both inter-firm and within-firm changes.

The overall job mobility rate was 8.3% in Taiwan in 1980 (Table 4.6), i.e., about 8 out of every 100 workers

changed jobs in 1980. Job mobility rate in 1988 was about the same at 8.5%. Taiwan's mobility rate was similar to that of the U.S. in the 1960s and 1970s at around 8% (Byrne, 1975).

Mobility rates were similar for both sexes, 8.2% for men, and 8.7% for women in 1980. Sexual differences in labor force participation rates and in occupational composition make their differences in mobility rates difficult to interpret. Their similarity in mobility rates may be explained by a higher rate of mobility among young women (Byrne, 1975).

In terms of occupation, blue-collar workers had the highest mobility rate of 11.1% in 1980, followed by clerical workers of 8.7%. Sales and service workers were the same with 7.6% mobility rates. Professional and technical workers had 7.5% mobility. Administrative and managerial workers had the second lowest rate of 6.3%, while agricultural workers had the lowest mobility of 3.9%.

In 1988, mobility of service workers increased and became the most mobile group, 10.2%, which is higher than that of blue-collar workers, 9.9%. Mobility of professional and technical, administrative and managerial, agricultural workers remained the lowest.

The less training an occupation required, the higher its mobility rate (Byrne, 1975). One reason for the low mobility rate of agricultural workers is heavy investments in land and machinery by the workers and a substantial long-term increase in agricultural productivity.

Professional and technical workers also required heavy investment in education. Their decreasing job mobility rate may reflect more investment is required for a professional and technical worker in recent years.

Higher mobility in general reflects an expanding job market. Higher mobility of an occupation implies greater demand for such workers, because mobile workers are always attracted to open opportunities (Hammerness and Rees, 1988). Agricultural, production-related, and professional and technical workers showed signs of decreasing job mobility rates from 1980 to 1988. This implies that the production-related job market was shrinking in 1988. On the other hand, administrative and managerial, clerical, sales, and service jobs all had slightly increasing job mobility from 1980 to 1988. These are all white-collar jobs, therefore, it confirms service sector expansion.

Men had higher mobility rates for sales and service workers, while women had higher rates in professional and technical, and clerical jobs during the 1980s. From 1980 to 1988, female professional and technical workers increased mobility, from 8.1% to 9.1%, but male professional and technical, on the other hand, decreased mobility from 7.2% to 5.5%. The difference in declining job mobility rates may imply insufficient demand for professional and technical male workers. There should have been greater demand of female professional and technical workers in 1988. Outflow patterns in the next section will further illustrate this phenomenon.

Table 4.6
Rates of Job Change by Occupations in Taiwan,
1980-1988

	Total		Male		Female	
	80	88	80	88	80	88
1. Overall (per year)	8.3	8.5	8.2	8.4	8.7	8.6
White-collar						
Prof. and technical	7.5	7.0	7.2	5.5	8.1	9.1
Adminis. and Managerial	6.3	6.6	6.7	6.7	0.0	5.3
Clerical	8.7	9.2	6.5	7.1	10.4	11.2
Sales	7.6	8.1	7.9	8.7	7.2	7.1
Blue-collar						
Production -related	11.1	9.9	10.9	10.1	11.7	9.6
Service	7.6	10.2	7.7	11.9	7.6	8.6
Agricul -tural	3.9	2.7	4.1	3.1	3.5	1.8

Source: Calculated from Taiwan manpower survey data, 1980, 1988.

Out-flow patterns

Overall, about one-third of agricultural and sales workers remained in their occupational categories, as did two-thirds of production-related and professional and technical workers (diagonal cells in Table 4.7). Compared to 1974,⁶ percentages of changing occupations became lower for professional and technical and administrative and managerial

workers, but higher for blue-collar, sales, and agricultural workers in 1980. Service workers remained the same between 1970s and 1980s.

Agricultural employment was declining in Taiwan. Where did these agricultural workers go? In 1988, 75%⁷ of them left agriculture and entered blue-collar jobs (75%), another 25% entered service or sales work. Transferred agricultural workers contributed more to the growth of the industrial sector than to the services sector. Increased outflow to sales jobs indicated growth of the services sector had absorbed agricultural workers.

There was also mobility from blue-collar work to service, and from blue-collar to white-collar occupations. In Taiwan, there were increasing proportions of blue-collar workers who moved to service jobs 3.8% (1980) and 7.5% (1988). These moves may due to the relative decline of the manufacturing industries and the booming of the service sector in the late 1980s.

There was even some movement from blue-collar to white-collar jobs. In 1988, about 2% of production workers moved to professional and technical jobs, 0.1% of them moved to administrative and managerial, 6.1% of them moved to clerical and 9.6% of them moved to sales work. There were increased outflows from blue-collar work to lower-level white-collar work in the 1980s.

The outflow table showed that less female professional and technical and clerical workers changed to other occupations than males in 1988. On the other hand, more male

professional and technical workers changed to other professions. This implied that female professional and technical workers were in greater demand in the labor market. However, males still dominated professional and technical occupations in 1988 (58%).

New workers entered into production-related occupations the most, more than 50% in the 1980s. Comparing between 1980 and 1988, proportions of new workers in clerical, sales, and service jobs increased in 1988, while they decreased in agricultural and production-related jobs. This trend again indicated the transition to a service economy in Taiwan.

Inflow patterns

First, in both 1980 and 1988, except for administrative and managerial occupations, the largest inflow of workers to each occupational category was new entrants (Table 4.8). Administrative and managerial workers came from either clerical-related jobs or professional and technical jobs.

Second, proportions of new entrants to professional and technical and administrative and managerial jobs have increased, while they decreased in all other occupations. This indicated labor force supply has been increased for high skill-level professions in Taiwan.

Table 4.7

Mobility Within One Year: Out-flow Percentage in 1980
and 1988

Previous Occup.	Present occup. in 1980							T.
	P & T	A & M	Clerical	Sales	Service	Agr.	Prod.	
P & T	63.2	2.9	10.3	16.2	2.9	3.0	1.5	100 (68)
A & M	28.6	42.8	0.0	0.0	14.3	0.0	14.3	100 (7)
Clerical	12.9	1.9	53.5	12.1	4.3	0.8	14.5	100 (256)
Sales	11.3	0.5	8.9	35.7	4.2	8.4	31.0	100 (213)
Service	2.5	0.0	5.0	9.3	52.1	3.4	27.7	100 (119)
Agri.	5.7	0.0	0.9	6.8	3.9	23.5	59.2	100 (456)
Prod.	10.8*	0.1	4.3	7.3	3.8	7.7	66.0	100 (1178)
NLF	10.8	0.1	12.5	8.6	6.5	7.9	53.6	100 (3283)

Previous Occup.	Present occup. in 1988							T.
	P & T	A & M	Clerical	Sales	Service	Agr.	Prod.	
P & T	66.7	0.0	11.3	10.7	2.6	2.0	6.7	100 (150)
A and M	0.0	53.0	17.6	17.6	5.9	0.0	5.9	100 (17)
Clerical	3.5	1.3	63.8	11.9	6.1	1.8	11.6	100 (395)
Sales	1.6	0.3	15.2	43.8	11.2	3.1	24.8	100 (322)
Service	1.7	0.0	9.7	10.1	51.9	1.3	25.3	100 (237)
Agri.	1.0	0.0	1.5	10.8	6.8	19.1	60.8	100 (204)
Prod.	1.8	0.1	6.1	9.6	7.5	4.6	70.3	100 (1469)
NLF	8.7	0.1	14.1	12.1	9.6	5.3	50.1	100 (2743)

* There may be some errors in data, see endnote 8.
P and T: professional and technical, A and M: administrative and managerial, Agri.: agriculture, Prod.: production-related, and NLF: not in labor force.

Source: Calculated from Taiwan Manpower survey data, 1980, 1988.

Third, besides new entrants and remaining workers, production-related workers were the third largest source of inflows. The proportion of inflow of production-related workers to other occupations has increased from 1980 to 1988.⁸ The increased inflow of blue-collar workers to other occupations indicated the declines of production-related jobs. Moreover, there were less new entrants into production-related jobs in 1988. The trend clearly points toward the decline of blue-collar work in the late 1980s.

The less self-recruitment (i.e., lowest percentage of remaining workers) an occupation has, the more it relies on inflow of manpower from other occupational groups (Blau and Duncan, 1967). For example, agricultural workers had the lowest self-recruitment, they had the highest inflow of other types of workers and also the highest outflow percentage in 1988 (Table 4.7). The relationship between inflows and outflows of an occupation can be summarized by an index of concentration of supply and of recruitment.

Table 4.8

Mobility Within One Year: Inflow Percentage in 1980 and
1988

Previous occup.	Present occup. in 1980						
	P & T	A & M	Clerical	Sales	Service	Agr.	Prod.
P & T.	7.1*	14.4	1.1	2.1	0.5	0.4	0.0
A & M.	0.3	21.4	0.0	0.0	0.3	0.0	0.0
Cleri.	5.4	35.7	21.5	5.9	3.0	0.4	1.3
Sale	3.9	7.1	3.0	14.5	2.5	3.7	2.2
Service	0.5	0.0	1.0	2.1	17.1	0.9	1.1
Agr.	4.2	0.0	0.6	5.9	5.0	22.2	9.2
Prod.	20.7*	7.1	8.0	16.4	12.2	18.8	26.4
NLF	57.9	14.3	64.8	53.1	59.4	53.6	59.8
Total (N=)	100.0 (613)	100.0 (14)	100.0 (636)	100.0 (525)	100.0 (362)	100.0 (483)	100.0 (2947)

Previous occup.	Present occup. in 1988						
	P & T	A & M	Clerical	Sales	Service	Agr.	Prod.
P & T	25.7	0.0	2.1	2.2	0.7	1.1	0.4
A &	0.0	45.0	0.4	0.4	0.2	0.0	0.0
Clerical	3.6	25.0	30.6	6.5	4.2	2.5	1.7
Sales	1.3	5.0	5.9	19.4	6.3	3.6	2.9
Service	1.0	0.0	2.8	3.3	21.3	1.1	2.2
Agri.	0.5	0.0	0.4	3.0	2.4	14.2	4.5
Prod.	6.9	10.0	10.8	19.4	19.1	24.8	37.9
NLF	61.0	15.0	47.0	45.8	45.8	52.7	50.4
Total (N=)	100.0 (390)	100.0 (20)	100.0 (822)	100.0 (727)	100.0 (576)	100.0 (275)	100.0 (2727)

* There were some data errors in these categories, see endnote 8.

P & T: professional and technical, A & M: administrative and managerial, Agr.: agriculture, Prod.: production-related, and NLF: not in labor force.

Source: Calculated from Taiwan manpower survey data, 1980, and 1988.

Concentration of supply and recruitment

The index of concentration of supply is the summation of differences between outflow percentage and its corresponding row percentage, which has the same sign. The index of concentration of recruitment is the summation of differences between inflow percentage and its corresponding column percentage which has the same sign.⁹

Sales, agricultural, and production-related jobs had lower concentration in both supply and recruitment than other occupations (Table 4.9). This means their workers outflowed to more diverse occupational categories than other occupations.

Professional and technical, administrative and managerial, and clerical jobs, on the other hand, had higher concentrations in both supply and in recruitment than any other occupations. These are mostly high-skilled and white-collar jobs, which means these occupations had higher degrees of specialization and lower flexibility in transferring workers to other occupations.

The low level of concentration of supply in both sales-related and agriculture-related occupations was mainly due to their lowest percentages of remaining workers in the professions (Table 4.7). Production-related occupation had the highest percentage of remaining workers, its low concentration of supply truly reflected its diverse supply of workers to many other occupations.

Over the years, concentration of supply only increased for sales workers for both sexes. This increase in

concentration of supply implies less mobility for workers between occupations and less outflow to diverse occupations. This increased stability may imply increased specialization as the economy developed. Workers received more specialized training, thus, making them less transferable to different occupations.

To explain the differences in supply and in recruitment of occupations, dual labor market hypothesis can be applied (Doeringer and Piore, 1971; Piore, 1975). The primary market (or internal market) is a closed one; it has its own internal channel of promotions. The secondary labor market (or external market) is mobile and open, but less desirable in terms of wages, promotion, and working conditions. The primary market should have a lower rate of job mobility since workers will try to remain in their jobs to wait for internal promotion (Hachen, 1990).

In this analysis, the primary labor market may exist more inside three types of white-collar occupations, professional and technical, administrative and managerial, and clerical, because of their higher degree of concentration in supply and in recruitment. On the other hand, agricultural and blue-collar occupations resembled more of the secondary labor market condition with the least concentration of supply and recruitment. Sales and service work may have a mixture of both the primary and the secondary labor market, for their medium level of self-recruitment.

Table 4.9

Index of Concentration of Supply and Recruitment

	Concentration of supply		Concentration of recruitment	
	1980	1988	1980	1988
P & T.	58.6	60.3	20.0	23.0
A & M.	65.7	58.8	21.7	44.9
Clerical	46.4	50.2	50.1	41.2
Sales	24.1	31.4	14.1	14.2
Service	45.2	42.8	14.9	17.0
Agri.	23.6	24.8	15.0	11.3
Prod.	27.6	29.7	5.3	11.4

Source: Calculated from Tables 4.7 and 4.8.

Reasons for voluntary job mobility

Most people changed jobs voluntarily in Taiwan, 65% in 1980 and 75% in 1988. Female workers had a higher rate of quitting than males, 73% for females and 60% for males in 1980. The situation remained the same in 1988. Studies show that women appeared to have higher propensities to quit, but once wages and length of employment were controlled, there were no gender differences in quitting (Hamermesh and Rees, 1988).

The most common reasons for quitting are: low-pay and changing workplace (Table 4.10). Low-pay was more important for males than changing workplace, while the need to change workplace was more important than low-pay for females. This trend was even more obvious in 1988.

Table 4.10
The Most Popular Reasons for Quitting in Taiwan
(%)

	Total		Male		Female	
	1980	1988	1980	1988	1980	1988
Quitters	1484 (100)	2082 (100)	890 (100)	1236 (100)	594 (100)	846 (100)
Because of low pay*	33.6	28.1	34.6	30.3	32.0	25.1
Because of workplace	28.7	26.2	25.2	22.3	34.0	31.9

* Questions on reasons for quitting were different between 1980 and 1988, therefore, percentages could not be compared across years here.

Source: Calculated from Taiwan Manpower Survey, 1980, 1988.

Low-pay

Did those who change jobs become better-off than those who did not change? Did those low-pay workers change to higher paying jobs? This is not always true in Taiwan, specially for males. Comparing between job changer and non-job changers, job changers had lower monthly income than non-changers. Among job changers, quitters had lower monthly income than averaged job changers in 1980 (Table 4.11).

This finding is contrary to the reason why they quit previous jobs. Furthermore, only those low-pay white-collar workers had a lower average monthly salary than the non-changers. Age may be a factor for non-changers, in general they were older and better established. The other factor may be white-collar workers were less in demand in 1980.

In 1988, the situation changed. Male low-pay workers had higher average monthly salary than those who did not change jobs. Non-job changers had the lowest average monthly salary and previously low-pay workers had the highest average monthly income after job change.

Female workers have different patterns in salary from males. Females average monthly salary was about 50% to 60% of that of males in Taiwan (Table 4.11). Average monthly salaries for female job changers and non-job changers were similar. Female quitters always had a higher average monthly salary than its average job changers. Female low-pay workers always had the highest monthly salary. Since low-pay was less important for females, female job changers and non-job changers had almost the same average monthly salary.

Taiwan's mobility patterns were found generally insensitive to earnings; earnings levels had no significant relationship with mobility rate (Hou and Hsu, 1976). The reason may be that new entrants or involuntarily mobile workers go where the jobs are, the "job vacancy" hypothesis. Income differences need not be too large to induce job changes (Hou and Hsu, 1976).

On the other hand, occupations with higher incomes require heavy investments in education, money or training. So the lure of higher income cannot increase the number of applicants quickly (Saben, 1967). In 1988, salary was only 11% higher in Taiwan for those who changed jobs for higher income than those who did not change.

Table 4.11
Average Monthly Salary of Workers by Job Change or not
in Taiwan
(\$NT) *

	Total		Male		Female	
	1980	1988	1980	1988	1980	1988
No change	786	12,572	939	15,105	474	9108
Job change	689	13,598	807	15,957	474	9,786
Quit job	668	13,244	790	15,324	484	10,205
Due to Low-pay	712	13,967	833	15,965	514	10,441

* Salary is in current prices of New Taiwan Dollars in 1980 and in 1988 respectively.

Source: Calculated from Taiwan Manpower Survey, 1980, 1988.

Locations of workplace

Since workplace is the second major reason for quitting, spatial mobility for those who quit their jobs is important. In 1980, there was a higher proportion of workers who quit because of workplace in the northern region than in any other regions (Table 4.12). Workers from the northern region of Taiwan had 10.7% more workers quitting for workplace than those who quit for other reasons, the difference (13.9%) was even larger for females. In the northern region, within the Taipei-metropolitan area, Taoyuan, and Hsinchu, showed higher ratios of workers who quit because of the need to change workplace.

In 1988, the difference between quitting for workplace and for other reasons had been reduced. Workers from the

central and the southern regions¹⁰ wanted to change workplace more. Less workers in the eastern regions or non-metropolitan areas changed jobs because of workplace. One reasons why workers in the north and populated areas quit their jobs more is because of the higher percentages of workers in these areas.

Spatial mobility was limited in Taiwan.¹¹ Whether changing jobs because of workplace or not, most workers remained in the same cities, same metropolitan areas, and same regions after job change. Those who quit for workplace remained in the same regions or cities less than those who quit for other reasons. More quitters moved from the north to the south than to other areas. Patterns of spatial mobility were from the north to the south, especially for males.

When comparing 1980 and 1988, males had identical patterns between these two years, while females differed on two occasions. In 1988, more females moved from the south to the north, and from the east to the central regions than in 1980.¹² In addition, more females in the south changed to the central area more than to the north. More female workers in the eastern region, remained in the eastern region than those who quit for other reasons.

The five largest cities were the principal recipients of immigrants from rural districts and cities in Taiwan (Hou and Hsu, 1976). Although northern Taiwan is the center for politics, culture and commerce, large numbers of people there quit their jobs in order to move to the south. This

may be due to polluted environment and overcrowding in the north, more jobs openings in the south, or other family obligations in the 1980s.

Spatial mobility in Taiwan occurred more from the north to the south, from central Taiwan to the north or from the south to the north, but not in the eastern region. Those who worked in metropolitan areas moved to non-metropolitan regions more and those in non-metropolitan areas moved to Taipei-metropolitan areas more.

Conclusions and Implications

The purpose of this chapter is twofold. One is to examine the macro-level occupational structure to see if it has entered the "post-industrial" stage. Taiwan has not transformed into a post-industrial society because the majority of its labor force is still in the goods-producing sector. Secondly, professional and technical, and administrative and managerial workers are the smallest, rather than the dominant, occupational groups in Taiwan. However, these high-level professionals at least doubled from 1952 to 1988. In order for Taiwan to enter a post-industrial society, an overall and continuous upgrading of agricultural and industrial sectors is needed to further release workers into the services sector.

Table 4.12

Regional Distribution of Previous Workplace by Reasons to Quit in Taiwan, 1980 and 1988

	Total		1980		Female	
	No	Yes	No	Yes	No	Yes
Quit because of workplace						
Northern	34.8	45.5	35.9	44.6	32.6	46.5
Central	27.1	20.2	25.7	18.8	30.1	21.8
Southern	34.6	32.9	34.6	35.7	34.5	29.7
Eastern	3.5	1.4	3.8	0.9	2.8	2.0
Total (N=)	100 (1871)	100 (426)	100 (1257)	100 (224)	100 (614)	100 (202)
	Total		1988		Female	
	No	Yes	No	Yes	No	Yes
Quit because of workplace						
Northern	47.2	48.7	47.5	50.4	46.6	47.0
Central	20.2	21.1	20.9	19.6	19.1	22.6
Southern	29.7	29.1	28.5	29.7	31.7	28.5
Eastern	2.9	1.1	3.1	0.3	2.6	1.9
Total (N=)	100 (2248)	100 (546)	100 (1450)	100 (276)	100 (798)	100 (270)

Source: Calculated from Manpower Survey Data, Taiwan, 1980, 1988.

The second purpose is to study patterns of micro-level job mobility. Job mobility rates in Taiwan reflect market demand of workers. In 1980, production-related workers had the highest job mobility rate. But in 1988, the service workers had the highest mobility rates. This trend is consistent with the macro-level occupational transformation toward service jobs.

Based on outflow and inflow tables, the supply of high-level white-collar work has relied mostly on self-recruitment or new entrants, while the lower-level white-collar jobs and others can be filled by agricultural and blue-collar workers. Taiwan's labor market has shown such an adjustment to move workers away from declining occupations and into expanding ones.

Most workers quit their jobs due to either income or location considerations. Male workers emphasized income while females were more concerned about location. However, in general, Taiwan's job mobility is not sensitive to income. The income differentials between those who quit and those who did not was about 10%. Geographic mobility is considered low in Taiwan, most people change jobs within the same regions. Workers from the north relocated to the south more often than to other regions.

The inclusion of job mobility data produced more accurate results for labor force projection than traditional analysis of job openings and entrants (Sommers and Eck, 1977). Mobility can be seen as a mechanism to adjust labor supply to demand. Inflows and outflows tables between occupations should be used for manpower projection in Taiwan. In order to have a complete transitional matrix of labor mobility, manpower survey data should be improved to include previous work history of those not presently in the labor force.

Three other suggestions are offered on how government may help to develop needed manpower for an information

society. First, vocational training programs should provide more white-collar work training and help those from other occupations (Chang and Chou, 1987). Future vocational training programs should be targeted at professional and technical, administrative and managerial, as well as clerical workers, especially for female workers. In the past, the government's training program was mainly for blue-collar, male workers. In the future, manual tasks and jobs will give way to supervisory and control functions (Knod, 1984), so technicians and other high-level manpower need to receive a broad training to assist application of new technologies.

Secondly, the Taiwan government should provide a wider scope of high-skilled professional training for females, since female professional and technical workers were in greater market demand than males in 1988. This suggestion is consistent with a service economy that many service jobs are more suitable for females, such as teaching, social work, health care, etc.

Thirdly, government should continue to develop other non-metropolitan areas away from the north in order to relocate workers. One of the most common reasons for job change is the need to change workplace, for example, workers in the north moving to the south. This is encouraging news for the government's decentralization plan, which is designed to shift populations from the north and the south to central areas, and from the west to the east (CEPD, 1981).

Finally, demand for more professional workers needs to be created further through upgrade of technology. Without upgrading, professional and technical workers will never become a major force of society. Occupational transformation will not be able to move to the post-industrial stage. On the other hand, without upgrading, an increase in the supply of professional and technical workers will lead to more underemployment. Therefore, a further increase in overall skill levels is very much needed in Taiwan.

Chapter IV--Notes

¹Singapore has the largest white-collar occupations among all East Asian countries, including Japan. (see Table 124, Yearbook of Manpower Statistics Taiwan Area, Republic of China, 1988).

²Table 124, Yearbook of Manpower Statistics Taiwan Area, Republic of China, 1988.

³Calculated from Table 97, and Table 144, Yearbook of Manpower Statistics Taiwan Area, Republic of China, 1988.

⁴According to the dual labor market perspective (Doeringer & Piore, 1971), the primary sector refers to jobs with relatively high wages, good working conditions, and opportunities for advancement, as well as equal, stable, and secure employment. The secondary sector is the opposite of the primary sector.

⁵For details on categories of mobility, see Caplow (1954), pp. 59-61.

⁶In 1974, 50% of professional and technical and the administrative and managerial workers and the blue-collar workers changed occupations; 60% to 70% of the clerical, sales and farm workers changed occupations, and 80% of the services workers changed occupations (Hou and Hsu, 1976).

⁷From Table 4.7, $60.8 / (100 - 19.1) = 75\%$.

⁸The data even showed some production-related workers changed to professional and technical jobs, however, we suspect the accuracy of the data collection here. Because 51% of 127 transferred blue-collar workers became economists; 20% became statisticians or related workers, and 12% became engineering-related technicians. Among those who moved to the professional jobs, the rubber and plastic workers had the highest mobility rates. Other textile workers, toolmakers, machine builders, and electrical, electronic fitters also moved into the professional category; each consisted of 8% of the workers who transferred from the blue-collar to the professionals.

⁹Concentration of supply = $\Sigma(C_{ij} - C_j)$, for $C_{ij} > C_j$
 C_{ij} = cell's outflow % of cell i^{th} col. and j^{th} row
 C_j = row % of j^{th} row
 Similarly, Concentration of recruitment = $\Sigma(D_{ij} - D_i)$,
 $D_{ij} > D_i$, D_{ij} = cell's inflow % of i^{th} col. and j^{th} row,
 D_i = column % of i^{th} column.

¹⁰For example, in Taichung and Tainan metropolitan areas.

¹¹There was a limited interregional labor movement in 1974. The net outflow of labor from rural districts (hsiang) was 3%, from "cities" it was 4%. The five largest cities had a net inflow rate of more than 6%. (Hou and Hsu, 1976)

¹²For example, females working in city of Kaohsiung moved to Taipei-Keelung areas more, women working in Hualien, moved to Taichung more often.

CHAPTER V
LABOR FORCE UTILIZATION IN TAIWAN
(1980-1988)

Introduction

After examining the transformation of the labor force in supply, industrial, and occupational structures in previous chapters, it is very important to study the pattern of labor force utilization. Taiwan had very low unemployment rates in the process of economic transformation,¹ nevertheless, unemployment rates are believed to represent only a partial picture of labor utilization problem in Taiwan (Hsu and Hwang, 1979; Hsu, 1982). Hauser (1982) showed that Taiwan's unemployment rate consisted of only 16% of total economic underemployment in 1973. Liu (1985:395) stated that, "open unemployment has never been a severe problem to the economy of Taiwan." The real problems of Taiwan's employment was disguised unemployment (i.e., shortage of working time), and under-utilization by production (i.e., low-income). Therefore, all different forms of underutilization should be understood in order to obtain the whole picture of labor force utilization in Taiwan.

Among sociologists, there are different views as to why underemployment exists. For example, Durkheim's view of incomplete division of labor and Sullivan's (1978) views of

the imbalance between supply and demand may explain Taiwan's situation.

Durkheim's (1964) "anomic division of labor" is a state of incomplete division of labor during social differentiation. The anomic conditions result from rapid division of labor in which expansion of occupational differentiation destroys the integrity of traditional solidarity (Giddens, 1972). Anomic division of labor referred to an absence of regulation of relations between functions and classes (Thompson, 1982). As economy develops into larger scales and complexity, dislocation (loss of direct contacts) occurs between employers and employees, and between producers and markets. This dislocation would generate crises of overproduction or class conflict in the society. Certain groups could be in possession of excess wealth and power, while some other groups are deprived of reasonable shares. This state of external inequalities needs to be transformed into a complete division of labor, where "labor is divided spontaneously only if . . . social inequalities exactly express natural inequalities" (quoted from Durkheim in Giddens, 1972:12).

Durkheim believed this anomic division of labor would be a transitory phenomenon, for the organic society would eventually restore its equilibrium. Nevertheless, Durkheim had doubts about its automatic transformation, its solution should lie in more planning of the economy, better organization, and more involvement of workers and employers in joint regulation of their industries (Thompson, 1982).

Hence, forms of labor under-utilization such as unemployment, low-income, and mismatch may reflect these "external inequalities," due to incomplete division of labor during Taiwan's rapid economic growth for the past forty years.

Labor under-utilization can also be perceived as "inadequate" supply or demand by some sociologists (Sullivan, 1978). From supply side, the cause of labor under-utilization is overpopulation, which is mostly the case for developing countries. From demand side, cause for labor under-utilization is "insufficient demand," which can be applied to developed countries. In the latter case, underemployment can co-exist with labor scarcity. Taiwan's labor under-utilization in the 1980s may due to the co-existence of an oversupply of middle-level manpower and an insufficient demand of high-level manpower. Therefore, the magnitude of under-utilization can be treated as an "empirical" question. The following analysis is intended to show such trend.

The conventional labor force statistics cannot encompass the problem of under-utilization. For example, labor force participation rates or unemployment rates often cannot tell whether workers are underemployed or marginally employed. Their statistics conceal the magnitude and composition of the "sub-unemployed" or the "underemployed" population (Clogg and Sullivan, 1983). Therefore, a more comprehensive framework is needed to understand labor utilization.

The Labor Utilization Framework (LUF) proposed by Hauser (1974), is a remedy for such a problem. One of the major differences between the labor force approach and LUF lies in the order of priority. The labor force approach identifies employed workers first, and treats unemployed persons as the residual of the labor force; whereas LUF identifies unemployed persons first, then follows with other forms of inadequate utilization, such as less working time, low income, and mismatch. They are mutually exclusive and hierarchical categories (Sullivan, 1978).

The value of the LUF is that, with little additional information and calculation, it provides more useful information than the standard labor force approach. The LUF renders seven different categories of labor utilization, which give a reliable, meaningful, and consistent measurement of change over time.²

The primary intention of the LUF was to measure underemployment in less developed countries. However, studies using the LUF have previously been applied more to the U.S.³ than to developing nations.⁴

In Taiwan, the LUF has been used since 1978 by the government's Manpower Planning Department to report utilization annually, however, the report is limited to statistical presentation. Other studies of under-utilization in Taiwan include Hou and Hsu (1976), Hauser (1977), Hsu and Hwang (1979), and Wang (1987). Hou and Hsu (1976) defined "underemployment" or "under-utilization" in terms of working time less than 36 hours per week and found this kind of

underemployment decreased from 3.15% to 0.77% between 1965 and 1973. Hauser (1977) first applied the LUF to Taiwan and found 16.6% under-utilization rate for total labor force in 1973. Hsu and Hwang (1979) used rate of idleness as an indicator for under-utilization. They observed the idle rate decreased from 13.5% to 5.49% between 1965 and 1977. Hsu (1982) also defined "underemployment" in terms of weekly working time between 15 and 36 hours and it declined steadily from 3.16% in 1965 to 1.69% in 1979. More recently, Wang (1987) using the revised LUF, showed increasing under-utilization rates for the college-level labor force for 23.2% and 28.5% in 1978 and 1985 respectively.

It can be concluded from previous studies that by some crude measure of under-utilization, Taiwan's labor utilization generally improved from the 1960s to the 1970s. In the 1980s, the highly-educated workers had higher under-utilization.

This study intends to expand Wang's by studying Taiwan's total labor force in the 1980s and using the revised version of the LUF. The Hauser-Sullivan-Clogg's model was a revision of Hauser's original framework. It further differentiates discouraged workers from the not-in-labor-force group (Clogg, 1979).

Hence, the first purpose of this chapter is to find out patterns of total utilization and changes in the 1980s for all types of workers, in terms of sex, age, education, industry, and occupation. The second purpose is to examine one debatable form of under-utilization in the LUF, the

"mismatch" category, in terms of its definition, composition, and consequences in the labor market.

Methodology

Concepts and operational definitions of the LUF

According to the original LUF (Hauser, 1974), labor force can be divided into three categories: not-in-labor-force, inadequately utilized, and adequately utilized. Inadequate utilization includes unemployment and underemployment. Underemployment can be divided into "visible" and "invisible" underemployment. The former includes involuntary part-time employment, and the latter includes low income and mismatch. Hauser named unemployment, involuntary part-time and low income as "economic underemployment due to economic forces, and mismatch as the "social" component of underemployment (Hauser, 1977).

Clogg (1979) has differentiated the category of "not-in-labor-force" into two sub-categories, i.e., "not-in-labor-force" and "sub-unemployed." The former represents those economically inactive, and the latter, marginally economically active, i.e., discouraged workers.⁵ In Table 5.1, items (2)-(6) correspond to the "ideal types" of the discouraged, the unemployed, the part-time, the working-poor, and the overeducated (Sullivan and Hauser, 1979). The categories in the LUF are "ordered" to classify all the people into mutually exclusive statuses, from not-in-the-labor-force to adequately utilized.

Table 5.1
Labor Utilization Framework

<u>(I) Not in labor force:</u>	
(1) Not-in-labor force	
<u>(II) Inadequately Utilized:</u>	
(2) Sub-unemployed	(economic component)
(3) Unemployed	(economic component)
(4) Involuntary part-time	(economic component)
(5) Low income	(economic component)
(6) mismatch	(social component)
<u>(III) Adequately Utilized:</u>	
(7) Adequately employed	

Source: Clogg (1979), p. 9, Hauser (1977), p. 12.

Our approach

Clogg's version of the LUF (Table 5.1) is operationalized in this study as follows:

(1) Sub-unemployed (S): (i) those who wanted to work "last week" but not seeking jobs, yet if there was a job available, he/she could start working; or (ii) those who were studying, doing housework, or others for last week, who did not work and did not look for jobs for the past year because of the belief that he/she was unable to find jobs.⁶

(2) Unemployed (U): (i) those who did not have a job but were seeking jobs "last week," (ii) those who did not have a job last week, but had looked for jobs and were waiting for the results, or (iii) those who had jobs but did not work because of waiting to start working again at least for a week, or waiting to be recalled.⁷

(3) Involuntary part-time (H): those who work less than 40 hours because of economic reasons, such as season, slack work, bad business, weather or disaster, during "last week" and want to work more.⁸

(4) Low income (I): those who worked at least 40 hours "last week" and with salary, but the last monthly wages he/she earned fell below half of the median wage in the corresponding categories divided by educational level, employment status, and sex.⁹

(5) Mismatch (M): those who worked at least 40 hours "last week," with wages at least equal to half of the median wage of the correspondent category, but his/her education did not match with his/her occupation, according to the occupation-education matrix developed in Taiwan (Appendix B, Table B.1).¹⁰

(6) Adequately employed (A): the residuals of the labor force after all the above calculations.

