FAST ECONOMIC GROWTH WITH HIGH INEQUALITY: WHY IS MAINLAND CHINA DIFFERENT FROM TAIWAN, CHINA?

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Abstract

This thesis was dedicated to explain mainland China's fast economic growth and high inequality from the approach of economic transition and to answer the question why economic transitions contrast in mainland China and Taiwan. Combined with both qualitative and quantitative strategies, and based on secondary data as well as official statistics, the thesis chose comparative study as research design. After two comparative studies, this thesis found that mainland China is also a model of agricultural-development-led industrialization as Taiwan, which largely contributed to the fast economic growth; and yet uneven economic transition among provinces in mainland China resulted in serious intra-rural and national inequality.

Key words: agricultural-development-led industrialization, income inequality, mainland China, Taiwan.

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Foreword

About eight months ago when I was conceiving a research plan for this thesis I had no idea how glad I would be right now. I am somehow surprised by what I have accomplished. This research topic can't be broader for a master thesis and a large number of books, articles and reports have studied almost every aspect of this topic, as a result at the beginning I thought the thesis would become nothing but a literature review. However, I managed to find a theoretical approach and proper methods to make the thesis original.

First of all, I would like to thank my supervisor Professor Gunnarsson. I could not have finished this thesis without his valuable advice and I enjoyed every face-to-face feedback which inspired many ideas in my thesis. Secondly, I am deeply grateful to my parents who have been supporting and encouraging me throughout my study. Last but not least, I want to thank all the teachers and classmates for discussing the thesis during the field work course.

Jing Luo, Lund, May 2009

List of abbreviations

CAAS	Chinese Academy of Agriculture Sciences
CASS	Chinese Academy of Social Sciences
CCP	Chinese Communist Party
CDRF	China Development Research Foundation
GDP	Gross Domestic Product
GLF	Great Leap Forward
GNP	Gross National Product
HDI	Human Development Index
HRS	Household Responsibility System
KMT	Kuo Min Tang
MLSS	Ministry of Labour and Social Security, PRC
NBSC	National Bureau of Statistics of China
NIE	New industrialized Economy
RCC	Rural Credit Cooperative
SEZ	Special Economic Zone
SME	Small and Medium Enterprise
SOE	State Owned Enterprise
TVE	Township and Village Enterprise
UNDP	United Nations Development Programme

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1. Introduction

1.1.   Research problem

During the last 30 years the whole world has witnessed the long-term and fast economic growth in mainland China[1]. The "Reform and Opening-Up" in 1978 was a watershed of China's economy growth: from a stagnant economy since the beginning of the Cultural Revolution to one with long lasting and fast economic growth after the Asian miracle economies or the new industrialized economies (NIEs). From 1978 to 2005, the average annual growth rate of GDP was 9.6 percent and 8.5 percent for GDP per capita (Naughton, 2007, p 140).

The fast economic growth brought great achievements in China's social-economic development. China's Human development index (HDI) during economic reform increased from 0.557 in 1980 to 0.755 in 2003, and HDI global ranking rose from 101st in 1991 to 85th in 2003 (UNDP and CDRF, 2005, p 7). We can also find an extraordinary decline of the number of absolute poverty since 1978. Measured by official poverty line, rural residents who lived in poverty was reduced from 250 million, more than 30 percent of the total population, in 1978, to 26 million, less than 5 percent, in 2004, while the urban poverty only contributed a negligible portion of national poverty (Naughton, 2007, p 212; Ravallion and Chen, 2007, p 7 and 8). Ravallion and Chen (2007) adjusted the poverty line in comparison to international standards. Although with a short term reverse in the late 1980s and early 1990s, their calculation also shows an evident downward trend of China's poverty: from 52.84 percent of the total population in 1981 to 7.97 percent in 2001(p 10).

However, along with China's economic growth, the Gini coefficient also continuously increased since the 1980s, from below 0.3 before 1986 to 0.447 in 2001

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[1] "Mainland China" (zhongguo *dalu*) refers to China on the Asian continent without Hong Kong and Macao Special Administrative regions. And in this thesis "China" also stands for "mainland China". "Taiwan, China" equals to "Taiwan" or "Taipei, China".

(Naughton, 2007, p 218; UNDP and CDRF, 2005, p 13). Moreover, one feature of mainland China's inequality is that it is higher in rural areas than in urban areas, which contrasts to other developing countries (Ravallion and Chen, 2007, p 2). Another feature, shared by most developing countries, is the enlargement of urban-rural household income gap.

Here the thesis restricts economic development within economic growth, poverty alleviation and income distribution, which can be measured respectively by the nation's GDP, poverty line (official poverty line and "one-dollar" poverty line) and Gini Coefficient. China' economic development pattern may be explained by the logic of Simon Kuznets (1955) that inequality will increase during the initial stage of economic growth and, as we could expect in China, it will decline in subsequent stages. More than enough counterparts are available even among Asian NIEs, in which fast economic growth came along with both poverty alleviation and inequality[2].

Now we encounter a debate on efficiency and equity in economic development. Based on the Harrod-Domar model, growth depends on the quantity of labour and capital, and high investment and accumulation will bring economic growth. Therefore, high profit and saving rates are viewed as indispensable factors and the improvement of income distribution becomes a trade-off with the object of growth (Ranis, 2005, p 122). But is there any other way for economic development? Quite a few countries have been assessed as counter-examples which proved that the inverse U-shaped Kuznets curve is not an inevitable route of economic development (ibid., p 128).

Taiwan is one of such counter-examples of rapid economic growth associated with

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[2] Quibria (2002) believes that economic growth, poverty and income inequality are closely intertwined. Poverty alleviation results from both economic growth that increases household income and improved income distribution:

$$P*=E(y)y*+E(i)i*$$

($P*$ is the rate if change in poverty in the inequality indicators, $y*$ is the rate of change in per capita, $i*$ is the rate of change in the inequality indicators, $E(y)$ is the growth elasticity, and $E(i)$ is the inequality of poverty.)

For Asian NIEs, Quibria (2002) argues that the main impetus for poverty alleviation is fast economic growth with insignificant effort from improvement of income distribution (p 13-14).

improved household income distribution, which is in contrast to mainland China. The economy in Taiwan maintained high growth rates from 1970s to 1996 (Quibria, 2002, p 8) and poverty reduced sharply from 47% in 1965 to 3% in 1985 based on the national poverty line (ibid., p 9). At the same time, Gini Coefficient in Taiwan stayed at a low level, with average Gini of 0.2962 from 1964 to 1993 (Deininger and Squire, 1996, p 575). Before we deal with the issue of to which extent the mainland China's development is different from Taiwan's, more similarities have been found.

Quibria (2002) has summarized various factors behind the East Asian miracle, a majority of them are also shared by mainland China, such as economic openness, benign macroeconomic environment created by an authoritarian government and favorable initial conditions (equitable income and high literacy rate) (p 22). We may find more factors in common between mainland China and Taiwan, if we look into the economic transition processes of the two economies. In the very beginning of economic development, land reform was launched by governments in both mainland China and Taiwan. The land reform between 1949 and 1953, and Household Responsibility System (HRS) were the most efficient incentive in respective agricultural sectors, and helped to improve agricultural productivity and peasants' incomes. Also at the same stage governments spared no effort to promote agricultural production by introducing advanced agricultural technology. In the subsequent stage or since the beginning rural industries started booming in the countryside accompanied with the sustainable growth of agricultural production. Those rural industries were featured with small scale labor-intensive production, and maintained close connections with the agricultural sector[3]. It appears that economic transitions in China and Taiwan were both focused and led by agriculture.

1.2.   Purpose and research question

The purpose of this research is to explain mainland China's fast economic growth and

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[3] Based on discussion in Naughton (2007) and Fei, Ranis, and Kuo (1979).

deterioration of income distribution from the approach of economic transition comparing with Taiwan's economic development. There are two ambitions in this research.

First, this research will explore the economic transitions in Taiwan and China based on the agriculture-led economic development theory proposed by John Mellor. Taiwan is a perfect model of agriculture-led economic development[4], moreover it seems that China surprisingly shared many common factors which emphasized the agricultural development at the start of transition, thus, it deserves an examination of to what extant mainland China fits the agriculture-led economic development pattern.

If mainland China matches the agriculture-led economic development model and agricultural development was indeed favored in the early stage of economic development, then why does the case of mainland China counter one of the social effects of that development model: improved income distribution? Because of vast territory and diversified natural endowments in different regions, adverse or positive effects among regions or provinces may be generated and intensified towards economic development of the whole economy. Hence, the other ambition is to carry a provincial or regional study of mainland China also from the angle of agriculture-led economic development,

From the above ambitions, the main research question is why economic transitions between mainland China and Taiwan contrast. There follows several sub research questions that the study will attempt to answer: What are the similarities between mainland China and Taiwan in agriculture emphasized development? Does the case of mainland China fit the model of agriculture-led economic development? If the answer is positive, what are the factors behind contrast outcomes of economic development of the two economies on the extent of income distribution? Why does Gini coefficient, particularly the rural one increase in mainland China with the fast economic growth?

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[4] See chapter 1, 2 and 11 in Mellor (1995).

What are the differences in economic development among provinces in mainland China? Do all provinces in mainland China share one economic transition model?

1.3.   Methodological framework

1.3.1.   Research design

This research is designed to be a non-experimental comparative study including both qualitative and quantitative research strategies. Comparative study embodies a logic in which "we can understand social phenomena better when they are compared in relation to two or more meaningful contrasting cases or situations" (Bryman, 2004, p 53). In the context of quantitative strategy, comparative study is close to a cross-sectional design format; while within qualitative strategy, comparative study takes the form of a multiple-case study (ibid., p 53, 55). Taiwan and mainland China are placed into two contradictory conditions of income distribution in economic transition, and there could be uneven paces of economic transitions among provinces, so a comparative study design fits the research purpose. First there is a qualitative research of these two economies by comparing various aspects of industrialization. This research is helpful in understanding the sequences of industrialization from Mellor's theory and more importantly generating a theory of whether mainland China resembles Taiwan in industrialization. The following quantitative research is going to test a hypothesis, raised in the beginning of the fourth section, that there is no general model of industrialization among provinces. Percentages of agricultural and nonagricultural output among 30 provinces are selected as variables. Finally this thesis will provide a new explanation of mainland China's transition and its implication to income distribution through a thick description of provincial transition patterns, after a series of processes of coding concepts about economic transition, categorizing the provinces and exploring the relationship between categories.

1.3.2.   Data collection

All data is secondary, including statistical yearbooks, research articles and official

reports. Data from China statistical yearbook (from 1981 to 2008) , and China's labour statistical yearbook (1999) were collected from "China Data Online" of All China Data Center[5] which is authorized by National Bureau of Statistics of China (NBSC). Lin and Yang (2001) deal with mainland China rural enterprises' growth together with a complete analysis of factors behind the growth. Though they found regional diversity in the mainland, provincial analysis was not carried out. Naughton (2007) provides a comprehensive monograph on China's economy and served as one of the most important literature and data sources in this thesis.

Data for Taiwan's economic development were adequately and systematically collected, processed and presented in discussion of "growth with equity" (Fei, Ranis and Kuo), agriculture-led economic development (Mao and Chi, 1995) and East Asian Miracle (Quibria, 2002). Thus this thesis will use academic articles and books as data sources instead of original statistical data, since those literatures are closely connected with this thesis and data in them are in good quality.

On income distribution and poverty, main secondary data sources are Ravallion and Chen (2004) and Khan and Riskin (1998 and 2005). Ravallion and Chen (2004) provided a careful analysis of relationship among growth, inequality and poverty based on Rural Household Survey and Urban Household Survey carried by NBSC. Using smaller samples from surveys carried by Chinese Academy of Social Sciences (CASS), Khan and Riskin (1998 and 2005) carried a research of inequality by analyzing rural and urban household income in 1988, 1995 and 2002. They both got similar conclusions of mainland China's inequality respectively, though their data sources were different.

1.3.3.   Criticism of the Sources

Data of mainland China and provinces are mainly from China statistical yearbooks from 1981 to 2008, and China labour statistical yearbooks, which are the long-term

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[5] All China Data Center is accessible at: http://chinadataonline.org/.

and most reliable data sources. However, these data suffer flaws including influences from government attitudes, changes of calculation and criteria, and diversified statistical categories from 1980s to 2000s.

Data of rural enterprises are only available from 1981 to 1999 in China statistical yearbook. In early 1980s the data collection was largely limited because rural enterprises were treated as auxiliary part of agricultural sector; after, more tables were available on several criteria of rural enterprises' development. Ownership was probably the most important criteria at early 1980s, and private-owned rural enterprises were overlooked until yearbook 1984. The data collection discontinued after 1999 but then showed up again in yearbook 2003. Moreover, the data of total output of rural enterprises are only available from yearbook 1981 to 1996. After 1996 the yearbooks diverted their focus to total income of rural enterprises.

There are also a few errors of numbers in those yearbooks not to mention some data that are slightly different among yearbooks. For example, there are extremely sharp and large declines of both numbers of rural enterprises and employment in 1997 in China labour statistical yearbook 1999. In that instance, data were carefully compared with other yearbooks, and finally replaced by data from China statistical yearbook of 2003. China statistical yearbook of township and village enterprises could be one of the main sources of data, especially in quantitative research part. Unfortunately, it wasn't available during this research.

There are shortcomings that may be hard to avoid in the secondary analysis and official statistics, including lack of familiarity with data, complexity of data, no control of data, and especially the change of definition that mentioned above. Some of them might even jeopardize the reliability of data (Bryman, 2004, p 205, 211). However, the advantages of secondary analysis and official statistics will not be obscured. Those data can not only support both cross-sectional and longitudinal analysis among mainland China's provinces, but also make cross-cultural (economic)

analysis applicable for mainland China and Taiwan (ibid., p 202, 209).

1.4.   Disposition of the research

After the introduction, section 2 on the approach and theoretical framework of agriculture-led economic development will follow. That part is going to summarize mainly John Mellor's theory with an emphasis on explanations of the reasons for agricultural development in the early stage and relations between agricultural and industrial development. Moreover, the second subsection will elaborate in Mellor's theory on how poverty reduction and income distribution improvement are influenced by this development model. Based on the summaries of section 2, section 3 will compare Taiwan and mainland China's economic development especially in rural areas. Both similarities and disparities during economic transitions in both economies from agricultural sector to nonagricultural sectors will be discussed.

The fourth section is dedicated to explore the possible differences in development among provinces in mainland China, and answer the question whether mainland China in the provincial level follows one general model of economic development. Combined with the previous section, the fourth one will finally try to propose an integrated explanation of economic transition in mainland China. Section 5 intends to solve the income distribution problem from the approach of agriculture-led economic development, mainly based on the explanation of mainland China's economic transition.

