



A geography of institutions and reforms : interprovincial disparities and institutional reform in post-Mao China
by Robert Karl Rothfuss II

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in
Earth Sciences
Montana State University
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Abstract:

The economic performance of the People's Republic of China has attracted global attention over the past 20 years. Coinciding with this performance, has been a conscious effort to reform the centrally planned economy into one that is more market friendly. It would seem that the reforms have caused the fine economic performance, but the matter is not so simple. Economic reforms have not been implemented uniformly throughout the country. Likewise, economic performance has not occurred uniformly. This research attempts to untangle some of the relationships between reforms and performance, at the provincial level, thus resulting in an economic geography of institutional reform in post- Mao China.

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This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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Signature Karl Rothman

Date 15 July 1997

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ABSTRACT

The economic performance of the People's Republic of China has attracted global attention over the past 20 years. Coinciding with this performance, has been a conscious effort to reform the centrally planned economy into one that is more market friendly. It would seem that the reforms have caused the fine economic performance, but the matter is not so simple. Economic reforms have not been implemented uniformly throughout the country. Likewise, economic performance has not occurred uniformly. This research attempts to untangle some of the relationships between reforms and performance, at the provincial level, thus resulting in an economic geography of institutional reform in post-Mao China.

CHAPTER 1

INTRODUCTION

China demands the world's attention for several reasons. It boasts one-fifth of the world's population, causing concern for the strain that such a large population places on the environment. Also China is one of the few remaining communist countries and its position as a nuclear power, coupled with several land disputes, including the sovereignty of Taiwan and Tibet, makes the world's powers anxious. China's trade status as a most favored nation is a recurring theme in American politics as well.

American politicians are able to overlook accusations of human rights abuses in order to maintain friendly economic relations with the Chinese government. These economic relations are important for a number of reasons, but one overriding factor is the performance of China's economy since the late 1970s. Since that time, China's economy has grown at approximately 10 percent annually, making it among the fastest growing in the world. By way of comparison, the U.S. economy grows at about 4 percent in a good year.

Per capita incomes in China are still low and it is classified as a developing country, but this does not make the growth figures less impressive. If current growth continues, it is speculated that income figures will surpass those of the wealthy countries

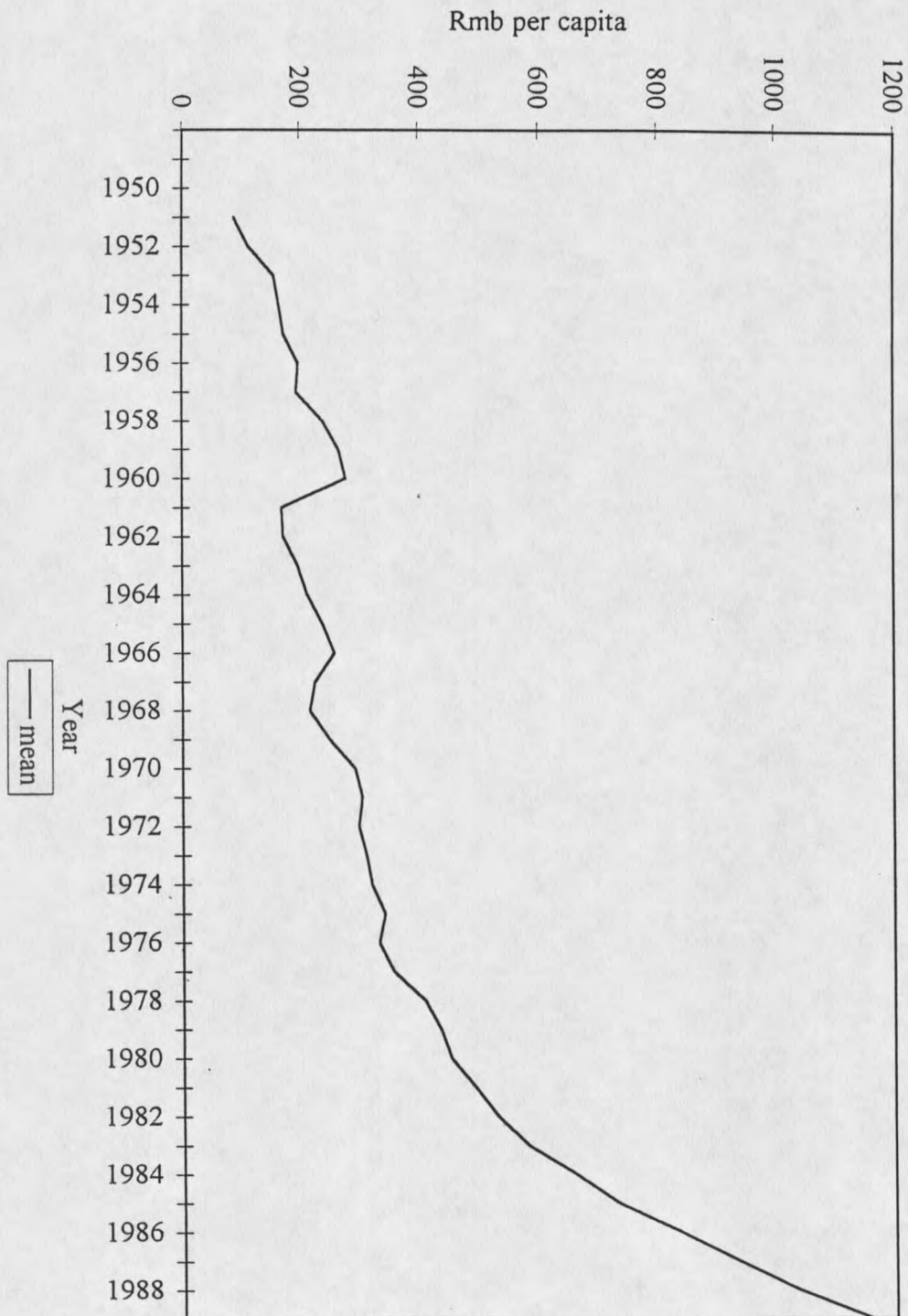


Figure 1: China's Real National Income per capita: 1949 - 1989

during the first quarter of the next century. Not only is this rapid growth and the potential for great wealth important in and of itself, but the apparent cause of the economic performance demands attention as well.