Some of our definitions are slightly different from that of Clogg's. Our definition of "part-time" work is 40 hrs/week, while the U.S. Census Bureau uses the 35 hrs/week as a criterion for part-time work. Clogg used previous year's work-related income of individuals, while we used last month's salary of individuals. Since the timeframe for employment is the preceding week, the discouraged worker should be defined as in the preceding week, and income as the present monthly salary. These are better indicators than Clogg's and Sullivan's data, which used previous year's information to define discouraged workers and low income.

The definition of mismatch is also different from that in the Hasuer-Sullivan-Clogg's studies. They used the "mean" years plus one "standard deviation" of schooling as the cutoff points. The comparison will be discussed later in this chapter ("Mismatch Workers in Taiwan").

Patterns of Labor Utilization in Taiwan, 1980-1988

The purpose of this section is to compose a whole picture of labor utilization in Taiwan and its changes from 1980 to 1988.

By year

Table 5.2 shows that there was a 5% increase of total under-utilization rate, since the adequate utilization rate dropped from 86.7% to 82.4% between 1980 and 1988. This was mostly due to a continuous increase of the social component of under-utilization, mismatch, from 5.1% to 8.7%. The economic components of under-utilization varied during the period. For example, the sub-unemployment, after reaching its highest level of 1.9% in 1983, declined continuously. The level of unemployment doubled from 1981 to 1986, reaching its highest level of 2.4% in 1986, but then dropped to 1.8% in 1988. The rates of involuntary part-time were also higher between 1982 and 1986 than in other years. However, the low-income ratios did not vary too much by years, and maintained around 4.0%.

It seemed that the economic cycle affected labor utilization in Taiwan with a time lag. The worldwide recession started from 1979, the economic component of labor force utilization in Taiwan worsened from 1982 to 1986. The period of 1982-86 had higher unemployment, sub-unemployment, and involuntary part-time. But low-income percentage did not change much during these years. These statistics might imply that Taiwan's wage distribution was stable and the labor market responded to economic recession by non-wage adjustment, such as working less hours or moving out of the labor market.

Table 5.2
LUF Components in Taiwan, 1980-1988 (%)

Year	S	U	H	I	M	A
1980	1.5	1.2	1.2	4.3	5.1	86.7
1981	1.4	1.1	1.8	4.0	5.6	86.1
1982	0.8	2.1	2.9	4.3	5.9	84.0
1983	1.9	2.4	3.6	4.0	6.3	81.8
1984	1.6	2.2	3.5	4.2	6.8	81.7
1985	1.5	2.6	2.8	4.4	7.0	81.7
1986	1.4	2.4	3.7	4.2	7.3	81.0
1987	1.2	1.9	2.0	4.6	8.0	82.3
1988	1.1	1.8	1.7	4.3	8.7	82.4

S: sub-unemployment, U: unemployment, H: involuntary part-time, I: low-income, M: mismatch, and A: adequate utilization.

Source: Calculated from Taiwan Manpower Survey data, 1980-1988.

By sex

Table 5.3 indicates that female workers had a similar level of adequate utilization as males. The ratio of females over males in terms of adequate utilization remained 1.0 over time. However, females consistently had higher sub-unemployment than males, the ratio ranged from 3.5 to 1.4 during 1980-1988, though their differences decreased over time. Females had similar unemployment rates as males, and the F/M ratio improved over time. Except for sub-unemployment, and unemployment, men tended to have higher rates than women on other types of underemployment such as involuntary part-time, low-income, and mismatch. Females had only 70% to 90% involuntary part-time, 50% to 60% low-income, and 80% to 90% mismatch compared to males.

The decrease in sub-unemployment and unemployment ratio between men and women seemed to signify the decline of females as marginal workers in Taiwan, but F/M ratios of involuntary part-time, low-income, and mismatch increased from 1980 to 1988. Women began to have different types of under-utilization as the economy developed. In the U.S., women also had less mismatch than men, but had higher overall under-utilization than men. Their sub-unemployment rates increased from 1969 to 1980 (Clogg and Sullivan, 1983).

Table 5.3
LUF Components by Sex in Taiwan, Selected Years

Year	Sex	S	U	H	I	M	A
1980	M	0.8	1.1	1.4	5.1	5.5	86.2
	F	2.8	1.3	1.0	2.7	4.4	87.8
	F/M	3.5	1.2	0.7	0.5	0.8	1.0
1984	M	1.3	2.3	4.0	5.1	7.0	80.3
	F	2.3	1.9	2.6	2.6	6.3	84.3
	F/M	1.8	0.8	0.7	0.5	0.9	1.0
1988	M	1.0	1.8	1.8	5.2	9.0	81.3
	F	1.4	1.7	1.6	2.9	8.2	84.2
	F/M	1.4	0.9	0.9	0.6	0.9	1.0

F/M: female rate divided by male rate.
S: sub-unemployment, U: unemployment, H: involuntary part-time, I: low-income, M: mismatch, and A: adequate utilization.

Source: Calculated from Taiwan Manpower Survey data, 1980, 1984, and 1988.

By age

The age groups formed a U-shape pattern of underutilization in Taiwan: both younger and older groups had higher rates of underemployment, 25.9% and 20.7%, respectively, while the prime age groups had lower rates, for example 11.7% for 35-49 age group (Table 5.4).

Low-income ratio was the main reason for the lower utilization rate among the young and the old. Both young and old had two to six times more low-income rates (11%) than other age groups (from 1.8% to 5.9%). Over the years, the rate of low-income for younger people decreased, but increased for older people over 65. This implied the supply

of younger workers had tightened, but supply of older workers had been increased over the years as a result of an aging labor force.

Mismatch rates were high for younger people less than 35 years old; their mismatch rates were two-thirds higher than those over 35. The U.S. study also showed a similar trend, that age group 25-29 had the highest mismatch rate and the rate declined regularly for older ages. This phenomenon, in both Taiwan and the U.S., indicated more younger educated workers in labor force, but occupational distribution did not adjust in time to utilize this manpower (Clogg and Shockey, 1984).

By industry

The industrial categories used here is Singelman's (1978b) category presented in Chapter III. Table 5.5 shows that growing industries had better labor utilization rates than declining ones. Transformative (manufacturing) and social service workers had the best utilization in 1980, 90.8% and 89.2%, respectively. Agricultural industries had the highest under-utilization rate of 14.5% due to high rates of involuntary part-time and low income. Since agriculture is a steadily declining sector, its under-utilization concentrated more on low income and involuntary part-time rather than on unemployment.

Table 5.4

LUF Components by Age in Taiwan, 1980, 1984 and 1988

Year	Age	S	U	H	I	M	A
1980	15-19	3.5	2.4	0.6	11.0	3.2	79.3
	20-24	1.8	2.9	0.6	2.2	9.4	83.0
	25-34	1.1	1.0	1.1	1.8	9.2	85.8
	35-49	0.7	0.3	1.7	3.4	1.7	92.3
	50-64	1.7	0.5	1.8	5.9	2.4	87.7
	65+	0.4	0	1.4	10.5	0.7	87.1
1984	15-19	3.6	3.6	1.3	10.0	5.6	75.9
	20-24	1.9	5.9	1.8	2.5	11.1	76.9
	25-34	1.3	2.0	2.9	2.3	11.3	80.2
	35-49	1.0	0.9	4.8	3.3	2.9	87.1
	50-64	2.2	0.8	5.0	6.7	2.0	83.3
	65+	0	0	3.5	13.9	0.5	82.1
1988	15-19	2.2	4.6	1.0	9.1	9.0	74.1
	20-24	1.8	4.9	1.0	2.8	14.1	75.4
	25-34	0.7	1.8	1.2	2.4	13.5	80.5
	35-49	0.7	0.7	2.0	3.3	5.0	88.3
	50-64	2.0	0.4	3.1	8.2	2.4	83.9
	65+	0.4	0.4	2.5	15.3	2.1	79.3

S: sub-unemployment, U: unemployment, H: involuntary part-time, I: low-income, M: mismatch, and A: adequate utilization.

Source: Calculated from Taiwan Manpower Survey data, 1980, 1984 and 1988.

When comparing between 1980 and 1988, every industry had declining utilization, except for the producer service industries. The producer service industry showed an improved utilization between 1984 and 1988, from 76.1% in 1984 to 81.0% in 1988. The trend indicated that since the producer services industry had been the fastest growing industry (Chapter III), its labor force utilization also improved.

Nevertheless, producer service industries, in general, had higher unemployment and mismatch rates than other industries. The high unemployment might reveal that jobs in producer industries were more competitive than those in other. Also more workers were willing to seek and wait for employment in these industries. On the other hand, the higher mismatch rate implied that more over-educated workers were employed in producer service industries. Therefore, the high unemployment and mismatch rates together inferred the competitiveness of jobs in producer service industries.

By occupation

Professional and technical (P & T) and administrative and managerial (A & M) occupations had the best utilization rates, over 95%, in the 1980s (Table 5.6). Agricultural and service workers had the worst utilization rate, about 75%. Clerical, sales, and production-related workers had 80% to 90%, adequate utilization rates.

The definition of mismatch used in this chapter has arbitrarily determined that P & T and A & M workers had zero mismatch rates. According to the occupation-education matrix (Appendix B), everyone who engages in these two highly-skilled occupational categories is considered adequately utilized, regardless of education. With zero mismatch rates, therefore, these two occupations had the highest utilization rates.

Clerical workers had the highest under-utilization rate because of their high unemployment and mismatch rates. Since

clerical workers have high job mobility rates and relatively high concentration of self-recruitment (see Chapter IV), high unemployment rates imply that more clerical workers were seeking employment within these same clerical professions. Since clerical work can be perceived as an entry level job to white-collar work, more workers with higher education may seek employment first in this kind of job. Therefore, higher mismatch rates are expected.

Agricultural workers had the highest under-utilization rate because of their extremely high rates of low-income and involuntary part-time. This pattern was mostly due to the fact that older people work on family farms (Sullivan, 1978).

The high under-utilization of service workers was because of their relative high mismatch rate (18% in 1988). This result indicated that more overqualified people went into service jobs when the service sector expanded. Another reason may be the inadequacy of the occupational category to accommodate new types of service jobs, which eventually are coded as "the others." The occupation-education matrix defines these "other service jobs" as only for junior high school and below education. This mismatch definition may also have arbitrarily increased the mismatch rates of service workers.

Table 5.5
LUF Components by Industry in Taiwan

Year	U*	H	I	M	A
1980					
Extractive	0.1	3.1	8.4	3.0	85.5
Transformative	1.1	0.7	3.2	4.3	90.8
Distributive S.	0.6	0.5	1.9	8.2	88.8
Producer S.	0.5	0.7	1.4	13.4	83.9
Social S.	0.9	0.5	3.1	6.3	89.2
Personal S.	0.9	2.1	6.8	6.5	83.7
1984					
Extractive	0.5	8.8	11.1	4.1	75.6
Transformative	2.0	3.0	2.3	5.6	87.1
Distributive S.	1.5	1.7	2.0	10.0	84.8
Producer S.	3.0	1.3	1.9	17.7	76.1
Social S.	0.9	0.8	3.0	7.3	87.9
Personal S.	2.1	4.1	7.1	8.6	78.2
1988					
Extractive	0.4	4.1	14.4	5.8	75.3
Transformative	1.6	1.5	2.4	7.0	87.7
Distributive S.	1.3	0.9	2.2	12.3	83.3
Producer S.	2.3	0.5	1.3	14.9	81.0
Social S.	0.8	0.6	2.6	8.2	87.8
Personal S.	1.8	2.6	5.3	13.2	77.1

* There is no sub-unemployment for employed workers.
U: unemployment, H: involuntary part-time, I: low-income, M: mismatch, and A: adequate utilization.

Source: Calculated from Taiwan Manpower Survey data, 1980, 1984 and 1988.

By education

The general trend of utilization by education is: the higher the education, the less the labor utilization (Table 5.7). The best utilized educational groups were the primary school (93%) and junior high school (89.7%); the worst

utilized educational groups were junior college (62.1%) and university and above (67.6%). Over the years, utilization of junior high school increased replacing the primary school as the best utilized group in 1984 and 1988, by less low-income rates.

Studies show that the highest rate of return-to-education is for the primary school (Psacharopoulos, 1981, 1985). One researcher predicts that unemployment, short hours, and low-income are negatively correlated to education, while mismatch is positively corrected to education (Sullivan, 1978).

The above analyses have shown that the less educated experienced more sub-unemployment, less working hours and lower incomes. Graduates of middle-level education such as vocational high schools had more unemployment, while those with higher education faced higher mismatch rates. Taiwan's educational under-utilization seemed to confirm such predictions, except for unemployment.

The less-educated did not have high unemployment rates in Taiwan because of the scarcity of unskilled workers in the 1980s. Therefore, their unemployment rates were lower than rates for more educated workers. The less-educated still had other types of economic under-utilization, such as lower income, due to a lack of investment in human capital.

Table 5.6
LUF Components by Occupations in Taiwan

Year	Occup	S	U	H	I	M	A
1980	P & T	-	0.7	1.5	1.9	0.0	95.9
	A & M	-	0.9	0.5	1.4	0.0	97.2
	Clerical	-	1.3	0.2	1.6	11.6	85.4
	Sales	-	0.5	0.5	2.1	8.2	88.7
	Service	-	0.9	1.7	2.7	10.2	84.5
	Agri.	-	0.1	3.2	8.8	2.9	84.9
	Prod.	-	0.9	0.8	4.2	3.6	90.6
1984	P & T	-	1.2	1.6	1.5	0.0	95.6
	A & M	-	0.7	-	1.0	0.0	98.4
	Clerical	-	2.1	0.3	1.9	15.3	80.5
	Sales	-	1.3	1.5	2.3	10.2	84.8
	Service	-	1.6	2.9	2.8	13.0	79.7
	Agri.	-	0.5	8.9	11.3	4.1	75.3
	Prod.	-	2.0	3.6	3.5	4.2	86.6
1988	P & T	-	1.0	1.4	1.2	0.0	96.4
	A & M	-	1.6	-	2.4	0.0	96.0
	Clerical	-	1.7	0.2	1.4	16.2	80.5
	Sales	-	1.4	1.1	2.5	12.6	82.4
	Service	-	1.5	1.9	3.1	17.6	75.9
	Agri.	-	0.3	4.2	14.8	5.8	74.9
	Prod.	-	1.4	1.7	3.2	5.6	88.1

S: sub-unemployment, U: unemployment, H: involuntary part-time, I: low-income, M: mismatch, and A: adequate utilization.

Source: Calculated from Taiwan Manpower Survey data, 1980, 1984 and 1988.

On the other hand, higher unemployment for vocational high school graduates signified problems of middle-level vocational training. Leonor (1985) argued that "vocational curricula" could only add to the problem of educated unemployment, not releasing it, because specific vocational skills are better taught on the job or in short courses.

General education, which emphasizes the 3Rs, may be better for employment. Taiwan's vocational education also reveals similar problems.

The lower utilization rates among better-educated workers is due to their high mismatch rates in Taiwan. For example, workers with junior high school and below had zero mismatch rates; workers with vocational high school had 15%, but those with higher education had more than 30%.

Summary

Overall under-utilization increased from 13.3% in 1980 to 17.6% in 1988. About one in every six workers experienced some form of under-utilization, which is less than the average one in every four workers underutilized in the U.S. (Sullivan, 1978). The increase in under-utilization over time was mostly due to a 70% increase in mismatch rates from 1980 to 1988.

The major difference of under-utilization among educational groups is mismatch. Mismatch is a form of social under-utilization, and is different from other forms of under-utilization, which are based on economic reasons. Almost 50% of the total under-utilization rate in Taiwan was due to mismatch. A further examination of mismatch follows.

Table 5.7
LUF Components by Education in Taiwan

Year	Edu	S	U	H	I	M	A
1980	1	2.1	0.2	3.4	4.5	0.0	89.7
	2	1.2	0.3	2.9	6.1	0.0	89.5
	3	1.1	0.6	1.5	3.9	0.0	93.0
	4	1.5	1.3	0.8	6.7	0.0	89.7
	5	2.0	2.3	0.3	2.5	11.6	81.2
	6	2.4	2.9	0.3	3.2	13.5	77.8
	7	0.8	1.7	0.8	2.6	31.9	62.1
	8	1.6	1.6	0.3	2.2	26.8	67.6
1984	1	2.3	0.7	7.1	3.8	0.0	86.1
	2	1.3	0.5	8.0	4.5	0.0	85.6
	3	1.4	1.1	5.3	4.9	0.0	87.3
	4	1.8	2.4	3.0	5.1	0.0	87.8
	5	2.3	3.4	1.1	3.3	11.5	78.4
	6	1.8	4.2	1.2	3.1	14.3	75.5
	7	1.5	3.1	0.7	2.4	32.5	59.8
	8	0.7	2.2	0.6	2.6	29.3	64.6
1988	1	1.6	0.3	4.7	6.4	0.0	87.0
	2	1.2	0.3	4.0	5.4	0.0	89.1
	3	1.0	0.7	2.5	5.8	0.0	90.1
	4	1.3	2.1	1.7	4.3	0.0	90.6
	5	1.2	2.6	0.6	3.4	14.5	77.8
	6	1.3	3.1	0.8	2.9	16.5	75.4
	7	0.7	2.6	0.3	2.1	35.1	59.2
	8	1.0	1.8	0.4	2.7	28.7	65.4

1: illiterate, 2: self-study, 3: primary edu., 4: Junior High, 5: Senior High, 6: Vocational High, 7: Junior college, and 8: University and above.

S: sub-unemployment, U: unemployment, H: involuntary part-time, I: low-income, M: mismatch, and A: adequate utilization.

Source: Calculated from Taiwan Manpower Survey data, 1980, 1984 and 1988.

Mismatch Workers in Taiwan

In this section, two types of measures of mismatch will be compared to show how the absolute level of mismatch is

changed by definitions. Then, economic consequences of mismatch will be addressed by income differentials between mismatch and non-mismatch workers.

Trends in mismatch, 1980-1988

The mismatch rate rose from 5.1% in 1980 to 8.7% in 1988 and the increase averaged 8.8% annually in Taiwan (Table 5.2). Approximately, 38,000 people become mismatch workers every year. The U.S. data showed an increase of 82% mismatch from 1969 to 1980, with an average annual growth of 7.5% (Clogg and Shockey, 1984). Taiwan had a larger increase of mismatch during 1980s than did the U.S. in the 1970s. This may partly contribute to the rapid expansion of Taiwan's educational system in the past four decades (see Chapter VII).

Men had a higher proportion of mismatch workers than women. In 1988 male mismatch workers outnumbered female workers two to one.¹¹ This number was larger than the sex ratio in the total labor force; 1.9 in 1980 and 1.6 in 1988.¹² This may be because there is a more fitted and homogeneous distribution of education attainment among women than among men in Taiwan.

The age group 25-29 had the highest shares of mismatch workers. Age group below 35 years, disproportionally, had more mismatch workers than their labor force shares. Mismatch workers mostly came from vocational high schools and junior colleges. Female business majors and male engineering majors had more mismatch than other majors. The

four service industries, such as distributive, producer, social and personal services, had disproportionately more mismatch workers. The three white-collar occupations, such as clerical, sales and service jobs, had disproportionately higher mismatch workers than others (Appendix Table B.7).

Two different measures

There are five different measures of mismatch in the literature. The first type is a subjective report of mismatch where individuals judge the existence of mismatch. For example, the Quality of Employment Survey (QES) asks: "My job lets me use my skills and abilities" (agree or disagree).

There is no necessary relationship between the subjective perception and the objective conditions of mismatch. The subjective reports may be confounded with age, experience, sex, time and other factors (Clogg and Shockey, 1984).

The second type of measure is to ask employers to describe the requirements of each job. Anything above these requirements would be considered a mismatch (Sullivan, 1978). However, employers usually do not have a clear set of requirements. They just hire the "best" ones. Even if employers could provide some information, it will not be complete for all occupations.

The third type of measure is to use the regression coefficient to summarize the earning-schooling relationship. Mismatch is defined by the rate of returns. This method can

only infer mismatch indirectly, as it is between education and earnings, but not between occupations and earnings. The assumption is that those with less income represented mismatch groups. Most mismatch studies stem from this type of definition (Clogg and Shockey, 1984).

The fourth type of measurement is the General Educational Development (GED) scores in the U.S., available from the Dictionary of Occupational Titles. GED defines the "functional requirement" of occupations by a range of scores of education. Beyond or below this range is considered mismatch. But the GED score has only two levels of scores (5 and 6) corresponding to college education, and the range of scores is too small to define mismatch for advanced degrees (Sullivan, 1978; Clogg and Shockey, 1984).

The fifth type of measure is the statistical mismatch used in LUF, which uses completed years of schooling for each occupational group. The occupational group is based on the regrouping of a 3-digit census classification of occupations, which has an internally homogeneous education. Hauser-Sullivan-Clogg define a "mismatch worker" as "if his/her education is greater than one standard deviation above the mean education in his/her current occupation" (Sullivan, 1978; Clogg, 1979).

The "functional requirement" has more "meaningful" criteria than the statistical cutoffs, as the former takes into account differences in types of education. However, these requirements are usually too "low" and thus may ignore reality (Sullivan, 1978). On the other hand, statistical

mismatch has artificially set the upper limit of mismatch by using the mean plus one standard deviation as its cutoff point. Then, does the mismatch figure represent a "real" problem or an artifact of the definition?

Taiwan has developed a matrix similar to the "functional requirement" for each occupational category (Appendix B). The mismatch matrix is a combination of two criteria: one by calculating the average completed years of education for each occupation, then adding 25% to such average years. This becomes the upper limit of education for each occupation. The other criterion is the similarity between content of formal schooling and the requirements of a occupation. For example, only agricultural majors (from vocational high schools, junior colleges and universities) are suitable to work in agricultural occupations. All university graduates are considered appropriate for all types of professional and technical jobs, administrative and managerial jobs, and certain clerical,¹³ sales,¹⁴ and service-related¹⁵ jobs related to their majors, but not for any production-related work.

Because of two technical considerations the term "functional requirement" approach will be used instead of "statistical cutoffs" in this study. First, the manpower survey data did not have a 3-digit occupational classification, at the same time, sample size of 0.4% did not include a complete set of occupation in Taiwan. Therefore, a "benchmark" statistical cutoff for mismatch cannot be created. Secondly, the matrix was developed by

manpower experts in Taiwan and is more relevant to domestic conditions.

How much difference will result from these two different measures?¹⁶ From Table 5.8, mismatch defined by the matrix rendered one to two times lower mismatch than the statistical cutoff. The discrepancies were larger for males than for females. Over the years, the difference seems to decline. The result has confirmed that the functional requirement approach usually renders lower mismatch rates than the statistical approach.

Table 5.8
Mismatch Workers by Different Measures in Taiwan (%)

Year	Measures	Total	Male	Female
1980	1. statistical*	13.4	15.8	9.1
	2. functional**	5.1	5.5	4.4
	3. 1/2 ratio	2.6	2.9	2.1
1984	1. statistical	13.1	15.4	9.0
	2. functional	6.8	7.0	6.3
	3. 1/2 ratio	1.9	2.2	1.4
1988	1. statistical	13.9	16.3	10.1
	2. functional	8.7	9.0	8.2
	3. 1/2 ratio	1.6	1.8	1.2

* statistical cutoffs: mean plus one standard deviation.

** functional cutoffs: based on education-occupation matrix (Appendix B)

Source: Calculated from Taiwan Manpower Survey data, 1980, 1984 and 1988.

Income differences of mismatch and non-mismatch workers

Mismatch may have economic, social, and political consequences for individuals and society.¹⁷ Discussion here is limited to economic effects by examining earnings difference between mismatched and non-mismatched workers.

In accessing the relationship between earnings and labor market matching, Shockey (1989) found that mismatched workers, regardless of gender or color, earned significantly more on average than those who were not mismatched. Some U.S. studies showed overeducation is rewarded, even though its benefits declined over time (Shockey, 1989; Rumberger, 1987).

In contrast, mismatched workers in Taiwan had lower average monthly salaries than non-mismatched workers (Table 5.9). The non-mismatch workers earned about 19% to 34% more than mismatched, and the differences were similar from 1980 to 1988. University graduates had the largest earning discrepancies, 33% to 34%, while mismatch workers with vocational high, and junior college education had smaller earning differences of about 20%.

Taiwan's definition emphasizes more of under-qualification, but not over-qualification for jobs.¹⁸ Therefore, mismatch workers, by definition, are those engaged in a lower-tier of occupation compared to their education. Earnings differentials thus showed less returns for a lower level of work.

Taiwan's results seemed to contradict Shockey's findings (1989), for he did not control for education level.

Without controlling education, Taiwan's income differentials came to the same conclusion as Shockey. But when education was controlled, results were just the opposite, because there was a different concentration of mismatch workers among educational levels. Most non-mismatch workers came from junior high school and below, while most mismatch workers came from senior high school and above. Therefore, if education was not controlled, the differences in salary between non-mismatch and mismatch workers would actually reflect differences in earnings between graduates of junior high and below and those of senior high and above. Non-mismatch workers have lower salaries than the mismatch workers (Ehrenberg and Smith, 1985).

Thurow's (1975) job competition model partly explain why mismatch workers existed. Since marginal products of labor (hence earnings) are associated with jobs, not individuals, individuals are allocated to available jobs based on a variety of personal characteristics, including education. Since this allocation is based on available supplies of both individuals and jobs, workers may possess more education skills than their jobs required (Rumberger, 1987).

Table 5.9

The Mean Monthly Salary of Full-time Paid Workers Aged 25-64
by Education in Taiwan

(in New Taiwan Dollars)*

Edu.	1980			1988		
	Non-mis.	Mismat.	Dif.	Non-mis.	Mismat.	Dif.
Voc. High	10,440 (N=1426)	8,659 (N=165)	21%	18,356 (N=3184)	5,297 (N=492)	20%
Junior Colleges	11,724 (N=697)	9,800 (N=292)	20%	22,382 (N=1327)	18,794 (N=700)	19%
Univer- sity	15,252 (N=806)	11,466 (N=280)	33%	27,634 (N=1049)	20,688 (N=457)	34%

* The salary was in current price for each year.
Non-mis.: non-mismatch workers; Mismat.: mismatch workers;
Dif.: differences.

Source: Calculated from Taiwan Manpower Survey data, 1980,
1988.

Summary and Discussion

Table 5.10 is a summary of findings in this chapter. By using the revised version of the Labor Utilization Framework (LUF), we found:

(1) Taiwan has a very high-level of adequate utilization of total labor force, although its level has declined in recent years. This finding was consistent with Galenson's (1979) observation that the gross underemployment that characterizes the less developed nations virtually disappeared in Taiwan during the late 1970s. Taiwan's labor utilization was even better than that in the U.S. The percent of underutilized workers was about 18% in Taiwan

(1988), as compared to 33% in the U.S. (1980).¹⁹ There may be many reasons for such differences, but one of the reason could be contributed to Taiwan's strong emphasis on full employment since the beginning of its economic policies.²⁰

Table 5.10
Summary of Patterns of Labor Utilization in Taiwan (%)

Category	1980	1988
1. The adequately utilized	86.7	82.4
2. The inadequately utilized	13.3	17.6
(1) Sub-unemployment	1.5	1.1
(2) Unemployment	1.2	1.8
(3) Involuntary part-time	1.2	1.7
(4) Low-income	4.3	4.3
(5) Mismatch	5.1	8.7

Source: see Table 5.2.

(2) Proportion of economic under-utilization in total under-utilization has decreased from 62% (1980) to 51% (1988).

(3) Social under-utilization has therefore increased in the 1980s and is less severe than economic under-utilization. This type of increase accounted for a higher percentage of under-utilization in 1988.

(4) From the above, it can be asserted that Taiwan's labor under-utilization is very low by international comparison. Because it was too low, the existence of labor scarcity became apparent.

(5) The definition of low-income is somewhat arbitrary. Percentage of low-income actually measures uneven distribution of wages. Percentage of labor force in the low-income category may not be really economically disadvantaged. Therefore, the low-income may not be a practical problem, due to the arbitrariness of its definition.

(6) Even though there was no serious problem of labor under-utilization in Taiwan, there would always be some mismatch, no matter how it was defined it. In a democratic society, it is possible to have voluntary mismatch due to individual preferences.

In the process of very rapid economic development, it is inevitable that division of labor cannot be adjusted quickly to changing demand (Durkheim, 1964). The incomplete division of labor would cause transitory under-utilization, based on dislocation between employers and employees or between producers and the market. The types of under-utilization will possibly change with different stages of labor force transformation and economic growth. For the 1980s, Taiwan had fewer problems in sub-unemployment, involuntary part-time or even low-income, because it has developed into a developed country. At this stage of its economic development, Taiwan has more mismatch problems than other forms of underemployment.

Although Taiwan did not have serious "educated unemployment" problems as founded in other developing countries, Taiwan's high mismatch rate, together with lower

salary for mismatch workers in higher education, also implies the existence of "educated underemployment" to a certain degree. Taiwan's under-utilization pattern has the characteristics of "insufficient demand" of high-level manpower, which was also typical of many developing countries (Blaug, 1969, 1973). This phenomenon also co-existed with a scarcity of labor at lower-skilled levels.

One of the key organizations related to mismatch problem is the educational system. In the past, the government has been under great pressure to expand its higher educational system to accommodate more people, this has further hindered the already slow adjustment process of labor supply (Chang and Lee, 1980).

One necessary reforms is the curriculum and structure of vocational high schools and junior colleges, especially for the engineering and business departments. From an analysis of under-utilization, it was seen that their graduates had encountered more unemployment and mismatch. The graduates of vocational high schools had persistently higher unemployment rates than others since the 1970s.

Not many jobs were created specifically for the vocational high school graduates in Taiwan because they were easily replaced by junior college graduates with higher levels of training or, most of them were not willing to take lower level, unskilled jobs.²¹ The Taiwan government should take the initiative to reduce the supply of vocational high and junior college graduates in the future.

Chapter V--Notes

¹Prior to 1964, before the labor survey began, the unemployment rate was estimated at 6% or higher. But since then, it has dropped to 4% or even lower (Kuo, 1976).

²See forward by Hauser in Sullivan (1978) and Sullivan and Hauser (1979) had an extensive comparison with other underemployment measures.

³For example, Sullivan, 1978; Clogg, 1979; Clogg and Sullivan, 1983; Shockey, 1985, 1989; Mutchler, 1985; Lichter, 1988; Allan and Steffensmeier, 1989.

⁴Hauser, 1974, 1977; Smith and Domingo, 1977; Wang, 1987.

⁵The definition of sub-unemployment is similar to the meaning of "discouraged workers," see Clogg (1979), p. 215.

⁶Clogg identified those who were not in the labor force, did not work "last year," and reported that the main reason for not working "last year" as "unable to find work." See Clogg (1979), p. 216.

⁷Clogg (1979) defined "unemployment" as "those who are civilians, during the survey week, had no employment but were available for work and (i) had engaged in any specific job-seeking activity within the last four weeks, (ii) were with a job but not at work and were waiting to be called back to a job from which they had laid off or (iii) were waiting to report to a new wage or salary job within 30 days, see Clogg (1979), p. 217.

⁸This original definition of involuntary part-time is less than 35 hrs per week due to "economic reasons". See Clogg(1979),p.218. Our definition is consistent with the official manpower report in Taiwan.

⁹Hauser, Sullivan, and Clogg all used the "poverty index" devised by the Social Security Administration in the United States. Clogg and Sullivan (1983) used 1.25 times of the Poverty Threshold as the criterion. We followed the criterion set by the official manpower report in Taiwan, for each subject is compared with the same educational background, employment status and gender, this will be more meaningful than the basic poverty line.

¹⁰Sullivan (1978) and Clogg (1979) defined "mismatch" as "more than one standard deviation above the mean completed years of schooling."

¹¹From Appendix B, Table B.2, $70.5/29.5=2.4$ in 1980, and $64.3/35.7=1.8$ in 1988.

¹²According to Appendix B, Table B.2, $65.4/34.6=1.9$ in 1980 and $62.2/37.8=1.6$ in 1988.

¹³Within the clerical-related occupations, university graduates can take on jobs such as clerical supervisor, government executive officials, computing machine operators, transport and communications supervisors, but not any of the following clerical work: stenographers, typists, bookkeepers, cashiers, transport conductors, mail distributive clerks, or telephone and telegraph operators.

¹⁴Among sales-related occupations, the university graduates can become managers, or working proprietors of wholesale or retail trade, or salesmen, or commercial travellers and manufacture's agents. But they cannot be sales supervisors and buyers, stock brokers, and auctioneers or salesmen.

¹⁵For service-related jobs, university graduates can become managers or working proprietors of catering or lodging services or protective service workers, but not cooks, waiters, beauticians and etc.

¹⁶The statistical measure is defined the same as the Sullivan-Clogg's, while the functional cutoffs is based on the education-occupation matrix developed for Taiwan. The occupation and education matrix was developed in 1976 by Manpower Planning Department, Council for Economic Planning and Development, Executive Yuan in Taiwan. See "1978 Underutilization Analysis of Taiwan Area", Monthly Labor Statistics Report, ROC, vol.65, March, 1979. The mismatch matrix is applied universally across the years, while the criterion of statistical cutoffs varies from year to year.

¹⁷Besides economic effects, the overeducated are much more dissatisfied than other workers (Sullivan, 1978). In developing countries, unemployment and underemployment of college graduates may cause political instability. Mismatch is more likely to affect those who are already middle-class and have a high sense of political efficacy.

¹⁸For example, it is non-mismatch if a primary school graduate takes a professional and technical job. But it is mismatch if a university graduate works as a stockbroker.

¹⁹See Clogg and Sullivan (1983), though the two measures of under-utilization were not completely identical for the categories of low-income and mismatch. Our measure of mismatch rate was estimated to be lower than the U.S. measure. Even if it increases from 8.7% to 13.9% (see Table 5.7), the utilization rate will be 77.2%, still higher than the 67.4% of the U.S. labor utilization rate.