The final section is going to first present an answer for the research question and then try to bring the discussion beyond China: what are the implications for other developing countries?

1.5.   Delimitations of this research

Mellor's agriculture-led-economic development theory which includes five social

achievements beyond economic growth: urbanization, poverty reduction, growth of private sector, democratization and income distribution[6], is a comprehensive theory of economic transition from an agrarian economy to an industrialized modern economy. This research, however, without any intention or ambition to scrutinizing every aspect in Taiwan's and mainland China's economic development from angles of that theory, only concentrates on the economic transition part, from agricultural development to industrialization, and two social impacts: poverty alleviation and income distribution. Therefore, in the subsequent section the research will summarize Mellor's theory with an emphasis on agricultural development in the early stage, in conjunction with the industrial sector, deals with poverty and income distribution as a social consequence of economic transition. In brief, agricultural-development-led-industrialization and its social impacts of poverty reduction and income distribution will form the main content of subsequent chapter: agriculture-led economic development.

This research will not and cannot cover all exogenous and endogenous factors when analyzing economic transition in Taiwan and mainland China. In general, this research focuses more on endogenous factors in economic transition. Foreign capital and international market may obscure the agricultural stimulus for industrial growth, including rural market and capital flows, therefore those are the only two exogenous factors in a later discussion. Moreover, some macroeconomic elements will not be discussed such as inflation rate, price policies for agricultural products, industrial policy, and so on.

Land reform played an important role during Taiwan and mainland China's economic transition by arousing peasants' initiative so as to foster agricultural production, yet there is another factor of land reform, of which this thesis will provide limited analysis. In Taiwan's land reform, the Kuo Min Tang (KMT) government bought land at a low price from landlords and then equally redistributed land among

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[6] Income distribution appears as one of social impacts of agriculture-led growth in the chapter of Taiwan case in Mellor ed. (1995), though not include in the discussion of introduction part. See p 8-10; 53-55 in Mellor ed. (1995).

peasants. In China rural households were equally provided with access to land, with those household even signing long-term land using contracts. However, the formal ownership was still in the hands of rural collectives. This form of vague property rights causes undervalued price and compensation in land expropriation in the process of urbanization and industrialization and may bring peasants back to poverty.

The issue of income distribution of mainland China cannot be more complicated. National inequality, intra-rural inequality and intra-urban inequality all have been increasing since "Reform and Opening-Up". Although every single one deserves a long article, this research from the approach of economic transition will not take certain social-political institutional factors as main study objects, such as the urban-rural divide, limitations in migration, social welfare, and socialist's legacy of urban subsidies, because they barely have any direct connections to agricultural-development-led industrialization. And the intra-urban inequality of mainland China is probably out of concern in later discussion.

2. Agriculture-led Economic Development

2.1. Concentrating on agriculture

John Mellor emphasizes agricultural development in early development stages of underdeveloped countries, and argues that two features of the agricultural sector make it distinct and important in those countries. The first is the size of the agricultural sector in underdevelopment countries. The role of food production and an extremely low efficiency in agricultural sector demand a majority of the land, labor and other resources of the whole country (Mellor, 1966, p 4). Johnston and Mellor (1961) estimate that "[t]ypically, some 40 to 60 per cent of the national income is produced in agriculture and from 50 to 80 per cent of the labor force is engaged in agriculture production" (p 566). Thus the production of the agricultural sector will strongly influences the national economy and society. The second characteristic is the secular decline in the relative size of the agricultural sector. Mellor explains it as "[t]he faster

agriculture grows, the faster its relative size declines" (Mellor, 1996, quote in Mellor, 1995, p 1). While supplying increasing amount of food and improved diet because of the population growth and per capita income that rises with economic growth, the agricultural sector is loaded with the burden of transferring capital and labor force to nonagricultural sectors (Mellor, 1966, p 4; Johnston and Mellor, 1961, p 567). Therefore, agricultural growth is crucial for national food security and nursing nonagricultural sectors.

Another cogent reason, provided by Robert Solow and Edward Dennison, that the agricultural sector should be emphasized in the early stage, also connects to it massive size in underdevelopment countries. Technology change that increases output per unit of input in the large scale sector could be easier to "boost national income substantially and hasten economic transformation and the shift to the potentially faster-growing sectors" than it first begins in smaller nonagricultural sector, because the smaller one needs to "proceed at a much higher rate than a given rate in the agriculture sector to achieve as much effect on national income" (Mellor, 1995, p 7).

Johnston and Mellor (1961) summarize five propositions of agriculture's contributions to economic development:

> "(1) Economic development is characterized by a substantial increase in the demand for agriculture products, and failure to expand food supplies in pace with the growth of demand can seriously impede economic growth. (2) Expansion of exports of agriculture products may be one of the most promising means of increasing income and foreign exchange earnings, particularly in the earlier stages of development. (3) The labor force for manufacturing and other expanding sectors of the economy must be drawn mainly from agriculture. (4) Agriculture, as the dominant sector of an underdeveloped economy, can and should make a net contribution to the capital required for overhead investment and expansion of secondary industry. (5) Rising net cash incomes of the farm population may be important as a stimulus to industrial expansion (p 571-572)."

These contributions also provide a solid argument that agricultural development

should be promoted in the early stage and will provide substantial support to nonagricultural sectors' development in the subsequent period.

2.2. Poverty and income inequality reduction

Poverty and income inequality reduction are two important goals in economic development. Adelman (1985) argues from the angle of poverty alleviation that the agricultural-development-led industrialization strategy is more promising for most developing countries than other demand-generating strategies for the following reasons:

> "1) agriculture is much more labor-intensive than even labor-intensive manufacturing; 2) land-augmenting increases in agriculture productivity generate increases in demand for the labor of the landless- the poorest of the poor; 3) increases in agricultural incomes generate high leakages into demand for labor-intensive manufactures on the consumption side and for manufactured inputs on the production side; 4) expansion in agricultural production is less import-intensive than an equivalent increase in manufacturing production; 5) increases in agricultural output with 'good-practice', developing-country technology are less capital-intensive than increases in manufacturing; and 6) the agricultural infrastructure required to increase agricultural productivity (roads, irrigation, and drainage facilities) has a high labor-output ratio (p 60)."

On the extent of the participation of the poor in economic development, the first two reasons are directly connected to poverty reduction and narrowing the gap of income distribution, while the rest also have implications for increased employment. Since in developing countries the number of the poor in rural areas overwhelmingly outstrips those in urban area, poverty reduction and narrowing income distribution gap basically rely on economic growth in rural areas by creating rural employment.

However, agricultural growth in the way of land augmenting may not effectively alleviate poverty if it works alone. One reason is that in some countries with high labor to land ratio and a long history of agrarian society, like China, arable land has been fully utilized, so the land augment is limited. The other is that "agriculture

production, even when it grows rather rapidly, has a limited capacity to absorb rapidly increasing quantities of labor in a productive manner" (Mellor, 1995, p 9). Hence, whether agricultural growth can improve the condition of the poor is uncertain, but it probably depends on the relationship of agricultural and nonagricultural sectors, for Mellor (1995) believes that the expansion of rural nonagricultural sectors on the extent of employment can lift the poor out of poverty. Thus the relationship between agriculture and rural nonagriculture is worth carefully studying especially on its implications for employment (ibid., p 9). Moreover, after comparing eight cases of agricultural growth and poverty reduction, Mellor combined the argument as: "where there has been a marked increase in agricultural production per capita of the total population and where nonagricultural growth has occurred rapidly, poverty has experienced a rapid decline, as in Taiwan /…/" (ibid., p 320).

As the same reason that probably there is a limit of labor employment in agriculture, income gap may be continually narrowed only when industries, especially industries in rural areas absorb surplus labor from agriculture. Moreover, comparing with agricultural sector, industry is a high-income sector and capable of providing high wages, therefore the effort to narrow income distribution from industry is more evident than agriculture.

2.3.   Conclusion

To put in a nut shell, agricultural-development-led industrialization stresses on agriculture' development in the early stage of economic development in developing countries, not only because that growth of agricultural production can support increasing large number of people, but also that the agricultural sector, which is the largest one in developing countries, can easily bring economic production to a high level by technology change, and even more importantly support industry growth through capital and labor flows towards industry, and creating market for industrial products. Agriculture, as the biggest labor intensive sector, will improve household

income and narrow the urban-rural income gap along with its development. Industries, especially rural industries' expansion can bring more abundant rural labor into modern sector which can provide higher wages than agriculture, consequently narrowing urban-rural income gap.

3. Economic transitions in Taiwan and China

Focusing on the take-off period of Taiwan and mainland China, this section is going to carry a qualitative research of the two economies based on the discussion of previous section. In the agricultural-development-led industrialization framework there are three parts that need to be addressed following the sequence of industrialization: agricultural development; rural nonagricultural development; and the linkages between them. Considering that initial condition played an important role in economic development among Asian NIEs, the economic condition of pre-development will also be included in discussion. For Taiwan case, the whole process has been well analyzed in Mao and Chi (1995), Quibria (2002), and Fei, Ranis, and Kuo (1979), therefore Taiwan case in this section will guide the discussion and set a sample to analyze the mainland China case.

3.1. Institutions for agricultural development

This subsection is going to deal with the institutions for agricultural development in mainland China before and after 1980s and in Taiwan before and after 1950s from three perspectives: human capital; income distribution and wealth; and Physical investment.

3.1.1. Human capital

High literacy rate is a part of Japanese colonial legacy in Taiwan especially in the primary level. By 1944, 81 percent of boys and 61 percent of girls of school age were enrolled in schools (Booth, 1999, p302). Later the KMT government based on that legacy and further extended the enrollment in primary and secondary level. In 1960s,

when Taiwan's industrialization took off and increased with a high rate, more than half the population had attained literacy and primary school enrollment's rate achieved nearly 70 percent (Quibria, 2002, p 41).

In mainland China, with the concern about satisfying people's "basic needs" in the socialist era, the China Communist Party (CCP) government had done a nice job of providing education to Chinese people on vast regions. Fairly substantial resources flowed in to education throughout socialist period even during political campaigns. Even though in the Cultural Revolution CCP shut down universities and colleges across the country, primary school education significantly spread and illiteracy declined rapidly during the same period (Naughton, 2007, p 82). In the 1982 census, two thirds of the population was literate and industry skills were widespread across the country (ibid., p 82).

3.1.2. Distribution of income and poverty reduction

Before the land reform Taiwan's Gini coefficient remained on a relatively high level. The Gini coefficient was 0.56 in 1953, but declined in subsequent decades: 0.32 in 1964 and 0.29 in 1972 (Mao and Chi, 1995, p 54). That was mainly due to the changes in land distribution. Before 1945, the poorest 40 percent of household owned less than 10 percent of the land, but the wealthiest 2 percent hold more than one third of land. Furthermore, about 40 percent of the households were landless tenant households, who worked almost 60 percent of total cultivated land (Fei, Ranis, and Kuo, 1979, p 23). After the land reform launched by KMT government, household owing medium plots land, from 0.5 to 3 *chia*[7], increased from 46 percent in 1952 to 76 percent in 1960. From 1948 to 1959, the proportion of land cultivated by tenants decreased from 44 percent to 17 percent, and proportion of tenant farmers in farm families reduced from 38 percent in 1950 to 15 percent in 1960 (ibid., p 42).

Mainland China had an even more favorable initial condition of income distribution

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[7] One chia equals to 0.97 hectare or 2.47 acres.

than Taiwan. Although China is a large and developing country with great diversities of nature endowments, yet under the socialist economy Chinese society was dualistic but egalitarian. The early rural reform even narrowed the rural-urban gap and made China less dualistic but still high egalitarian (Naughton, 2007, p 217). In China's rural reforms between 1978 and 1984, every rural collective divided its land according to the number of labors and the number of members to feed in a household. Although the formal property right remains in collectives, households have accesses to work on land and the land-use rights can be extended up to 50 years. This reform, as Walder (2000) saying, was: "the most egalitarian land reform in history" (Naughton, 2007, p 120), resulted in little landlessness in rural China, and "there is little of the crushing poverty caused by absolute landlessness found in many development economies" (ibid. p120). Around 1982 to 1984 China reached the lowest point of Gini Coefficients, with less than 0.25 for rural area, around 0.16 for urban area and less than 0.30 for national Gini coefficients (ibid., Figure 9.2, p 218).

3.1.3. Physical investment

Taiwan was deliberately built as an important food supplier for Japan, therefore under Japan's 50 years of occupation, agriculture accounted for half of Taiwan's GNP and the biggest labor employer. Before the 1920s the growth rate of agricultural production was about 2 percent annually, contributed by expansion of cultivated land area which expanded from 519,000 hectares in 1910, to 752,800 hectares in 1921, and reached 837,000 hectares in 1942. Over the 1920s and 1930s irrigated land area rose from 364,100 hectares to 528,000 hectares, and 545,000 hectares in 1942, meanwhile the irrigated portion of cultivated land increased from 48.4 to 61.6 percent (Mao and Chi, 1995, p 25; Fei, Ranis, and Kuo, 1979, p 22). In order to facilitate the transportation of rural production, the Japanese undertook various projects to build an efficient and inexpensive system of railroad and rural roads. During those years improved varieties of crops and the use of chemical fertilizers were also introduced into production and significantly raised crop yields. The Japanese also set up farmers' associations and rural credit cooperative so as to provide advice on modern

agricultural practices and assistance for agricultural finance. The farmer's associations still remained as one of the most important rural organizations in agricultural development after 1945.