Coinciding with the late 1970s take-off of the Chinese economy is an explicit commitment on the part of China's leaders to reform their economic policy. After the death of Mao Zedong and the establishment of Deng Xiaoping's regime, China's economy set out to distance itself from the strong centralization and planning of the previous few decades. Chinese economic policies were moving toward liberalization and increased reliance on market mechanisms.

This reform process directly countered the principles of Mao's era. There were new economic institutions that encouraged foreign trade, new forms of organization, and alternative incentive structures. China looked as if it was abandoning its command economy.

Though the reform process has been characterized by market-oriented changes, China has not become a capitalist country. There has been a retreat from some socialist practices in some areas, but reform has not transformed the economy entirely. In fact, China has instituted most of its reforms on a regional basis. For example, China has opened up its economy to foreign trade practices, but only in certain restricted areas. The other parts of the country have not enjoyed such reform.

An additional fact not always stated in discussions of China's economy is that the impressive growth rates are not necessarily accurate representations of economic performance for the country as a whole. Some provinces have grown quickly while some

have not. Reform has led to large improvements in provincial growth in some places and has barely had a noticeable effect in others.

The overall relationship appears straightforward. China reformed its economy and its economy responded positively. However, further scrutiny of the facts suggests that the cause and effect relationship may not be so clear.

If reforms were not implemented uniformly and economic growth has not been uniform either, then it remains to be seen what exactly led to economic growth. This introduces the questions to be addressed by this discussion. Have reforms been uniformly implemented? And has provincial growth been equal? Finally, what is the relationship between the answers to these two questions? The purpose of this paper is to suggest answers to these questions.

The format of the following sections is as follows: Chapter 2 discusses the performance of China's economy. Chapter 3 describes the reform process that took shape in the late 1970s. Chapter 4 looks into the regional approach taken in reforming China's economy and observes the performances of China's provincial economies. Chapter 5 poses the research question and introduces the data. Chapter 6 then looks at the empirical evidence and examines the statistical tests. Finally, Chapter 7 provides some discussion and concluding thoughts.

CHAPTER 2

BACKGROUND: CHINA'S ECONOMIC GROWTH

The Maoist Era: 1949 - 1977

1949 marks the beginning of the Communist Party's rule and the establishment of the People's Republic of China. Ravaged by war and decades of poverty, China was set to be modernized by Mao Zedong and the Chinese People's Party. Soviet-style industrialization emphasized heavy industry, collective agriculture, and self-sufficiency as the path to a high-growth economy. In terms of growth rates in national income per capita, socialist China fared well; between 1949 and 1989 the People's Republic grew at an average annual rate of 7.65 percent.

Looking more specifically at the actual years that Mao governed Chinese policy suggests a somewhat less optimistic perspective, however. As Gregory Chow explains, "The economic development strategy of the People's Republic of China during the three decades beginning in the early 1950s is characterized by a high rate of capital accumulation at the expense of consumption and the promotion of industry at the expense of agriculture" (Chow 1993, pg. 809). The average annual growth rate of per capita income between 1949 and 1977, the Maoist period, was 5.84 percent. Still a respectable

rate, the mechanics of this growth have been shown by Chow to have been almost entirely extensive; that is, output was increased by a corresponding increase in inputs, such as land and labor. China was not developing any real growth engine - it did not grow intensively, through advances in technology or productivity. Chow's research found that three-quarters of the roughly 6 percent annual growth rate was caused by a 7.6 percent growth rate of capital (Chow 1993). He concludes, "There is no reason to assume that technological progress occurred during the period up to 1980" and adds, "Without incentives from private enterprise to innovate, [from] where could technological progress have come?" (Chow 1993, pg. 841). China's economic growth under Mao was decent, but it lacked the increasing levels of productivity provided by technological innovation. There was nothing miraculous about it; they were simply adding more inputs to create more output. There was no real economic development. The period after Mao's death, however, describes a different story, involving a much higher rate and a different source, of economic growth.

The Reform Era: Since 1978

The performance of China's economy since the establishment of Deng Xiaoping's leadership has been the subject of much attention. Deng's regime broke from the hard-line communist policies of the previous era and began the transition toward a more liberal, market-oriented economic system. This period represents a 5.74 percent increase in the average annual growth rate of per capita income; from 5.84 percent between 1949 and 1977 to 11.58 percent between 1978 and 1989. This shocking leap in performance, Steven

Cheung has predicted, "will be remembered as one of the most significant economic events in history" (Cheung 1989, pg. 21). China's reform economy boasts the highest growth rates in the world.

