THE DETERMINANTS OF NATIONAL AND PROVINCIAL ECONOMIC GROWTH IN CHINA

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ABSTRACT

Key terms: Convergence, growth determinants, regional disparity, China

This dissertation investigates the determinants of economic growth in China since 1978, with a focus on the determinants of spatial growth. A study of the theories of economic growth shows that both proximate and fundamental factors can contribute to economic growth. In the case of China, institutional changes are the keys to the Chinese transitional economy. Given the special nature of China's economy, the main institutional reforms since 1978 are examined, together with the gradual transition process.

Furthermore, from the overview of empirical literature, it is found that the proximate determinants such as initial gross domestic product (GDP), investment, population growth, human capital and openness are determinants of economic growth in China based on the findings in cross-country growth literature. From growth accounting exercises, capital formation and total factor productivity (TFP) growth can be seen to play important roles in the rapid economic growth in China.

However, while the nationwide economic growth is impressive, the pace of reform and economic development has been uneven across provinces. In the existing literature, geography and preferential policy are emphasised as particular factors that affect coastal-interior disparity. This study incorporates the economic variables identified as important stimulants to growth, drawing on major findings in the study of convergence and economic growth to estimate the determinants of regional economic growth in China. To address the weaknesses of using ordinary least squares (OLS) for cross-country regression analyses, fixed-effects ordinary least squares (OLS) and random-effects generalised least squares (GLS) panel data estimators are applied to provincial data from 1994 to 2003. It is concluded that the convergence hypothesis does not hold in China, and that export, investment, education, foreign direct investment (FDI) growth and coastal dummy have a positive effect on regional GDP per capita growth in China while population growth affects the annual growth rate negatively.

OPSOMMING

Sleutelwoorde: Konvergensie, groei-determinante, streeksontwikkeling, Sjina

In hierdie studie word die determinante van ekonomiese groei in Sjina ondersoek, met 'n spesiale fokus op die determinante van streeks (provinsiale) ekonomiese groei.

Die verskeie bydraes tot die teorie van ekonomiese groei beklemtoon dat beide fundamentele en onmiddellike faktore verantwoordelik kan wees vir ekonomiese groei. Die studie bevind dat in geval van Sjina, dat fundamentele determinante'n groot rol gespeel het om aanleiding te gee tot die hoë ekonomiese groeikoerse wat die land oor die afgelope drie dekades ervaar. Dit is veral institusionele hervormings, wat sedert 1978 toegeneem het, wat in hierdie studie bespreek word.

Die studie identifiseer ook as onmiddellike determinante van ekonomiese groei in Sjina die volgende: beleggings, bevolkingsgroei, onderwys en opleiding en openheid ten opsigte van internasionale handel.

Om egter te verklaar waarom sekere provinsies in Sjina vinniger as ander gegroei het, word'n paneeldata ekonometriese ondersoek in die studie gedoen. Data van 1994 tot 2003 vir 31 provinsies word gebruik. Daar word bevind dat daar nie tans konvergensie in per kapita inkomstes tussen provinsies is nie, en dat uitvoere, beleggings, onderwys en direkte buitelandse investering'n positiewe effek op groei het, terwyl bevolkingsgroei'n negatiewe effek het.

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ABBREVIATIONS AND ACRONYMS

CCP: Chinese Communist Party

COEs: Collectively owned enterprises

ETDZs: Economic and technology development zones

FDI: Foreign direct investment

FFEs: Foreign-funded enterprises

FTAs: Free trade areas

GDP: Gross domestic product

GLS: Generalized least squares

Hong Kong SAR: Hong Kong special administrative region

HTDZs: High-technology development zones

ICOR: Incremental capital output ratio

OCCs: Open coastal cities

OECD: Organization for Economic Cooperation and Development

OEZs: Open economic zones

OLS: Ordinary least squares

POEs: Privately owned enterprises

PRC: People's Republic of China

R&D: Research and development

SEZs: Special economic zones

SOEs: State-owned enterprises

SSB: State Statistical Bureau of China

TFP: Total factor productivity

TVEs: Town and village enterprises

WTO: World Trade Organization

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CHAPTER 1: INTRODUCTION

1.1 Research question

China's economic reform was initiated in 1978. Since then, the Chinese economy has achieved an average annual growth rate of more than 9% (Wu, 2000). This growth is unprecedented in world history. Up to now (2005), China has transformed itself from a poor, centrally planned economy to a lower middle-income, emerging market economy. Why is China growing so fast? It is the purpose of this study to identify the determinants of economic growth in China over the past decades. However, when the whole country has experienced significant economic growth, disparity in regional development is also well-recognised. Therefore, the study will also focus on identifying and testing the determinants of economic growth by considering the determinants and patterns of sub-national (provincial) growth rates in China.

1.2 Problem statement

While pre-1978 China had seen annual growth of 6% a year, post-1978 China saw average real growth of more than 9% a year. In several peak years, the economy grew by more than 13%. Per capita income has nearly quadrupled in the last 15 years, and a few analysts are even predicting that the Chinese economy will be larger than that of the United States in about 20 years. Such growth compares very favourably to that of the "Asian tigers"—Hong Kong, Korea, Singapore, and Taiwan Province of China—which, as a group, had an average growth rate of 7 to 8% over the period 1980-1995 (Hu and Khan, 1997).

Why has China done so well? In 1978, after years of state control of all productive assets, the government of China embarked on a major programme of reform. It encouraged the formation of rural enterprises and private businesses, liberalised foreign trade and investment, relaxed state control over some prices, and invested in industrial production and the education of its workforce (Hu and Khan, 1997; see table 1.3).

The economic reform that started in 1978 has brought across-the-board benefits to all provinces in China. However, the coastal provinces have experienced much higher economic growth than the inner provinces. The uneven economic growth has resulted in a wider income gap between the coastal and inner provinces (see table 1.4).

1.3 Objectives

In light of the research question and problem statement, the objectives of this study are as follows:

- To describe the gradual process of transition from a centrally planned system to a market system in China.
- To identify the determinants of national economic growth in China since 1978.

- To identify and explain the patterns of spatial economic growth in China, particularly on a provincial level.
- To test the significance of the determinants in explaining Chinese provincial economic growth between 1994 and 2003.

1.4 Background

1.4.1 General information on China

China, (People's Republic of China; PRC), is situated in eastern Asia, bounded by the Pacific in the east. It is the third largest country in the world, next to Canada and Russia and has an area of 9.6 million square kilometres or one-fifteenth of the world's land area. Its total population of 1.2591 billion (1999) is about 22% of the total population of the world (http://www.china-tour.net).

China has 23 provinces, 5 autonomous regions, 4 municipalities (provincial level cities) and 2 special administrative regions—Hong Kong and Macao. The capital of China is Beijing (see figure 1.1). Table 1.1 provides summary information on the various regions of China. It should be noted that coastal (eastern), central and western regions refer to the three economic zones classified by the Chinese government (Yao and Zhang, 2001a). Among them, central and western regions usually are called by a joint name—inner areas.

Figure 1.1 Map of China

Source: http://www.china-tour.net

Table 1.1: China's regions

Province	Capital	Important cities	Total population (2003) Unit: 10000
Eastern (coastal) zone			
Beijing			1456
Tianjin			1011
Hebei	Hengshui	Baoding, Cangzhou	6769
Liaoning	Shenyang	Dalian, Jinzhou	4210
Shanghai			1711
Jiangsu	Nanjing	Suzhou, Nantong	7406
Zhejiang	Hangzhou	Huzhou, Ningbo	4680
Fujian	Fuzhou	Xiamen, Quanzhou	3488
Shandong	Jinan	Jining, Tai'an	9125
Guangdong	Guangzhou	Shantou,zhenzen	7954
Guangxi	Nanning	Beihai, Guilin	4857
Hainan	Haikou		811
Central zone			
Shanxi	Taiyuan	Datong, Yuci	3314
Inner Mongolia	Hohhot	Baotou, Hailiar	2380
Jilin	Changchun	Siping, Liaoyuan	2704
Heilongjiang	Harbin		3815
Anhui	Hefei	Huangshan, Bengbu	6410
Jiangxi	Nanchang	Juijiang, Jingdezhen	4254
Henan	Zhengzhou	Kaifeng, Luoyang	9667
Hubei	Wuhan	Huangshi,Shashi	6002
Hunan	Changsha		6663
Western zone			
Sichuan	Chengdu	Leshan, Nanchong	8700
Chongquing			3130
Guizhou	Guiyang		3870
Yunnan	Kunming	Pu'er, Lijiang	4376
Tibet	Lhasa		270
Shannxi	Xi'an	Lintong, Yan'an	3690
Gansu	Lanzhou	Baiyin, Dingxi	2603
Qinghai	Xining		534
Ningxia	Yinchuan	Shizuishan	580
Xinjiang	Urumqi		1934

Source: China Statistical Yearbook, 2003.

Note: Before 1987, there were 29 provinces, provincial level cities and autonomous regions. In 1988, Hainan, previously part of Guangdong Province, became a separate province. In 1997, Chongquing, which used to be part of Sichuan Province, was granted the status of provincial level city (Zhou, 2004). For political as well as economic reasons, Taiwan Province is excluded from the table.

1.4.2 Historical background

For centuries China stood as a leading civilisation, outpacing the rest of the world in the arts and sciences. But in the 19th and early 20th centuries, China was beset by civil unrest, major famines, military defeats, and foreign occupation. In 1949, the Communists under Mao Zedong established the People's Republic of China.

It is appropriate to consider the years 1956-1978 as covering the essence of the Maoist period. In effect, 1949-1955 corresponds to the establishment of state power by the Communist Party of China (CPC) and the construction of the new democracy. Most of the time during the Maoist period, the Chinese police were extremely politicised and the government failed to heed its economic mandate. In other words, economics gave way to politics as the priority aims and preferred means in state policy. For more than 20 years, economic construction was ordered by official politics and the Cultural Revolution (1966-1976) was a key illustration of that situation (although it was waged under the name of unprecedented democracy). Until the end of the Cultural Revolution in the late 1970s, the slogan resounding in every office and workshop of business enterprises was to "put politics in command". Anyone who was considered overly devoted to production or other economic affairs would be criticised as committing the sin of "putting economy in command". It was not surprising, therefore, that such social syndromes as the "iron rice bowl" and "eating out of the common big pot", while economically unhealthy, remained intact (Charles, 1999).

Mao's demise in 1976 created an opportunity for fundamental changes in Chinese policy. Deng Xiaoping, the country's late paramount leader, who has been described as the architect of modern China, succeeded in setting the country on the road to socialist modernisation. He has ushered China into a new historical period (http://www.anoca.org/china/party/deng_xiaoping.html).

In 1978, under Deng Xiaoping's leadership, the Eleventh Central Committee of the Communist Party of China put the reform of the economy at the head of the agenda and the Council of State issued the first official documents on the reforms in 1979. The changes that the economy and society of China have experienced go far beyond simple "adjustments". According to Charles (1999), they can be said to constitute a new revolution. 20 years later, the Chinese economy is fundamentally different from what it was when Mao, the founder of the CPC, died (Charles, 1999).

1.4.3 The five-year plans

In 1952, Chinese authorities compiled the first five-year plan which was followed by "the great leap"[1] period between 1957 and 1960. Since then, every five-year plan identifies for the goals which the Chinese leadership wants to achieve in every specific period. From the main policies of each five-year plan, various phases of China's economic development can be distinguished (Lin, 2001). These phases are summarized in table 1.2.

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[1] "The Great Leap" borrowed elements from the history of the Union of Soviet Socialist Republics in a uniquely Chinese combination. It was thought that through collectivization and mass labor, China's steel production would surpass that of the United Kingdom only 15 years after the start of the "leap." An experimental commune was established in Henan early in 1958, and soon spread throughout the country. Tens of millions were mobilized to produce one commodity, symbolic of industrialisation—steel. The Great Leap Forward is now widely seen both within China and outside as a major economic disaster. As inflated statistics reached planning authorities, orders were given to divert human resources into industry rather than agriculture. Various sources now put the death toll somewhere between 25 and 60 million people, with the majority of the deaths owed to starvation. The three years between 1959 and 1962 were known as the "Three Bitter Years," and the Great Leap Famine, as the Chinese people suffered from extreme shortages of food. It is believed by some to have been the greatest famine in history (http://en.wikipedia.org/wiki/Great_Leap_Forward).

Table 1.2 shows the sixth five-year plan between 1980 and 1985 was the first one following the economic reform started in 1978. The major consequences of the five major policies in the sixth five-year plan were: i) Industrial structure had been changed drastically. ii) Foreign investment had been successfully attracted into China. iii) Town and Village Enterprises (TVEs) became the fastest growing sector in the early 1980s (Lin, 2001).

There were four major policy thrusts during the eighth five-year plan for the period between 1990 and 1995. There were two important outcomes during these five years. Firstly, FDI into China had increased sharply from 1992. Currently China is the country with the second largest FDI inflow in the world, next to the U.S (Zhang, 2002). Secondly, China had started to reform her legal system since 1994 and attained quite good results (Lin, 2001).

There were several features in the ninth five-year period: First, the private sector had been growing fast. Second, the problem of regional disparity became more serious instead of easing, though China's economy maintained rapid growth.

The latest five-year plan is for the period 2000-2005 with five major goals as shown in table 1.2. Among the five goals, developing the great western region is the most important goal.

Table 1.2: Ten five-years plans

Plan	Period	Policy
First Five-Year Plan	1952-1957	• Focusing on 156 industrial constructions designed with the help of Soviet Russia. Developing heavy industry is the priority. • Constructing the authoritarian economic managerial system.
The Great Leap	1957-1960	• Focusing on the steel industry and sacrificing other industries.
Second Five-Year Plan	1960-1965	• Reinforcing agriculture. • Suppressing the scale of fundamental construction. • Implementing the close, stop, merger of enterprises.
Third Five-Year Plan	1965-1970	• Taking the military and defence construction as the centre of economic construction. • Emphasising the construction of southwestern inland.
Fourth Five-Year Plan	1970-1975	• Stressing "Five Small" heavy industries. • Emphasising the construction of "Three West" (West of Henan, Hubei, and Hunan)
Fifth Five-Year Plan	1975-1980	• Rendering the authority of economic management. • Stressing "Big and Fast" to reach the level of developed countries.

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Sixth Five-Year Plan	1980-1985	• Raising open door policy. • Light industry having higher priority for development. • Adjusting heavy industry to serve for developing consumer industry • Supporting TVEs. • Speeding development of the agricultural sector.
Seventh Five-Year Plan	1985-1990	• Keeping stable development of agriculture and light industry. • Energy, Transportation and Communication industries having higher priority for development. • Speeding development of the tertiary sector.
Eighth Five-Year Plan	1990-1995	• On the basis of raising economic efficiency and ameliorating industrial structure, kee • ping at least 6 % annual GDP growth rate. • Deepening the economic reform. • Expanding open-door policy. • Strengthening the spiritual civilisation and law construction.
Ninth Five-Year Plan	1995-2000	• Eliminating poverty. • Speeding modern business institutional construction. • Improving technological education. • Accomplishing a market economic system with socialist characteristics.
Tenth Five-Year Plan	2000-2005	• Speeding industrial reform and upgrading industrial structure. • Elevating the quality of technology and culture. • Developing the great western region. • Further expanding open door policy. • Improving the infrastructure of transport, energy, and water supply. • Forming a complete mechanism for SOEs leaving the market.

Source: Lin, 2001.

1.4.4 Economic growth in China

Table 1.3 shows that, since 1979, the average annual growth rate of GDP was as high as 9.7%. Meanwhile, GDP composition had also changed sharply. The share of agriculture declined from 31.2% in 1979 to 17.7% in 1999, though the absolute percentage of agriculture was still relatively high compared with other developing countries (China Statistical Yearbook, 2000).

Table 1.3: GDP and industrial structure unit (%)

Year	GDP (billionYuan)	Real Growth Rate	Primary (sector share %)	Secondary (sector share %)	Tertiary (sector share %)
1979	403.8	7.6	31.2	47.4	21.4
1980	451.8	7.8	30.1	48.5	21.4
1981	486.0	5.2	31.8	46.4	21.8
1982	530.1	9.3	33.3	45.0	21.7
1983	595.7	11.1	33.0	44.6	22.4
1984	720.6	15.3	32.0	43.3	24.7
1985	896.4	13.2	28.4	43.1	28.5
1986	1020.1	8.5	27.1	44.0	28.9
1987	1195.5	11.5	26.8	43.9	29.3
1988	1492.2	11.3	25.7	44.1	30.2
1989	1691.8	4.2	25.0	43.0	32.0
1990	1854.8	9.1	27.1	41.6	31.3
1991	2166.3	14.1	24.5	42.1	33.4
1992	2665.2	13.1	21.8	43.9	34.3
1993	3456.1	12.6	19.9	47.4	32.7
1994	4667.0	9.0	20.2	47.9	31.9
1995	5749.4	9.8	20.5	48.8	30.7
1996	6685.1	8.6	20.4	49.5	30.1
1997	7314.3	7.8	19.1	50.0	30.9
1998	7696.7	7.8	18.6	49.3	32.1
1999	8042.3	7.1	17.7	49.3	33.0

Source: China Statistical Yearbook, 1996; 2000.

1.4.5 Regional growth in China

As discussed above, China has experienced rapid economic growth over the last two decades due to economic reforms and the "open-door" policy of Deng Xiaoping. However, this has been accompanied by a significant spatial divergence in per capita incomes. Table 1.4 shows that there were significant differences in per capita GDP across provinces in 1978. These differences increased rather than decreased during the period. The average per capita GDP ratios of the three economic zones, east-central-west, for example, changed from 1.00-0.71-0.54 to 1.00-0.54-0.41 (Yao and Zhang, 2001b).

Table 1.4: Per capita GDP by province and economic zone at 1990 prices

Province and economic zone	Per capita GDP in Yuan				Growth rate in %	
					Total	Annual
	1978	1984	1990	1995	1978-95	1978-95
Eastern zone	***823***	***1342***	***2104***	***4223***	***513***	***10.1***
Beijing	2034	3225	4612	6995	344	7.5
Tianjin	1762	2741	3590	6075	345	7.6
Hebei	668	972	1455	2751	412	8.7
Liaoning	1224	1786	2712	4287	350	7.7
Shanghai	2909	4203	5894	10712	368	8.0
Jiangsu	692	1215	2093	4392	635	11.5
Zhejiang	633	1282	2120	4901	774	12.8
Fujian	577	1044	1744	3995	692	12.1
Shandong	676	1192	1779	3762	557	10.6
Guangdong	726	1218	2319	5156	710	12.2
Guangxi	574	790	1059	2138	372	8.0
Hainan	612	995	1563	3219	526	10.3
Central zone	***587***	***952***	***1346***	***2299***	***392***	***8.4***
Shanxi	686	1142	1481	2255	329	7.3
Inner Mongolia	572	977	1477	3636	636	11.5
Jilin	709	1169	1743	2814	397	8.4
Heilongjiang	1038	1476	2019	2828	272	6.1
Anhui	481	841	1162	2117	440	9.1
Jiangxi	479	757	1125	2009	419	8.8
Henan	421	739	1081	1888	449	9.2
Hubei	610	1066	1516	2622	430	9.0
Hunan	590	867	1218	1979	335	7.4
Western zone	***473***	***752***	***1135***	***1765***	***373***	***8.1***
Sichuan	454	748	1097	1811	399	8.5
Chongquing	-	-	-	-	-	-
Guizhou	336	593	804	1152	343	7.5
Yunnan	479	759	1211	1837	384	8.2

(continued)

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Tibet	633	1090	1271	1861	294	6.5
Shaanxi	479	713	1128	1670	349	7.6
Gansu	504	652	1077	1579	313	6.9
Qinghai	903	1217	1562	2093	232	5.1
Ningxia	631	924	1391	1871	297	6.6
Xinjiang	648	1101	1792	2879	445	9.2
All China	***657***	***1066***	***1611***	***2970***	***452***	***9.3***

Source: Yao and Zhang, 2001b.

1.5 Methodology

1.5.1 Literature survey

The literature survey, contained in chapter 2 to chapter 5 of this study, will identify the potential determinants of national and sub-national (provincial) economic growth in China.

A first look at the theories of economic growth in chapter 2 will indicate that both proximate and fundamental factors can contribute to economic growth. In the case of China, institutional changes are the keys to the Chinese transitional economy. Therefore, given the special nature of China's economy, the main institutional reforms since 1978 will be examined in chapter 3, together with the gradual transition process. Furthermore, from an overview of the existing studies, it will be shown in chapter 4 that the followings are potential determinants of national economic growth in China: initial GDP, population growth, investment, human capital and openness. It will be also shown that capital formation and TFP growth play important roles in Chinese rapid economic growth from growth accounting exercises. However, while the nationwide economic growth is impressive, the pace of reform and economic development has been uneven across provinces. In the existing literature, geography and preferential policy will be emphasised in chapter 5 as particular factors that affect coastal-interior disparity.

1.5.2 Empirical investigation

The empirical part of this study will consist of a regression analysis using panel data from Chinese regions and spanning the period 1994-2003 (see chapter 5). The regression analyses will be based on the standard growth regressions following Barro (1997). The standard growth model will be discussed in chapter 4.

In this study, the empirical evidence will indicate if the convergence hypothesis holds in China during the period 1994-2003 and will test the significance of geographic factors, preferential policy (the two factors will be accounted for through a coastal dummy variable), investment, population, quality of human resources, FDI

and export (these factors as mentioned in section 1.5.1 will be discussed in chapter 4 as the determinants of national economic growth) are determinants of regional growth in China.

This study will use the data from the China Statistical Yearbook complied annually by the State Statistical Bureau (SSB) of China. For political as well as economic reasons, Taiwan Province is an outlier and an anomaly for this group of observations and will be excluded. The regression analysis will be done using STATA version 9.

In this study, the methodology will be driven by a desire to address traditional econometric problems in cross-country regressions such as unobserved country effects and endogeneity. As such various estimators and specifications are used, namely Ordinary Least Squares (OLS) and Generalized Least Squares (GLS) (Random-effects). Section 5.5 will describe the methodology in detail.

1.6 Layout of the study

The main objective of this study is to identify the determinants of economic growth in China since 1978, with a focus on the spatial determinants of growth.

Chapter 2 deals with the theory of trade and economic growth, which provides the theoretical understanding of China's rapid economic growth and emphasises that institutional changes are the keys to this extraordinary growth.

To provide that both proximate and fundamental factors can contribute to the economic growth in chapter 2, chapter 3 will be an overview of the main institutional reforms in China, which are the fundamental determinants of economic growth, and discuss the extent to which institutions have shaped China's economic outcomes. In this chapter, China's gradual transition experience will be described.

Chapter 4 will be to provide an overview of the empirical literature on the proximate determinants of economic growth in China. It will report on the findings from the existing growth regressions on China.

Chapter 5 will show that although every province has achieved remarkable growth since 1978 as discussed in chapters 3 and 4, there are significant disparities across Chinese regions. This chapter first reports the results of convergence analyses from the empirical studies. Based on the determinants of national economic growth identified in chapter 4, chapter 5 sets out the panel regression analyses to estimate whether there has been spatial convergence in the economic development of China between 1994 and 2003.

Chapter 6 contains a summary and concludes this study.

CHAPTER 2: THEORY OF ECONOMIC GROWTH

2.1 Introduction

In this chapter, an overview of economic growth theory will be provided. From this, the theoretical determinants of economic growth can be identified. This chapter's sections will be as follows: first, the Harrod-Domar growth model is set out in section 2.2. The neoclassical growth theory is described in section 2.3 and in section 2.4, the theory of endogenous growth is described. Section 2.5 focuses on institutions, institutional change and transitional institutions. The chapter concludes with a summary in section 2.6.

2.2 Harrod-Domar growth model

2.2.1 Overview

Evsey Domar (1914-1998) and Roy Harrod (1900-1978) proposed a model of economic growth. Following their contributions in the period 1939-1947 (Harrod, 1939, 1948; Domar, 1946, 1947), their model became popularly known as the "Harrod-Domar growth model" (An encyclopedia of macroeconomics, 2002: 316-320).

The Harrod-Domar model, with exogenously determined technological progress, "sanctioned the overriding importance of capital accumulation in the quest for enhanced growth" (Shaw, 1992). A major strength of this model is its simplicity. Within the Harrod-Domar framework the growth of real GDP is assumed to be proportional to the share of investment spending (I) in GDP and, for an economy to grow, net additions to the capital stock are required. The relationship between the size of the total capital stock (K) and total GDP (Y) is known as the capital output ratio ($K/Y = v$). If it is assumed that total saving determines total new investment, then the essence of the Harrod-Domar model can be set out as follows (An encyclopedia of macroeconomics, 2002: 316-320). Assume that total savings is some proportion(s) of GDP, as shown in equation (2.1):

$$S = sY \tag{2.1}$$

Since investment spending can be defined as a change of the capital stock (assuming, for simplicity, no depreciation), it can be written as equation (2.2):

$$I = \triangle K \tag{2.2}$$

Given $v = K/Y$, it also follows that $v = \triangle K/\triangle Y$ (the incremental capital output ratio or ICOR). Since the equality $S = I$ must hold ex post, the following equation can be formulated:

$$S = sY = I = \triangle K = v\triangle Y \tag{2.3}$$

This simplifies to equation (2.4):

$$sY = v\triangle Y \tag{2.4}$$

Rearranging (2.4), the following can be set as equation (2.5):

$$\triangle Y / Y = s / v \tag{2.5}$$

Here $\triangle Y/Y = Y_t - Y_{t-1}/Y_t$ is the growth rate of GDP. By substituting G for $\triangle Y/Y$, the so-called Harrod-Domar growth equation, $G = s/v$, can be written. This states that the growth rate (G) of GDP is jointly determined by the savings ratio (s) divided by the capital output ratio (v). The higher the savings ratio and the lower the capital output ratio, the faster will an economy grow. Allowing for depreciation of the capital stock (δ), the equation becomes $G = (s/v) - \delta$ (An encyclopedia of macroeconomics, 2002: 316-320).

2.2.2 Predictions

The Harrod-Domar model was influential in development economics literature during the third quarter of the twentieth century, and was a key component within the framework of economic planning (Snowdon, 2001). It was used to calculate a financing gap that needed to be filled if an economy was going to develop. It suggested that the key problem facing developing countries was simply to increase the share of resources devoted to investment. A target growth rate times the ICOR (the incremental capital output ratio) would give the required investment to meet the growth target. The financing gap was the gap between available financing for investment (such as domestic savings) and the required investment. Filling this gap with aid, the country would get the required investment, which in turn would yield the target growth rate (Easterly, 1998).

2.2.3 Criticism

A number of shortcomings of the Harrod-Domar model have been identified. Firstly, it shows that investment responds to the incentives to invest in the future. However, giving aid to a country does not change those incentives and so does not increase investment. People will consume a permanent flow of aid, not invest it, according to the permanent income theory of consumption. Moreover, the financing gap calculation creates perverse incentives for aid—the lower the domestic savings effort, the larger the gap and the more aid that is required (Easterly, 1998).

A further weakness of the Harrod-Domar model is the assumption of zero substitutability between capital and labour (that is, a fixed factor proportions production function) which leads to an instability property that even for the long run an economic system is at best balanced on "a knife-edge equilibrium growth" (Solow, 1956). This is a crucial but inappropriate assumption for a model concerned with long-run growth and is also the main difference between the Harrod-Domar model and the neoclassical growth theory which assumes a positive elasticity of factor substitution between the two inputs (An encyclopedia of macroeconomics, 2002: 316-320).

2.3 The neoclassical growth theory

2.3.1 Overview

The neoclassical growth model (also known as the Solow model after Robert Solow), starts from the neoclassical aggregate production function:

$$Y = F(K, ZL) \tag{2.6}$$

where Y is output, K is capital, L is labour, and Z is a measure of the level of technology. ZL can be seen as the labour force measured in efficiency units, which incorporates both the amount of labour and the productivity of labour as determined by the available technology. The basic building block of the neoclassical model is the production function exhibiting constant returns to scale. Therefore, the production function can be set as equation (2.7):

$$y = f(k) \tag{2.7}$$

where $y = Y/ZL$, $k = K/ZL$, and $f(k) = F(k, 1)$. This production function relates output per efficiency unit of labour to the amount of capital per efficiency unit of labour (Mankiw, 2000).

The neoclassical model emphasises how growth arises from the accumulation of capital. At any moment, the capital stock is a key determinant of the economy's output, but the capital stock can change over time, and those changes can lead to economic growth:

$$\triangle k = sf(k) - (n + g + \delta)k \tag{2.8}$$

where $\triangle k$ is the change in the capital stock between one year and the next, s is the rate of savings, n is the rate of population growth, g is the rate of growth in technology, and δ is the rate at which capital depreciates. The model takes s, n, g and δ as exogenous (Mankiw, 1995).

As long as the production function is well behaved, the economy approaches a steady state over time. The steady state is defined by:

$$\triangle k = 0 \tag{2.9}$$

or, using a star to denote a steady-state value:

$$sf(k^*) = (n + g + \delta)k^* \tag{2.10}$$

Therefore, k^* is called the steady-state level of capital. In the steady state, output per efficiency unit, $y^* = f(k^*)$, is constant. Output per person grows at rate g, and total output grows at rate $(n + g)$ (Mankiw, 1995).

2.3.2 Predictions

As shown in section 2.2.3, Solow (1956) pointed out how the Harrod-Domar model was incompatible with the

notion that "people respond to incentives". If capital is the only constraint on production and there is surplus labour, then producers will have an incentive to substitute abundant labour for scarce capital (Easterly, 1998).

As the most representative version of the neoclassical growth theory, the Solow (1956) growth model invokes an aggregate Cobb-Douglas production function with constant returns to scale, but diminishing returns to each input (An encyclopedia of macroeconomics, 2002: 202-203). It shows how saving, population growth and technological progress affect the level of an economy's output and its growth over time (Mankiw, 2000).

The framework of this model therefore becomes the basis for sources of growth accounting. Output growth per person is a weighted average of the growth of capital per person and labour-augmenting technical change. The latter is known as "total factor productivity (TFP) growth". It is designed to show how much of output growth is due to growth of capital, labour and TFP (Mankiw, 2000).

Some important predictions of the neoclassical growth model or the Solow model are:
i) The steady-state level of output depends on the rates of savings and population growth. The higher the rate of savings, the higher the steady-state level of output per person. The higher the rate of population growth, the lower the steady-state level of output per person.

ii) The steady-state rate of growth of output per person depends only on the rate of technological progress; it does not depend on the rates of savings and population growth.

From i) and ii), it can be concluded that saving and population growth lead to growth only temporarily and growth in the long run is a function only of technical change (Easterly, 1998). This is the most basic proposition of the neoclassical growth theory, which shows that if there were no technological progress, then the effects of diminishing returns would eventually cause economic growth to cease (Aghion and Howitt, 1998).

iii) In the steady state, the capital stock grows at the same rate as income, so the capital-to-output ratio is constant. That is, in the long run, growth of output per person and growth of capital per person are both equal to TFP growth (Mankiw, 2000).

iv) Initial per person income will have a negative effect on the growth rate. The higher the initial level of per person income, the lower the per person growth rate. This is the convergence[2] principle which is driven by diminishing returns to capital (Rogers, 2003; see chapters 4.2.2.1, 5.4.1 and 5.5.1).

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[2] One of the key predictions of the neoclassical growth model is absolute or unconditional convergence of economies with identical rates of savings and population growth, and unlimited access to the same technology. Such an outcome is only likely to be observed across a group of countries or regions that share similar characteristics. For economies with different rates of savings or population growth, conditional convergence is predicted (Barro and Sala-I-Martin, 2004).

2.3.3 Criticism

Criticism of the neoclassical model is that it leaves technology growth as an exogenous factor (i.e. external to the behavioural variables of the model). Without technology growth the model asserts that economic growth will, ultimately, cease (Rogers, 2003).

The estimated impacts of saving and labour force growth are much larger than the model predicts (Mankiw, Romer & Weil, 1992).

2.4 Endogenous growth theory

From section 2.3, it can be seen clearly that the neoclassical model implies that growth in output per person eventually approaches g, the exogenous rate of technological progress. Although the model can explain international differences in growth rates as the result of convergence to different steady states, it cannot explain the persistence of economic growth throughout most of the world. Persistent growth is built into the neoclassical model in a way that is simple but not illuminating. The goal of endogenous growth theory, therefore, has been to develop models of persistent growth that avoid the assumption of exogenous advances in technology (Mankiw, 2000).

2.4.1 The basic model

To see the idea behind endogenous growth theory, this section will start with the production function, $Y = AK$, where Y is output, K is capital stock[3], and A is a constant measuring the amount of output produced for each unit of capital. This production function has the property of constant returns to the accumulated factor. One extra unit of capital produces A extra units of output, regardless of how much capital is. This absence of diminishing returns to capital is the key difference between this model and the Solow model (Romer, 1990). To see what this implies for economic growth, the accumulation equation (2.11) is considered:

$$\Delta K = sY - \delta K \tag{2.11}$$

It can be assumed that a fraction s of income is saved and invested. This equation states that the change in the capital stock (ΔK) equals investment (sY) minus depreciation (δK). Combining this equation with the $Y = AK$ production function, and after some manipulations, the following is found (Mankiw, 2000):

$$\Delta Y/Y = \Delta K/K = sA - \delta \tag{2.12}$$

[3] The literature on endogenous growth has often relied on capital with externalities and human capital when making the case for constant returns (Mankiw, 2000).

Equation (2.12) shows what determines the growth rate of output $\Delta Y/Y$. As long as $sA > \delta$, the economy's income grows forever, even without the assumption of exogenous technological progress (Romer, 1990).

Thus, a simple change in the production function can dramatically alter the predictions about economic growth. In the neoclassical model, saving leads to growth temporarily, but eventually the economy approaches a steady state in which growth is independent of the saving rate. By contrast, in this endogenous growth model, saving leads to growth forever (Romer, 1990).

The most appealing way of interpreting the endogenous growth model is to view knowledge as a type of capital. It is clear that scientific discoveries build on previous scientific discoveries. Knowledge is used to produce knowledge. Compared to other forms of capital, the production of knowledge seems less likely to exhibit diminishing returns. Indeed, as Romer (1986) has emphasised it appears that growth has accelerated somewhat over time during the long spans of history. The production of knowledge might even exhibit increasing returns (Mankiw, 1995).

This growth theory has two notable properties. First, differences in saving rates across countries lead to increasingly large differences in income over time. Second, large differences in income are not associated with differences in the return to capital. Thus, the world can contain great disparities in income without any incentive for capital to move from rich to poor countries (Mankiw, 1995).