Since the 1950s China's agricultural growth greatly benefited from the green revolution. In Figure 3.1, irrigation area rose from more than 19 million hectares in 1952 to more than 44 million hectares in the late 1970s, and later the number leveled off throughout 1980s, but kept climbing up in the 1990s and finally exceed 55 million hectares in 2005. Organic fertilizers were widely used in the traditional agriculture input system and it's capable to provide sufficient nutrients, hence chemical fertilizer consumption was almost stagnant during the 1950s, with 78,000 tons in 1952, slowly increasing in the 1960s and 1970s, and finally reached almost 8,840,000 tons in 1978. The consumption grew vigorously from the 1980s and it reached more than 51 million tons in 2007 (See Figure 3.2). China spared no effort in agricultural research ever since the 1950s when China government built the world largest multilevel research system. Cooperating with provincial level academies and agricultural extension service in counties, the Chinese Academy of Agriculture Sciences (CAAS) undertook the jobs of seed promotion, production, distribution and adaptation. The whole system kept working and progressing even during the Culture Revolution. Two greatest experience before the 1980s were development of high-yielding dwarf variety of rice in 1964, and introduction and extension of hybrid varieties of various crops (Naughton, 2007, p 261- 262).
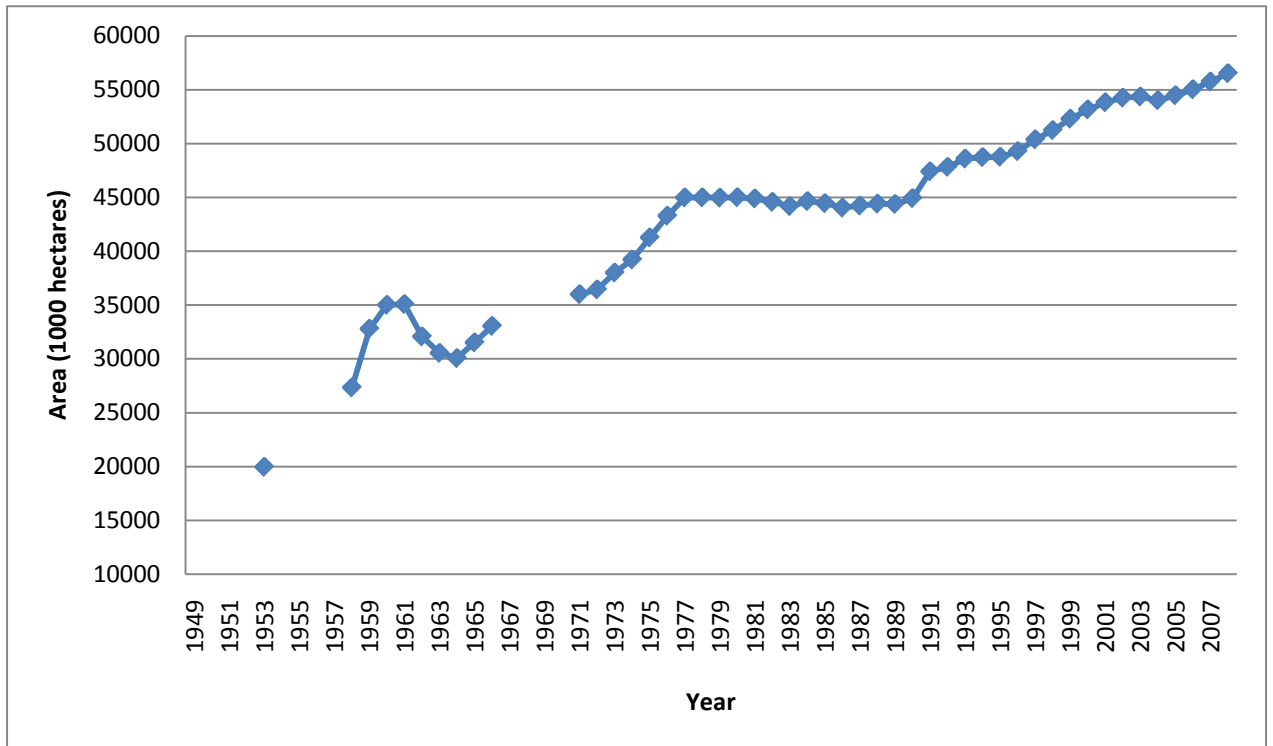
Figure 3.1: Change of total irrigated areas in mainland China, 1949-2007

Sources: Data from 1949 to 1989 comes from "Production Condition for Agriculture of China" in National Statistics category of China Data Online; Data from 1990 to 2007 refers to NBSC (2008).
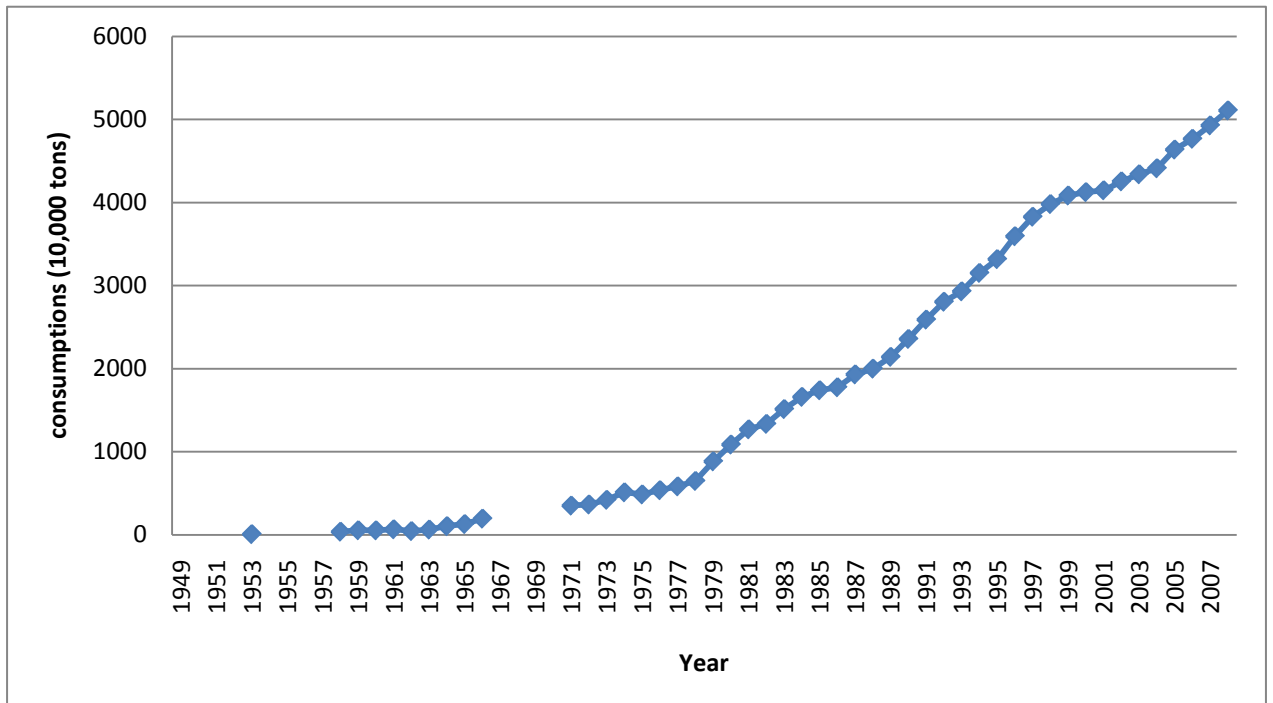
Figure 3.2: Changes of chemical fertilizer consumptions in mainland China, 1949-2007

Source: "Production Condition for Agriculture of China" in National Statistics category of China Data Online.

3.2. Agricultural growth

The period from 1946 to 1950 was Taiwan's recovery and rehabilitation time with a high annual growth rate of 19.2 percent in agricultural production. However, the growth rate declined sharply to 6.2 percent from 1950 to 1955 and further dropped to below 3 percent in the early 1970s and the whole 1980s. The growth rate of total agricultural production grew 4.3 percent annually from 1950 to 1988 which makes Taiwan a successful economy of agricultural production (Mao and Chi, 1995, p 27). Meanwhile, other items of agricultural production, including livestock, fisheries, and forestry, grew even more strikingly and their share in total production extended, except forestry of which production started to decrease in late 1960s (ibid., Table 2.1, p 27).

In mainland China the agricultural production growth evidently accelerated after the "Reform and Opening-up". Table 3.1 and Table 3.2 collected data of gross output of main agricultural products and indices of every five years in mainland China from 1978 to 2008. The grain production in 1978 was about 305 million tons which was only 57.67 percent of about 528 million tons in 2008, and contrasted to the peak before 1978 of 300 million tons per year (Naughton, 2007, p 253). As in Taiwan case, the achievements of other main agricultural products including cotton, oil-bearing crops, sugar, meat and aquatic products were even more impressive. Total productions of cotton, oil-bearing crops, sugar, meat and aquatic products in 1978 were, respectively, only 28.89 percent, 17.69 percent, 18.32 percent, 14.62[8] percent, and 9.51 percent of the ones in 2008. Figure 3.3 shows that the annual growth rates floundered after 1978, however, they were all above 3 percent, expect in 1980. The average annual growth rate from 1978 to 2007 is 6.16 percent, which is higher than Taiwan's from 1950 to 1988.

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[8] Data in 1979.

Table 3.1: Gross output of main agricultural products in mainland China, 1978-2008 (current prices)

Year	Grain (10000 tons)	Cotton Crops (10000 tons)	Oil-Bearing Crops (10000 tons)	Sugar (10000 tons)	Output of Meat (10000 tons)	Total Aquatic Products (10000 tons)	Total Gross Output (100 million Yuan)
1978	30,476.50	216.7	521.79	2,381.80	1,062.4*	465.35	1,397.00
1983	38,728.00	463.7	1,055.00	4,032.30	1,402.10	546	2,750.00
1988	39,408.00	414.9	1,320.30	6,187.40	2,479.50	1,060.90	5,865.30
1993	45,648.80	373.93	1,803.94	7,624.20	3,841.50	1,823.00	10,995.50
1998	51,229.53	450.1	2,313.86	9,790.40	5,723.80	3,382.66	24,541.90
2003	43,069.53	485.97	2,811.00	9,641.70	6,443.32	4,077.02	29,691.80
2008	52,850.00	750	2,950.00	13,000.00	7,269.00	4,895.00	48,893.00**

Source: "Output of major farm crops of China" in National Statistics category in China Data Online; NBSC (1990 and 2008)

Note:*data of 1979; **data of 2007

Table 3.2: Indices of main agricultural products in mainland China, 1978-2008 (index, 2008=100)

Years	Grain	Cotton	Oil bearing crops	Sugar	Meat	Aquatic products	Total gross output
1978	57.67	28.89	17.69	18.32	14.62*	9.51	2.86
1983	73.28	61.83	35.76	31.02	19.29	11.15	5.62
1988	74.57	55.32	44.76	47.60	34.11	21.67	12.00
1993	86.37	49.86	61.15	58.65	52.85	37.24	22.49
1998	96.93	60.01	78.44	75.31	78.74	69.10	50.20
2003	81.49	64.80	95.29	74.17	88.64	83.29	60.73
2008	100.00	100.00	100.00	100.00	100.00	100.00	100.00**

Source: "Output of major farm crops of China" in National Statistics category in China Data Online; NBSC (1990 and 2008)

Note:*data of 1979; **data of 2007
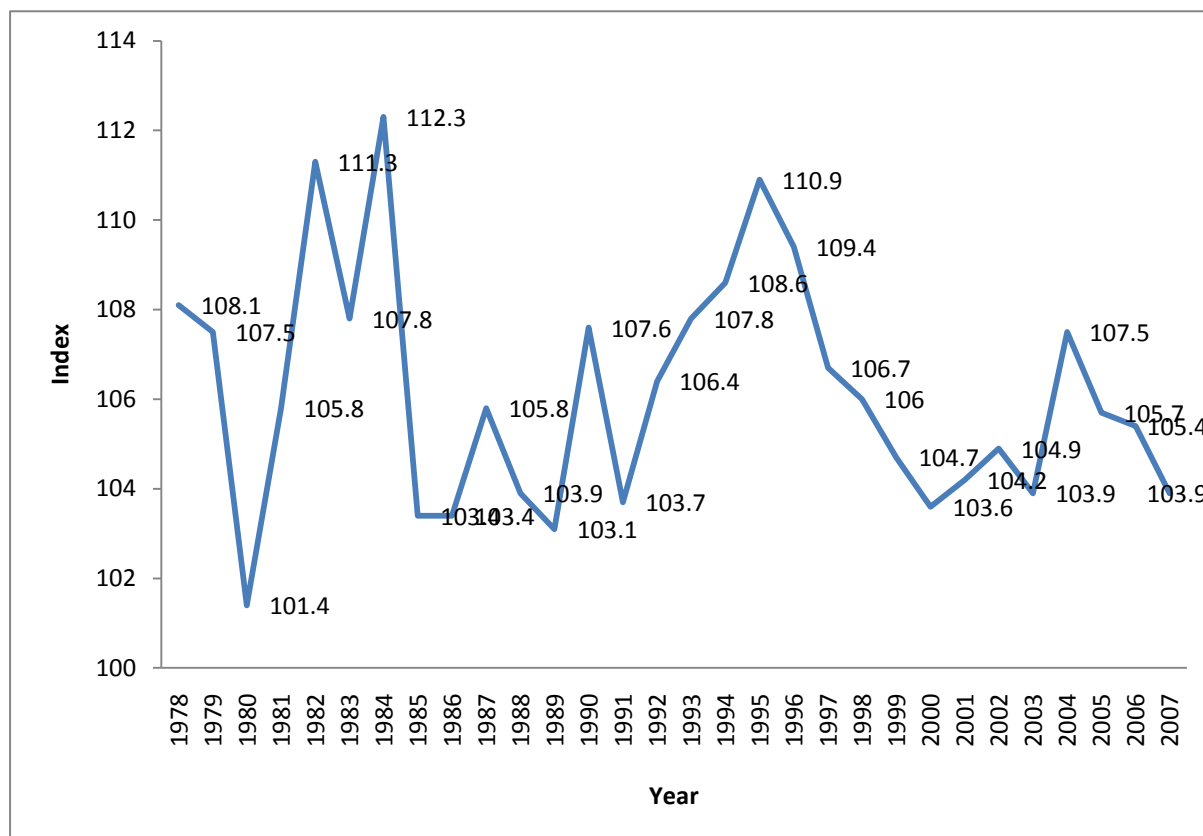
Figure 3.3: Indices of gross output of agriculture in mainland China, 1978-2007 (valued by constant price[9], preceding year=100)

Source: NBSC (1991and 2008)

3.3. The rise of rural industries

The small, labor-intensive and indigenous firm which started at the very beginning of takeoff period in rural areas was a common feature in rural industrialization of Taiwan and China (Lin and Yang, 2001, p 180). The small and medium enterprises (SMEs) and the rural industries, or the Township and village enterprises (TVEs), both played important roles in economic transition of Taiwan and mainland China.

The SMEs in Taiwan, defined as fewer than 100 employees firms, were the absolutely majority among manufacturing firms from the 1950s to 1980s. At the beginning nearly all, above 99 percent, manufacturing firms were SMEs. The number

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[9] Indexes in Figure 3.3 are comparable prices, valued by constant prices to eliminate the effects of price changes. There are three constant prices in this figure from 1978 to 2007. Prices from 1978 to 1981 were valued by 1970 price; from 1981 to 1991 were valued by 1980 price; and after 1991 were valued by 1990 price (NBSC, 2002b).

of SMEs slightly declined from 99.4 percent in 1954 to more than 95 percent in the 1970s and 1980s. The average size of SMEs increased from 8.4 persons in 1961 to 21.3 persons in 1966 and then dropped from the peak of 28.2 persons in 1971 to above 24 persons in the 1980s. Labors in SMEs accounted 61percent of total manufacturing employment in 1961 and continuingly declined with average size of firms in the mid 1970s, but steadily rose again in the 1980s (Mao and Chi, 1995, Table 2.6, p 44). Benefited from export promoted policies, SMEs absorbed Taiwan's abundant labor, made use of simple technologies, and easily entered various industrial sectors due to their small size. The share of SMEs in total manufacture production increased from 27 percent in 1971 to 48 percent in 1984. The percentage of total export values grew from 55.7 percent in 1972 to 66.7 percent in 1980, and 75.9 percent in 1982 to 71.8 percent in 1984 (ibid., p 45).