The growth of the reform era appears to be motivated differently than that of the Maoist era. As Chow revealed, Mao's growth rates were attributable to increasing levels of input – more labor, more land, and more natural resources. The 11.58 percent average annual growth in per capita income since 1978 is apparently fueled by increasing levels of productivity. Given fixed levels of input, more output can be achieved through superior organization and methods of production. Innovations have allowed more to be created with less. It has been found that even in China's state-owned industries, multifactor productivity has risen after decades of stagnation (Jefferson, Rawski, and Zheng 1992). China's new growth, therefore, has a sustainable quality as it is largely motivated by endogenous sources. This is what economists refer to as "economic miracles".

The statistical data on China's economic growth describes a distinct increase occurring in the late 1970s. Though some researchers suggest that China's economy started its rapid growth in the years preceding the reforms (Borensztein and Ostry 1996), the timing of the impressive change in economic performance and the massive reforms in economic policy closely coincide. To achieve a better understanding of the relationship between the change in policy and its effect on economic performance, it is necessary to understand more specifically the types of reform enacted. The exact nature of China's liberalization is the subject of the following section.

CHAPTER 3

BACKGROUND: CHINA'S REFORM PROGRAM

Political Economy of Reform

1976 marked the death of three prominent figures in communist China: Mao Zedong, Zhou Enlai, and Zhu De. After a decade of turmoil caused by the Cultural Revolution, this loss of leadership in a single year provided an opportunity for the reform-minded attitude of Deng Xiaoping to assert itself in December 1978, at the Third Plenum of the Communist People's Party (Wu and Reynolds 1988; Dernberger 1989).

To incite popular acceptance of the reforms that China needed, both the economic conditions and the political ideology had to be ripe for such change. Though official government statistics tell a somewhat optimistic story of Mao's economic leadership, many scholars tell it differently. Economist Jan Prybyla tells that at the time of Mao's death in 1976 the condition of China's economy was bad. Ten years of profound social and political turmoil during the Cultural Revolution just added to an already long-term negative trend. Factor productivity had averaged -1.5 percent annually for the 30 years prior. Periods of leftward adjustment, such as the Great Leap Forward (1958-1960) and the Cultural Revolution (1966-1976) were just "exclamation points on this downward spiral". Prybyla

explains, "the result was poverty verging on destitution in large areas of China's countryside" (Prybyla 1990, pg. 146-7).

The economic conditions leading up to the reform era require a bit more examination. As previously discussed, the government statistics regarding growth rates in aggregate output were decent, but they did not reflect the state of economic crisis that prevailed in China at the time. The Chinese economy was choking on severe bottlenecks, rising capital-output ratios, a stagnant standard of living, and large increases in real resource costs per unit of output (Dernberger 1989). Dwight Perkins observes, "Central planning led to a misallocation of both investment goods and of current inputs and outputs. Excessive control from the center, together with restrictions on the use of material incentives of any kind dampened the energies and enthusiasm of workers, managers and farmers alike" (Perkins 1988, pg. 602). Chinese economists had long recognized these problems. They too argued that China's poor economic situation "was due to excessive concentration of state power in economic decision making; complete disregard for supply and demand and the true market price of labor, material, and capital; and political management of enterprises that stifled sound economic organization and practices" (Rabushka 1987, pg. 72). The inability of central planners to allocate resources efficiently had led China's economy into a state of despair.

China faced four major economic problems in the late 1970s (Prybyla 1990). First, there were chronic shortages of wanted goods, both by consumers and producers. Second, constant misallocation of resources resulted in massive waste. Third, there was a complete stagnation of research, development, innovation, and diffusion of modern technology. And

finally, labor, management, and entrepreneurship all faced deficient incentives that led to low levels of productivity. These factors combined to create one major problem of economic performance.

Three causes can be attributed to this poor performance (Prybyla 1990). First, there were objective causes: China's large size, its huge population and population growth, decreasing farmland, decreasing energy reserves, and the huge weight of tradition. Second, there were individual policy errors and misjudgments. Finally, there was the rigid and unresponsive system itself. It was incapable of dealing with the objective problems and usually responsible for the misguided policies (Prybyla 1990).

However bad the economic conditions were, an appropriate political opportunity was needed for reform to find a supportable voice. Hewett has observed that:

It is political leaders who decide when and if the economic problems in their countries are sufficiently serious that economic reforms are required to set things right ... It is political leaders who signal that a debate on the economy can commence. It is they who determine how much of that debate can be public. It is they who determine the limits of that debate ... It is politicians who determine the general timing of a reform: the time allotted to implementation; in what order measures will be introduced; and when the pauses come ... It is the politicians who determine when the political costs of the reform outweigh the economic benefits, and therefore when it is time to retreat. (Hewett 1989, pg. 17)

After decades of flawed communist economic policy, the death of Mao provided the opening for political voices recommending reform. The economic conditions of the time had long provided an open ear among the Chinese people.

Mao died in September 1976, and soon after new political leadership asserted itself, "arresting, neutralizing and otherwise removing" key ideologues who had dictated the ultra-leftist policies of the Great Leap Forward and Cultural Revolution. Deng Xiaoping had consolidated political power by 1978 and set in motion a series of reforms that gave greater emphasis to market forces and lessened the role of the state in China's economy (Rabushka 1987, pg. 71). Many who took over control of economic policy had been mistreated during the Cultural Revolution and strongly disliked the policies that guided that decade.

Dwight Perkins explains, "China's leadership put revolutionary politics and class struggle aside and set out to make the nation wealthy and powerful" (Perkins 1988, pg. 601). The number one priority became economic development. China's new leaders were well aware that their economic performance over more than two decades paled in comparison to that of the country's East Asian neighbors. (Perkins 1988) The previously explained economic conditions coupled with this political opportunity allowed liberal reforms to be accepted.