2.4.2 A two-sector model

The $Y = AK$ model is the simplest example of endogenous growth, but the literature on endogenous growth theory has gone well beyond this. In the model of Lucas (1988), the economy has two sectors: manufacturing firms and research universities. Firms produce goods and services, which are used for consumption and investment in physical capital. Universities produce a factor of production, knowledge, which is then used freely in both sectors. The economy is described by the production function for firms, the production function for universities and the capital-accumulation equation:

$$Y = F\ [K, (1-u)EL] \qquad \text{(production function in manufacturing firms)} \qquad (2.13)$$

$$\Delta E = g(u)E \qquad \text{(production function in research universities)} \qquad (2.14)$$

$$\Delta K = s\ Y - \delta K \qquad \text{(capital accumulation)} \qquad (2.15)$$

where u is the fraction of the labour force in universities, E is the stock of knowledge and g is a function that shows how the growth in knowledge depends on the fraction of the labour force in universities. As before, the production function for the manufacturing firms is assumed to have constant returns to scale (Mankiw, 2000).

This model is a cousin of the $Y = AK$ model. In particular, this economy exhibits constant returns to scale in the accumulated factors of production. If the inputs of capital and knowledge are doubled, the output of both

sectors is doubled. Like the $Y = AK$ model, this model can generate perpetual growth without the assumption of exogenous shifts in the production function. Here persistent growth arises endogenously because the creation of knowledge in universities never slows down (Mankiw, 2000).

There are two key decision variables in this model. As in the neoclassical model (see section 2.3), the fraction of output used for saving and investment, s, determines the stock of capital. In addition, the fraction of labour used in universities, u, determines the stock of knowledge. Both s and u affect the level of income, although only u affects the long-run growth rate. Thus, this model of endogenous growth takes a small step toward showing which societal decisions determine the rate of technological change (Mankiw, 2000).

2.4.3 Criticism

The endogenous growth theory's value is twofold. First, it helps explain the existence of worldwide technological progress, which the neoclassical growth model takes as given. It introduces the formation of knowledge, either as part of labour or as a broad notion of capital into the theory endogenously. Second, it offers a more realistic description of research and development. In this theory, even though knowledge is largely public goods, much research is done in firms that are driven by the profit motive. Research is profitable because innovations give firms temporary monopolies (Mankiw, 1995).

Yet for practical macroeconomists trying to understand international differences, the payoff from endogenous growth theory is not clear. Models that emphasise immeasurable variables such as knowledge are hard to bring to the data. It is not surprising, therefore, that these models have appealed to more theoretically inclined economists, and that there have been few attempts to evaluate these models empirically (Mankiw, 1995).

2.5 The role of institutions

During economic history, as was discussed in section 2.2 to 2.4, growth theory began with Harrod-Domar model of the 1940s and moved forward in the 1950s with the work of Solow (1956), who endogenised the capital-labour ratio which had been assumed as given by technology in the Harrod-Domar model. After significant activity in the 1960s, growth theory stagnated and was brought back in a new form by Romer and Lucas in the 1980s. These models tend to concentrate on the accumulation of factor inputs such as capital and labour, and also on variables that influence the productivity of these inputs, such as scale economies and technological change (An encyclopedia of macroeconomics: 191-192). Economists call these variables proximate causes of growth (Denison, 1985; Maddison, 1995). In recent years, some economists such as Coase (1992) and North (1990) have stressed another kind of sources of growth—fundamental determinants. In this section, beyond the proximate causes of growth, the wider fundamental determinants will be delved into in order to understand better why some countries have performed so much better than others in terms of economic growth.

2.5.1 Fundamental determinants

What are the fundamental sources of growth? Fundamental determinants relate to the variables which have an important influence on a country's ability and capacity to accumulate factors of production and invest in the production of knowledge. That is, they contains the influence of non-economic as well as economic variables that can influence the growth potential and performance of an economy, including the incentives, rules and regulations that determine the allocation of entrepreneurial talent (Baumol, 1990).

2.5.2 Institutions

From the above definition, it is clearly seen that moving from the proximate to the fundamental causes of growth shifts the focus of attention to the institutional framework of an economy, to its "social capability" (Abramovitz, 1986) or "social infrastructure" (Hall and Jones, 1999). As North (1991) argues, the "central issue of economic history and of economic development is to account for the evolution of political and economic institutions that create an economic environment that induces increasing productivity". Economic history shows that unsuccessful economies, in terms of achieving sustained growth of living standards, are those that fail to produce a set of enforceable economic rules that promotes economic progress. There is now widespread acceptance of the idea that "good" institutions are an important precondition for successful growth and development (North, 1990; Abramovitz and David, 1996; Barro, 1997).

The question is asked, what are these institutions? North (1991) defines institutions as "the humanly devised constraints that structure political, economic and social interaction". Therefore, economic institutions are the rules and bodies that govern economic interactions (Zipfel, 2004).

The constraining institutions may be informal (customs, traditions, taboos, conventions, self-imposed codes of conduct involving guilt and shame) and/or formal (laws, contract enforcement, rules, constitutions, property rights). In an ideal world the informal and formal institutions will complement each other. These institutions provide a structure within which repeated human interaction can take place: they support market transactions, they help to transmit information between economic agents, and they give people the incentives necessary to engage in productive activities (An encyclopedia of macroeconomics, 2002: 193).

Through economic history, the institutions, as the ultimate drivers of science, technology, and even productivity, have a great influence on social development. This influence can be positive or negative. North used the development of economic institutions in the medieval period of European history and its evolution as explanations for the rapid economic and technological development of the West. He regarded the following economic institutions as important to economic growth and prosperity: private property rights, the rule of law, legal structure and so on. In an environment of weak law and contract enforcement, poor protection of property rights and widespread corruption, unproductive profit (rent)-seeking activities will become endemic and cause immense damage to innovation and other growth-enhancing activities (Tanzi, 1998).

2.5.3 Institutional change

In the 1970s, North won the Nobel Prize for his pioneering work on economic institutions and institutional change. Institutional change is another fundament of the institutionalist school of economic growth theory (Zipfel, 2004).

2.5.3.1 Definition

Roland (2004) defines that institutional change is driven by social forces that favour it and opposed by social forces that would lose from it. The balance of power between those two groups determines the dynamics of change. Yet, how the relative strengths of forces between of change and of conservatism map onto conflict and change also depends on the existing institutions, on how they help or hinder groups in solving their collective action problem, and on how representative and participatory the political institutions are (Roland, 2004).

2.5.3.2 Transaction costs

From the definition, it can be seen that any institutional change relates to two different institutions which service the different social forces, namely the old institution and the new one. When change comes about, the old institution is no longer relevant in the context of a new economy. For the latter to operate effectively it requires its own requisite institutional framework. The establishment of the new institution aims to reduce high transaction costs in the old institution, enhancing integrated process of society. However, inevitably, in the process of the replacement of the old institution by a new one, a lot of transaction costs will exist, such as frictional costs in the transformation of the old and new institutions, equity exchange costs in the progression of new institution, repeated game costs in institutional transformation and leasing costs to the new institution and alternative costs etc. Therefore, in institutional change of countries, restrictions on social costs and individual costs must be strengthened to weaken the impulse for and to lessen the times of reverse choosing (Wang, 2003).

2.5.3.3 The aims of institutional change

The general purpose of institutions as shown above is to provide an environment in an objective content in which people can interact, following some set of rules that act as guidelines governing their actions (Zipfel, 2004). The aim of institutional change is to produce positive effects for institutions through improving better environments and to strengthen the complementarity between institutions. That is, institutional change emphasises forming a good social atmosphere and leads institutions to good aspects through seeking an alternative specific institution that better exerts all its advantages (Wang, 2003).

2.5.4 Transition economy

As early as 1991, the increase in attention paid to institutions and institutional change was a reflection of one

of the most important events in modern economic history. This event is that transition economies emerged. The fact that over 35% of articles on transition now involve discussion of institutions is of sure signs that institutions have something to offer during the process of transition (Murrell, 2003).

The so-called transition economy is commonly understood to refer to a country which has moved or is moving from a primarily state-planned to a market-based economic system, with private ownership of assets and market-supporting institutions (Charles, 1999). Economists view transition as a process of large-scale institutional change (Dewatripont and Roland, 1997; Charles, 1999).

The last decade of 20th century has witnessed the transition of the formerly centrally planned economies of Europe and Asia to market economies, a process affecting some 1.7 billion people in 28 countries (Charles, 1999). The economic and social performance of these transition economies has varied considerably. It is necessary to understand how institutional change works in these transition economies.

2.5.4.1 Two approaches

With the demise of the planning system, countries in transition adopted two different approaches in the process of institutional change to attain a market-oriented economy and reintegrate into the global economy. They are the "big bang" or shock therapy approach and the gradual or pragmatic approach (Charles, 1999).

The big bang approach was adopted by Eastern Europe primarily. It advocates the need to eliminate all remnants of the old planning system as rapidly as possible, and to replace it with a system based on a market allocation of resources with predominant private ownership (Charles, 1999). From a theoretical point of view, the attempt of the big bang approach is to reform the economic system so that the existing stock of resources can be used more efficiently. Then privatisation can be accomplished in a stroke, and other market supporting institutions can be established overnight (Lin, 2004).

On the other hand, China adopted the alternative gradual or phased approach to economic transition. This approach focuses upon local experiments that, if successful, are expanded to include the rest of the economy. As the institutional building blocks of a market system are gradually put in place, markets are slowly but steadily extended to other parts of the economy. This strategy relies on there being scope to reap large productivity gains from the first, partial reforms. These, in turn, raise incomes and build momentum for further more difficult reforms in a self-reinforcing process. Such a gradual approach to reform requires sustaining the reforms over an extended period, and containing adverse side effects arising from selective liberalisation of the economy (Charles, 1999).

2.5.4.2 Best practice institutions

When the transition started in Eastern Europe, most economists in the West favoured the big bang approach, which included the conventional wisdom of transition focusing on stabilisation, price liberalisation, and

privatisation. They considered these three reforms to be the necessary for a successful transition to a market economy (Blanchard et al, 1991). The institutionists (Coase, 1992; Williamson, 1994; North, 1997) therefore put forward the "menu perspective" on institutions to complete all these reforms, such as secure private property rights protected by the rule of law; impartial enforcement of contracts through an independent judiciary; appropriate government regulations to foster market competition; effective corporate governance and transparent financial systems etc. All of them can be readily found in the developed economies, especially in the United States. This implies that they are "best practice" institutions. Economists then use these institutions as "a benchmark to judge transition and developing economies" (Qian, 2003).

2.5.4.3 Transitional institutions

However, the experience of Eastern Europe indicates that immediate implementation of the best-practice institutions is not a panacea. The big bang approach has resulted in an unexpected sharp and prolonged decline in GDP with extraordinarily high inflation rates and serious deterioration of other social indicators (World Bank 1996a; 2002).

At the same time as the big bang approach was theoretically perfect and feasible, the Chinese approach was considered by some economists at the beginning of the transition (Murphy, Shleifer, and Vishny, 1992; Sachs 1993).

But after over twenty years, contrasting the economic collapse and social crisis in Eastern Europe, without being guided by a well-founded theory or a pre-determined blueprint, China has become the fastest growing country in the world since the transition started. The success of China suggests that transitional institutions, produced by incremental changes, can be productive (Murrell, 2003).

The central lessons to be derived from the experience of countries in transition focus on the following: The distinction between the conventional, best-practice institutions and the transitional institutions is important and transitional institutions might have worked better than best-practice institutions. Building best-practice institutions is a desirable ultimate goal, but transitional institution is about searching for a feasible path toward the goal. Therefore, the real challenge of institutional change in transition economies is not about what is "desirable", but about what is "feasible" (Murrell, 2003; Qian, 2003).

Because many dimensions of the initial conditions are country and context specific, which require special arrangements to accommodate, transitional institutions display a variety of non-standard forms. Therefore, successful transitional institutions are not usually "a straightforward copy of best practice institutions". China's experience has shown that impressive growth does not require "perfect institutions but imperfect and sensible institutions" can perform (Qian, 2003).

On the other hand, it is noteworthy that unconventional institutions in some transition economies do not constitute an argument against fostering best-practice institutions. It is an argument against simplistic and

naive views on institutional change, as Roland (2004) emphasised, "transition has forced us to think about institutions not in a static way but in a dynamic way" (Murrell, 2003; Qian, 2003).

2.6 Summary

In this chapter, the study discussed the theories of economic growth in order to understand the two kinds of determinants, proximate and fundamental causes, which can contribute to economic growth.

The proximate determinants of economic growth are modelled by the Harrod-Domar model, the neoclassical and endogenous growth theories that are the most influential ones in economic history among many economic growth models. Compared with endogenous growth theory, the Harrod-Domar model and its successor, the Solow growth model, are known as the neoclassical models of exogenous growth (Easterly, 1998).

The original idea of the neoclassical exogenous growth model has two noteworthy properties. The first one is that per capita growth will eventually come to a halt. The second prediction of the model is the so-called convergence property. It states that the lower the starting level of real per capita GDP, the higher the predicted growth rate will be. Both properties are driven by the assumption of diminishing returns to capital. Reality, however, shows that positive per capita growth rates do persist over centuries and do not have a tendency to decline. This problem was solved in a rather pragmatic way in Solow's model. The introduction of technological progress in an unexplained (exogenous) way made persistent growth possible, while retaining the convergence property (Campenhout, 2002).

By keeping technology outside of the model, the neoclassical theory was insufficient if one was looking for the real determinants of long-term economic growth. Endogenous growth theory thus emerged, trying to explain the missing link in the neoclassical growth models. A large body of literature emerged trying to incorporate a theory of technical progress into growth models. First, researchers experimented with ideas which were unintended by-products of production or investment, a process known as learning by doing (Romer, 1986; Lucas, 1988; Rebelo, 1991). Later, theories of research and development (R&D) were developed (Romer, 1990; Grossman and Helpman, 1991; Aghion and Howitt, 1992). Although in a different way, both these theories were consistent with positive growth rates in the long run. These endogenous growth theories renewed interest in the role of the government in GDP growth, through enabling a climate favourable to R&D (Campenhout, 2002).

In conclusion, the exogenous and endogenous growth theories focus on the proximate causes of growth, such as labour, physical capital, human capital and productivity. These determinants allow economists to better understand and explain the "how" of growth. However, they lack mechanism for explaining "why" countries grow at different rates. This implies that one cannot hope to find the magic bullet by using economic analysis alone. To explain growth "miracles" and "disasters" requires an understanding of the fundamental

determinants of economic growth—institution and institutional change (An encyclopedia of macroeconomics, 2002: 197-198).

North (1991) considers that history is "largely a story of institutional evolution" and effective institutions "raise the benefit of co-operative solutions or the costs of defection". How economic institutions shape human behaviour through the rewards and costs applied to human action and how different institutions help or inhibit human action and behaviour in promoting economic efficiency are the fundamental thrusts for the institutionalist school of economic growth theory (Zipfel, 2004).

In the last decade of the 20th century, the transition in the socialist countries from the planned economy to a market economy has contributed to the remarkable increase in the role attributed to institutions. As Murrell (2003) emphasised: "The process of transition is an important stimulus to the increasing interest in institutions. ···It has moved the role of institutions into the mainstream of economics" (Murrell, 2003).

The different transitional experience between Eastern Europe and China has also shown that recognising the importance of institutions is only a beginning. It is also important to recognise that it is not enough to study the best-practice institutions as a desirable goal. One should study "how feasible transitional institutions fit the economic and political reality and function as stepping-stones in the transition process towards the goal" (Qian, 2003).

To be effective, the actual reform measures should take the economy's specific circumstances into consideration and exploit all favourable factors within and without the economy. Therefore, as Qian (2003) considers: "the specific design and sequence of institutional change in an economy should be 'induced' rather than 'imposed'... A simple transplantation of successful measures in an economy will not guarantee its success in other economies". In the next chapter, this study will discuss how the non-standard paths of institutional development lead to remarkable economic success in China.

CHAPTER 3: CHINA'S INSTITUTIONAL REFORMS

3.1 Introduction

In chapter 2, it was mentioned that China's transition from a planned to a market economy had often been portrayed as a gradual and experimental process.

In this chapter, the study will firstly examine the evolutionary process of China's transition to markets, and then discuss the fundamental determinants that contributed to this transitional country's impressive economic growth from the institutional point of view. This chapter is structured as follows: in section 3.2, the background of China's reforms is discussed. In section 3.3, the two turning points in the reform process are discussed. In section 3.4, 3.5 and 3.6, the three main institutional reforms in China are discussed, namely market liberalisation, entry and growth of non-state enterprises (including the development of TVEs and private economy) and the opening-up of the economy. Lastly, in section 3.7, the chapter ends with a summary.

3.2 Background

3.2.1 Overview

At the beginning of the 1980s, following from the disastrous decade of the Cultural Revolution (see section 1.4.2), China was poor, over-populated, short of human capital and natural resources, and was constrained by the hostile ideology to markets and powerful opposition to radical reform.

Today, China has transformed itself from a poor, centrally planned economy to a lower middle-income, emerging market economy. With total GDP growing at an average annual rate of more than 9%, China's per capita GDP has more than quadrupled between 1978 and 1998. The benefits of growth are also shared by the people on a broad basis: the number of people living in absolute poverty has been substantially reduced from over 250 million in 1978 to about 50 million in 1998, a decline from one third to one twenty-fifth of its population; and life expectancy has increased from 64 in the 1970s to over 70 in the late 1990s (Qian, 2003).

Given its economic growth and improving living standards, it is clear that China's reform since 1978 has been successful. Underlying China's reform is a series of institutional changes concerning the markets, firms, and the government in the novel form of "transitional institutions" (see section 2.5.4.3). As Qian (2003) wrote: "These institutions succeed when they achieve two objectives simultaneously: to improve economic efficiency through incentives and competition, and to make the reform a win-win game and thus interest-compatible for those in power" (Qian, 2003).

3.2.2 Two results of transition

As chapter 2.5.4 has shown, both China and Eastern European countries have experienced the process of moving from a centrally planned system to a market system. In Eastern Europe, reforms started as early as 1968 in Hungary, 1980 in Poland, and 1985 in the Soviet Union, but their reforms prior to 1990 have been deemed a failure (Kornai, 1986; 1992). It is this Eastern European experience that led Kornai (1992) to conclude that "in spite of generating a whole series of favourable changes, reform [in socialist countries] is doomed to fail...The system is incapable of stepping away from its own shadow. No partial alternation of the system can produce a lasting breakthrough." It is this reform failure that eventually contributed to a political revolution in Eastern Europe after 1990 (Charles, 1999).

In contrast, China has experienced market-oriented reform after 1978 representing an alternative approach to social transformation. The difference between China and Eastern Europe is that China's reform was a success. Its transition to markets, building upon this success, evolved smoothly without any political revolution. In the over two decades, China has transformed itself incrementally from a centrally planned economic system to an emerging market economic system (Charles, 1999).

Based on the Chinese and Eastern European experience, China's reform has been viewed as an anomaly in terms of transition to a market economy (Qian, 1999). The Chinese path of transition poses a challenge to the conventional wisdom of transition (Qian, 1999; see chapter 2.5.4.2). How did China manage to succeed in the political system under the Communist Party but Eastern European countries failed? To understand this question, it is necessary to trace the roots of Chinese reform.

3.2.3 The demands for reforms

After the Cultural Revolution (1966-1976), the information arriving from Chinese neighbours provided strong evidence in favour of increasing the role of the market and opening the economy. Most Chinese were stunned by the fast economic development of East Asian countries during the time period of the Cultural Revolution. China was far behind these countries. The economic reality in the late 1970s was:

i) The poor progress of agricultural productivity due to a serious rural overpopulation and a poor utilization of this workforce slowed down industrial development potential.

ii) A reduction of the share of services in the national product, which fell from 24.5% to 20.4% during the period, was contrary to the experience of other developing countries.

iii) By 1978, the growth of urban unemployment reached approximately 10 million, out of a total urban population of 172 million.

iv) The reduction in the marginal efficiency of investment, which fell from 0.75 in 1962-1965 to 0.25 in 1970-1975, indicated a growing underutilisation of capital. This underutilisation was also linked to insufficient production of energy and raw materials, as well as the frequent breakdowns of overworked

and poorly maintained plants (Bettelheim, 1988).

These disastrous consequences for the national economy and the living standards of the people were attributed to the Chinese Communist Party's focus on "political movement" during the Cultural Revolution. Lack of economic development fuelled mass resentment of the Party. The experience of the Cultural Revolution had enormous effects on the mind-set of some leaders. It taught the Chinese leadership an important lesson that economic development was the key to maintaining its power. They were convinced that without economic development the Party could not survive, in other words, the necessary condition for maintaining the Party's power and regaining popular support was economic development. The proposition of economic development became compelling in the late 1970s, because it was the only source from which the government could gain its legitimacy. Therefore, the economic factors combined with the political will of the leadership explain the demands for reforms in China (Qian and Wu, 2003).

3.3 The turning points in China's reforms

Since 1978, there have been substantial reforms in China. Qian (2000), in his analysis of China's reforms since 1978, identified two turning points: One marks the beginning of the reform; the other marks a watershed change, indicating the beginning of a new direction of economic reform.

3.3.1 The strategic shift: beginning the reform

In December 1978, the Third Plenum of the Eleventh Chinese Communist Party (CCP) Congress was widely regarded as the beginning of the reform era. The main achievement of the meeting was the shift of the Party's focus from "class struggle" to "economic development". This shift of development strategy created a more relaxed economic environment in which the government's control was relaxed and individual freedom could be better accommodated. In this meeting, the idea of "planning as a principal part and market as a supplementary part" was the accepted ideology which was a big change from Mao's ideology of abolishing markets. The event was known in China as the first wave of "emancipation of the mind" and it paved the way for initialisation of reform (Qian, 2000).

3.3.2 The strategic move: setting the goal for a market system

3.3.2.1 Deng Xiaoping's famous Southern Tour

From above statement, it can be seen that at the outset of reform, China desired change in order to increase productivity and improve living standards, but at no time did the leadership think of introducing a full-fledged market system (Perkins, 1994).

Only in the early 1990s did the official ideology start to change from the idea of "combining plan and market

together" to "socialist market economy". This message became clear during Deng Xiaoping's famous Southern Tour in the spring of 1992, when he made the point that "both plans and markets are economic means". He prepared the ideological groundwork for the adoption of a more comprehensive reform strategy aimed at transforming the Chinese economy to fully a market-based system by announcing that the market mechanism was a tool for economic development and was consistent with socialism (Charles, 1999).

Following his remarks, the big ideological breakthrough occurred at the Fourteenth Party Congress in September 1992 when the Party, for the first time, formally endorsed the "socialist market economy" as China's reform goal. This was known as the second wave of "emancipation of the mind". In a fundamental way, a "socialist market economy" differs from "market socialism" which was advocated by some Eastern European countries in the 1970s and 1980s. In a "socialist market economy", the word "socialist" is an adjective and the goal is "market economy" (Qian and Wu, 2003). In contrast, in "market socialism", the "market" is a simulated one to serve the purpose of "socialism" based on public ownership (Kornai, 1992).

3.3.2.2 The November 1993 decision

The contents of transition to a "socialist market economy" became clearer one year later in China. In November 1993, the "Decision on Issues Concerning the Establishment of a Socialist Market Economic Structure" was adopted by the Third Plenum of the Fourteenth Party Congress (China Daily, November 17, 1993). The "Decision" emphasised the importance of coordination among various aspects of reforms, known as "combining package reform with breakthrough in key areas". For the first time it left the door open regarding the privatisation of SOEs. The essence of the November 1993 decision is to replace China's centrally planned system with a modern market system eventually to incorporate international institutions. This landmark document represents a turning point in China's road to a market economy. This document, together with several subsequent decisions, is a very significant historic event (Qian and Wu, 2003).

3.3.2.3 Subsequent decisions

1) The Fifteenth Party Congress, *in* September 1997

The Fifteenth Party Congress held in September 1997 made a major breakthrough on ownership issues. The official ideology toward private ownership had a big change. State ownership was downgraded from a "principal component of the economy" to a "pillar of the economy" while private ownership was elevated from a "supplementary component of the economy" to an "important component of the economy". The meaning of public ownership was redefined, because public ownership can have many "different realisation forms", such as joint stock corporations with investment by many owners. This is known as the third "emancipation of the mind" (Qian and Wu, 2003).

2) An *amendment* of Chinese Constitution, in March 1999

In March 1999, private ownership and the rule of law were incorporated into the Chinese Constitution. An amendment of Article 11 of the Constitution placed private businesses on an equal footing with the public

sector by changing the original clause "the private economy is a supplement to public ownership" to "the non-public sector, including individual and private businesses, is an important component of the socialist market economy" (China Daily, March 16, 1999; Qian, 2000). Immediately after the amendment, local governments started to relax local restrictions on private enterprises (People's Daily, April 9, 1999; Qian, 2000). Furthermore, Article 5 of the Constitution was amended to include the principle of "governing the country according to law" which demonstrated that China's commitment to a full market system was based on the rule of law (China Daily, March 16, 1999; Qian, 2000).

3.3.3 Conclusion

From the two turning points in China's reform, it can be seen that China's transition to markets has experienced two stages, where the first stage spanned about fifteen years between 1978 and 1993 and the second stage began in 1994. During the two-stage reform, China provides a case that proved impossible in Eastern Europe and elsewhere: the Chinese Communist Party itself voluntarily made the ideological shift. China has become the first country where the ruling Communist Party has voluntarily changed its official ideology to embrace a market economy and private ownership (Qian and Wu, 2003).

It can be also realised that during the Chinese reform experience, institutional changes have played a dominant role in China's growth. The process of institutional changes in China can provide a number of interesting and important lessons for other transition economies, in terms of the pace, sectoral emphasis, sequencing and key ingredients of the reform strategy.

3.4 Market liberalisation: the dual-track approach

In the first stage reform of China, the institutional changes take the form of incremental reform (see section 2.5.4.3), that is, introducing dramatic change outside, rather than inside, the existing core of central planning (Qian, 1999). Quite a few economists consider that incremental reform is the determinant to explain why China was able to avoid the failure of Eastern European reform (Qian, 1999; Wu, 1999). The most significant examples are the "non-state sector" outside the state sector and "dual-track" mechanism (Qian and Xu, 1993; Wu, 1999). Because it is widely accepted that the essential building block of a market system is the allocation of resources according to free market price. Therefore, in this section, a dual-track approach to market liberalisation in China will be described first.

3.4.1 The basic principle

A dual-track approach is defined as follows: in one track (the "plan track"), the existing (often inefficient) central economic plan and the distribution of rents under it are left intact; in the other track (the "market track"), liberalisation is carried out at the margin. That is, economic agents have both the right and the incentive to participate in the free market provided that the obligations under the original plan are fulfilled

(Lau, Qian and Roland, 1997).

Many economists have presented formal analysis and systematic evidence to prove how the dual-track approach works in China (Sicular, 1988; Byrd, 1991; Lau, Qian and Roland, 1997; 2000). The dual-track approach is appealing for two reasons: one is from politics. This approach represents a mechanism for the implementation of a reform without creating losers. Because by maintaining the pre-existing distribution of rents under the original plan, the dual-track approach implements lump-sum[4] transfers to compensate any loser under the reforms. In comparison, the single-track approach to liberalisation cannot guarantee an outcome without losers. The other is from economics. This approach always improves efficiency. Because all markets are open under dual-track liberalisation and thus any rent transfers are infra-marginal. That is, after fulfilling the obligations under the plan, the market track functions to undo the inefficiency of the plan track (Lau, Qian and Roland, 1997; 2000; Qian, 2003).

According to the work of Lau et al (2000) and Qian (2003), based on the principle, the dual-track approach had worked in product and labour market liberalisation in China since 1978. The Chinese experience demonstrates that such an approach succeeds.

3.4.2 Dual-track liberalisation in product markets

3.4.2.1 Agricultural market liberalisation

In the agricultural reform undertaken since 1978, the dual-track approach is the first successful application. Under the dual-track, the state procurement of domestically produced grains had remained essentially fixed between 1978 and 1988, with 47.8 million tonnes in 1978 and 50.5 million tonnes in 1988. These data demonstrate sufficiently effective enforcement by the state of the planned delivery obligations (Historic Material for Grain Work in Contemporary China, 1989: 1800-1805; 1838-1839; Qian 2003).

The introduction of the market track in agriculture increases the incentives for households to raise output because farm returns link directly to production. It provides opportunities for farm households to make their own economic decisions, including allocating production inputs and retaining surplus output after filling government quotas or targets. Household farming is motivated by profit (Lin, 1992). Between 1978 and 1985, the share of transactions at plan prices in agricultural goods fell from 94% to 37% (Lau, Qian and Roland, 2000). However, over the decade 1978-1988, the total domestic grain production increased from 304.8 million tonnes to 394.1 million tonnes, almost a one-third increase (Historic Material for Grain Work in Contemporary China, 1989: 1800-1805; 1838-1839; Lau, Qian and Roland, 2000; Qian, 2003). Between 1978 and 1990, the agricultural output of China doubled which provided evidence of the huge supply response to the market track (China Reform and Development Report, 1992-1993: 54; Lau, Qian and Roland, 2000).

[4] The term "lump-sum transfers" as used here simply means that the transfers are independent of the actions of the individual economic agents (Lau, Qian and Roland, 2000).

3.4.2.2 Industrial market liberalisation

The most noticeable application of the dual-track approach concerns industrial goods, which also shows how markets could grow out of plans (Byrd, 1991; Naughton, 1995). Coal and steel are two of the most important industrial commodities, which were also the most tightly controlled under central planning (Lau, Qian and Roland, 2000). For coal, China's principal energy source, the share of the plan allocation declined from 53% in 1981 to 42% in 1990, but the market track increased much more (China Statistical Yearbook, 1991). The increments came mainly from small rural non-state coalmines run by individuals and township and village enterprises (Lau, Qian and Roland, 2000; see section 3.5.2). For steel, the plan track in absolute terms was quite stable, but the share of plan allocation fell from 52% in 1981 to 30% in 1990 (China Statistical Yearbook, 1991; Lau, Qian and Roland,, 2000). This supply response in steel came mainly from large state-owned enterprises rather than small non-state firms (Byrd, 1991). In the cases of both coal and steel, because the plan track is essentially frozen, the economy is able to "grow out of the plan" on the basis of the market track expansion by state or non-state firms (Naughton, 1995; Qian, 2003).

3.4.3 Dual-track liberalisation in labour market

China's labour market reform follows a similar pattern, starting with limited market liberalisation. Table 3.1 shows that between 1978 and 1994, the employment in the non-state sector increased much more rapidly than employment in the state sector. Within the state sector, there are two tracks: pre-existing permanent employment status and the more flexible contract system. Beginning in 1980, employment in the plan track has been virtually stationary while most new hires in the state sector are made under the contract system and often at lower wage rates (Lau, Qian and Roland, 2000; Qian, 2003).

Table 3.1: The dual tracks in non-agricultural employment (million employees), 1978-1994

	1978	1983	1985	1988	1989	1990	1991	1992	1993	1994
STATE[1)]	74.51	87.71	89.90	99.84	101.08	103.46	106.64	108.89	109.20	112.14
Permanent	74.51	87.14	86.58	89.76	89.18	89.74	90.75	88.31	85.24	83.61
Contract	0.00	0.57	3.32	10.08	11.90	13.72	15.89	20.58	23.96	28.53
NON-STATE	48.90	62.10	107.97	138.28	136.49	152.53	159.49	172.28	195.87	204.85
Urban	20.63	29.75	38.18	42.83	42.82	43.84	46.04	47.41	50.45	56.01
Rural	28.27	32.35	69.79	95.45	93.67	108.69	113.45	124.87	145.42	148.84
STATE PERMANENT/TOTAL	0.60	0.58	0.44	0.38	0.38	0.35	0.34	0.31	0.28	0.26

Source: China Statistical Yearbook, 1994; 1995.

Note: 1) The state sector includes civil servants in government agencies and non-profit organisations.

3.4.4 Phasing out planned prices

Sections 3.4.2 and 3.4.3 described the gradually declining trend of the plan track throughout the 1980s. After 1990, price liberalisation moved very fast because the differences between planned and market prices became insignificant. That is, the plan track in markets had been largely phased out in the 1990s and the two tracks had been merged into a single market track. By 1996, in industrial producer goods, the plan track accounted for only 14.7% while in agricultural procurement it accounted for about 16.6% (People's Daily, August 22, 1997; Lau, Qian and Roland, 1997; 2000).

3.4.5 Conclusion

China's institutional change was accomplished through a dual-track approach to market liberalisation. The general principle underlying the dual track approach is to make reforms efficiency-improving and

interest-compatible. It differs from the single-track approach: prices are freed in one stroke and determined solely by the market, which was experienced by Eastern European countries after 1990 (Qian, 2003). The high social and economic costs of the single-track approach proved a failure (Charles, 1999). The Chinese experience shows that the dual-track approach is an example of transitional institutions making best use of existing institutions. It uses the "existing information contained in the original plan and enforces the plan track through existing planning institutions" (Lau, Qian, and Roland, 2000). Therefore, contrary to common understanding of the relationship between state power and reform, state enforcement power is needed here "not to implement an unpopular reform, but to carry out one that creates only winners" (Lau, Qian, and Roland, 2000).

3.5 Entry and expansion of non-state enterprises

In section 3.4 of this study, the dual-track mechanism, one form of incremental reform, was discussed. In this section, non-state enterprises, another significant example of incremental reform in the process of Chinese institutional changes, will be described.

3.5.1 Diverse forms of Chinese enterprises

The Chinese economy is divided into "urban" and "rural" areas, which is an administrative rather than economic concept inherited from the planning era. Firms in the urban area consist of state-owned, collectively-owned, privately-owned, and other (including foreign) firms. Firms in the rural area are called rural enterprises, which consist of two ownership types: town and village enterprises (TVEs) and private firms. In China, the state sector refers to state-owned enterprises (SOEs) in urban areas and the non-state enterprises refer to the rest (Jin and Qian, 1998).

SOEs are national public firms owned by the central government and supervised by the four upper levels of government: central, provincial, prefecture, and county (a municipality can have a rank of the latter three) (Jin and Qian, 1998). Non-state enterprises, unlike SOEs, operate outside the scope of central planning and they are subject to harder budget constraints and face more competition than SOEs (Qian and Wu, 2003). China's experience demonstrates that the economic growth impetus arises mainly from the non-state sector. Diverse forms of business enterprises have emerged from "under the shadow of the formerly dominant SOEs to operate in marketised sectors" since 1978 (Anderson et al, 2003). In contrast, in Eastern European countries, in the late 1980s after decades of reform, the state sector continued to dominate the economy and their non-state sector remained insignificant, especially in industry (Kornai, 1986).

Table 3.2 illustrates the change in output accounted for by the different forms of firm ownership between 1978 and 1999 in China. The most remarkable changes include a decline in the contribution of SOEs and the dramatic rises in the relative output of privately owned enterprises (POEs) and collectively-owned enterprises (COEs) in the same time period. These shifts, in total, tell a story of radical reshaping of the economy in terms

of enterprise ownership in China.