²⁰See Li (1988), and chapter 8 of this study.

²¹A survey in Taiwan showed that most vocational high graduates wanted to go to college (Djang, 1977).

CHAPTER VI
CONFUCIAN WORK ETHICS AND LABOR FORCE QUALITY IN TAIWAN

Introduction

The purpose of this chapter is to provide a cultural dimension for the discussion of the labor force. We know that labor force quality is affected not only by the level of education and training, but also by the culture or the work ethic of the labor force, because work ethics influence workers' motivation and behavior and, thus, their productivity.

The argument that Confucianism is accountable for the rapid development in East-Asia has existed for some time. Some researchers think that one of the distinct features of East Asian development is a set of work ethic values that is different from those of the West (Kahn, 1979; MacFarquhar, 1980; Oshima, 1980; Hofheinz and Calder, 1982). But most of these arguments are centered around speculations and ad hoc explanations, without any direct empirical evidence (Berger, 1988). The linkage between micro-level values embedded in individuals and macro-level economic development has not yet been established. The assertion that Confucian values are conducive to a worker's behavior has not been systematically dealt with on both theoretical and empirical grounds. Moreover, different characteristics of Confucianism in each country have not been fully specified.

This study is an attempt to analyze the impact of Confucian values on Taiwan's workers. Some aspects of Confucian ethics, such as frugality, hard work, and cooperation, are believed to be conducive to economic growth, but under some conditions, these positive work ethics may not be evident. The contributions of Confucianism to economic development may be the result of interactions between values and settings.

With this complexity in mind, I will first theoretically identify elements of Confucian ethics and work ethics. Then, some evidence will be provided. For example, values of emphasis on learning can be illustrated from survey data by educational expectations, and values of familism can be shown by family support during periods of unemployment. Besides, content analyses of moral education textbooks will be used to show how the government has tried to induce Confucian work ethics through the educational system. The extent these values have been internalized cannot be assessed, but secondary analyses of empirical studies will demonstrate the prevalence of Confucian work ethics during economic development in Taiwan.

Confucian Work Ethics

In this section, basic ethics of classical and neo-classical Confucianism will be introduced. Then, work-related Confucian ethics will be discussed. The task here is to provide a theoretical linkage between Confucian ethics

and Chinese attitudes toward work and work-related relationships.

The nature of classical- and neo-Confucianism

The worldliness and practical concern of the Chinese people are reflected in a distinctly this-worldly orientation of classical Confucianism. Confucius shifted the focus from Heaven to Earth by his change of emphasis from ancestor worship to filial piety (Smith, 1958).

Classical Confucianism

Table 6.1 summarizes some conceptualizations of classical Confucian ethics. Smith (1958) postulates the major contents of classical Confucianism into five concepts: Jen (goodness), Chun-tzu (gentlemen), Li (propriety), Te (government by virtue), and Wen (the arts of peace). Under Li (propriety), come the famous Five Relationships, which provide a framework of human relations. Among the Five Relationships, three denote familism: (i) Between parents and children, there should be love; (ii) between husband and wife, there should be a division of labor; (iii) between elder and younger persons there should be order and harmony; (iv) between friends there should be mutual confidence; and (v) between the emperor and his subjects there should be a proper sense of duties (Cheng, 1980).

In this framework, one can achieve individuality without creating bitter conflict toward others, because individual freedom is bounded by social norms. This does not mean autonomy is less important. On the contrary, individual

independence is stressed equally as familism in Confucianism. Within the family, children's respect for their parents is most important; it is the very concept of "filial piety."

In Confucianism, an individual lives for himself, his parents, his sons and grandsons whom he knows to exist and learns to care for and respect (Cheng, 1980). Therefore, the sense of groupness or group-related virtues is more likely to be confined to family situations than to a non-kin environment. This has become one of the limitations of Confucianism to adopt industrial society, where kinship ties have weakened (Woo, 1987).

Among the principles of Confucianism, Jen (goodness) is the center of Confucian ethics (Lindley, 1943). Chen (1911) concludes that there are five moral constants in Confucian thought: love, justice, rite (Li), wisdom, and sincerity. The law of reciprocity is the means to achieve the principle of Jen. From Jen, other positive virtues develop, such as self-realization, loyalty (Chu), forgiveness (Shu), mutual considerateness, sincerity (Ch'eng), wisdom (Chih), and love of learning.

Table 6.1
The Classical Confucian Ethics

Chen (1911)	Lindley (1943)	Smith (1958)
rite(Li) wisdom	love loyalty	propriety (Li) government by virtue (Te)
sincerity	forgiveness	gentlemen (Chung- tze)
reciprocity justice	Li wisdom sincerity mutual considerateness self-realization love of learning the middle way	arts of peace (Wen)

Neo-Confucianism

The original concern of classical Confucianism is mainly the relations between people. Neo-Confucianists added man's place and role in the universe, as well as the relation between man and nature to classical Confucianism. Neo-Confucianism still maintained the ethical approach to human existence from classical Confucianism.

Neo-Confucianism has been known as "the science of reason" or "Li-hsueh," because the Sung scholars believed that reason is the common basis of knowledge. The universals of natural or ethical knowledge are found only by reason in human nature (Cheng, 1980). The prerequisite to reason or to investigate things is seriousness (Ching) or diligence. The greatest understanding to be achieved from an investigation of things is Jen, defined by Chu Hsi, the greatest Neo-

Confucianist, as "the character of man's mind and the principle of love" (Chan, 1963:591).

Neo-Confucianism is also regarded as a philosophy of sagehood, i.e., the quality of being wise and upright. The sage must love to learn intensely in order to obtain wisdom and to become self-disciplined in order to cultivate the highest virtues in himself.

Therefore, both classical- and neo-Confucianism are rooted in Jen, which summarized the quality and goal of a Confucian man with upright moral endowment in relation to his family, himself, others, and his work.

Work-related Confucian ethics

From the above, four categories of Confucian work ethics can be identified: (1) familism, (2) emphasis on learning and education, (3) group virtues, and (4) individual virtues (Table 6.2).

The relationship between familism and work ethics is that familism, through filial piety and love of siblings, will encourage an individual to work hard to please his parents, to support younger siblings through education, and to provide his own children with the best education and living conditions.

The relationship between the emphasis on learning and education and work ethics is that through an eagerness to learn, an individual has the initiative to acquire the necessary skills and knowledge required for his job, and can

obtain the required attitude of seriousness about tasks and obligations.

Table 6.2
Work-related Confucian Ethics

Familism	filial piety
	love for siblings
Emphasis on learning and education	eagerness to learn
Group-oriented virtues	benevolence to others
	commitment
	cooperation
	face
	interpersonal harmony
	loyalty
	obedience
	quanxi or particularistic tie
	reciprocity
	respect for authority
	responsibility
	team spirit
	trustworthiness
Individual virtues	achievement orientation
	adaptability
	entrepreneurship
	hard work
	integrity
	pursuit of wealth
	risk-taking
	self-control
	thriftiness

Under group-oriented virtues, there are thirteen related work attitudes: benevolence toward others, commitment, cooperation, face, interpersonal harmony,

loyalty, obedience, quanxi or particularistic ties, reciprocity, respect for authority, responsibility, team spirit, and trustworthiness. In general these virtues contribute to the stability of one's work performance, tolerance of difficulty and frustrations in work, harmonious relationships in the workplace, cooperative spirit, and commitment, thus on the whole, a productive labor force.

Individual virtues internalized from teachings in schools and family have further equipped the individual with achievement motivation, adaptability, entrepreneurship, hard work, integrity, risk-taking, self-control, and thriftiness. These virtues cultivate innovation and creativity needed in the workplace.

There are three ways to examine the existence of Confucian work ethics in contemporary Taiwan. First, existing empirical studies will be reviewed to confirm the Confucian work ethics developed in Table 6.2. Second, recent textbooks used in vocational high schools will be analyzed to understand the contents of moral education on work attitudes and ethics. Third, manpower and vocational survey data will be used to demonstrate familism and eagerness to learn.

Empirical Studies on Confucian Work Ethics

Over the past forty years Taiwan has developed its own characteristics of Confucian work ethics to suit its own unique social and economic conditions. The following

presentation is based on categories developed in Table 6.2. The purpose of this section is to examine what is and what is not Taiwan's version of Confucian work ethics based on a secondary analysis of empirical studies.

Familism

Familism is still prevalent in Taiwan. Workers not only work for the sake of the family, but are also supported, to a great extent, by their families in time of need.

In a survey covering both urban and rural areas in Taiwan during 1978, Li and Lu (1979) used three items to measure familism. These items are: "If you need an assistant, then it's better to hire a relative"; "If you encounter difficulties, only relatives are reliable"; and "It's better to open a business with relatives." The study showed that rural people tended to agree with these items more than did the urban residents. Li and Lu concluded that traditional familism was still practiced mostly in rural areas in Taiwan.

Not only does familism influence the way business is conducted, but it also provides incentives for factory workers to work harder for the sake of family. Stites (1985) studied male factory workers in Luzhou, a Taipei suburb, during 1979 and found that they actually preferred entrepreneurship to factory work. One reason was traditional family ideology. Family is still the major form of security for most people in Taiwan as there is no social security system, and safety standards are low. Because males are

expected to support elderly family members, it is considered safer to open a small business than to remain in factory work. In this way individuals have better control over their own fate and that of family members.

On the other hand, the inheritance pattern, from father to son, also encourages both the father and son to work harder. Ownership of small businesses has provided a way for the continued transfer of subsistence (wealth) from one generation to another, in the same way as inheritance of land. Workers try harder to save money, to open their own businesses, and then work even harder to accumulate wealth for their families, because familism is still strongly influencing an individual's behavior in Taiwan.

Familism in Confucianism has two components, filial piety and love for siblings, which also influence work attitudes.

Filial piety

Workers in Taiwan work for reasons of "filial piety," especially the women. Diamond (1979) points out that women's wages usually remain under the control of the household head, and women's work is defined as an extension of their familial duties. Women work as members of households, not as individuals. Remittances from young female workers are partly a repayment to their parents, for a dowry.

For example, during periods of unemployment, 67% of the unemployed reported "family" as their main source of financial support; only 32% relied on personal savings (Table 6.3). Females relied on family support more than

males, 73% for females vs 63% for males. Moreover, those aged between 15 and 30 depended mostly on family when unemployed, ranging from 63% to 86%. Only those older than 30 years old, relied more on personal savings during unemployment. The interdependence between individuals and family exists to an older age and to a larger degree in Taiwan than in Western societies.

Table 6.3
Types of Support During Unemployment in Taiwan, 1988
(%)

Support	Total	Male	Female	
Family	66.7	63.2	72.8	
Savings	31.7	34.7	26.7	
Pensions	0.5	0.8	0	
Others(loans)	1.0	1.3	0.5	
Age-group	15-19	20-24	25-30	31 and above
Family	86.2	81.7	62.9	35.0
Savings	12.8	17.4	37.1	60.0
Pensions	0	0	0	2.0
Others(loans)	1.1	1.0	0	3.0

Source: Calculated from Taiwan Manpower Survey data, 1988.

For those female workers living in factory dormitories, about 46% of their gross earnings were sent back to their parents. For those who lived at home, 70% to 80% of their wages were given to their parents (Diamond, 1979). Therefore, the practice of "filial piety" is very much related to their work.

Love for siblings

Diamond (1979) also described how young women in Taiwan joined the labor force in order to help their brothers' careers. The remittances they sent home were used partly to support the family and to allow their brothers to attend school or to help to start a small family business.

Peasant and working-class parents tended to invest heavily in the education of their sons, and encouraged their daughters to sacrifice for their brothers (Diamond, 1979:331). For daughters, going out to work was a family strategy, fully supported and encouraged by parents, in order to contribute to household finances.

In short, familism is a very strong motive for fathers, sons, and daughters to work harder for the benefit of the family.

Eagerness to learn

The second dimension of Confucian work ethics is the desire to learn. This virtue derives from the method of character cultivation (Hwang, 1988), which emphasizes diligence of study, application of knowledge, and a sense of shame. This type of cultivation can be transferred into the workplace.

One question asked in a 1985 vocational training survey was: "Do you want to go for further study?" Results showed a high level of eagerness to learn (Table 6.4). For example, more than 62% of the students asked wanted to go on for further study. If categorized by present educational

levels, 93.3% of junior high school students, 92.5% of senior high school students, and 51.3% of vocational high school students wanted to go for further study. Even in higher education, 34% of junior college students and 38% of university students wanted to acquire more education. The sex difference is significant. More than 66% of male students, compared to 58.4% of female students, wanted to study more. If measured by majors in higher education, about 52% of science and engineering students wanted further study, and 45% of students from other disciplines intended to go on for advanced study.

Table 6.4
Desire to Go for Further Study in Taiwan, 1985
(%)

Further study	Total	Male	Female
Yes	64.4	67.9	60.2
No	35.6	32.1	39.8
Total (N=5,933)	100.0	100.0	100.0

Education Level	Junior High	Senior High	Voc. High	Junior Coll.	Uni. and above
Further study	94.3	93.4	52.9	35.4	39.6
No further study	5.7	6.6	47.1	64.6	60.4
Total (N=5,933)	100.0	100.0	100.0	100.0	100.0

Majors	Science & Engineering	Others
Further study	51.8	43.7
No further study	48.2	56.3
Total (N=3750)	100.0	100.0

Source: Calculated from Vocational Training Survey data, 1985.

Even among lower-level factory personnel, Silin (1976) found that in a private enterprise there was considerable interest in new work methods and a desire to learn new ways. The managers especially showed widespread concern for things modern and Western.

Group-oriented virtues

The third aspect of Confucian work ethics is group-oriented virtues. Since Confucianism emphasizes interpersonal relationships, this aspect is particularly praised by Westerners. However, not all positive aspects of Confucian ideas are realized in the workplace. In other words, there are some constraints placed on the manifestation of Confucianism work ethics in Taiwan.

Benevolence to others

In the workplace, the virtue of benevolence to others rarely existed, which is not surprising to most Chinese in Taiwan. Silin (1976) found a prevalent hostile environment between workers, executives, and the boss, who mistrust each other, and have difficulty communicating. This mistrust relates to the Chinese belief that benevolence should not extend to those who are not related (Woo, 1987). If a relationship was not rooted in the family or with extended family members, then Chinese tended to use the "equity rule," rather than the affective rule or benevolence in dealing with people (Hwang, 1983).

Commitment

Similarly, commitment to a company or employer is not universal in Taiwan. The restricted commitment to both superior and colleagues was caused by the didactic norms of leadership prevailing in Taiwanese enterprises (Silin, 1976), mainly because company leaders tend to deny the contributions and importance of subordinates. Although superiors may stress in publicly that success is based on solidarity and cooperation, their actions tended to deny the importance of subordinates. For example, there is a marked tendency to pass blame downward rather than upward. If anything goes wrong, it was assumed that subordinates made the mistake. Or, superiors often made changes in work done by subordinates without explanation, even when subordinates had superior knowledge. Sometimes, leaders also tended to by-pass regular channels and dealt directly with lower-level workers, undermining the position of middle-level managers. These practices contributed greatly to limiting the commitment of employees and managers to their company, superiors, and colleagues.

Cooperation

In terms of cooperation, the picture is mixed. There is an old Chinese saying that, "one monk can carry his own basket to get water, two monks can carry the basket together to get water, and three monks will have no water." It is felt that three Chinese are unable to cooperate among themselves. In general, Chinese in Taiwan have low expectations of achieving solidarity over long periods of

time. In the workplace, cooperation has a high price, to the extent the honest and accurate reports would be withheld in exchange for future cooperation with other departments or colleagues (Silin, 1976).

There were at least three kinds of anti-cooperation in the workplace. The first was withdrawal of training by a manager to his subordinates (Silin, 1976). The second kind of anti-cooperation came from peers or supervisors. Anyone who shows great initiative and ability would be perceived as a threat to others, thus peers or superiors would withhold cooperation.

The third type of anti-cooperation was competition for the favor of superiors. Because of inconsistency or gaps between authority and influences peer group members see themselves in direct competition for the trust of their superiors. This favoritism generates rivalry among workers, greatly reducing incentives to cooperate with one another.

Whether one can cooperate and get along with colleagues in workplace depends on several factors. One study of young workers, ages 16-30 in suburban Taipei, showed that workers with less education, who were married and were interested in their work tended to cooperate with others better than those with more education, who are single or were not interested in their work. On the other hand, a tendency to cooperate also depended on the satisfaction of superiors toward the workers, opportunities for promotion and whether workers thought their work was meaningful (Hsu, 1980).

Face

Concern for face could be either helpful or harmful to work performance. On the positive side, not to lose face for one's family was used by elders to correct and educate the young ones (Wilson, 1970). An internalized concept of "lien" (face) has cultivated their consciousness of collective responsibility to family.

On the negative side, concern for face may become a fear of not letting a superior lose face. It is often not easy to know what the boss wants. Hence, the only way to make sure a superior not lose face is to agree with all of his ideas or suggestions, even when they are wrong. The concern for face thus overrides the truth of matters. Formal meeting became a place full of praises, but not facts. Often information on real situations has to be conveyed through informal channels, usually through a very few interactors trusted by the boss (Silin, 1976).

Inefficiency and distortion thus became inevitable and unsolvable. Such dysfunction in a company was often compensated by the overly hard-working "boss", who oversees everything. Also, a company may be coordinated through a few trusted executives or relatives, who sometimes held concurrent posts across departments or work units, to ensure that the functions were carried out properly of each department or division (Silin, 1976).

Hwang (1983) used a "face model" to test the impact of the practice of "face" in business organizations. According to his model, an "expressive tie" is used among family

members, based on a "need rule"; an "instrumental tie" is used between strangers, based on an "equity rule," and a "mixed tie" is used among relatives, friends, colleagues, and classmates, based on the "face rule." His study showed that family-oriented and public enterprises, where "face rule" was prevalent, had a lower level of job satisfaction and working morale among employees. "Face rule" had negative effects on work performance.

Interpersonal harmony

The quickest way to get things done is through personal relations, not "by the book" in Taiwan (Silin, 1976:92). Interpersonal harmony may contribute to efficiency in the workplace depending on types of organization.

Comparing three types of enterprises in Taiwan, Hwang (1990:615) found that higher interpersonal harmony was achieved in the U.S.-invested enterprises and private-owned local enterprises, where rules and regulations are clearly stated, than in family businesses managed by owners. He suggested that when formal rationality is emphasized, Confucian virtues could develop to a relatively larger extent.

Interpersonal harmony could become the workers' only source of satisfaction from factory work. Stites's (1985) study of male factory workers in suburban Taipei found that workers liked to work in smaller factories, because of the interpersonal harmony and affection found there.

Kung's (1981:203) study of female workers in a large electronic firm in Taiwan showed that a good social

relationship among female workers with their group leaders was the most rewarding aspect of their work. They were careful to manage their personal ties in order to maintain smooth relations with everyone. This pressure would be even greater, if one works in a small company as would be too awkward if one did not get along with a coworker.

But overemphasis on interpersonal harmony may be interpreted as a "lack of system." In order to maintain long-term working relationships with peers and superiors, employees always had to weigh against their need to achieve immediate goals (Silin, 1976:94). Therefore in the long-run, the work ethic of interpersonal harmony alone may not be healthy to organizational development.

Loyalty

In Taiwan most employees regard loyalty to the boss the same as loyalty to the company. But sometimes, what is good for the boss may not be good for the company. Among Chinese, loyalty is perceived as a rational subscription to the leader's ideology. This concept of loyalty implied a denial of the emotional component between a leader and his followers, which is very different from the Japanese concept of loyalty, with a high level of emotional involvement. Therefore, in Taiwan loyalty to the leader is conditional on a leader's successful performance (Sulin, 1976:58). Loyalty also implies a willingness to work for the good of the group which the leader represents.

Loyalty was found more prevalent in modernized firms with formal regulations than in family-owned businesses

(Hwang, 1990, 1983). High-level executives and the boss's entourage were generally very loyal to the boss and the organization. Managers in Taiwan are not as committed to the enterprise as are Japanese managers in large firms. Executives work hard, are concerned with gaining the trust of the boss, but they are not totally committed to the firm to the extent of identifying completely with it (Silin, 1976:78).

Obedience

Emphasis on obedience in the Chinese family begins early in childhood. Obedience is required, while quarreling is punished, and competition shamed (Wilson, 1970:26). Therefore, the socialization process has resulted in most Chinese to be reared to be more obedient than their Western counterparts.

Female workers are the ideal kind of labor supply in Taiwan, because of their obedience, submissiveness, and docility (Gallin, 1984:397). They are willing to accept low-pay and do not complain about their poor working conditions. They consider their jobs as temporary until they marry.

Quanxi or particularistic ties

Quanxi is a kind of social exchange-network. The use of quanxi is also prevalent in Taiwan's business environment. The boss, especially in large companies, would have his "entourage." This group was normally composed of older, less aggressive individuals on whom the boss relies to assist him with managing his personal affairs (Silin, 1976:68). The boss's closest associates were not necessarily in high

positions. Those who had special "quanxi" with the boss were those who could understand his dispositions, and had more opportunity to interact with him (Silin, 1976:67).

On the other hand, formation of "horizontal cliques" (equal ranks but in different units), or "vertical cliques" (people with unequal status) also signified the importance of "quanxi" in the workplace (Silin, 1976:95-96). These groups serve as an interest group looking after their own members. These particular ties have helped to increase coordination between units.

Reciprocity

Reciprocity can be explained as "mutual benefit relationships" (Silin, 1976:55). But reciprocity is perceived as a mixed blessing. Because, in general, colleagues are seen as a threat to one's advancement, not as equal partners in Taiwan. One must work with others to achieve one's goals, but one must always realize there is a price to pay for such cooperation, for people may take advantage of the situation. Therefore, reciprocity is often practiced with great caution. Without trust, reciprocity is on shaky ground.

Respect for authority (or subordination)

Chinese management style is usually highly centralized, where leaders actively attempt to control and supervise subordinates. Usually, the chief is free to act arbitrarily and inconsistently, and subordinates are expected to accept such behavior (Silin, 1976:63). Furthermore, subordinates must show proper respect for superiors by being suitably in

awe (Silin, 1976:65). Respect means that the respected person is never wrong.

To justify such subordination, the boss or superiors are considered as dispensers of knowledge; information flows downward. Subordinates should not present information contradictory to a superior's decisions (Silin, 1976:69). This kind of management style may be detrimental to the workers' creativity.

Responsibility

Taiwan's children were socialized in the norm of responsibility. This quality is partly responsible for making females the ideal labor supply for labor-intensive industries (Gallin, 1984:397). For example, Shieh (1990:222-223) observed an older female worker who felt that it was her responsibility to protect the end products in an electronics workshop. She voluntarily save raw materials for the boss. Nowadays, this kind of attitude may not be typical.

A sense of responsibility works better in enterprises with rules and regulations than in family businesses in Taiwan (Hwang, 1990: 614-615). In a uni-powered enterprise, there is another way to increase responsibility of employees, i.e., the forming of cliques, which greatly improves "group spirit" because of more emotionally positive relations among members (Silin, 1976:99).

Team spirit

Responsibility: In Taiwan's elementary schools, group unity is carefully cultivated, and group themes are a

constant aspect of Chinese literature read by children (Wilson, 1970:33-34). There are several methods to develop a group sense in Taiwan's elementary schools. They include: to assume collective responsibility as a principle of punishment; to keep children together year after year, along with their teachers; and to display slogans on walls to encourage team spirit, such as: "The struggle to obtain the victory of the group is the individual's victory" (Wilson, 1970:34).

In companies, slogans were often created to cultivate team spirit. For example, when interviewing a staff member in the personnel training department of "Sampo," one of the largest electronic companies in Taiwan, I was told that new slogans were created as often as monthly to cultivate team spirit in order to boost production.

Trustworthiness

Trustworthiness has an all-or-none quality in superior-subordinate relationships in Chinese society. Trustworthiness is interpreted as "belief in another." Within this context, there is little room for "loyal opposition" or a discussion of constructive criticism (Silin, 1976:59).

In small factories in Taiwan, people like to operate on trust and affection (ganqing). Whenever possible they prefer to avoid legalistic forms, such as written guarantees; Chinese believe that legal formality will destroy the "human" touch in a relationship (Stites, 1985: 235).

Furthermore, trust or credit (hsin-yung) is the most important thing in doing business in rural Taiwan. One speaks of a man's hsin-yung, means his trustworthiness, his willingness and ability to meet his business and financial obligations (DeGlopper, 1972:304). However, hsin-yung is earned and based on performance in business, not given or ascribed by status or family background (DeGlopper, 1972:304).

Individual virtues

If group virtues are seriously cultivated among Chinese through Confucianism, then individual virtues are equally emphasized in Confucianism throughout history, and sometimes even taking precedence over group identity. In the following, nine different individual virtues related to work ethics will be discussed.

Achievement motivation

Achievement motivation is a personal drive, and is cultivated in Taiwan's school not merely for the benefit of individuals but, above all, for the benefit of the group. The supreme goal of achievement in its group context is to work for the society itself (Wilson, 1970:42-43).

Wilson (1970:42) studied grade school students in Taiwan and found that rural children had much lower achievement motivation than urban students in Taiwan. This was attributed to a lack of models or institutions in rural areas for students to identify with.

In the business world, Hsu et al. (1979:930) did not find any correlation between the degree of achievement motivation of entrepreneurs and types of strategies a company used, and consequences of business practices. Therefore, achievement motivation in Taiwan is highly emphasized with a connection to collectivity. The influence of an individual's achievement motivation in business practice is not conclusive, because many other factors are also important.

Adaptability

Adaptability in early socialization is essential for the Chinese. It is adaptability, not consistency, that is required for the same person to play different roles of superordination and subordination at the same time within the Five Relations emphasized in Confucianism.

In the economic realm, such an ability is transferred to meet the need of the product market in Taiwan. One item in the survival kit of small businesses is their ability to adjust. Household enterprises in Taiwan have a great deal of flexibility to choose types and amounts of work to take on; they can easily manufacture articles of a similar design for a number of customers (Niehoff, 1987:300).

Smaller family workshops in Taiwan have one of the distinguished features of flexibility. Family members are the primary source of labor. They are willing to work long hours to meet deadlines. Family labor also offers the advantages of flexibility in the deployment of labor. Relatives such as sisters-in-law or the mother will "chip

in" when there is a need for an extra hand (Shieh, 1990:199-200).

Furthermore, Taiwanese firms can adapt to change without requiring system-wide adjustments. One reason for such adaptability is that employees want to compete with other firms while at the same time they want to win the boss's favor. Therefore, Taiwanese firms easily accept new methods, especially if they are suggested from the top management (Silin, 1976:131).

These organizations also showed an ability to adapt to change without incurring crises (Silin, 1976:143). Avoidance of dependence on others is a great concern, therefore, self-adjustment seems the best solution to any crisis.

Entrepreneurship (or self-independence)

The drive for self-independence in Taiwan is caused by an emphasis on self-reliance and respect for cleverness, nerve, and skills in Chinese society. But utilitarian relationship between managers and organization (which lacks commitment and trust) in many companies also creates the atmosphere for entrepreneurship.

Male factory workers in small firms see work only as a brief interim in their careers. Their factory labor ends with some form of self-employment. The basic motive behind this entrepreneurial strategy is the consideration of security. With a strong family ideology in society, entrepreneurship appears less risky than dependence on factory work (Stites, 1985:240).

With Taiwan's booming economy, potential entrepreneurs started small businesses and minimized risk through a variety of strategies, which include: partnership with other family members, or combining wages to cushion risks, when beginning the business (Stites, 1985:241).

At one time or another, almost all Taiwanese managers seriously consider leaving the large enterprises with the intention of opening their own firms. In small- and medium-scale firms, managers, whose abilities cannot be fully utilized, would leave and begin independent businesses by opening a subcontracting business to the parent firm. The subcontractors frequently receive financial assistance from the parent firm. In this kind of arrangement, many bosses are willing to let managers leave, and not feel betrayed (Silin, 1976:78).

Li and Lu (1979:567,575) found more than 90% of their subjects had "the spirit of entrepreneurship." The researchers used questions such as: Should one improve one's techniques in work? Should there be priority of things to be done at work? to measure that concept. However, there is a significant difference between the urban and rural areas in Taiwan on this dimension; rural people did not feel the urge to become entrepreneurs as intensely as urban dwellers. However, rural people do not necessarily lack entrepreneurship, Schultz's (1964) study shows that farmers are very sensitive to the cost of crops.

Hard working

In general, everyone is industrious and frugal in Taiwan, especially during the last forty years of economic development. But status of employment and type of organization may influence such work ethics. For example, owners of small businesses are more diligent than paid-workers, and family workers are more hard-working than non-family workers. Employees in an organization with a formal establishment work harder than those in family businesses with no formal regulations.

Hsu (1980:122) studied factory workers in suburban Taipei and showed that 86.1% of them agreed or strongly agreed that hard work is essential to obtain a high position. Taiwan's industrial workforce is very diligent. Workers in larger factories typically work up to 11 hours per day in two shifts, and 27 days a month. Family members work even harder for household manufacturing enterprises. They often work between 12 to 16 hours a day, the entire year with only a few holidays off (Niehoff, 1987:296). Both factory workers and family workers, in their diligence, perceive overtime as an opportunity rather than a hardship. They have a higher goal as they are not working just to feed and clothe themselves, they choose to work hard in order to pursue dreams of moving up the class hierarchy to become bosses themselves (Niehoff, 1987:302-303).

Stites (1985:234) observed that Taiwan's workers viewed extraordinary demands calmly. Even a request for three hours

of overtime after a 10-hour workday did not elicit any complaints.

Besides status or expectation of employees, types of organization also affect working hard. Hwang (1990:614) stated that employees in U.S.-invested enterprises had the highest level of diligence or hard working, which he defines as "aggressiveness in initiating tasks." Employees in private enterprises scored second, and those in family businesses managed by the owner had the least level of diligence. Hence, diligence is likely to be reinforced by fairness, not by affection or personal ties.

Another motive behind diligence is that Chinese workers are not mindless workaholics. Hard work is just an antidote to the ambivalence of depending too much on one employer (Stites, 1985:237). Chinese workers want independence and prosperity. Industry and perseverance permit one to get by, and to be a respected member of the community (DeGlopper, 1972:324).

Women in Taiwan are also socialized in the norms of hard work (Gallin, 1984:397). Family members are more willing to work for long hours and work overtime than hired workers, and women are a major part of family workers (Shieh, 1990:199).

Silin (1976:64) found that the boss in a large private enterprise felt that the subordinate did not always work as hard as he wanted them to. One manager in a company commented that among executives, about 70% do their work and work hard, while about 20% of them did the minimal amount

and did not like overtime. Only about 5% would voluntarily stay and do overtime for the good of the company. Among workers, probably 50% just do minimal work, and 50% will work hard (Silin, 1976:85).

Nowadays workers are not willing to work so hard to earn more money as they did ten years ago, because everyone had worked very hard during the past ten years and now had sufficient savings (Shieh, 1990:220-221). So, workers now can afford to work less, with higher pay, but are not willing to work overtime.

Integrity

An enterprise leader in Taiwan is recognized by his subordinates as a morally superior man, not simply because of technical competence but because there is a certain mystical quality of understanding about him (Silin, 1976:62).

In Chinese society, the integrity of a leader includes both technical and moral aspects. He is supposed to have an unselfish view of business and takes care of all his subordinates, even at his own expense. A leader gives this kind of high regard in exchange for the absolute subordination of his followers.

Pursuit of wealth

Confucianism does not consider the pursuit of wealth itself as a good virtue. But in relation to work, the pursuit of wealth becomes a legitimate motive behind all endeavors. DeGlopper (1972:324) observes that the businessmen of Lukang, a small town in the central part of

Taiwan, are doubtless devoted to success and the pursuit of wealth in their local furniture industry.

Materialism is part of the business value-system that is transmitted through the family in Taiwan (Olsen, 1972:289). High school boys in Taiwan, without a family business background, had an even higher tendency toward the pursuit of profit (wealth) than those with a business background (Olsen, 1972:287).

Risk-taking

The virtue of risk-taking is embedded with the ability to adapt to changing market demand. This kind of work attitude is developed because of the need to survive. The development of such ability is a learned process that may relate to one's background. In a survey of high school boys in Taipei, those who came from business families were more inclined than other boys to favor risk-taking, particularly in an investment situation (Olsen, 1972:290-291).

Self-control (or discipline)

Discipline is emphasized from early socialization in Taiwan. On the scale of "instrumental values" Taiwan's college students ranked "self-discipline" higher than Hong Kong's college students and overseas Chinese students in Taiwan (Appleton, 1970:81).

A disciplined nature is carried over to the workplace, especially by female workers. Because of this disciplined attitude, the cost of management has been greatly reduced in labor-intensive industries during economic development in Taiwan.

Thrift (or frugality)

Everyone in Taiwan is frugal, and this virtue is taken for granted (DeGlopper, 1972: 324). It is reported that frugality is one of the attitudes greatly expected by the boss, and is the means to achieve what the boss wants in a private enterprise (Silin, 1976:74).

Li and Lu (1979:574), measuring degree of frugality, asked their subjects if they agreed that "money should not be spent on entertainment." More than half of the total sample responded "yes." Rural people had an even higher percentage, 73% of them agreed, while only 49% of urban subjects agreed.

Summary

Confucian work ethics of familism, eagerness to learn, and most individual virtues are conducive to work performance and are prevalent in contemporary Taiwan. But group-oriented virtues give a mixed picture. The often-mentioned qualities of post-Confucian men such as benevolence, commitment, cooperation, loyalty, reciprocity, and interpersonal harmony may not be as apparent as popular speculations seem to indicate. The degrees of manifestation of these virtues highly interact with types of organization and types of workers. This analysis indicated that the larger the use of rational rules in a company, the greater the prevalence of Confucian group virtues; the higher the share of ownership of the business, the greater the individual's hard-work.