Introduction of Reform

The bureaucratic housecleaning and ideological reinterpretation of the late 1970s led China to actively seek an understanding of the causes of its economic problems. It was soon discovered that greater freedom was required to make local decisions and that the reward system should more closely relate to economic performance (Perkins 1988). The institutions guiding decision making and work incentives needed to be changed if efficiency and productivity were to improve. This suggested that the government bureaucracy should loosen its grip and market forces should play a more prominent role in directing the economy. In essence, the Chinese economy required liberalization, and this meant reform.

The general objectives of China's economic reform program were the following:

- (1) to decentralize production and income distribution in order to gain greater initiative and more efficiency;
- (2) to reduce the dominance of the state-planned sector, and alternatively allow a greater role for the private sector and market forces;
- (3) to reduce constraints on material rewards which spurred individual and local level activity; and
- (4) to participate in greater levels of foreign trade and emphasize opening the economy to reliance on foreign loans and direct foreign investment.

(Dernberger 1989)

These objectives were implemented through deliberate and major adjustment policies (Prybyla 1990; Wu and Reynolds 1988). Economic administration was simplified and local authorities and industrial managers took more responsibility for decision making. Even the

highly centralized budgetary system was changed to one featuring stratified management with contractual revenue sharing. The priorities of the system were reordered to more specifically benefit agriculture, industry, and foreign economic relations. The urban and rural collectives, as well as the private economy, were encouraged to grow rapidly. Emphasis was placed on the importation of modern engineering technology to "help modernize the technologically retarded Chinese plants and equipment" (Prybyla 1990, pg. 148). Two specific measures aimed at agriculture were a sharp rise in the state purchase price for farm products and reduction of the state purchase quota as well as the replacement of the People's Commune with the household-based contract responsibility system (Wu and Reynolds 1988). It was the intention China's reform leadership to use selected capitalist techniques to supplement the command economy. They aimed at using capitalism in order to build socialism (Prybyla 1990).

The following three sub-sections look more closely at the three main arenas for China's reform: agriculture, industry, and foreign trade and investment. It is in these areas where the intention to reform begins to take shape.

Agricultural Reform

1955 and 1956 mark the collectivization of agriculture in China. Producer's cooperatives of about 200 families were organized and individual farmers were rewarded by earning points based on the amount of time, effort, and skill they put into their work and the political attitude they displayed. The Great Leap Forward (1958-1960) coincides with the transformation of producer's cooperatives into Rural People's Communes. In

1962 they reverted back to producer's cooperatives and remained approximately the same until the late 1970s.

In 1978, a typical Chinese rural collective was composed of three levels: the commune, the production brigade, and the production team. In that same year, Chinese agriculture comprised 294 million people in 72,780 communes with an average of 13 production brigades of 7-10 production teams (Johnson 1988). The production team represented the basic accounting and production-organizing unit in the agricultural sector. On a yearly basis each team was given a production target for which it drew up a production plan. The production plan described how to use the land, labor, animals, and farm tools; when to plow; and what types of fertilizer to use for which types of crops (McMillan, Whalley, and Zhu 1989). The quantity of work done was measured in terms of labor days, under the "labor day/work payment" system. Those who showed up in the field received a labor day and work points received per labor day measured the quality of work done. Work points were attached to the different grades that classified team members according to their technical skills, their capacity for work, and their success in meeting the labor norms set up by the team. Members periodically assessed each other's work and determined each others' grades and thus work points. At the end of the agricultural year, the combined income of the team was divided by the sum of work points credited to all team members to determine the value of one work point. The income of each member was determined by multiplying by the number of work points the individual had accumulated over the agricultural year. (McMillan, Whalley, and Zhu 1989, pg. 784) In addition, 5

percent of the arable land was set aside for personal use. Nevertheless, the ability to sell this produce was severely restricted.

As the most broadly defined unit, the commune was both a political and an economic form of organization. It was responsible for most of the local government functions, such as police, justice, welfare, education, and health care (including family planning). In addition, the commune had exclusive power over the economic functions of its brigades and production teams. In essence, "the commune, including all its units, determined who got how much pay in kind and in money and who got assigned to specific jobs" (Johnson 1988, pg. S229). This system had remained fairly intact since the early 1960s.

Prior to reform, China's agricultural growth was sluggish (Lin 1992) and the reform leadership began to view their rural collective economy as an obstacle to economic progress (Putterman 1992). At the Third Plenum of December 1978, it was decided that reform should aim at raising farmers' material rewards and relating them to performance (Perkins 1988, pg. 607). This was the beginning of agricultural reform in China.

In 1978, it was acknowledged that the key to improving farmers' incentives was solving the managerial problems in the team system. The government at the time considered the subdivision of collectively owned land into individual household tracts as contrary to socialist principles. It explicitly prohibited this practice. Nevertheless, around the end of 1978, a few production teams, first covertly and later openly, began to use the system of contracting land, resources, and output quotas to individual households. After a year, these teams brought in far greater yields than other teams. (Lin 1992, pg. 37) There were two primary features of the agricultural reform. First, the state raised its procurement

prices and lowered compulsory state quotas. Second, the so-called Household Responsibility System was instituted whereby land was contracted to individual households with the objective of tying the reward received more closely to the work performed.