Table 3.2 also shows that in the first fifteen years of reform between 1978 and 1993, the most dynamic segment in the non-state was TVEs. In the 1990s, private firms became the engine of economic growth in China. The innovative ownership forms of enterprises are regarded as another pillar of China's institutional change (Qian, 2003).

Table 3.2: Industrial output (as %) by classification of ownership, 1978-1999

	1978	1980	1982	1984	1986	1988	1990	1992	1994	1996	1998	1999
SOE[1)]	77.63	75.97	74.40	69.09	62.27	56.80	54.61	51.52	37.34	36.32	28.24	28.21
COE[2)]	22.37	23.54	24.82	29.71	33.51	36.15	35.63	35.07	37.72	39.39	38.41	35.37
OOE[3)]	0.00	0.48	0.68	1.01	1.46	2.72	4.38	7.61	14.85	16.65	21.91	26.14
POE[4)]	0.00	0.02	0.06	0.19	2.76	4.34	5.39	5.8	10.09	15.48	17.11	18.18

Source: Chinese Statistics Yearbook, 1999.

Note: 1) SOE: State-owned enterprises, owned wholly by the state.

2) COE: Collectively owned enterprises, in which ownership is held by a collective group. They include both urban collective enterprises and rural town and village enterprises (TVEs).

3) OOE: Other-ownership enterprises, which are predominantly joint ventures but include some other forms of ownership.

4) POE: Privately owned enterprises, whose assets are controlled by an individual or a partnership.

3.5.2 Rural town and village enterprises (TVEs) (1978-1993)

Most economists agree that TVEs have made a significant contribution to the national economy between 1978 and 1993 (Weitzman and Xu, 1994; Chang and Wang, 1994 and Che and Qian, 1998a; b). As Qian (2003) said: "China's reform performance would look very different without the early contributions of TVEs." Thus, in order to understand how reform worked in China, one has to understand TVEs.

3.5.2.1 The definition of China's TVEs

TVEs are local community public firms owned and controlled by the local community (i.e. town or village) government. TVEs are a unique and dynamic ingredient in China's reform, which differ from the forms of non-state enterprises in Eastern Europe and most other developing countries. What makes TVEs special is a government structure in which the local community government plays a central role, in contrast with firms

controlled by private or national government. That is, TVEs' ownership form is not standard—it is neither private nor state owned (Chang and Wang, 1994; Li, 1996; Qian, 2000).

3.5.2.2 Community government in TVE governance

How does the community government involve itself in TVE governance in the process of Chinese transition? Economic studies note that the roles of the community government in TVEs are shaped by the imperfect institutional environment in China. The comparative advantages of community government ownership of firms in three types of imperfections are emphasised in the economic literature (Che and Qian, 1998a; b; Jin and Qian, 1998; Qian, 1999; 2000).

First, the community government plays a critical role in protecting TVEs in an environment lacking secure property rights (Chang and Wang, 1994; Li, 1996). Because of insecure property rights combined with strong anti-private property ideology (see section 3.2.1), private enterprises are vulnerable to state predation, which distorts private investment incentives (Jin and Qian, 1998). Che and Qian (1998b) develop a theory that community governments can provide productive local public goods, which increase future revenues for higher levels of government in China. As a result, the national government is friendlier towards TVEs than private enterprises. Therefore, TVEs have an advantage under insecure property rights. The cost of TVEs is the lower incentives provided for managers (Che and Qian, 1998b).

Second, in transition and developing economies, capital is one of the most scarce resources, and start-up private enterprises have great difficulty obtaining it. By involving the community government as an intermediary, the governance of TVEs has several advantages in financing investment compared to private enterprises (Che and Qian, 1998a; Qian, 1999). Byre (1990) provides an analysis that the community government is able to reduce the risks borne by the banks through cross-subsidisation among its many diversified enterprises. Che and Qian (1998a) report that the community government can make use of its political connections with the state bank to channel loans to TVEs.

Finally, TVEs are more efficient than SOEs in terms of productivity growth (Jefferson and Rawski, 1994). One fundamental reason for TVEs to perform better than SOEs is the community government has relatively hard budget constraints from the fiscal and financial channels. SOEs suffer from a "soft budget constraint"[5] problem because government controls both SOEs and banks, it can order a bank to refinance projects, if it seems necessary (Kornai, 1980). In the case of TVEs, however, although the community government controls enterprises, it does not control banks. Thus the community government can only influence or bargain with a bank, but it cannot order it to provide refinancing. This separation of control over enterprises and banks may allow banks to refuse refinancing when the benefits of refinancing are small. In this way, community governments and TVEs face harder budget constraints (Dewatripont and Maskin, 1995; Che and Qian, 1998a).

[5] Anticipating relaxed financial discipline, SOE managers may then make irresponsible business decisions, which can lead to inefficiencies. This is known as the "soft budget constraint" problem (Kornai, 1980).

In sum, TVEs are better at reducing higher government predation and raising capital in an imperfect capital market than private enterprise on the one hand, and the community government causes harder budget constraints for TVEs than for SOEs on the other. However, it is noteworthy that only in the specific imperfect institutional environment that these potential benefits of involving the community government in TVE governance can be seen. That is to say, the same local government ownership becomes something phenomenal only in a particular time period under particular circumstances. This has been demonstrated by the development history of TVEs in China (Qian, 2003).

3.5.2.3 The evolution of TVEs

1) Before 1978:

The root of TVEs' organisation in China is the agricultural commune system initiated in 1958. Many small-scale industrial enterprises were set up by communes, and all of them failed shortly thereafter. These failed experiments were the first attempt at rural industrialisation in which community governments played an essential role. In the 1970s, the same organisational structure of the commune also bred the commune and brigade enterprises, the predecessor of the TVEs, which pushed for a moderate success in the second wave of rural industrialisation, operating on the fringe of the central planning (Che and Qian, 1998a; Qian, 2003).

2) 1978-1993:

In 1984, commune and brigade enterprises were renamed as TVEs and became the engine of growth and the driving force for market-oriented reform (Qian, 2003). During this period, the central government's attitude toward TVEs changed from tolerance to encouragement. It issued several internal documents that promoted TVEs in the 1980s, and released the public and national legal regulations on TVEs in 1990 (Che and Qian, 1998a). By the end of 1993, there were about 1.5 million TVEs with 52 million employees, and the shares of TVE output and employment in rural industry were 72% and 58% respectively (China Township Enterprises Statistical Yearbook, 1994). TVEs were indeed significant by both absolute and relative measures.

3) After 1994:

The new wave of reform in 1992, following Deng Xiaoping's Southern Tour (see section 3.3.2.1), encouraged private sector development. The Chinese private sector flourished as ideological barriers fell. In the changed institution environment, TVEs share of total output keeping around 35% and did not grow anymore after 1990 (see table 3.2). This fact tells a story that one should not take a static view on institutional reforms as stated in section 2.5.4.3 (Che and Qian, 1998a; Qian, 2003).

3.5.2.4 Conclusion

The success of TVEs in China demonstrates that in transition and developing economies, the ownership of firms should consider the institutional environments of both the state and market. In fact, TVE governance, the crucial feature of TVEs, is perceived as "an organisational response to imperfect institutions" in China when both the state and privately owned enterprises were experiencing difficulties with growth (Che and Qian, 1998a). Che and Qian (1998a) concluded that "although this new organisational structure differs from, and appears less efficient than, those found in mature market economies, it functions better given the institutional reality".

3.5.3 The development of the private economy

In table 3.2, it was seen that TVEs had played more important roles in rural industrialisation than private enterprises between 1978 and 1993. However, since the early 1990s, both SOEs and TVEs have been increasingly privatised and most newly established firms are private enterprises. This is because private enterprises, relative to TVEs, are more likely to develop if there are more developed product markets and a less hostile ideological environment to markets as discussed in section 3.5.2.3 (Jin and Qian, 1998). The private sector has replaced TVEs as the most dynamic growth point in the Chinese economy since 1994.

3.5.3.1 The definition of private economy

Private economy in China includes private enterprises and individual industrial or commercial households. The latter constitutes small-scale private economy, which refers to those enterprises with fewer than eight employees and the former has at least eight (Zhang, 2003).

3.5.3.2 The evolution of China's private economy

The development of private economy in China has experienced a rough road.

1) Before 1978

Under the Cultural Revolution (1966-1976), the individual industrial or commercial sector (the predecessor of private enterprises) was continuously attacked and destroyed. By 1978, the individual industrial or commercial sector was on the brink of extinction and the private economy lost its legal status (Zhang, 2003).

2) 1978-1993

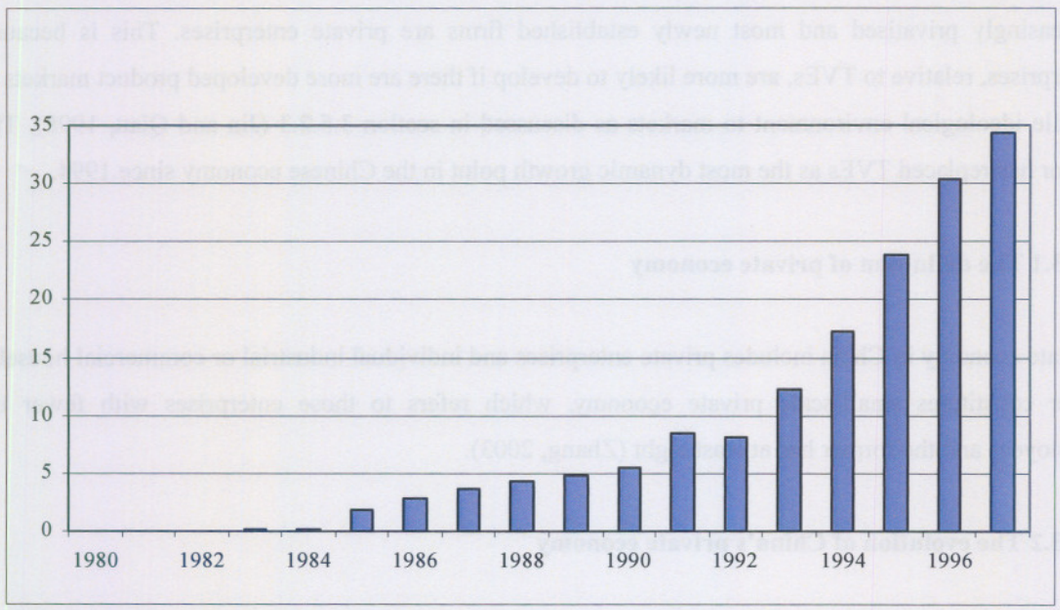
Private economy emerged after the Third Session of CCP's Eleventh Conference in 1978, the first turning point in China's reforms (see section 3.3.1). The Chinese authority explicitly required the encouragement of and support for the development of individual economy. Private economy grew rapidly after the state strengthened the administration and rectification of private economy. At the same time, relevant polices and rules were perfected. Private economy was on a stage of adjustment and consolidation (Zhang, 2003).

3) After 1993

After Deng Xiaoping's speeches in his Southern Tour (see section 3.3.2.1) and the November 1993 Decision (see section 3.3.2.2), the second turning point in China's reforms, private economy entered an era of rapid development in an openly hospitable political atmosphere. The 15th Party Congress in 1997 (see section 3.3.2.2.1) lifted the status of the private economy from "supplement" to "an important component" of the economy. The revision of the constitution in 1999 (see section 3.3.2.2.2) equated the state and non-state sectors further and improved the political environment for private entrepreneurs. The private sector has been playing an increasingly important role in China's national economy (Zhang, 2003).

3.5.3.3 Size of private economy

Figure 3.1: Share of private sector industrial output in national total, 1980-1997



Source: China Statistical Yearbook, 1982-1998; Yearbook of China Industrial and Commerce Administrative Management, 1992-1998; Yang, 1999).

Note: Before 1991, only individual industrial or commercial households are included. Starting in 1991, both individual industrial or commercial households and private firms are included.

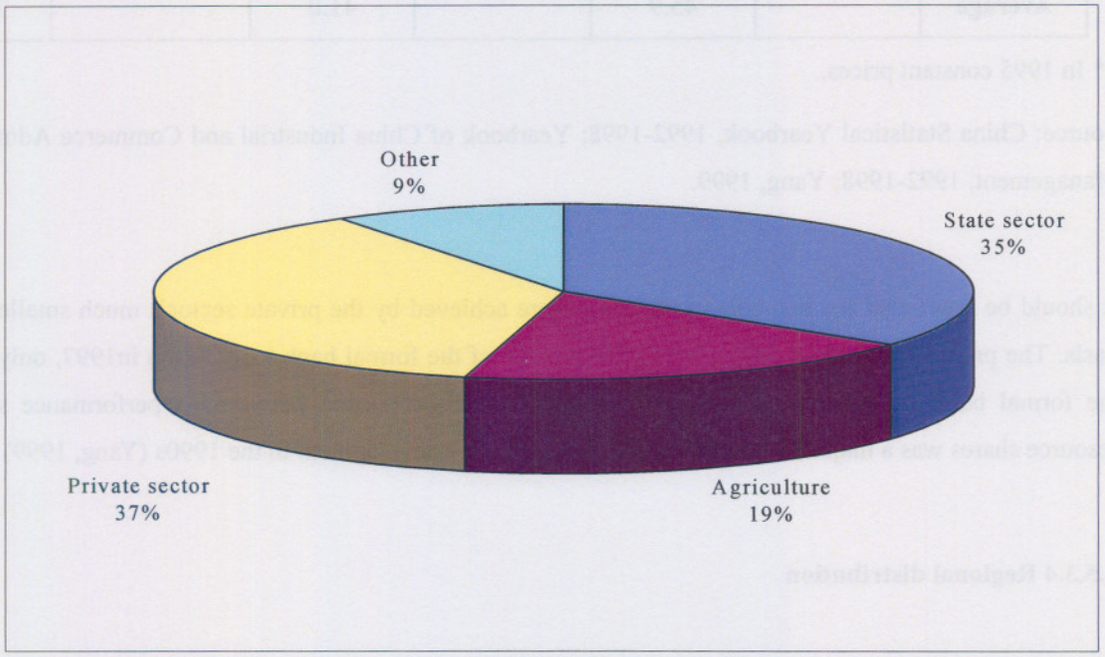
In figure 3.1, it can be seen that China's private sector industrial output had experienced an exponential growth in the 20 years between 1978 and 1998. Before 1985, the share of private sector industrial output in the national total was negligible. In 1985, it reached nearly 2%. By 1993, that figure climbed to 12.2%. In 1997, it reached 34.3%, about 3.84 trillion Yuan (Yang, 1999).

At the same time, its share of employment also grew rapidly from 2% of the national non-agricultural labour

force in 1981 to more than 18% in 1995. By 1997, its total number of workers reached 67.91 million (China Statistical Yearbook, 1982-1998; Yearbook of China Industrial and Commerce Administrative Management, 1992-1998; Yang, 1999).

In terms of GDP, the private sector's share in the national total had been increased from less than 10% in 1991 to 37% in 1998 (Yang, 1999). Figure 3.2 shows that in 1998, the size of the private sector was larger than the size of the state sector whose share of the national GDP was 35%. If agriculture—a sector that was mostly comprised of individual farmers—was regarded as private, the share of the private sector would be increased to 56% (China Statistical Yearbook, 1999; Yang, 1999).

Figure 3.2: Shares in GDP, 1998



Source: China Statistical Yearbook, 1999; Yang, 1999.

According to Yang (1999), the fast growth of the private sector in the 1990s had been brought about by fast development of private firms in that period. The growing number of private enterprises has thrust the country's private economy into the spotlight. In 1991, the output share of private firms in the private sector's total was only about 17%; in 1997, it reached 47%. In the period of 1991 to 1997 for which data are available, the annual growth rates for the number of private firms, their employment, and output were 45.9%, 41.0% and 70.9%, respectively (table 3.3) (China Statistical Yearbook, 1992-1998; Yearbook of China Industrial and Commerce Administrative Management, 1992-1998; Yang, 1999).

Table 3.3: Private firm development since 1992

	Firms		Workforce		Output*	
Year	**Number (1,000)**	**Growth (%)**	**Number (1,000)**	**Growth (%)**	**Value (billion yuan)**	**Growth (%)**
1991	107.8		1839.0		93.7	
1992	139.6	29.5	2318.4	26.1	116.0	23.8
1993	237.9	70.4	3726.3	60.7	260.1	124.2
1994	432.2	81.7	6483.4	74.0	551.7	112.1
1995	654.5	51.4	9559.7	47.4	1,005.3	82.2
1996	819.3	25.2	11711.3	22.5	1,592.3	58.4
1997	960.7	17.3	13492.6	15.2	1,983.7	24.6
Average		45.9		41.0		70.9

* In 1995 constant prices.

Source: China Statistical Yearbook, 1992-1998; Yearbook of China Industrial and Commerce Administrative Management, 1992-1998; Yang, 1999.

It should be noted that the numbers in table 3.3 were achieved by the private sector's much smaller resource basis. The private sector took only a negligible portion of the formal bank loans: even in1997, only 0.87% of the formal bank loans went to the private sector. The disproportion between its performance shares and resource shares was a major feature of China's private sector development in the 1990s (Yang, 1999).

3.5.3.4 Regional distribution

Table 3.4 provides information on the regional distribution of private firms. In this table, the provincial units are divided into three groups: coastal, central, and western zones according to the classification in table 1.1 of this study (see section 1.4.1). It can be seen clearly that in terms of both the number of firms and employment, central provinces were faster than western provinces in catching up with the coastal provinces. Table 3.4 implies the question of regional inequality in China. The major factors that cause the difference in growth among the Chinese provinces will be discussed in chapter 5 of this study. The Chinese government has already realised the serious degree of the problem and has shifted the gravity of its investment to the central and western provinces.

Table 3.4: Regional distribution of private firms (1,000)

	Coastal zone		Central zone		Western zone	
Year	**Firms**	**Workers**	**Firms**	**Workers**	**Firms**	**Workers**
1992	95.4	1754.5	24.5	453.4	19.7	380.5
1993	159.3	2351.3	44.6	768.9	34.1	600.6
1996	529.2	7232.8	178.6	2741.2	111.4	1737.4
1997	610.1	8235.5	211.1	3189.7	139.5	2067.4

Sources: Yearbook of China Industrial and Commerce Administrative Management, 1992-1998; Yang, 1999.

3.5.3.5 Conclusion

Institutional arrangements, particularly property rights, are central to incentives and hence to economic performance. Therefore, ownership reform of firms is a central issue in transition to a market economy. In the case of China, the emergence of the private sector is one of the most striking outcomes of the market-oriented reform (Qian, 2003). Several tables and figures in this section reported how large the private economy was in China between 1978 and 1998. In particular the most rapid expansion of private sector occurred in the 1990s as ideological barriers had fallen. The two turning points of Chinese reform make the policies and institutions on private sector mature. Chinese experience demonstrates that the private sector has strengthened the market-oriented reform by ending the monopoly of state firms and changing the functions of the government, which has changed the landscape of China's economy. It also shows institutions are often responses to the economic environment.

3.6 Opening up the economy and the inflows of foreign direct investment in China

In the Chinese path of reform, although a lot of non-standard institutions such as the dual-track approach and TVEs have succeeded, Chinese authority has adopted many standard policies advocated by economists. Opening up the economy has been one of the most successful examples of China's institutional changes.

Since 1949 the Chinese economy had been closed to the western countries. When the conflict with the Soviet block broke out in the early 1960s, the Chinese economy was also closed to the eastern block, and by 1978, it was one of the most closed economies in the world. China began administering policies to encourage foreign businesses to invest in China in 1979. During the past two decades, the increasing openness of its economy has been a driving force behind China's exceptional growth performance, especially to trade and foreign direct investment (FDI). Indeed, attracting FDI has been a pillar of China's institutional change to increase its openness to the world economy. This section will look into several questions posed by China's success in

attracting FDI during 1978-1998. These questions are as follows: What are the key trends and characteristics of China's FDI? How does China take its advantages in attracting FDI? What lessons can China's experience with FDI offer for other countries?

3.6.1 Key trends of FDI in China

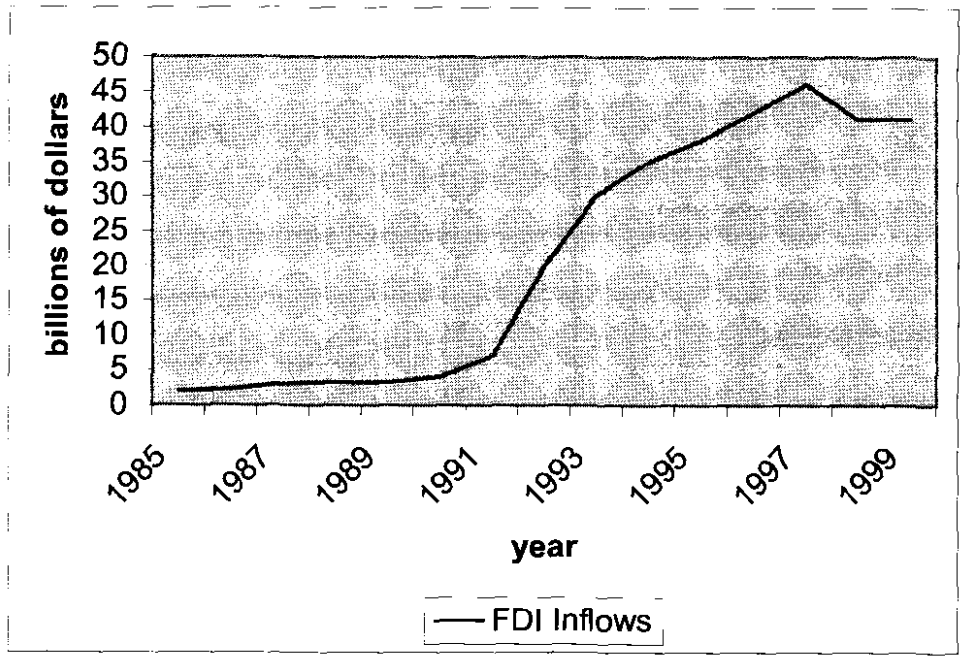
FDI inflows to China have surged from almost nil at the start of reform in the late 1970s. But large FDI inflows did not occur in the initial period because of the poor infrastructure and the lack of experience in dealing with foreign investors (Zhang, 2002). Table 3.5 and figure 3.3 show that the sharp rise in FDI in the 1990s was the most impressive characteristic of the trend in contrast with the moderate growth in the 1980s. In 1993 China seemed to reach its critical threshold of attracting FDI on a large scale. The one-year FDI flow in 1993 (US$ 26 billion) exceeded the cumulative flows (US$ 23 billion) of thirteen years (1979-1991) (China Statistical Yearbook, 2000). This was due to Deng Xiaoping's famous Southern Tour (see 3.3.2.1), where he "reaffirmed China's continued commitment to reforms and to opening the economy to the outside world" (Tseng and Zebregs, 2003). Table 3.5 also shows China's FDI position in the developing countries during 1984-1999. In the 1990s, China has become the largest recipient of FDI among developing countries and the second in the world next to the United States (Zhang, 2002; Tseng and Zebregs, 2003). By the end of 2001, the total realised FDI in China reached US$ 393.48 billion (People's Daily overseas edition, January 14, 2002; Zhang, 2002).

Table 3.5: Alternative measures of FDI inflows, 1984-1999

Measure (period averages)	1984-89	1990-99	1990-94	1995-99
Billions of dollars	2.3	28.3	16.1	40.6
% of GDP	0.7	4.4	3.7	4.7
% of total FDI flows to developing countries	12.7	24.3	27.1	25.3
Memorandum: growth in GDP (% a year)	9.7	10.1	12.2	8.3

Source: IMF, Balance of Payments Statistics Yearbook and International Financial Statistics, 1979-2000; China Statistical Yearbook, 2000; Tseng and Zebregs, 2003.

Figure 3.3: FDI inflows, 1985-1999



Source: China Statistical Yearbook, 2000; International Financial Statistics (IMF), 1979-2000.

3.6.2 Characteristics

3.6.2.1 The important sources of FDI

FDI sources in China have a unique pattern different from other countries. The majority of FDI in China did not come from industrial countries, but was received from Hong Kong special administrative region (SAR), Taiwan Province of China and the overseas Chinese (Zhang, 2000a and 2001a; b). From table 3.6, it is clear that Hong Kong SAR and Taiwan Province of China have traditionally been important sources of FDI in China, on the premise that over 90% of global FDI originates from industrial countries (United Nations Conference on Trade and Development (UNCTAD), 2000). Zhang (2001a and 2002) explained that this was the result of special links of Hong Kong SAR, Taiwan province, overseas Chinese in Asia with China in culture and history.

Table 3.6: Sources of FDI (as % of total)

Source economy	1991	1995	1999
Hong Kong SAR	55.3	53.4	41.0
Japan	13.1	8.5	7.2
Taiwan Province of China	10.1	8.4	6.5
United States	7.1	8.2	9.9
European Union	5.7	5.7	11.0
Singapore	1.2	4.9	6.2
Republic of Korea	0.0	2.8	3.0
Other	7.5	8.2	15.1

Source: China Statistical Yearbook, 1991-2000; Tseng and Zebregs, 2003.

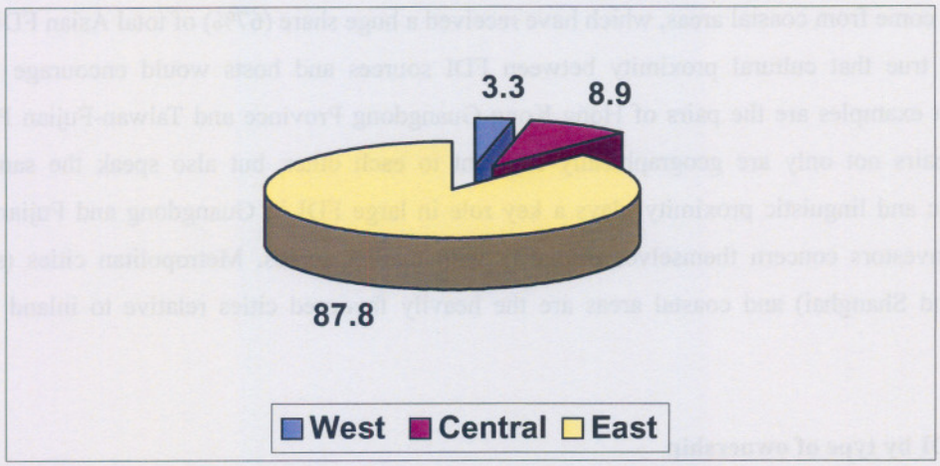
3.6.2.2 FDI inflows by sector

The predominant share of FDI from Asian developing economies raises the question about their competitive edge in the world market for investment. The competitive edge of Hong Kong SAR and Taiwan Province rests primarily on managerial and marketing advantages in making and selling light consumer goods such as textiles, garments, toys and light electronics (U.S.-China Business Council (USCBC), 1990; Zhang, 2002). Overall, their investment is small by international standards, and specialises in labour-intensive, low technology activities (Zhang, 2000a). This is why the largest share of FDI in China is destined for manufacturing. Among manufacturing industries, about half of FDI has been directed toward labour-intensive products, which tend to be undifferentiated and sold mainly on the basis of price rather than distinct design or performance characteristics (Wells, 1993). This feature of FDI in sectors also suggests that an important motivation for foreign companies has been to take advantage of China's low labour costs (Tseng and Zebregs, 2003).

3.6.2.3 FDI inflows by region

In figure 3.4, it can be seen that the geographic pattern of FDI in China showed a huge disparity among regions between 1983 and 1998. It tended to be highly concentrated in eastern (coastal) provinces and major metropolitan cities, which accounted for nearly 90% of total FDI in China during the period 1983-1998. The uneven regional distribution of FDI in China is a result of a variety of factors.

Figure 3.4: FDI inflows by region (as % of total), 1983-1998



Source: Organization for Economic Cooperation and Development (OECD), 2000.

In the recent literature, Tseng and Zebregs (2003) note that this pattern stems from the FDI policies pursued by the Chinese authorities and reflects the incremental nature of the reform process in China. As was discussed in chapter 2.5.4.1, much of China's early reforms consisted of experiments in selected regions and sectors, which allowed the authorities to assess the results of these experiments before extending them to other parts of the country. The open-door policy started with creation of the special economic zones (SEZs[6]) in the south-eastern provinces of Guangdong and Fujian at the outset of the reforms in the late 1970s, followed by the opening of another SEZ in Hainan and the designations of 14 cities in China's coastal regions as "open coastal cities" (OCCs[7]) in the 1980s. SEZs and OCCs have enjoyed "preferential policies" (see section 3.6.3.5; 4.4.2 and 5.4.2.1) which provide a more relaxed institutional environment to attract FDI. This has resulted in a concentration of FDI in the eastern part of the country. When the authorities adopted broader economic reforms and open-door policies for FDI in the 1990s, FDI started to spread to other provinces (Tseng and Zebregs, 2003).

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[6] SEZs were the first and, until 1984, the only open economic zones in China. Four SEZs were established in 1980, three (Shenzhen, Shantou, and Zhuhai) in Guangdong Province near Hong Kong SAR, and one (Xiamen) in Fujian Province, close to Taiwan Province of China. In 1988 Hainan Province became the fifth SEZ. SEZs have enjoyed considerable autonomy in their investment policies regarding both infrastructure projects (provided they can be financed locally) and investment approvals. They have offered preferential income tax treatment and exemptions from import licenses as well as tax and tariff concessions for raw materials and for intermediate and capital goods. Within SEZs, sales of locally produced goods have been free from duties and taxes, and sales of imported goods have been subject to a reduced tariff, with full tariffs and duties applying to sales outside SEZs (except exports) (Wall, Jiang and Yin, 1996).

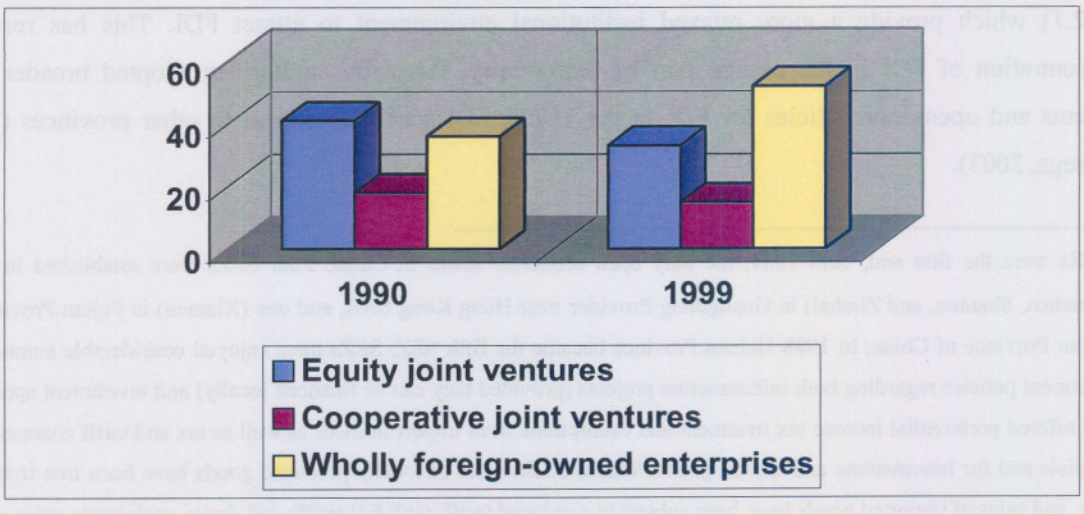
[7] In 1984, 14 cities in the coastal regions with already established industrial bases and infrastructure were designated open coastal cities (OCCs) and opened to foreign investment. Although not separate customs areas, and less independent than SEZs, OCCs have enjoyed greater flexibility in investment and tax policies than other regions in China. Several OCCs and the surrounding countries have created larger development areas, such as the Pearl River delta and the Yangtze delta (including Shanghai) (Wall, Jiang and Yin, 1996).

Zhang (2002) provides another message that the destinations of the investments from Asian developing economies reflect ethnic factors. The "Chinese connection" factor is pervasive. Most overseas Chinese originally come from coastal areas, which have received a huge share (67%) of total Asian FDI (Zhang, 2001a). It is also true that cultural proximity between FDI sources and hosts would encourage FDI flows. The significant examples are the pairs of Hong Kong-Guangdong Province and Taiwan-Fujian Province because the two pairs not only are geographically adjacent to each other, but also speak the same dialect. Such geographic and linguistic proximity plays a key role in large FDI in Guangdong and Fujian provinces. The western investors concern themselves primarily with market access. Metropolitan cities (such as Beijing, Tianjin and Shanghai) and coastal areas are the heavily favoured cities relative to inland regions (Zhang, 2002).

3.6.2.4 FDI by type of ownership

Equity joint venture companies, cooperative joint venture companies, and foreign-funded enterprises (FFEs, also called wholly foreign-owned enterprises) have been the main forms of FDI entering China. Early in the 1980s, China allowed FDI only in the form of joint ventures (except in the SEZs) for ideological reasons. It was not until 1986 that wholly foreign-owned enterprises were permitted outside the SEZs. Figure 3.5 shows the trends that FDI was increasingly directed into FFEs, which accounted for more than half of total commitments in 1999 (Tseng and Zebregs, 2003).

Figure 3.5: FDI by type of ownership arrangement
(as % of total contracted value)



Source: OECD, 2000; Tseng and Zebregs, 2003.

FFEs tend to be the most dynamic and productive firms in China's economy. Empirical research has found that domestic firms appear to benefit from FFEs more than the other two forms, through positive spillovers (Zebregs, 2003). Such spillovers come about when FFEs introduce new technologies and management skills (Tseng and Zebregs, 2003).

3.6.3 Main determinants of FDI

To understand China's success in attracting FDI requires attention to China's comparative advantages and disadvantages from the international perspective. Many economists note its obvious disadvantages relative to other host countries (Kamath, 1990; Lardy, 1994; Perkins, 1994), especially in the following aspects: i) The legal system in China is still imperfect; ii) China's currency is not convertible so that foreign investors have no insured sources of hard currency earnings; iii) Corruption in China has been severe so that foreign investors incur additional costs (Zhang, 2002). Studies of FDI in China have also shown that the determinants of FDI in China are not unique to China but have also been important in attracting FDI to other emerging market economies (Liu *et al*, 1997; Cheng and Kwan, 2000). In order to provide some lessons to other transition and developing countries, this section will focus on China's real distinctions to explain the China's FDI boom.

Two types of FDI flows should be considered before looking into the factors attracting FDI in China: domestic market-oriented flows and export-oriented flows. Domestic market-oriented FDI is motivated mostly by the size and growth rate of the host country. Export-oriented FDI mainly looks for cost competitiveness (Tseng and Zebregs, 2003). Since 1979, under the export-promotion FDI regime, many export-processing and export-assembling plants (mainly from Hong Kong SAR and Taiwan Province) have been established in China. When China began gradually to open its domestic market to the developed countries in certain sectors (for example: telecommunications, transport, banking, and insurance) since 1992, China realised that technology transfers from industrial countries might be possible only as the market-oriented FDI is allowed (Zhang, 2002).