However, some other types of group-oriented virtues, such as obedience, *quanxi*, responsibility, team spirit, and trustworthiness, appear to be more stable across situations.

The Role of Government to Promote Confucian Work Ethics

The general political atmosphere in Taiwan encourages familism (Diamond, 1979:335). Official ideology promoted Confucian values of strong and harmonious families (Greenhalgh, 1984:551). Wilson (1970:45) found that in Taiwan all virtues are based on "loyalty" and "filial piety." People are expected to fulfill principles of complete loyalty to the government and filial piety to their families.

In Taiwan, textbooks on social science are aimed to develop children's moral concepts, such as group consciousness, patriotic thoughts, habits of cooperation, the attitude of service, and the spirit of sacrifice (Wilson, 1970). The social science textbooks of vocational high school are used next as a sample to show how Confucian ethics are cultivated through formal education in Taiwan. Vocational high schools primarily prepare their students for lower-level technical jobs. Most of their moral education centers around the work ethic. Therefore, their social science textbooks are most relevant to this analysis.

A close resemblance was found between Confucian work ethics, mentioned in Table 6.2, and the textbook contents. Work ethics emphasized in textbooks are a blend of the

Confucian work ethics and modern management principles (Chen, 1988:77-79; Hsu, 1988:94-98). For example, the concept of "factory as family" is familism. The rationale is that since one must spend most of the day in the workplace, in order to excel, one must learn with all one's heart, and devote all the time to work. The textbook says,

Whenever one arrives at the workplace, one should regard it as coming home, one should feel familiar, pleasant, indulged in work, forgetting everything else, and be totally involved in the work. At the same time, one should regard one's colleagues as family members. Only so, one's performance at work can be excellent, and one is able to obtain a sense of achievement out of it. (Hsu, 1988: 94-95, translated from Chinese)

The virtue of eagerness to learn is stressed by pursuing on-the-job training. Initiative is the key for such training. One should seek every opportunity to improve whether outside or within the firm. The textbook says,

The continuous pursuit of knowledge after getting a job is called on-the-job training. There are many methods to do it: (1) register at the evening courses, (2) join evening coaching classes, (3) participate in the training courses in the company, (4) compete for the scholarship offered by the company, (5) study with the television programs for junior college or university diplomas, (6) listen to the radio or television teaching programs, (7) plan your own readings, (8) attend various seminars or symposiums, and (9) others. (Hsu, 1988:97-98, translated from Chinese)

In reference to group virtues, cooperation, loyalty and team spirit are the most emphasized. Liang et al. (1988:162) state,

To build a group consensus needs cultivation. It cannot be demanded right away. If the employee in an enterprise can recognize that he himself is a member of the team, he shares the glory and the shame together with the company, then he will strive with the highest spirit of hard work, enhance efficiency, and promote the growth of the enterprise. (translated from Chinese)

The rationale given for groupness and cooperation is based on the mutual benefits one can receive by working for the group, and it in turn, can help the individual to succeed. Cooperation should be based on proper division of labor and delegation of responsibility (Liang et al., 1988:164). The textbook describes,

. . . when the head cannot manage or must go out of town, he should designate proper responsibility to the subordinates. On one hand, he can rely on their expertise, on the other hand, it can test their ability. Once there is a crisis, the normal operation of the enterprise will not be affected. (Liang et al., 1988:164, translated from Chinese)

In terms of individual virtues, honesty, obeying the law, hard-working and diligence are frequently mentioned. Other aspects from the management point of view, such as quality control, neatness of workplace, and reasonable profits, are also stressed.

Diligence is primarily emphasized for the acquisition of skills. Excellent skills are obtained only through experience and practice. The methods given are:

First, everytime you practice, you have to totally concentrate on the job. Second, you need to carefully observe others' methods and motions, especially those who have better skills than you have. Third, whenever you have time, meditate and search for the essence of the skills. Fourth, ask for others' opinions and guidance for the skill. Fifth, read relevant articles and books about the skill. Sixth, inspect others' final products and study their details. Seventh, you have to be patient, and persistent, and you will have a breakthrough, and eighth, you have to make up your mind, establish confidence, and you will succeed. (Hsu, 1988:95, translated from Chinese)

In summary, the textbook's exposition of work ethics seems to include most of the problems encountered in the workplace. The ethics which are mostly emphasized are the ones mostly absent in the workplace, such as cooperation and the factory as family. Government plays a role in keeping Confucian work ethics alive, and tries to correct undesirable attitudes in practice. But the effect of such ethics education may often be frustrated by prolonged problems in workplace.

Conclusions and Implications

This chapter examined the nature of Confucian work ethics in Taiwan and the interaction of these ethics with other factors. Confucian work ethics are divided into four major categories, namely, familism, emphasis on learning and education, group-oriented virtues and individual virtues. Conclusions reached are as follows:

First, Confucian work ethics are found to be variable, depending on types of workers and types of industrial organizations. For example, (1) family workers are found to be more diligent than non-family workers, (2) workers in factories with rational regulations tend to work harder than workers in family-owned businesses, and (3) Owners are found to work harder than employees (Silin, 1976:86).

Second, Confucian work ethics seemed to operate through informal channels (such as cliques) rather than through formal channels in large organizations (Silin, 1976:105).

It is only through the informal channel of horizontal or vertical cliques that workers could cultivate cooperation, trust, loyalty, and commitment to the leader or to the goals of the company.

Third, contrary to the cooperative image of Confucianism, there is severe competition among same-level workers and mistrust between superior and subordinates. Why? It may be that the internalization of the concept of "cooperation" is not deep-rooted in Chinese Confucianism. The nature of cooperation in Chinese society is derived from the concept of "face" (lien), therefore, cooperation is stressed as a outward conformity of one's behavior, rather than internalization of group values and motivation (Wilson, 1970:23). Therefore, when there are conflicts or advantages involved, groupness or cooperation often loses its charm and importance to competition. Therefore, cooperation should be regarded as "situational morality" (Wilson, 1970:23), and types of organization become a major factor in the prevalence of cooperation.

Fourth, among Confucian work ethics, those linked to group-virtues (such as cooperation, loyalty, obedience, trustworthiness, responsibility, harmony and respect toward others) are more influenced by institutions, while familism, emphasis on learning and education, or individual virtue (like thriftiness, perseverance, and self-control) are less influenced by institutions. The virtue of hard work varies with the type of reward system (Silin, 1976; Shieh, 1990).

Finally, the ideal Confucian values may not be carried out in practice. Young school children who learned these group virtues have to readjust to new ethics of individuality prevalent in certain workplaces.

When there are economic incentives, culturally inherited work ethics seem to function best. From this perspective, Taiwan's labor quality does not result only from Confucian work ethics but rather is a product of their interaction with the characteristics of organizations. It is the dominance of family enterprises that provide the best motivation to bring out good Confucian values such as hard work in the labor market. Family enterprises are encouraged in Taiwan and in response businessmen engage in the unlimited pursuit of wealth.

Finally, Confucian work ethics have also shaped the nature of business practice in Taiwan. For example, the Confucian value of familism led many Taiwan businesses to run on the logic of survival rather than on the logic of profit maximization. Taiwan's family businesses frequently underquote and work long hours, triggering intense market competition and forcing firms either to stay small or to go out of business. This practice has the side-effect of hindering companies to upgrade their business to capital- and skill-intensive technology. Many small firms have also limited research and development in Taiwan's industries. All these effects have negative impacts on the transformation and utilization of skilled workers and future economic development.

CHAPTER VII

QUALITY OF LABOR FORCE--EDUCATIONAL EXPANSION IN TAIWAN

Introduction

The quality of a labor force includes such things as health, nutrition, work ethics, and education. Among them, education is a major and frequently mentioned component. Thus, the quality of a labor force is often measured by its educational level. The increase in educational attainment of labor force is mainly due to the expansion of the educational system in numbers of schools, classes, and graduates.

The study of educational expansion in sociology is a relatively recent phenomenon (Ericson, 1982). There has been no general theory regarding world-wide educational expansion after World War II (Meyer and Hannan, 1979). The mainstream of the sociology of education focused primarily on studies of status attainment, classroom and school organization, but neglected institutional or systemic factors, such as factors affecting the origin and expansion of the national educational system or the effects of an expanded educational system for individuals, groups, and societies (Ramirez and Meyer, 1980).

There are several explanations for the expansion of mass education. For example, economic demand, social differentiation, rationalization, cultural capital,

international adaptation, and moral socialization (Ramirez and Meyer, 1980) are some reasons given. In Taiwan, there may be at least four factors interacting to contribute to the overall expansion of its educational system. They are: population growth, economic demand, socio-cultural values, and educational policies of the state.

The organization of this chapter is, first, to show the increasing supply of educated labor force at various levels in the past four decades in Taiwan. Second, four major factors relevant to such changes will be discussed. Third, government's educational policies at secondary and higher educational levels will be analyzed. Fourth, some consequences of educational expansion will be examined.

Changes of Educational Attainment in Taiwan

Changes in population over 15

The educational level of the population over 15 years old has increased tremendously from 1951 to 1988 (Table 7.1). In fact, the educational transformation in Taiwan has gone through three stages, i.e., from a high illiteracy stage to high elementary education, and then to a high secondary education over the past four decades. The first transition from illiteracy to elementary education occurred during the 1950s and the 1960s. The illiteracy rate decreased from 60% in 1951 to 9.5% in 1988. Proportions of primary education in the population over 15 years old increased from 24% in 1951 to 43% in 1971, then decreased to

30% in 1988. This change occurred in the 1979s because of the second transition from primary to secondary education.

The compositions of the population with secondary school education (including junior high, senior high, and senior vocational) increased continuously from 10% in 1951 to 45% in 1988 (Table 7.1). The total growth for secondary school education was 354% between 1951 and 1988. However, among secondary education, senior "vocational" education increased by eight times (2.1% in 1951 to 19% in 1988), and senior general education, by four times (from 1.7% to 8.5%).

The growth of higher education was 915%, from 1.3% in 1951 to 13.3% in 1988, the highest among all groups. The future trend of educational transition is expected to go from a predominantly secondary education to higher education. The ongoing Six-year National Plan is targeted for the expansion of higher education.

Changes in the labor force

The majority of the labor force have had a primary education, 46% in 1978 and 33% in 1988. Twenty percent of the labor force had a junior high education and another 20% had senior vocational education. Only 13.4% of the labor force had higher education (junior college and above). Percentages of vocational education (junior college and senior vocational education) in the labor force doubled in ten years from 1978 to 1988 (Table 7.2), as a direct result of the promotion of vocational education during the 1970s.

This increase also indicated a strong demand for middle-level technicians for both male and female workers.

Table 7.1

Educational Attainment of Population Over 15 in Taiwan
by Sex, 1951-1988

	(%)				
	1951	1961	1971	1981	1988
Total population					
Illiterate	60.5	35.4	25.7	13.1	9.5
Self-educated	4.2	2.9	3.5	2.9	2.3
Primary	24.0	40.1	42.6	36.1	29.6
Junior High	6.2	12.0	11.4	16.6	17.3
Senior High	1.7	3.4	5.1	8.5	9.1
Senior Vocation	2.1	3.7	7.6	13.0	19.0
Junior College and up	1.3	2.5	4.1	9.8	13.2
Total	100.0	100.0	100.0	100.0	100.0
Males					
Illiterate	43.4	22.3	14.4	6.5	4.5
Self-educated	5.7	4.1	4.6	3.1	2.3
Primary	34.9	45.5	45.6	36.3	29.2
Junior High	9.1	14.7	13.6	18.7	19.5
Senior High	1.6	4.1	6.7	9.9	10.2
Senior Vocation	3.2	5.3	9.3	13.1	18.4
Junior College and up	2.1	4.0	5.8	12.4	15.9
Total	100.0	100.0	100.0	100.0	100.0
Females					
Illiterate	79.7	49.3	37.2	19.6	14.5
Self-educated	2.5	1.6	2.4	2.7	2.3
Primary	11.8	34.2	39.4	36.0	30.0
Junior High	2.9	9.2	9.2	14.5	15.2
Senior High	1.9	2.7	3.6	7.1	8.0
Senior Vocation	0.8	2.1	5.9	12.9	19.5
Junior College and up	0.4	0.9	2.3	7.2	10.5
Total	100.0	100.0	100.0	100.0	100.0

Source: calculated from Table 5 and Table 95, Yearbook of Manpower Statistics, Taiwan Area, Republic of China, 1988, Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Republic of China, June, 1989.

The female labor force in general, had lower educational attainment than males. Females had a higher percentage of illiteracy and more were self-educated, but had lower numbers with higher levels of education. For example, the male labor force had only 2.3% illiteracy, with 8.7% for females (1988). Rate of decrease in illiteracy was also faster for men (66%) than for women (44%) between 1978 and 1988. Proportions of junior high level increased in the male labor force (21%) more than that of females (7%) between 1978 and 1988. However, the proportion of senior high school education and above in the female labor force grew faster than that of males, for example, 21% versus 7% at the senior high level; 72% versus 40% at the university and above level.

The sex differences indicated that more females with higher education entered the labor market in 1988 than in 1978. On the other hand, more men with lower education, such as junior high, were in the labor force more in 1988 than ten years earlier (1978). This may signify a greater demand for males in the late 1980s than in the late 1970s. Even so, male labor scarcity still occurred in the late 1980s (see Chapter VIII).

Changes in industry

Workers with no formal education were predominantly (over 50%) in the agricultural sector. Workers with primary to senior high education were mostly (35% to 53%) in

transformative industries (manufacturing, utilities, and construction). Workers with higher education were employed mostly in social service industries (33% to 51%), such as public administration, social services and public health industries (Table 7.3).

Agricultural industries have decreased workers with junior high level or below education by one-fourth. Illiterate workers increased by half in transformative industries, and by one-third in distributive service industries, such as retail, wholesale, and trade. More lower-educated workers also went to personal service industries (65%) between 1978 and 1988. More low-level educated workers left construction industries (29%) between 1978 and 1988. Their high mobility out of construction work created acute labor scarcity and a demand for imported labor.

In manufacturing industries, both lower-educated workers and higher-educated workers increased, with a greater increase for the lower-educated workers. There was an average 14% growth for the illiterates and the self-educated, with only a 2% growth rate for university graduates between 1978 and 1988. This indicated that the growth of high-skilled jobs lagged behind jobs for low-skilled workers in the industrial sector. The task of industrial upgrading was slow between 1978 to 1988 in Taiwan.

Table 7.2

Educational Attainment of Labor Force by Sex in Taiwan,
1978-1988 (%)

Total (N=)	1978 (26,260)	1984 (31,975)	1988 (33,727)
Illiterate	9.6	6.2	4.7
Self-educated	3.6	2.6	2.0
Primary edu.	46.0	36.5	32.5
Junior high edu.	17.3	19.6	20.1
Senior high edu.	5.8	7.0	7.6
Senior vocational	10.1	16.6	19.7
Junior colleges	3.8	6.1	7.8
Universities and above	3.8	5.4	5.6
(Total)	(100.0)	(100.0)	(100.0)
Males (N=)	1978 (17,531)	1984 (20,469)	1988 (21,040)
Illiterate	6.7	3.6	2.3
Self-educated	3.6	2.5	1.9
Primary edu.	47.7	38.2	33.7
Junior high edu.	18.2	20.9	22.1
Senior high edu.	6.5	7.7	8.1
Senior vocational	9.2	14.9	17.9
Junior colleges	3.8	6.2	8.0
Universities and above	4.3	6.0	6.0
(Total)	(100.0)	(100.0)	(100.0)
Females (N=)	1978 (8,729)	1984 (11,506)	1988 (12,687)
Illiterate	15.5	10.9	8.7
Self-educated	3.4	2.7	2.2
Primary edu.	42.3	33.3	30.3
Junior high edu.	15.7	17.2	16.8
Senior high edu.	4.5	5.9	6.7
Senior vocational	11.9	19.6	22.7
Junior colleges	3.8	6.1	7.6
Universities and above	2.9	4.3	5.0
(Total)	(100.0)	(100.0)	(100.0)

Source: calculated from Manpower Survey Data, 1978, 1984, and 1988.

Table 7.3

Educational Attainment of Employed Persons by Industry and Sex in Taiwan, 1978-1988 (%)

	Extra.	Trans.	Dist.	Producer	Social	Personal	Total
	Total						
Illiterate							
1978	63.8	18.8	9.5	0.0	1.3	6.6	100.0
1988	48.0	28.7	12.5	0.3	2.8	7.7	100.0
Self-educated							
1978	59.7	19.5	10.0	0.2	3.8	6.8	100.0
1988	53.1	22.7	14.1	0.3	3.1	6.7	100.0
Primary edu.							
1978	33.2	40.4	15.4	0.3	2.4	8.3	100.0
1988	24.3	42.5	19.1	0.5	3.1	10.5	100.0
Junior high							
1978	16.1	51.5	17.9	0.8	5.2	8.5	100.0
1988	10.3	52.7	18.6	1.1	3.3	14.0	100.0
Senior general							
1978	7.4	36.7	28.6	3.4	18.5	5.4	100.0
1988	5.0	38.5	29.3	4.3	14.0	8.9	100.0
Senior vocational							
1978	7.1	43.8	22.7	6.2	15.4	4.8	100.0
1988	4.8	46.0	24.6	5.8	10.5	8.3	100.0
Junior college							
1978	2.2	27.8	21.2	4.6	41.4	2.8	100.0
1988	2.4	31.8	22.9	7.3	32.7	3.0	100.0
Universities and up							
1978	1.6	20.3	17.2	8.2	51.0	1.7	100.0
1988	0.8	25.1	19.1	8.6	44.3	2.1	100.0

Table 7.3 (continued)

Educational Attainment of Employed Persons by Industry and Sex in Taiwan (1978-1988)

	Extra.	Trans.	Dist.	Producer	Social	Personal	Total
	Males						
Illiterate							
1978	66.1	17.9	9.1	0.1	1.8	5.0	100.0
1988	52.8	28.5	9.6	0.8	2.7	5.6	100.0
Self-educated							
1978	57.6	20.6	11.1	0	4.8	5.9	100.0
1988	54.2	20.7	14.4	0	4.7	6.0	100.0
Primary edu.							
1978	36.2	37.8	16.2	0.4	2.8	6.6	100.0
1988	28.1	41.0	19.2	0.5	3.3	7.9	100.0
Junior high							
1978	19.8	48.5	18.1	0.8	5.0	7.8	100.0
1988	12.7	51.0	19.8	1.0	3.4	12.1	100.0
Senior general							
1978	8.9	36.7	29.7	2.9	17.1	4.7	100.0
1988	6.7	38.7	31.9	3.2	11.8	7.9	100.0
Senior vocational							
1978	9.4	43.5	25.2	5.5	12.4	4.0	100.0
1988	7.4	47.7	24.8	4.7	8.2	7.2	100.0
Junior college							
1978	3.2	33.1	23.6	3.9	33.6	2.6	100.0
1988	3.7	38.2	23.3	6.5	25.0	3.3	100.0
Universities and up							
1978	2.1	22.7	17.3	9.1	47.1	1.7	100.0
1988	1.1	30.0	18.8	9.5	38.7	1.9	100.0

Table 7.3 (continued)

Educational Attainment of Employed Persons by Industry and Sex in Taiwan (1978-1988)

	Extra.	Trans.	Dist.	Producer	Social	Personal	Total
	Females						
Illiterate							
1978	61.6	19.7	9.8	0	0.9	8.0	100.0
1988	46.0	28.8	13.7	0.1	2.8	8.6	100.0
Self-educated							
1978	64.1	17.1	7.7	0.7	1.7	8.7	100.0
1988	51.4	25.7	13.6	0.7	0.7	7.9	100.0
Primary edu.							
1978	26.6	46.0	13.5	0.2	1.5	12.2	100.0
1988	17.3	45.4	19.0	0.4	2.7	15.2	100.0
Junior high							
1978	7.4	58.3	17.5	0.9	5.8	10.1	100.0
1988	5.0	56.4	15.7	1.4	3.3	18.2	100.0
Senior general							
1978	3.2	36.3	25.3	5.0	22.6	7.6	100.0
1988	1.5	38.5	24.2	6.5	18.4	10.9	100.0
Senior vocational							
1978	3.5	44.4	18.7	7.3	20.0	6.1	100.0
1988	1.5	43.6	24.3	7.4	13.4	9.8	100.0
Junior college							
1978	0.3	17.0	16.5	5.8	57.0	3.4	100.0
1988	0	20.5	22.2	8.6	46.3	2.4	100.0
Universities and up							
1978	0	12.9	16.9	5.6	63.0	1.6	100.0
1988	0.3	15.2	19.6	6.7	55.6	2.6	100.0

Extra.=Extractive (agriculture or primary),
 Trans.=Transformative (Industry or secondary), and
 Dist.=Distributive.

Source: calculated from Manpower Survey Data, 1978, and 1988.

Changes in occupation

Table 7.4 demonstrates the occupational distribution of education for employed persons. Workers with no formal education were concentrated in the agricultural occupations of farmers, fishermen, or forestry workers. More workers with primary education, junior high, senior general, or senior vocational high education became production-related workers. Workers with junior college education were concentrated in clerical occupations, while those with university and above education were employed mostly as professional and technical (P&T) workers.

Changes of occupational structure between 1978 and 1988 were: (1) more lower-level educated workers (junior high and below) left agricultural work; (2) significantly more illiterate workers and senior vocational level workers went into blue-collar work; (3) more junior high graduates entered service positions; (4) more junior college graduates went into clerical work; (5) more senior general high and vocational high left clerical occupations; (6) more junior college workers left P&T occupations; and (7) more university and up level workers left Administrative and Managerial (A&M) occupations.

In summary, most occupations improved their labor status with more education, except P&T or A&M jobs. The proportion of workers with higher education decreased in these P&T occupations, especially for women. Taiwan's education upgrading in secondary education contributed significantly to the improvement of labor quality in most

occupations. However, improvement was limited to lower- and middle-levels skilled jobs, which attracted more workers with higher education. This is likely to create more mismatch between education and occupation as evident in Chapter V. The decreasing educational levels in P & T and A & M jobs indicated the demand for high-skilled workers was less than the supply during the period of 1978-1988.

Expansion of Educational Systems in Taiwan

The educational system in Taiwan is absolutely centralized. Except for primary and junior high schools, the number of students in any public or private high school, accredited college or university has been absolutely determined by the Ministry of Education, through various entrance examinations administered each year. In this centralized educational system, the government has total control over the quantity of schools and students enrolled.

Number of schools

Under such a system, the expansion of the education system was the direct result of government policy. Table 7.5 shows that the number of schools at different levels increased from 1 to 22 times between 1950 and 1988. The number of elementary schools doubled, the number of secondary schools quadrupled, and vocational high schools increased by one and a half times.

Table 7.4

Educational Attainment of Employed Persons in Taiwan
by Occupations and Sex, 1978-1988 (%)

	P&T	A&M	Cler.	Sales	Serv.	Agr.	Operat.	Total
	Total							
Illiterate								
1978	0	0.1	0.2	7.9	7.5	61.5	22.8	100
1988	0.1	0.1	0.8	11.3	11.0	47.4	29.3	100
Self-educated								
1978	0	0.6	1.2	8.5	7.3	57.9	24.5	100
1988	0.7	0.2	0.4	12.0	9.5	52.7	24.5	100
Primary edu.								
1978	0.4	1.1	2.1	11.0	6.6	31.7	47.1	100
1988	0.4	0.3	3.2	14.2	10.6	23.8	47.5	100
Junior high								
1978	1.0	1.3	7.2	12.1	5.9	15.5	57.0	100
1988	1.0	0.2	6.1	13.0	10.4	10.0	59.3	100
Senior high								
1978	4.7	3.0	29.6	19.3	7.6	6.1	29.7	100
1988	4.5	1.4	24.9	20.0	10.8	4.8	33.6	100
Senior voc.								
1978	6.8	2.1	35.6	13.1	4.8	5.9	31.7	100
1988	5.7	0.7	26.1	16.7	7.7	4.5	38.6	100
Junior col.								
1978	35.4	4.2	30.7	11.8	4.0	1.4	12.5	100
1988	28.5	2.1	35.1	14.3	4.9	2.0	13.1	100
Universities and up								
1978	42.6	8.4	33.7	9.5	2.2	0.5	3.1	100
1988	42.9	3.8	36.9	9.9	2.1	0.4	4.0	100

Table 7.4 (continued)

Educational Attainment of Employed Persons in Taiwan
by Occupations and Sex (1978-1988) (%)

	P&T	A&M	Cler.	Sales	Serv.	Agr.	Operat.	Total
Males								
Illiterate								
1978	0	0.3	0.3	6.2	6.0	62.1	25.1	100
1988	0	0.4	1.3	6.9	8.5	51.1	31.8	100
Self-educated								
1978	0	0.6	1.6	8.8	6.6	55.1	27.3	100
1988	0.8	0.3	0.5	11.0	9.2	53.4	24.8	100
Primary edu.								
1978	0.5	1.6	2.2	10.1	5.6	34.2	45.8	100
1988	0.4	0.5	3.8	11.9	7.5	27.4	48.5	100
Junior high								
1978	1.0	1.8	6.0	11.4	5.5	19.0	55.3	100
1988	1.1	0.2	5.4	12.3	8.3	12.3	60.4	100
Senior high								
1978	3.8	3.8	25.4	21.0	7.3	7.4	31.3	100
1988	3.6	1.8	19.4	20.9	10.5	6.5	37.3	100
Senior voc.								
1978	6.5	3.4	23.0	15.7	4.7	8.2	38.5	100
1988	4.7	1.1	15.4	17.1	6.8	7.0	48.0	100
Junior col.								
1978	28.5	5.9	25.7	14.7	5.3	2.1	17.8	100
1988	23.2	3.1	28.1	17.8	5.7	3.2	18.9	100
Universities and up								
1978	39.8	10.7	31.4	10.8	2.7	0.7	3.9	100
1988	42.4	5.5	31.9	12.5	2.3	0.6	4.8	100

Table 7.4 (continued)

Educational Attainment of Employed Persons in Taiwan
by Occupations and Sex (1978-1988) (%)

	P&T	A&M	Cler.	Sales	Serv.	Agr.	Operat.	Total
Females								
Illiterate								
1978	0	0	0.2	9.4	8.9	60.7	20.8	100
1988	0.1	0	0.6	13.2	12.0	45.8	28.3	100
Self-educated								
1978	0	0.7	0.3	8.1	8.7	63.7	18.5	100
1988	0.7	0	0.4	13.6	10.0	51.4	23.9	100
Primary edu.								
1978	0.2	0.2	1.9	13.1	8.9	26.1	49.6	100
1988	0.4	0.1	2.1	18.6	16.2	17.1	45.5	100
Junior high								
1978	1.2	0.3	9.9	13.7	6.9	7.1	60.9	100
1988	0.9	0.1	7.6	14.6	15.1	4.8	57.0	100
Senior high								
1978	7.4	0.5	41.8	14.5	8.4	2.4	25.0	100
1988	6.4	0.5	36.0	18.2	11.5	1.4	26.0	100
Senior voc.								
1978	7.3	0.1	55.5	8.9	4.8	2.5	20.9	100
1988	7.1	0.1	40.0	16.2	8.8	1.3	26.5	100
Junior col.								
1978	48.8	0.9	40.9	6.1	1.5	0	1.8	100
1988	37.8	0.4	47.5	8.1	3.4	0	2.8	100
Universities and up								
1978	50.6	1.6	40.6	5.6	0.8	0	0.8	100
1988	43.7	0.5	47.0	4.8	1.6	0.2	2.2	100

P & T=Professional & Technical; A & M=Administrative & Managerial; Agri.=Agriculture; Cler.=clerical; Serv.=service.

Source: calculated from Manpower Survey Data, 1978, and 1988.

The number of junior colleges had the largest increase, 22 times, colleges and universities, 8 times, and other supplementary schools, 19 times during the same period.

There were different stages of expansion since the 1950s. The biggest growth of elementary schools occurred between 1950 and 1960 with a 5% average annual growth rate. Between 1960 and 1970, the expansion of elementary schools dropped to 3% per annum. The expansion of the elementary schools pushed the government to expand the secondary schools during 1960-1970, resulting in a 20% average annual growth rate. Expansion of secondary schools also dropped to only a 1% growth per year between 1970 and 1980. The most dramatic increase was of junior colleges, which grew at 30% per annum during 1950-1960, and 48% per annum during 1960-1970. Peak years for vocational education in Taiwan were 1950 to 1970 .

The number of colleges and universities also grew 2.7 times during the 1950s, from 4 to 15. From 1960 to 1980, they increased at a moderate rate of 1.25 times, from 12 to 27 schools. At this period, expansion was focused on secondary and junior colleges levels. After the expansion of elementary and secondary schools, the growth of institution of higher education rose at a rate of 5.5% annually during the 1980s. Expansion was expected to continue in the 1990s, according to the Six-year National Plan.

Table 7.5
Number of Schools at Different Levels in Taiwan,
1950-1988

Edu. Levels	School Year		1970	1980	1988
	1950	1960			
Elementary	1,231	1,843	2,319	2,428	2,478
Junior High	128	244	553	648	683
Senior High*	-	-	185	184	168
Vocational**	85	119	147	191	212
Junior College	3	12	70	77	70
Coll. and Universities	4	15	22	27	39
Others***	25	53	170	356	500

* Before 1968, both the Junior High and Senior High Schools were counted together.

** Normal Schools are included with Vocational Schools.

*** "Others" include Special School, General Supplementary School, Vocational Supplementary School, Junior College Supplementary Schools, and Open Universities.

Source: Educational Statistics of the Republic of China, 1990, pp.2-5.

Number of graduates

The number of graduates at different levels of education all increased during the same period as the number of schools grew. Noticeable was the increase of students with masters or Ph.D. degrees with an average annual growth rate of 21% between 1950 and 1988 (Table 7.6). The number of graduates from institutions of higher education is expected to continue into the 1990s as more attention has now been focused on higher education.

Table 7.6

Number of Graduates at Different Levels in Taiwan, 1950-1988

Edu. Levels	School Year				
	1950	1960	1970	1980	1988
Elementary	86,995	239,254	384,131	375,005	396,248
Junior High	16,850	41,842	241,428	351,956	340,545
Senior High	3,523	14,706	48,039	53,075	63,366
Vocational*	10,532	23,815	45,586	99,442	140,393
Junior College	523	1,413	19,114	38,370	57,801
Coll. and Uni.	1,013	5,086	17,173	32,214	40,856
Graduate S.	1	205	674	2,004	5,257

* Normal Schools are included in the Vocational Schools.

Source: Educational Statistics of the Republic of China, 1990, pp.24-25.

Factors Contributing to Educational Expansion in Taiwan

There are at least four factors contributing to the overall expansion of educational system in Taiwan: the demographic, the economic, the socio-cultural and the institutional factors.

Demographic factors

High population growth in Taiwan after World War II contributed to the increasing population base for education

expansion. The average annual natural population growth rate was 3.5% in the 1950s, 3.0% in the 1960s, and 2.0% in the 1970s.¹ The primary school population increased from 953,000 in 1952 to 1,972,000 in 1972, with an annual growth of 5%. The secondary school population increased from 857,000 to 1,819,000. The higher education population increased from 742,000 to 1,495,000.² Overall increases of the school population put pressure on each educational level to expand. Therefore, population growth is a major reason for the government to expand education throughout the primary, secondary and tertiary levels.

Economic factors

The continued expansion of higher education could not happen without economic growth in Taiwan. The economic growth, with increasing shares of manufacturing goods for export, placed demand on upgrading skills in production, and induced a derived demand for a more educated labor force. At the same time, economic growth increased the affordability of education for individuals. The annual growth rate of college graduates was 8% between 1950 and 1970 (Table 7.6), which was higher than the 4% population growth of the same age group.³ This growth could not be explained by the demographic factor alone. Affordability of education was related to the higher income level due to economic growth. Substantial increases in per capita income⁴ enhanced opportunities for individuals to pay for their education. Thus, rising national income per capita generated more

demand for education (Lin, 1983). The desirability of higher education may also relate to the "socio-cultural factor" of credentialism.

Socio-cultural factors

The socio-cultural factor can be called "educational credentialism" in Taiwan. Its definition has not been empirically defined, however, its existence has been mentioned frequently. One aspect of educational credentialism is institutional, which relates to the emphasis on credentials rather than knowledge for recruitment. For example, Lee (1974) states that higher education has become a means to enter white-collar occupations with better social prestige and more a comfortable working environment in Taiwan. Credentialism intensifies the need to get the higher credentials required for a job which previously only needed a lower level of education.

Besides recruitment processes, two other factors may also relate to rising credentialism. One is an oversupply of labor force and the other is the tight control over the attainment of higher credentials. For example, if the supply of a certain type of worker exceeds its demand, then employers will raise the minimal requirements to an extent to even hire someone who is over-qualified or over-educated (Freeman, 1976). On the other hand, if government retains a tight control over higher education, it will further increase the worth of a college degree which will lead to a

greater emphasis on educational credentialism. Low et al. (1991) implied that Taiwan's absolute tight control over secondary and higher education has created excess demand.

The other aspect of educational credentialism stems from an individual's pursuit of credentials for the sake of possessing them. Yang and Yeh (1984) commented that the purpose of pursuing education in Taiwan did not focus on the content of schooling, but rather on the privileged status adherent to the certificates gained from education. This may relate to Confucianism, which highly values scholars, and to the Chinese examination system which fosters upward mobility (Ho, 1962).

A survey of educational expectation has revealed the degree of credentialism in Taiwan. A student's highest expectations for degrees were: high school (7.5%), junior colleges (28.8%), Bachelor's degree (51.3%), Master's degree (8.2%) and Ph.D. (4.3%) (Table 7.7). More females expected to graduate from high school, junior college, and university, but more males expected to get master's and Ph.D. degrees.