The increase in state procurement prices for major crops was, on average, about 22.1 percent in 1979 (Lin 1992). The system had traditionally involved two prices: quota prices and above-quota prices. Reform meant increases in both of these and led to a large rise in the state's financial responsibility to the agricultural sector. Lin points out, "The government's original intention was to improve agricultural production through raising the long-depressed state procurement prices for major crops, modifying management methods within the collective system, and increasing budgetary expenditure on agricultural investments" (Lin 1992, pg. 36). In addition, the state reduced taxes on grain, livestock, and collectively run enterprises (Rabushka 1987). These programs fiscally overextended the government. To reduce the state's burden, mandatory quotas were soon abolished and replaced by procurement contracts negotiated between the government and farmers (Lin 1992). China's agriculture, once the centerpiece of socialist central planning, was beginning to resemble that of a decentralized market economy.

The Household Responsibility System changed the basic unit of agricultural decision making from the production team to the individual household. Land was now contracted out to the households for periods of 15 years and procurement contracts were negotiated by the household. The new system, which ironically had been expressly prohibited only a year earlier, involved contracts between the production team and each household, used to

regulate taxes and delivery quotas payable to the state and the welfare funds and investment funds payable to the team. Production above the delivery quota was retained by the household, who could sell it and keep any proceeds. Most restrictions on production activities on private plots were removed (McMillan, Whalley, and Zhu 1989, pg. 785) and regions were now allowed to specialize in planting crops more suitable to their environmental characteristics. Also, rural trade fairs were freed up in 1979, although there is no reliable measure of the extent of this. Dwight Perkins points out that the results were readily apparent to any traveler who visited the Chinese countryside in both the early 1970s and 1979 (Perkins 1988, pg. 608). By 1984, 97 percent of farm families were under the Household Responsibility System.

With agriculture working toward decollectivization, individual farmers and households, after meeting state contracted output requirements, were free to dispose of surplus as they saw fit. Private plots doubled to constitute 15 percent of China's total cultivated area and farmers were soon allowed to hire other farmers as laborers (Rabushka 1987). Though many of the ingredients for a market system were already in place (Perkins 1988), this institutional reform of 1979 led to remarkable achievements in China's agricultural sector (Lin 1989). Whereas, in the period before reform, the main contributions to agricultural output growth were grain, after the freeing up of rural markets in 1979, all components of farm output grew more rapidly including grain despite the de-emphasis on "taking grain as the key link". Cash (nongrain) crops and animal husbandry, however, displayed the largest increases in output growth. (Perkins 1988, pg. 612).

Between 1979 and 1984, agricultural output increased by 61 percent. Of this rise in output, 78 percent was found to be directly linked to the incentive effects of the Household Responsibility System while the remaining 22 percent came from the increase in agricultural price levels (McMillan, Whalley, and Zhu 1989). In addition, new incentives led to a 32 percent increase in total factor productivity (McMillan, Whalley, and Zhu 1989). This structural change is also expected to lead to sustained long-run increases in agricultural output by improving the incentive for adopting new technologies (Lin 1989). It has become clear that the institutional reform characterized by the change from the production team to the Household Responsibility System met with great success between 1979 and 1984.

Economist Gale Johnson, however, offers the insight that as economic growth occurs, farming provides a declining share of total employment opportunities in the economy. In most countries, "farm people find alternatives to the decline in farm job opportunities by either migrating to cities or towns or engaging in nonfarm work while retaining their farm residence. In China migrating to cities, especially to large cities, is severely restricted, one might say almost prohibited" (Johnson 1988, pg. S237). This evidence suggests that reform isolated to one industry or one facet of the economy will eventually become restricted by those areas not yet reformed.

Nevertheless, for the most part, agricultural reform has been seen as successful. It was these good results in agriculture that provided momentum for similar reform sentiments to be raised regarding the industrial sector (Perkins 1988). Industrial reform would prove a more difficult task though, as will be discussed in the next section.

Industrial Reform

Much as had been the case in the agricultural sector, industry under Mao's regime was transformed into a wholly state-controlled affair with central planners determining who would work where and for how much, what each factory would produce, and at what price all goods would be sold. Material incentives in the state sector were strictly forbidden and the market played virtually no role in the allocation of consumer goods. (Byrd 1993, pg. 329). Chinese industry was greatly affected by the industrial strategy of the Soviet Union.

This industrial program met with several chronically debilitating problems; again much like that of the Soviet Union. William Byrd lists the troubles facing Chinese state-owned industry: "Inefficiency in converting material inputs and energy into outputs; poor product quality; mismatches between supply and demand; excessive inventories; inefficient investment; widespread underutilization of fixed assets; and [an] overly dispersed ... inefficient regional pattern of industrialization" (Byrd 1993, pg. 329). In addition, David Dollar suggests three main sources for these constant industrial inefficiencies (Dollar 1990). First, planners generally do not have the information necessary to make the optimal allocation of resources across enterprises. These decisions require precise knowledge of the facts specific to different industrial units. Second, administrators have weak abilities to monitor enterprises in order to ensure that they are using resources efficiently. Again, this requires knowledge specific to local situations. Finally, the main incentive that administrators could use to reward good performance was to create additional

employment. This generated a bias toward excessive labor input and low labor productivity.

In Chinese industry from the early 1950s to the late 1970s, the allocation of labor, capital, and materials to industrial enterprises was done bureaucratically, at the central or regional level, and output was usually sold to the state at fixed prices. Though this system succeeded in channeling capital and labor into industry and raising industrial output, there is considerable evidence of poor allocative efficiency in this planned sector. "Total factor productivity was at best stagnant in Chinese industry from 1957 to 1978 and may have actually declined over that period" (Dollar 1990, pg. 89). This being the pre-reform situation, Mao's death provided a timely opportunity for industrial reform.