3.6.3.1 Market

Empirical studies at both the national and provincial level have found a strong correlation between market size and FDI inflows in China (Zhang, 1999; 2000b; 2002). The enormous market potential in China has attracted FDI because the larger market size offers greater opportunities to realise economies of scale effectively (Zhang, 2000b). It appears that market size has been a more important determinant of FDI from Europe and the United States than of FDI from Hong Kong SAR and Taiwan Province of China, as the latter tends to be more export oriented. In contrast, many European and American multinationals have set up factories in China with the aim of producing for the domestic market (Tseng and Zebregs, 2003).

3.6.3.2 Abundant supply of cheap labour

The empirical evidence also confirms that low wage costs appear to have played a significant role in attracting FDI to China (Chen, 1996; Head and Ries, 1996; Liu *et al*, 1997; Cheng and Kwan, 2000). Some analysts have suggested that low wage costs have been especially important in attracting export-oriented FDI from Hong Kong SAR and Taiwan Province of China, as a response to rising wage costs in those economies. This has contributed to China's rapid emergence as an important global competitor in labour-intensive manufacturing

(Zhang, 2002).

3.6.3.3 Infrastructure and transportation

It has been recognised and tested in the empirical studies that those regions with more developed infrastructure have tended to receive more FDI (Head and Ries, 1996; Cheng and Kwan, 2000). This partly explains the concentration of FDI in the eastern (coastal) areas with their superior infrastructure and transport linking to external markets (Zhang, 2002).

3.6.3.4 Scale effects

Several studies have found a strong persistency in FDI flows (Head and Ries, 1996; Cheng and Kwan, 2000; Tseng and Zebregs, 2003). This is the case not only for total FDI flows to China, but also for FDI flows to China's provinces. This suggests that a province with a critical mass of FDI can attract more. The coastal provinces, in particular the southern provinces of Guangdong and Fujian, which are close to Hong Kong SAR and Taiwan Province of China, have been the largest recipients of FDI and have acquired an important advantage over the inland provinces in attracting FDI over the past decades (Zhang, 2002).

3.6.3.5 Preferential policies

As was discussed in section 3.6.2.3, at the beginning of the reform process the Chinese authorities confined the open-door policy to the open economic zones (OEZs[8]). That is, foreign investors in OEZs were provided with special favourable policies in taxation, land use, and foreign currency exchange to encourage FDI. As a result, these regions have received the lion's share of total FDI. The success of OEZs in China suggests that preferential policies are useful in catalysing economic development and attracting FDI (Zhang, 2000a; b). Certainly, on the other hand, by focusing on specific regions, China's preferential policies have contributed to the growing income disparity between coastal and inland provinces, which will be discussed in section 5.4.2.1 of this study.

Because of the accepted practice of experiments from OEZs, Chinese authorities have made great efforts in order to overcome certain ideological obstacles to FDI, classify the legal environment for FDI, relax governmental controls and provide practical assistance as well as political and legal assurances. The role of institutions has exerted a profound influence. By the 1990s, more and more regions and economic sectors in China have been opened to FDI. Therefore, it is widely accepted that the reduction of barriers to FDI and policies to improve the investment environment have played a key role in attracting FDI to China (Zhang, 2002; Tseng and Zebregs, 2003).

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[8] Open economic zones (OEZs) include SEZs, the open coastal cities, and various development zones (Wall, Jiang and Yin, 1996).

3.6.4 Conclusion

More and more developing countries view FDI as an engine of economic growth (UNCTAD, 1992; Zhang, 2001a and 2001b). China's experience contributes to this point. In international economy, the aim of institutional change is to realise an open economy (Wang, 2003). From heavily restrictive policies on FDI before 1978 to a wider space provided for the foreign investors in broader fields, China has become more and more integrated into the global economy. The FDI boom in China is the result of Chinese authorities carrying out a series of policies and rules on reducing barriers and proving special privileges. It is clearly seen that OEZs have played a central role in the gradual opening of the economy, which again demonstrates that partial, incremental and experimental change can produce results.

3.7 Summary

Deng Xiaoping has a widely quoted phrase to portray the process of China's transition to markets: "crossing the river by groping for stones". But how far has China progressed across the river since 1978? How tough is the transitional journey? This chapter reviewed China's economic performance, with focus placed upon the key institutional reforms, which contributed to one of the most impressive growths in the largest developing and transitional economy in the world since 1978.

The question asked is what brought about this great transition in such a socialist country that strongly rejected the market as the mechanism. The experience from the Cultural Revolution (1966-1976) brought the two sides' demands for reforms. One was the pressing poor economic reality. There was a striking contrast between China's economic failure and the outstanding economic performance of the four "Asian tigers" which provided strong evidence in favour of increasing the role of market and opening the economy. The other was the political will of the Chinese leadership who were taught an important lesson by the Cultural Revolution that economic development was the key to maintaining its power (Qian, 2000).

During the transitional period, China's reform since 1978 has evolved in two stages with the Third Plenum of the Eleventh CCP Congress held in 1978 and the November 1993 decision marking two turning points (Qian and Wu, 2003). Through examining the process of change in the mind-set of the Chinese leadership, the crucial point can be realised that China's growth depends on institutional changes. In fact, China's reform is a process of integration which involves different levels and category institutions (Wang, 2003). The process of institutional changes that take the form of incremental reform in China can provide a number of interesting and important lessons for other transition economies.

The statement of transition economy in chapter 2.5.4 shows that for any country in transition, the essential objectives are to build up the market system and reintegrate into the global economy (Charles, 1999). Therefore, Chinese institutional changes in this chapter were divided into two strands: the market-oriented reform on market liberalisation and private ownership of assets in China were discussed in the earlier sections.

The open economy was discussed in the later section. Each of them has played a crucial role in moving China away from the planning system and at the same time contributing to economic growth.

As the significant example of transitional institutions in China, the dual-track approach to market liberalisation is based on the continued enforcement of the existing plan while simultaneously liberalising the market. It is unconventional but shows in the simplest way of how a reform can simultaneously improve efficiency by market track and protect existing rents by planned track. Contrary to the high social and economic costs with a single-track approach which was adopted by Eastern Europe after 1990, the success in Chinese product and labour markets proves this approach is productive (Lau, Qian and Roland, 1997; 2000).

In the institutional view, a good market economy requires not only "getting prices right", but also "getting property rights right" (North, 1997). The transitional economy has given birth to a new diversity in organisational forms and to a plurality of property ownership types (Qian, 2003). Therefore, in China's reform period, diverse forms of business enterprises have emerged from under the shadow of the formerly dominant SOEs that follow "different rules of the game" (North, 1997).

The most significant achievement in this period is made by the fast entry and expansion of urban and rural non-state enterprises. In China, they are referred to as both private firms and TVEs outside the state plan. These firms are under harder budget constraints and have better internal incentive structures compared with SOEs (Jin and Qian, 1998). China's experience demonstrates that the economic growth impetus mainly comes from non-state sector. In the first fifteen years of reform between 1979 and 1993, the most dynamic segment in the non-state sector was town and village enterprises (TVEs) (Qian, 2003). And in the 1990s, private firms became the engine of economic growth in China (Zhang, 2003).

TVEs are local community public firms owned and controlled by the local community government (Chang and Wang, 1994; Li, 1996). The non-standard ownership form makes TVEs special and unique in China's reform, which is the response to imperfect institutional environment in China (Che and Qian, 1998a). The success of TVEs shows how existing institutions can be used and modified to serve the new purpose of development and it also demonstrates that there is no standard model of transition from plan to market, nor does there exist such a model for economic development (Li, 1996; Qian, 2003).

Private enterprises, relative to TVEs, have stronger managerial incentive and are more likely to develop in the environment of less anti-market ideology and better market development (Jin and Qian, 1998). After two turning points of China's market-oriented reform and fifteen years of transition, private sector had emerged and expanded rapidly in the 1990s, replacing TVEs as the most dynamic force in the Chinese economy.

Since 1978, the transition of the economic system and the transformation of the social structure occurring in China have been called the "reforms and opening up". Therefore, an outward economy is another central development strategy for Chinese authorities. Following more than two decades opening up, China has emerged from economic isolation and quickly established itself as a major participant in the world economy. It

has completely abandoned its traditional "import substitution" and "self sufficiency" development model of the central planning era (Shang, 1993). China has become a leading destination of FDI in the world economy. This study considered several sectors posed by China's success in attracting FDI including the key trends, characteristics and main determinants of FDI. The open FDI policies (especially the establishment of OEZs) seem to have been major factors in attracting FDI.

In conclusion, this chapter focused on an analysis of the fundamental determinants of economic growth in China through three institutional pillars including: the dual-track approach, the entry and expansion of the non-state sector and open policies.

In the next chapter, an overview of the empirical literature on the proximate determinants of economic growth in China will be discussed.

CHAPTER 4: DETERMINANTS OF NATIONAL ECONOMIC GROWTH IN CHINA

4.1 Introduction

One of the main objectives of this study is to identify the determinants of economic growth in China since 1978. In chapter 2, the study discussed the theories of economic growth in order to theoretically provide the proximate and fundamental determinants of economic growth. Proximate causes include the factors such as labour, physical capital, human capital, productivity and also the variables that influence these factors. Fundamental causes include the factors such as domestic policies, institutions and institutional changes (An encyclopedia of macroeconomics: 191-192; 197-198).

Based on the existing empirical studies and impressive economic performance due to the main institutional reforms, chapter 3 focused on the fundamental determinants and emphasised that institutional changes were the keys to the extraordinary economic growth of China.

The purpose of this chapter is to provide an overview of the empirical literature on the proximate determinants of economic growth in China. This chapter is structured as follows: in section 4.2, the proximate determinants of Chinese national growth within cross-sectional regression models are discussed. Section 4.3 will identify the major sources of economic growth within growth accounting to decompose Chinese output growth. The chapter concludes with a summary in section 4.4.

4.2 Cross-country regression models of growth

4.2.1 The framework

Some countries grow quickly; some countries grow slowly. Academics and policymakers have long been puzzled by the coexistence of uneven, erratic growth trajectories of some less developed countries and the rapid, sustained growth paths of others. This discrepancy in economic growth among various countries has become a research arena for scholars. Numerous studies have attempted to identify the determinants of economic growth. Following the theoretical framework of chapter 2, an overview of empirical studies that use a specific methodology, namely cross-country regressions, in order to explain the proximate determinants of economic growth in China after 1978 will be discussed in this section.

A framework for determining growth is succinctly provided by the work of Barro (1997), based on the neoclassical growth theory (see chapter 2.3). In this model,

$$\Delta y = f(y, y^*) \tag{4.1}$$

Here, Δy is the growth rate of output per capita, y is the current level of output per capita, and y^* is the long-run steady-state level of output per capita. y^* in its turn depends on an array of choice and environmental variables. The private sector's choices include saving and investment rates, labour supply and fertility rates and demand for education and health services. The government's choices involve spending in various categories (non productive consumption, spending on education and spending on health), tax rates, the extent of distortions of markets and business decisions (for example openness to trade), maintenance of the rule of law and property rights (social capital). For the environmental variables, the terms of trade will also prove to be an important determinant of the long-run steady-state in developing countries. Other geographical environmental variables that are important are easy access to international markets, climatic conditions and natural resource endowments (Campenhout, 2002).

In the neoclassical framework, as was shown in section 2.3.2, the initial per capita income (y) will have a negative effect on the growth rate (Δy), which is the convergence principle driven by diminishing returns to capital. On the other hand, the long-run steady-state level of output per capita (y^*) will have a positive effect on the per capita growth rate. If one of the determinants of y^* changes, inducing a change in y^*, this will translate into a transitional change in the growth rate of an economy (Campenhout, 2002).

4.2.2 Proximate determinants of China's economic growth

China's economic reform was initiated in 1978. Since then, the Chinese economy has achieved an average annual growth rate of more than 9% (Hu and Khan, 1997). This growth is unprecedented in world history. China's status as the largest developing economy in the world and her outstanding economic performance over the past few decades has been the focus of many economic studies. In view of the uniqueness of China's surprising economic performance (see chapter 3), it is of interest to explore the proximate determinants of economic growth in China, particularly in the post-reform period. Based on the findings in cross-country growth literature on China, the following economic variables are widely identified as important stimulants to China's growth: i) initial GDP; ii) investment; iii) population growth; iv) human capital and v) openness to trade. In this section, it will be explained how each determinant influences the economic growth and how China has done on each determinant.

4.2.2.1 Initial GDP

As already stated (see section 4.2.1), the convergence property (including absolute and conditional convergence; see sections 2.3.2 and 5.5.1) is one of the key predictions in the neoclassical model. Numerous empirical findings support the property (Barro, 1991). The main reason for this phenomenon in the neoclassical growth model is diminishing returns to reproducible capital. The initial level of GDP per capita reflects endowments of physical capital and natural resources (and also depends on effort and the unobservable level of technology) (Barro, 1997). Poor countries tend to have low ratios of capital to labour, and consequently have high marginal products of capital. Therefore, they tend to grow at relatively high rates (see section 5.5.1; Chen and Feng, 1999).

In the case of China, many statistical results are consistent with the theoretical expectations (Chen and Feng, 1999; Anuradha and Husain, 2002). In the study of Li, Liu, and Rebelo (1998), the conditional convergence hypothesis (see section 5.5.1) is supported and the convergence rate is estimated to be a relatively high 4.75% a year. It is amazing that at the beginning of 1978, the average Chinese citizen only made US$120 per year; by 1980, only two yeas later, this average had quickly grown to US$167. Then at an 8.2% growth rate, the average GDP per capita grew from US$167 in 1980 through US$768 in 1999 to US$963 in 2002 (China Statistical Yearbook, 1999; IMF World Competitiveness Yearbook, 2003).

Though it is true that China has developed very fast in these years, it is also the case that China is still a relatively poor country and is likely to be able to continue catching up for many years to come. As the neoclassical theory suggests, countries such as China that are relatively less developed and distant from the technological frontier in the industrial countries have a capacity for rapid growth if they mobilise and allocate physical and human capital effectively, adapt foreign technology to their factor proportions, and make good use of the opportunities for specialisation that come from closer integration with the global economy.

4.2.2.2 Investment

In the neoclassical growth model for a closed economy, the savings rate is exogenous and equal to the investment ratio to output (see section 2.3.1). A higher investment rate raises the steady-state level of output (y^*) per effective worker and therefore the growth rate for a given starting level of GDP (y) (Campenhout, 2002). There has been some empirical evidence of a positive effect of investment on growth (Delong and Summers, 1991; Mankiw, Romer and Weil, 1992; Barro, 1997).

As shown in table 4.1, in the two decades between 1978 and 1998, China, like many other developing countries, had consistently allocated a large share of GDP to investment. In 1994, investment/GDP ratio reached an extraordinary 43% (Wang and Yao, 2001). However, as Yeh (2001) states, China's case is distinctive in two respects: firstly, China sustains a high investment rate despite its low per capita income. In terms of per capita GDP in 1998, China ranked 129 in the world, way below all the other Asian countries listed in the table 4.1 (except India in 1998). Yet, its investment rate was higher than all others' (except Singapore's in 1980). Second, China's investment rate had been quite stable over time, in a period when its economic system underwent drastic changes, and when its neighbouring countries were hit by a severe and contagious financial crisis. The average share of investment in GDP during 1978-1998 was 36.8% (World Bank, 1999; Yeh, 2001).

Table 4.1: The rate of investment/GDP in selected countries, 1980 and 1998

	Rank: per capital/GDP	1980 (%)	1998 (%)
China	129	35	39
Low-income countries	—	28	30
Singapore	5	46	37
Hong Kong	18	35	30
South Korea	55	32	35
Mexico	71	27	26
Malaysia	79	30	32
Thailand	91	29	35
India	163	20	23

Source: World Bank, 1999; Yeh, 2001.

4.2.2.3 Population growth

There are two reasons why population growth may influence economic growth in a negative way. First, population growth reduces the long-term steady-state level of GDP per capita (y^*), because a portion of the economy's investment gets used to provide these new persons with capital, rather than raise capital per worker. The second reason is that childcare draws away time that cannot be used for production (Brendan, 2002; Campenhout, 2002).

This negative relationship between population and economic variables has been well documented by Malthus (1798) and Becker (1999). In the empirical studies, population growth usually gets proxied by the total fertility rate. Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with prevailing age-specific fertility rates (Campenhout, 2002). High fertility often indicates the opportunity cost of economic growth and a reduction in the fertility rate can enhance economic growth (Barro, 1997).

The empirical findings on China also provide support for this view. China's experience shows the One-Child Policy is essential to sustain and raise GDP per capita growth in the most populous country in the world. The deceleration in the population growth rate is the Chinese government's goal with implementing the One-Child Policy. After this Policy was adopted at the beginning of 1970s, the fertility went from 5.7 children for every woman in 1970 to 2.5 children in 1980. The population growth rate has steadily decreased from 2.7% in 1970 to 1.333% in 1979, and to 0.914% in 1999 (Brendan, 2002).

The One-Child Policy has benefited China economically for more than 20 years. It has succeeded in increasing

the GDP per capita by increasing the adult to child ratio, which was 1.4 adults for every child in 1970, and levelled off at 2.6 adults per child in 1999 and will probably decrease substantially in the future. This allows families to spend more on human and physical capital. Although curtailing population growth brings capital accumulation, this increase in wealth is accompanied by the increases in transport, education, and health in China (Feng, *et al*, 2000; Brendan, 2002).

4.2.2.4 Human capital

Human capital plays a critical role in endogenous growth model, which holds that knowledge-driven growth can lead to a constant, or even increasing, rate of return (see section 2.4). In Romer (1990), human capital is the major input to research and development that innovate technologies. Mankiw (2001) also asserts that in general, "investment in human capital is at least as important as investment in physical capital for a country's long-run economic success". Therefore, countries with larger initial human capital stock are more likely to have new products and grow faster than other countries (Chen and Feng, 1999). It is commonplace to assign human capital an important role in economic growth.

The extent of human capital is often measured through education. Empirical evidence has revealed a positive relationship between education and growth (Barro, 1991; Levine and Renelt, 1992). Barro and Sala-i-Martin (1999) report significant effects of schooling on economic growth, and they note that the proportion of population with secondary and higher education is the significant correlation with growth rates. Kreuger and Lindahl (2001), in their analysis on the effect of schooling on growth, find that evidence supports a positive effect of initial level of education on growth among low-productivity countries. Therefore, in theoretical analyses and empirical evidence, education, particularly higher education, has an important role in determining productivity and its growth.

In the case of China, a number of papers also report evidence of such a significant positive relationship using aggregate data at the national and provincial level. According to the World Bank (1997), education alone contributed 29% of Chinese GDP growth in 1978-1995. Démurger *et al* (2001) uses a panel of 24 provinces (excluding municipalities) over the period 1984-1998 to estimate a positive, significant, and robust relationship between the proportion of population with secondary- or higher education and per capita growth. Chen and Feng (1999) estimate a cross-sectional growth equation for 29 Chinese provinces covering the period 1978-1989. They also find that the higher-education enrolment rate has a statistically significant and substantial relationship to provincial economic growth rates.

As one of the priorities of China's economic and social development, education is a matter of great concern to the government. The decisive guiding principle that "education should be geared to the needs of modernisation, of the world and of the future" (Message written for Jingshan School by Deng Xiaoping on October 1, 1983) has promoted the accelerated development of China's educational undertakings. China has attained considerable achievements attracting worldwide attention in education.

From 1978 to 1999, investment in education contributed somewhat more than 10% to overall per capita growth in China (Wang and Yao, 2001). By the end of 1998, 91% of the country had instituted compulsory primary education; with nearly 99% of school-age children were enrolled in schools. In the higher education sector, there were 1,022 universities and colleges in China in 1998, with 3.41 million students; 736 graduate training units, with 199,000 students and 962 adult higher-learning institutions, with 2.82 million students (China Statistical Yearbook, 1999).

4.2.2.5 Openness to trade

The neoclassical growth model assumes that technical change is exogenous (see section 2.3), and is not affected by a country's trade policy (Solow, 1957). The importance of international trade to economic performance has been strongly emphasised in endogenous growth theory. Endogenous growth theory views commercially oriented innovation efforts that respond to economic incentives as a major engine of technological progress and productivity growth (Romer, 1990; Grossman and Helpman, 1991).

Specifically, the literature on the relationship between openness and economic performance mainly focuses on the impact of trade orientation on productivity. There are a variety of reasons why openness to trade might affect productivity. Openness to trade is thought to encourage greater efficiency in the allocation of the economy's scarce resources. It also promotes competition, thereby reducing possible monopolies and increasing quality and customer care. It may also encourage the importation of technological innovations and improvements to raise total factor productivity in the entire economy. Openness to trade can also encourage international factor mobility, especially in the form of financial and physical capital. (Wei, *et al*, 2001; Campenhout, 2002).

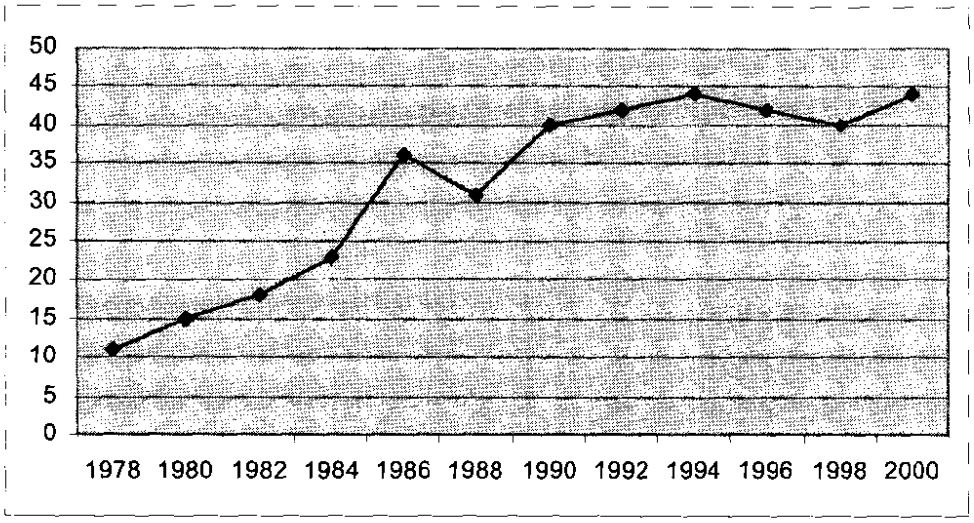
In 1978, China started its economic reform and opening to the outside world from one of the most closed economies. The open-door policy started with creation of the special economic zones (SEZs) (see section 3.6). In 1992, China decided to develop a full market-oriented economy with more openness to the world (see section 3.3). Since then, China has experienced a number of incremental policy moves and export-led industrialisation has helped turn China into a major economic power (see section 3.6).

Many papers use the trade/GDP ratio as the measure for openness to trade (Rose, 2002; Calvo, Izquierdo and Mejia, 2003). Rose (2002) offers empirical evidence that a country with a high trade/GDP ratio is correlated with low default probabilities. Figure 4.1 shows the growth of the trade/GDP ratio in China from 1978 to 2002. That ratio in China was around 40% since 1991. With the combined effects of robust economic growth and a transition toward more foreign trade, China's exports to the rest of the world have boomed. In fact, from 1996 to 2002, China's share of world merchandise exports increased by 81%, which was more than the 60% increase in its share of U.S. goods imports (Liu, Wei and Liu, 2001).

Openness to trade reduces tariffs and non-tariff barriers. The remarkably liberal trade policy is one of the main

features in China's institutional changes. In 1992, average statutory tariff on manufactures was 46.5%. By the end of 1997, China had competitively lowered its average tariff to 20.1% (Alamgir, 1999). After accession to the World Trade Organisation (WTO), this will be down to 6.9%. For primary products, the decline was from 22.3% to 3.6%. China also reduced the coverage of non-tariff barriers from 32.5% of imports to 21.6% between 1996 and 2001 (Liu, Wei and Liu, 2001). This liberalisation further increases the competitiveness of China's exports, because a tax on imports is also a tax on exports.

Figure 4.1: Growth of trade (% of GDP) in China



Source: China Statistical Yearbook, various issues.

In the existing empirical studies, FDI is explicitly included as an important measure of openness to explain economic growth (Liu, Wei and Liu, 2001). During the reform era, China also experienced a higher degree of openness in terms of FDI inflows (see section 3.6). The existence of a positive link between FDI and GDP growth in host countries has been widely documented in the literature (De Mello, 1997). Such a link has also been established in the case of China (Wei, 1994; Mody and Wang, 1997; Zhang, 1999; Démurger, 2000). High rates of GDP growth have been associated with large inflows of FDI to China, especially during the 1990s. FDI has been the driving force of China's economic growth (Zhang, 1999).

The direct contribution of FDI through the formation of capital leads to the augmentation of the total capital stock. The indirect contribution is the impact of FDI on total factor productivity (TFP) through the introduction of new technologies, managerial know-how, and other efficiency gains (see section 4.3.2.3). The empirical research of Zebregs (2003) indicates that FDI is a significant contributor to GDP and productivity growth in China. In his study, the contribution of FDI to annual GDP growth through capital deepening was on average 0.4% a year in the 1990s, and the contribution to long-run TFP growth was on average 2.5% a year over the same period. Hence the total contribution of FDI to GDP growth during the 1990s was estimated at about 3% a year (Zebregs, 2003).

In summary, the higher degree of openness to the outside world facilitates China's increasing its pace to catch up with the world best practice. China benefits from its policy of openness. Certainly, the accession of China into the WTO is conducive to making the economy more open and so to improving the quality of the growth (Liu, Wei and Liu, 2001).

4.3 Sources of GDP growth in China

This section will examine how China's economy has grown so fast since 1978. First the study will introduce the basic of growth accounting, a simple method used to decompose growth rates.

4.3.1 Growth accounting

Growth accounting essentially divides output growth into a component that can be explained by input growth, and a 'residual' that captures changes in productivity. The Cobb-Douglas form of the production function is:

$$Y_t=A_tK_t^{\alpha}L_t^{1-\alpha} \tag{4.2}$$

Where Y_t is real GDP, A_t is total factor productivity, K_t is the real capital stock, L_t is the amount of labour force, t is a time subscript and α is a parameter with a value between 1 and 0. If output changes, it can only be because the economy's capital stock, its labour force, or its level of total factor productivity changes (Sarel, 2002).

This production function is often used to approximate the production possibilities of the economy. The reason is that it has many properties that tend to be observed in national economies, such as constant returns to scale and constant factor income shares (Sarel, 2002).

If equation (4.2) is divided by the population size, the following is found:

$$y_t= A_t k_t^{\alpha} l_t^{1-\alpha} \tag{4.3}$$

Where y is the output per person, k is the capital per person and l represents labour per person (or the labour participation rate) (Sarel, 2002).

Equation (4.3) is a static equation. It represents the amount of output, as a function of inputs, in any specific period t. From it, a dynamic version that describes how output per person increases over time can be derived:

$$\Delta y/y = \Delta A/A + \alpha \cdot \Delta k/k + (1-\alpha) \cdot \Delta l/l \tag{4.4}$$

Equation (4.4) decomposes the growth rate of output per person into three elements: the first element describes the growth rate of productivity (also called the growth of TFP, the rate of technological progress, or the Solow residual); the second element describes the contribution of the capital stock per person growth rate; and the third element describes the contribution of the labour participation rate (Sarel, 2002).

The decomposition done in equation (4.4) has a very important empirical application. It provides a good idea of the magnitude of the parameter α. It is easy to measure the growth rate of output per person, and it is possible, in principle, to measure the capital per person and the labour participation rates. Therefore, the growth rate of technology (or productivity) can be estimated, and the proportion of output growth per person attributable to this technological progress calculated (Sarel, 2002).

The growth decomposition in equation (4.4) also leads to an interpretation that plays a fundamental role in understanding long-run growth. It points out that a significant and sustained rate of technological progress is the only possible way for an economy to achieve a sustained rate of growth of output per person in the long run. The intuition for this result is that the labour participation rate can only increase for a while, but obviously cannot increase without bounds in the long run. Furthermore, higher growth in capital than in labour will lead to diminishing returns to capital with output growth falling over time, even if capital growth is maintained. Therefore, in order to achieve permanent growth, an economy must continuously improve its technology. This kind of growth is called "intensive growth". In contrast to intensive growth, increasing output by increasing inputs ("extensive growth") can work only for a limited period and it cannot last too long (Sarel, 2002).

4.3.2 Contributions to GDP growth

In growth accounting the question is always asked as to how much of that growth is attributable to increased factor inputs, capital and labour, and how much is accounted for by increased TFP. This study summarises the results from growth accounting exercises of the Chinese economy during the pre-reform period and the reform period in table 4.2. The growth records identify the major sources that generate the extraordinary and almost uninterrupted growth of two decades (1978-1998) in China.

From table 4.2, several interesting features are identifiable. First, during the pre-reform period and the reform period, China's economic growth depended heavily on the growth of capital. Second, in the reform period since 1978, China's growth of TFP was much more significant than that of the pre-reform period. Third, by contrast, the contribution of labour growth was relatively small, especially in the reform period. To better understand the growth process in China, the causes of growth of capital, labour, and productivity need be looked further into (Yeh, 2001).

Table 4.2: Sources of economic growth

Source	Period	GDP growth rate	% contributions from		
			Capital	Labour	TFP
Hu and Khan, 1997	1952-1978	6.0	65.2	16.9	18.0
	1979-1994	9.5	45.6	12.8	41.6
Li, 1998	1978-1995	9.4	46.8	13.3	39.8
Ezaki and Sun, 1999	1981-1985	10.8	44	16	40
	1986-1990	7.9	72	17	11
	1991-1995	12.0	41	8	51
Shen, 1999	1953-1978	6.1	73.8	23.7	2.5
	1979-1990	9.0	44.4	19.4	37.2
	1991-1997	11.2	46.4	10.3	43.3
Wang and Yao, 2001	1953-1977	6.46	56.8	49.1	-5.9
	1978-1999	9.72	48.3	27.8	23.9

4.3.2.1 Capital formation

The neoclassical model suggests that capital growth depends mainly on investment. As shown in section 4.2.2.2, a high and stable investment is one of the most striking features of the Chinese economy during the reform period 1978-1998. Two sources of savings had been particularly important in sustaining such an investment: a rising volume of foreign capital inflows and a high household saving rate (Zhen, 1999; Yeh, 2001).

Table 4.3: Capital inflow, 1985-1998 (billions US$)

	1985	1990	1998
Total	4.6	10.3	58.6
Loans	2.7	6.5	11.0
FDI	1.7	3.5	45.4
Others	0.3	0.3	2.1

Source: Zhen, 1999.

In section 3.6, the FDI boom in China was discussed. China's large domestic market, low wage costs, and improved infrastructure, complemented by open FDI policies (especially the establishment of OEZs), seemed to have been major factors in attracting FDI. In section 4.2.2.5 of this chapter, the direct impact of FDI on the formation of capital in China was provided by the empirical findings. It is noteworthy here that FDI has already been the most important source of total capital inflows in China. By 1998, it constituted almost 77% of total capital inflows (see table 4.3). Compared with foreign loans, FDI is less volatile in times of financial crises (Zhen, 1999).

As was shown in section 4.2.2.1, the figures on the different average income per capita in different years (in 1978, 1980, 1999 and 2002) reported the sharp rise in Chinese citizens' income since 1978. This rise greatly enhances the households' capacity to save. At the same time, by tradition, the Chinese people are rather frugal and, of necessity, it is quite natural for households to save more for precautionary purposes when uncertainties abound with the economy in transition. Therefore, the above factors contribute to the household saving rate becoming another important source of capital stock in China (Zhen, 1999). In the period 1978-1995, household savings accounted for from only 5% to 41% of total domestic savings and domestic savings rose from 122 billion in 1978 to 2449 billion Yuan in 1995 (People's Bank, 1994; World Bank, 1995; 1997; Yeh, 2001).

4.3.2.2 Labour growth

Table 4.2 shows that the contribution of the growth of labour input to GDP growth in China is relatively modest in almost all the growth accounting results, but it is non-negligible. The Solow model assumes that the labour force and the population at large grow at the same rate (see section 2.3.1). Section 4.2.2.3 gave the message that the Chinese population growth was brought down to near replacement levels due to a demographic transition brought about by the One-Child Policy since the 1970s. This was why the size of the Chinese labour force had not grown at a high rate during this period. However, China is still the most populous country in the world. The indirect contribution of the large labour supply to GDP growth has been substantial, which has kept wages low and thereby maintained China's comparative advantage in international markets (Yeh, 2001).

4.3.2.3 TFP growth

All of the authors in table 4.2 consider that a sharp, sustained increase in TFP has been the driving force behind the economic boom in China since 1978. The analyses of the pre- and post-1978 periods by these economists indicate that the market-oriented reforms in China are critical in creating this productivity boom. Productivity gains come from three sources in China in the broad definition: resource reallocation, improvements in the quality of inputs, and technological changes narrowly defined by economists (Yeh, 2001).

The literature concludes that three major sources contribute to increases in allocative efficiency:

i) The first source is the structural shifts in resource use from low productivity to high productivity sectors.

The most notable shift is that of labour from traditional agriculture to industry and services (higher-value-added manufacturing). Between 1978 and 1998, employment in agriculture dropped from 70% to 50% of total employment, while that in the non-agricultural sector rose correspondingly. The rapid growth of TVEs, which was discussed in section 3.5.2, is the result of such a structural change (Hu and Khan, 1997; Yeh, 2001).

ii) A second important source is the economies of scale resulting from the opening of the economy to internal and external markets (see section 3.6; Fan, Zhang and Robinson, 1999; Yeh, 2001). How productivity benefits from openness to trade has already been discussed in section 4.2.2.5 of this study.

iii) A third type of allocative efficiency originates from the strong incentives and managerial skills to use resources efficiently at the enterprise level (Yeh, 2001). The post-1978 reforms grant greater autonomy to enterprise managers. A case in point is the dramatic increase in agricultural output per worker after China introduced the household responsibility system[9] and dual-track approach in agricultural reform (see section 3.4.2.1). The state in effect assigned to the farm households the rights to allocate their resources freely, which greatly motivated the peasants to increase output. The reforms also gave greater room for the development of non-state firms that operated far more efficiently than the SOEs (see section 3.5; Fan, Zhang and Robinson, 1999; Yeh, 2001).

The empirical research has attempted to quantify the significance of the productivity gained from reallocating resources in China. World Bank (1996) attributed 11% of GDP growth in 1985-1994 to reallocation of employment, and 2% to ownership change. Sachs and Woo (1996) estimated the contribution of reallocation of labour from agriculture at 13% of GDP growth in 1979-1993. Fan et al (1999) found 17% of aggregate growth in China in 1978-1995 was due to structural change. According to Lin (1992), the reintroduction of household farming accounted for nearly half of the growth of agricultural output in 1978-1984.