By calculated by their educational levels, 37% of junior high school students, 88% of senior high school students, and 76.8% of junior college students wanted to get a bachelor's degree. More than 70% of university and college students wanted to complete a master's degree, while more than 25% of the university and college students desired Ph.D. degrees.

This excessive demand for higher credentials has coexisted with an over 80% increase in the enrollment rate

of higher education in the 1980s in Taiwan.⁵ Thus, pressure from credentialism cannot be ignored in the expansion of higher education.

Table 7.7
Expectation of the Highest Degree in Taiwan, 1985
(%)

Education	Total	Males	Females
High school	7.5	7.1	8.0
Junior coll.	28.8	28.5	29.1
Bachelor degree	51.3	50.0	53.0
Master degree	8.2	8.7	7.6
Doctoral degree	4.3	5.8	2.3

Source: Calculated from Vocational Training Survey data, 1985, N=3821.

The institutional factor: role of government

One goal of education in Taiwan is to keep pace with manpower requirements in the economy. Ironically, Taiwan's manpower planning started because of the imbalance in the supply of graduates in the late 1960s (see Chapter VIII). From then on, the Ministry of Education and Manpower Planning units have worked closely together to monitor the manpower supply. Therefore, manpower plans have been important to the speed and direction of education in Taiwan since the 1970s (Hou and Chang, 1982). Two important aspects of educational policy may have contributed significantly to educational expansion, especially for higher education. One is the low-tuition policy, and the other is government control of curriculum and administration in all schools. The

main reason for the government to take a "low-tuition policy" is to ensure that no one from a low-income family would be rejected from the opportunity to receive education (Gai, 1984). This low-tuition policy greatly increases the desirability and affordability for more education at the same time.

In Taiwan, a university, by law, must consist of at least three colleges, and each college must have at least three departments (Council for Research, Development and Evaluation, 1986, p. 355). This regulation encouraged schools to divide one subject field into two or three different departments in order to be qualified as a college or university (Chie, 1981); which created many unnecessary departments in higher education. Many liberal arts departments were established in the early stages as they were less expensive to set up. The low-tuition policy and the regulation of college programs have contributed to the overexpansion of liberal arts programs in Taiwan (Chie, 1980).

Educational Policies Related to Educational Expansion

The basic philosophy behind Taiwan's education is the concern for survival due to its limited natural resources. Four influential educational policies affect educational expansion and its direction in Taiwan. They are: (1) redirection and expansion of secondary education, (2) a nationwide vocational education system, (3) the role of

higher education from elite education to mass education, and (4) the emphasis on research.

Redirection and expansion of secondary education

In 1968, Legislative Yuan passed the "Enforcement Rules for Nine-year National Education," which extended compulsory education from six to nine years. The rise of school-leaving age was caused by a number of societal pressures. Among them, high unemployment rates for those who failed to enter secondary schools, and the changing patterns of industrial and business skills. In addition to an extension of basic education, junior-high schools are also designed to provide students with a foundation for later academic and vocational specialization. The compulsory nature of junior-high education has become one of the most important educational achievements in the past four decades (Lin, 1983). It greatly increased the enrollment of school-age students and resulted in a 48% annual increase in junior high graduates during 1960-1970.⁶

A nationwide vocational education system

Due to changing demand of the agricultural and industrial sectors, Taiwan's government saw the need to adjust workers' training to the constant technological advances in the 1970s. A nationwide vocational-educational system was set up, designed to link school education more closely to trainings for industry. The system coordinated

vocational courses with both employment and vocational examinations (Lin, 1983).

Furthermore, the College of Industrial Technology was established in 1975 in order to provide advanced vocational studies. A complete system of technical and vocational education was thus set up. The promotion of vocational education was in part to reduce the proportion of the general high schools. As a result, the ratio of general to vocational senior high schools was reduced to nearly 30:70 in the 1970s (see Chapter VIII).

Higher education from elite education to mass education

The change in the role of higher education from elite education to mass education was also due to several factors; (1) the perceived demand of high-level technical and professional personnel with more industrialization; (2) the popular demand for higher education; and (3) the increased demand for leaders in both the service and administrative areas (Lin, 1983).

Therefore, expansion of colleges and universities has been reinstated in the 1980s after its start in the 1950s. As a result, higher education has become a mass education, the proportion of college graduates in the population over 15 years of age increased nine times from 1951 to 1988 (Table 7.1).

The emphasis on research

The emphasis on research to advance knowledge and accelerate socio-economic development is a very recent goal. It has been a slogan for sometime, but only in the late 1980s has emphasis on research been treated more seriously. When the comparative advantage of cheap labor is no longer available in Taiwan, the desire for high value-added products will require significant investment in research and development and the need for high-level research personnel. One way to meet this goal is to strengthen the universities' research function; another way is to increase the number of graduate students (Lin, 1983). The number of graduate students doubled in 8 years from 1980 to 1988 (Table 7.6), however, the research capabilities of universities will take longer to establish.

Educational policies in Taiwan have tried to strike a balance between the demands of the economy and the demands of the people for more education during the different stages of economic development. However, due to its centralized nature, Taiwan's educational system was less subject to market forces to determine its supply and demand. Therefore, some unintended consequences were created.

Impact of Educational Expansion on Manpower in Taiwan

The tight control of education and the low-tuition policy in Taiwan have caused the excess demands on secondary and higher education and the deterioration of educational quality.

First, the fundamental reason for rigid control of general secondary education and higher education is the fear of educated unemployment. This was also a political consideration to avoid youth unrest. Therefore, the government hoped to balance the supply and demand of manpower and at the same time suppress the increasing demand for education caused by economic and social factors. However, due to the export-oriented nature of the economy, to predict manpower needs by the Manpower Requirements Approach (Briggs, 1987) was very difficult. On the other hand, the over-control of higher education has made it difficult to secure diplomas in higher education, making them scarce and adding to their prestige. Thus over-control of higher education generated an even greater demand for it.

Second, the low-tuition policy contributed to a lower quality of post-secondary education. It unintentionally encouraged the establishment of low-quality and low-cost liberal arts programs in vocational schools and in higher education (Wang, 1987). Tuition and fees paid by students at public colleges and universities are less than one-fifth of their total educational cost. At the same time, the government set ceilings for tuition and fees of private colleges and universities (Yang, 1983).

Lower tuition resulted in higher government subsidies for public schools and smaller educational budgets for private schools. Under these conditions of insufficient funding,⁷ the tendency is to establish more low cost departments, such as liberal arts, than high cost ones, such

as the sciences (Chang, 1980). For example, the total number of classes was 1,634 for liberal arts programs, and 1,423 for science programs in both the public and private colleges and universities in 1985. Among them, 1,039 out of 1,634 liberal arts classes were in private schools, while only 767 out of 1,423 science programs were in private schools.⁸

Since more liberal arts programs than science programs were established and more were established in private schools than in public schools, unemployment of liberal arts graduates became a big issue in the late 1970s and early 1980s (Wang, 1987). The tension was eased somehow in the late 1980s due to the liberalization of the financial market and mass media. The labor market is still tight for these graduates, and high-level science and engineering personnel is still in short supply in the early 1990s.

Taiwan's educational policies, on one hand, made higher education accessible to the common people by adopting its low-tuition policy, while on the other hand, the government used very tight controls to match supply with demand. This kind of contradiction generated not only social issues of credentialism, unemployment of liberal arts students, but also delayed the improvement of quality in higher education. These problems have been gradually recognized by liberalizing higher education starting in the 1990s (see Chapter VIII).

The issue of "brain drain" also relates to the educational policies and labor force supply. Taiwan has sent the largest number of foreign students to the U.S. for many

years, only second to Mainland China since 1988.⁹ The return rate of these students has increased over the years, from an average of 8% during the 1950s to 22% during the 1980s,¹⁰ that is, about one in five students returns after studying abroad.

The degree of "brain drain" was most serious during the 1960s, when the return rate was only 5%.¹¹ At that time, push and pull factors encouraged students to remain abroad. Push factors included Taiwan's domestic political climate, favoritism, and parents' attitudes while examples of pull factors are higher income in the U.S., satisfaction with the American way of life, and the further pursuit of knowledge (Kao and Lee, 1973).

Today, the view of the "brain drain" has undergone great changes in Taiwan. It is "quality" not "quantity" that matters now. Quality of brain drain is defined by the needs of national development, such as manpower of high-level automation, information science, bio-technology and etc. (Chen, 1983). On the other hand, Taiwan's job market has been very tight for master's degree holders, only those with Ph.D.s in the sciences and engineering are still in demand. Therefore, not every non-returning scholar or expert should be automatically counted as contributing to the "brain drain". As it would depend on the fields of expertise needed. For those who are not in high demand, by staying overseas they may ease employment pressure domestically.

Those real considered part of the "brain drain," it create a loss to their country of origin. However, if the

government knows how to create incentives to invite them back, in the long-run it may not be a total loss. Those experts who do not return may have received the best "on-the-job" training abroad. When the push and pull factors favor the original countries, the brain drain can be reversed. The increasing return rate in Taiwan in the 1980s was a good example.

Therefore, investment in human resources will eventually benefit the society, whether in the short-term or in the long-term. As for the individuals, they will always choose to maximize private return to education. The issue of brain drain will thus be determined by market forces, not by artificial regulations.

Conclusions

The quality of the labor force in Taiwan has shown great improvement through educational attainment. This improvement has gone through three stages over the past four decades, i.e., from a high illiteracy stage to high elementary education, and then to high secondary education. Educational attainment of the labor force has grown by an average of 50% for all educational levels over a 10-year period from 1978 to 1988. The male labor force has been faster in reduction of the lower educational workforce, such as junior high level and below. The female labor force, on the other hand, has improved more on its higher educational level workforce, such as in the levels of senior high and

the universities and up. The future trend of the educational composition of the labor force will continue to increase for higher education level, since the expansion of higher education is the focus for the 1990s in Taiwan's Six-year National Plan.

Educational levels have been upgraded for all industries and occupations. The proportion of illiterates in agricultural industries has decreased by one-third; the proportion of senior vocational level has increased in transformative, distributive, and personal services industries by about 100%; and the proportion of junior college level workers has increased in producer and social service industries by two-thirds and one-third, respectively. Educational upgrade occurred more in the lower- or middle-skilled occupations, such as production and clerical work, but not in professional and technical or administrative and managerial jobs. On the contrary, the proportion of junior college and university educated workers even decreased in these high-skilled occupations, especially for women. This pattern has reflected the fact that upgrade of labor force quality has concentrated mostly at the secondary educational level in Taiwan.

Most educational expansion from elementary education to higher education in Taiwan occurred during 1950-1970. After that, there was only limited growth for all types of education during the decade of 1970-1980. However, in the 1980s, only the growth of higher education surged. This is

an indication that higher education will be the focus of expansion in the 1990s.

Four major factors contributed to the overall expansion of the educational system in Taiwan: (1) The increase of school-age population due to the baby-boom after World War II put a natural demand on the expansion of elementary schools. (2) The rise in per capita income due to rapid economic growth in Taiwan pushed education expansion further to the secondary and higher education levels. (3) Credentialism accelerated demand for more higher education. (4) The concern for manpower utilization shaped the direction of expansion to go for more vocational secondary and higher education, rather than to academic education. However, adjustment to market conditions has shifted higher education from that of an elite type to education for the masses.

Educational expansion has created unintended consequences such as lowering the quality of private education, oversupply of liberal arts college students, and stimulating excess demand of education itself. Brain drain is a natural phenomenon when pull and push factors are unfavorable to country of origin. If Taiwan continued to grow economically, socially, and politically, at the same time, the U.S. economy faced recession, Taiwan's brain drain will improve or even reverse in the future.

Chapter VII--Notes

¹Calculated from Taiwan Statistical Data Book, 1977 and 1982.

²Ibid. In general, the age group for primary school students should be 6-12 years old; secondary school, 13-18 years old and colleges and universities, 19-22 years old in Taiwan. However, the available data for age groups do not exactly match these school ages.

³Calculated from Statistical Yearbook of the ROC, 1990, p.8-13.

⁴For example, the per capita income in Taiwan was about \$130 in 1960, but rose to about \$5798 in 1988 (from Taiwan Statistical Data Book, 1989, Table 3-5a for 1960 data and Quarterly National Economic Trends, Taiwan Area, The Republic of China, vol.55, Nov. 1991 for 1988 data. The N.T. (New Taiwan Dollars) is based on current prices and the exchange rate between US dollars and N.T. is estimated at 1 \$US=40 N.T. for 1960. However, the exchange rate in 1988 has become around 1 US\$=28 N.T.). The real average annual percentage increase in per capita income was 7% in Taiwan from 1960 to 1988. (see Taiwan Statistical Data Book, Table 3-5b).

⁵This average ratio was already very high in the 1950s, 1960s and 1970s; 69% in 1951-1960, 73% in 1961-1970, and 77% in 1971-1980 (calculated from Table 11, Educational Statistics of the Republic of China, 1986).

⁶Calculated from Table 7.6 of this chapter.

⁷In Taiwan, the central government is in charge of higher education, according to the Constitution, the total budget of educational expenditures in the central government should be 15% of the total government spending, but, in the past, there were only 6%-12% of total government expenditures for education. See K. Gai (1984), pp.3 and 13. For private schools, there have been complaints about no budgets for necessary classroom building and laboratory equipment. Hence, some private universities had to cut down on laboratory hours and training, see K. Gai (1984), p.7.

⁸Calculated from Educational Statistics of the Republic of China, 1986, p.104.

⁹See The Communication of Studying Abroad, Ministry of Education, Taipei, Taiwan, vol. 65, Dec.20, 1991, p.2.

¹⁰Calculated from Educational Statistics of the Republic of China, 1990, Tables 19 and 20.

¹¹Calculated from Educational Statistics of the Republic of China, 1990, Tables 19 and 20.

CHAPTER VIII
MANPOWER POLICIES IN TAIWAN

Introduction

The purpose of this chapter is to investigate the role of government in transformation, utilization, and quality of the labor force. Manpower planning can be seen as a means used by government to accelerate economic growth and development, especially in developing countries (Psacharopoulos, 1984). Taiwan's manpower policies will be evaluated with actual performances at different stages of economic development.

Manpower planning is by nature approximate and experimental (Helper, 1968). Manpower plans are usually based on theories, assumptions, and even hopes. A manpower plan can be defined as:

An attempt to forecast the manpower needs of the economy over a period of years in terms of broad industrial and occupational groups and to formulate policies and programs designed to provide measures and facilities that will help to strike a balance between foreseen needs and available supplies. (Helper, 1968:8)

Any manpower plan must be flexible, and under constant review, and revision. Manpower planning is more than just determining present and future manpower demand and supply, it must contain how to get ahead of time by including labor force's education and training, incentive for relocation, and means for full utilization.

Is manpower planning necessary? There is no easy answer. The question is whether we can come up with a proper plan, not whether we need a plan or not. In reality, an unrealistic plan is always the problem.

A manpower plan is a partner of an economic development plan. Developing countries now realize more that an economic plan may fail unless there is a proper manpower plan. Their manpower problem is not the aspect of quantities, but rather a question of quality and distribution. Hence, what is needed is to have the right kind of workers in the right places at the right time.

The general manpower problems in developing countries are: rapid population growth, lower education levels, insufficient job opportunity, shortage of technical labors, high proportion of labor force in agricultural sector, and lack of infrastructure (Chang, 1985:22). Therefore, the major content of manpower policies in developing countries become population policy, investment policy, educational policy, and labor policy. In the beginning, investment policy was used to create job opportunity and population policy was employed to control population growth. Afterward, education policy needed to respond to labor demand. Only at a later stage, did manpower development policy promote labor force participation and quality (Chang, 1985: 22).

Because of the broad spectrum of their manpower plans, developing countries had to rely on different institutions to handle various types of policies. For example, the Ministry of education may be responsible for the planning

and implementation of education policies, while investment policies are handled by the Ministry of Economy, and so on. Therefore, additional problems of coordination and communication occur.

In the following section, the contexts and administration of manpower planning will be introduced in order to show the evolution of manpower policies in Taiwan during economic development.

The Evolution of Manpower Policies in Taiwan

The spirit of Taiwan's manpower policies followed that of the developing countries, priority was given to the creation of employment (Chang, 1985:33). Three principles of manpower planning in Taiwan were: (1) to upgrade human resource quality, (2) to maintain high-level employment, and (3) to improve labor conditions (Chen, et al. 1983). Since the beginning, the nature of Taiwan's manpower planning is employment- and productivity-oriented, only at a later stage were welfare and social security aspects considered. In this case, Taiwan's manpower planning may be different from other developing countries. They may tend to promote labor welfare first by arbitrarily raising minimum wage before labor productivity rises to match it, for example in the Philippines. However, this only creates problems in the labor market.

Contexts of manpower planning in Taiwan

Different manpower policies emerged during the five stages of economic development (Table 8.1). Taiwan's manpower planning will be introduced according to each economic stage.¹ Though Taiwan's manpower plans were part of its economic plans from the beginning, systematic manpower planning was not established until the later stages of economic development.

The period of economic reconstruction: 1945-1952

In this period, just after World War II, the Nationalist government was restoring the production ability of all industries on the island. The economic condition was at the beginning stage of industrialization, employment opportunities were limited, unemployment rates were high as was population growth (Kuo et al., 1981).

At this period, there was no other mission for a manpower policy per se. The government's emphasis was on the creation of employment opportunities, so that the labor force increased at about 90,000 people annually; about 30% of the labor force was absorbed into the agricultural sector, 20% into the industrial sector, and 50% into the service sector² (Chang, 1985:6).

A unique situation of manpower supply at this stage was in the large influx of refugees from Mainland China after 1949. These refugees provided Taiwan with much of the technical and managerial manpower needed at that time (Djang, 1977). Japanese colonial government restricted

native Taiwanese from any professional training, except medicine. However, Taiwan was fortunate to have a supply of professional and managerial manpower in the early stages of economic development.

However because of the "bamboo curtain" set up on Mainland China after 1949, the supply of such skilled manpower was soon cut off for the next 30 years. Taiwan now had to rely on locally trained and educated people for a supply of skilled labor.

The period of stable growth: 1953-1964

The second period was characterized by the stable growth of GNP, 8.1% annually. Three four-year economic plans were in force (Table 8.1).

The major manpower problem in this period was underemployment, with an unemployment rate of about 2.5% annually (Taiwan Statistical Data Book, 1989, p.14). High-level technical personnel for construction were imported from more advanced countries, such as the U.S. (Chang, 1985).

There were no clear-cut manpower policies. Manpower policies were included with economic policies. The Second Four-year Economic Plan included sections on how to increase employment opportunities, and a special program to relocate veterans to civilian jobs. The Third Four-year Economic Plan had a population policy to reduce the birth rate and plans for the development of technical personnel.

Table 8.1

The Economic Development Stages and Manpower Policies
in Taiwan

Stages of ED	1	2	3	4	5
Years	1945-52	1953-64	1965-73	1974-80	1981-90
Nature	Economic reconstruction	Stable growth	Rapid growth	Unstable growth	Slow growth
GNP growth (annual)	-	8.1%	11%	8.5%	7.6%
Unemployment rates (annual)	-	2.5%	1.2%	1.0%	1.4%
Economic Plans (EP)	None	1st-3rd	4th-6th	Six-year	10-year
Manpower Plans (MP)	None	None	1st-4th	Six-year Special Project	10-year
Manpower Planning Units	None	MRC* (1964)	MDG* (1967) MDW* (1969) MDPG* (1972) Canceled (1973)	None	MPG* (1980) MPD* (1985)

*MRC: Manpower Resources Committee, MDG: Manpower Development Group, MPG: Manpower Planning Group, MDW: Manpower Development Workforce, MDPG: Manpower Development Planning Group.

Sources: Before 1989, average GNP growth rates and unemployment rates are computed from Table 1-1b and 2-8b in Taiwan Statistical Data Book, 1988, respectively. For 1989-1990, data are from Quarterly National Economic Trends, Taiwan Area, The Republic of China, Aug., 1991.

The period of rapid growth: 1965-1973

The third period was characterized as a period of rapid economic growth. Its GNP growth was between 9.0% and 13.4%, the average annual growth rate was 11.0% and export volumes increased an average of 30% each year (Table 8.1). Because of pre-existing disguised underemployment, the great demand from export and labor-intensive industries did not yet drive up wages. Labor-intensive industries still maintained a comparative advantages with cheap labor and unskilled workers were in great demand.

At this period, the educational system had extended its compulsory education from six to nine years, and contributed to the tight supply of unskilled labors after the 1970s (Chang, 1985).

Manpower problems in this period included a lack of unskilled labor, a surplus of some high-level manpower, and a lack of vocational training. The unemployment rate for this period averaged only about 1.2% (Taiwan Statistical Data Book, 1989, p.14, and p.16).

Also during this period in 1966, the first manpower plan was drafted. The plan contained policies on education, technical training, science research, and employment service. Throughout this period, four manpower plans were written, but only the first and the third were approved for implementation.

The period of unstable growth: 1974-1980

The fourth period was characterized by unstable economic growth, largely due to the oil crises and world-wide depression. GNP growth was between 1.2% (1974) and 14.0% (1978), and the average annual growth rate was 8.5%. During the oil crisis in 1974, Taiwan was among the few which managed to maintain a positive GNP growth, and recovered very quickly from the crisis (James et al., 1988). Exports in Taiwan had a negative growth of 5.7% only in 1975, but for the whole period, the average annual growth was 24% (Taiwan Statistical Data Book, 1989, p.2). The unemployment rate averaged 1% for this period (Taiwan Statistical Data Book, 1989, p.14, and p.16).

Overall wages began to rise rapidly during this period, and competition for labor-intensive products from other developing countries emerged due to a shortage of unskilled labor in Taiwan.

Problems of a shortage of unskilled and technical labor and a surplus of liberal-arts college graduates accelerated.³ College graduates from liberal arts departments experienced difficulties in finding jobs in the 1970s (Wang, 1987).

Manpower policy during this period was guided by a Six-year Manpower Special Project Plan. Technical manpower needed for national construction programs was emphasized. Manpower planning had been ignored during this period because the manpower planning unit had been removed and its duties were carried out by other transitional committees.

The period of slow growth: 1981-1990

The 1980s were characterized by slow economic growth. Economic growth in Taiwan had slowed down because of world depression since the oil crises. GNP growth in this period averaged about 7.6%, mostly below 10%, except for the years 1984, 1986, and 1987, and ranged between 3.4% and 11.9%. Exports grew about average 10.2%⁴ annually, which was only half of the record in last period (24%) (Taiwan Statistical Data Book, 1989, p.2).

This was a critical period for Taiwan's economy because of cheaper labor from the challenge of other developing countries, and the protectionism in the developed countries. Therefore, Taiwan had to find ways to break through this bottleneck of industrialization.

The political situation in Taiwan also made a dramatic turn at the end of this period. After the abolishment of Martial Law in 1987 and the death of President Chiang Ching-Kuo in 1988, the society opened up in every direction, which affected the course of the economy and manpower problems. More liberalization of trade and the establishment of the domestic financial market helped to develop the service sector and to upgrade the industrial sector. Many noncompetitive, labor-intensive factories have moved to other southeast Asian countries and Mainland China and left more resources for capital- and technical-intensive firms to develop. The long existing manpower imbalance started to

reduce due to the adjustment of the educational system and the increased demands of the domestic market.

In this period, vocational training legislation was passed in 1984 and promoted the responsibility of vocational training in various companies (Chang, 1985:10). The training of human resources outside formal educational systems had legal bases to operate. Taiwan was also ready for a long-term plan of manpower development in this period. The Ten-year Manpower Development Plan (1980-89) and the Long-term Plan (1986-2000) were results of these efforts.

In sum, the first manpower plan did not appear until 14 years after the first economic policy was implemented in Taiwan. It appeared in the third stage of economic development, between 1965 and 1973, when economic policies had gone through three four-year plans. There have been four manpower plans during this period. Between 1974 and 1980, there was one Six-year Special Project plan. In the fifth period between 1981 and 1990, there was a Ten-year Manpower Development Plan.

The administration of Taiwan's manpower planning

From the history of manpower planning units, recognition of manpower planning came late in Taiwan. Manpower planning unit's were always a temporary institution, a permanent manpower planning department was established only after 1985.

Manpower planning units

Manpower planning in Taiwan began in the mid-60s. Signs of mismatch in supply of manpower in 1958 was the reason to start the overall manpower policy in the late 1960s (Chang, 1979).

The first manpower planning unit, the Manpower Resource Committee (MRC), was established at the end of the second period of economic development. MDC consisted of Vice-Ministers from relevant ministries, a commissioner or director from relevant departments of Taiwan Provincial Government, and renowned scholars and experts. MDC was headed by the Minister of Executive Yuan. A secretariat was set up as an operating agency to execute all MDC's policy decisions and resolutions (Hsu, 1969).

In 1967, MDC became the "Manpower Development Group" (MDG). In 1969, its name was changed again to the "Manpower Development Workforce" (MDW). In 1972, it was renamed the "Manpower Development Planning Group" (MDPG). Shortly after in 1973, the MDPG was disbanded because of a lack of funding and support from the government.

From 1973 to 1980, supervision of the Six-year Special Project Plan was carried out by several manpower planners from the General Planning Department in Council for Economic Construction (CEC). In 1980, a Manpower Planning Group (MPG) was resumed after the government again recognized the need to have a national manpower planning unit. In 1985, this group was established permanently under the Council for

Economic Planning and Development (CEPD) under Executive Yuan.

In sum, the development of manpower plans went through three stages: the first stage, from 1965 to 1973, had three different planning groups. The second stage, from 1974 to 1980, had no planning units. The third stage, from 1981 to 1989, employed a permanent Manpower Planning Department to coordinate manpower planning in Taiwan.

Manpower planning procedures

Taiwan's manpower planning worked through a manpower requirement approach (Castley and Alfthan, 1986). Briefly, the steps included: first, forecasting manpower supply and demand by industrial sectors and broad occupational fields (Hepler, 1968:90). These forecasting figures are based on assumptions related to the future output of goods and services, population trends, and labor force participation rates. After estimating the probable supply and demand of manpower during each of the planned years, the next step was to outline the procedures to balance supply and demand at various intervals. This approach could work in Taiwan largely due to the complete control over the supply of manpower held by the centralized educational system. The only thing left to be decided was demand side. The estimation error in matching supply and demand has thus greatly reduced.

There was close cooperation between ministries and manpower planning agencies. Coordination meetings enabled mutual understanding and thorough discussion of the contents

and duties of implementation. Since the process involved the heads of each department, implementation became more effective. For example, progress in increasing the ratios of science departments and control over liberal arts expansion in higher education, starting from the mid-1970s, was largely due to the full support by the Minister of Education at that time.⁵ Since the manpower planning unit itself was not the actual implementing institutions, results of manpower planning should be attributed to both the cooperation and efforts of the related government agencies and manpower planning units.

The Contents of Taiwan's Manpower Policies (1965-1990)

From 1965 to 1990, there were six different manpower plans. There were three levels of planning in the first four manpower plans, i.e., long-term, mid-term, and short-term plans. Usually, the long-term plan spelled out the goals, and the mid-term and short-term plans described channels and methods to reach those goals. Long-term plans covered a ten-year period, mid-term plans were for five years or four years⁶, and short-term plans were in effect for two years. Short-term plans usually did not involve changes of legislation or budget, while mid-term plan included plans for changing laws and budgets, if necessary. However, after the fourth manpower plan, there was no longer such differentiation.

Although each plan varied in content and goals, they all included six basic areas: population, employment structure, education, vocational training, employment service, and labor conditions. Policies on employment structure and labor conditions will be excluded from this section, as employment structure was only mentioned in the first four manpower plans and were largely a natural result of economic development. The policies on labor conditions will be discussed in the section on labor shortage.

Long-term goals and their evaluations will be presented in order of population, education, vocational training, and employment service.⁷

Population

Policy

The major goal of population policies, in the first period of manpower planning (1964-1973), was on the reduction of natural population growth. The target was set to reduce population growth to 1.8% annually by early the 1980s. The method to achieve such a goal was by implementing family planning since 1964. In 1968, legislation called an "Act of family planning" was passed. Then, in 1969, the "Act of Population Policy" was established. The budget of family planning came from the government at the national and local levels. Family planning began in schools, concepts of family planning were included in textbooks. Methods of contraceptives were widely introduced and distributed, and free to poor women. The targeted groups of family planning

were: schools, military camps, factories, and farms. Tax exemptions were provided to families with less than three children.

The second stage of the population policy was aimed at reducing the annual natural population growth further to 1.7% for the period of 1974-1980. New methods included more follow-up study of married women aged below 30, using different channels to introduce contraceptives to different target groups, family planning hotlines, and an alternating service of family planning in remote areas. Another important task was to revise legislation to promote the status of women, raise the legitimate age for marriage, and to include results of the family planning program as part of the evaluation of the head administrator in each level of government.

In the third stage (1981-1990), the target of population policies was to reduce annual population growth to 1.25%. The new concerns were the aging population, quality of population, and even distribution of population. For the elderly, the building of more private and public nursing homes were encouraged, and community-based recreations centers for the elderly were expanded. Conditional abortion was to be legalized, and follow-up case studies for abortions would be conducted.

Other means included: to educate men in the use of contraceptives, to expand population education in schools, to legislate welfare laws for children, teenager, and the elderly. To even the population distribution, more priority

public projects would be invested in less desirable and less-populated areas. Each region was asked to develop its own distinct feature in order to balance the population. In the following, these population policies will be evaluated in terms of their quantifiable goals.

Evaluation

Table 8.2 gives a summary of quantitative population goals, including natural population growth rates, percentage of population under age 15, and total fertility rates. Actual data show that a population growth rate of 1.25% had been reached, and fell below the goal of 1.1% in 1989. Second, the percentage of population below 15 years old had already reached its goal of 35% by 1977. Third, total fertility rate was lower than the target of 3.0 by 1977 and the goal of 2.3 was not met in 1981, but total fertility rate had reached 1.7 in 1989.

In general, Taiwan's population policies were effective in reducing population growth for the past three decades. It was difficult to explain whether the result was mainly due to family planning programs or to economic progress (Freedman et al., 1985). Obviously, both results are important in reducing women's fertility.

Education

Policy

Education policy is one of the most important aspects of manpower planning in Taiwan. In the first stage of manpower planning (1964-1973), one of the goals of education

was to increase the enrollment in elementary and secondary schools. The second focus was to increase the proportions of vocational education. Vocational schools were encouraged to cooperate with factories and firms to train students. Incentives and loans were given to private vocational high schools and junior colleges.

Table 8.2

The Goals of Population in Manpower Plans in Taiwan

Period	1st			2nd		3rd
Manpower Plans	1st	2nd	3rd	4th	6-yr	10-yr
Targeted Yr	1975	1977	1980	1983	1981	1989
Natural population growth						
goals:	2%	2%	1.8%	1.8%	1.7%	1.25%
actual data:	1.9%	1.8%	1.9%	1.5%	1.9%	1.1%
Percent below 15 yrs						
goals:	40%	35%	-	-	-	-
actual data:	35.3%	33.9%				
Total fertility rates (x1,000)						
goals:	-	3.0	-	-	2.3	-
actual data:	2.8	2.7	2.5	2.2	2.5	1.7

Sources: (1) For goals, from various Taiwan's Manpower Plans, CEPD, Executive Yuan, Taipei, Taiwan, ROC. (2) for actual data: from Taiwan Statistical Data Book, 1988, Social Indicators of the Republic of China, 1987, and Projections of the Population of the Taiwan Area, Republic of China, 1990-2036, 1991.

In the second stage of manpower planning (1974-1980), educational policy still promoted vocational schools. The ideal ratio between students of vocational high schools and general high schools was set at 7:3. The quantity of general

high schools should be controlled, while their quality should be upgraded. An annual increase of higher education was also controlled under less than 3%. The priority of expansion was given to science, engineering, medical, and agricultural departments in colleges and graduate schools.

In the third stage of manpower planning (1981-1990), the goal of education was to provide for the need of the labor market. General high schools should prepare students not only for college, but also for the labor market. Therefore, there were elective courses in skills training such as carpentry, and electronics available in general high schools. Vocational schools would train more engineers and service workers. Two- and three-year technical colleges were established to upgrade the supply of technicians. Adult education and post-graduate education were also promoted during this period. The results of these educational goals are reviewed next.

Evaluation

Table 8.3 summarized the quantitative goals of education in manpower planning as ratio of elementary school graduates entering junior high schools, ratio of students in vocational high to general high schools, percentage of educational expenditures in the GNP, and ratio of technical college students. First, percentages of graduates from elementary school entering junior high schools exceeded target levels in every stage of the manpower plan, increasing from 90% to 99.6% in 1989. This indicated the

success of the extension of compulsory education from 6 to 9 years since 1968.

Second, the ratio of number of students in vocational high schools to general high schools reached the target of 6:4 in 1980. But after that, the goal of 7:3 for 1983 was not reached, indicating that this ratio was not realistic under the strong demand for higher education in Taiwan.⁸

Third, the goal of educational expenditure as 6% of GNP was not reached, but the percentage increased from 3.9% to 5.4% in 1989, showing that government did not spend enough on education to match the needs of education improvement. In spite of quantity increase, quality of education was hindered. For example, the student-teacher ratio was much higher in elementary and secondary schools than in western countries. Heavy spending on military and economic activities may have affected educational expenditures.

Fourth, the proportion of technical college students of 57% was not met by 1989. The proportion of college students was 54% in 1989 in natural sciences, engineering, medicine, and agriculture, which meant that liberal arts and social science programs could not be adjusted in the short-run.

The achievement of the educational policy was in the area of expansion. However, its major failure was in the adjustment of overexpansion in secondary and higher education.