Industrial reforms differed somewhat from the more structurally-oriented agricultural reforms in that they came more by way of adjustments to the level of centralization of the command system. Structural reforms did not take on a significant role until later in the 1980s, after the success of agricultural reforms was evident. In fact, industrial reforms were initially launched as small scale experiments like the early agricultural reforms (Rabushka 1987).

In October of 1978, six enterprises in Sichuan were the subjects of an experiment intended to "analyze the economic effects of letting managers plan production according to market demand, marketing production directly, retaining profits, investing profits in new capacity, and controlling personnel affairs" (Rabushka 1987, pg. 79). In early 1979 the experiment was expanded to 100 firms and then to 4000 more firms throughout the

country later that same year. By June 1980, the reform experiment included 6,600 enterprises; by 1981, the number was 30,000 (Rabushka 1987).

Alvin Rabushka better details the features of these reform experiments:

1. After meeting a government-specified output target, the enterprises could produce and market additional merchandise in response to market demand.
2. An enterprise could market its above-target output and any new products it developed.
3. An enterprise could retain 3 to 5 percent of the profits it made according to the state plan, as well as an additional 15 to 20 percent of its profits from above-plan sales.
4. An enterprise could retain 60 percent of depreciation funds for technical renovation and innovation.
5. An enterprise could pay its workers and staff a production bonus of 17 percent of standard total wages.
6. Enterprises could appoint middle management without interference from higher state bodies.
7. Interest on working capital was set at zero for quota sales and at low rates for above-quota production, but at high rates to finance excess inventory. (Rabushka 1987, pg. 80)

The theme of these reform experiments was the devolution of economic control to the enterprise level. The success of the experiments led to more widespread industrial reform.

Around 1980, industrial firms were given increased rights to profit retention, a bonus system was instituted to increase work incentives, enterprises were given more choice regarding input and output decisions, and foreign trade and investment (to be discussed in more detail later) was given greater priority (Rawski 1994). By the mid-1980s, industrial plan targets were increasingly being replaced by "responsibility contracts" that allowed firms to retain any surplus after fulfilling specific production and financial obligations. This surplus could then be exchanged in markets at largely uncontrolled prices (Rawski 1994).

The goal of industrial reform was to change the industrial setting so that managers and workers could make decisions about inputs and outputs and have a direct material stake in those decisions (Dollar 1990, pg. 92). This goal was to be achieved by implementing reform with some common basic components aimed at improving efficiency. Reforms allowed greater discretionary power at the enterprise level regarding production and investment activities; made use of material incentives to supplement administrative directives; and expanded the role of the market mechanism in resource allocation (Byrd 1983). Primarily, industrial reforms consisted of "enabling measures" meant to remove barriers to enterprise initiative (Rawski 1994).

Using a World Bank survey of 20 state-owned enterprises, Dollar found total factor productivity to have increased significantly during the period of China's industrial reform (Dollar 1990). Big gains in output, employment and exports have also been recorded (Rawski 1994). Though many policy innovations considered essential to market transition, such as privatization and bankruptcy laws, are absent in the Chinese industrial reform; even this partial deregulation has "sufficed to unleash vigorous competition"

(Rawski 1994, pg. 273) in the form of rural industry, entrepreneurship, and defense conversion. Coupled with mounting financial pressures, this competition has greatly improved the performance of China's industrial sector.

Professor Rawski offers a summary account of the situation confronting China's reform industries:

In essence, institutional changes arising from partial reform created a virtuous circle in which the growing intensity of competition not only rewarded winners and punished losers, but by crippling the growth of fiscal revenues, diminished the ability of the state to protect losers from the consequences of high costs, poor quality, inattention to customer requirements, and other long-standing habits carried over from the planned economy. State enterprises, stung by competition and only partially compensated for falling profits or financial losses, pressed for further relaxation of the state's regulatory web and sought relief from costly social obligations which their collective rivals had largely avoided. These pleas brought fresh increments of deregulation, stronger competition, additional erosion of profits, slower growth of government revenue, and so on.

(Rawski 1994, pg. 273)

As was the case with the agricultural reforms, industrial reforms do not exist isolated from other influences. In addition to reforms in its domestic spheres of policy, China's reform agenda consisted of measures aimed at commercial relations with the world economy.

China's open-door policy is the subject of the next section.

Open-Door Policy

The reform era prompted a new attitude toward relations with the outside world; a sphere historically problematic for China. In its quest for modernization, revision of the foreign trade and foreign investment structure were seen as integral and critical components. Introduced in the broader strategy of reconstruction and reform, China's open-door policy was given the purpose of "absorbing advanced technology and know-how through the promotion of foreign trade and investment" (Leung 1991, pg. 96). This strategy represented a significant policy shift from the isolationist days of the Communist era and the many centuries prior to it.

In July of 1979, two provinces, Guangdong and Fujian, were authorized to "take extraordinary measures to develop tourism, foreign trade, and investment" (Stoltenberg 1984, pg. 308). As part of this policy, in December 1980 four cities were formally designated as Special Economic Zones (SEZs), an idea borrowed from the successful "export-processing zones" in other developing countries (Rabushka 1987, pg. 85). These special processing or manufacturing zones, like the Chinese SEZs, were, in essence, a "geographically defined area within which lower taxes prevail, fewer commercial restrictions are in effect, and less government intervention in the economy is evident" (Wang and Bradbury 1986, pg. 308). The SEZ cities were Shenzhen, Zhuhai and Shantou in Guangdong, and Xiamen in Fujian.