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[9] The most important change in the profit sharing system in China was the replacement of collective farming with a household-based system in rural reform, now known as the Household Responsibility System (HRS). Under this system, farm households constitute the basic production units instead of production teams in the commune system and local collectives allocate farmers long-term use rights to agricultural land for up to 30years. In return for the allocation, farmers are obligated to deliver a grain quota that is bought by state grain bureaus at prices determined by the government. China began to phase in the HRS in the early 1980s, after the decision to allow greater autonomy to farm households was made by the Third Plenary Session of the 11th Communist Party Conference of China's Central Committee in 1978. The policy, which was designed to increase the incentives for households to raise output and therefore, income by linking farm returns directly to production, provided opportunities for farm households to make their own economic decisions, including allocating production inputs and retaining surplus output after filling government quotas or targets. With implementation of the HRS, household farming was motivated by profit. The new system boosted production incentives and encouraged farmers to cut costs, take risks, and enter new lines of production. Since the rural economy, the value of agriculture output has grown steadily and the rural economy has become more diversified (Lin, 1992).

Apart from resource reallocation, there is the second major source of productivity growth: improvements in the quality of capital and labour (Yeh, 2001). The quality of capital inputs has improved in China through the large volumes of new equipment being put in place after 1978 (Sun, 1984; Li, 1998). As Nelson's (1964) conclusion states, new technologies are generally embodied in new capital equipment: Therefore, the younger the average age of the capital stock, the more new technologies that have been introduced.

Improvement in the quality of the labour force is even more marked, as evidenced by the change in the educational level of the workforce that is shown in table 4.4 (Yeh, 2001). From this table, it is seen that in the post-reform period, the proportion of illiterate workers has reduced sharply and the proportions of those with high school and college education have increased discernibly. A higher educational attainment indicates higher quality of workers (Wang and Yao, 2001). Section 4.2.2.4 of this study supported empirically that China's improved education led to accelerated economic development.

Table 4.4: Composition of the workforce by educational level (as %), 1982 and 1997

	1982	**1997**
Total workers	100.0	100.0
College and above	0.9	3.5
Senior high school	10.5	12.1
Junior high school	26.0	37.9
Primary school	34.4	34.8
Illiterate or semi-illiterate	28.2	11.6

Source: China Statistical Yearbook, 1986; 1998.

Another source of TFP growth is technological change (Yeh, 2001). Since 1978, the Chinese authorities have made a lot of efforts to promote technological advances. For example, only expenditures on R&D increased from 4.6 to 52.6 billion Yuan in the period 1978-1998 (China Statistical Yearbook, 1989; 1999; Yeh, 2001). Considerable technological diffusion must have taken place, too, as suggested by the rise in the volume of transactions in technology markets, from 0.05 billion Yuan in 1983 to 43 billion Yuan in 1998 (State Science and Technology Commission, 1987; China Statistical Yearbook, 1999; Yeh, 2001).

In conclusion, in the last few decades, China has generated rapid economic growth primarily by sustained increases in productivity growth through reallocating resources, integrating with the world economy, and accumulating human capital.

4.4 Summary

China has been noted for the extraordinary, almost uninterrupted growth since 1978. Numerous studies have attempted to identify the determinants of Chinese economic growth. Some economists attribute China's economic success to the institutional changes, which were discussed as fundamental determinants in chapter 3 of this study. Other researchers focus on the economic performance of the proximate determinants of economic growth in China. The purpose of this chapter is to provide an overview of the empirical literature on the latter. The literature has three strands:

i) The first strand deals with the determinants of Chinese growth within cross-country regression models.

ii) The second strand deals with the growth of China over time, using growth accounting and decomposing Chinese economic growth to estimate TFP growth.

iii) The third strand deals with the provincial/regional growth rates in China, which is based on the observation that different provinces of China experienced different growth rates over time.

This chapter discussed the first and second strands. The third strand will be the topic of the next chapter. Based on the findings in cross-country growth literature on China, the rapid national economic growth after 1978 is determined by the economic variables such as investment, population growth, human capital and openness to trade. Most of the studies confirm that the conditional convergence is a valid representation of reality in China during the post-reform period. That is to say, China has enjoyed a higher transitional growth rate over the last few decades. Some important policy implications for China's economic growth can be inferred from these general findings.

First, investment can play an important role in improving a less-developed country's economic growth. The central government needs to provide a more stable macroeconomic environment conductive to attract more FDI and funds should be used in the ways that achieve maximum growth.

Second, a reduction in population growth can enhance economic growth. Through examining the pattern of demographic transitions in China, it is shown that government can promote long-term development through implementing a population policy that favours economic growth (Brendan, 2002).

Third, human capital is crucial for a less-developed country to achieve high economic growth. To build human capital, efforts need to be directed at education, especially secondary education, in the next decades in China. This is not only because growth regressions point out to the importance of secondary education to growth but also because, though gross enrolment rates rise progressively, both enrolment rates and growth at higher education institutions remain low in China, relative to those of other Asian countries (Wang and Yao, 2001).

The results of cross-country growth literature also indicate that openness can be conductive to a country's

growth and development. The higher degree of openness to the outside world may facilitate a relatively poor country to increase its pace to catch up with world best practice. To promote openness, in particular, the government should create more favourable conditions for inward FDI growth. In the future, China will benefit from the accession to the WTO in attracting FDI.

Growth accounting is another methodology used to determine the proximate determinants of economic growth. It sheds light on the contribution of factor accumulation and the growth of TFP to economic growth. The records from growth accounting exercises of the Chinese economy show the extent to which economic growth in China is produced by changes in investment (capital), labour force size and TFP respectively. Capital formation and TFP growth are found to play important roles in explaining the rapid economic growth of China since 1978.

A high household saving rate and a rising volume of foreign capital inflows are two sources of savings that sustain a high and stable investment in China. Besides the high growth rate of capital, China has generated rapid economic growth primarily by sustained increases in productivity growth through reallocating resources, integrating with the world economy, and accumulating human capital (Yeh, 2001).

Accounting for the sources of Chinese economic growth is particularly important as the country searches for the engine of future economic growth. The results of growth accounting give some ideas for future economic growth in China.

First, because of the rapid expansion of the capital base in China, the relative importance of factor accumulation may be declining (the law of diminishing returns). So, in the long run, the potential to further increase factor inputs is limited and contributions by all factor inputs will decline. TFP growth is becoming, or will become, the driving force for China's growth performance (Wang and Yao, 2001; Yeh, 2001).

Second, past TFP growth focused on catching up with technologies obtained by imitation. The next stage of economic reforms in China will relate to building an innovation-oriented economy. Many of the "easy" reforms were implemented and past TFP growth was attributable to efficiency gains from initial market-oriented reforms and initial integration with the global economy. At present, China's innovation capability is rather poor. If China is to sustain its growth and welfare improvement in the future, the continuing reforms may be more painful (Wang and Yao, 2001; Yeh, 2001).

Third, investing in human capital has immense potential for contributing to productivity growth and welfare. There is no doubt that China will continue to accumulate human capital through education and vocational training in order to bring substantial productivity gains (Wang and Yao, 2001).

However, it should be noted that China's economy has been growing fast since its reform and opening up to the outside world in 1978, but not every Chinese benefits equally from their country's remarkable economic

performance. The disparity between coastal cities and interior areas has become more and more obvious. In recent years, the academic interests in China shift from the national economic growth miracle to regional inequalities. In the next chapter, this study will devote its attention to the origin and causes of inequalities across Chinese regions.

CHAPTER 5: DETERMINANTS OF PROVINCIAL ECONOMIC GROWTH RATES IN CHINA

5.1 Introduction

In the previous chapters, the determinants of China's economic growth since 1978 were discussed. Although national economic growth rates have been impressive since 1978, it is also true that the pace of reform and economic growth has been uneven across provinces. In this chapter, the aim is to identify and test the determinants of provincial economic growth rates in China.

Section 5.2 will show that economic performance has varied widely across China's 31 provinces and regions. Section 5.3 describes the theory of geographical economics. Section 5.4 provides an overview of the empirical literature on regional disparity in China. Section 5.5 contains the results from the empirical study of the determinants of provincial economic growth rates in China, using the panel data regressions. The chapter concludes with a summary in section 5.6.

5.2 Overview of spatial development in China

With more than two decades of reforms, incomes per capita have grown in all Chinese provinces in absolute terms, and both initially rich and initially poor provinces have experienced a significant increase in living standards. However, the extent of improvement in living standards has differed substantially from province to province.

Figure and table 5.1 shows the general background and the data of the economic development of 22 provinces (excluding Taiwan Province), 5 autonomous regions and 4 municipalities (provincial level cities) between 1994 and 2003. It can be seen that economic performance has varied widely across China's regions.

Figure and table 5.1: The locations and economic data of 31 regions in China 1994-2003

Province

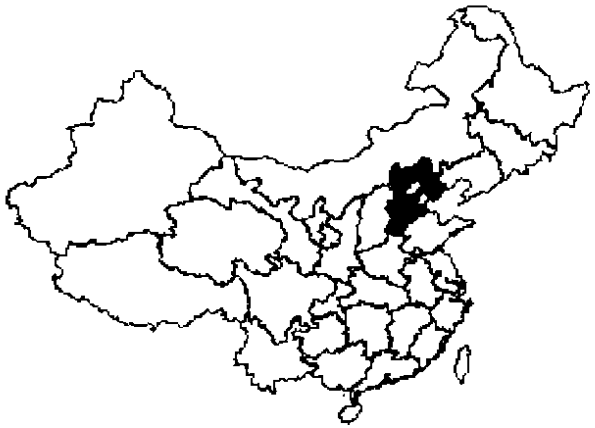
Beijing

Area (sq km): 16,800

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	10,000	1,125	1,251	1,259	1,240	1,246	1,257	1,382	1,383	1,423	1,456
Gross Domestic Product	100mil	1,084.03	1,394.89	1,615.73	1,810.09	2,011.31	2,174.46	2,478.76	2,845.65	3,212.71	3,633.10
Foreign Direct Investment	10,000	137,157	107,999	155,290	159,286	216,800	197,525	168,368	176,818	172,464	219,126
Export	10,000	834,205	1,024,977	811,975	961,103	1,052,334	990,352	1,196,813	1,178,687	1,261,386	1,688,682
Import	10,000	2,093,221	2,678,536	2,119,858	2,077,749	1,999,404	2,445,599	3,765,376	3,975,444	3,989,142	5,161,335
Investment in Innovation											
Total	100mil	162.53	157.24	168.05	191.15	252.43	175.21	185.94	186.51	169.63	216.27
Manufacturing	100mil	74,61,	51.38	47.50	54.01	44.01	30.98	47.13	48.65	52.94	78.33
Service	100mil	20.30	51.27	63.23	70.47	117.30	52.00	65.84	77.60	69.75	73.89
Number of Staff and Workers											
Total	10,000	477.9	470.9	460.6	465.3	418.8	403.0	397.9	400.3	434.2	436.3
Manufacturing	10,000	142.8	138.7	132.7	127.1	103.8	97.5	89.6	89.2	101.4	95.2
Service	10,000	28.2	20.2	20.8	21.0	19.3	18.7	17.5	17.2	17.7	15,6 + 28,4
Education											
Investment	100mil	0.37	2.10	1.61	2.65	1.49	1.31	2.33	0.87	0.61	1.10
Universities	unit	67	65	65	65	63	64	58	61	62	73
No. of Graduates H.E.	unit	34,855	45,094	46,471	49,973	49,322	50,307	51,931	56,221	67,958	82,828
High Schools	unit	693	710	724	736	752	754	760	791	786	763

Province

Hebei



Capital: Hengshui

Area (sq km): 185,900

Important cities: Baoding, Cangzhou, Langfang, Chengde

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	10,000	6,388	6,437	6,484	6,525	6,569	6,614	6,744	6,699	6,735	6,769
Gross Domestic Product	100mil	2,187.49	2,849.52	3,452.97	3,953.78	4,265.01	4,569.19	5,088.96	5,577.78	6,122.53	7,098.56
Foreign Direct Investment	10,000	52,340	54,668	83,022	110,064	142,868	104,202	67,923	66,989	78,271	96,405
Export	10,000	230,266	286,561	307,839	323,902	311,618	311,914	371,000	395,559	459,411	592,754
Import	10,000	85,416	105,214	111,430	86,426	111,115	146,081	152,862	178,172	207,114	305,071
Investment in Innovation											
Total	100mil	111.66	171.55	212.26	255.03	293.31	324.22	305.91	342.30	377.78	511.90
Manufacturing	100mil	70.28	119.87	131.05	137.17	138.71	153.80	139.78	164.42	199.32	302.58
Service	100mil	24.29	26.14	36.23	64.88	80.87	86.18	90.10	89.78	81.94	50.42
Number of Staff and Workers											
Total	10,000	699.2	698.0	696.2	676.7	587.7	563.8	539.4	519.2	494.7	486.8
Manufacturing	10,000	259.0	259.1	250.4	236.5	293.3	324.2	305.9	342.3	377.8	511.9
Service	10,000	36.9	36.5	36.8	35.8	30.6	29.5	28.6	28.2	27.5	3,5 + 26,5
Education											
Investment	100mil	0.05	0.21	0.81	1.18	1.24	2.00	3.10	3.03	4.56	4.29
Universities	unit	52	47	45	46	46	48	51	63	75	83
No. of Graduates H.E.	unit	27,491	36,388	41,837	42,234	40,562	39,606	43,473	45,871	62,910	113,442
High Schools	unit	5,294	5,256	5,175	5,076	4,984	4,949	4,910	5,098	5,053	5,024

Province

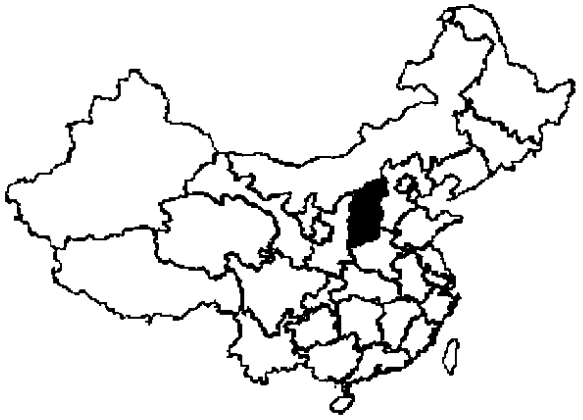
Tianjin

Area (sq km) : 11,300

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	935	942	948	953	957	959	1,001	1,004	1,007	1,011
Gross Domestic Product	**100mil**	725.14	920.11	1,102.40	1,240.40	1,336.38	1,450.06	1,639.36	1,840.10	2,051.16	2,447.66
Foreign Direct Investment	**10,000**	101,499	152,093	215,273	251,135	211,361	176,399	116,601	213,348	158,195	153,473
Export	**10,000**	269,121	406,407	465,082	524,387	549,879	633,134	862,578	949,211	1,163,169	1,434,940
Import	**10,000**	285,408	397,951	489,323	508,750	511,510	626,960	852,822	867,998	1,117,972	1,499,304
Investment in Innovation											
Total	**100mil**	90.14	94.89	106.68	133.75	119.62	103.61	111.93	139.52	162.51	208.62
Manufacturing	**100mil**	36.03	42.89	47.27	54.89	48.35	46.01	65.41	87.01	106.80	127.84
Service	**100mil**	23.93	22.26	18.48	33.83	27.15	23.85	18.80	23.88	22.74	23.90
Number of Staff and Workers											
Total	**10,000**	291.9	289.6	284.0	281.3	209.7	202.7	193.3	184.0	177.0	174.9
Manufacturing	**10,000**	135.4	136.0	132.0	128.0	83.0	81.3	78.6	74.9	69.3	72.5
Service	**10,000**	17.9	17.6	18.4	18.2	13.9	13.2	12.5	12.5	12.7	1,5 + 12,2
Education											
Investment	**100mil**	0.25	1.06	0.31	1.41	0.99	0.35	1.29	0.26	0.71	0.52
Universities	**unit**	22	21	20	20	20	21	21	33	37	37
No. of Graduates H.E.	**unit**	14,661	20,203	18,429	19,535	18,342	19,292	20,112	19,103	27,295	40,221
High Schools	**unit**	672	716	734	732	731	712	690	708	695	664

Province

Shanxi



Capital: Taiyuan

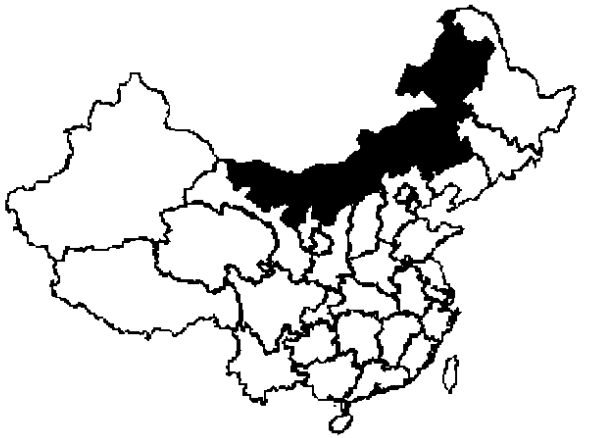
Area (sq km): 156,000

Important cities: Datong, Yuci, Yangquan, Changzhi, Linfen

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	3,045	3,077	3,109	3,141	3,172	3,204	3,297	3,272	3,294	3,314
Gross Domestic Product	**100mil**	853.77	1,092.48	1,305.50	1,480.13	1,486.08	1,506.78	1,643.81	1,779.97	2,017.54	2,456.59
Foreign Direct Investment	**10,000**	3,170	6,383	13,808	26,592	24,451	39,129	22,472	23,393	21,164	21,361
Export	**10,000**	65,397	114,255	93,212	112,812	89,321	83,951	123,687	146,824	166,161	227,202
Import	**10,000**	18,490	25,973	23,164	21,250	21,792	44,799	52,751	47,274	64,993	81,811
Investment in Innovation											
Total	**100mil**	47.21	65.20	81.52	87.44	89.41	85.76	110.84	145.30	193.92	252.35
Manufacturing	**100mil**	17.55	28.98	34.56	36.51	38.59	40.64	56.67	72.66	99.59	154.18
Service	**100mil**	11.36	8.25	9.78	13.03	18.36	17.72	27.19	35.92	37.59	25.42
Number of Staff and Workers											
Total	**10,000**	466.0	463.4	464.9	455.9	391.8	379.4	370.2	363.0	351.6	347.9
Manufacturing	**10,000**	154.7	147.5	145.0	138.2	104.5	98.6	94.7	89.4	81.3	75.0
Service	**10,000**	25.9	26.0	25.8	25.0	23.2	24.0	23.5	22.8	22.3	2,5 + 21,5
Education											
Investment	**100mil**	0.04	0.08	0.03	0.01	0.01	0.05	0.16	0.04	0.19	0.15
Universities	**unit**	26	26	25	24	23	23	24	33	39	45
No. of Graduates H.E.	**unit**	16,160	20,312	19,943	19,297	18,935	19,628	20,657	21,938	31,906	40,779
High Schools	**unit**	3,485	3,401	3,370	3,324	3,292	3,284	3,346	3,385	3,403	3,379

Province

Inner Mongolia



Capital: Hohhot

Area (sq km): 1,2m

Important cities: Baotou, Hailiar

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	2,260	2,284	2,307	2,326	2,345	2,362	2,376	2,377	2,379	2,380
Gross Domestic Product	**100mil**	681.92	832.88	984.78	1,094.52	1,192.29	1,268.20	1,401.10	1,545.79	1,756.29	2,150.41
Foreign Direct Investment	**10,000**	4,007	5,781	7,186	7,325	9,082	6,456	10,568	10,703	17,701	8,854
Export	**10,000**	47,441	49,968	52,073	65,540	52,579	53,460	97,017	62,707	80,667	115,569
Import	**10,000**	45,041	49,755	52,918	41,761	43,715	75,955	165,188	140,763	162,736	167,333
Investment in Innovation											
Total	**100mil**	41.97	67.06	53.93	48.81	51.61	55.90	58.58	79.58	107.55	173.59
Manufacturing	***100mil***	26.73	49.11	32.92	24.84	24.50	23.73	25.14	40.45	62.60	98.59
Service	**100mil**	7.63	7.61	12.42	23.40	18.10	23.32	20.45	16.92	19.13	14.62
Number of Staff and Workers											
Total	**10,000**	387.1	383.7	379.7	363.9	298.9	278.2	263.9	251.0	243.2	240.3
Manufacturing	**10,000**	105.4	103.3	101.4	92.4	65.2	59.1	54.1	48.3	44.9	44.7
Service	**10,000**	25.2	24.3	23.9	15.5	19.8	19.6	18.8	18.0	17.6	2,4 + 16,1
Education											
Investment	**100mil**	0.04	0.02	0.01	0.02	0.06	0.03	0.03	0.89	0.07	0.03
Universities	***unit***	19	19	19	18	19	19	18	20	21	27
No. of Graduates H.E.	***unit***	9,695	13,647	10,763	11,307	10,525	10,911	12,218	12,317	15,608	24,919
High Schools	***unit***	1,905	1,853	1,829	1,791	1,731	1,710	1,707	1,809	1,762	1,743

Province

Liaoning

Capital: Shenyang

Area (sq km): 146,000

Important cities: Dalian, Jinzhou

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	10,000	4,067	4,092	4,116	4,138	4,157	4,171	4,238	4,194	4,203	4,210
Gross Domestic Product	100mil	2,461.78	2,793.37	3,157.69	3,490.06	3,881.73	4,171.69	4,669.06	5,033.08	5,265.66	6,002.54
Foreign Direct Investment	10,000	144,014	142,461	173,782	220,470	219,045	106,173	204,446	251,612	341,168	282,410
Export	10,000	605,320	824,357	863,683	915,645	805,210	819,988	1,085,632	1,100,845	1,236,656	1,457,935
Import	10,000	418,433	495,533	543,188	574,907	468,896	551,844	817,516	879,870	937,039	1,192,982
Investment in Innovation											
Total	100mil	165.51	216.90	186.95	241.40	259.80	260.94	283.44	329.88	365.11	462.03
Manufacturing	100mil	92.98	135.50	112.86	123.30	119.33	118.25	150.73	188.29	218.34	274.72
Service	100mil	51.17	43.54	37.24	54.64	75.46	86.29	69.92	69.53	54.54	38.09
Number of Staff and Workers											
Total	10,000	1,031.3	1,028.4	997.7	969.4	689.8	631.0	587.0	545.3	502.0	483.5
Manufacturing	10,000	451.0	445.2	433.5	411.7	246.2	217.5	198.4	177.1	155.4	147.5
Service	10,000	58.1	57.2	54.6	55.5	43.1	40.8	38.9	37.0	32.6	4,3 + 33,1
Education											
Investment	100mil	0.05	0.06	0.06	0.06	0.13	0.06	0.28	0.65	1.32	1.19
Universities	unit	61	61	61	62	61	64	64	66	67	70
No. of Graduates H.E.	unit	35,923	44,072	51,068	49,591	47,557	49,964	53,353	60,271	72,791	98,908
High Schools	unit	2,448	2,459	2,447	2,434	2,444	2,439	2,401	2,376	2,362	2,341

Province

Jilin

Capital: Changchun

Area (sq km): 187,400

Important cities: Siping, Liaoyuan, Yanji, Da'an

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	2,574	2,592	2,610	2,628	2,644	2,658	2,728	2,691	2,699	2,704
Gross Domestic Product	**100mil**	936.78	1,129.20	1,337.16	1,446.91	1,557.79	1,660.91	1,821.19	2,032.48	2,246.12	2,522.62
Foreign Direct Investment	**10,000**	24,192	40,802	45,155	40,227	40,917	30,120	33,701	33,766	24,468	19,059
Export	**10,000**	136,597	109,673	97,188	93,233	74,847	101,877	125,683	146,171	176,849	218,228
Import	**10,000**	142,483	151,031	113,178	92,126	90,382	119,357	131,359	174,514	193,398	396,613
Investment in Innovation											
Total	**100mil**	42.00	54.13	62.43	57.68	83.20	99.42	114.54	128.74	161.19	212.13
Manufacturing	**100mil**	32.07	41.24	40.73	42.25	51.04	69.95	76.36	95.76	130.11	177.71
Service	**100mil**	7.53	5.16	8.75	5.80	19.54	13.02	8.05	8.53	5.15	3.54
Number of Staff and Workers											
Total	**10,000**	530.1	520.4	513.3	500.9	374.1	352.6	329.9	313.3	298.3	286.8
Manufacturing	**10,000**	197.4	189.0	184.2	174.6	108.9	98.5	88.5	79.5	75.7	72.9
Service	**10,000**	29.6	28.6	28.8	28.8	24.7	24.5	23.8	24.0	22.7	2,5 + 25.2
Education											
Investment	**100mil**	0.00	0.08	0.10	0.32	0.23	0.27	0.12	0.06	1.46	0.10
Universities	**unit**	43	43	40	40	41	40	34	35	40	40
No. of Graduates H.E.	**unit**	22,032	26,225	29,110	27,526	29,000	30,315	30,480	34,808	37,825	52,605
High Schools	**unit**	1,845	1,819	1,804	1,790	1,756	1,722	1,710	1,744	1,725	1,698

Province

Heilongjiang

Capital: Harbin

Area (sq km): 469,000

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	3,672	3,701	3,728	3,751	3,773	3,792	3,689	3,811	3,813	3,815
Gross Domestic Product	**100mil**	1,618.63	2,014.53	2,402.58	2,708.46	2,798.89	2,897.41	3,253.00	3,561.00	3,882.16	4,430.00
Foreign Direct Investment	**10,000**	34,759	51,686	56,691	73,485	52,639	31,828	30,086	34,114	35,511	32,180
Export	**10,000**	124,272	116,640	108,039	130,872	90,879	95,714	145,118	161,192	198,665	287,426
Import	**10,000**	118,487	122,005	136,709	115,584	111,093	124,116	153,519	177,234	236,251	245,514
Investment in Innovation											
Total	**100mil**	85.25	112.79	119.08	117.48	219.47	141.24	239.65	201.12	215.06	231.69
Manufacturing	**100mil**	30.37	46.25	42.96	47.73	59.79	56.31	49.70	55.39	72.28	102.34
Service	**100mil**	18.16	38.84	41.62	55.04	80.85	34.50	52.48	62.27	52.49	53.85
Number of Staff and Workers											
Total	**10,000**	853.5	834.9	814.6	797.0	607.3	574.7	531.5	510.9	496.5	487.8
Manufacturing	**10,000**	253.7	241.7	244.0	233.5	145.2	131.4	122.1	116.6	112.8	110.4
Service	**10,000**	43.7	43.1	44.6	44.7	35.5	35.8	34.9	32.6	32.6	3,8 + 31,9
Education											
Investment	**100mil**	0.01	0.07	0.01	0.01	0.00	0.00	0.02	0.02	0.06	0.24
Universities	**unit**	43	38	38	37	38	39	35	41	47	54
No. of Graduates H.E.	**unit**	23,145	30,622	33,439	30,589	30,055	30,218	35,180	37,359	46,401	69,050
High Schools	**unit**	2,690	2,681	2,725	2,725	2,712	2,699	2,674	2,775	2,746	2,719

Province

Shanghai

Area (sq km): 6,340

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	1,356	1,415	1,419	1,457	1,464	1,474	1,674	1,614	1,625	1,711
Gross Domestic Product	**100mil**	1,971.92	2,462.57	2,902.20	3,360.21	3,688.20	4,034.96	4,551.15	4,950.84	5,408.76	6,250.81
Foreign Direct Investment	**10,000**	247,309	289,261	394,094	422,536	360,150	383,665	316,014	429,159	477,229	546,849
Export	**10,000**	915,722	1,296,379	1,302,879	1,506,897	1,595,634	1,879,958	2,535,233	2,762,367	3,203,739	4,845,296
Import	**10,000**	890,499	1,139,353	1,411,006	1,473,101	1,538,797	1,981,854	2,935,569	3,326,948	4,058,972	6,388,659
Investment in Innovation											
Total	**100mil**	169.77	389.20	414.44	386.24	365.01	393.59	396.26	432.03	422.58	388.01
Manufacturing	**100mil**	87.83	158.67	181.00	165.44	161.75	211.78	220.79	234.91	234.27	225.35
Service	**100mil**	20.38	56.12	71.29	59.37	73.05	56.60	43.54	88.48	96.35	47.68
Number of Staff and Workers											
Total	**10,000**	478.7	470.5	456.8	435.3	348.5	327.1	307.0	290.0	290.6	279.2
Manufacturing	**10,000**	238.2	231.5	212.9	189.2	142.8	129.9	119.1	108.0	112.0	107.0
Service	**10,000**	30.7	30.2	29.8	28.6	23.5	23.9	21.8	20.3	19.7	3,1 + 29,2
Education											
Investment	**100mil**	1.11	2.61	2.83	2.31	2.77	3.74	5.42	7.42	5.98	2.87
Universities	**unit**	46	45	41	39	40	41	37	45	50	56
***No. of* Graduates H.E.**	***unit***	31,771	39,568	39,043	38,961	36,203	40,316	40,922	42,842	55,198	71,158
High Schools	**unit**	754	770	798	825	855	869	875	879	871	858

Province

Jiangsu

Capital: Nanjing

Area (sq km): 102,600

Important cities: Suzhou, Nantong, Wuxi

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	7,021	7,066	7,110	7,148	7,182	7,213	7,438	7,355	7,381	7,406
Gross Domestic Product	**100mil**	4,057.39	5,155.25	6,004.21	6,680.34	7,199.95	7,697.82	8,582.73	9,511.91	10,631.75	12,460.83
Foreign Direct Investment	**10,000**	376,315	519,082	521,009	543,511	663,179	607,756	642,550	691,482	1,018,960	1,056,365
Export	**10,000**	668,450	978,926	1,159,872	1,409,624	1,562,709	1,830,582	2,576,683	2,887,354	3,182,342	5,911,302
Import	**10,000**	507,235	652,062	909,889	953,275	1,072,161	1,295,159	1,986,953	2,247,739	3,182,342	5,450,438
Investment in Innovation											
Total	**100mil**	146.32	218.78	239.51	268.77	296.01	297.86	337.99	402.32	453.28	691.96
Manufacturing	**100mil**	99.20	148.59	138.90	146.43	131.97	135.25	152.10	215.39	292.68	474.63
Service	**100mil**	26.68	38.50	64.21	80.79	102.20	82.71	88.00	107.70	70.24	65.08
Number of Staff and Workers											
Total	**10,000**										
Manufacturing	**10,000**	407.8	414.2	400.0	386.4	292.4	272.2	251.4	229.4	215.9	216.8
Service	**10,000**	56.1	54.3	54.5	53.8	47.7	45.9	42.5	38.4	35.2	5,1 + 33,1
Education											
Investment	**100mil**	0.35	0.48	0.20	1.04	1.38	1.86	2.33	2.80	3.06	1.72
Universities	**unit**	67	67	66	65	66	72	69	73	93	94
No. of Graduates H.E.	**unit**	44,690	59,470	61,181	58,831	57,325	61,499	65,643	79,838	104,079	137,048
High Schools	**unit**	4,761	4,439	4,230	4,051	3,870	3,727	3,675	3,622	3,551	3,262

Province

Zhejiang

Capital: Hangzhou

Area (sq km): 101,800

Important cities: Huzhou, Ningbo, Wenzhou

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	4,294	4,319	4,343	4,435	4,456	4,475	4,677	4,613	4,647	4,680
Gross Domestic Product	**100mil**	2,666.86	3,524.79	4,146.06	4,638.24	4,987.50	5,364.89	6,036.34	6,748.15	7,796.00	9,395.00
Foreign Direct Investment	**10,000**	114,441	125,806	152,050	150,345	131,802	123,262	161,266	221,162	307,610	498,055
Export	**10,000**	608,499	769,242	803,918	1,008,533	1,086,624	1,287,144	1,944,275	2,297,636	2,941,068	4,159,497
Import	**10,000**	290,216	381,730	448,933	415,789	398,759	543,417	838,987	982,225	1,254,508	1,981,584
Investment in Innovation											
Total	**100mil**	62.32	98.51	110.34	113.20	171.16	209.62	242.55	318.25	356.77	356.71
Manufacturing	**100mil**	40.75	58.14	60.70	51.10	64.19	74.87	93.61	133.65	187.54	221.42
Service	**100mil**	13.95	21.33	29.01	41.90	83.27	99.13	99.52	125.78	97.60	69.42
Number of Staff and Workers											
Total	**10,000**	500.9	498.6	495.3	482.3	421.9	396.8	373.0	353.2	350.6	373.2
Manufacturing	**10,000**	215.1	206.0	195.8	182.8	141.3	127.2	113.4	101.0	97.2	109.0
Service	**10,000**	27.9	27.6	27.6	27.4	24.3	22.6	21.1	18.8	18.8	4,2 + 18,7
Education											
Investment	**100mil**	0.22	0.18	0.92	0.07	0.49	0.63	1.60	3.70	2.25	0.42
Universities	**unit**	37	37	36	35	32	36	35	39	61	64
No. of Graduates H.E.	**unit**	17,895	22,443	25,393	26,386	24,296	26,750	32,477	37,230	48,431	78,685
High Schools	**unit**	3,315	3,255	3,240	3,186	3,128	2,995	2,940	2,900	2,781	2,695

Province

Anhui

Capital: Hefei

Area (sq km): 140,000

Important cities: Huangshan, Bengbu, Wuhu, Ma'anshan

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	5,955	6,013	6,070	6,127	6,184	6,237	5,986	6,328	6,338	6,410
Gross Domestic Product	**100mil**	1,488.47	2,003.58	2,339.25	2,669.95	2,805.45	2,908.58	3,038.24	3,290.13	3,553.56	3,972.38
Foreign Direct Investment	**10,000**	37,000	48,256	50,661	43,443	27,673	26,131	31,847	33,672	38,375	36,720
Export	**10,000**	104,641	139,305	131,352	154,783	148,254	167,607	217,198	228,226	245,313	306,363
Import	**10,000**	52,003	61,496	90,789	82,969	77,463	97,237	117,486	133,771	172,784	288,418
Investment in Innovation											
Total	**100mil**	68.00	96.35	101.61	114.96	109.65	122.85	152.83	185.33	231.63	355.22
Manufacturing	**100mil**	52.40	63.43	67.26	70.72	51.02	55.33	58.75	81.38	129.96	253.69
Service	**100mil**	8.18	9.99	9.23	22.16	31.22	30.58	50.52	64.61	37.82	30.22
Number of Staff and Workers											
Total	**10,000**	492.9	502.8	502.8	502.6	427.6	408.9	392.7	372.0	358.7	337.8
Manufacturing	***10,000***	*174.3*	*185.3*	*174.6*	*168.1*	*125.0*	*113.9*	*104.7*	*94.6*	*84.9*	*77.3*
Service	**10,000**	28.7	28.5	28.5	28.5	23.4	22.6	21.5	19.8	18.6	2,3 + 16,5
Education											
Investment	**100mil**	0.01	0.29	0.12	0.12	0.22	0.65	0.80	0.84	0.44	0.16
Universities	**unit**	35	35	35	34	34	37	42	52	61	73
No. of Graduates H.E.	**unit**	21,077	28,872	26,240	24,245	26,196	23,101	29,830	34,388	44,318	65,685
High Schools	**unit**	4,234	4,170	4,012	3,926	3,841	3,792	3,767	3,787	3,819	3,820