Table 8.3

The Goals of Education in Manpower Plans in Taiwan

Period	1st		2nd		3rd	
Manpower Plan Targeted Yr	1st 1975	2nd 1977	3rd 1980	4th 1983	6-yr 1981	10-yr 1989
Elementary graduates entering Junior High (goals)	-	-	90%	92%	94%	98%
(actual data):	90%	94%	97%	99%	97%	99.6%
Ratio of voc.high to general high (goals)	-	-	6:4	7:3	7:3	7:3
(actual data):	6:4	6.3:3.7	6.6:3.4	6.8:3.2	6.8:3.2	6.8:3.2
Educational expenditure (% of GNP) (goals)	-	-	6%	-	-	-
(actual data):	3.9%	4.1%	4.3%	5.6%	4.5%	5.4%
Percent of technical college students* (goals)	-	-	-	-	57%	-
(actual data):	-	-	-	-	49%	54%

*: including those who study at day sessions in the universities, in the disciplines of natural sciences, engineering, medicine, agriculture and architecture.

Sources: (1) For goals, from various Taiwan's Manpower Plans, CEPD, Executive Yuan, Taipei, Taiwan, ROC. (2) For actual data: from Educational Statistics of the Republic of China, 1976, 1981, 1988, 1990, Ministry of Education, Taipei, Taiwan, ROC.

Vocational training

Policy

Since the beginning vocational training was an important aspect of manpower planning in Taiwan. In the first period of manpower planning (1965-1973), policies of

vocational training focused on how to build systematic vocational training in Taiwan. Several organizations were established, such as the Central Vocational Training Committee, the Vocational Training Association, and the National Demonstration Center of Vocational Training. Legislation was set up for Vocational Training Fund Regulations,⁹ factory apprenticeship training, certification of technicians, and annual skills competition. In the first stage of manpower planning, five vocational training centers were to be built across the country.

During the second period of manpower planning (1974-1980), vocational training capacity should be increased in these centers, and large corporations should set up their own training plans. The target groups for vocational training were general high school graduates, handicapped youth, and some vocational high school graduates.

In the third period of manpower planning (1981-1990), focus was on promoting vocational training inside firms, on-the-job training for all types of teachers, and supply of vocational teachers. Each center was to develop its own specialization, and more vocational training centers were to be built in labor abundant areas. The target groups of vocational training during this period were service workers, females, handicapped youth, and people who change jobs. The ideal was to set up a lifelong training plan for everyone, and many evening schools should offer training courses. Results of these vocational plans will be assessed by vocational training survey data next.

Table 8.4
Vocational Training Statistics in Taiwan, 1965-1987

Period of MP	First 1965-1973	Second 1974-1980	Third 1981-1987
Annual Average no. of trainees			
Total*	136,641	237,185	221,125
(Growth rate)	-	74%	- 7%
In public enterprises	31,269	34,530	54,512
(Growth rate)	-	10%	58%
In private enterprises	31,706	106,083	87,557
(Growth rate)	-	235%	-17%

* "Total" includes: public vocational training centers, public enterprises, private enterprises, government agencies, schools, and civic organizations.

Source: The Statistics of Vocational Training, Skill Test and Employment Service in Taiwan Area of The Republic of China, 1988, Employment and Vocational Training Administration, Council of Labor Affairs, Executive Yuan.

Evaluation

Systematic planning and guidance of vocational training in Taiwan began only during the third period of manpower planning. In 1981, the Department of Vocational Training was established under the Ministry of Interior. In 1983, legislation for the Vocational Training Act was passed for implementation and provided the legal base to require public and private enterprises setting up their own vocational training programs (Chang, 1985). In 1987, the

Council of Labor Affairs was set up under Executive Yuan, and the department of Vocational Training was transferred under it. It is expected that the Council of Labor Affairs would later become the Ministry of Labor Affairs and be in charge of all labor-related affairs. The intended change in administration signifies the gaining importance of vocational training in the future with national level administration and legislation.

Table 8.4 shows that the number of trainees increased 74% in the second period of manpower planning, as compared to the first period. Comparing between the first and the second periods, trainees have doubled in private enterprise, but only increased 10% in public enterprise. Data show the expanding capacity of vocational training during the second period has been achieved mostly in private enterprises.

The third-period policy promoted within-firm vocational training. The number of trainees grew 58% for public enterprises, but had negative growth of 17% for private enterprises during this period, because private enterprises had already tripled their training capacity during the previous period, their growth in the third period slowed down.

Furthermore, the promotion of on-the-job training also succeeded. In the second period, apprenticeship training was the dominant type of vocational training (50.8%), but declined to only 4.6% in 1985 (Table 8.5). On-the-job training became dominant in the third period, 70.6% in 1985, and increased to 66% between 1979 and 1985. Therefore, on-

the-job training has been successfully promoted in both the public and private enterprises during the third period of manpower planning. However, its contents and quality may be difficult to evaluate. In general, on-the-job training can facilitate the adjustment of workers to new technologies and products as well as increase the ability of firms to meet changing market demands.

Table 8.5
Types of Vocational Training in Taiwan, 1979-1985

	(%)		
Year	1979	1985	1985-1979 growth
Total (persons)	100.0 (38947)	100.0 (44664)	- -
W/o VT	81.4	81.3	- 0.1
With VT	18.6	18.7	+ 0.1
From Public institutes	10.6	8.8	- 1.8
From Private institutes	14.8	13.0	- 1.8
From education	14.2	3.0	-11.2
From OJT*	4.6	70.6	+66.0
Apprenticeship and others	50.8	4.6	-46.2
Subtotal	100.0	100.0	100.0

* OJT: on-the-job training.

Source: computed from Vocational Survey data, 1979, 1985.

Large increases in vocational training during the second period may be due to two factors: (1) the demand for

skilled labor because of rapid economic development during the mid-1970s, and implementation of the Ten Major Construction Projects in 1973 and (2) some aspects of vocational training policy, such as Vocational Training Fund Regulations. Since any enterprise having over 40 employees had to contribute vocational training funds at the rate of no less than 1.5% of total wage payment each month, both the public and the private firms competed for the allocation of such funds.¹⁰ Therefore, VTFR played an important role in stimulating vocational training in private firms, but the continuation of vocational training should be contributed to an increased demand for technical manpower in Taiwan (Djang, 1977).

Employment services

Policy

Since the beginning of manpower planning, employment services have been emphasized. The most important function of employment services was to serve both workers and employers. When there was a labor surplus during the first period of manpower planning, employment services provided employment information by regularly visiting employers and firms. This information was posted immediately. Services were targeted to new and entry-level young workers, college graduates, and veterans. Public employment centers were usually located in industrial or rural areas for better services.

During the second period of manpower planning, these centers actively sought workers in labor abundant and rural areas to help them find jobs. Aims also tried to include a supply of labor during periods of labor shortage. Priority was given to encourage youths to establish their own businesses by giving government loans. Efforts also included inviting high-level manpower from abroad to ease the "brain drain."

In the third stage, a national network of employment service was established. Operations of the employment service centers would be computerized to speed up the exchange and distribution of information. The major target of these employment services was the disadvantaged groups. Evaluation of their functions is given next.

Evaluation

The ideal employment security system would include four aspects: employment service, vocational training, unemployment insurance, and supervision of private employment-service agencies. In the first manpower plan, it was stated that all these aspects could be implemented within a decade after the adoption of the Plan (Djang, 1977). However, until 1991, legislation of employment security systems is still being debated in the Congress. Except for vocational training, none of the other aspects have been implemented in Taiwan. One consideration was that unemployment insurance would create a financial burden for the government (Chang, 1985).

In the second period, the quality of public employment services had been affected by the absence of manpower planning units in the central government (Djang, 1977). In the third period, since there was no legislation on employment service, it was hard to manage illegal workers and to control employment service administration.

Until 1985, there were 44 public employment service units in the country, but due to insufficient advertisement, neither employers and workers have utilized it well (Chang, 1985).

Efficiency of employment services can be evaluated by rate of applicants placed.¹¹ Table 8.6 shows that the average rate of applicants placed was 47.68% in the first period (1964-1973), 63.24% in the second period (1974-1980), and 49.35% in the third period (1981-1987). The second period had the best record.

Table 8.6

The Annual Average Public Employment Service Statistics of Taiwan, 1964-1987

	1964-1973	1974-1980	1981-1987
No. of applicants	130,660	192,459	238,464
(Growth rates)	-	(47%)	(24%)
Rate of applicants placed	47.68	63.24	49.35
Ratio of no. of openings to no. of applicants	1.28	2.14	1.61

Source: The Statistics of Vocational Training, Skill Test and Employment Service in Taiwan Area of the Republic of China, 1988, Council of Labor Affairs, Executive Yuan.

The second period had the best record because there was a higher ratio of number of openings to number of applicants (2.14) than in the other periods. The higher the ratio, the greater the demand for labor, thus, it was easier to replace workers. Furthermore, the average number of applicants continued to grow in each period, 47% in the second period, and 24% in the third period. This showed that the government played a more important role in the job market than before to facilitate the balance of supply and demand.

However, when people were asked how they got their present jobs, public employment service only shared 1.6% (1978) to 1.2% (1988) out of all possible channels (Table 8.7). Relatives and family channels were the two most effective ways to obtain employment. The functions of public employment service even declined from 1978 to 1988, only channels of advertisement and examinations increased by 7.2% and 1.4%, respectively. This indicated employment information had become less personalized in the late 1980s.

Table 8.7
The Channels of Getting Present Jobs in Taiwan,
1978-1988
(%)

Year	1978	1988	1978- 1988
Channels			
Relatives	38.5	37.0	-1.5
Private emp.service	0.8	0.6	-0.2
Advertisement	10.0	17.2	+7.2
Public emp.service	1.6	1.2	-0.4
Examinations	4.3	5.7	+1.4
Family hiring	38.0	35.6	-2.4
Others	5.9	2.7	-3.2
Total	100.0	100.0	-
(N=)	(25,820)	(33,071)	

Source: Computed from Manpower Survey data, 1978, 1988.

Between 1971 and 1974, Taiwan's public employment service centers may have placed more junior high school graduates (Djang, 1977), but between 1978 and 1988, elementary school graduates and below, (35.8% in 1978), and senior vocational graduates (25.6% in 1988) were the largest groups to benefit from such services (Table 8.8). Over the years, more educated workers sought employment in public service: senior vocational graduates, 7.6% more; junior college graduates, 4.5% more; and universities and above graduates, 6.8% more. The upgrade in educational level of the labor force may be part of the reason because people still lack confidence in the public employment service systems.¹²

Moreover, females and youth were not getting equal assistance from public employment service. From Table 8.8 it is seen that female users were only 13% to 25% of the total users and users aged 15 to 23 were about 14% of the total users between 1978 and 1988. However, more females and youths used the service in 1988 than before.

In summary, public employment service has helped more lower-educated workers. Taiwan's employment information is still mostly through private channels. The usefulness of public employment service increased in the late 1980s, but demand for public employment service seemed to decline. Other channels, such as advertisements and examinations, increased in importance to get employment.

Conclusions

Taiwan's population policy was effective in reducing population growth. The educational policy was successful in increasing percentages of junior high enrollment, but only partially successful in adjusting student ratios in general high and vocational high schools. It also failed in increasing education expenditure in proportion to GNP, and proportions of technical college students.

Table 8.8

The Characteristics of the Effective Users of Public,
Employment Service in Taiwan 1978-1988

	1978	1988	1988-1978 growth
Total #	411 (100%)	403 (100%)	-
Sex component			
male	86.9	75.7	-11.2
female	13.1	24.3	+11.2
Age component			
15-23	12.9	14.1	+ 1.2
24-33	16.3	28.3	+12.0
34-43	15.8	18.4	+ 2.6
44-53	35.3	15.6	-19.7
54-63	19.2	22.8	- 3.6
64 and above	0.5	0.8	+ 0.3
Education component			
Elementary	35.8	24.8	-11.0
Junior High	18.3	16.6	-1.7
Senior High	14.1	7.9	-6.2
Senior Voc.	18.0	25.6	+7.6
Junior College	13.8	25.1	+11.3

Source: Computed from Manpower Survey data, 1978, 1988.

The number of people who received vocational training increased dramatically between 1974 and 1980, but decreased slightly between 1981 and 1987. Private enterprise tripled their vocational training capacities in the 1970s, followed by public enterprise in the 1980s. The major form of vocational training shifted from apprenticeship in 1979 to on-the-job training in 1985. The disadvantaged groups did not receive equal opportunities for public vocational training centers, which was contrary to its policy.

The public employment service centers received more job applicants over the years, but people still did not have confidence in its service. The employment information is still imperfect and personalized in Taiwan, as most find jobs through friends or relatives.

Future Manpower Planning in Taiwan

In this section, future challenges in each aspect of manpower policies will be addressed based on the Long-term Manpower Plan (1986-2000), and the Six-year National Plan (1991-1996). There are new conditions in labor markets due to changing political and social conditions in Taiwan in the early 1990s.

Population policy

In the future, Taiwan's population policy will bear more of social welfare aspects than just its birth control mission. There are some new goals in the Long-term plan for population policy. First, family planning should continue to provide secure, convenient, cheap, and new contraceptives to the public. The goal is to maintain two children per family. Second, health and quality of population should be emphasized and should include premarital physical examinations, preventive health care, etc.

Third, a system to care for the increasing aging population should be in place. By the year 2001, the population aged 65 and above will increase from 1,264,000¹³

(1990) to 1,743,000.¹⁴ One major task of the population policy is to develop a social welfare system that makes use of traditional Chinese values of family and integrate it with a western-type nonpersonal social welfare system.

Fourth, redistribution of the population should be completed. Based on the prediction of the Six-year National plan, by the year 1996, population in the north should reduce to 9,240,000; while population in the south, the central section and the east should increase. The methods to achieve such goals would be to develop these areas with their special natural resources and industries. The ultimate goal is to attract businesses and people to work and live in these newly developed cities.

Educational policy

According to the Six-year National Plan, there will be four major developments in education. One is to balance the development of higher education between the liberal arts and science disciplines. The quality of the liberal arts education would be upgraded together with an expansion of science education. The second development is to expand higher education and balance its development in terms of location. In six years, there will be an increase of 25 new colleges and universities, four of them in the north, five in central Taiwan, fourteen in the south and two in the east. Third, the percentage of college students in the total population aged 18-21 should reach 36% by 1996, an increase from 28% in 1991. This is an effort to catch up with the

developed countries. Finally, the ultimate goal of the education system is to provide life-time training for every adult. Universities and colleges would be open for more night classes or programs for personal growth and self-enrichment.

Vocational training

The problem for public vocational training is its insufficient demand.¹⁵ Remedies are needed to increase the demand for vocational training. These include an adjustment of training categories to fit demands of labor, such as increased training for job changers, supplementary training for disadvantaged groups or for service sector jobs. The targeted volume of training for these 16 public training centers will increase from about 20,000 people in 1990 to 30,000 people in 1996. Finally, private on-the-job training should be encouraged further to be the central policy of vocational training in the future.

Employment services

Improvement of employment service networks and establishment of legal bases for the operation of employment services are the two most crucial tasks for employment services. According to the Six-year National Plan, eight more public employment service centers will be created, i.e., a total of 54 centers in Taiwan by 1996. Moreover, there will be a nation-wide computer network linking all these centers together for up-to-date employment

information. The legislation of employment service is in the legal process, and is expected to be passed in 1992. After the legislation is in place, the complete employment security system will be established, which includes unemployment insurance and the regulation of private employment service agencies.

The imported labor policies

Today, the labor shortage is most severe in the manufacturing and construction sectors for low-skilled workers in Taiwan. Fourteen out of 18 employers' associations experiencing labor shortages have suggested that the government import unskilled labors. The reasons for labor shortage were low rates of job applicants, lower wages than expected and no interest in the jobs by workers (Tseng, 1988). But importing labor requires legislation and Taiwan has only temporary policies in this regard.

However, due to pressing need of the Six-year plan, several guidelines concerning imported labor have been published. In June, 1990, a primary agreement was reached among government officials on how to recruit foreign workers. An example of these guidelines included: their salaries would be set between NT\$20,000 and NT\$30,000, which is equivalent to \$740-\$1100 U.S.dollars; domestic firms should apply to the Council of Labor Affairs and would indicate the country of origin, number, qualifications and salary of the workers needed; then the council would recruit these workers through the foreign affairs offices in the

countries specified. The procedures will take about six months before any foreign workers could enter Taiwan (World Journal Daily News, June 19, 1990, 5th col.).

Furthermore, in July, 1991, Executive Yuan agreed to open 14 important construction contracts, 6 industries, and 15 occupations to imported laborers.¹⁶ Four basic principles regarding an imported labor policy were: (1) The government does not intend to open the market to all foreign workers, only specified ones. Illegal workers would be sent back, with no chance of legalizing their status within Taiwan. (2) Those construction contracts related to the Six-year National plan can apply for imported workers on a case-by-case basis. But available jobs must be advertised and offered to domestic workers first, only discrepancies in the labor pool can be filled by foreign workers. (3) Before legislation on employment service is passed (expected in 1992), all the management and application of foreign workers would be carried out by the Council of Labor Affairs, and (4) female domestic jobs would not be open to foreign workers, only health care workers in nursing homes and hospitals would be allowed to import labor. This has become the first official guideline to imported labors in Taiwan (Central Daily News, overseas version, June 23, 1991; July, 13, 1991; July 23, 1991; and Aug. 12, 1991; United Daily Evening News, Aug, 26, 1991).

As of August 1991, the Taiwan government approved about 3,500 imported workers to work for 14 important construction contracts, among them about 1,300 have entered the country

(Central Daily News, overseas version, August 12, 1991). By the end of December, 1991, it is estimated 30,000 legally imported laborers will be in Taiwan. Among them, 10,000 will be in 14 important construction sites, 15,000 will be in the six industries which are open to foreign workers, and 5,000 will be in construction work related to the Six-year National plan. The Taiwan government has signed agreements with the governments of Thailand, Indonesia, Malaysia and the Philippines to provide documents of any criminal behavior and health examinations for those who apply.

Evaluation of an imported labor policy is still under study by the Council of Labor Affairs, but several problems have emerged. Illegal immigrant workers were not eliminated, and their number is approximately the same as before. Even though there were 2,2579 illegal workers were reported to the police by the end of February 1991, for voluntary deportation in exchange for a tax amnesty and the right to return legally in the future (Central Daily News, Feb. 27, 1991; Far Eastern Economic Review, 151(11): 21-22, March, 1991), the number of illegals remaining in Taiwan is still around 1,000 people per month as of August, 1991. Another problem is the higher management cost for foreign workers which has caused some employers to review their policy of using foreign workers.

Moreover, application procedures for foreign workers are so complicated that it is easier and more convenient to engage illegal workers. The discrepancy between workers reported needed and hired (including domestic and foreign

workers) was about 6,000 for 14 construction contracts as of August 1991 (Central Daily News, August 12, 1991). It is suspected that the hiring of illegal workers is very common, and the labor shortage is still prevalent even after the importation of foreign workers due to the slow application process.

The Taiwan government has been very cautious in adopting an imported labor policy. There are four areas of considerations: (1) its effect on the upgrade of industrial structure to high-tech; (2) employment opportunity of domestic workers; (3) overall working conditions, and (4) social and national security and health problems of foreign workers (Central Daily News, July 23, 1991). Therefore, besides hiring foreign workers, other alternatives have also been suggested, which include upgrading of industry in order to reduce the need for unskilled labor, improving management to retain and attract more domestic workers, creating adjustment centers to coordinate supply of needed workers by contracting, promoting proper work ethics to avoid popularity of risky gambling, reducing personal income tax to induce labor participation, providing child care to attract female labor participation, promoting part-time work schedules to allow housewives, students, and retired persons to work, and reducing numbers of government employees in order to release them to private sector (Tseng, 1989).

Labor management policies

The labor movement is a recent phenomenon in Taiwan occurring after the abolishment of Martial Law in 1987. In the past forty years, the relationship between employers and workers has been relatively harmonious, mostly because there were no strong employers or strong labor unions to monopolize labor's market activity. On the employers' side, Taiwan had many small firms relative to a few large corporations during the development process. Therefore, the labor market was not dominated by any strong firms. On the workers' side, though they have the right to organize unions, under Martial Law, workers had no right to strike; the means to use unions to promote workers' consciousness and welfare were limited.

Furthermore, unions have been weak in terms of wage negotiations. Partly due to rapid economic growth, the demand for workers became so great that wages and benefits were increased automatically in order to attract more workers. Hence, there was not much room left for unions to demand higher wages. As a result of both political and economic conditions in the past, Taiwan's labor market has remained fairly competitive and free of strong outside influences from either employers or workers' unions (Lin, 1989)

When the political situation in Taiwan became liberalized in the 1980s, labor issues and movements increased. According to the statistics from the Council of Labor Affairs, the number of dispute cases increased after

1980. In 1987, cases of labor-management disputes reached its highest number, i.e., 1,609 cases, with 15,404 workers involved. Forty-eight percent of the dispute involved "claim for allowance and compensation." In 1988, number of dispute cases fell to 1,314, but the number of involved workers increased to 23,449. Some disputes were bonus-related strikes, or were caused by layoffs or the closing down of factories (Moore, 1989).

Several factors related to the increase of labor disputes: (1) change of expectation of working conditions by workers--because of increased income and rising education, the quality and characteristics of workers changed. They demand better working conditions and benefits; (2) rising labor consciousness--because of the liberalization of the economy and politics, workers became more conscious of their rights, unions became more active; (3) intervention by opposing political forces--the Democratic Progressive Party tried to use the labor movement to win popularity; (4) lag in the adjustment of management personnel--especially in family-owned firms. Some owners still tried to maintain an authority figure in dealing with labor issues and denied equal status of labor unions; and (5) the outdated labor laws--although various labor laws had been revised, some major frameworks needed to be changed. Besides, implementation of the existing laws had been too loose, and some labor laws are not practical. There were not enough administrative personnel to carry out the laws. The Standard Labor Law had been passed, but some aspects of the

law like the illegal dismissal, working hours, and holidays, retirement, and pension schemes needed more revisions. These problematic areas always caused labor disputes (Lin, 1989).

The Council of Labor Affairs was established in July, 1987, to be in charge of all labor-related administration. One department and four divisions were appointed to be in charge of employer-worker relationships. Facing increasing labor-management disputes, the Council's position was difficult, and it lacked the experience to deal with new and complicated labor issues.

Even though labor disputes increased after the lifting of martial law, no large-scale strikes occurred, and disputes were mostly confined to a particular firm or the factory itself. The lack of strong unions in Taiwan, and the prevalence of many small firms in the economy may be the two most important reasons for the small number of strikes.

The future of manpower planning

In conclusion, when Taiwan faced new economic, social, and political changes, the government's role concerning manpower planning also changed. It is perceived that in the future, national manpower planning unit will be more of an information provider, and less of a controlling center.

In the on-going Six-year plan there is no separate manpower plan, and manpower aspects have been integrated into the overall development plan. Various aspects of the manpower policies will tend to depend more on the private sector to operate and cooperate. The liberalization of the

education policy will gradually let market forces determine the supply of education output, cost of education and demand. Vocational training in the future will depend more on on-the-job training within firms. Employment services will aim to provide more efficient market information to the public. Individuals will have more freedom to make decisions with more information available. The future of labor quality will be more in private hands than in government. However, government's role will change but not diminish in Taiwan.

Chapter VIII--Notes

¹The five stages are the same as in Chapter III.

²Most of the people were employed in the agricultural sector. In 1946, 69.1% of the labor force was in the primary sector, 6.1% in the secondary sector, and 29.7% in the tertiary sector in 1946 (Chang, 1985:6). Up to 1952, agricultural employment consisted of 56.1%, the industrial sector employed 16.9% and the service sector contained 27% of the labor force (Taiwan Statistical Data Book, 1989, p.16). There was a 13% decline in agricultural employment, a 2.7% decline in service employment, but a 10.8% increase in industrial employment at the end of this period.

³In 1966, it was estimated that the supply of medical, engineering, and education college graduates was in shortage supply, agricultural and liberal arts graduates were in surplus, and the supply and demand of natural science graduates had reached equilibrium (The Manpower Development Planning, 1966, The International Economic Coordination and Development Committee, Executive Yuan, p.22. (mimeo.))

⁴For 1981-1988, data came from Taiwan Statistical Data Book, 1989, p.2. For 1989-1990, data came from Quarterly National Economic Trends, Taiwan Area, The Republic of China, Aug., 1991, p.51.

⁵From my interviews with staff members in the Manpower Planning Department in summer 1989.

⁶After the second manpower plan, the mid-term plan changed from a 5-year period to a 4-year period, in order to match the ongoing 4-year economic plan (The Third Year Manpower Plan, ROC., p.6).

⁷The references are based on the written plans and official documents obtained from the Manpower Planning Department in Taiwan.

⁸See Chapter VII.

⁹Vocational Training Funds Regulations (VTFR), enacted in February 1972, required that all enterprises having over 40 employees shall contribute no less than 1.5% of their total wage payments to the fund. This fund was to support the public centers of vocational training.

¹⁰However, VTF stopped collecting these funds in 1974 due to the economic recession.

¹¹This is the ratio of no. of applicants over no. of placements.

¹²A further analysis of the data showed that more than 80% of the unemployed said, they would not go to the centers for help. In 1978, 20.2% said yes, while in 1988, only 12.6% reported yes. The most popular reason for not registering was: they did not think they could find a good job there, 26.2% in 1978, and 48.8% in 1988.

¹³The Manual of Interior Statistics, 1991, p.19.

¹⁴Projections of the Population of the Taiwan Area, Republic of China, 1984-2011, Manpower Planning Committee, Council for Economic Planning and Development, Executive Yuan, 1984, p.44.

¹⁵There were not enough people enrolled in these classes held in various public vocational training centers. One of the reasons is the wage structure. The salary of basic technical workers was not much different from non-technical workers (Chang, 1985).

¹⁶See Chapter II for more details.

CHAPTER IX
CONCLUSIONS AND DISCUSSION

Introduction

This chapter will summarize the findings of the study and discuss them in terms of the human resources development framework. The first part includes findings on (1) labor force transformation in supply, industrial, and occupational structures; (2) labor force utilization; (3) labor force quality; (4) government's role in affecting labor force development; (4) the female labor force in Taiwan, and (5) policy implications for labor force development in Taiwan.

Discussions on future trends and problems of Taiwan's human resources development, in terms of conditions for continued success, problems ahead and possible solutions, and future political uncertainty in Taiwan will follow. Finally, some further studies will be proposed in both applied and theoretical fields.

The theoretical framework was based on Harbison's (1973) "human resource development" (HRD) approach which regards human resources as the principal concern of development and analyzes its relationship with development.

The HRD approach has several distinct features. First, it stresses development of the "entire" labor force in terms of their skills, knowledge, and capacities. Increases in education, health and work opportunities for all population are regarded as the priority result of national development.

Second, the HRD approach is concerned with the effective interrelationship between employment opportunities and learning opportunities. The goal of this approach is a full-employment economy, where reduction in unemployment is a central policy.

Four major problems of human resources are: (1) employment generation and utilization of the labor force in productive activity; (2) development of skills, knowledge, and capacities of people through the formal education system; (3) skill development through nonformal education and training activities; and (4) internal and international migration of strategic high-talent manpower.

This study goes beyond Harbison's original concerns of employment and training, and adds cultural and institutional factors to the study of the labor force. Confucian work ethics and the manpower policies of the government also contributed to the development and utilization of the labor force. Furthermore, the culture dimension of the labor force has expanded the concept of labor quality beyond the dimensions of education, health, and nutrition.

Therefore, this revised human resource development framework examines variables of labor force employment, labor force utilization, labor force work ethics, and labor force policy.

A Summary of Conclusions

The first section focuses on Taiwan's labor force transformation in supply, industrial, and occupational structures, drawn from Chapters II, III and IV. The second section will cover labor force utilization, based on Chapter V. Section three of this summary is on labor force quality, based on Chapters VI and VII. The final conclusion will cover the role of government, seen in Chapter VIII.

Taiwan's labor force transformation

Quantitative supply

1. Trends in labor force size is a function of natural population growth and labor force participation rates. After the 1950s, Taiwan's natural population growth was mostly due to an increase in the birth rate, rather than a decline in death rates. Fertility rates declined continuously in Taiwan since 1950s, except in 1976,¹ and total fertility rates reached the replacement level of 2.0 in the late 1980s.

Demographic changes accounted for 85% of total labor force changes from 1970 to 1988 and socio-economic factors for only 15%. Socio-economic factors were more important for females than for males in explaining the growth of labor force. Male workers had decreasing LFPR from 1970 to 1988.

2. In the future, the labor supply will slow down in Taiwan as it has in many developed countries. The average annual growth of the labor force between 1970 and 1988 was 4.3%,² but its growth was estimated to be only 1.9% between

1988 and 2001 and 1% to 2% between 2001 and 2011.³ Future labor force supply will increase mainly because of a higher female LFPR.

3. Taiwan's overall LFPR is still lower than in many developed countries, because of lower female participation rates in Taiwan. The labor force participation rate can be raised further because of remaining labor reserves to be drawn upon, especially married and older women.

4. Another prevalent trend of the future labor supply in Taiwan is aging of the labor force. Labor force aging may affect productivity, mobility, labor costs, and the relative economic status of younger workers (Bauer, 1990). The median age of the labor force will increase from 33.6 in 1988 to 39.6 in 2011. But compared with more advanced countries, Taiwan's population is still relatively young.

5. Finally, the decreasing labor supply and aging population indicate an urgent need for Taiwan to upgrade its production structure away from labor-intensive industries and into technical-intensive and skill-intensive industries. These high-tech jobs will require workers with more education and experience. On the other hand, the upgrade and expansion of service sector jobs, such as restaurants, travel, finance, and insurance, can provide more jobs for older and female workers, which will surely be in greater supply in Taiwan.

Labor force's industrial structure

1. In 36 years, Taiwan's employment structure changed from an agriculturally-dominated to service-dominated structure, with simultaneous growth of the industrial and service sectors after the decline of agricultural sector. Then the industrial sector took off in the 1970s and the service sector began to outgrow the industrial sector in the late 1980s.

2. Taiwan's sectoral transformation has followed Fisher-Clark's (Fisher, 1935; Clark, 1940) prediction that the decline of the primary sector directly led to the growth of the secondary sector first, and then to the growth of the tertiary sector. There were only 12 years between these two transformations in Taiwan. This pattern was similar to that of industrial countries in that a concomitant growth of employment in secondary and tertiary sectors occurred after the decline of the primary sector.

3. The Fisher-Clark thesis also predicts that service consumption increases as per capita income increases over time. Taiwan also followed such a pattern. Since 1964, per capita GNP was positively correlated with service employment. The growth of service consumption was even faster than that of per capita income from 1961 to 1985.

4. The micro-level mobility between industry was consistent with Urquhart's (1984) observation that an employment shift to services was not caused by actual migration of workers from one sector to another, but rather

resulted from the expansion of the labor force, especially the increasing participation of female workers.

5. Possible reasons for absorbing many new workers in non-agricultural sectors in Taiwan are the existence of many small firms, which makes it easier and cheaper for workers to find new employment and the economic prosperity; higher economic growth demands more labor.

6. Taiwan's labor market expansion in the 1980s did not depend on the absolute out-migration of agricultural workers, but rather on new workers in each sector, especially for women. The secondary sector attracted more new entrants than other sectors. Over an eight-year period, the tertiary sector caught up with the secondary sector in absorbing new workers. Micro-level analysis of labor force transformation also confirms the Fisher-Clark thesis that employment will shift to the service sector as the economy grows.

7. Within the service sector, commerce is expected to get the highest share, followed by the governmental service sector. In terms of growth in output, the fastest growing service industries will be the producer services, followed by distributive services. In terms of employment growth, the producer services will show the highest growth, followed by personal services.

8. There was lack of development of social service industries in Taiwan. The lower growth in social service industries in Taiwan may be due to less government expenditure in this area. In the past Taiwan's government

was more concerned with the economic infrastructure than with social welfare systems. The public services industries, such as education, medicine, social security system, and public health, have not been increased as fast as the growth of the overall economy.

9. Taiwan's future labor supply will consist of more educated workers. However, in the 1980s, the producer service industries in Taiwan employed more vocational high school graduates rather than college graduates. In the future, Taiwan will need to hire more better-educated high-level producer service workers.

10. In the past, Taiwan had a surplus of college-educated liberal arts and business graduates. The growth of the service sector, especially for producer services, can absorb these business college graduates by upgrading skill levels in that sector.

11. Taiwan's future economic growth will be closely linked to their ability to further transform its labor force to the service sector. Although its proportion of service workers has increased, but not all service jobs are new. Because some of them are simply more specialized versions of the old ones, as the "unbundling" hypothesis described (Urquhart, 1984). Therefore, economic development in the future will no longer be defined in terms of "industrialization" alone, "servicization" is currently the trend. Taiwan has begun to open up its market to new stimulation and competition in this area.

Labor force's occupational structure

1. Taiwan has not met the criteria of a post-industrial society because (1) its goods-producing sector still employs more workers than its service-producing sector; (2) its occupational structure still lacks sufficient professional and technical and administrative and managerial workers; and (3) its goods-producing sector lacks enough high-level, technical-elites to influence government decision-making. On the other hand, the pattern of sex segregation already resembles that of a post-industrial society with men concentrated in high-level white-collar positions, while women are concentrated in lower-level clerical and service jobs.

2. However, these high-level professionals at least doubled from 1952 to 1988. In order for Taiwan to enter a post-industrial society, an overall and continuous upgrading of the agricultural and industrial sectors is needed to further release workers into the service sector.