Locationally and in terms of their function, the new SEZs were reminiscent of the Treaty Ports of the 19th century. However, unlike the Treaty Ports, the SEZs do not represent China caving in to external pressures; they represent China caving in to the

internal pressure for economic growth. The locations of the SEZs are meant to be accessible to overseas Chinese entrepreneurs, especially in Hong Kong, Macao, and Taiwan. In addition, Fujian and Guangdong are the home provinces of many overseas Chinese (Wang and Bradbury 1986).

The establishment of the SEZs, though contrary to communist principles, met with significant Party approval. Gu Mu, CCP Secretariat member, is quoted as saying:

The faster a country's economic development, the bigger strides it will take in using foreign capital, importing technology, and developing trade. It will become a trend of economic development in the present world for a country to open itself to the outside world and develop economic exchange with foreign countries to promote and accelerate its own economic construction. (Fewsmith 1986, pg. 79)

Similarly, Premier Zhao Ziyang, stated:

The special economic zones ... are bridgeheads in our opening to the outside world, and they should play the role of springboard. On the one hand, they should import advanced foreign technology, equipment, and management and operations methods; absorb and digest them; apply them in innovations; and transfer them to the interior. On the other hand, they should sell commodities produced in the coastal areas with foreign technology to the interior, and export the latter's raw materials and produce, with added value after processing here, to the international

market, in order to achieve better economic results. (Fewsmith 1986, pg. 79).

In 1984, 14 Open Coastal Cities (OCCs) were established in the likeness of the SEZs. Surrounding these cities, Open Coastal Areas were maintained to disperse the benefits of greater economic freedom beyond the city boundaries. In addition, Hainan Island was designated as the fifth SEZ during that same year.

The specific functions of SEZs and OCCs are described as follows:

1. to serve as bridges for introducing foreign capital, advanced technology, and equipment, and as classrooms for training personnel capable of mastering advanced technology;
2. to promote competition between regions, between trades, and within a certain trade, all to the larger end of developing the national economy and expediting China's enterprise production and management;
3. to absorb foreign exchange and to filter part of the foreign capital, technology, and equipment through the SEZs to other regions;
4. to serve as experimental units in economic structural reform and as schools for learning the law of value and the regulation of production according to market demands; and,
5. to employ many young people waiting for jobs. (Stoltenberg 1984, pg. 639)

China was moving further away from the policies of Mao and toward the capitalist West.

A key ingredient of the SEZ and the OCC is the promotion of joint-ventures whereby Chinese partners provide land, labor, and infrastructure, while foreign partners provide capital and key equipment. These types of enterprises are encouraged through favorable policies such as, import tax exemption for equipment and construction materials; export tax exemption for finished and semi-finished products; two-way remittance of foreign currencies; and preferential tax rates (Wang and Bradbury 1986). Rabushka writes:

Within the zones, foreign-owned enterprises and joint-ventures managed by foreigners and overseas Chinese and their boards of directors produced goods for export. Local Chinese government intervention was minimized. Foreigners were subject to income taxes and property rents, but, by and large, the zones were intended to simulate Hong Kong's free-market system. The zones constituted enclaves of capitalism within China, with an outward orientation. (Rabushka 1987, pg. 86)

Through preferential policies in the spheres of investment, foreign exchange, revenue remittance, pricing, and financing, China's SEZs and OCCs mimicked capitalist institutions in an attempt to save their socialist economy.

The preceding discussion has been an attempt to highlight the reform process of post-Mao China. The important points to be gained from this are that China was ripe for reform after almost three decades of economic stagnation, and that reform aimed at liberalizing the economy. These reforms manifested themselves in the three main arenas discussed: agriculture, industry, and foreign economic-relations. Their goals were similar across these

sectors though; they aimed at decentralizing, increasing incentives, and opening the economy.

CHAPTER 4

THE REGIONAL NATURE OF REFORM AND INTERPROVINCIAL DISPARITIES

The Regional Nature of Reform

As suggested in the previous chapter, the changes brought about by China's reform process have been massive. However limited, this acceptance of liberal economic policy would have been considered criminal prior to the late 1970s. Nevertheless, China's transformation toward a market economy is by no means complete, nor is there substantial evidence suggesting that it ever will be. The rhetoric of the leaders of the People's Republic shows no sign of backing away from their commitment to the principles of Chinese socialism.

The disjuncture between their words and their actions with regard to liberal economic policy is masked by slogans such as "socialism with Chinese characteristics" and "using capitalism to build socialism". Some researchers have assumed that the goal of China's reform process is to become a market economy. Under this assumption, it is natural to deem the reform as partial or incomplete, as it has not achieved its assumed aim. There is no reason to believe, however, that complete reform in this sense is the end for which China's leaders wish.

The goal to which Chinese economic reforms aspire is wealth. The pragmatic Deng Xiaoping has made it clear that his intention was to develop the Chinese economy and that reforms would be implemented with that aim in mind. Given this clear end, all that remains to be determined are the means appropriate to achieving it. China has pursued a unique strategy toward determining which reforms serve best the efficient attainment of their goal. They have not implemented economic reforms uniformly throughout the country, but have introduced them regionally; as if experimentally to determine how different reforms perform in different test markets.

Instead of committing to one set of reforms throughout the economy, policy change in China has been pursued on a regional basis. Borensztein and Ostry explain that China has pursued a "strategy of selective localized liberalization" such that "the current Chinese economic geography includes regions dominated by dynamic market oriented activities (such as the south coastal region) as well as regions dominated by traditional, Soviet-style, industrial state-owned enterprises (as in the northeast)" (Borensztein and Ostry 1996, pg. 226). This regional approach to reform is an important and distinctive feature of China's economic policy.