Traditional China's rural economy was featured for prosperous small-scale, nonagricultural activities, which created a web for agricultural production and processing. However, that linkage was crushed by command economy and caused income decline especially in commercialized rural areas, where the agricultural land per capita was low. TVEs first appeared as a response during the Great Leap Forward (GLF). Communes were encouraged to run factories, construction team and all kinds of nonagricultural undertakings. In the Cultural Revolution era, rural industrialization revived rapidly with the assist from state support under the guideline of new leap forward. In the 1970s rural industries expended from "serve agriculture" to several capital-intensive industries: the "Five Small Industries" which consisted of iron and steel, cement, chemical fertilizer, hydroelectric power and farm implements.

Although rural industries were important in rural economy before 1978: they absorbed surplus labor in rural area, increased household income; and their revenue was channeled to supporting agricultural development and public works, yet the development of rural industries was bounded in the structure of command economy, badly influenced by center policies. Hence, as a consequence, their connections with

agriculture were weak, and their functions and roles in rural development were restricted[10].

After 1978 rural enterprises entered a golden era of development. Except TVEs[11], or precisely collective-owned firms, private enterprises and self-employed individuals also expanded rapidly. Figure 3.4 provides us an overview of the nonagricultural employment in mainland China's rural area from 1985 to 2002. The total number of employment increased from 69 million in 1985 to a peak of about 135 million in 1996. However the golden age ended in the mid 1990s, employment declined and stagnated until the early 2000s. This figure also indicates an evident decline of employment in collective-owned firms but a significant extension in private firms and self-employed individuals after 1997 until 2002[12]. This transition can be explained that the favorable policy ambiance for collective-owned firms ceased to exist and a widespread privatization initialed among those firms[13]. Table 3.3 tells a similar outline. The total number of rural enterprises increased from 1.52 million in 1978 to 21.33 million in 2002, but the peak was 24.94 million in 1994. The share of number of employees hired by rural enterprises in total rural labor force grew from 9.2 percent in 1978 to a crest of 29.8 percent in 1996, and then declined, but leveled off around 27 percent later. The industrial output of rural enterprises accounted for only 9.1 percent in 1978, however, this share reached 57.9 percent in 1997. And the share of rural enterprise export in total exports dramatically increased from 9.19 percent in 1986 to 45.81 percent in 1997 (Lin and Yang, 2001, Table 4.1, 4.2, p 146-147).

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[10] Discussions in these two paragraphs are based on part 12.1 in Naughton (2007).

[11] The identifications of TVEs (*xiangzhen qiye*) varied in the last 30 years. At first TVEs referred to only collective and brigade owned enterprises. This definition was framed in the industry system of ownership: state-owned (*guoyou*), collective-owned (*jiti suoyou*) and private-owned (*siyou*) enterprises. In early years the private-owned enterprises were not approved and in some cases they were covered by local government as a part of collectives. The private-owned enterprises were not included in the calculation of nonagriculture sectors until 1985. Later the "TVEs" acquired a broader extension, and in many documents it covered both collective-owned and private-owned enterprises. The private-owned enterprises (*siyou qiye*) can be divided in to private enterprises (*siyin qiye*) and self-employed individuals (*geti hu*). Private enterprise (*siyin qiye*) is bigger than self-employed individual in scale (more than 8 people) moreover there exists the employer-employee relationship in those enterprises.

[12] Based on different sources of data, Naughton (2007) found the decline of employment in collective-owned firms and the increase in private and self employed firms are sustained until 2004 (Figure 12.2, p 286).

[13] See p285-293 in Naughton (2007).

However, the end of golden age implied no indication of retrogression among rural enterprises but a modest growth rate closer to GDP growth rate. TVE value added as a share of GDP increased from 26 percent in 1996 to 30 percent in 1999 and sustained at the same level through 2004 (Naughton, 2007, p 286). Moreover, Naughton presumed that rural enterprises succeeded in raising labor efficiency thus they could promote their production without adding workers (ibid., p 286).
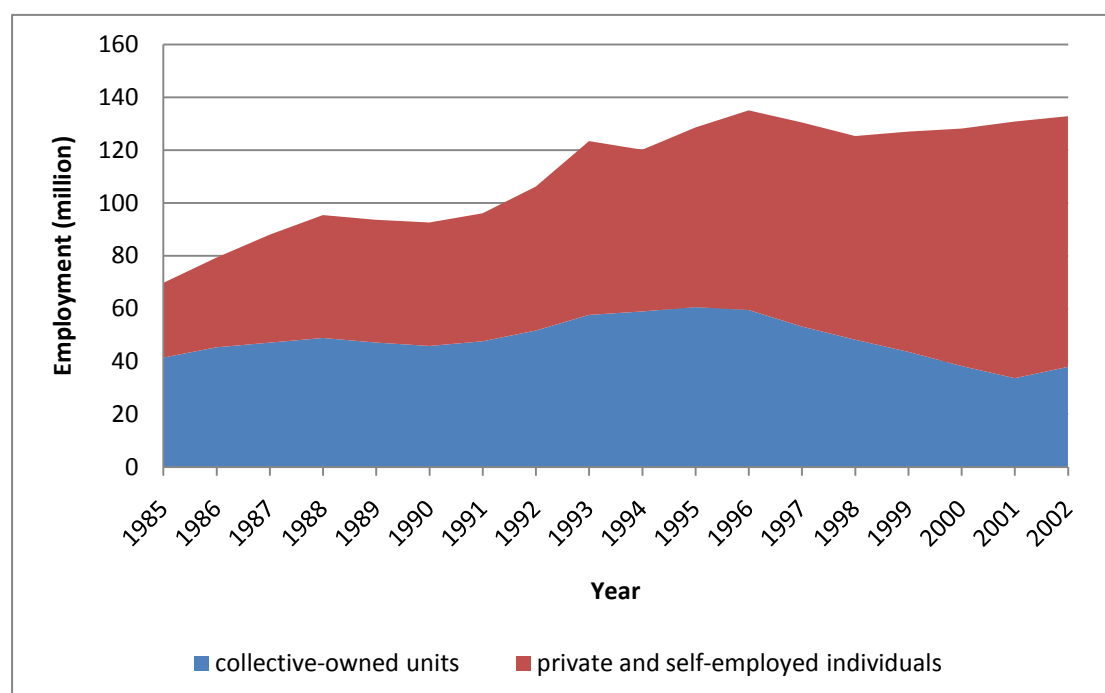
Figure 3.4: Nonagricultural employments in rural China, 1985-2002
Source: NBSC (1991 and 2003)

Table 3.3: Employment and number of rural enterprises, 1978-2002

years	number of firms (millions)	Employment (millions)	percent of total rural labor %
1978	1.52	28.27	9.2
1979	1.48	29.09	9.4
1980	1.42	30	9.4
1981	1.34	29.7	9.1
1982	1.36	31.13	9.2
1983	1.35	32.34	9.3
1984	6.07	52.08	14.5
1985	12.22	69.79	18.8
1986	15.15	79.37	20.9

1987	17.5	88.05	22.6
1988	18.88	95.45	23.8
1989	18.69	93.67	22.9
1990	18.73	92.65	22.1
1991	19.09	96.09	22.3
1992	20.92	106.25	24.2
1993	24.53	123.45	27.9
1994	24.94	120.17	26.9
1995	22.03	128.62	28.6
1996	23.36	135.08	29.8
1997	20.15	130.50	28.4
1998	20.04	125.37	27.0
1999	20.71	127.04	27.1
2000	20.85	128.20	26.7
2001	21.16	130.86	27.1
2002	21.33	132.88	27.4

Source: NBSC (2000 and 2003); NBSC and MLSS (1999).

Note: Data for 1978-1983 only include township and village level enterprises.

3.4. Linkages within economic transition

Section 3.3 has described the labor transition from agricultural sector to rural enterprises. Agricultural sector supports rural enterprises by transforming surplus labor to indigenous and labor-intensive rural factories. This section is going to widen the discussion of labor transition to the whole economy, for the reason that a large number of surplus rural labors migrated to urban area and provided cheap labor to the booming second and tertiary industries.

The labor flows from agricultural to nonagricultural sectors in Taiwan can be divided into two periods. From 1952 to 1964 agriculture still absorbed large amount of increased labor. Agricultural labor increased from 1.64 million to 1.81 million, but the growth rate was lower than that of total labor force. During the same period more than 200,000 agricultural workers transferred to nonagricultural sectors, at an average of 19, 000 a year, and the growth rate ranging from 0.3 to 2.3 percent. The labor transferring accelerated after 1965 because of the rapid industrialization in nonagricultural sector. From 1965 to 1973 labor migrated from agriculture to

nonagriculture at an average of 93,522 persons per year (Mao and Chi, 1995, p 49).

The mainland China case also clearly shows the trends of general labor flows. Figure 3.5 illustrates that from 1978 to 2007 the percentage of employment in agricultural sector decreased steadily from 70 to 40 percent, and during the same period nonagricultural employment kept rising up to about 60 percent.
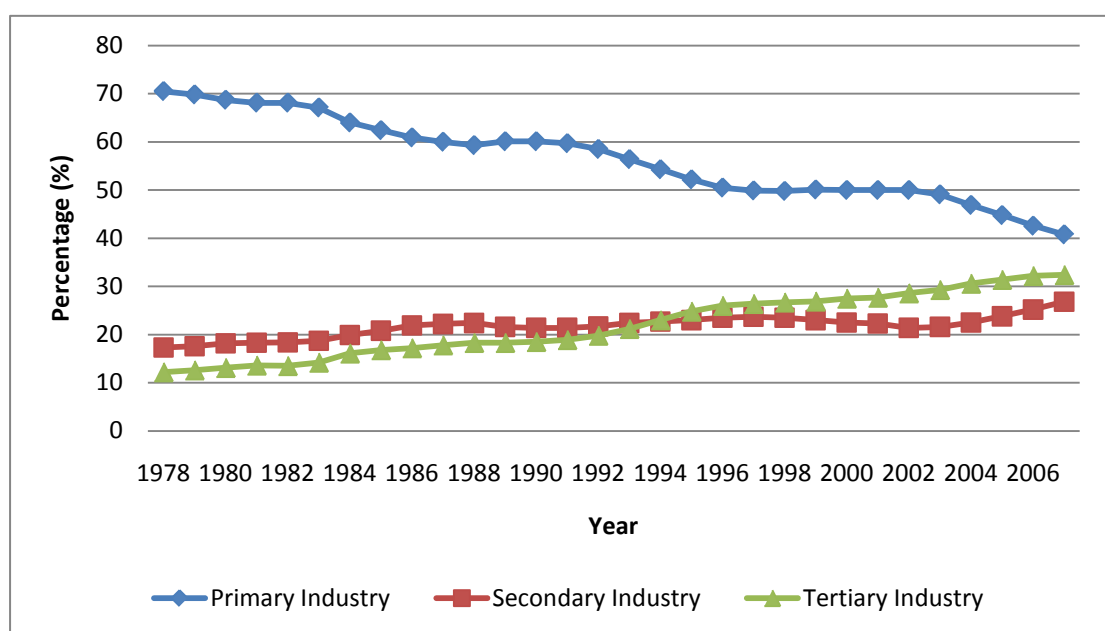
Figure 3.5: Change of employment in Mainland China, 1978-2007
Source: NBSC (2008)

The capital flow from agricultural to nonagricultural sectors is another argument in agricultural-development-led industrialization. It's not easy to estimate, however it's rational to argue that nonagricultural sectors' development was benefited from domestic savings originated from agricultural development. In Taiwan, SMEs' growth was not supported by government so they could hardly gain any low-cost loans together with other resources from government. What they relied on was the informal money market which consisted of domestic savings. In mainland China however, due to the political and historical reasons the capital flowing from agricultural sector to nonagricultural sectors was propelled by local governments. Rural industries received

capital from agricultural revenues through collectives at the beginning. When rural industries extended in 1980s, the rural credit cooperatives (RCCs) were allowed to lend more local deposits to rural industries, though the RCCs were designed to transfer rural domestic savings to urban areas. What makes mainland China different from Taiwan was that local governments were willing to act as intermediaries and guarantors for rural industries, mainly collective-owned TVEs, to ensured bank capitals and even gave pressure upon local branches of banking system to provide loans to their firms. Hence rural firms had enough money to extend their scales and newly founded firms can enter business with a larger size, and to start with some mechanization (Naughton, 2007, p 278-279).