3. Job mobility rates in Taiwan reflect the market demand of workers. Higher mobility of an occupation implies a greater demand for such workers because mobile workers are always attracted to open opportunities. Agricultural, production-related, and professional and technical workers showed signs of decreasing job mobility rates from 1980 to 1988. This implies that the production-related jobs market was shrinking in 1988. On the other hand, administrative and managerial, clerical, sales, and service jobs all had a slightly increasing job mobility from 1980 to 1988. These

are all white-collar jobs, therefore, it confirms service sector expansion. In 1980, production-related workers had the highest job mobility rate. But in 1988, service workers had the highest mobility rates. This trend is consistent with the macro-level occupational transformation toward service jobs.

4. Based on outflow and inflow tables, the supply of high-level white-collar jobs has relied mostly on self-recruitment or new entrants, while lower-level white-collar jobs and others can be filled in by agricultural and blue-collar workers. Taiwan's labor market has shown such adjustment to move workers away from declining occupations and into expanding ones.

5. Sales, agricultural and production-related jobs had lower concentrations than other occupations in both supply and recruitment. This means their workers outflowed to more diverse occupational categories than did other occupations. Professional and technical, administrative and managerial, and clerical jobs, on the other hand, had higher concentrations in both supply and in recruitment than any other occupations. These are mostly high-skilled and white-collar jobs that had a higher degree of specialization and lower flexibility in transferring workers to other occupations.

6. From inflow and outflow patterns between occupations, the primary labor market may exist more inside three types of white-collar occupations--professional and technical, administrative and managerial, and clerical,

because of their higher degree of concentration in supply and in recruitment. On the other hand, agricultural and blue-collar occupations resembled secondary labor market conditions with the least concentration of supply and recruitment. Sales and service work may have a mixture of both the primary and the secondary labor market, for their medium level of self-recruitment.

7. Most workers in Taiwan quit their jobs due to either income or location considerations. In seeking employment, male workers emphasized income while females were more concerned about location. However, in general, Taiwan's job mobility is not sensitive to income. The income differential between those who quit and those who did not was about 10%. Geographic mobility is considered low in Taiwan, most people change jobs within the same regions. Workers from the north relocated to the south more often than to other regions.

Taiwan's labor force utilization

1. By using the revised version of the Labor Utilization Framework (LUF), Taiwan has a very high-level of adequate utilization. Taiwan's labor utilization was even better than in the U.S. About one in every six workers experienced some form of under-utilization, which is less than the average one in every four workers under-utilized in the U.S. The increase in under-utilization over time was mostly due to the 70% increase in mismatch rates from 1980 to 1988.

2. The major difference of under-utilization among educational groups is mismatch. Mismatch is a form of social under-utilization, and is by nature very different from other forms of under-utilization, which are based on economic reasons. Almost 50% of the total under-utilization rate in Taiwan is caused by mismatch. There may be many reasons for such differences, but one reason could be attributed to Taiwan's strong emphasis on full employment since the beginning of its economic policies.

3. Female workers had a similar level of adequate utilization. The age groups formed a U-shaped pattern of under-utilization in Taiwan: both the younger and older groups had higher rates of underemployment, while the prime age groups had lower rates. Growing industries had better labor utilization rates than declining ones. Manufacturing and social service workers had the best utilization, while agricultural industries had the worse utilization. Professional and technical and administrative and managerial occupations had the best utilization rates, but agricultural and service workers had the worst utilization. Clerical, sales, and production-related workers had a medium level of utilization. The higher the education, the less the labor utilization. The best utilized educational group was primary and junior high school; the worst utilized educational group was junior college and university and above.

4. Mismatch rate increase averaged 8.8% annually in Taiwan, which was higher than that of the U.S. in the 1970s

(7.5%). This may partly contribute to the rapid expansion of the educational system in Taiwan in the past four decades.

5. Men had a higher proportion of mismatch workers than women. The age group 25-29 had the highest share of mismatch workers and age groups below 35 years old had disproportionately more mismatch workers than their labor force shares. Mismatch workers mostly came from vocational high schools and junior colleges. Female business majors and male engineering majors had more mismatch than other majors. The four service industries such as distributive, producer, social, and personal services, had disproportionately more mismatch workers. The three white-collar occupations, such as clerical, sales, and service jobs, had disproportionately higher mismatch workers.

6. Mismatch defined by the occupation-education matrix rendered one to two times lower mismatch than the statistical cutoff as used in LUF. The result has confirmed that the functional requirement approach usually renders lower mismatch rates than the statistical approach.

7. Mismatch workers in Taiwan had lower average monthly salaries than non-mismatch workers. The non-mismatch workers earned about 19% to 34% more than mismatched workers. Because Taiwan's definition measures under-qualification, by definition, mismatch workers engaged in a lower-tier of occupation. Their earning differentials thus showed less returns for lower levels of work. Taiwan's statistics contradict with Shockey's (1989) results; however Shockey did not control for education level.

8. Whether permanent or transitory, labor under-utilization exists in all societies because of imperfections in the labor market. The types of under-utilization will possibly change with different stages of labor force transformation and economic growth. For the 1980s, Taiwan had fewer problems in sub-unemployment, involuntary part-time or even low-income, because it has become a developed country. At this stage of economic development, Taiwan has more mismatch problem than other forms of underemployment.

Taiwan's labor force quality

Confucian work ethics

1. Confucian work ethics are divided into four major categories, namely, familism, emphasis on learning and education, group-oriented virtues, and individual virtues.

2. Confucian work ethics are found to be a variable, depending on types of workers and type of industrial organizations. Family workers are found to be more diligent than non-family workers. Workers in factories with rational regulations tend to work harder than workers in family-owned businesses. Owners are found to work harder than employees.

3. Confucian work ethics seem to operate through informal channels rather than through formal channels in large organizations. Since formal channels require universalistic treatment in an affective-neutral manner, it is only through the informal channels of horizontal or vertical cliques that workers could cultivate cooperation,

trust, loyalty, and commitment to the leader or to the goal of the company.

4. Contrary to the cooperative image of Confucianism, severe competition exists among same-level workers and mistrust is evident between superiors and subordinates. This may be because internalization of the concept of "cooperation" is not deeply-rooted in Chinese Confucianism. The nature of cooperation in Chinese society is derived from the concept of "face" (lien) where cooperation is stressed as an outward conformity of one's behavior, rather than an internalization of the group's values and motivation. When there was conflict or advantages are involved, groupness or cooperation often loses its charm and its importance to competition. Cooperation should be regarded as a "situational morality" and types of organization must become a major factor so that cooperation can prevail.

5. Among Confucian work ethics, those linked to group-virtues (such as cooperation, loyalty, obedience, trustworthiness, responsibility, harmony and respect to others) are influenced more by different institutions, while "familism", "emphasis on learning and education", and "individual virtue" (like thrift, perseverance, and self-control) are influenced less by institutions. The virtue of hard work varies with type of reward system.

6. Ideal Confucian values may not be carried out in practice. Group virtues may be affected by new ethics of individuality prevalent in certain workplaces.

7. Economic incentives will facilitate culturally inherited work ethics to function better. The quality of labor in Taiwan is not just a result of Confucian work ethics, but is rather a product of labor's interaction with the characteristics of organizations.

8. The dominance of family enterprises provides the best motivation to bring out good Confucian values such as hard work. Family enterprises are encouraged in Taiwan, and in response, businessmen engage in the unlimited pursuit of wealth.

9. Confucian work ethics have also shaped the nature of business practices in Taiwan. The Confucian value of familism has led many Taiwan businesses to run on the logic of survival rather than on the logic of profit maximization. Taiwan's family businesses frequently under-quote and keep long hours, triggering intense market competition and forcing firms either to stay small or to go out of business.

10. This practice has the side-effect of hindering companies from upgrading their businesses to capital- and skill-intensive technology. Many small firms have also limited their research and development in Taiwan's industries. These practices have negative impacts on the transformation and utilization of skilled workers in the labor force as well as on future economic development.

Educational level

1. The quality of the labor force in Taiwan has shown great improvement through educational attainment. The

improvement has gone through three stages, i.e., from a high illiteracy stage to high elementary education, and then to high secondary education over the past four decades. The educational attainment of the labor force has grown by an average of 50% for all educational levels over a 10-year period from 1978 to 1988. The male labor force has been faster in its reduction of a lower educational workforce, such as junior high level and below. Female in the labor force, on the other hand, have improved more on higher educational levels, such as senior high and the university and up levels. The future trend of the educational composition of the labor force will continue to increase more for higher education levels, since the expansion of higher education is the focus for the 1990s according to the Six-year National Plan in Taiwan.

2. Educational levels have been upgraded for all industries and occupations. The proportion of illiterates in the agricultural industries has been decreased by one-third; the proportion of the senior vocational level have been increased in transformative, distributive, and personal services industries by about 100%; and the proportion of junior college level workers has increased in the producer and social services industries by two-thirds and one-third, respectively. Educational upgrades occurred more in lower- or middle-skilled occupations, such as production and clerical work, but not in professional and technical or administrative and managerial jobs. On the contrary, the proportion of junior college and university educated workers

decreased in these high-skilled occupations, especially for women. This pattern reflects the fact that an upgrade of labor force quality has been concentrated mostly at the secondary educational level.

3. Most educational expansion in Taiwan occurred during 1950-1970 from elementary education to higher education. After that, there was only limited growth for all types of education in the decade of 1970-1980. However, in the 1980s, only the growth of higher education surged. This indicates that higher education will be the focus of expansion in the 1990s.

4. Four major factors contributed to the overall expansion of the educational system in Taiwan. The increase of the school-age population due to the baby-boom after World War II placed a natural demand on the expansion of elementary schools in Taiwan. The rise in per capita income, due to rapid economic growth, pushed education expansion further to the secondary and higher education levels. The credentialism has accelerated demand for more higher education. The concern for manpower utilization has shaped the direction of expansion toward more vocational secondary and higher education, rather than for academic education. However, adjustment to market conditions has shifted higher education from that of an elite type to mass education.

5. Educational expansion has created unintended consequences such as lowering the quality of private education, an oversupply of liberal arts college students, and stimulating excess demand for education itself. Brain

drain is a natural phenomenon caused by pull and push factors unfavorable to the country of origin. If Taiwan continues to grow economically, socially, and politically, and the U.S. economy faces recession, Taiwan's brain drain will improve or even reverse itself in the future. The government is trying to its loosen control on education and establish more colleges to accommodate demand. A liberalization of higher education can bring up both the number of institutions and the quality of education, eventually improving the labor force in Taiwan.

Role of the government

1. The spirit of Taiwan's manpower policies follows that of the developing countries, with employment creation as its top priority. Though Taiwan's manpower plans were part of its economic plans from the beginning, systematic manpower planning was not established until the later stages of economic development.

2. The first manpower plan did not appear until 14 years after the first economic policy was implemented in Taiwan. It appeared in the third stage of economic development between 1965 and 1973, when economic policies had already gone through three four-year plans. There have been four manpower plans during this period. Between 1974 and 1980, there was one Six-year Special Project plan. In the fifth period between 1981 and 1990, there was a Ten-year Manpower Development Plan.

3. Development of manpower planning units went through three stages. In the first stage, from 1965 to 1973, there were three different planning groups. In the second stage, from 1974 to 1980, there were no planning units. In the third stage, from 1981 to 1989, the permanent Manpower Planning Department to coordinate manpower planning in Taiwan was in force.

4. Since the manpower planning unit itself was not the actual implementing institution, results of manpower planning should be attributed to both the cooperation and efforts of related government agencies and manpower planning units.

5. Altogether there were six separate manpower plans, each varied in contents and goals. All six included six basic areas: population, employment structure, education, vocational training, employment service, and labor conditions.

6. In general, Taiwan's population policies were effective in reducing population growth for the past three decades. The goal of population growth rate 1.25% was reached, by 1.1%, in 1989. A percentage of the population below 15 years of age reached its goal of 35% by 1977. The total fertility rate goal of 2.3 was not met in 1981, but it reached 1.7 in 1989. It is difficult to explain whether the results were due mainly to family planning programs or to economic progress, since both factors are important in reducing women's fertility.

7. The achievement of the education policy was in the area of expansion. However, a major failure was the adjustment of over-expansion in secondary and higher education. Education policy was successful in increasing percentages of junior high enrollment, but only partially successful in adjusting students' ratios in general high and vocational high schools. It also failed in increasing education expenditure in proportion to GNP, and proportions of technical college students.

8. The number of people who received vocational training increased dramatically between 1974 and 1980, but decreased slightly between 1981 and 1987. Private enterprises tripled their vocational training capacities in the 1970s, followed by public enterprises in the 1980s. The major form of vocational training has shifted from apprenticeship in 1979 to on-the-job training in 1985. Disadvantaged groups did not receive equal opportunities for public vocational training centers, which was contrary to its policy.

9. The public employment service centers received more job applicants over the years, but people still did not have confidence in its service. Employment information is still imperfect and personalized in Taiwan, as most people still find jobs through friends or relatives.

10. The Taiwanese government has been very cautious in adopting an imported labor policy. However, due to the pressing needs of the Six-year plan, several guidelines on imported labor have been published. Today, the labor

scarcity is most severe in the manufacturing and construction sectors for low-skilled workers in Taiwan. The government has agreed to open 14 important construction contracts, 6 industries and 15 occupations to the imported laborers.

11. The labor movement is a recent phenomenon in Taiwan, occurring after the abolishment of Martial Law in 1987. Even though labor disputes increased greatly after the lifting of martial law, no large-scale strikes have occurred, and disputes were mostly confined to particular firms or factories. The lack of strong unions in Taiwan and the prevalence of many small firms in the economy may be the two most important reasons for no large-scale strikes.

Female labor force in Taiwan

The fourth conclusion from this study concerns the female labor force in Taiwan. They can be described in terms of labor supply, industrial employment, occupational employment, labor utilization and labor quality.

Labor supply

1. The female population has increased in the past, except for those under 15 years old. Aging of the population was slower for females. The age group 60-64 had about 140% growth rate, but males had a higher growth rate of old people.

2. The increase of labor force size in age groups 60 and above was more than three-fold for women. Older female workers increased their participation in the labor market

five times more in 1988 than in 1970. The decline of younger workers aged 15-19 was higher in males than in females.

3. The proportion of women in the labor force increased significantly in Taiwan; in every age group, the male/female ratio has decreased greatly from 1970 to 1988. The number of female workers between the ages of 15 and 24, exceeded that of males. Schooling and military obligations for males contributed mainly to this difference. Moreover, the increase of female workers in all age groups is expected to continue into the year 2011.

5. The socio-economic effect was positive for females and negative for males. This implied that male workers decreased their participation in the labor market, while female participation grew. The age group 15-19 had the highest socio-economic effect of 108%, which implied that the decline of the female labor force in this age group was entirely due to the decline of its LFPR. The increase of female labor force above aged 25 was mostly accounted for by the increase of socio-economic effect rather than by the demographic effect. Thus, LFPR is far more important for women than for men in explaining labor force growth.

6. Although Taiwan's female LFPR is not low compared to other Asian countries, it can be raised further. Comparing between Japan and Taiwan, Taiwan's female LFPR was smaller in almost every age group, except for the age groups of 15-19 and 30-34. More females between the ages of 15 and 19 were in the labor market in Taiwan than in Japan because fewer women continued their junior high education in Taiwan.

Females in Japan aged 40 and above returned to the labor market more than those in Taiwan. The largest difference was in group 65 and above.

Industrial employment

1. The share of females was higher in the service-producing sector (41%) than in the goods-producing sector (35%). Women increased their share of employment in the service sector. In ten years, their employment grew 20% in service-producing industries, while men decreased their share in service employment by 10%.

2. There are some differences between males and females in labor force intersectoral mobility. There were twice as many new female workers as new male workers, except in the primary sector. The employment shift to the service sector was not caused by the actual migration of workers from one sector to another, but rather resulted from an expansion of the labor force, especially the increasing participation of female workers.

3. At the same time, females stayed less in their original sector, and were less likely than men to transfer to other sectors. Males had greater stability in industrial employment than females. They either moved within the same industries, or did not change jobs at all in a one-year period.

4. On the whole, growth rates for females were higher than those of males in all types of services, except personal services. These results show that the rate of females entering into the service sector is faster than for

males over the years. More females entered the service industries, producer services, while personal services absorbed the lowest number.

Occupational employment

1. Women entered professional and technical, and service and clerical jobs more at a higher proportion than men in 1988. Men still dominate in all occupations. The proportion of professional and technical workers in the total female labor force was higher than that of males. As the economy developed, the gap narrowed.

2. However, females had a smaller share of the total professional and technical jobs than males; the growth rate was larger for males than for females. As the economy developed, more males entered professional and technical jobs than females. Even though the total number of female professional and technical workers increased, their share in the labor force declined.

3. Economic development created relatively unfavorable terms for women to enter into professional and technical jobs in Taiwan. The trend in the administrative and managerial occupations was even more drastic. Taiwan's trend was similar to post-industrial society in that more women would hold white-collar lower clerical, or sales jobs, a higher proportion of men would be in professional and technical and administrative and managerial occupations.

4. As more men and women acquire the same qualifications to enter better positions, men often have better chances than women to secure employment. Therefore,

the growth rate of the proportion of males in professional and technical jobs increased more than that of females. Sex segregation in occupations may be the result of the interaction of employers' decisions with labor market characteristics. Employers may hire fewer women in the primary sector because of assumptions that women lack commitment due to their child-rearing and family responsibilities. Therefore, women tend to be more concentrated in secondary sector and lower-tier-primary sector jobs, such as service, sales, and clerical occupations.

5. Men had higher mobility rate for sales and service workers, while women had higher rates in professional and technical, and clerical categories in Taiwan during the 1980s. The female professional and technical workers had increasing mobility rates over the years while male professional and technical workers had decreasing mobility rates.

6. Increased mobility rates for female professional and technical workers in 1988 show that they were in greater demand than in 1980. At the same time, fewer female professional and technical and clerical workers changed to other occupations in 1988 when compared to male workers.

7. Female workers had higher rate of quitting than males. The two most common reasons for quitting were low-pay and changing workplace. The reason of low-pay was more important for males to change jobs than the need to change

workplace, while the need to change workplace was more important for females than the reason of low-pay.

8. Average monthly salary for females was about 50% to 60% less than salaries received by males. The average monthly salaries between female jobchangers and non-jobchangers were similar because low-pay was a less important a reason for females to quit. Females who quit their previous jobs always had a higher average monthly salary than those of the jobchangers. Female workers who quit previously because of low-pay always had the highest monthly salary compared to other groups. Because they accepted their present jobs which give them higher pay.

9. Female workers in the north (1980) and in the central part of Taiwan (1988) had higher proportion of quitting for the reason of changing workplace. In 1988, more females moved from the south to the north, and from the east to the central regions than in 1980.

Patterns of utilization

1. Female workers had similar levels of adequate utilization as the males. The ratio of females over males in terms of adequate utilization remained 1.0 over time. However, females had consistently higher sub-unemployment than males, though these differences decreased over time. Females had similar unemployment rates as males, and the ratio of F/M improved over time. Men tend to have higher rates on the rest of underemployment such as, involuntary part-time, low-income, and mismatch than women. Females only

had 70% to 90% involuntary part-time, 50% to 60% low-income, and 80% to 90% mismatch when compared with males.

2. Decrease in sub-unemployment and unemployment ratio between men and women seemed to signify the decline of females as marginal workers in Taiwan, but the ratio of involuntary part-time, low-income, and mismatch increased from 1980 to 1988 between women and men. Women began to have different types of under-utilization as the economy developed.

3. Low mismatch rate among women may be due to their higher under-utilization in other categories, or because of their educations fits the job better. On the other hand, lower mismatch for women may imply a narrower demand for women's training and employment. This would lower the mismatch and unemployment rates for women. Women often have the alternative not to participate in the labor force, therefore, they show a lower mismatch rate.

4. The proportion of mismatch workers from senior high and university graduates decreased faster for males than for females. Female business majors and male engineering majors had more mismatch than other workers. The distributive service industries had the largest proportion of mismatch workers, over the years, male mismatch workers increased, while mismatch decreased for females in service industries.

5. Female mismatch workers were concentrated more in clerical and the service work, while more male mismatch workers came from production-related and sales occupations.

6. Mismatch workers in Taiwan had a lower average monthly salary than non-mismatch workers. For females, the salary differences were smaller, about 3% to 4%. For males, the difference was much higher, 21% to 23% between 1980 and 1988.

Labor force quality

1. Male population over 15 years old had higher educational attainment than females, especially in the secondary and post-secondary levels. Both males and females have greatly increased their education between 1951 and 1988; however, gains were larger for females than for males. The only exception was in senior high general education, where males increased faster than females.

2. A basic reason for the faster growth for females in educational attainment is because originally their educational levels were so much lower than that of the males. With more equal access to formal education in Taiwan, and the gradual reduction of preference of sons over daughters, female educational attainment overall has greatly improved. But there is still a gap, especially in general high school and higher education.

3. The female labor force, in general, had lower educational attainment than males. It can be seen from the higher percentages of illiterates and the self-educated, but lower percentages in other higher levels of education for women. The female labor force grew faster in senior high educational level and university and above level than males.

4. Sex differences in the changes of educational attainment indicated that more females with better education have entered the labor market more easily in 1988 than in 1978. Female workers differed significantly from male workers in distributive service industries. In 1988 more female workers than men, with primary education and below, senior vocational and junior colleges, joined distributive industries. The proportion of female workers in distributive industries increased greatly for both low and high educational levels.

Policy implications

The following is a summary of policy implications derived from this study regarding development of labor force in Taiwan.

1. The public vocational training centers should open more to unskilled, older, and female workers in order to help them make the transition to service or higher level skilled jobs. Those middle-aged married women re-entering the labor market should also be given priority in training and employment services. The training in the future should provide more women with high-level skills in producer service industries, for example, banking, finance, insurance, and law.

2. To ease labor shortage, strengthening the legal base for control of foreign labors should be the priority of the government. Currently, Taiwan has labor scarcity, but importation of labor has been constrained by the

government's slow response to establish policies. In the future, imported labor should and will increase.

3. There is a need to re-classify occupations in Taiwan's manpower survey to cope with the rapid change of the service economy. As a result of rapid economic development in Taiwan, more types of clerical and service jobs have been created. Therefore, more workers belong to the "other unclassified" categories of clerical or service work.

4. Priority should be given to the reform of its formal education system to meet the needs of future service demand. Government should recognize the need for more service-related education and training available to first-time job hunters or new entrants.

5. In the future, the focus on promoting high-level manpower should also include producer services professionals and managers as well as technical and scientific manpower. Incentives should be also given to business and liberal arts majors in college. Taiwan may have a surplus in these disciplines, but this should not be a reason to ignore or postpone the training of highly qualified producer services workers, because there is a close linkage between producer services and goods producing sectors.

6. Taiwan should develop its welfare system such as national medical insurance system, and employment compensation for unemployment more aggressively. The transformation of the service sector in Taiwan in the 1980s

did not include social services industries, which is very different from the developed countries.

7. The government should open its markets to foreign service industries, like banking, insurance, and tourism to upgrade domestic service industries. With the development of service sector, Taiwan may be able to export its the service products to other developing countries in order to promote growth in the future.

8. The government should continue to develop non-metropolitan areas away from the north in order to attract more employment to other areas. This study has shown that, in late 1980s, more workers in the north moved to the south. This is an encouraging development for the government's decentralization plan, which is designed to shift the population from the north and the south to the central area, and from the west to the east.

9. The under-utilization data should be used for the formation of a manpower policy in Taiwan so that the severity of any specific types of under-utilization and policy formation target groups can be found. The questionnaire of the manpower survey should include the past work history for every individual, not just those presently employed. This will enable one to study mobility patterns more accurately. Data on foreign workers should begin to accumulate in order to understand the effectiveness and problems of the imported workers.

10. The government should establish a policy and work on creative ways to further cultivate and the promote

positive aspects of Confucian work ethics in the workplace. Work ethics emphasized in the textbooks of vocational high schools are largely missing in the workplace, such as cooperation and factory as family. Confucian work ethics have been challenged by westernization and industrialization.

The Future of Labor Force Development in Taiwan

Will success continue?

Taiwan's first success in labor force development is its relocation of labor from the agricultural to the service sector. At the same time, massive rural to urban migration was prevented because of these policies of decentralized labor-intensive industrialization.

Taiwan's second success lies in the supply of middle-level technicians by a large expansion of secondary vocational education since the 1970s. These graduates have helped to upgrade labor-intensive industry with innovation and productivity to make Taiwan's products competitive in the world market.

Taiwan has learned how to make the best use of its abundant labor. Can Taiwan continue to develop new ways to use its human resources? Now, Taiwan is facing the biggest challenge ever to upgrade its industrial structure to skill and technical-intensive levels, which the government has tried to do since the 1980s. The type of manpower needed is high-level professional and technical workers and high-level

administrative and managerial personnel. The task is totally different from the past, since labor force transformation in the future means quality transformation more than sectoral transformation. Although the foundation of primary and secondary education has been laid, tertiary education has yet to improve in both quantity and quality. High-level research and scientific personnel are still lacking in both quantity and quality in Taiwan. Continued success in the labor sector is not automatically granted. Three major challenges lie ahead in the overall human resource development in Taiwan: (1) the upgrading of its quality of labor force in a broader sense, including education, moral education, and democratic citizenship, (2) the re-distribution of manpower away from the north and metropolitan areas, and (3) the solution for the labor scarcity.

Structural upgrading and liberalization

The number one challenge for Taiwan in the near future is how to upgrade its economic structure to a technical-intensive and capital-intensive level. The infrastructure and capital are there but the human capital is lacking. Taiwan has a very low percentage of professional and technical personnel (7%) and administrative and managerial workers (1%) as compared to other NICs and developed countries. These percentages indicated that the economic structure and organization are yet to be improved in order to employ more high-level professional workers.

A related phenomenon is that Taiwan's investment in research and development is relatively low, especially for the private sector. This is a great impediment to the creation and development of value-added products. The government has created the Industrial and Science Park in Hsin-Gu to attract high-tech companies, but compared to the rest of the country, the investment of research and development is very limited.

On the other hand, Taiwan still has about 12% agricultural employment; a relatively high ratio as compared to developed countries. Farm productivity and mechanization need to be increased to further release workers into industrial and service sectors.

One of the best ways to stimulate changes is competition, which means further opening of domestic markets for agriculture, heavy-industry, and service products. With an open-door policy, the competitive industries will stay, while the non-competitive ones will move out.

As for the supply of qualified workers, the liberalization of higher education is also needed, which means a further expansion of higher education based on market demand and costs. To continue to improve R&D ability and to train domestic specialists, more cooperation with advanced countries is needed in science and technology education and research.

Manpower concentration and relocation

Except for agriculture, all other industrial and occupations are concentrated in the northern part of the island, more than 40% of the total labor force is employed in the north. All kinds of industrial and service jobs are concentrated in the north, such as transformative (46%), distributive (50%), producer services (55%), social services (45%), and personal services (46%), while agricultural jobs are spread throughout the central (40%) and the southern parts (41%) (see Appendix Table B.1). The quality of schools varies by regions: the north has the best teachers and facilities; eastern part is the least developed, and lacks infrastructure for industrial development.

The solution may be to adopt a policy of decentralized technical-intensive industries and create different specialities by region throughout the island.

Labor scarcity and labor importation

Labor scarcity in Taiwan began to emerge in the 1970s. By the late 1980s, it reached a point where public construction was interrupted. Due to a lack of legislation to monitor foreign workers, the numbers of illegal immigrants surged in the late 1980s. The policy of imported labors has not been formed firmly, especially regarding labor from Mainland China. The importation of labor is a trend, but its legal base lags behind the need. The mechanism, with languages training and counseling, to help in the adjustment of those foreign workers also has not been setup.

The importation of Mainland China labor is currently under consideration, but the pace should be slower due to political consideration. The first step is to see how other foreign laborers from southeast Asia have been monitored and controlled effectively.

The future uncertainty

Political future

The greatest uncertainty for Taiwan lies in its political future. With an optimistic view, more cooperation should occur between Mainland China and Taiwan. The formation of economic unity among Mainland China, Taiwan, and Hong Kong may gradually appear. The utilization of Taiwan's capital and manpower, Hong Kong's management and marketing ability, and Mainland China's surplus labor and natural resources will maximize growth in all three areas. The manpower can be exchanged in these three areas, where Taiwan could utilize scientists from Mainland China to fill in the gaps in high-level research.

But with a pessimistic view, Mainland China may not reform its political system, and eventually Hong Kong and Taiwan will be suffocated by Mainland China's military aggression. If this happens, upper and middle level manpower will be the first to leave Taiwan and only the lower-level manpower will remain, as is happening in Hong Kong now. Taiwan's human resources will be greatly eroded.

At the present time the Taiwan government is facing a great dilemma. The conflict between appeals for unification

and for independence has threatened its social stability. The continued upgrade of human resources by education of citizenship, democracy, work ethics and morals will create a larger middle-class, which in turn may lead the society onto a more rational path. The quality of Taiwan's human resources should be able to influence its own political future.

The U.S. recession

Since Taiwan's export is largely related to the American market, the recession in the U.S. will trigger more protectionism, and thus reduce Taiwan's exports to the U.S. This recession will also affect employment opportunity due to high unemployment and under-utilization in Taiwan. A deterioration in the economy will also affect investment in human capital for both individuals and government. Thus, the quality of the labor force will be reduced, and eventually productivity would be affected.

The remedy to such a condition would be to diversify Taiwan's export further to other regions, such as Asia and Europe. The continued growth of exports will raise the demand of both the quantity and quality of labor force.

The role of manpower planning

With more liberalization in the educational system, imported labor and the economy, the need for government control of the supply-side of labor force will decrease. On the other hand, liberalization of the economy places more responsibility on individuals. The government's role will

still be more important in providing market information and job allocation counseling. Thus, the contents of manpower policies may be changed, but the responsibility of government will not be altered easily in Taiwan. The manpower department in government should strengthen its database, while loosening its control of the labor force.

In sum, the future role of manpower planning should be directed toward facilitating the efficiency of the adjustment process of the economy by addressing institutional obstacles. As one author put it: "The goal of human resource development should be to provide opportunities for individuals to become better informed--in the sense both of one's personal ability to be prepared for employment and one's broader awareness of the quality of the society of which he or she is a part." (Briggs, Jr., 1987:1235)

Future Research

Due to the broad span of this study, there are many areas which need to be further investigated. The following are suggested:

1. Regarding labor supply: (1) As aging of population in Taiwan is inevitable, its effects on productivity, mobility, labor costs, and the economic status of young workers should be examined. (2) Effects of development of high-technology industries on income equality should be

explored as Taiwan has promoted more on high-tech industries since the 1980s.

2. For industrial employment: (1) Factors causing the growth of producer services industries in Taiwan should be studied, such as its demographic composition, manpower needs, and productivity growth. (2) Factors influencing the slow growth in the social services industry in Taiwan should be investigated. The government's policies, workers compositions, and future trends should be examined. (3) The study of possible servicization in Taiwan should be analyzed, and how to speed up the growth of service sectors should be included.

3. For the occupational structure: (1) Compositions and factors influencing the growing needs of female professional workers must be understood, as such an understanding is very important to the future status of women in Taiwan. (2) How to improve manpower forecasting by using the inter-mobility table of industries and occupations should be examined in order to improve forecasting techniques. (3) Study of wage differences for voluntary turnover by geographical locations and firm sizes in Taiwan is important in relation to the government's decentralization policy.

4. For labor utilization: (1) How to use the result of the labor utilization framework to help the formation of manpower policy in Taiwan should be further studied, so that underutilized groups can benefit more from government policy. (2) The demographic composition of the

under-utilized groups should be identified consistently in order to improve their employment status.

5. For work ethics: A large-scale survey to examine the prevalence of Confucian work ethics in Taiwan should be conducted, based on the category developed in this study. The controlling variables should include sex, types of organization, employment status, and worker relationships. It can empirically define Confucian work ethics in contemporary Taiwan and develop a scale to measure them.

6. For educational and manpower policies: (1) A model of educational expansion in Taiwan at different levels should be established. Factors which determine expansion should be identified. (2) The latest push and pull factors of brain drain should be analyzed, and policies to decrease it should be examined.

7. In terms of manpower planning: (1) Demand for public vocational training in Taiwan should be assessed in order to evaluate the function of public vocational training centers. (2) Methods to strengthen on-the-job training in the private sector are needed to help Taiwan's industrial upgrading. (3) How to improve the function of employment services in Taiwan needs investigation in order to evaluate public employment service centers.

Besides the above specific topics for future study, this research also recommends future studies in sociology of work, sociology of labor market, sociology of development, and even a new area such as sociology of human resources development. For sociology of work: macro-micro linkage can

be obtained by studying macro-level employment structures with micro-level work ethics, as suggested in this study. For sociology of the labor market, models are needed to include free market with government planning and control, such as managed trade and managed market. Related to sociology of development, study of the world-system should investigate human resources development, role of human resources in economic development, and East-Asian models with a focus on human resource development. A suggested area of Sociology of human resources development should be more than a demographic study and should focus on the quality of the labor force, measurement of labor force quality, the institutional factor in human resources development, and cultural and value aspects of the labor force, from both macro-level and micro-level studies. Sociology should be able to deal with quality, cultural, and institutional variables of human resources more comfortably and better than other disciplines.

Chapter IX--Notes

¹It increased from 2.8 to 3.1, which partly reflected the baby boomers reaching child-bearing age (Lin, 1982).

²Calculated from Yearbook of Manpower Statistics, Taiwan area, ROC, 1988, pp.18-20.

³Calculated from Appendix tables A.2 and A.4.