Province

Fujian

Capital: Fuzhou

Area (sq km): 121,700

Important cities: Xiamen, Quanzhou, Zhangzhou

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	3,183	3,237	3,261	3,282	3,299	3,316	3,471	3,440	3,466	3,488
Gross Domestic Product	**100mil**	1,685.34	2,160.52	2,606.92	3,000.36	3,286.56	3,550.24	3,920.07	4,253.68	4,682.01	5,232.17
Foreign Direct Investment	**10,000**	371,318	404,390	408,455	419,666	421,211	402,403	343,191	391,804	383,837	259,903
Export	**10,000**	643,020	790,795	838,269	1,026,480	995,937	1,035,166	1,290,607	1,392,584	1,737,063	2,113,173
Import	**10,000**	575,933	653,765	712,990	792,429	720,081	726,753	831,439	870,368	1,102,674	1,419,380
Investment in Innovation											
Total	**100mil**	51.76	80.53	92.52	137.31	168.34	172.55	175.42	188.99	194.49	226.80
Manufacturing	**100mil**	24.95	37.89	41.74	48.07	55.64	59.02	63.45	68.55	89.99	143.14
Service	**100mil**	18.79	26.81	31.96	68.34	82.06	85.08	85.24	106.31	80.12	54.34
Number of Staff and Workers											
Total	**10,000**	352.0	344.1	350.5	357.7	334.5	320.4	318.0	314.3	315.3	334.1
Manufacturing	**10,000**	145.6	136.5	136.9	140.9	129.1	126.6	127.9	127.9	134.1	152.1
Service	**10,000**	18.8	18.1	17.9	17.8	15.4	14.8	14.9	14.0	13.0	3 + 13,6
Education											
Investment	**100mil**	0.01	0.12	0.15	0.08	0.37	1.23	0.64	1.03	2.01	0.01
Universities	**unit**	33	30	30	30	29	30	28	32	33	39
No. of Graduates H.E.	**unit**	16,873	20,389	22,316	21,826	21,457	20,691	24,307	28,449	36,775	47,792
High Schools	**unit**	1,639	1,771	1,834	1,880	1,902	1,893	1,921	1,988	1,998	2,006

Province

Jiangxi

Capital: Nanchang

Area (sq km): 166,600

Important cities: Juijang, Jingdezhen, Ji'an

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	4,015	4,063	4,105	4,150	4,191	4,231	4,140	4,186	4,222	4,254
Gross Domestic Product	**100mil**	948.16	1,245.11	1,517.26	1,715.18	1,851.98	1,853.65	2,003.07	2,175.68	2,450.48	2,830.46
Foreign Direct Investment	**10,000**	26,168	28,888	30,126	47,768	46,496	32,080	22,724	39,575	108,197	161,202
Export	**10,000**	80,539	104,194	85,097	111,394	101,822	90,606	119,741	103,904	105,198	150,490
Import	**10,000**	50,163	28,121	26,452	21,845	22,896	40,776	42,664	49,190	64,249	102,315
Investment in Innovation											
Total	**100mil**	45.10	58.78	60.25	65.87	66.16	69.45	75.38	107.28	142.00	195.61
Manufacturing	**100mil**	32.46	36.11	36.56	34.21	29.48	28.79	30.02	40.15	64.41	119.97
Service	**100mil**	3.91	14.38	13.68	21.07	30.04	29.96	21.15	49.47	44.53	32.72
Number of Staff and Workers											
Total	**10,000**	413.9	411.3	412.0	409.4	322.5	305.9	291.6	279.3	261.9	256.7
Manufacturing	**10,000**	148.2	146.5	140.7	135.8	91.2	83.6	75.1	67.2	60.5	59.2
Service	**10,000**	22.3	21.8	22.0	22.8	18.7	18.0	17.9	17.0	16.8	2,1 + 15,1
Education											
Investment	**100mil**	0.04	0.02	0.02	0.11	0.18	0.55	1.19	0.95	1.05	5.13
Universities	**unit**	31	31	31	31	31	34	32	33	47	54
No. of Graduates H.E.	**unit**	17,414	2,004	24,433	23,709	22,938	25,057	25,903	27,602	35,047	47,167
High Schools	**unit**	1,812	2,790	2,785	2,748	2,765	2,739	2,792	2,868	2,835	2,848

Province

Shandong

Capital: Jinan

Area (sq km): 156,700

Important cities: Jining, Tai'an, Qingdao, Weifang

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	10,000	8,671	8,705	8,738	8,785	8,838	8,883	9,079	9,041	9,082	9,125
Gross Domestic Product	100mil	3,872.18	5,002.34	5,960.42	6,650.02	7,162.20	7,662.10	8,542.44	9,438.31	10,552.06	12,435.93
Foreign Direct Investment	10,000	255,242	268,898	263,355	249,294	220,274	225,878	297,119	352,093	473,404	601,617
Export	10,000	586,536	816,017	918,127	1,096,569	1,035,931	1,157,645	1,552,884	1,812,067	2,110,783	2,655,706
Import	10,000	375,414	378,335	698,278	667,830	627,003	669,053	946,092	1,083,304	1,282,665	1,807,977
Investment in Innovation											
Total	100mil	132.52	211.04	237.24	263.45	283.49	312.90	398.60	521.26	691.77	910.52
Manufacturing	100mil	80.56	122.83	146.56	156.67	145.50	141.35	190.28	242.34	383.78	597.79
Service	100mil	18.38	26.59	36.63	37.19	68.22	71.01	100.24	105.69	99.57	59.22
Number of Staff and Workers											
Total	10,000	872.3	91,7,4	930.7	937.6	836.8	809.1	790.1	770.5	764.8	762.3
Manufacturing	10,000	337.3	378.1	372.2	370.0	303.1	292.3	281.0	272.9	271.6	270.1
Service	10,000	40.5	40.0	40.3	40.7	34.6	33.8	33.6	33.1	31.7	5,2 + 30,4
Education											
Investment	100mil	0.59	0.68	0.57	0.74	1.06	1.17	0.26	1.81	1.51	0.40
Universities	unit	49	48	48	48	49	52	47	65	75	85
No. of Graduates H.E.	unit	50,457	52,083	47,835	50,141	50,208	49,612	58,355	69,583	94,697	117,253
High Schools	unit	5,429	5,073	4,820	4,693	4,653	4,586	4,575	4,684	4,684	4,606

Province

Henan

Capital: Zhengzhou

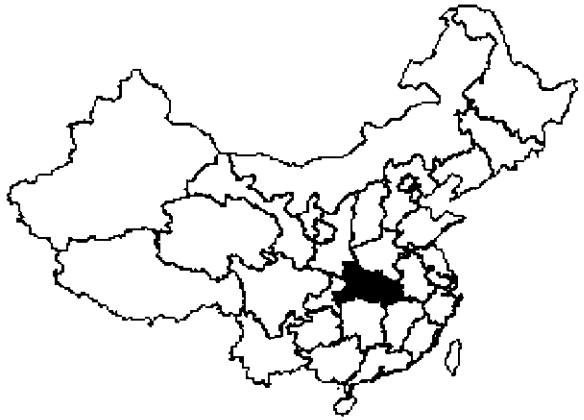
Area (sq km): 167,000

Important cities: Kaifeng, Luoyang

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	10,000	9,027	9,100	9,172	9,243	9,315	9,387	9,256	9,555	9,613	9,667
Gross Domestic Product	100mil	2,224.43	3,002.74	3,683.41	4,079.26	4,356.60	4,576.10	5,137.66	5,640.11	6,168.73	7,048.59
Foreign Direct Investment	10,000	38,673	47,855	52,356	69,204	61,654	52,135	56,403	45,729	40,463	53,903
Export	10,000	101,280	135,745	123,919	128,071	118,762	112,730	149,578	170,491	211,862	297,929
Import	10,000	61,170	87,159	72,907	61,036	54,674	62,155	78,712	107,685	108,454	173,288
Investment in Innovation											
Total	100mil	87.04	132.47	155.65	169.30	165.43	159.47	163.36	198.53	233.79	369.72
Manufacturing	100mil	52.37	80.80	99.43	93.63	77.29	59.34	75.70	96.03	108.96	210.91
Service	100mil	16.34	19.59	22.53	29.11	36.11	38.58	40.47	38.58	42.33	17.56
Number of Staff and Workers											
Total	10,000	789.3	815.0	842.1	841.3	748.1	723.2	718.2	704.4	693.9	682.5
Manufacturing	10,000	276.9	284.7	287.1	274.0	221.8	206.9	196.2	184.4	169.8	157.5
Service	10,000	42.9	42.4	42.1	37.2	37.2	37.2	37.5	35.8	35.9	4,4 + 32,3
Education											
Investment	100mil	0.11	0.20	0.30	0.49	2.21	0.82	0.83	1.52	0.82	1.08
Universities	unit	50	50	50	50	51	56	52	64	65	71
No. of Graduates H.E.	unit	29,434	37,601	39,133	38,877	39,606	39,890	45,709	46,120	71,226	108,975
High Schools	unit	6,476	6,367	6,282	6,142	6,069	6,120	6,217	6,384	6,399	6,363

Province

Hubei



Capital: Wuhan

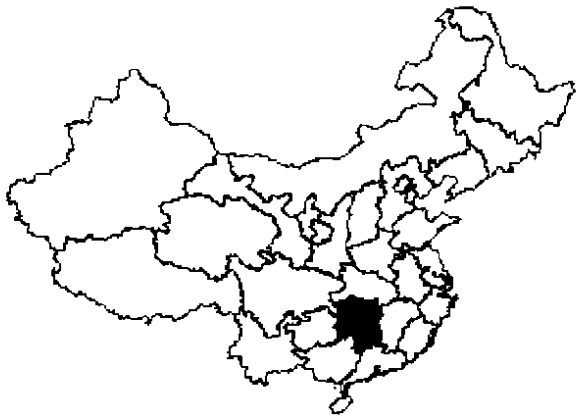
Area (sq km): 187,700

Important cities: Huangshi, Shiyan, Shashi, Xiangfan, Yichang

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	5,719	5,772	5,825	5,873	5,907	5,938	6,028	5,975	5,988	6,002
Gross Domestic Product	**100mil**	1,878.65	2,391.42	2,970.20	3,450.24	3,704.21	3,857.99	4,276.32	4,662.28	4,830.98	5,401.71
Foreign Direct Investment	**10,000**	60,186	62,512	68,079	79,019	97,294	91,488	94,368	118,860	142,663	156,886
Export	**10,000**	171,560	197,968	152,549	192,075	170,767	151,229	193,555	179,672	209,826	265,537
Import	**10,000**	103,026	142,453	133,615	128,396	112,456	116,533	128,731	178,041	185,488	245,393
Investment in Innovation											
Total	**100mil**	81.71	150.54	191.93	211.84	227.02	221.79	245.16	290.02	320.17	383.16
Manufacturing	**100mil**	44.89	93.99	98.25	104.90	117.05	95.64	115.42	159.79	190.20	259.69
Service	**100mil**	22.88	31.59	48.46	54.94	55.23	47.31	57.92	72.70	68.61	39.72
Number of Staff and Workers											
Total	**10,000**	738.9	742.4	738.0	735.4	597.9	568.0	529.4	501.6	483.4	468.1
Manufacturing	**10,000**	284.5	284.0	274.4	267.6	187.2	172.2	154.2	146.8	143.5	146.7
Service	**10,000**	43.9	43.9	45.5	46.7	37.4	35.4	34.7	32.3	33.1	3,5 + 31,1
Education											
Investment	**100mil**	0.15	0.26	0.19	1.04	0.82	1.95	2.35	4.24	3.26	5.21
Universities	**unit**	60	56	55	54	54	57	54	60	73	75
No. of Graduates H.E.	**unit**	38,304	41,675	48,741	50,420	49,632	49,362	56,566	60,443	78,430	119,118
High Schools	**unit**	4,027	3,761	3,630	3,409	3,344	3,301	3,261	3,331	3,295	3,305

Province

Hunan



Capital: Changsha

Area (sq km): 212,000

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	6,355	6,392	6,428	6,465	6,502	6,532	6,440	6,596	6,629	6,663
Gross Domestic Product	**100mil**	1,694.42	2,195.70	2,647.16	2,993.00	3,118.09	3,326.75	3,691.88	3,983.00	4,140.94	4,638.73
Foreign Direct Investment	**10,000**	31,114	50,773	74,530	91,702	81,816	65,374	67,833	81,011	90,022	101,835
Export	**10,000**	154,338	147,015	135,294	149,697	128,280	128,187	165,271	175,281	179,528	214,585
Import	**10,000**	70,773	56,873	51,273	44,645	49,917	37,359	85,951	100,498	108,055	158,651
Investment in Innovation											
Total	**100mil**	56.19	86.96	118.61	107.26	115.54	143.30	175.20	198.31	227.96	301.87
Manufacturing	**100mil**	31.93	59.14	71.86	61.89	40.52	46.95	75.02	98.72	141.26	212.17
Service	**100mil**	13.48	21.59	38.00	37.14	60.72	78.12	87.34	69.74	41.35	34.87
Number of Staff and Workers											
Total	**10,000**	590.7	597.5	596.8	597.5	475.1	459.4	441.3	397.9	393.5	379.4
Manufacturing	**10,000**	207.2	207.6	199.9	194.3	123.9	115.7	105.2	87.7	82.9	77.4
Service	**10,000**	33.8	33.4	34.6	33.8	27.9	28.3	28.0	26.2	25.9	4,3 + 23,9
Education											
Investment	**100mil**	0.10	0.37	0.74	0.26	0.21	0.52	0.88	3.82	2.26	0.24
Universities	**unit**	47	47	46	46	47	51	52	61	60	73
No. of Graduates H.E.	**unit**	26,392	32,931	36,416	36,381	37,020	39,688	47,426	49,703	62,098	90,035
High Schools	**unit**	5,022	4,863	4,722	4,559	4,532	4,502	4,505	4,695	4,712	4,689

Province

Guangdong

Capital: Guangzhou

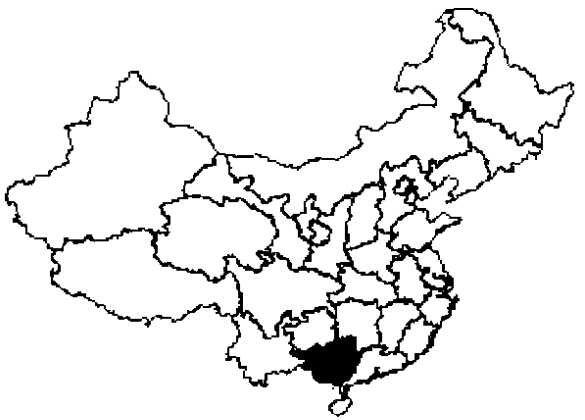
Area (sq km): 178,000

Important cities: Shantou, Shenzen, Zhanjiang, Zhuhai

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	6,689	6,868	6,961	7,051	7,143	7,270	8,642	7,783	7,859	7,954
Gross Domestic Product	**100mil**	4,240.56	5,733.97	6,519.14	7,315.51	7,919.12	8,464.31	9,662.23	10,647.71	11,735.64	13,625.87
Foreign Direct Investment	**10,000**	946,343	1,026,011	1,175,407	1,171,083	1,201,994	1,165,750	1,128,091	1,193,203	1,133,400	782,294
Export	**10,000**	5,019,850	5,657,260	5,934,099	7,453,952	7,563,971	7,768,679	9,191,770	9,542,609	11,846,274	15,284,823
Import	**10,000**	4,645,365	4,734,966	5,056,907	5,550,782	5,418,676	6,265,562	7,818,118	8,106,860	10,263,357	13,067,654
Investment in Innovation											
Total	**100mil**	170.13	253.36	273.19	273.54	326.86	368.60	435.55	484.66	514.93	658.77
Manufacturing	**100mil**	68.94	77.62	94.28	96.86	92.40	81.30	91.90	112.94	134.86	224.51
Service	**100mil**	61.74	99.56	118.93	108.89	165.48	183.88	224.78	251.73	226.01	180.61
Number of Staff and Workers											
Total	**10,000**	879.8	912.0	904.1	879.3	809.9	780.9	747.7	724.6	735.1	763.5
Manufacturing	**10,000**	323.6	346.4	330.5	324.8	279.2	266.5	251.8	240.6	254.8	281.6
Service	**10,000**	56.0	55.8	55.6	55.3	50.0	48.4	46.4	43.4	43.4	10,7 + 42,6
Education											
Investment	**100mil**	1.04	3.61	2.00	3.96	3.49	4.96	6.13	6.77	8.21	9.07
Universities	**unit**	46	42	41	42	43	50	52	62	71	77
No. of Graduates H.E.	***unit***	25,999	34,839	42,644	44,134	49,270	47,988	51,432	58,835	84,696	105,533
High Schools	**unit**	3,817	3,845	3,882	3,889	3,879	3,914	3,964	4,074	4,156	4,176

Province

Guangxi



Capital: Nanning

Area (sq km): 236,660

Important cities: Beihai, Guilin, Liuzhou

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	4,493	4,543	4,589	4,633	4,675	4,713	4,489	4,788	4,822	4,857
Gross Domestic Product	**100mil**	1,241.83	1,606.15	1,869.62	1,817.25	1,903.04	1,953.27	2,050.14	2,231.19	2,455.36	2,735.13
Foreign Direct Investment	**10,000**	83,633	67,263	66,313	87,986	88,613	63,512	52,466	38,416	41,726	41,856
Export	**10,000**	129,038	170,198	126,901	227,924	180,389	124,721	148,891	123,536	150,746	196,992
Import	**10,000**	174,662	138,872	75,704	58,707	60,495	50,619	54,488	56,163	92,303	121,683
Investment in Innovation											
Total	**100mil**	48.75	68.56	71.33	59.10	69.72	70.10	80.16	86.60	107.15	146.84
Manufacturing	**100mil**	35.94	40.82	36.87	28.79	27.45	21.23	23.83	32.30	59.11	97.91
Service	**100mil**	7.00	16.07	21.26	17.89	28.55	33.25	36.91	41.43	33.92	18.37
Number of Staff and Workers											
Total	**10,000**	341.1	343.3	344.5	340.0	307.8	295.2	283.1	274.3	259.3	255.7
Manufacturing	**10,000**	102.2	101.1	100.4	97.7	78.7	71.5	65.9	61.7	57.0	55.7
Service	**10,000**	22.0	22.1	21.6	20.8	17.9	17.1	16.8	16.3	17.3	2,3 + 16,1
Education											
Investment	**100mil**	0.19	1.15	0.52	0.45	0.58	0.66	0.15	0.35	0.17	0.12
Universities	***unit***	27	27	27	26	28	29	30	30	36	45
No. of Graduates H.E.	***unit***	12,785	17,784	17,526	15,628	19,119	19,262	21,858	23,597	31,967	40,178
High Schools	***unit***	3,050	3,077	3,117	3,039	3,037	3,012	3,019	3,040	3,018	2,990

Province

Hainan

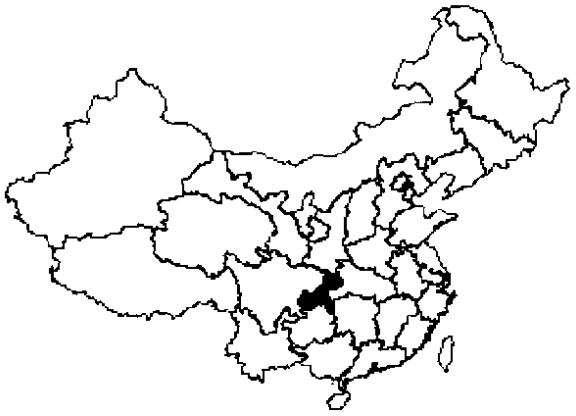
Capital: Haikou

Area (sq km): 33,940

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	711	724	734	743	753	762	787	796	803	811
Gross Domestic Product	**100mil**	330.95	364.17	389.53	409.86	438.92	471.23	518.48	545.96	597.50	676.93
Foreign Direct Investment	**10,000**	91,809	106,207	78,908	70,554	71,715	48,449	43,080	46,691	51,196	42,125
Export	**10,000**	95,298	92,323	65,849	79,901	76,498	74,725	80,289	79,797	81,930	86,620
Import	**10,000**	180,748	143,249	160,437	112,783	98,082	46,979	48,497	94,908	104,749	140,871
Investment in Innovation											
Total	**100mil**	7.24	6.55	8.51	7.50	6.27	7.59	9.84	15.23	12.83	12.81
Manufacturing	**100mil**	3.24	4.21	4.06	4.15	1.73	1.51	1.77	5.11	2.48	3.97
Service	**100mil**	1.59	0.98	2.67	2.04	1.89	2.64	5.50	5.48	4.11	2.87
Number of Staff and Workers											
Total	**10,000**	109.5	107.0	102.8	102.6	83.3	80.4	77.8	74.7	73.1	76.6
Manufacturing	**10,000**	13.2	13.1	13.1	12.9	9.0	8.4	7.8	7.3	7.0	6.7
Service	**10,000**	4.4	4.6	4.8	4.9	3.9	4.0	3.8	3.9	3.8	0,6 + 3,5
Education											
Investment	**100mil**	0.00	0.01	0.07	0.02	0.03	0.07	0.22	0.13	0.08	0.01
Universities	**unit**	5	5	5	5	5	5	5	9	9	11
No. of Graduates H.E.	**unit**	2,365	3,145	3,459	3,689	3,504	3,700	4,021	3,860	3,939	5,846
High Schools	**unit**	475	478	484	494	487	501	503	527	535	542

Province

Chongquing



Area (sq km): 82,000

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**				3,042	3,060	3,075	3,090	3,097	3,107	3,130
Gross Domestic Product	**100mil**			1,179.09	1,350.10	1,429.26	1,479.71	1,589.34	1,749.77	1,971.30	2,250.56
Foreign Direct Investment	**10,000**				38,675	43,107	23,893	24,436	25,649	19,576	26,083
Export	**10,000**				75,562	51,411	49,038	99,566	110,255	109,101	158,499
Import	**10,000**				90,748	51,985	71,841	79,024	73,136	70,226	100,977
Investment in Innovation											
Total	**100mil**	1949 - 1996: Data collected together with Sichuan			65.43	89.22	92.13	89.91	107.79	115.08	122.01
Manufacturing	**100mil**				32.43	32.85	22.02	24.69	30.24	48.16	56.58
Service	**100mil**				19.34	41.11	48.67	48.39	56.32	45.54	33.94
Number of Staff and Workers											
Total	**10,000**				289.3	236.6	222.3	208.9	201.2	199.9	205.6
Manufacturing	**10,000**				113.1	77.2	69.1	61.4	55.6	53.0	54.1
Service	**10,000**				20.3	17.0	15.9	15.4	15.2	14.5	1,8 + 14,3
Education											
Investment	**100mil**				0.14	0.41	1.98	0.46	0.34	1.40	1.07
Universities	***unit***				21	22	23	22	29	29	34
No. of Graduates H.E.	***unit***				18,979	22,579	20,442	22,187	24,316	30,712	42,653
High Schools	***unit***				1,606	1,555	1,552	1,568	1,607	1,574	1,564

Province

Sichuan

Capital: Chengdu

Area (sq km): 458,000

Important cities: Leshan, Nanchong, Panzhihua, Zigong

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	11,214	11,325	11,430	8,430	8,493	8,550	8,329	8,640	8,673	8,700
Gross Domestic Product	**100mil**	2,777.88	3,534.00	2,985.15	3,320.11	3,580.26	3,711.61	4,010.25	4,421.76	4,875.12	5,456.32
Foreign Direct Investment	**10,000**	92,174	54,159	44,090	24,846	37,248	34,101	43,694	58,188	55,583	41,231
Export	**10,000**	180,430	226,951	175,690	202,841	117,116	113,851	139,437	158,272	271,163	320,871
Import	**10,000**	129,420	121,045	197,492	54,972	92,174	132,996	115,083	151,644	175,690	242,558
Investment in Innovation											
Total	**100mil**	107.75	160.32	168.81	117.82	196.15	167.73	173.92	196.45	257.49	369.11
Manufacturing	**100mil**	62.62	91.13	91.73	63.00	59.59	67.83	91.74	111.83	190.61	282.48
Service	**100mil**	23.18	27.97	39.23	27.34	103.79	69.95	50.07	46.78	32.46	29.61
Number of Staff and Workers											
Total	**10,000**	987.1	990.3	987.4	681.6	572.8	547.2	515.4	486.7	481.2	486.7
Manufacturing	**10,000**	366.7	364.7	358.7	228.4	165.7	152.5	138.0	122.0	118.2	117.4
Service	**10,000**	54.4	56.3	56.2	34.2	28.1	27.5	25.5	23.9	23.6	4,1 + 21,7
Education											
Investment	**100mil**	0.21	0.31	0.61	0.25	0.43	0.77	1.38	1.40	1.24	0.25
Universities	**unit**	63	64	64	43	43	43	42	49	57	62
No. of Graduates H.E.	**unit**	45,221	63,219	59,714	37,640	36,672	35,465	42,672	44,602	52,405	74,307
High Schools	**unit**	6,287	6,259	6,157	4,420	4,448	4,375	4,321	5,154	5,093	5,000

Province

Guizhou

Capital: Guiyang

Area (sq km): 174,000

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	3,458	3,508	3,555	3,606	3,658	3,710	3,534	3,799	3,837	3,870
Gross Domestic Product	**100mil**	521.15	610.71	719.83	792.98	841.88	911.86	993.53	1,084.90	1,185.04	1,356.11
Foreign Direct Investment	**10,000**	6,363	5,703	3,138	4,977	4,535	4,090	2,501	2,829	3,821	4,521
Export	**10,000**	30,408	44,269	35,498	44,423	38,787	35,775	42,056	42,177	44,183	58,798
Import	**10,000**	16,464	22,158	13,050	18,503	23,974	18,983	23,942	22,468	24,964	39,635
Investment in Innovation											
Total	**100mil**	24.45	39.45	43.55	55.10	62.79	65.19	93.30	117.37	118.70	140.06
Manufacturing	**100mil**	14.24	21.62	22.96	26.32	25.56	27.58	28.57	44.95	60.39	71.34
Service	**100mil**	5.51	7.05	9.10	13.30	25.23	18.72	23.33	40.61	27.87	25.18
Number of Staff and Workers											
Total	**10,000**	231.1	226.6	231.6	232.8	207.0	187.5	194.0	189.2	188.5	188.7
Manufacturing	**10,000**	72.4	70.4	69.4	68.9	54.5	50.1	46.0	42.8	40.8	41.2
Service	**10,000**	12.5	12.0	12.6	12.3	10.0	9.7	9.1	9.2	8.6	1 + 9.2
Education											
Investment	**100mil**	0.05	0.07	0.07	0.02	0.03	0.06	0.07	0.17	0.23	0.25
Universities	**unit**	22	22	22	20	20	20	23	30	32	34
No. of Graduates H.E.	**unit**	7,932	8,975	10,035	10,234	10,213	10,568	13,739	15,092	17,874	25,362
High Schools	**unit**	1,769	1,783	1,801	1,839	1,881	1,896	1,953	2,222	2,291	2,488

Province

Yunnan

Capital: Kunming

Area (sq km): 394,000

Important cities: Pu'er, Lijiang, Dali

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	3,939	3,990	4,042	4,094	4,144	4,192	4,288	4,287	4,333	4,376
Gross Domestic Product	**100mil**	973.97	1,206.68	1,491.62	1,644.23	1,793.90	1,855.74	1,955.09	2,074.71	2,232.32	2,465.29
Foreign Direct Investment	***10,000***	*6,500*	*9,769*	*6,537*	*16,566*	*14,568*	*15,385*	12,812	6,457	*11,169*	8,384
Export	**10,000**	96,526	125,734	104,380	113,511	113,002	103,455	117,509	124,406	142,971	167,659
Import	**10,000**	66,655	89,050	80,596	54,382	52,166	62,556	63,767	74,472	79,705	99,254
Investment in Innovation											
Total	**100mil**	47.07	98.66	107.00	122.48	130.14	89.77	81.12	101.58	114.00	148.35
Manufacturing	**100mil**	29.46	71.14	66.37	69.49	63.47	32.13	34.08	43.64	56.16	74.35
Service	**100mil**	6.53	12.31	22.95	30.71	36.55	31.22	22.44	44.86	42.27	38.35
Number of Staff and Workers											
Total	**10,000**	312.3	311.6	315.4	313.7	295.1	284.5	273.4	261.6	249.3	244.0
Manufacturing	**10,000**	80.0	78.5	77.7	75.4	64.8	58.7	54.7	51.0	48.2	46.1
Service	**10,000**	18.9	18.9	18.9	19.4	17.9	17.5	17.0	16.9	16.4	2,9 + 14,2
Education											
Investment	**100mil**	0.41	0.33	0.44	0.67	0.75	0.45	0.75	0.48	1.27	0.86
Universities	**unit**	26	26	26	26	26	24	24	28	31	34
No. of Graduates H.E.	**unit**	14,341	16,286	14,546	14,895	15,295	15,797	18,573	19,419	25,620	31,337
High Schools	**unit**	2,182	2,225	2,242	2,240	2,245	2,225	2,236	2,362	2,267	2,275

Province

Tibet

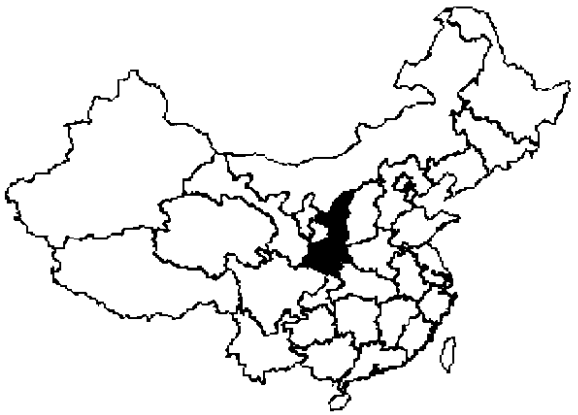
Capital: Lhasa

Area (sq km): 1,23m

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	236	240	244	248	252	256	262	263	267	270
Gross Domestic Product	**100mil**	45.84	55.98	64.76	76.98	91.18	195.61	117.46	138.73	161.42	184.50
Foreign Direct Investment	**10,000**	-	-	-	-	-	-	-	-	-	-
Export	**10,000**	4,487	868	2,074	3,741	4,758	8,627	11,334	8,237	8,112	12,126
Import	**10,000**	60,249	20,854	15,589	13,816	7,212	8,018	1,697	1,054	4,925	3,860
Investment in Innovation											
Total	**100mil**	1.39	3.45	0.31	2.26	3.06	3.44	4.45	4.70	9.25	9.29
Manufacturing	**100mil**	0.06	0.15	0.29	0.03	22.00	0.05	0.54	0.54	0.28	0.53
Service	**100mil**	1.17	1.51	-	1.75	1.21	1.55	1.08	2.79	3.87	3.72
Number of Staff and Workers											
Total	**10,000**	16.0	16.3	16.7	16.7	16.3	15.8	16.2	16.0	14.8	14.5
Manufacturing	**10,000**	1.2	1.1	1.2	1.1	1.1	1.0	0.9	0.6	0.6	0.7
Service	**10,000**	1.9	1.9	1.9	1.8	1.6	1.5	1.1	1.4	1.1	0.2
Education											
Investment	**100mil**	0.01	0.01	-	0.02	0.11	0.10	0.20	0.02	0.01	0.03
Universities	**unit**	4	4	4	4	4	4	4	3	3	4
No. of Graduates H.E.	**unit**	621	525	1,242	857	1,151	1,066	764	1,050	1,686	1,745
High Schools	**unit**	77	86	88	90	90	97	98	100	103	105

Province

Shaanxi



Capital: Xi'an

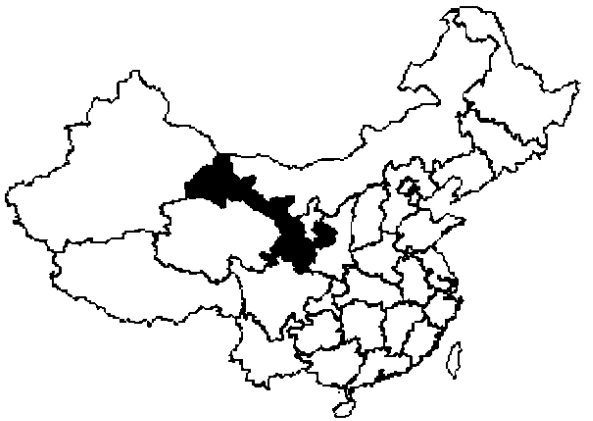
Area (sq km): 205,600

Important cities: Lintong, Yan'an

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	3,481	3,514	3,543	3,570	3,596	3,618	3,605	3,659	3,674	3,690
Gross Domestic Product	**100mil**	816.58	994.65	1,165.38	1,326.04	1,381.53	1,487.61	1,660.92	1,844.27	2,101.60	2,398.58
Foreign Direct Investment	**10,000**	23,860	32,407	32,609	62,816	30,010	24,197	28,842	35,174	36,005	33,190
Export	**10,000**	95,790	126,844	108,539	122,768	117,699	115,084	131,005	110,819	137,603	173,414
Import	**10,000**	46,226	41,443	65,947	50,295	87,480	85,492	83,003	95,381	84,800	104,848
Investment in Innovation											
Total	**100mil**	46.83	67.19	76.46	63.04	83.96	88.77	135.19	133.99	144.86	173.23
Manufacturing	**100mil**	27.99	34.84	35.36	32.05	36.35	23.69	43.62	41.32	55.92	79.72
Service	**100mil**	5.86	19.87	27.55	16.36	27.55	24.37	39.40	42.22	27.14	14.98
Number of Staff and Workers											
Total	**10,000**	392.1	395.0	398.0	396.2	335.2	335.4	327.6	323.8	321.8	319.4
Manufacturing	**10,000**	146.7	146.6	144.7	139.8	104.7	100.5	93.6	91.2	88.6	86.8
Service	**10,000**	21.2	20.5	23.8	23.9	21.8	21.3	21.4	21.0	20.6	2,6 + 19,8
Education											
Investment	**100mil**	0.18	0.50	0.06	0.02	0.02	0.04	0.01	0.01	0.27	0.35
Universities	**unit**	47	46	43	43	42	43	39	47	52	57
No. of Graduates H.E.	**unit**	28,207	37,482	36,927	34,839	34,079	36,328	36,587	42,884	51,603	79,785
High Schools	**unit**	2,829	2,788	2,687	2,645	2,614	2,586	2,599	2,680	2,699	2,714