Figure 3.6 shows changes of expenditure to support agriculture and social subsidies in total operation revenue of rural industries in mainland China from 1978 to 2007. Although it is an incomplete estimation of rural industries efforts to support agriculture, the figure can prove that in mainland China rural industries did support agricultural development in the way of capital flow. This expenditure kept rising up from below 5 billion to more than 25 billion in 1996 and then continued declining until 2002. It shows that the total amount of expenditure was greatly influenced by the performance of rural enterprises and the decline happened when the golden age of TVEs ended (See section 3.3.).
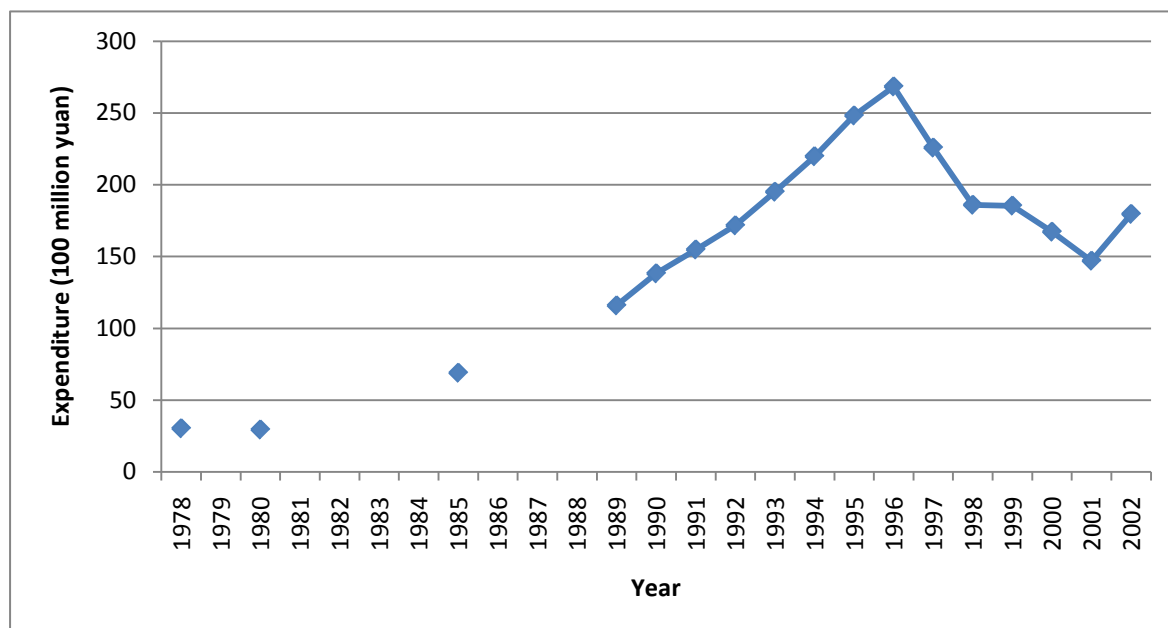
Figure 3.6: Expenditure for supporting agriculture and social subsidies from total operation revenue of rural industries in mainland China, 1978-2002

Source: NBSC (2003)

3.5. Conclusion

So far this section has finished the comparing of Taiwan and mainland China based on the discussion of agricultural-development-led industrialization in section 2. Both economies' development benefited from several institutions especially in the initial stage: human capital, distribution of income and poverty reduction, and physical investment. Either colonial age or socialist era in Taiwan and China provided larger number of educated people for economic growth than some less developed countries. Societies in those two economies were egalitarian and income gaps were small at least in the early stage of economic transition. Land reforms in Taiwan and mainland China not only stimulated agricultural production, but also significantly reduced social poverty and improved income distribution. Taiwan and mainland China both had well developed infrastructure foundation for agricultural production, such as paved roads, irrigation, and extended cultivated land. Moreover, green revolution spread all over the two economies ever since the colonial or socialist's ages. New productive seeds and agricultural chemicals were widely adopted so as to increase production. Farmer

associations in Taiwan, CAAS and rural collectives in mainland China were adopted to organize agricultural production and promote the green revolution. To sum up, mainland China, at the beginning of reform and opening up, shared all the same favorable factors for economic development as Taiwan in the takeoff age.

The subsequent two subsections elaborated the growth of agricultural and rural nonagricultural sectors. Agricultural productions increased evidently in Taiwan and mainland China throughout economic transitions and at the same time rural industries expended and grew in a more remarkable speed and acted an increasingly important role in the whole economy. Therefore, there existed a correlation of agricultural development and rural industries growth not only in Taiwan but also in mainland China. The fourth subsection found certain causal linkages between agricultural and rural industrial growth. Large number of former agricultural labors transferred to nonagriculture sectors in both economies, and rural industries received a large number of domestic savings from agriculture growth. Because of substantial supports from local government, rural firms in mainland China enjoyed even better environment for development. Later in mainland China case, findings revealed an outflow of capital from rural industries to support agricultural growth since 1978.

All in all, by comparing Taiwan and mainland China's economic growth, this section reaches a conclusion that mainland China's economic transition can't be more similar to the Taiwan model of agricultural-development-led industrialization. However, the closer mainland China's and Taiwan's economic transitions grow, the more delusive of mainland China's worsen income distribution become.

4. Provincial analysis

Last section has proved that mainland China is also an agricultural-development-led industrialization just as Taiwan; however the former failed to accomplish the social aim of income distribution improvement. So far in this thesis the puzzle that Gini

coefficient especially the rural one rose steadily in mainland China which counters the case of Taiwan hasn't been solved. Moreover the findings in last section make it even more complicated and confusing: broad commonalities in industrialization processes existed between mainland China and Taiwan. Nevertheless, this puzzle doesn't so much originate from previous findings as from a possible presumption of a universal mainland China case. On one hand the national data can tell us the mainstream or general pattern of China's economic transition, which was proved to be agricultural-development-led industrialization, on the other, might disguise the possible regional patterns of economic transition which may result in the increasing inequality in China. Therefore the hypothesis is that sub models or patterns exist among provinces because of vast diversities of nature endowment and foundations for economic development. Hence, in order to find a clue of the failure in income distribution improvement, this section will try to test the hypothesis and provide an explanation of agricultural and rural industries' development in mainland China through provincial analysis.

4.1. Different paces of industrialization

Table 4.1 presents percentages of agriculture and nonagriculture in total output of rural economy in 1981 and 1990, and ranks the 30 provinces[14] in mainland China by the change of percentage of nonagricultural output. The percentage of total nonagricultural output to total rural output was only 14.33 percent in 1981 however it rose by 39.57 percent and reached 53.9 percent in 1990. At the same time the percentage of total agricultural output to total rural output decreased from 85.67 to 46.1 percent. Although the percentage of nonagricultural output of national level increased by 39.57 percent, the provincial changes ranged from 51.74 percent in Shandong province to -1.23 percent of Tibet autonomous region. Table 4.1 has divided all the provinces into two groups through the change scale of 39.57 percent. Eight provinces' changes exceed the national level: Shandong, Jiangsu, Zhejiang,

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[14] Hainan province was a part of Guangdong province before 1988, hence in 1981 there're 29 provinces. Chongqing city was a newly founded municipality in 1997. Please refer to the map of China in appendix.

Beijing, Liaoning, Hebei, Shanghai and Guangdong. Meanwhile, their percentage of nonagricultural output in 1990 was much higher than most of the second group provinces, expect Tianjin and Shanxi, of which the percentages of nonagricultural output were higher both in 1981 and 1990 than most provinces though their increase wasn't distinct.

Therefore, Table 4.1 at least proved that the economic transitions among province were asynchronous. Ten provinces with higher percentage of nonagricultural output: Shanghai, Tianjin, Jiangsu, Shandong, Beijing, Hebei, Guangdong, Liaoning, Shanxi and Zhejiang coexisted with quite a few provinces with lower portion, below national level of 53.9%, such as Tibet, Xinjiang, Qinghai, Guizhou, Guangxi, Inner Mongolia in the west, and Hubei, Anhui in the middle, as well as Jilin, Fujian in the east, etc. Moreover, Table 4.1 does provide evidences that big municipalities and several coastal provinces, which had larger increase of nonagricultural output percentage and higher nonagricultural output percentage, were probably leading the industrialization of rural China while most of the provinces in middle and west China were left far behind.

Table 4.1: Percentage of agriculture and nonagriculture in total output of rural economy, 1981 and 1990 (%)

Provinces	Agricultural output		Nonagricultural output		Change
	1981	1990	1981	1990	1981-1990
Shandong	88.32	36.58	11.68	63.42	51.74
Jiangsu	75.97	28.01	24.03	71.99	47.96
Zhejiang	77.34	29.56	22.66	70.44	47.78
Beijing	70.49	25.19	29.51	74.81	45.3
Liaoning	84.19	38.89	15.81	61.11	45.3
Hebei	82.04	40.97	17.96	59.03	41.07
Shanghai	58.33	17.35	41.67	82.65	40.98
Guangdong	86.9	46.06	13.1	53.94	40.84
National level	*85.67*	*46.1*	*14.33*	*53.9*	*39.57*
Henan	86.72	48.81	13.28	51.19	37.91

Shaanxi	89.61	53.15	10.39	46.85	36.46
Hubei	91.97	57.39	8.03	42.61	34.58
Shanxi	73.24	38.71	26.76	61.29	34.53
Anhui	92.53	58.13	7.47	41.87	34.4
Sichuan	93.15	59.6	6.85	40.4	33.55
Gansu	92.93	60.72	7.07	39.28	32.21
Fujian	82.4	50.53	17.6	49.47	31.87
Hunan	89.97	61.35	10.03	38.65	28.62
Jilin	86.89	58.69	13.11	41.31	28.2
Heilongjiang	90.89	63.64	9.11	36.36	27.25
Ningxia	92.05	68.95	7.95	31.05	23.1
Jiangxi	84.58	62.26	15.42	37.74	22.32
Tianjin	41.52	19.81	58.48	80.19	21.71
Yunnan	90.37	74.95	9.63	25.05	15.42
Hainan	---*	85.95	---*	14.05	14.05
Qinghai	93.74	80.22	6.26	19.78	13.52
Guizhou	87.79	74.99	12.21	25.01	12.8
Inner Mongolia	89.81	77.03	10.19	22.97	12.78
Guangxi	88.43	76.49	11.57	23.51	11.94
Xinjiang	93.4	86.72	6.6	13.28	6.68
Tibet	92.31	93.54	7.69	6.46	-1.23

Source: NBSC (1981 and 1991)

Note: *data are not available.

4.2.   Regional patterns

Table 4.2 calculated index of nonagricultural and agricultural output per capita in 1981, 1990 and 1995. Higher indexes indicate better performance in either agricultural sector or nonagricultural sectors and vice versa. And if the index is more than one, then the performance exceeds national level. Based on the data from Table 4.2, Figure 4.1, 4.2 and 4.3 revealed that there were positive correlations between indexes of nonagricultural and agricultural output per capita in all the three years, moreover from 1981 to 1995 these correlations became stronger[15]. In another way of saying, from 1981 to 1995 province which held a higher nonagricultural output per capita was more likely to maintain a higher agricultural output per capita, vice versa.

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[15] R square in 1995 is lower than the one in 1990, but it will increase to 0.4032 if Xinjiang is excluded as an outlier. If Hainan, another outlier, is excluded, then the R square in 1995 will reach 0.5419, which shows a relatively strong relationship.

This finding somehow might show us a clue that among the provinces there was a close connection between agricultural and nonagricultural production: the better agricultural performs the better nonagricultural sectors develop, vice versa.

Furthermore, the strengthening correlations in from 1981 to 1991 and 1995 might result from the relief of command economy and center policies. Rural nonagricultural sectors finally got the chance to choose a development road in favor of their comparative advantages of abundant labor and built a closer connection to agricultural sector. Those findings are not surprising since they testified again the conclusion in section 3 that in national wide mainland China was on the road of agricultural-development-led industrialization and the development in agricultural and nonagricultural sectors was closely knitted.

Table 4.2: Indices of nonagricultural and agricultural output per capita in provinces, 1981, 1990 and 1995 (National level=1)

Provinces	Nonagricultural output per capita			Agricultural output per capita		
	1981	**1990**	**1995**	**1981**	**1990**	**1995**
Beijing	3.48	4.79	2.01	1.39	1.88	2.00
Tianjin	7.45	5.62	3.66	0.88	1.62	1.52
Hebei	1.11	1.00	0.93	0.85	0.81	0.97
Shanxi	1.71	0.88	0.82	0.78	0.65	0.59
Inner Mongolia	0.75	0.33	0.59	1.11	1.29	1.18
Liaoning	1.47	1.88	1.98	1.31	1.40	1.54
Jilin	1.24	0.88	0.60	1.37	1.46	1.54
Heilongjiang	0.97	0.71	0.68	1.62	1.45	1.64
Shanghai	7.26	7.01	5.15	1.70	1.72	2.10
Jiangsu	2.45	2.78	2.22	1.30	1.26	1.43
Zhejiang	2.00	2.36	2.77	1.14	1.16	1.12
Anhui	0.50	0.56	0.81	1.04	0.90	0.89
Fujian	1.17	0.91	1.31	0.92	1.09	1.31
Jiangxi	1.05	0.50	0.87	0.96	0.97	0.89
Shandong	0.88	1.57	1.72	1.12	1.06	1.18
Henan	0.82	0.71	0.58	0.90	0.79	0.76
Hubei	0.58	0.69	1.00	1.11	1.08	1.10

Hunan	0.70	0.48	0.59	1.06	0.90	0.89
Guangdong	0.79	1.45	1.14	0.88	1.45	1.16
Guangxi	0.65	0.21	0.34	0.83	0.81	0.86
Sichuan	0.38	0.48	0.73	0.86	0.82	0.73
Guizhou	0.50	0.17	0.08	0.60	0.60	0.53
Yunnan	0.50	0.22	0.20	0.78	0.77	0.64
Tibet	0.74	0.07	---*	1.47	1.12	0.80
Shaanxi	0.54	0.57	0.35	0.78	0.75	0.63
Gansu	0.30	0.35	0.29	0.66	0.63	0.67
Qinghai	0.42	0.19	0.07	1.04	0.92	0.77
Ningxia	0.48	0.33	0.11	0.93	0.86	0.70
Xinjiang	0.58	0.21	0.17	1.37	1.58	2.16
Hainan	---**	0.22	0.32	---**	1.54	1.91
National level	**1**	**1**	**1**	**1**	**1**	**1**

Source: NBSC (1981, 1991 and 1996)

Note: * Data for Tibet is not available after 1992 in China statistical yearbook; ** Data are not available for Hainan.
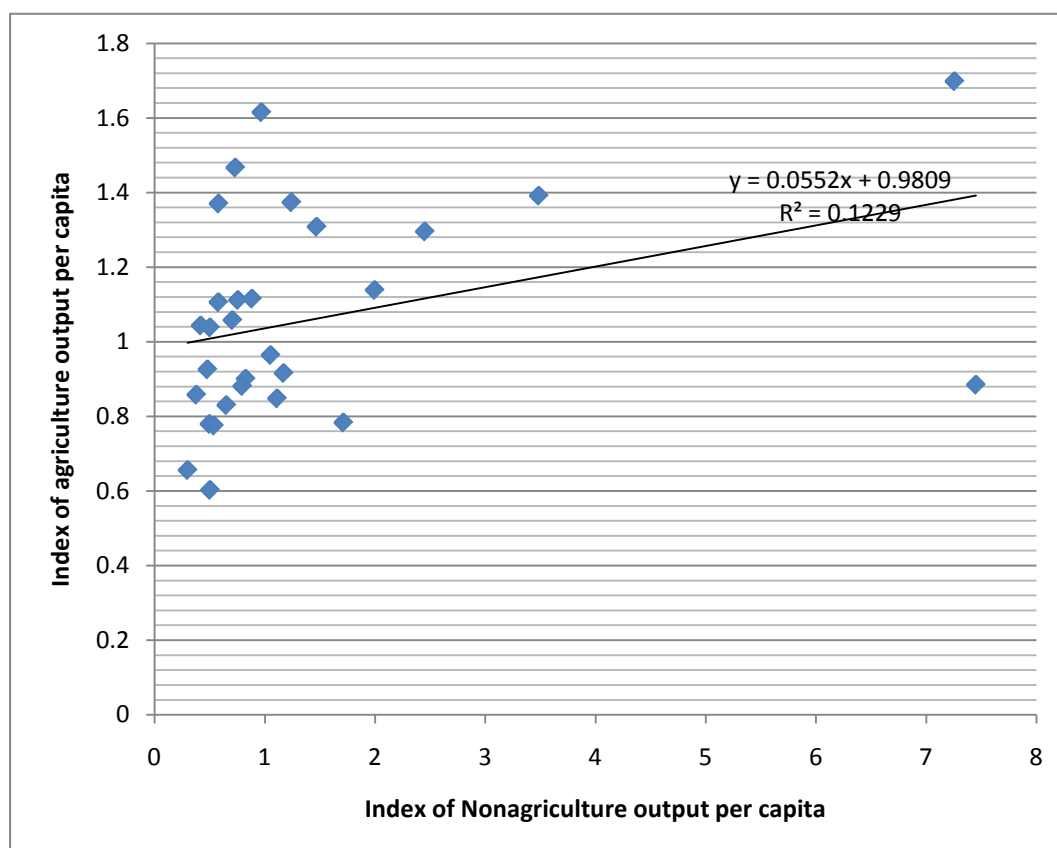
Figure 4.1: Provincial correlation of agricultural and nonagricultural output per capita (1981)