APPENDIX A

PROJECTIONS ON LABOR FORCE IN TAIWAN

Table A.1

Projection of Labor Force in Taiwan, 2001

	Estimated pop.15+(x1000)	Estimated LFPR (%)	Estimated Labor force (1)x(2)
TOTAL			
15-19	2009	22.4	451 (100.0%)
20-24	1560	70.0	1092 (100.0%)
25-29	1576	75.9	1332 (100.0%)
30-34	1838	75.7	1391 (100.0%)
35-39	1934	75.6	1462 (100.0%)
40-44	1859	75.6	1406 (100.0%)
45-49	1681	73.1	1229 (100.0%)
50-54	1133	66.7	756 (100.0%)
55-59	858	60.7	521 (100.0%)
60-64	772	47.8	369 (100.0%)
65+	1853	14.8	274 (100.0%)
Total	17255	59.6	10283 (100.0%)
MALE			
15-19	1015	20.0	203 (2.0%)
20-24	594	70.0	416 (4.1%)
25-29	880	94.5	831 (8.1%)
30-34	928	98.5	914 (8.9%)
35-39	972	98.6	958 (9.3%)
40-44	930	98.2	913 (8.9%)
45-49	837	96.4	807 (7.9%)
50-54	566	94.4	534 (5.2%)
55-59	430	87.1	374 (3.6%)
60-64	379	75.0	284 (2.8%)
65+	952	25.0	238 (2.3%)
Total	8482	76.3	6472 (62.9%)
FEMALE			
15-19	994	25.0	248 (2.4%)
20-24	966	70.0	676 (6.6%)
25-29	877	57.1	501 (4.9%)
30-34	910	52.4	477 (4.6%)
35-39	963	52.4	504 (4.9%)
40-44	930	53.0	493 (4.8%)
45-49	844	50.0	422 (4.1%)
50-54	567	39.2	222 (2.2%)
55-59	428	34.3	147 (1.4%)
60-64	394	21.6	85 (0.8%)
65+	901	4.0	36 (0.4%)
Total	8773	43.4	3811 (37.1%)

Source: Tables 10, 11 and 12, in Manpower Planning Department (1984).

Table A.2

Projection of Labor Force in 2011, Based on the Average LFPR of 1983-1988 in Taiwan

	(1) Estimated pop.15+ (x1000)	(2) Ave.LFPR of 1983-88 (%)	(3) Estimated Labor force (1)x(2)
TOTAL			
15-19	1459	33.7	491
20-24	1575	67.8	1068
25-29	1788	73.5	1315
30-34	1986	74.8	1486
35-39	1787	76.8	1372
40-44	1833	76.0	1392
45-49	1912	71.9	1374
50-54	1793	66.0	1183
55-59	1583	58.4	924
60-64	1086	41.2	448
65+	2323	9.8	227
Total	19125	59.0*	11279
MALE			
15-19	754	32.4	244
20-24	813	73.9	601
25-29	918	94.8	871
30-34	1016	97.9	995
35-39	910	98.1	893
40-44	930	97.8	909
45-49	964	96.1	927
50-54	898	90.3	811
55-59	787	79.3	624
60-64	537	58.2	313
65+	1122	15.8	177
Total	9649	76.3*	7364
FEMALE			
15-19	705	34.9	246
20-24	763	64.0	488
25-29	870	52.1	454
30-34	970	51.0	495
35-39	876	53.7	470
40-44	904	52.7	476
45-49	947	46.8	443
50-54	895	38.4	344
55-59	796	29.2	232
60-64	549	17.5	96
65+	1201	3.3	40
Total	9476	40.0*	3785

* Modified by $LFPR=(3)/(1)*100$. Source: (1) Based on medium projection, see Manpower Planning Department (1988). (2) The ave. LFPR of 1983-88 is calculated from Yearbook of Manpower Statistics, Taiwan Area, ROC, 1988, pp.24-26.

Table A.3

The Projection of Labor Force in 2011, Based on the
Projected LFPR of 2001 in Taiwan

	(1) Estimated pop.15+ (x1000)	(2) LFPR of 2001 (%)	(3) Estimated Labor force (1)x(2)
TOTAL			
15-19	1459	22.4	327
20-24	1575	70.0	1103
25-29	1788	76.3	1365
30-34	1986	76.0	1509
35-39	1787	75.9	1356
40-44	1833	75.9	1392
45-49	1912	73.4	1403
50-54	1793	66.9	1199
55-59	1583	60.5	958
60-64	1086	48.1	522
65+	2323	14.2	329
Total	19125	59.8*	11463
MALE			
15-19	754	20.0	151
20-24	813	70.0	569
25-29	918	94.5	868
30-34	1016	98.5	1001
35-39	910	98.6	897
40-44	930	98.2	913
45-49	964	96.4	929
50-54	898	94.4	848
55-59	787	87.1	685
60-64	537	75.0	403
65+	1122	25.0	281
Total	9649	78.2*	7545
FEMALE			
15-19	705	25.0	176
20-24	763	70.0	534
25-29	870	57.1	497
30-34	970	52.4	508
35-39	876	52.4	459
40-44	904	53.0	479
45-49	947	50.0	474
50-54	895	39.2	351
55-59	796	34.3	273
60-64	549	21.6	119
65+	1201	4.0	48
Total	9476	41.3*	3918

* Modified by (3)/(1)x100, slightly different from the original estimation in Appendix Table A.2.

Source: same as Appendix Tables A.1 and A.2.

Table A.4

Projection of Labor Force of 2011 in Taiwan, Based on the
Japan's LFPR of 1988

Age	(1) Estimated pop.15+ (x1000)	(2) Japan's LFPR/'88(%)	(3) Estimated Labor force (1)x(2)
		TOTAL	
15-19	1459	16.8	245
20-24	1575	72.3	1139
25-29	1788	77.3	1382
30-34	1986	74.3	1476
35-39	1787	79.5	1421
40-44	1833	82.8	1518
45-49	1912	83.2	1591
50-54	1793	79.6	1427
55-59	1583	70.7	1119
60-64	1086	53.8	584
65+	2323	23.8	553
Total	19125	65.1*	12454
		MALE	
15-19	754	17.2	130
20-24	813	71.0	577
25-29	918	96.2	883
30-34	1016	97.0	986
35-39	910	97.5	887
40-44	930	97.5	907
45-49	964	97.2	937
50-54	898	96.0	862
55-59	787	91.3	719
60-64	537	71.1	382
65+	1122	35.8	402
Total	9649	79.5*	7671
		FEMALE	
15-19	705	16.5	116
20-24	763	73.7	562
25-29	870	54.5	474
30-34	970	54.5	529
35-39	876	64.5	565
40-44	904	64.5	583
45-49	947	66.4	629
50-54	895	66.4	594
55-59	796	45.2	360
60-64	549	45.2	248
65+	1201	15.7	189
Total	9476	51.2*	4849

* Modified by (3)/(1)x100, slightly different from the original estimation. Source: (1) same as Appendix Table A.2. (2) The Japanese 1988 LFPR is from p.27, Labor Statistics of Japan, 1989, Statistical Bureau, Management & Coordination Agency, Japan.

Table A.5

The Determinants of Labor Force Size in Taiwan, 1970-1988

	(1) 1970 LF (X1000)	(2) 1988 LF (X1000)	(3) 1988LF x70'LFPR (X1000)	(4) Total change (2)-(1)/ (1)x100	(5) Demo. factor (3)-(1)/ (1)x100	(6) Socio-econ. factor (2)-(3)/(1) x100
Total	4606	8247	7688	79.0	66.9	12.1
MALE						
Total	3166	5131	5376	62.1	69.8	- 7.7
15-19	461	255	473	-44.7	2.6	-47.3
20-24	250	432	475	72.8	89.9	-17.1
25-29	430	907	928	110.9	115.7	- 4.8
30-34	444	876	878	97.3	97.8	- 0.5
35-39	421	732	735	73.9	74.7	- 0.8
40-44	376	454	454	20.7	20.8	0.0
45-49	316	440	431	39.2	36.5	2.7
50-54	222	370	363	66.7	63.5	3.2
55-59	165	349	340	111.5	106.2	5.4
60-64	59	227	164	284.7	177.5	107.3
65+	22	89	68	304.5	209.5	95.0
FEMALE						
Total	1440	3116	2363	116.4	64.1	52.3
15-19	442	270	456	-38.9	3.2	-42.1
20-24	251	626	451	149.4	79.7	69.7
25-29	137	543	294	296.4	114.6	181.8
30-34	159	472	282	196.9	77.4	119.5
35-39	155	408	266	163.2	71.6	91.6
40-44	128	247	162	93.0	26.6	66.4
45-49	81	218	132	169.1	63.0	106.2
50-54	48	156	93	225.0	93.8	131.3
55-59	28	106	51	278.6	82.1	196.4
60-64	8	52	15	550.0	87.5	462.5
65+	3	18	7	500.0	133.3	366.7

Source: Calculated from Statistical Yearbook of the Republic of China, 1990.

Table A.6

The Labor Force Participation Rates in Taiwan, 1970

	Total	Male	Female
15-19	51.28	52.03	50.51
20-24	59.36	78.86	47.63
25-29	63.71	96.63	30.79
30-34	63.81	98.23	32.25
35-39	67.84	98.59	36.73
40-44	68.11	97.66	36.06
45-49	65.30	94.61	29.56
50-54	59.60	89.16	23.53
55-59	48.37	78.20	14.89
60-64	23.10	41.55	5.41
65+	5.85	11.58	1.27
Total	56.13	78.41	34.55

Source: Calculated from Statistical Abstract of ROC, 1971, p.573.

Table A.7

The Labor Force Participation Rates in Taiwan, 1988

	Total	Male	Female
15-19	28.98	28.01	29.94
20-24	68.31	71.71	66.14
25-29	75.67	94.50	56.77
30-34	76.23	97.93	54.02
35-39	77.59	98.12	56.39
40-44	76.59	97.66	54.86
45-49	72.94	96.55	48.85
50-54	65.62	91.06	39.47
55-59	58.49	80.18	30.90
60-64	41.68	57.50	19.05
65+	9.64	15.21	3.43
Total	60.21	74.83	45.56

Source: Yearbook of Manpower Statistics, Taiwan Area, ROC, 1988, pp.24-26.

APPENDIX B

MISMATCH WORKERS IN TAIWAN

Table B.1 The Occupation-Education Matrix in Taiwan

教育程度	職業	專門性工作人員	行政及主管人員	監督及佐理		
		Professional, technical & related workers	Administrative and managerial workers	業務監督人員 Clerical supervisors	政府行政監督及佐理人員 Government executive officials	打字員 Typists
不自 國 國 高 高	不識字	A	A	A	A	A
	小學	A	A	A	A	A
	初中	A	A	A	A	A
	高中	A	A	A	A	A
	高工	A	A	A	A	A
	醫藥	A	A	A	A	A
	警政	A	A	A	A	A
	其他	A	A	A	A	A
	師範	A	A	A	A	I
	人	A	A	A	A	I
大	商工	A	A	A	A	I
	醫藥	A	A	A	A	I
	警政	A	A	A	A	I
	其他	A	A	A	A	I
	學文	A	A	A	A	I
	法律	A	A	A	A	I
	商理	A	A	A	A	I
	工業	A	A	A	A	I
	醫藥	A	A	A	A	I
	警政	A	A	A	A	I
其	教育	A	A	A	A	I
	其他	A	A	A	A	I

A : 表示教育與職業相稱

I : 表示教育與職業不相稱

Table B.1 The Occupation-Education Matrix in Taiwan
(Continued)

人 員 Clerical and related workers					Occupation Educational attainment
簿記員出納員 Book-keepers, cashier	計算機操作員 Computing mach. operators	運輸通信監督人員 Transport & communications supervisors	隨車工作人員 Transport conductors	郵政佐理人員 Mail distri, clerks	
A	A	A	A	A	Illiterate
A	A	A	A	A	Self-educated
A	A	A	A	A	Primary school
A	A	A	A	A	Junior high
A	A	A	A	A	Senior high
					Vocational
A	A	A	A	A	Commerce
A	A	A	I	A	Industry
A	A	A	I	A	Agriculture
A	A	I	I	I	Medical care
A	A	A	I	A	Police work
I	A	A	I	A	Others
A	A	A	I	I	Normal school
					Junior college
A	A	A	I	A	Humanities
A	A	A	I	A	Commerce
I	A	A	I	I	Industry
I	A	A	I	I	Agriculture
I	A	I	I	I	Medical care
I	A	I	I	I	Education
I	A	A	I	I	Others
					College
I	A	A	I	A	Humanities
I	A	A	I	A	Law
I	A	A	I	A	Commerce
I	A	A	I	I	Normal science
I	A	A	I	I	Industry
I	A	A	I	I	Agriculture
I	A	I	I	I	Medical care
I	A	A	I	A	Police work
I	A	I	I	I	Education
I	A	A	I	A	Others

A: Matching occupational and educational attainment

I: Matching occupation and educational attainment

Table B.1 The Occupation-Education Matrix in Taiwan
(Continued)

職業 Education	監督及佐理人員 Clerical end related workers		買賣工作人員 Sales and related workers				
	電信工作人員 Telephone & telegraph operators	其他佐理人員 Clerical related workers not elsewhere classified	批發及零售經理 Managers (wholesale & retail trade)	批發及零售業主 Working proprietors (wholesale & retail trade)	售貨監督及 採購人員 Sales supervisors & buyers	專技銷售員 、行商及代理商 Tech. salesmen, commercial travel- lers & mfgs' agents	
不自	A	A	A	A	A	A	
國	A	A	A	A	A	A	
國	A	A	A	A	A	A	
高	A	A	A	A	A	A	
高	A	A	A	A	A	A	
商	A	A	A	A	A	A	
工	A	A	A	A	A	A	
農	A	A	A	A	A	A	
醫	I	A	A	A	A	A	
軍	A	A	A	A	A	A	
其	A	A	A	A	A	A	
師	I	I	A	A	I	A	
專	A	A	A	A	A	A	
人	A	A	A	A	A	A	
商	A	A	A	A	A	A	
工	I	A	A	A	A	A	
農	I	A	A	A	A	A	
醫	I	A	A	A	I	I	
教	A	A	A	A	A	A	
其	A	A	A	A	A	A	
大	A	I	A	A	I	A	
人	A	I	A	A	I	A	
法	A	I	A	A	A	A	
商	I	I	A	A	I	A	
理	A	I	A	A	A	A	
工	I	I	A	A	A	A	
農	I	I	A	A	I	A	
醫	A	I	A	A	I	I	
軍	A	I	A	A	I	I	
其	A	I	A	A	A	A	

A: 表示教育與職業相稱

I: 表示教育與職業不相稱

Table B.1 The Occupation-Education Matrix in Taiwan
(Continued)

Sales workers			服務工作人員 Services workers		Occupation Educational attainment
經紀人拍賣員 Stock brokers & auctioneers	售貨員 Salesmen	其他買賣工作人員 Sales workers not elsewhere classified	餐旅業經理 Managers (catering & lodging services)	從業自營業主 Working proprietors (catering & lodging services)	
A	A	A	A	A	Illiterate
A	A	A	A	A	Self-educated
A	A	A	A	A	Primary school
A	A	A	A	A	Junior high
A	A	A	A	A	Senior high
					Vocational
A	A	A	A	A	Commerce
A	I	I	A	A	Industry
A	I	I	A	A	Agriculture
A	I	I	A	A	Medical care
A	A	A	A	A	Police work
A	A	A	A	A	Others
I	I	I	A	A	Normal school
					Junior college
A	I	I	A	A	Humanities
A	A	A	A	A	Commerce
I	I	I	A	A	Industry
I	I	I	A	A	Agriculture
I	I	I	A	A	Medical care
I	I	I	A	A	Education
A	A	A	A	A	Others
					College
I	I	I	A	A	Humanities
A	I	I	A	A	Law
A	I	A	A	A	Commerce
I	I	I	A	A	Normal science
I	I	I	A	A	Industry
I	I	I	A	A	Agriculture
I	I	I	A	A	Medical care
I	I	I	A	A	Police work
I	I	I	A	A	Education
I	I	I	A	A	Others

A : Matching occupation and educational attainment

I : Mismatching occupation and educational attainment

Table B.1 The Occupation-Education Matrix in Taiwan
(Continued)

教育程度	職業	服務工人					
		家事及有關服務監督人員 Housekeeping & related service supervisors	廚師、侍者、保酒 Cooks, waiters	傭工及其他家庭服務工作人員 Maids & other housekeeping service workers	建築物看管人、工務 Building caretakers & cleaners	洗濯及熨燙工 Launderers & pressers	理髮、美容師 Hairdressers, barbers & beauticians
不自 國 國 高 高	字	A	A	A	A	A	A
	修	A	A	A	A	A	A
	小	A	A	A	A	A	A
	中	A	A	A	A	A	A
	中	A	I	I	I	I	I
	職	A	I	I	I	I	I
	商	A	I	I	I	I	I
	工	A	I	I	I	I	I
	農	A	I	I	I	I	I
	醫	A	I	I	I	I	I
	其	A	I	I	I	I	I
	師	I	I	I	I	I	I
大 人	文	I	I	I	I	I	I
	科	I	I	I	I	I	I
	文	I	I	I	I	I	I
	工	I	I	I	I	I	I
	農	I	I	I	I	I	I
	醫	I	I	I	I	I	I
	教	I	I	I	I	I	I
	其	I	I	I	I	I	I
	法	I	I	I	I	I	I
	商	I	I	I	I	I	I
	理	I	I	I	I	I	I
	工	I	I	I	I	I	I
醫 軍 教 其	農	I	I	I	I	I	I
	理	I	I	I	I	I	I
	工	I	I	I	I	I	I
	農	I	I	I	I	I	I

A: 表示教育與職業相稱

I: 表示教育與職業不相稱

Table B.1 The Occupation-Education Matrix in Taiwan
(Continued)

員 Services workers		農 林 漁 牧 工 作 人 員 Agricultural, animal husbandry and Forestry workers, & fishermen			Occupation Educational attainment
公共安全工作人員 Protective service workers	其他服務工作者 Service workers not elsewhere classified	農場經理及管理員 Farm managers	農 場 場 主 Farmers	農耕及畜牧工作者 Agricultural & animal husbandry workers	
A	A	A	A	A	Illiterate
A	A	A	A	A	Self-educated
A	A	A	A	A	Primary school
A	A	A	A	A	Junior high
A	I	A	I	I	Senior high
					Vocational
A	I	A	I	I	Commerce
A	I	A	I	I	Industry
A	I	A	A	A	Agriculture
A	I	A	I	I	Medical care
A	I	A	I	I	Police work
A	I	A	I	I	Others
A	I	I	I	I	Normal school
					Junior college
A	I	I	I	I	Humanities
A	I	I	I	I	Commerce
A	I	I	I	I	Industry
A	I	A	A	I	Agriculture
A	I	I	I	I	Medical care
A	I	I	I	I	Education
A	I	I	I	I	Others
					College
A	I	I	I	I	Humanities
A	I	I	I	I	Law
A	I	I	I	I	Commerce
A	I	I	I	I	Normal science
A	I	I	I	I	Industry
A	I	A	A	I	Agriculture
A	I	I	I	I	Medical care
A	I	I	I	I	Police work
A	I	I	I	I	Education
A	I	I	I	I	Others

A: Matching occupation and educational attainment

I: Matching occupation and educational attainment

Table B.1 The Occupation-Education Matrix in Taiwan
(Continued)

及有關工作人員 Prod. and related workers					Occupation
木材製造工及造紙工 Wood preparation workers & paper makers	化學製造工及 有關工作者 Chemical processors & related workers	紡織、針織、 染者 Spinners, weavers, knitters	皮革及生皮調製工 Leather goods makers	食品及飲料製造工 Food, beverage processors	Educational attainment
A	A	A	A	A	Illiterate
A	A	A	A	A	Self-educated
A	A	A	A	A	Primary school
A	A	A	A	A	Junior high
A	A	A	A	A	Senior high
					Vocational
I	I	I	I	I	Commerce
A	A	A	A	A	Industry
A	A	I	I	A	Agriculture
I	A	I	I	I	Medical care
A	A	A	A	A	Police work
I	I	I	I	I	Others
I	I	I	I	I	Normal school
					Junior college
I	I	I	I	I	Humanities
I	I	I	I	I	Commerce
I	I	I	I	I	Industry
I	I	I	I	I	Agriculture
I	I	I	I	I	Medical care
I	I	I	I	I	Education
I	I	I	I	I	Others
					College
I	I	I	I	I	Humanities
I	I	I	I	I	Law
I	I	I	I	I	Commerce
I	I	I	I	I	Normal science
I	I	I	I	I	Industry
I	I	I	I	I	Agriculture
I	I	I	I	I	Medical care
I	I	I	I	I	Police work
I	I	I	I	I	Education
I	I	I	I	I	Others

A : Matching occupation and educational attainment

I : Mismatching occupation and educational attainment

Table B.1 The Occupation-Education Matrix in Taiwan
(Continued)

教育程度	職業	生產作業人員及有					
		菸葉及其製造工 Tobacco processors	成衣、縫紉、 裝飾品 Tailors, sewers, upholsterers	製鞋工 Shoemakers	家具及有 木製 Cabinetmakers & related wood workers	石工 Stone cutters	鐵匠、工具 製造工 Blacksmiths, toolmakers
不自 因 國 國 高 高	字 修 小 中 中 職	A	A	A	A	A	A
		A	A	A	A	A	A
		A	A	A	A	A	A
		A	A	A	A	A	A
	商 工 農	I	I	I	I	I	I
		A	A	A	A	A	A
		A	I	I	I	I	I
		I	I	I	I	I	I
	醫 工 其 師 專	I	I	I	I	I	I
		A	A	I	I	A	A
		I	I	I	I	I	I
		I	I	I	I	I	I
	人 商 工 農	I	I	I	I	I	I
		I	I	I	I	I	I
		I	I	I	I	I	I
		I	I	I	I	I	I
	醫 教 其 大 人 注	I	I	I	I	I	I
		I	I	I	I	I	I
		I	I	I	I	I	I
		I	I	I	I	I	I
商 理 工 農	I	I	I	I	I	I	
	I	I	I	I	I	I	
	I	I	I	I	I	I	
	I	I	I	I	I	I	
醫 專 教 其	I	I	I	I	I	I	
	I	I	I	I	I	I	
	I	I	I	I	I	I	
	I	I	I	I	I	I	

A : 表示教育與職業相稱

I : 表示教育與職業不相稱

Table B.1 The Occupation-Education Matrix in Taiwan
(Continued)

職 工 作 人 員 Prod. and related workers					Occupation
機 器 裝 配 工 Mach. assemblers	電 機、電 子 裝 配 工 Electrical, electronic fitters	傳 播 及 音 聲 設 備 操 作 工 Broadcasting station & sound-equipment operator	電 鉗 工、焊 接 工、 金 工 Plumbers, welders, sheet metal	珠 寶 及 貴 金 屬 工 造 工 Jewellery & precious metal workers	Educational attainment
A	A	A	A	A	Illiterate
A	A	A	A	A	Self-educated
A	A	A	A	A	Primary school
A	A	A	A	A	Junior high
A	A	A	A	A	Senior high
					Vocational
I	I	I	I	I	Commerce
A	A	A	A	A	Industry
A	I	I	I	A	Agriculture
I	I	I	I	I	Medical care
A	A	A	A	A	Police work
I	I	I	I	I	Others
I	I	I	I	I	Normal school
					Junior college
I	I	I	I	I	Humanities
I	I	I	I	I	Commerce
I	I	I	I	I	Industry
I	I	I	I	I	Agriculture
I	I	I	I	I	Medical care
I	I	I	I	I	Education
I	I	I	I	I	Others
					College
I	I	I	I	I	Humanities
I	I	I	I	I	Law
I	I	I	I	I	Commerce
I	I	I	I	I	Normal science
I	I	I	I	I	Industry
I	I	I	I	I	Agriculture
I	I	I	I	I	Medical care
I	I	I	I	I	Police work
I	I	I	I	I	Education
I	I	I	I	I	Others

A : Matching occupation and educational attainment

I : Mismatching occupation and educational attainment

Table B.1 The Occupation-Education Matrix in Taiwan
(Continued)

職業 類別	生產作業人員及有						
	玻璃工及陶工 Glass formers potters	橡膠及 塑膠製品 Rubber & plastics product makers	紙製品及紙板 製品 Paper & paperboard products makers	印刷及有 關者 Printers & related workers	油漆工 Painters	其他生產及有關 工作者 Prod. & related workers not elsewhere classified	
不自 國 國 高 高 商 工 農 醫 藥 其 節 事 人 商 工 農 醫 教 其 大 人 法 商 理 工 農 醫 藥 其	字	A	A	A	A	A	A
	修	A	A	A	A	A	A
	小	A	A	A	A	A	A
	中	A	A	A	A	A	A
	中	A	A	A	A	A	A
	職	I	I	I	I	I	I
	商	A	A	A	A	A	A
	工	I	A	A	I	I	I
	農	I	A	A	I	I	I
	醫	I	I	I	I	I	I
	藥	A	A	A	A	A	A
	其	I	I	I	I	I	I
	節	I	I	I	I	I	I
	事	I	I	I	I	I	I
	人	I	I	I	I	I	I
	商	I	I	I	I	I	I
	工	I	I	I	I	I	I
	農	I	I	I	I	I	I
	醫	I	I	I	I	I	I
	教	I	I	I	I	I	I
其	I	I	I	I	I	I	
大	I	I	I	I	I	I	
人	I	I	I	I	I	I	
法	I	I	I	I	I	I	
商	I	I	I	I	I	I	
理	I	I	I	I	I	I	
工	I	I	I	I	I	I	
農	I	I	I	I	I	I	
醫	I	I	I	I	I	I	
藥	I	I	I	I	I	I	
其	I	I	I	I	I	I	

A : 表示教育與職業相稱 I : 表示教育與職業不相稱

Table B.1 The Occupation-Education Matrix in Taiwan
(Continued)

職 工 作 人 員 Prod. and related workers					Occupation Educational attainment
砌磚工、營造木工 Bricklayers, carpenters	固 定 引 擎 Stationary engine	起重機械操作工 Material handling equip. operators	運輸工具操作工 Transport equipment operators	學徒與其他體力工人 Apprentices & laborers not elsewhere classified	
A	A	A	A	A	Illiterate
A	A	A	A	A	Self-educated
A	A	A	A	A	Primary school
A	A	A	A	A	Junior high
A	A	A	A	I	Senior high
					Vocational
I	I	I	I	I	Commerce
A	A	A	A	I	Industry
I	A	A	A	I	Agriculture
I	I	I	I	I	Medical care
A	A	A	A	I	Police work
I	I	I	I	I	Others
I	I	I	I	I	Normal school
					Junior college
					Humanities
I	I	I	I	I	Commerce
I	I	I	I	I	Industry
I	I	I	I	I	Agriculture
I	I	I	I	I	Medical care
I	I	I	I	I	Education
I	I	I	I	I	Others
					College
I	I	I	I	I	Humanities
I	I	I	I	I	Law
I	I	I	I	I	Commerce
I	I	I	I	I	Normal science
I	I	I	I	I	Industry
I	I	I	I	I	Agriculture
I	I	I	I	I	Medical care
I	I	I	I	I	Police work
I	I	I	I	I	Education
I	I	I	I	I	Others

A : Matching occupation and educational attainment

I : Mismatching occupation and educational attainment

Source: Report on the Manpower Utilization Survey, Taiwan Area, ROC, 1988, Appendix 4.

Table B.2

Distribution of Mismatch Workers by Sex in
Taiwan, 1980 and 1988

Year	Total(#)	Male (% in LF)	Female (% in LF)
1980	1,449	70.5% (65.4)	29.5% (34.6)
1988	2,940	64.3% (62.2)	35.7% (37.8)

Source: Calculated from Taiwan manpower survey data, 1980 and 1988.

Table B.3

Distribution of Mismatch Workers by Age in Taiwan,
1980 and 1988

1980				
Age	% in LF	Total	Male	Female
15-19	12.4	8.0	5.9	13.1
20-24	14.7	27.4	21.9	40.4
25-29	16.3	35.5	36.4	33.2
30-34	10.2	11.6	13.2	7.7
35-39	9.9	4.5	5.4	2.3
40-44	9.6	3.3	4.2	1.2
45-49	9.4	1.9	2.5	0.5
50-54	7.7	3.5	4.7	0.7
55-59	5.8	3.2	4.4	0.5
60-64	3.0	1.0	1.2	0.5
65+	1.0	0.1	0.2	0.0
Total	100.0 (27944)	100.0 (1449)	100.0 (1021)	100.0 (428)
1988				
Age	% in LF	Total	Male	Female
15-19	5.9	6.3	4.1	10.1
20-24	12.7	21.1	15.3	31.5
25-29	16.9	30.0	30.0	30.0
30-34	15.6	20.3	22.8	15.8
35-39	13.6	11.3	13.0	8.1
40-44	8.8	4.1	5.1	2.4
45-49	8.6	2.1	2.7	1.0
50-54	6.8	1.3	1.8	0.4
55-59	6.1	1.8	2.5	0.5
60-64	3.6	1.5	2.3	0.1
65+	1.4	0.3	0.4	0.2
Total	100.0 (33,555)	100.0 (2940)	100.0 (1890)	100.0 (1050)

Source: Calculated from Taiwan manpower survey data, 1980 and 1988.

Table B.4

Distribution of Mismatch Workers by Education in Taiwan,
1980 and 1988

Education	% in LF	1980		
		Total	Male	Female
Senior High	6.6	14.9	15.4	13.8
Vocational H.	12.2	32.2	31.7	33.4
Junior Colleges	4.7	29.3	31.2	25.0
Universities & above	4.5	23.5	21.7	27.8
Total (N=)		100.0 (1449)	100.0 (1021)	100.0 (428)
		1988		
Senior High	7.6	12.7	13.4	11.2
Vocational H.	19.8	37.5	37.3	37.8
Junior Colleges	7.8	31.5	34.5	26.0
Universities & above	5.6	18.4	14.8	25.0
Total (N=)		100.0 (541)	100.0 (279)	100.0 (262)

Source: Calculated from Taiwan manpower survey data, 1980 and 1988.

Table B.5

Distribution of Mismatch Workers by Majors in Taiwan, 1980
and 1988

Majors	% in LF	1980		
		Total	Male	Female
Humanities	5.0	7.6	4.4	15.2
Social S.	1.4	1.9	2.2	1.4
Business	40.2	35.8	23.4	65.0
Sciences	1.6	1.4	1.4	1.4
Engineering	28.4	36.6	49.5	6.2
Agriculture	6.9	5.2	6.4	2.4
Medicine	4.3	1.7	1.2	3.0
Military	4.8	5.8	8.3	0
Education	5.3	1.4	1.6	0.8
Others	2.1	2.6	1.6	4.6
Total	100.0	100.0 (1233)	100.0 (864)	100.0 (369)

Majors	% in LF	1988		
		Total	Male	Female
Humanities	4.0	5.7	2.7	10.9
Social S.	1.0	1.6	1.3	1.9
Business	37.8	34.3	17.7	63.4
Sciences	1.1	1.1	1.3	0.5
Engineering	37.0	44.0	62.8	10.8
Agriculture	5.1	3.8	4.5	2.6
Medicine	4.4	2.3	1.8	3.2
Military	3.1	3.4	5.3	0.1
Education	4.4	1.3	1.3	1.4
Others	2.1	2.5	1.3	5.2
Total	100.0	100.0 (2568)	100.0 (1636)	100.0 (932)

Source: Calculated from Taiwan manpower survey data, 1980
and 1988.

Table B.6

Distribution of Mismatch Workers by Industry in Taiwan,
1980 and 1988

Industry	% in LF	1980		
		Total	Male	Female
Extractive	21.9	12.5	15.5	5.4
Transformative	41.9	34.5	36.5	29.7
Distributive S.	18.1	28.2	28.5	27.6
Producer S.	2.0	5.2	4.7	6.3
Social S.	8.4	10.1	6.5	18.7
Personal S.	7.7	9.5	8.3	12.4
Total	100.0 (27693)	100.0 (1449)	100.0 (1021)	100.0 (428)

Industry	% in LF	1988		
		Total	Male	Female
Extractive	14.8	9.7	12.7	4.3
Transformative	42.1	33.2	36.5	27.2
Distributive S.	20.8	28.9	30.9	25.4
Producer S.	2.9	4.9	4.2	6.2
Social S.	10.0	9.3	5.6	14.3
Personal S.	9.4	14.0	9.2	22.6
Total	100.0 (33221)	100.0 (2940)	100.0 (1890)	100.0 (1050)

Source: Calculated from Taiwan manpower survey data, 1980 and 1988.

Table B.7

Distribution of Mismatch Workers by Occupation in Taiwan,
1980 and 1988

Occupation	% in LF	1980		
		Total	Male	Female
Clerical	12.3	27.2	21.0	42.1
Sales	12.1	19.0	21.9	11.9
Services	7.0	13.6	9.2	24.1
Agriculture	20.6	11.5	14.0	5.4
Production-related	42.3	28.8	33.9	16.6
Total (N=)		100.0 (1449)	100.0 (1021)	100.0 (428)

Occupation	% in LF	1988		
		Total	Male	Female
Clerical	14.2	25.9	18.5	39.0
Sales	14.6	20.7	26.4	10.4
Services	9.1	18.1	12.3	28.7
Agriculture	14.4	9.5	12.5	4.1
Production-related	40.6	25.9	30.3	17.8
Total (N=)		100.0 (2940)	100.0 (1890)	100.0 (1050)

Source: Calculated from Taiwan manpower survey data, 1980 and 1988.

APPENDIX C

THE DISTRIBUTION OF INDUSTRY BY REGION IN TAIWAN, 1988

(%)

Region	North	Central	South	East	Total
Industry					
Extractive	12.8	40.1	41.1	6.0	100.0
Transformative	45.8	24.3	28.7	1.2	100.0
Distributive	50.3	17.2	29.0	3.5	100.0
Producer	55.4	17.2	25.3	2.1	100.0
Social	44.6	21.9	29.8	3.7	100.0
Personal	46.1	20.3	30.3	3.3	100.0

Source: Calculate from Manpower Survey data, 1988.

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