Province

Gansu



Capital: Lanzhou

Area (sq km): 454,000

Important cities: Baiyin, Dingxi, Longnan, Tianshui

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	10,000	2,378	2,438	2,467	2,494	2,519	2,543	2,562	3,575	2,593	2,603
Gross Domestic Product	100mil	451.66	553.35	714.18	781.34	869.75	931.98	983.36	1,072.51	1,161.43	1,304.60
Foreign Direct Investment	10,000	8,776	6,392	9,002	4,144	3,864	4,104	6,235	7,439	6,121	2,342
Export	10,000	34,687	36,027	27,331	35,931	34,482	31,703	41,495	47,632	54,891	87,720
Import	10,000	15,599	23,925	20,031	11,904	10,313	8,924	15,458	30,256	32,849	44,994
Investment in Innovation											
Total	100mil	25.16	36.18	52.33	60.58	76.25	79.26	88.99	115.82	137.92	161.80
Manufacturing	100mil	14.15	25.69	27.30	27.80	31.32	32.79	30.07	59.01	80.51	109.10
Service	100mil	5.89	5.37	13.74	14.61	16.16	21.29	34.64	31.15	24.78	12.67
Number of Staff and Workers											
Total	10,000	253.4	250.1	251.6	246.7	221.8	205.4	201.2	193.0	190.2	189.0
Manufacturing	10,000	88.9	85.8	85.5	81.8	66.0	60.3	54.3	49.7	47.6	47.4
Service	10,000	16.2	15.1	14.9	15.0	12.7	11.9	11.8	12.0	12.5	1,8 + 12,3
Education											
Investment	100mil	0.13	-	0.07	0.20	0.31	0.15	0.09	0.01	0.09	0.05
Universities	unit	17	17	17	17	17	18	18	25	25	31
No. of Graduates H.E.	unit	9,963	14,288	13,314	13,140	13,251	14,007	14,255	17,000	21,647	29,582
High Schools	unit	1,632	1,626	1,657	1,767	1,777	1,778	1,789	1,979	2,004	2,031

Province

Qinghai

Capital: Xining

Area (sq km): 720,000

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	10,000	474	481	488	496	503	510	518	523	529	534
Gross Domestic Product	100mil	138.24	165.31	183.57	202.05	220.16	238.39	263.59	300.95	341.11	390.21
Foreign Direct Investment	10,000	241	164	100	247	-	459	-	3,649	4,726	2,522
Export	10,000	12,627	12,999	11,347	11,659	10,405	8,686	11,200	14,913	15,100	27,389
Import	10,000	2,626	2,398	1,455	1,201	1,369	2,099	4,773	5,577	4,565	6,525
Investment in Innovation											
Total	100mil	5.17	8.59	10.91	13.64	13.67	15.26	17.09	20.79	25.78	40.57
Manufacturing	100mil	3.73	4.45	5.03	6.85	5.83	6.53	5.41	9.70	12.73	27.67
Service	100mil	0.58	1.50	1.29	2.56	2.32	3.72	6.67	4.84	2.97	0.35
Number of Staff and Workers											
Total	10,000	65.3	65.8	65.6	63.7	56.2	52.4	46.9	43.5	42.2	41.1
Manufacturing	10,000	19.3	19.4	18.8	17.2	13.2	11.4	8.3	7.1	6.7	6.7
Service	10,000	4.6	4.5	4.4	4.2	3.7	3.6	3.6	3.5	3.5	0,7 + 2,8
Education											
Investment	100mil	0.05	0.10	0.12	0.12	0.04	0.01	0.02	0.02	0.04	0.50
Universities	unit	7	7	7	6	6	6	7	8	11	12
No. of Graduates H.E.	unit	1,781	2,133	2,033	2,135	2,241	2,490	2,202	2,561	2,763	4,771
High Schools	unit	471	471	467	459	449	448	448	486	492	504

Province

Ningxia

Capital: Yinchuan

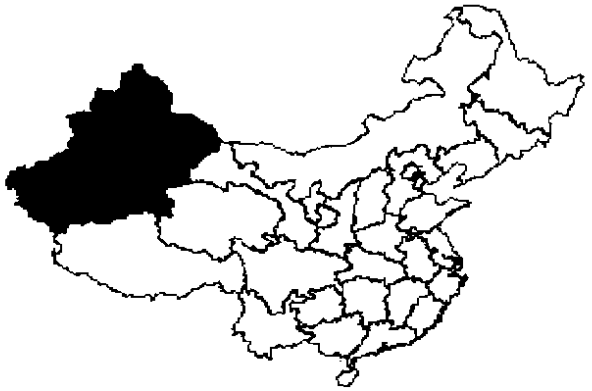
Area (sq km): 66,400

Important cities: Shizuishan

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	**10,000**	504	513	521	530	538	543	562	563	572	580
Gross Domestic Product	**100mil**	133.97	169.75	193.62	210.92	227.46	241.49	265.57	298.38	329.28	385.34
Foreign Direct Investment	**10,000**	727	390	555	671	1,856	6,134	1,741	1,680	2,200	1,743
Export	**10,000**	10,923	16,849	15,468	18,616	21,037	24,765	32,737	35,184	32,318	51,195
Import	**10,000**	6,371	5,114	3,507	3,987	2,858	7,034	11,555	18,093	11,473	14,128
Investment in Innovation											
Total	**100mil**	11.63	15.17	17.37	17.97	18.47	18.44	22.73	25.02	25.15	40.76
Manufacturing	**100mil**	6.30	7.00	8.76	8.75	6.01	9.34	14.27	17.25	15.67	29.29
Service	**100mil**	1.81	3.52	4.08	4.43	7.52	5.68	4.75	4.42	4.59	4.57
Number of Staff and Workers											
Total	**10,000**	72.3	73.4	72.7	73.9	67.4	64.1	62.7	60.4	59.6	59.4
Manufacturing	**10,000**	20.2	21.2	21.0	20.4	16.2	15.1	14.4	13.1	12.4	11.7
Service	**10,000**	3.3	3.8	3.6	3.6	3.1	3.3	3.3	3.3	3.5	0.6 + 3.1
Education											
Investment	**100mil**	0.03	0.07	0.02	0.02	0.02	-	-	-	0.04	-
Universities	**unit**	7	7	7	5	5	5	6	8	12	12
No. of Graduates H.E.	**unit**	2,398	2,717	3,277	2,721	3,052	2,680	3,154	3,177	3,379	5,461
High Schools	**unit**	438	436	438	442	430	432	433	448	449	446

Province

Xinjiang



Capital: Ürümqi

Area (sq km): 1,6m

	Unit	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population	10,000	1,632	1,661	1,689	1,718	1,747	1,774	1,925	1,876	1,905	1,934
Gross Domestic Product	100mll	673.68	825.11	912.15	1,050.14	1,116.67	1,168.55	1,364.36	1,485.48	1,598.28	1,877.61
Foreign Direct Investment	10,000	4,830	5,490	6,390	2,472	2,176	2,404	1,911	2,035	1,899	1,534
Export	10,000	42,264	59,212	47,210	56,978	74,769	102,734	120,413	66,849	130,850	254,055
Import	10,000	43,568	57,935	46,662	55,426	77,732	73,801	105,991	110,299	138,320	222,931
Investment in Innovation											
Total	100mll	40.45	62.67	68.58	73.91	76.09	61.09	77.54	108.18	115.35	127.41
Manufacturing	100mll	15.83	21.78	17.89	16.05	15.75	22.07	27.58	31.40	41.91	54.58
Service	100mll	6.60	12.11	18.30	19.53	20.71	16.51	17.71	38.84	31.66	21.11
Number of Staff and Workers											
Total	10,000	311.8	311.9	313.6	310.7	283.3	270.9	255.8	247.0	242.3	237.9
Manufacturing	10,000	54.6	56.0	54.3	50.9	42.2	37.7	32.7	30.9	28.2	26.6
Service	10,000	16.1	15.4	14.9	14.3	13.0	12.2	11.4	10.8	10.3	1,5 + 10,6
Education											
Investment	100mll	0.09	0.19	0.42	0.12	0.35	0.33	0.54	0.09	0.54	0.76
Universities	unit	21	21	18	18	17	17	16	21	22	26
No. of Graduates H.E.	unit	7,645	10,414	12,130	10,750	11,228	11,657	13,774	15,844	16,025	25,264
High Schools	unit	1,830	1,792	1,776	1,770	1,773	1,725	1,711	1,929	1,945	1,932

Source: China Statistical Yearbook, 1994-2003.

Note: 1. The data of Taiwan Province are not included.

2. In 1997, Chongqing, which used to be part of Sichuan Province, was granted the status of a municipality (provincial level city). Therefore, data for Chongqing before 1997 are incorporated into those for Sichuan Province.

5.3 Overview of theory of geographical economics

As can be seen in figure and table 5.1, during the period 1994-2003, the variation in economic performance had displayed some distinct geographical patterns in China. Coastal provinces had tended to outperform the central provinces, which in turn had surpassed the western provinces (see section 1.4.1 and table 1.1 about the information on coastal, central and western regions). In the recent literature on economic growth, geography as well as institutions (see section 2.5) is often identified as the ultimate determinants of economic growth and development (Zipfel, 2004). Therefore, it is necessary to understand the role of geography in development.

5.3.1 Two geographical divides

On a global scale, the wealth of nations is well characterised by two geographical divides. The first geographical divide emphasises differences in ecological conditions: the temperate zone versus the tropical zone. The second geographical divide emphasises differences in the ability to conduct international trade: the coast versus the interior. Both of these geographical divides are a combination of independent causes of economic wealth and of proxies for some important determinants of economic prosperity (Demurger *et al*, 2002a; b).

5.3.2 Temperate–tropical divide

The empirical validity of the temperate–tropical divide is well supported by the fact that over 90% of the world's poor lives between the tropic of Cancer and the tropic of Capricorn. That is, the general point about differences in the development potential of different ecological zones is important (Demurger *et al*, 2002a; b). Section 1.4.1 of this study provided the information that China does not have a substantial part of its territory within the tropical zone. Therefore, from the geographical viewpoint, the temperate-tropical dichotomy is not the major factor to explain the significant variation in regional economic performance in China, which is a feature of the provincial data in figure and table 5.1.

However, the insights from physical geography have led many economists to realise that geography fundamentally influences how a society develops (Diamond, 1997; Engerman and Sokoloff, 1997; Landes, 1998; Gallup, Sachs, and Mellinger, 1999). Using geography as an explanation of economic performance focuses on the fact that some geographic characteristics are great accelerators to the economic development of a society, others are great hindrances (Zipfel, 2004).

For example, if a country or region has great access to fertile land, this can allow it to support a larger population and allow people to specialise in non-agricultural tasks and will increase the productivity and complexity of the sector's economy (Zipfel, 2004). China covers 9.6 million square kilometres. The arid plateaus of northwestern China are different from the grain-growing plains of central China, and the wet, warm southwestern provinces. The different geographical features should help to explain differences in provincial

incomes (Démurger, 2001; Démurger *et al*, 2002a; b).

5.3.3 Coast–interior divide

The coast–interior dichotomy highlights the importance of transport costs in determining a region's participation in international trade (Demurger *et al*, 2002a; b). The point is that transport costs that seem quite modest relative to the value of gross output can be very large relative to value added attributable to immobile factors of production. Transport costs can then have a major impact on per capita incomes (Venables, Shalizi and Henderson, 2000). This is why the low cost of water transport makes the coastal areas along navigable rivers that flow to the sea better suited to be platforms for producing manufactured exports. It is widely accepted that investments in physical infrastructure and transport technology can change the comparative advantages of a region (Démurger, 2001; Démurger *et al*, 2002a; b). The advantages of geographical location possessed by China's coastal region compared to the interior areas will be discussed in detail in the following section.

5.4 Empirical studies into China's provincial growth

As shown in section 5.2, the Chinese economy in general and the well-being of the world's largest population in particular have improved significantly since 1978 and every province has achieved remarkable growth during the period. However, different provinces evince quite different growth trajectories. The apparent widening disparity across China's provinces or groups of provinces raises the question of whether provincial per capita incomes have diverged and, if so, why? There have been a handful of empirical studies of regional disparities in China (Wan, 1998; Li and Zhao, 1999; Fujita and Hu, 2001). It is noteworthy that the majority of the empirical work in this area uses data for the time-period before the end of 1990s. This section intends to summarise these existing studies in order to address the questions of regional convergence or divergence.

5.4.1 Studies on convergence in China's regional economies

In section 2.3.2 of this study, convergence was introduced as one of the key predictions in the neoclassical model. In section 4.2.2.1, it was shown that the empirical results of studies of China, as a whole nation, supported the prediction. As the trend has been for the rapid economic growth to be concentrated along the coastal provinces, convergence or divergence of China's regional economic growth has become an important issue. A number of studies have been carried out in the field (Knight and Song, 1993; Hussain, Lanjouw and Stern, 1994; Wan, 1998; Li and Zhao, 1999).

For example, Jian, Sache, and Warner (1996) find some evidence of convergence for 1978-1990 and strong evidence of divergence in 1965-1978. During 1990-1993, although convergence continued within the coastal provinces, the coastal and interior regions of China began to diverge, reflecting in part the special privileges given to the coastal regions (preferential policies; see section 5.4.2.1). That is, from 1990 to 1993, the

divergence in regional incomes was shown by an increase in the variance of per capita incomes between the coastal provinces and the interior provinces, was rather than by an increase in the variance of per capita incomes within either the coastal region or the interior. They conclude that China is on a dual track, with a prosperous coastal region that is growing rapidly and the poor interior that is growing more slowly.

Chen and Fleisher (1996), using an augmented Solow growth model, find evidence of conditional convergence of per capita production across China's 25 provinces from 1978 to 1993 after controlling for the variables of employment, physical capital, human capital, and the dummy for the coastal zone. Their result also suggests that convergence is occurring within the coastal and inland regions but not between these regions.

Li, Liu, and Rebelo (1998) subdivide the period 1978-1995 into three time intervals to test the neoclassical model of economic growth at the provincial level. They point out that although economic reforms in China have facilitated convergence of each province toward its steady state, they have also widened the gap between the steady states of different provinces.

Yao and Zhang (2001a; b) use both cross-section and panel data approaches to study regional growth in China. They find that inter-regional income inequality increased and the coastal areas became richer but interior regions, especial western provinces became poorer over the data period 1978-1995. Other studies, including Knight and Song (1993), Rozelle (1994), Hussain *et al* (1994) and Yao (1997; 1999) also show a significant increase in cross-region income inequality in the reform period, particularly in the late 1980s and 1990s.

Therefore, the major conclusion is that until the end of 1990s Chinese regions had converged into three distinctive geo-economic clubs of economic growth. Within each economic club, there was a tendency of convergence, but between the clubs, there was a tendency of divergence. That is, the problem of inequality is between the coastal zone and the inland areas, particularly the western part of the country.

5.4.2 Determinants of China's regional growth

From the overview of the existing literature (see section 5.4.1), which has focused on assessing inequalities among regions (coastal, central and western) in China, the dominant view is that regional disparity had increased from 1978 to 1990s. So, the question about the origin and causes of the inequalities has emerged.

What are the major factors that drive high economic growth in the coastal region, and what causes the inner regions to lag behind during this period? What useful lessons about development can the inner regions learn from its coastal counterpart? These issues have become the new focus of current debate in China. A broad range of reasons has been forwarded to explain the divergence of regional incomes. It is generally accepted that the reasons for the poor performance of interior regions include poor economic basis, shortage of capital, low quality of human resources and poor natural conditions. Various researchers have been emphasising particular factors that affect regional disparity. It should be pointed out that no evidence of conditional

convergence emerges without adding a coastal dummy variable. That is, in almost all the provincial growth regressions, the common finding is that the coastal dummy variable significantly accounts for differences in economic growth among provinces. The coastal dummy variable used in many studies is an amalgam of "pure geography effects" and "preferential-policy effects", which means that the high coastal growth has been due to the institutional reform; and it also comes from geographical advantages (Chen and Fleisher, 1996; Jian, Sachs, and Warner, 1996; Démurger, 2001; Zhang, 2001). In this section, explanations will be given as to why geography and preferential policy are emphasised as particular factors that affect coastal-interior disparity in the empirical literature.

Some studies quantify the relative contributions of geography and preferential policy variables to the growth rates of provinces in the different regions (Wang and Hu, 1999; Démurger, 2001; Démurger *et al*, 2002a; b). With the cross-sectional growth regressions, Démurger (2001) reported that the growth rate of the typical coastal province benefited about equally from its geographical location (2.84%) and preferential polices (2.83%) in the period 1996-1999. The level of each type of benefit received by the coastal provinces was higher than the level received by provinces in other regions in their empirical work. Up to now, the two factors—geography and preferential policy—have been mainly accounted for through a coastal dummy variable in the existing empirical studies (Jian, Sachs, and Warner, 1996).

5.4.2.1 Preferential policies

In the post-1978 period, it is widely accepted that "preferential policies" have an important and special position in China's economic development (Chen and Fleisher, 1996; Jian, Sachs, and Warner, 1996; Démurger, 2001 and Zhang, 2001). In section 3.6.3.5 of this study, it was discussed that "preferential policy", as one of the determinants of FDI, referred to the special favourable policies in taxation, land use, and foreign currency exchange in open economic zones (OEZs). In the same chapter, it was also mentioned that because of focusing on specific regions (OEZs), China's preferential policy was largely to blame for the growing gap between coastal and inland provinces (Wang and Hu, 1999).

From the above content, it can be concluded that the so-called "preferential policies" extended to the coastal regions are in essence policies to marketise and internationalise these coastal economies. Many economists consider that the real meaning of preferential policies in the context of China should rightly be called "deregulation policies" because a centrally planned economy is an over-regulated economy. What the preferential policies really do is to remove some of these regulations against the marketisation and internationalisation of economic activities (Démurger, 2001; Démurger *et al*, 2002a; b).

Table 5.2 summarises the various types of economic zones and the preferential policies that have been offered by Chinese authorities, mainly on favourable tax incentives. It also reveals that the coastal provinces have benefited from the preferential policies that allow these coastal provinces to operate in an economic environment closer to those of their East Asian neighbours (and competitors) (Démurger *et al*, 2002a; b).

Table 5.2: China's regional preferential policies

Type of opened zone and abbreviations	Preferential policies
Special Economic Zones (SEZs)	The income tax rate for domestic enterprises and FFEs in SEZs is 18%. FFEs receive the same two-year exemption and three-year reduction as under the standard income tax regime. Export-oriented and advanced-technology FFEs pay 10% (instead of 15%) after the initial five-year exemption and reduction period has expired. FFEs engaged in infrastructure projects in Hainan (for airports, harbours, docks, railways, highways, power plants, and water conservation) and with contracts for operating periods of 15 years or more are eligible for a five-year exemption period followed by an additional five years at a reduced rate (10% instead of 15%) after the first profitable year.
Open Coastal Cities (OCCs) and Areas, Open Border Cities, Inland Provincial Capitals, and Yangtze River Open Cities	Domestic enterprises in these areas pay 33% and FFEs 27% (including the 3% local government component) and enjoy the same two-year exemption and three-year reduction as under the standard income tax regime. For projects with foreign investment of US$30 million or more (registered capital) and a long recovery period, knowledge- or technology-intensive projects, and energy, transport, or harbour construction projects, the 24% component may be reduced to 15%.
Economic and Technology Development Zones (ETDZs)	Domestic enterprises and production-related FFEs in economic and technology development zones pay 18% (including the 3% local component), the latter with the same two-year exemption and three-year reduction as under the standard income tax regime. For export-oriented and advanced-technology FFEs, the same extended reductions as in the SEZs apply.
High Technology Development Zones (HTDZs)	Domestic enterprises and FFEs pay 18% (including the 3% local component). The latter are entitled to the same exemptions and reductions as under the standard income tax regime for high- or new-technology enterprises.

Source: Tseng and Zebregs, 2003.

The leading role of this selective open-door policy in regional growth has been emphasised by many empirical studies (Mody and Wang, 1997; Chen and Feng, 1999; Démurger, 2000). For example, based on cross-country empirical analysis, Chen and Feng (1999) confirmed that the open-door policy consistent with the establishment of SEZs was conductive to the coastal provinces' growth and development. It has also been found that FDI is a very effective channel for technology transfer that mainly benefits the coastal provinces, because most of the FDI is concentrated there. Therefore, it can be realised that FDI is the main growth mechanism of the provincial preferential policies (Démurger, 2000).

5.4.2.2 Geography

One result from figure and table 5.1 was that the performances of Chinese provinces displayed distinct geographical patterns. This phenomenon led to the overview of the theory of geographical economy in section 5.3. Through summarising the regressions from existing studies, section 5.4.1 showed that the Chinese provinces appeared to have converged into three distinctive growth clubs. This situation is consistent with the official definition of three geo-economic zones (east, central and west; see section 1.4.1) (Yao and Zhang,

2001a; b). Consequently, there is no doubt that geography is an important factor for explaining the growth of the coastal economies.

The knowledge of China's topography and the changes in China's economic structure and policy regime in the pre- and post-reform period suggest at least two channels through which geography has influenced provincial income levels. The first channel is agriculture, and the second channel is international trade and FDI (Démurger, 2001; Démurger *et al*, 2002a; b).

Topographically speaking, China is a "three-step staircase stepping down from west to east" (Démurger *et al*, 2002a; b). The highest step is the Qinghai-Tibet Plateau, 4000 metres above sea level in the southwest. The central regions form the second step, consisting of highlands and basins with elevation of 1000 to 2000 metres. The eastern regions lie in the lowest step. These regions are close to coastlines and seaports and most of their land is flat. The climate in the eastern regions is also more favourable, warmer and with more precipitation (Démurger, 2001; Démurger *et al*, 2002a; b).

Due to these geographic differences, the eastern regions are traditionally important bases for agriculture and commerce and their population densities are high. The western regions are richly endowed with mineral resources, but the mountainous landscape makes it very costly for the people in these regions to explore those endowments. The natural conditions in the west are poor and the climate harsh. Therefore, those regions are sparsely populated and historically speaking, they were the poorest (Démurger, 2001; Yao and Zhang, 2001).

Section 1.4.3 of this study introduced "the five-year plans" in China. From the changes in China's economic structure and policy regime, it can be realised that China was a predominantly agricultural economy until the middle of the 1980s (see seventh five-year plan in table 1.1). Prior to the 1978 reforms, nearly four in five Chinese worked in agriculture (Hu and Khan, 1997). As was shown in section 4.3.2.3, the development of the Chinese economy is consistent with the industrialisation process (Chenery and Syrquin, 1986). In the post-1978 period, there are big differences in the degree of structural change, labour shifts from agriculture to industry, across different provinces, but agriculture remains the dominant economic sector for most non-coastal provinces. Given the large size of the agricultural sector in many provinces during 1978-1998, agricultural productivity was still an important determinant of provincial income per capita (Démurger, 2001; Démurger *et al*, 2002a; b). Since differences in provincial topographical features, such as elevation and flatness of arable land, help shape differences in agricultural productivity across provinces. As suggested by the theory of geographical economy, they should also help to explain differences in provincial income (see section 5.3.2; Démurger, 2001; Démurger *et al*, 2002a; b).

From the point of view of topography, geography also affects provincial income through physical location. Section 5.3.3 explained why the coastal economies were most advantageously located to engage in international trade. As most FDI in China is export-motivated, FDI would prefer provinces that provide easier access to sea transport. Since a large and growing proportion of China's export is produced by rural enterprises,

it has been natural for these export-oriented rural enterprises (TVEs) to be established in the coastal provinces. It was discussed in section 3.5.2 that TVEs were the engine of economic growth, which accounted for almost 30% of the increase in output during 1978-1993 (Woo, 1998). Thus rapid development of TVEs has made the coastal regions into major growth areas in China. Therefore, FDI and TVEs, as the main growth mechanisms for geography, allow provinces with easy access to sea transport to receive boosts to their incomes from international trade (Démurger, 2001; Démurger *et al*, 2002a; b).

In the empirical literature, Démurger *et al* (2002a; b) use geographic characteristics to explain differences in provincial economic growth and find that geographical determinism fit the data well. Wang and Hu (1999) discuss in detail the importance of physical terrain in determining provincial economic growth. They also note that "policy variables may also reflect a province's geography location".

5.5 Estimation of regional disparity

In the existing literature, as discussed in section 5.4.1, it can be realised that almost all the convergence analyses across China's regions use data for the time-period before the end of 1990s. In analysing provincial economic growth in China, the most common approach adopted in empirical studies is a standard "cross-section" approach (for example, Chen and Feng, 1999). The purpose of this section is to estimate the determinants of provincial economic growth across China's 31 regions and do convergence analysis for the more recent period of 1994-2003. Instead of using a cross-section approach, fixed- and random-effects models are adopted for the analysis of panel data. These models of panel estimation allow for both time-specific and province-specific variations.

5.5.1 Convergence and empirical modeling

As discussed in the previous parts of this study (see sections 2.3.2; 4.2.2.1 and 5.4), "a key property of the neoclassical growth model is its prediction of conditional convergence" (Barro and Sala-i-Martin, 2004). Such a concept applies "when the growth rate of an economy is positively related to the distance between this economy's level of income and its own steady state". In contrast, absolute convergence applies "when poor economies tend to grow faster than rich ones". Barro and Sala-i-Martin (2004) believe that "absolute (unconditional) convergence is more likely to apply across regions within countries than across countries" due to relative homogencity in terms of technologies used by firms and households of different regions, tastes and preferences of consumers, common central governments, and similar institutional setups and legal systems. Convergence takes place because of diminishing returns to capital.

Based on the work of Barro and Sala-I-Martin (2004), the concept of unconditional convergence can be represented by the following basic equation:

$$\frac{1}{T} ln(y_{i,t}/y_{i,t-T}) = \alpha + \beta ln(y_{i,t-T}) + \varepsilon_i \qquad (5.1)$$

$y_{i,t}$ is real per capita GDP in region i at time t. α is a constant term and ε_i, an error term. Negative β implies unconditional β convergence. According to the neoclassical growth theory, α is influenced by the rate of technological progress and the steady state growth rate of real per capita GDP (Barro and Sala-i-Martin, 2004). β represents the speed of convergence (Yao and Weeks, 2000).

As it is suggested above, unconditional convergence happens when all regions converge to the same steady state values. This is based on the assumption that regional economies within a country do not differ significantly in their technological levels, investment ratios, industrial structures and other structural factors (Barro and Sala-i-Martin, 2004).

By comparison, the concept of conditional convergence can be represented as follows:

$$\frac{1}{T} ln(y_{i,t} / y_{i,t-T}) = \alpha + \beta ln(y_{i,t-T}) + A^T X_i + \varepsilon_i \quad (5.2)$$

where X_i is a vector of all the control and environmental variables and A is the associated vector of coefficients. When β is less than zero, conditional β convergence occurs. It is labeled as "conditional" because regional economies converge to different steady states, given different fundamentals (Yao and Weeks, 2000).

In the section below, these two concepts of convergence will be tested through the panel data approach across *different regions in China, in terms of levels of per capita income or product.*

5.5.2 Methodology

In this study, the methodology is driven by a desire to address traditional econometric problems in cross-country regressions such as unobserved country effects and endogeneity. As such, various estimators and specifications are used, namely Ordinary Least Squares (OLS) and Generalized Least Squares (GLS) (Random-effects). This section describes the methodology.

5.5.2.1 Estimators

Equation (5.2) comprises the single point, period-averaged, cross-section regression equation, using OLS. However, this approach has certain shortcomings. Islam (1995) argues that the bias generated by the correlation of omitted country- (region-) specific technology effects and the technological growth rate in steady state, biased the convergence speed parameter downwards. Furthermore, according to Yao and Weeks (2000), "there may be additional problems due to endogeneity of control variables."

China is the most populous country in the world and, among its regions, there are strong geographic disparities in resource endowments, living standards, and other determinants of economic growth (see section 5.4.2.2).

Since the reform started in China in 1978, the regions across China haven't had the same access to the same technologies and know-how. In fact, across the Chinese regions, there exists heterogeneity in both initial technology and the rate of technological progress (Zhou, 2004). Yao and Weeks (2000) believe that "the panel data approach initiated by Islam (1995) has potential advantages over the cross-sectional method in overcoming these two problems."

In the case of panel data, more complex estimation strategies have to be followed such as using GLS panel data estimators. With panel data, the issue is whether to use random effects or fixed effects estimation approaches. To illustrate the choice and its implications, consider the following:

Equation (5.2) can be written in the following manner to illustrate the different estimation options when a panel of data is available (showing that panel data models have complex error structures).

$$y_{it} = x_{it}\ \beta + c_i\ + u_{it} \tag{5.3}$$

For i = 1,.....N and t = 2,.....T and where y_{it} = economic growth rate of region i in period t; x_{it} = a $1 \times K$ vector of explanatory variables that can vary over t and i; c_i = unobserved region characteristics, e.g. due to initial technical efficiency, that are constant over the time period, and influence y_{it}; and u_{it} = an idiosyncratic error term with variance δ_u^2 with the usual properties (Naudé, 2004).

From equation (5.3) the so-called "between" estimator[10] is OLS applied to the following equation (Naudé, 2004):

$$\overline{y}_i = \alpha + \overline{x}_i\ \beta + c_i + u_i \tag{5.4}$$

where $\overline{y}_i = T^1 \Sigma_{t=1}^{T} y_{it}$ and so on. It should be noted that the "between" estimator is not consistent because $E(\overline{x}_i c_i) \neq 0$.

The fixed effects (or "within") estimator[11] is obtained by using OLS to estimate (Naudé, 2004):

$$(y_{it} - \overline{y}_i) = (x_{it} - \overline{x}_i)\ \beta + (u_{it} - u_i) \tag{5.5}$$

The random effects estimator is a weighted average of the estimates produced by the between estimator (5.4) and within estimator (5.5) (Naudé, 2004).

[10] The between estimator only uses the variation between the cross section observations.

[11] The within estimator uses the time variation within each cross section of observations.

In the section 5.5.2.4, two of the methods/approaches discussed in this section (random effects and fixed effects) will be used (with STATA 9.0) and compared to estimate the determinants of spatial economic growth in China. The following section sets out the variables used in the $1 \times K$ x_{it} vector of explanatory variables.

5.5.2.2 Variables and specifications

In section 4.2.2, the five economic factors, initial GDP, investment, population growth, human capital and openness, were identified as the determinants of national growth in China since 1978. It was also explained how each determinant influenced economic growth through economic growth theory. Empirical studies support the theoretical expectations in China.

In this section, the above five economic factors will also be used in the growth regressions to test the significance of these determinants in explaining provincial economic growth in China between 1994 and 2003.

It is noteworthy that for each of human capital and openness factors, a number of alternative measures or instruments are available. For example, there are many forms of human capital investment, such as education, health care, training and etc. For simplicity, this study will follow Mankiw, Romer and Weil (1992) in focusing on education. The educational growth (level) will be used in this study as a proxy for human capital stock.

The impact of openness has also been measured by various variables in the existing empirical studies (see section 4.2.2.5). In this study, export growth and FDI growth will be used as proxies to measure the openness of a province. Thus, a positive relationship will be expected between both of them and the region's economic performance.

In section 5.4.2, it was emphasised that a coastal dummy variable had been found in the literature to be significantly positively correlated with provincial GDP per capita growth between 1978 and 1998. Across the entire period 1994-2003, it is also expected in this study that the coastal regions should experience rapid growth as a result of the geographical advantages and preferential policies. To test this idea, as previous empirical studies did, a coastal variable is added to the standard convergence regressions: a dummy variable coded to take the value one if the province contains open coastal cities, and the value of zero otherwise. The coastal dummy variable, as was used in many studies (see section 5.4.2), is an amalgam of "geography effects" and "preferential-policy effects".

Following economic growth theory and the explanations for provincial economic growth in China, two growth-specifications will be estimated using various estimators in this study. The first specification is a test for absolute convergence in growth rates amongst China's 31 regions and contains only initial GDP per capita as regressor. The second specification conditions convergence on the variables which were discussed above.

5.5.2.3 Data

The data set is a panel of 31 regions covering the period: 1994-2003, yielding 276 observations. The primary data source for this study is figure and table 5.1 from the China Statistical Yearbook complied annually by the State Statistical Bureau (SSB) of China. The initial level of real per capita GDP is that of 1994. The variables are averaged over the period. It should be noted that the data of Chongqing only began in 1997 because Chongqing, previously part of Sichuan Province, became a provincial level city in 1997. Also, for political as well as economic reasons, Taiwan Province is an outlier and an anomaly for this group of observations and is therefore excluded.

5.5.3 Regression results

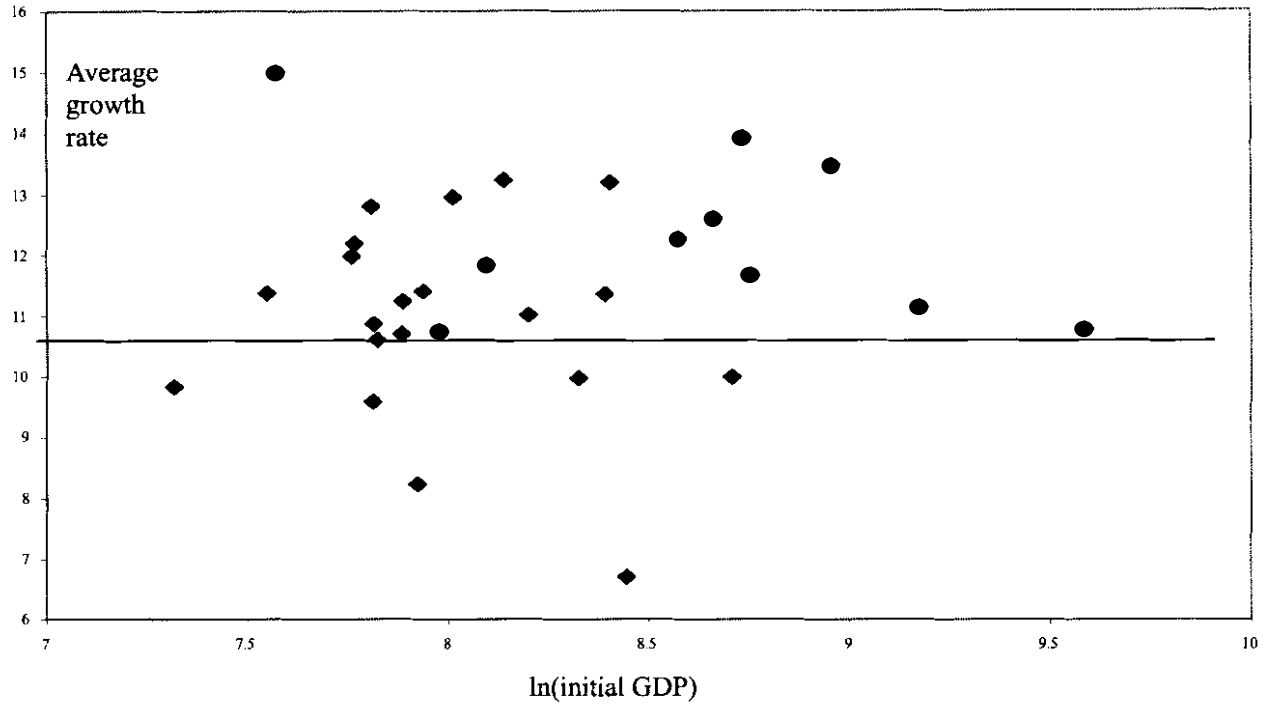
5.5.3.1 Results for absolute convergence across regions

Table 5.3 reports the regression results for the first specification. As discussed above, convergence can be tested by regressing average annual growth rates of GDP per capita (y_i) on the log of initial GDP per capita (y_{i0}). The first specification rejects absolute convergence. Figure 5.2 gives the same result with table 5.3. It is clear that, during 1994-2003 period, the regions in China had mainly shown a tendency of divergence.