Source: NBSC (1981)
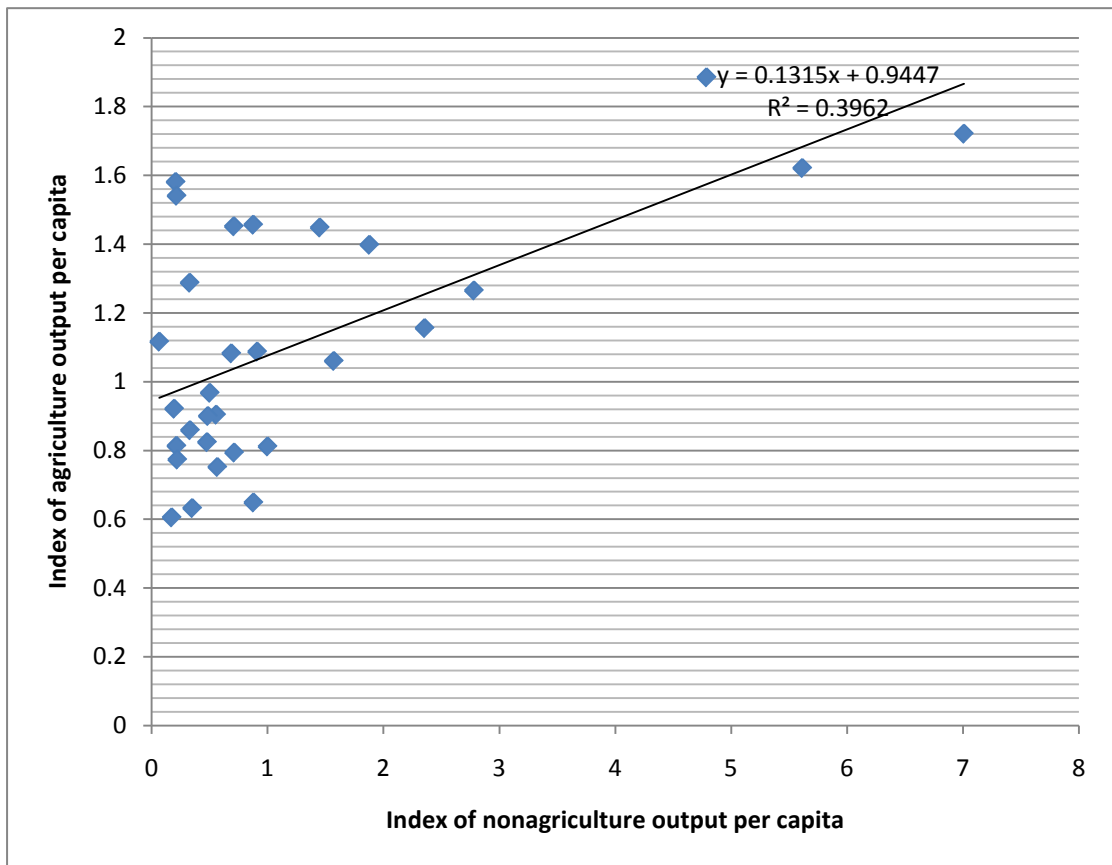
Figure 4.2: Provincial correlation of agricultural and nonagricultural output per capita (1990)

Source: NBSC (1991)
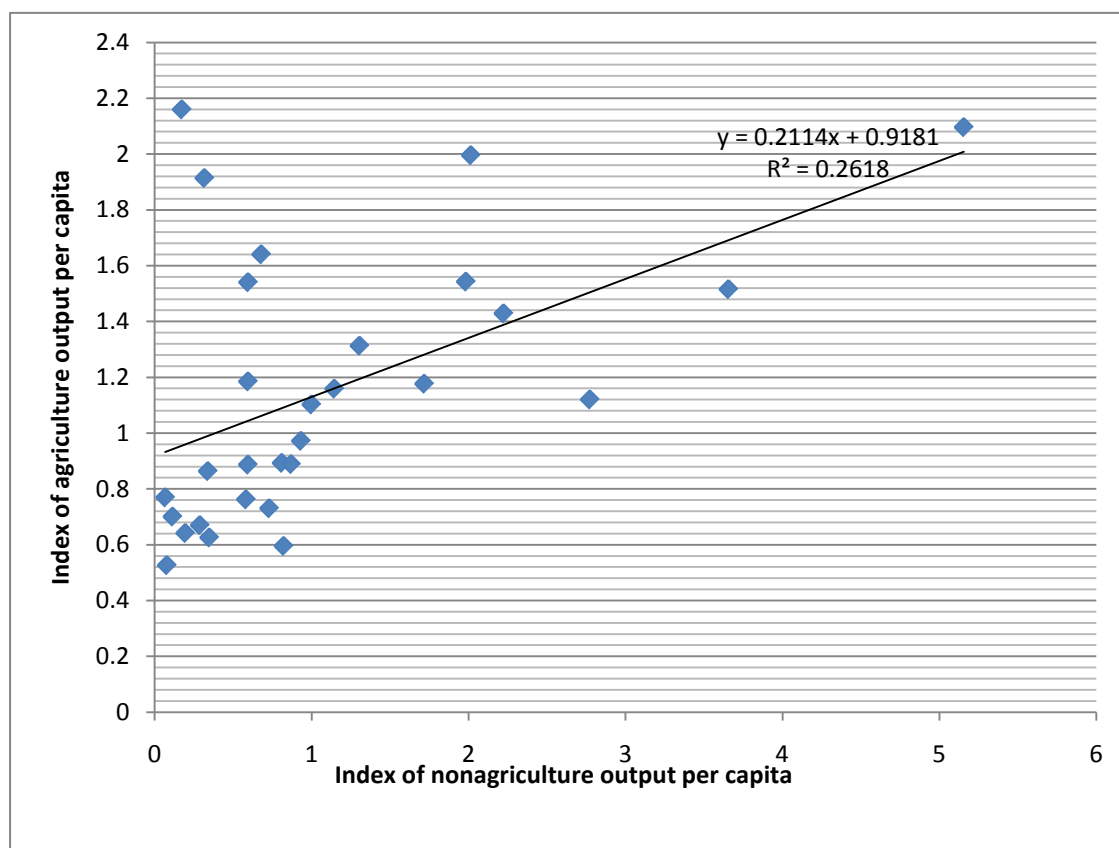
Figure 4.3: Provincial correlation of agricultural and nonagricultural output per capita (1995)

Source: NBSC (1996)

Note: Tibet is not included in Figure 4.1, 4.2 and 4.3.

Figure 4.4, 4.5 and 4.6 set index of agricultural output per capita as Y coordinate axis and index of nonagricultural output per capita as X coordinate axis. The national level value is selected as the origin of coordinates. There are four quadrants in these coordinates, and from one to four respectively represents: 1) high agricultural and non agricultural output per capita index group; 2) high agricultural but low nonagricultural output per capita index group; 3) low agricultural and non agricultural output per capita index group; and 4) low agricultural but high nonagricultural output per capita index group. As mentioned above the indexes can suggest performance in both agricultural and nonagricultural sectors. Higher indexes indicate a better performance in either agricultural sector or nonagricultural sectors thus for example the first quadrant equals to group with better agricultural and nonagricultural performances.

Index of agricultural output per capita

Tibet, Hunan, Hubei, Shandong, Anhui, Heilongjiang, Inner Mongolia, Qinghai, Xinjiang (9)	Zhejiang, Jiangsu, Jilin, Liaoning, Beijing, Shanghai (6)
Shaanxi, Gansu, Ningxia, Henan, Guangdong, Guangxi, Sichuan, Guizhou, Yunnan (9)	Hebei, Shanxi, Fujian, Jiangxi, Tianjin (5)

Index of Nonagricultural output per capita
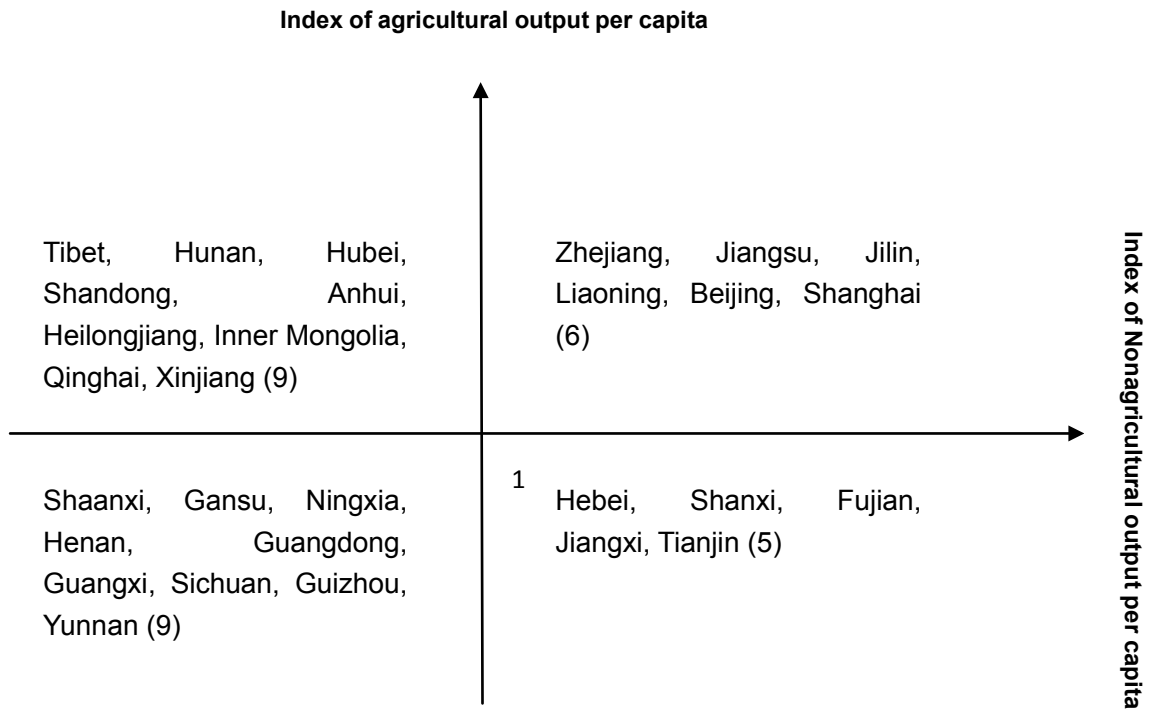
Figure 4.4: Distribution of provinces by indexes, 1981

Index of agricultural output per capita

Tibet, Heilongjiang, Inner Mongolia, Xinjiang, Hubei, Fujian, Hainan (7)	Zhejiang, Jiangsu, Liaoning, Beijing, Shanghai, Tianjin, Shandong, Guangdong (8)
Hebei, Shanxi, Anhui, Jiangxi, Shaanxi, Gansu, Ningxia, Henan, Hunan, Guangxi, Sichuan, Guizhou, Yunnan, Qinghai (14)	Jilin (1)

Index of nonagricultural output per capita
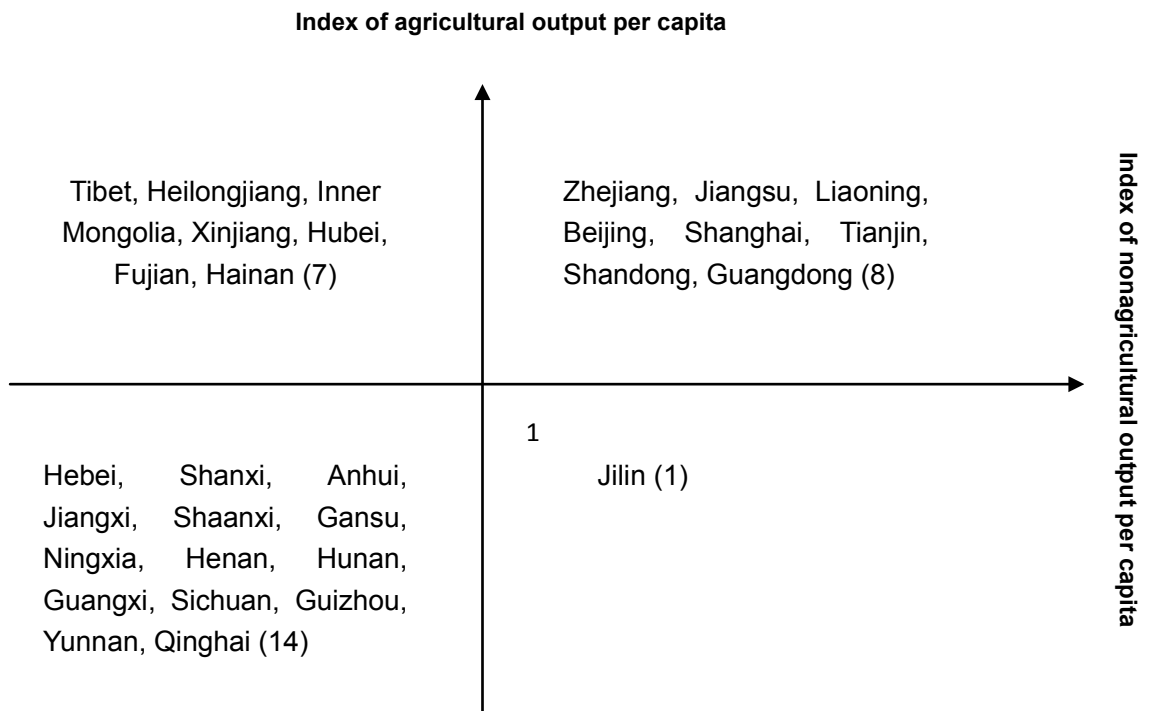
Figure 4.5: Distribution of provinces by indexes, 1990

Heilongjiang, Inner Mongolia, Xinjiang, Hubei, Jilin, Hainan (6)	Zhejiang, Jiangsu, Liaoning, Beijing, Shanghai, Tianjin, Shandong, Guangdong, Fujian (9)
Hebei, Shanxi, Anhui, Jiangxi, Shaanxi, Gansu, Ningxia, Henan, Hunan, Guangxi, Sichuan, Guizhou, Yunnan, Qinghai (14)	

Index of nonagricultural output per capita

1
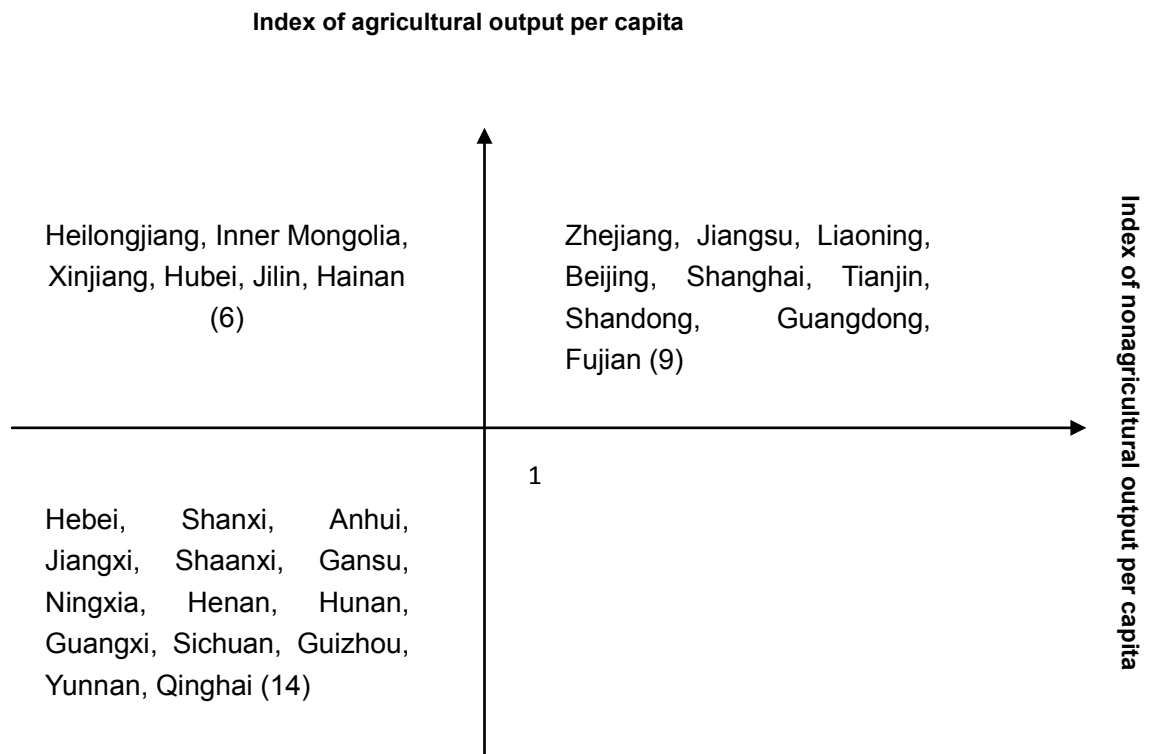
Figure 4.6: Distribution of provinces by indexes, 1995

Note: Tibet is not included in figure 4.5 and 4.6.

Based on the analysis above, there are three groups among mainland China's 29 provinces, if we prefer data in 1995: 1) high agricultural and nonagricultural output per capita index group, including Beijing, Shanghai, Jiangsu, Zhejiang, Guangdong, Shandong and so on; 2) high agricultural but low nonagricultural output per capita index group, including Inner Mongolia, Hubei, Xinjiang, and so on; 3) low agricultural and nonagricultural output per capita index group, including Hebei, Anhui, Jiangxi, Henan, Sichuan, etc. Group 1 contained all the municipalities in 1995 and several coastal provinces; however group 2 and 3 mainly consisted of middle and western provinces. There was a forth group of low agricultural but high nonagricultural output per capita in 1981 and 1990, but it vanished in 1995 case.

Until now the thesis has not only proved that economic transitions among mainland China's provinces took different steps and far from a universal pattern, but also established sub-patterns among provinces. Provinces in group 1 resembled Taiwan's

agricultural-development-led industrialization. Those provinces had higher agricultural and nonagricultural output per capita, which also means better agricultural and nonagricultural performance than other provinces, and they were founded as economic centers, leading the development of the whole economy. Provinces in group 2 and 3 were largely left behind, though most of them have paid great efforts to agricultural and rural industrial development. However, their economy, especially rural industries, didn't perform as well as provinces in group 1. Provinces in group 2 and 3 like Henan, Sichuan, Hunan, Anhui, etc, which has a large number of surplus labor, become suppliers of migrant workers to economic centers built in group 1.

4.3. **Mainland China's economic transition**

4.3.1. **Trends in mainland China's economic transition**

There are two evident general trends by comparing those three figures: 1) a large decline of province number in the fourth quadrant; and 2) an increase of total number of provinces in the first and third quadrants. The number of provinces in the fourth quadrant (low agricultural but high nonagricultural performance) dropped from 5 in 1980 to 1 in 1990 and 0 in 1995, meanwhile the total number in quadrant 1 and 3 increased from 15 in 1981 to 22 in 1990 and 23 in 1995. Since any increase of province numbers in the first and third quadrants will strengthen the correlation of agricultural and nonagricultural sectors but the increase in the second and fourth quadrants will weaken the correlation, these two changes indicate that the correlation of agricultural and nonagricultural development was strengthened from 1981 to 1991 and 1995.

Moreover, the first trend may also suggest that a growth of higher nonagricultural performance but lower agricultural performance wasn't sustainable. And the higher number of provinces in 1981 of the fourth quadrant can be explained by policy as exogenous factor which fostered rural industries development. As described in section

3.3, both centre and local governments encouraged rural enterprise growth by providing them with access to fund and land. Furthermore the command economy made their disadvantage of outdated technology abated. Hence, those provinces could acquire a better performance of nonagricultural sectors even if their agricultural sectors were weaker than other ones in early years of economic growth.

Yet the shift of five provinces in the fourth quadrant to other ones was a miserable experience. Three of the five provinces, Hebei, Shanxi and Jiangxi, which are all inland provinces, moved to the third quadrant of low agricultural and nonagricultural output per capita, and they stayed there in 1990 and 1995. Only Fujian and Tianjin got spared. Fujian, a coastal province closest to Taiwan moved to the second quadrant of high agricultural but low nonagricultural output per capita index. Meanwhile, Tianjin, a municipality bordered on Beijing, directly joined the first quadrant provinces of high agricultural and nonagricultural performance.

There were three provinces succeeded in entering the first quadrant expect Tianjin: Shandong, Fujian and Guangdong. Shandong and Fujian shifted to the first quadrant after they had a better agricultural performance or precisely higher agricultural output per capita. This finding most likely suggests that those two provinces' development followed the agricultural-development-led industrialization. As discussed in section 3, higher agricultural output per capita index can promise transfer of higher savings, surplus labour for the reason that agricultural sector is capable of undertaking its job of feed increasing number of population in a smaller scale, and larger indigenous market are available because higher GDP per capita also implies higher household income. Thus to reach the second quadrant may be the first step of entering the first one, namely, agricultural development should come first in economic transition if we want to reach a better performance of both agricultural and nonagricultural sectors.

It seems that Guangdong province shift directly from the third quadrant to the first one in 1990. In order to eliminate the possibility that Guangdong might have moved

to the second quadrant before it reached the first quadrant as Fujian and Shandong, data in earlier years, before 1990, have been processed. The result is that Guangdong entered the first quadrant in 1985, but it remained in the third quadrant of both low agricultural and nonagricultural performance until 1984. In 1983 index for agricultural and nonagricultural output per capita respectively was 0.87 and 0.75, which means an increase of 0.08 in agricultural output per capita index but a decrease of 0.13 in nonagricultural output per capita index compared with 1981 index, and the indexes later declined to an even lower level of 0.80 and 0.65 in 1984, but they surprisingly reached 1.16 and 1.10 in 1985. The large decline from 1983 to 1984 could be explained by the change in statistics of rural population. In spite of natural growth of population, statistics of national rural population declined about 10 percent from 1983 to 1984, however, rural population in Guangdong decline only 4.4 percent and at the same time urban population increased at similar ratio in both mainland China and Guangdong. Hence, the lower urbanization speed might be the statistical explanation for the decline of Guangdong's agricultural and nonagricultural indexes[16].

Could Guangdong province becomes a counter example of the finding that to reach the second quadrant may be the first step of entering the first one, or agricultural development comes first? Guangdong province represents the famous Pearl River Delta model in which rural industries were stimulated by foreign investment and the majority came from Hong Kong. Although other coastal provinces may share the common characters of large number of foreign investment and light, labor intensive products, another two features make Guangdong unique: 1) rural industries are mainly export-oriented; 2) fast and abundant capital accumulation result in large factories which welcome large number of surplus rural labor from other provinces. Hence, rural industries' development was capable of relying on labor, capital and market outside Guangdong, instead of domestic agricultural sector. Thus relationship between agricultural and nonagricultural sectors is vague in this case and the development from 1981 to 1985 in Guangdong could be explained that the effects of large number

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[16] Data calculated in this paragraph come from NBSC (1981, 1983, 1984 and 1985).

of foreign capital investment took long time to appear.

Moreover, to reach the second quadrant is a necessary but not sufficient condition for entering the first one. Heilongjiang, Inner Mongolia, Xinjiang and Hubei located in the second quadrant in1981, 1990 and 1995, and Hainan, the new province, joined them in 1990 and 1995. Agricultural sectors in most of provinces are diversified and have more profitable products than rice as their main products: beet, wheat, and bean in Heilongjiang; animal husbandry in Inner Mongolia; fruit and cotton in Xinjiang; tropical fruit in Hainan. Hubei, Heilongjiang and Jilin together with Anhui and Hunan which fell into the third quadrant from the second one in 1990, had a larger portion of nonagricultural output to GDP in rural area than other provinces in this quadrant in 1990 (see Table 4.1) but they failed to make a shift to the first quadrant as Fujian and Shandong did when they were in the second one. At last Jilin province is special case considering that it was the only province fell out of the first quadrant to the third and then went to the second one, moreover it used to be the only non-coastal province in the first quadrant.

All in all, comparing with many inland provinces especially Hubei, Heilongjiang Jilin, Anhui and Hunan province, Guangdong, Tianjin, Fujian and Shandong's transition combined with conditions of Zhejiang, Jiangsu, Liaoning, Beijing and Shanghai already in the first quadrant implies that large municipalities (also border on the sea, except Beijing) and coastal provinces were much more well off in the reform and opening up and easier to enter the first quadrant than the rest[17].

4.3.2. Factors behind the diversified transition

Economic transitions in mainland China varied among provinces or regions, but generally support the argument of agricultural-development-led industrialization, because one of the findings argues that agricultural development should come first in economic transition is a necessary but not sufficient condition for entering the first

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[17] The outliers include Guangxi autonomous region and Hainan, a newly founded province.

quadrant. Moreover, another finding suggested that large municipalities and coastal provinces were well off and easy to get in the first quadrant. Hence, we can jump to a conclusion that there are two factors behind the diversified transition: agricultural development and locations of province.

Obviously this argument is superficial and has neglected many factors in economic transition. Lin and Yang (2001) have carried a comprehensive comparative analysis of factors in rural enterprises' development in mainland China. Findings from Lin and Yang (2001) and this thesis are complementary, though the former is more focus on regression test on specific factors behind rural enterprises' development. Lin and Yang (2001) conclude that 1) coastal provinces are in more advantageous position than the rest of the country; 2) higher income is important to drive rural enterprises' development; and 3) world trade and foreign direct investment (FDI) help rural enterprises' development (p 179).

Lin and Yang (2001) also found transportation facilities, type of state owned enterprises (SOEs)[18], and capital endowment of the province influenced rural enterprises. However, the latter two findings might be questionable. Foreign investment and agricultural revenue can compensate low capital endowment so as to build a larger rural nonagricultural sector. As mentioned in previous sector, special development institutions abated the disadvantage of outdated technique in rural enterprises. However, this thesis won't converge on the discussion of specific factors but go back to the framework of economic transition.

Is there any province which acquired most of those factors and would have developed along with those municipalities and coastal provinces? The answer is positive and Hubei province is one of them. Hubei province was in the second

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[18] Lin and Yang (2001) believe there is a relationship (technology transfer) between SOE and rural industries. Since rural industries are normally labor intensive and light in mainland China aligned with comparative advantage of abundant labor, lighter SOEs in a province are more likely to foster rural industries' development (p 166).

quadrant of higher agricultural performance than national level in 1981, 1990 and 1995, which means capital was more likely to accumulate from agricultural revenue for rural nonagricultural sectors. Transportation is convenient and developed, since Yangzi River runs through the province from west to east and railway connects Beijing and Guangdong from north to south. Wuhan, the capital of Hubei, is the largest and most developed cities in middle China, and one of the metropolises in mainland China. Wuhan together with large region around it was a heavily invested industry center in middle China, which implies solid industry foundation for development. Why Hubei lagged behind? The only factor from above paragraphs can be used in explanation is that Hubei is not a coastal province and had no access to FDI and foreign market.

It seems that until now in most cases location of east and coastal can guarantee FDI, foreign market and economic development, but there is one fact in the reform and opening up hasn't been discussed. East coastal provinces and municipalities got developed and had access to FDI and foreign market because of the "cautious, incremental and geographically localized" (Naughton, 2007, p 402) economic reform in early age. Guangdong and Fujian were the only two provinces in which four special economic zones (SEZs)[19] were founded from 1979 to 1980 so as to attract foreign investment. And in the 1980s steadily increased foreign investment brought great changes to the two provinces. The second wave of opening up started in 1984 and fourteen new "open cities" were set up but all of them located in east coastal provinces[20]. In 1988, Hainan province was founded and at the same time became a SEZ. Therefore, since 1988 all east coastal provinces from Liaoning in northeast to Guangxi in southeast have either several SEZs or open cities. In those SEZs and open cities, since there were few SOEs in rural areas, "the implication was that foreign investors were encouraged to set up subsidiaries and joint ventures with rural collectives that would make use of low-cost rural labor outside the framework of the

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[19] The four SEZs are Zhuhai, Shenzhen and Shantou in Guangdong and Xiamen in Fujian.
[20] The fourteen open cities include Dalian, Qinhuangdao, Tianjin, Yantai, Qingdao, Lianyungang, Nantong, Shanghai, Ningbo, Wenzhou, Fuzhou, Guangzhou, Zhanjiang, and Beihai.

planned economy" (ibid., p 409). Guangdong and Fujian were the only two leading provinces in absorbing FDI since economic reform and later they were followed by other coastal provinces (ibid., p 405), because SEZs and open cities were allowed to offer competing packages of preferential policies to attract foreign investors.