Table 5.3: Test for absolute convergence: dependent variable growth in GDP

Variables	Coefficient	t-value	P>| t |
Constant	10.19695	2.02	0.0528
ln(initial GDP)	0.15003	0.24	0.8087
$R^2 = 0.0021$ Number of observations = 276			

Figure 5.2: Plot of the log of initial per capita GDP with average growth rate, 1994-2003



5.5.3.2 Random and fixed effects panel data regressions

For the estimation of the second specification, two estimation methods are used. The results of fixed-effects OLS estimator and the GLS random-effects regression are contained in table 5.4.

The random effects approach to estimating β exploits the correlation in the composite error in equation (5.3), $v_{it} = c_i + u_{it}$. The approach puts c_i in the error term assuming that c_i is orthogonal to x_{it} and uses a Generalized Least Squares (GLS) estimator to take into account serial correlation in the composite error v_{it}.

There can, however, be many instances where this assumption is invalid. Specifically, c_i can be correlated with x_{it} in a cross-country growth framework if c_i influences the variables. In such a case, using the fixed-effects estimator may be more appropriate. Wooldridge (2001) shows that a fixed-effects estimator is more robust than a random effects estimator. A shortcoming of the approach is, however, that time-constant factors, such as geographical factors and initial period variables, cannot be included in x_{it} – otherwise there would be no way to distinguish the effects of these variables from the effects of the unobservable c_i.

Table 5.4: Panel data regression analysis results for GDP per capita growth

Estimation method	Fixed-effects OLS regression		Random-effects GLS regression	
Variables	**Coefficient**	**P > |t|**	**Coefficient**	**P > |t|**
ln initial *GDP*			0.0000459	0.992
Export growth	0.0561846	0.002***	0.061809	0.000***
Education growth	0.0008522	0.791	0.0016948	0.586
Investment growth	0.1540903	0.000***	0.1427491	0.000***
FDI growth	0.0127898	0.264	0.0217589	0.042**
Population growth	-0.0029584	0.972	0.039474	0.628
Coastal dummy			0.0103255	0.166
R^2	0.2511		0.2633	

Note: 1) ***Significance at the 1%, **at the 5% level.

2) The Hausman specification test rejects the null hypothesis that the difference in coefficients between the random effects and fixed effects estimates is not systematic.

Accordingly, the fixed-effects estimator is used to estimate the regression and the Hausman specification test is also done to evaluate the assumption in the random effects model that c_i is orthogonal to x_{it}. The fact that this test (reported at the bottom of table 5.4) can reject the null hypothesis, suggests that the random effects model assumption is invalid in this case.

The model of fixed-effects OLS panel data regression explains 25% of the variance in per capita GDP growth. In column 1 of table 5.4, all of the variables are of the right signs. As expected, export growth, education growth, investment growth and FDI growth are positively related with the average growth rate of per capita GDP and population growth affects the annual growth rate negatively. In terms of coefficient size, export growth and investment growth clearly have the most important effects on regional economic growth in China: a 1% increase in export growth or investment rate results in a 0.056% and 0.15% rise respectively in regional economic growth rate.

In comparison, the results of GLS random-effects panel data regression first reject conditional convergence. The "goodness of fit" of this model is about 26%. Just like in the fixed-effects model, export growth, education growth, investment growth and FDI growth affect economic growth positively. But unlike the result in the fixed-effects model, the coefficient of FDI growth becomes significant and population growth turns out to have positive influence on regional economic growth.

As for the effect of population growth, it is generally accepted that population growth affects economic performance negatively since part of social resources has to be diverted from production to sustain the increased population (see section 4.2.2.3). However, this positive sign might be explained by the fact that there is something quite unusual going on in China. After the Chinese government opened up coastal cities, local governments and enterprises in those open cities implemented special policies to attract talented people from other areas. Therefore, people from other regions flocked to those cities. Economies in the host regions are greatly boosted by the immigrant workers (Zhou, 2004). Meanwhile, the average stocks of physical capital in the home areas are also improved. As a result, during the period 1994-2003, population growth was positively related with output growth in this model.

The only surprise is that the estimate of the coastal dummy variable does not have the expected significance. Holding other variables constant, coastal regions grow faster than interior areas at an estimated annual speed of 1.03%. Except for FDI growth, the other variables that are statistically significant are still export growth and investment growth.

5.5.4 Conclusion and policy implications

In this section, the recently available data (1994-2003) from the Chinese provinces were used to study the factors that drove economic growth across the provinces and the income convergence between the coastal and inner regions. The estimation methods used in this study were fixed-effects estimator and GLS random-effects estimator.

Overall, the evidence of this study through the panel data approach indicates that the convergence hypothesis does not hold for China between 1994 and 2003. The regression results suggest that export growth, investment growth and FDI growth have a significant positive effect on regional GDP per capita growth. These results are in line with expectations.

Some policy implications can be drawn from these results. First, one result suggests that the open-door policy is a good way to spur the economy and foreign investment should be encouraged. The positive and significant effects of the FDI growth shows that effort toward attracting foreign investment can serve as a means to narrow the differences in economic performance between the eastern (coastal) region and the other two regions. Therefore, if foreign investment can be directed to the inland provinces through institutional factors, higher levels of GDP in the regions can be expected to result, and thus the gap in GDP between the coastal and inland regions can be narrowed.

On the other hand, inner provinces should engage more in foreign trade. Promoting export is also a channel to encourage economic development. To the extent that the cost of direct trade with foreign countries is high, the inner provinces may capture the external benefits of foreign trade by trading with coastal provinces, which trade with other countries at relatively low costs. Like foreign trade, inter-provincial trade is conducive to

factor equalisation and sharing economic growth (Chen and Feng, 1999).

Second, the results of this study also suggest that more investment would benefit the development of the economy. It is especially emphasised that more physical capital investment would improve regional economic performance. Accordingly, the central government should place more emphasis on investing in the Chinese hinterland. Both the central and provincial governments should adopt appropriate investment policies to help central and western regions in promoting regional performance or alleviating regional disparities.

5.6 Summary

The question of regional inequality in China has been extensively studied in recent years. The most commonly highlighted feature in the existing studies on regional disparity between the post-1978 and the end of 1990s is the growing gap in both the income levels and the income growth rates between the coastal provinces and the inland provinces.

Among the various explanations given for the regional divergence, it is generally accepted that geography and preferential policy through the coastal dummy are the determinants that influence Chinese regional divergence during the period 1978-1998. This can be explained by the rapid development of FDI, the main growth mechanism in coastal region. Since 1978, the selective open-door policy led to a rapid integration into the world markets and the development of modern industrial sectors in coastal provinces, especially huge inflows of FDI. On the other hand, the theory of geographical economy also suggests that coastal provinces in China can benefit from a higher percentage of arable land, better conditions for developing infrastructure, and easy access to the sea. Therefore, a coastal location is certainly more convenient for export-oriented processing industries, which have been developing very rapidly during the 20 years (1978-1998) (Démurger, 2001; Démurger *et al*, 2002a; b).

After the overview of the existing literature, this study made use of the more recent data to draw its own conclusion on estimating the determinants of regional economic growth and the income convergence between the coastal and inner regions. Two different econometric estimation methods including fixed-effects OLS and random-effects GLS panel data estimators were used in this section.

In the literature, the most common approach to studying convergence is to conduct a β-convergence exercise, which amounts to verifying whether the neoclassical model is a good description of a region's development experience. The evidence of this study through panel data approach indicated that there was no β-convergence in China between 1994 and 2003. This result suggests that the Chinese provinces are in a process of grouping into different economic clubs as the coastal region goes up to its high steady state and the inner area down to its low equilibrium.

As was expected, most of the independent variables that were used in the quantitative analysis had the

expected coefficients. The export growth is significantly positive because the more exports grow so does per capita GDP. Educational growth is positive because more educated people are more able to run a region's economic environment, make better decisions and can help their own region to become more competitive with such as high-skilled labour and R&D. Investment in infrastructure (roads and telecommunication) can help to significantly reduce inventory levels (and thus the cost of doing business), thus making the region more competitive. FDI is also significantly positive, as this helps to enhance competitiveness and acquire new skills and resources abroad. Based on the regression results for coastal dummy variable, the geographic location and preferential policy still play an important role. Coastal region grew faster than interior areas during 1994-2003.

Some policy implications are suggested here. Continuous investment in factor inputs is crucial for regional development in China. To maintain or accelerate the economic performance of the eastern (coastal) region, policies aimed at attracting FDI and promoting exports are essential.

The study thus achieved its objectives to:

i) identify and explain the patterns of regional economic growth in China, particularly on a provincial level.

ii) test the significance of the determinants in explaining Chinese spatial economic growth between 1994 and 2003.

It should be noted that the Chinese authorities have already realised that the uneven growth between the coastal provinces and the inland provinces can cause serious social and political problems. Therefore, since 1996, the Chinese authorities have intensified their efforts to narrow the income gaps among China's provinces. Indeed, about two-thirds of expenditure under the fiscal stimulus packages in 1998 and 1999 was targeted at the central and western provinces. A "Develop the West" initiative has been launched (see the tenth five-year plan in section 1.4.3). Under this plan, efforts are focused on infrastructural investment, technological upgrading, and training and education. Today, it is vital for Chinese authorities to develop the economies of the inner regions, so that their incomes can catch up with those of the coastal regions.

CHAPTER 6: SUMMARY AND CONCLUSION

6.1 Introduction

Napoleon once said that China was a giant lion in deep sleep and the whole world would be amazed once it woke up. It happened. Since China opened up to the outside world and started the transition process from a centrally planned economy to a market one in 1978, the Chinese economy has been growing fast. After the four "Asian tigers" (Hong Kong, Singapore, South Korea and Taiwan), China is regarded as another "miracle economy". Most of the "tigers" were greatly affected by the Asian financial crisis in 1997 and slowed down. However, China's economy has kept expanding at a remarkable pace of over 9% annually. In the past few years, with the US economy slowing down and European economies stagnating, China becomes the bright spot and is praised as the engine for global economic growth. A first question therefore asked is: what drives China to do so well?

In recent years, public concern for regional income disparity in China has been increasing rapidly. This concern is rooted in the widening of the income gaps between the coastal regions and the inner areas. The seriousness of regional inequality is vividly demonstrated by the State Council and the Central Committee of the Chinese Communist Party's recent efforts to promote the development of West China. Therefore, the second question is: what determines different economic performances across the Chinese provinces?

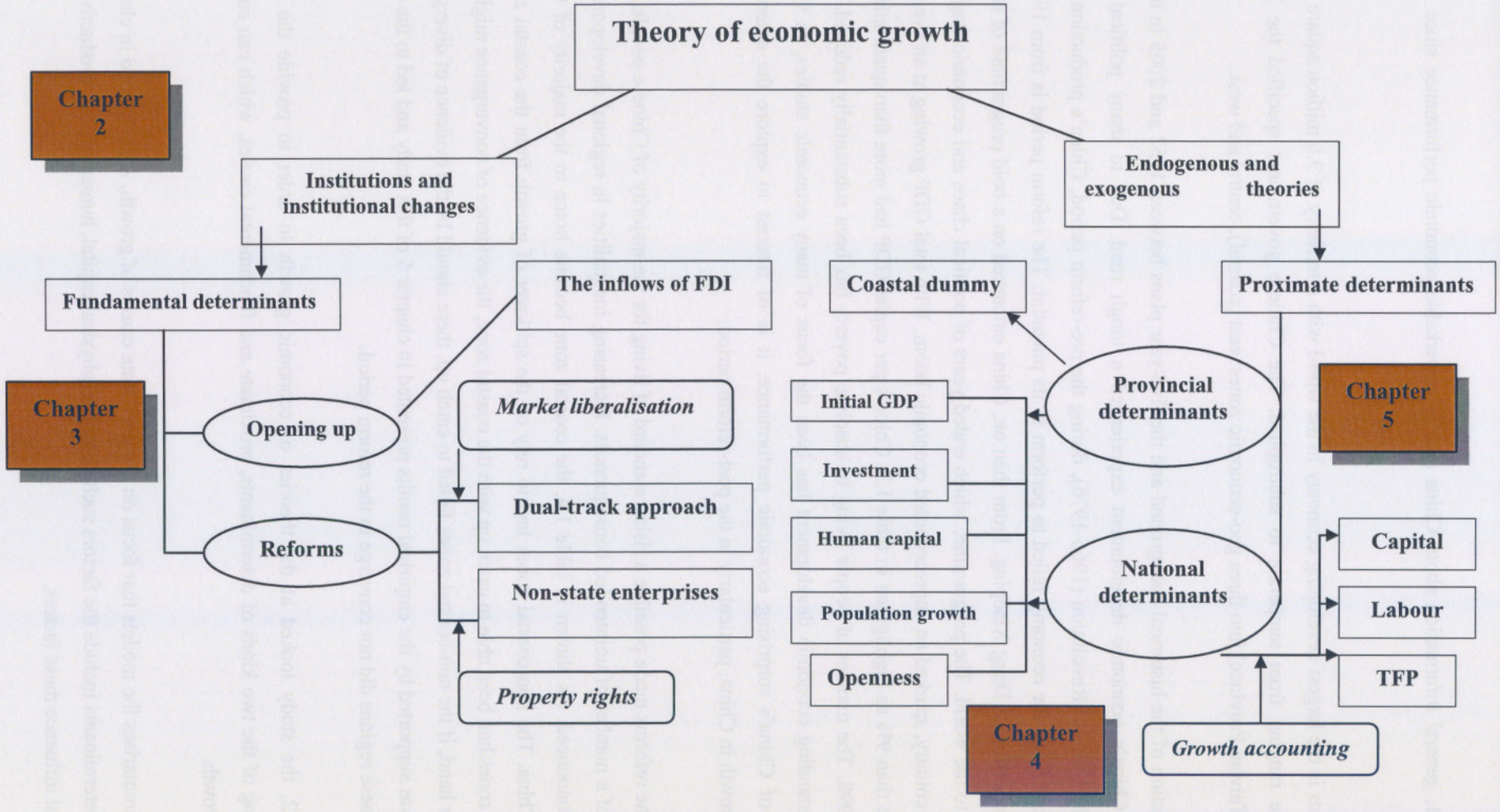
In light of these research questions, the objectives of this study were:

- to describe the gradual process of transition from a centrally planned system to a market system in China;
- to identify the determinants of national economic growth in China since 1978;
- to identify and explain the patterns of spatial economic growth in China, particularly on a provincial level;
- to test the significance of the determinants in explaining Chinese provincial economic growth between 1994 and 2003.

Chapter 2 provided the theoretical background for this study. Chapter 3 achieved the first objective. The second objective was achieved in chapters 3 and 4. The third and fourth objectives were achieved in chapter 5.

Chart 6.1 shows the structural layout of all of the chapters in this study.

Chart 6.1: Structural layout of this study



6.2 Summary

In chapter 1, general information about China and its remarkable economic performance since 1978 were introduced.

China's status is the largest developing economy in the world with a territory of 9.6 million square kilometers with climate ranging from temperate to subtropical. The Chinese government specified the 31 regions (excluding Taiwan Province) into three geo-economic zones: east (coastal), central and west.

The introduction of the historical background and the five-year plans between 1952 and 2005 in this chapter noted that China's economic development experienced a tough road. Due to many political struggles, especially the Cultural Revolution (1966-1976), during the pre-reform period, China's production incentives were suppressed and the economy failed to perform to its potential. The reform period is from 1978 onward under the leadership of Deng Xiaoping. From then on, China embarked on a bold programme of reforms and opening up to the world. The programme, which ended years of political chaos and economic stagnation that plagued the country, sparked an unprecedented economic boom. With total GDP growing at an average annual rate of more than 9% as highlighted in table 1.3, China's per capita GDP had more than quadrupled between 1978 and 1998. The number of people living in absolute poverty has been substantially reduced. Therefore, China's outstanding economic development has been the focus of many economic studies. In view of the uniqueness of China's surprising economic performance, it is of interest to explore the determinants of economic growth in China, particularly in the post-reform period.

Yet, while the reforms made possible a rising standard of living for the majority of Chinese people, they came at the cost of a number of unintended consequences. Increasing inequalities in regional development may be the most pronounced. As shown in table 1.4, the coastal zone became home to the majority of the growth centres in China. The non-coastal zones had to rely on the spillover of growth from the coastal zone. If the non-coastal zones had been able to catch up with the coastal zone, the evidence of convergence might be found. On the other hand, if the non-coastal zones failed to catch up, there should be the evidence of divergence. This latter case was supported by the empirical results presented in chapter 5 of this study and led to the conclusion that the Chinese regions did not converge in the reform period.

In chapter 2, the study looked at the theories of economic growth in order to provide the theoretical understanding of the two kinds of determinants, proximate and fundamental causes, which can contribute to economic growth.

Table 6.1 summarises the models that focus on the proximate causes of growth. As discussed in chapter 2, the proximate determinants include the factors such as labour, physical capital, human capital, productivity and the variables that influence these factors.

Table 6.1: The models on the proximate causes of growth

Model	Equation	Prediction	Criticism
Harrod-Domar model	$G=s/v$	It firmly links the growth rate to the ability to save and the capital-output ratio.	The assumption of zero substitutability between capital and labour
The Neoclassical/ Solow model	$\triangle k = sf(k) - (n + g + \delta)k$	• Convergence property • Per capita growth will eventually come to a halt.	To leave technology growth as an exogenous factor.
Endogenous growth model	$\triangle Y/Y = \triangle K/K = sA - \delta$	• To introduce endogenously into the theory the formation of knowledge. • To offer a more realistic description of research and development.	Knowledge is hard to bring to the data.

Factor accumulation and productivity changes are endogenous, depending on the improvement in technology, allocative efficiency and incentives, which in turn are shaped by institutions. Therefore, in order to understand "why" countries grow at different rates, the fundamental determinants of economic growth can provide wider answers.

During discussing the work of the institutionalist school of economic growth theory, the structure was arranged on three levels in this chapter.

The first level concentrated on "institutions". It discussed the definition, the classification and the functions of institutions. It also emphasised that institutions could have a strong effect on economic growth in both theoretical and empirical work.

North (1991) has pointed out that history is "largely a story of institutional evolution". The process of institutional evolution is about "institutional changes". How do institutions change? What are the goals of institutional change? And are the sizable costs associated with institutional change? The answers to these questions were the content of the second level.

The last level was about one of the most important events in modern economic history, namely transitional economies. The unique historical experience of transition economy has greatly contributed to the theory of economic development and economic change. As Murrell (2003) emphasised: "The process of transition is an important stimulus to the increasing interest in institutions. It has moved the role of institutions into the mainstream of economics". Another lesson learned from transition might challenge conventional wisdom. That means that transitional institutions might have worked better than best-practice institutions. The different transitional experience between China and Eastern European countries proved this point.

Comparing China with Eastern Europe for the last decade, the difference between them is not at all that China established best practice institutions and that Eastern Europe did not. The difference lies in the institutions in a

transition economy. China adopted the gradual approach but Eastern Europe adopted the big bang one. The amazing economic success in China showed that the gradual and pragmatic approach was appropriate, which took into consideration specific initial conditions.

Therefore, the relevant institutions for successful development are not the "first-best" set of institutions but the optimality of institutional systems that are country-specific. It is not enough to study the familiar forms of conventional institutions found in most developed economies as a desirable goal; it is also essential to study the variety of unfamiliar forms of institutions in transition.

Given the special nature of China's economy, chapter 3 discussed how the non-standard paths of institutional changes worked in China, together with the gradual transition process. Because, for any country in transition, the essential objectives are to build up the market system and reintegrate into the global economy. A good market economy requires not only "getting prices right", but also "getting property rights right". Therefore, Chinese institutional changes, in this chapter, were divided into two strands: The market-oriented reforms on the market liberalisation and private ownership of assets in China were discussed in the earlier sections. The open economy was discussed in the later section. Each of them is not a straightforward copy of best practice institutions found in most developed economies.

Table 6.2 shows the contrast between standard and non-standard paths of the above three institutional changes in China. It should be noted that just because each of them takes China's specific circumstances into consideration and adopts the feasible but non-standard measures to fit the economic and political reality, they have played crucial roles in moving China away from the planning system and at the same time have contributed to remarkable economic growth since 1978.

Table 6.2: The contrast between standard and non-standard paths of institutional changes

	Standard path	Non-standard path (incremental reform in China)	Reflection
Market liberalisation	Single-track	Dual-track	Section 3.4.1
Property rights (ownership)	Private or state owned	Local community government owned (in TVEs)	Section 3.5.2
Integration into the global economy	Opening up	The selective open door policy	Sections 3.6.2.3; 3.6.3.5 and 5.4.2.1

The three significant examples of transitional institutions also bore witness to China's tough transitional journey. As Deng Xiaoping's widely quoted phrase: "crossing the river by groping for stones", China's transition to markets wasn't guided by a well-founded theory or a pre-determined blueprint at the beginning of reform. From the market rejected strongly as the mechanism, to the private part elevated as an important component of the economy, the two events, the Third Plenum of the Eleventh CCP Congress held in 1978 and

the November 1993 decision, are regarded as two turning points in the reform. They have moved China from intact and unhealthy economic reality brought by the Cultural Revolution (1966-1976) to miracle economy in only few decades.

The process of economic transition in China, especially the three significant examples of transitional institutions, can provide a number of interesting and important lessons for other transition and developing countries:

- The gradual or phased approach to economic transition adopted in China provides a new angle for studying the dynamics of and interrelationship between reform and development. This approach, which takes the form of "incremental reform", focuses upon local experiments that, if successful, are expanded to include the rest of the economy, which creates a virtuous cycle: as the reforms produce economic fruits, supports for reforms become more widespread, allowing more reforms to be implemented.
- China's experience with the dual-track approach to market liberalisation highlights the general principle of transitional institutions in the most obvious way: making reform efficiency-improving and interest-compatible. This approach also broadens the understanding of the relationship between state power and reform: state enforcement power can carry out a reform that creates only winners.
- In transition and developing economies, the initial conditions might play an important role in implementing reforms. In the case of China, both the dual-track approach and the ownership of TVEs are good examples of how existing institutions can be used and modified to serve the new purpose of development.
- The development of the private sector can strengthen the market-oriented reform through ending the monopoly of state firms and changing the functions of the government.
- Countries in transition should, as rapidly as possible, integrate their economies with that of the global economy.

China's experience also demonstrates that the gradual and incremental approach can also contribute to rising income disparities, particularly where certain areas or regions (especially OEZs) are given preferential treatment. This problem was discussed in chapter 5 of this study.

After discussing the economic performance of the fundamental determinants in chapter 3, chapter 4 drew attention to the proximate determinants of economic growth in China. The empirical literature on the latter has three strands as follows:

i) The first strand deals with the determinants of Chinese growth within cross-country regression models.

ii) The second strand deals with the growth of China over time, using growth accounting and decomposing Chinese economic growth to estimate TFP growth.

iii) The third strand deals with the provincial/regional growth rates in China, which is based on the observation that different provinces of China experience different growth rates over time.

The purpose of chapter 4 was to discuss the first and second strands. The third one was the objective of chapter 5.

Based on the findings in cross-country growth literature on China, the rapid economic growth after 1978 was determined by the economic variables such as investment, population growth, human capital and openness to trade. Most of the studies confirmed that the conditional convergence was a valid representation of reality in China during the post-reform period. That is to say, China has enjoyed a higher transitional growth rate over the last few decades. Some important policy implications for China's economic growth can be inferred from these general findings.

First, investment can play an important role in improving the less-developed country's economic growth. The central government needs to provide a more stable macroeconomic environment conductive to attracting more FDI and funds should be used in the ways that achieve maximum growth.

Second, a reduction in population growth can enhance economic growth. Through examining the pattern of demographic transitions in China, it is shown that government can promote long-term development through implementing a population policy that favours economic growth.

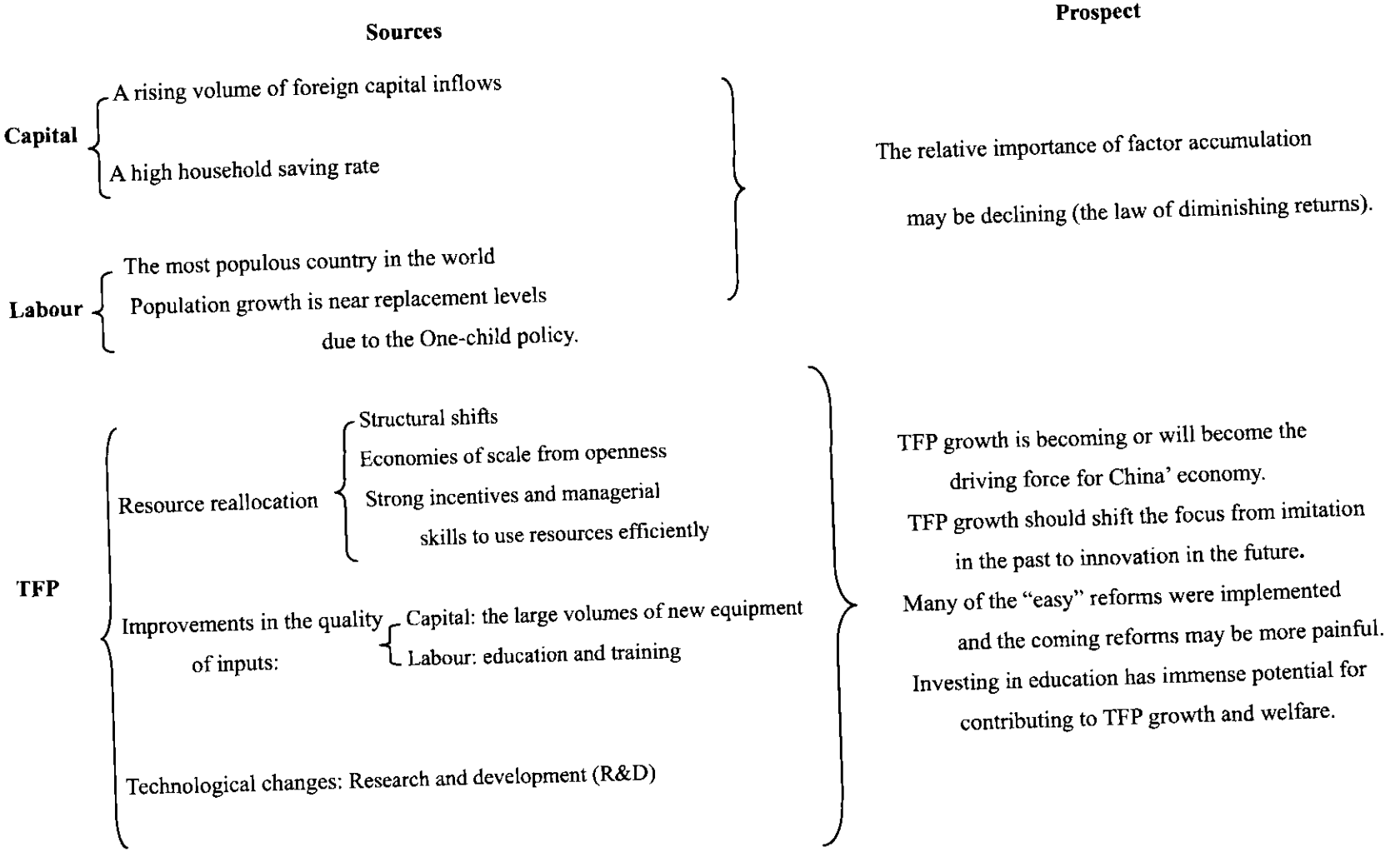
Third, human capital is crucial for a less developed country to achieve high economic growth. To build human capital, efforts need to be directed at education, especially secondary education, in the next decades in China.

The results of cross-country growth literature also indicate that openness can be conductive to a country's growth and development. The higher degree of openness to the outside world may facilitate a relatively poor country to fasten its pace to catching-up with the world best practice. To promote openness, in particular, the government should create more favourable conditions for inward FDI growth. In the coming future, China will benefit from the accession into the WTO in attracting FDI.

Growth accounting is another methodology used to determine the proximate determinants of economic growth. It sheds light on the contributions of factor accumulation and the growth of TFP to economic growth. The records from growth accounting exercises of the Chinese economy show the extent to which economic growth in China is produced by changes in investment (capital), labour force size and TFP respectively. Capital formation and TFP growth were found to play important roles in explaining Chinese rapid economic growth since 1978.

Chart 6.2 shows the sources of capital, labour and TFP growth in China. Because accounting for the sources of Chinese economic growth is particularly important as the country searches for the engine of future economic growth, chart 6.2 also summarises some ideas for future economic growth in China based on the overview of the growth accounting exercises.

Chart 6.2: Sources of capital, labour and TFP in China and the prospects for future economic growth



China's economic growth is impressive since its reform and opening up to the outside world in 1978 as discussed in chapters 3 and 4, but not every Chinese benefits equally from their country's remarkable economic performance. The disparity between coastal cities and interior areas has become more and more obvious. In recent years, the academic interests in China shift from the national economic growth miracle to regional inequalities. In chapter 5, this study devoted its attention to the origin and causes of inequalities across Chinese regions in order to achieve its objectives as follows:

- to identify and explain the patterns of regional economic growth in China, particularly on a provincial level; and
- to test the significance of the determinants in explaining Chinese spatial economic growth between 1994 and 2003.

A broad range of reasons has been proposed to explain the divergence of regional incomes. Various researchers have been emphasising particular factors that affect regional disparity. Among the explanations given for regional divergence, it is generally accepted that geography and preferential policy through the coastal dummy are the determinants that influence Chinese regional divergence during the period 1978-1998. This can be explained by the rapid development of FDI, the main growth mechanism in the coastal region. Since 1978, the selective open door policy led to a rapid integration into world markets and the development of modern industrial sectors in coastal provinces, especially huge inflows of FDI. On the other hand, the theory of geographical economy also suggests that coastal provinces in China can benefit from a higher percentage of arable land, better conditions for developing infrastructure, and easy access to the sea. Therefore, a coastal location is certainly more convenient for export-oriented processing industries, which had been developing very rapidly during the 20 years (1978-1998).

After the overview of the existing literature, this study made use of more recent data to draw its own conclusion on estimating the determinants of regional economic growth and the income convergence between the coastal and inner regions. Two different econometric estimation methods were used in this section including fixed-effects OLS and random-effects GLS panel data estimators.

The evidence of this study through the panel data approach indicated that there was no β-convergence in China between 1994 and 2003. This result suggests that the Chinese provinces are in a process of grouping into different economic clubs as the coastal region goes up to its high steady state and the inner area down to its low equilibrium.

As was expected, most of the independent variables that were used in the quantitative analysis had the expected coefficients. The export growth is significantly positive because the more exports grow so does per capita GDP. Educational growth is positive because more educated people are more able to run a region's economic environment, make better decisions and can help their own region to become more competitive with such as high-skilled labour and R&D. Investment in infrastructure (roads and telecommunication) can help to significantly reduce inventory levels (and thus the cost of doing business), thus making the region more

competitive. FDI is also significantly positive, as this helps to enhance competitiveness and acquire new skills and resources abroad. Based on the regression results for coastal dummy variable, the geographic location and preferential policy still play an important role. Coastal regions grew faster than interior areas during the period 1994-2003.

Some policy implications were suggested. Continuous investment in factor inputs is crucial for regional development in China. To maintain or accelerate the economic performance of the eastern (coastal) region, policies aimed at attracting FDI and promoting exports are essential.

It should be noted that the Chinese authorities have already realised that the uneven growth between the coastal provinces and the inland province can bring about serious social and political problems. Therefore, since 1996, the Chinese authorities have intensified their efforts to narrow the income gaps among China's provinces. Indeed, about two-thirds of expenditure under the fiscal stimulus packages in 1998 and 1999 was targeted at the central and western provinces. A "Develop the West" initiative has been launched (see the tenth five-year plan in chapter 1.4.3). Under this plan, efforts are focused on infrastructural investment, technological upgrading, and training and education. Today, it is vital for Chinese authorities to develop the economies of the inner regions, so that their incomes can catch up with those of the coastal regions.

6.3 Conclusion

The purpose of this study was to identify the determinants of national and provincial economic growth in China, given that the recent growth debate focused on China's unprecedented economic growth since 1978 and well-recognised disparity in regional development. In this regard, this study provides the determinants of national growth from two strands: the first strand attributes China's economic success to the fundamental determinants of institutional changes and the second one focuses on the economic performance of the proximate determinants such as capital, labour and the variables that influence the productivity of these inputs. In estimating the determinants of regional economic growth and convergence, this study further contributes by making use of recent Chinese provincial data (1994-2003) and random and fixed effects estimation methods.

Some conclusions and implications can be drawn: firstly, China's amazing economic performance has shown that successful transitional institutions, which are usually not a straightforward copy of best practice institutions, must take specific initial conditions into consideration.

Secondly, a good market economy requires not only "getting prices right", but also "getting property rights right". Therefore, a transitional economy should shed light on the reforms of market liberalisation and private ownership of assets.

Thirdly, China's experience with a gradual approach to transition also highlights the problems with such an approach, especially the rising of income disparities by focusing on specific regions.

Fourthly, the open-door policy appears a good way to spur the national and provincial economies. As far as a country is concerned, openness supports integration of the economy into the global economy. As far as a province is concerned, effort towards attracting foreign investment can serve as a means of narrowing the gap in economic performance between different regions.

Fifthly, the policies aimed at strengthening human capital (education) and physical capital (investment) have been shown good not only for national long-term development but also for regional development in the case of China.

Lastly, in order to sustain high economic performance in the future, China's reforms still have a long way to go. Earlier reforms were relatively easy. The benefits from these reforms apparently have "run their course". The next phase of high growth must come from new reforms that might be more painful and costly. The prospects for sources of economic growth in China are that the potential to further increase factor inputs is limited and contributions by all factor inputs might decline because of the law of diminishing returns, while TFP growth will most probably become the driving force for China's growth performance in the long run. This is a topic for future research.

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