Therefore, economic transitions were influenced by this dual-track, incremental reform in which new system worked along with the existing one and finally replaced the latter. Inland provinces had no access to FDI or foreign market in the first place and then lost advantage in competition for them with coastal provinces, even if some of them had good economic conditions.

4.4. Conclusion

Mainland China's economic transition was once again proved generally support the model of agricultural-development-led industrialization in this section since the provincial analysis found a strong correlation between development of agricultural sector and nonagricultural sectors, and this correlation strengthened from 1981 to 1990 and 1995.

However, provinces in mainland China were far from sharing one growth model. Many a province legged behind in industrialization process, while coastal provinces and big municipalities were leading the economic transition. After comparing provincial GDP per capita of both agricultural and nonagricultural sectors to national level, provinces in mainland China can be divided into four quadrants and later three quadrants in 1995 case. Provinces in the first quadrant of higher agricultural and nonagricultural output per capita are all coastal provinces and municipalities. The other two quadrants are consisted of middle and western provinces with lower agricultural or (and) nonagricultural output per capita.

The analysis of the two general trends of economic transition (a large decline of

province number in the fourth quadrant; and an increase of total number of provinces in the first and third quadrants) together with respective studies of Guangdong and provinces in the second quadrant found that 1) growth of better nonagricultural but lower agricultural performance might be unsustainable; 2) the second quadrant is a necessary but not sufficient condition for entering the first one, or agricultural sector should develop first; and 3) big municipalities and coastal provinces were much more well off in the "reform and opening up" and easier to enter the first quadrant than the rest.

Moreover, the feature of dual-track, incremental and geographically localized in The "Reform and Opening-up" was demonstrated to be a very important factor of the uneven economic transitions among provinces in mainland China. Center policies deliberately made provinces grow with different speeds by providing the east coastal provinces with access to FDI and foreign market in the early age of reform.

5. Income distribution in economic transition

In mainland China economic transition generally took the road of agricultural-development-led industrialization, and started from agricultural sector at the beginning of economic reform. Successful agricultural development kept bringing total output to higher levels so as to raise increasing number of people. Income from farming kept rising up so as household savings. Meanwhile, the secular decline of agriculture brought more surplus labor, because productivity rate increased and less labor could produce more products. Those all stimulated the development of subsistent rural enterprises. Successful agricultural-development-led industrialization largely contributed to fast and long term economic growth and large scale of poverty alleviation to mainland China, just like the Taiwan case. However this process was uneven and at unequal rates among provinces in mainland China, which partially resulted from not only many factors of diverse endowment and agricultural development, but also unequal access to FDI and foreign market.

Actually the question of inequality in mainland China has partially been solved since previous section has proved there's no universal economic transition model among provinces and they could be divided into four or three groups with different levels of agricultural and nonagricultural production. Uneven progress and different patterns of economic transition among provinces probably resulted in the high inequality of mainland China.

In household income, farm income and wages from nonagricultural sectors are different from one province to another. In provinces from the first quadrant income are probably much higher than the rest since they have a higher GDP per capita of both agricultural and nonagricultural sectors. Normally wages from nonagricultural sectors are much higher than farm income so the urban-rural income gap can be narrowed and peasants can get out of poverty if adequate nonagricultural jobs are available for rural surplus labor (see Section 2.2). However, because nonagricultural sectors among provinces grow at different speeds, the capabilities of siphoning off surplus labor are barely at the same level. In some province surplus labor have no access to enough nonagricultural jobs, while others, like Guangdong, actively attracts more labor from inland provinces to satisfy their rural industries, so intra-rural inequality may rise because of the unequal opportunities to jobs. Different agricultural output per capita means uneven farm income among provinces and an un-equalizing effect of household income as farm income still constitutes the main component of rural household income especially in middle and western provinces. Moreover Table 4.1 shows that agricultural output in those inland provinces was higher than half of total rural output in 1990, and agricultural sector employ much more labors than nonagricultural sectors. Hence unequal farm income will also cause inequality in China, though it's lower than wages and more reliable on poverty alleviation and inequality reduction (see Section 2.2). To sum up, uneven economic development resulted in inequality of income distribution in mainland China.

Findings from household income and distribution analysis in Khan and Riskin (1998 and 2005) as well as Ravallion and Chen (2007) on poverty alleviation are congenial with above analysis: 1) farm income, the largest source of rural income, has a positive effect on improving income distribution; and 2) wage is the most important disequalizing effect on rural income distribution, however has an equalizing effect on national income distribution (Khan and Riskin, 2005, p377; 1998, p 246-249; Ravallion and Chen, 2007, p 2, 38). Khan and Riskin's research also shows the evolution of wages' role in income distribution. At first wages was the only component in rural income that was disequalizing for China as a whole between 1988 and 1995 (Khan and Riskin, 1998, p 246), because the average wage was higher relative to rural per capita income (Mellor, 1966, p 32); wages as source for income is only available for a few people; and wages are probably concentrated in higher income regions (Khan and Riskin, 1998, p 238). The comparing of 1995 and 2002 shows a reduction of disequalizing effect of wages and they have a strongly equalizing effect on national income distribution while making rural income unequal (Khan and Riskin, 2005, p 377- 378) as the rural and urban employment grew rapidly and the regional inequality of access to wage employment were reduced (ibid., p 364-365). Moreover Khan and Riskin (1998) claimed that compositions of income between the rich and the poor in rural area are different, for the principal sources of the rich are wages employment and non-farm entrepreneurship, but farming and rental values for the poor (p 240).

Together with discussion of inequality and poverty in section 2.2, above findings suggest that the improvement of income distribution in mainland China largely relies on the development of rural economy. Associated with lower inequality overall economy (Ravallion and Chen, 2007, p 23) the growth of agriculture brings more farm income to household and will especially benefit the rural poor of whom farm income is the main source of household income. Development of agriculture can improve conditions of provinces in the third quadrant of lower GDP per capita and reduce intra-rural inequality. The growth of rural nonagricultural sectors can provide

more wage employments, so as to reduce the regional inequality of acquiring jobs in higher income modern sectors. That will enable provinces in the second and the third quadrant to catch up with their peers in the first quadrant. However, the growth of rural enterprises can't be a panacea for every province today. Due to diversified nature endowments provinces like Tibet and Inner Mongolia are not suitable for building large numbers of industries. Moreover the favorable environment for rural enterprises development is no longer existed and rural markets of inland provinces have already been taken by the firms from east coastal provinces. Thus development of rural nonagricultural sector among inland provinces should probably count on transferring firms from eastern areas because of the rising production costs, and changes in center policies. Through migration a large number of surplus labors can involve in high-income sectors of economy so the national income gap will decline, but the intra-urban inequality will rise up (Khan and Riskin, 2005, p 358)": since migrants consist of rural surplus labors who are linked to rural economic growth through migration, transfer and trade, rural economic development can also reduce intra-urban inequality (Ravallion and Chen, 2007, p 23-24).

To put in a nutshell, inequality in mainland China largely resulted from uneven progress of provincial development. Reduction of poverty and inequality in mainland China relies on the development of rural economy, especially agricultural development of inland provinces.

6. Conclusion

This thesis has accomplished its purpose and provided answers to all research questions. The economic transition in mainland China after 1978 generally followed processes of the agricultural-development-led industrialization, just as Taiwan's development, and had better conditions for development. However, provinces in mainland China took different steps in their transitions partially resulting from unequal access to FDI and foreign market. Therefore, in mainland China the

long-term and fast economic growth as well as poverty alleviation was contributed by the successful agriculture-led economic transition, however uneven economic transitions among provinces brought unequal household incomes and deteriorated income inequalities to China. Now Mellor's theory is still useful in mainland China's development precisely how inland provinces can catch up with eastern coastal provinces and municipalities and narrow down the income gap. Based on the first two findings in section 4.4, discussion on rural household income in section 5 and Aldeman's argument in section 2.2, this thesis proposes that among inland provinces particularly those with lower agricultural output per capita than national level, development of rural economy should be paid utmost attention, especially the development of agricultural sector.

There are several implications from mainland China case which may be applicable to other developing countries: 1) agricultural-development-led industrialization can contribute to fast economic growth and poverty alleviation; 2) agricultural sector should develop first; and 3) growth with better nonagricultural but lower agricultural performance is probably unsustainable. Moreover, if we can find a proper coordinate origin then the method of categorizing provinces may be applicable to analyze other developing countries.

Mellor's agriculture-led economic development theory has a presupposition that in less developed countries capital is scarce and has a slow accumulation rate, meanwhile foreign capital and demand are normally not that reliable as domestic saving from agricultural development as a source for capital accumulation (Mellor, 1966, p 81-85; Mellor, 1995, p 2). However, a theoretical implication of this thesis is that Mellor's theory would be more applicable in opening economy if it contained discussions on foreign capital and market. Moreover, discussion on how to utilize foreign capital and market is more important than how to acquire them. Successful experiences from Guangdong and Fujian provinces suggest that channeling foreign capital and market to rural economy in the model of agricultural-development-led

industrialization is promising and effective in economic development[21].

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[21] Comparing Korea with Guangdong and Fujian cases is necessary since they all enjoyed foreign market and foreign investment or savings, yet the economic development sequence of the former is reverse with the latter two: supported by foreign savings industries in Korea preceded rural development and support agriculture sector(Ho, 1982, p 983). Moreover, there will be more findings relate to debates of Free Market theory and Governed Market theory about to what extent government should influence economy, considering that government interventions aggravated problems from initial conditions in Korea, while CCP provided open environment for development. The reverse track of development could partially result from government interventions. See Lin and Yao (2001), p 180-182, Ho, 1982, p 973, 982, and 983, and Wade (2004) for Free Market and Governed Market theories.

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Appendix

Map of China produced by State Bureau of Surveying and Mapping, P.R. China (June, 2008). See next page.

MAP OF THE PEOPLE'S REPUBLIC OF CHINA

Edition of Administrative Region

RUSSIA

KAZAKHSTAN

Oz. Zaysan

Oz. Balkhash

KYRGYZSTAN

BISHKEK
Ysyk-Köl

TASHKENT
UZBEKISTAN
TAJIKISTAN
AFGHANISTAN

PAKISTAN

Area actually controlled by Pakistan

Cease-fire line between India and Pakistan

ISLAMABAD
Area actually controlled by India

KASHMIR

Indus R.

NEW DELHI

INDIA

NEPAL
KATHMANDU

Ganga

BHUTAN
THIMBU

BANGLADESH

INDIA

MYANMAR

NAY PYI TAW

THAILAND

VIENTIANE
THAILAND

LAOS

VIET NAM

HA NOI

Beibu Gulf

Ūrūmqi

XINJIANG UYGUR ZIZHIQU(AUT.REG.)

MONGOLIA

ULAANBAATAR

NEI MONGOL ZIZHIQU
(INNER MONGOLIA AUT.REG.)

QINGHAI

Qinghai Hu

Xining

Huang He

Lanzhou

GANSU

Yinchuan

NINGXIA HUIZU ZIZHIQU (AUT.REG.)

Hohhot

SHANXI

Taiyuan

BEIJING SHI
BEIJING
HEBEI
Shijiazhuang
Tianjin
TIANJIN SHI

HEILONGJIANG

Harbin

JILIN

Changchun

LIAONING

Shenyang

D.P.R. KOREA

P'YONGYANG

SEA OF JAPAN

R.O. KOREA

SEOUL

TOKYO

JAPAN

Bohai (SEA)
Bohai Haixia

SHANDONG

Jinan

YELLOW SEA

XIZANG ZIZHIQU(AUT.REG.)

Yarlung Zangbo Jiang

Lhasa

Qomolangma Feng

Jinsha Jiang

SICHUAN

Chengdu

SHAANXI

Xi'an

Huang He
Zhengzhou

HENAN

HUBEI

Wuhan

Chang Jiang

ANHUI

Hefei

JIANGSU

Nanjing

Hongze Hu

Tai Hu

Chongming Dao

Shanghai
SHANGHAI SHI

Hangzhou

CHONGQING SHI

Chongqing

Dongting Hu

HUNAN

Changsha

ZHEJIANG

Poyang Hu

JIANGXI

Nanchang

EAST CHINA SEA

GUIZHOU

Guiyang

Kunming

YUNNAN

GUANGXI ZHUANGZU ZIZHIQU (AUT.REG.)

Nanning

Xi Jiang

GUANGDONG

Guangzhou

FUJIAN

Fuzhou

TAIWAN

Taipei

Taiwan Tao

Taiwan Strait

Huangwei Yu
Tiaoyu Tao
Chiwei Yu
Pengchia Yu

Lu Tao
Lan Yu

Macao
MACAO S.A.R.

Hongkong
HONG KONG S.A.R.

HAINAN

Haikou

Hainan Dao

SOUTH CHINA SEA

Dongsha Qundao

PACIFIC OCEAN

Tropic of Cancer

PHILIPPINES

LEGEND

⊛ BEIJING Capital
◉ HA NOI Foreign capital
⊙ Xi'an Province-level administrative centre
        National boundary
        Undefined national boundary
--- --- Regional boundary
········· Military demarcation line

        Boundary of provinces, autonomous regions and municipalities.
-·-·-   Boundary of Special Administrative Region
        River
        Lake
▲ 8844.43 Peak and elevation (m)
        Coral reef

SCALE 1 : 20 000 000

km200 0 200 400 600 800 1000km

Inset: South China Sea Islands

YUNNAN
Nanning
GUANGXI ZHUANGZU ZIZHIQU
HA NOI
VIET NAM
LAOS
CAMBODIA
Guangzhou
Hongkong
Macao
MACAO
GUANGDONG
Haikou
HAINAN
Hainan Dao
Xisha Qundao
Zhongsha Qundao
TAIWAN
Taiwan Tao
Dongsha Qundao
Huangyan Dao
SOUTH CHINA SEA
Nansha Qundao
Zengmu Ansha
BANDAR SERI BEGAWAN
BRUNEI
MALAYSIA
INDONESIA
PHILIPPINES
MANILA
Tropic of Cancer

SOUTH CHINA SEA ISLANDS
SCALE 1 : 40 000 000