There are several explanations for this reform strategy. One asserts that China has used different reforms in different regions as a method of experimentation. Fligstein claims that it is clear that China's leaders have been experimenting with their institutions (Fligstein 1996, pg. 1080). This seems a logical manner to pursue an end whose most appropriate means are not known; reforms that are successful will be repeated while those that fail will be discarded. This approach is, however, unconventional in economic development policy.

Alternatively, geographer Cindy Fan suggests that China's leaders are pursuing a growth-pole or ladder-step strategy toward economic development whereby certain areas develop and eventually bring the rest of the country up to their level. It is evident that Chinese economic reforms explicitly divided the country into three economic belts (Fan 1995; Naughton 1988). The eastern section was deemed most appropriate for export-oriented industry and foreign trade. The central region was dedicated to agriculture and energy, while the west was to perform its duties in animal husbandry and mineral exploitation. The overall plan was that foreign trade and industrial production in the eastern region would initiate economic growth, which would diffuse to the central and western regions. Economic reform was intended to allow some people and some regions to get rich first in order to pull the rest up behind them.

Another explanation is that not all of the regional and industry-specific reform that has occurred has been planned. Economist Louis Putterman suggests that some areas of the economy were more easily reformed than others. As he explains:

The economic reforms that began in 1978 contained an implicit attack on the dualistic character of the Chinese economy. Changes and proposals for change in the rural collective and the state industrial sectors pointed toward making both sectors operate under the regulation of markets; and if factors of production were allocated to both sectors according to market signals, dualism would come to an end. In practice, however, the institutions governing both state industry and the staple crop core of agriculture were resistant to change, and it proved easier to open the economy to the

growth of competitive forces on the fringes of these sectors than to put either of them on a fully commercial basis. Reform put an end to dualism in China, but it did so by creating yet another institutionally distinct sector rather than creating a unified market economy. (Putterman 1992, pg. 470)

According to this explanation, economic reform has not been applied uniformly throughout China because parts of the economy are entrenched enough to resist pressures to change.

Though there may be several explanations, it appears evident that China has implemented its reforms unequally throughout its provinces. Industrial and agricultural reforms were first tested on small scale, trial-bases and open-door reforms have been introduced through regionally defined Special Economic Zones and Open Coastal Cities. It follows that if reform has not been implemented uniformly, its effects on economic performance are not likely to be observed uniformly either. Along these lines, Fan claims that "preferential policies constitute the institutional mechanisms that have resulted in concentrated and selective growth in certain ... locations" (Fan 1995, pg. 426). Inter-provincial economic disparities in China are the subject of the following discussion.

Interprovincial Disparities

It has been shown that the Chinese economy has, overall, performed very well since the late 1970s. It remains to be seen, however, whether this economic success has been spread uniformly throughout the country, or if the some provinces have grown rapidly

while others stagnated. This is an important issue for any study of China's economic performance and during both the Maoist era and since the beginning of market-oriented reforms, provincial equity has figured prominently in China's development experience (Lyons 1991).

During the Maoist era, inter-provincial equity was a stated aim of economic policy. As Thomas Lyons explains:

One of the most widely remarked elements of the Chinese model is the high priority assigned regional objectives and, more specifically, to "balance" in the distribution of income and, hence, consumption. During the Maoist era, the central government pursued regional objectives through such measures as interregional transfers of investment resources (effected via the planning system), subsidization of health and education expenditures in poor regions, and attempts to maintain a safety net of state relief (effected largely via control of grain surpluses). In short, there is little doubt that prior to 1979 the Chinese leadership placed an unusually high value on the spread of modern growth and the improvements in welfare associated with it and persistently acted to limit the emergence or widening of interregional disparities. (Lyons 1991, pg. 471)

Dispersion of regional output and income appears to have been relatively narrow during the pre-reform era. Exceptions do appear during the years of Maoist radicalism such as the Great Leap Forward (1958-60) and the Cultural Revolution (1966-76) (Lyons 1991). The years since reform do not provide a clear picture on interregional disparities however.

Scholars seem unsure as to the state of economic dispersion between China's provinces since the late 1970s. Some find disparities widening rapidly, while others hold out the hope that economic reforms will undo the inequality brought about by the misguided policies of the Cultural Revolution (Lyons 1991, pg. 472). Among researchers, there is direct contradiction of the evidence.

Sociologist Victor Nee suggests that regional disparities have been on the increase due to regional variation in the extent of institutional reform. He explains:

The maritime provinces -- targeted by Beijing as the experimental grounds for market reforms -- have experienced a more rapid shift to markets, which sparked more rapid economic growth there. Though the maritime provinces were more developed economically prior to economic reform, the gap between coastal and inland provinces increased throughout the 1980s. (Nee 1996, pg. 917)

The position here is that disparities have increased as the coastal regions outpace interior provinces. Cindy Fan, on the other hand, directly opposes this evaluation of the facts.

Fan suggests that, though it seemed that economic disparities between provinces were on the increase, they have actually been reduced. She claims that because the high growth coastal regions were relatively underdeveloped prior to reforms, their performance has had the effect of evening out disparities. Her argument is that diverging growth rates have resulted in converging income levels (Fan 1995). This conclusion seems paradoxical to Fan since the policy designed to favor China's most developed region has reduced

inequality among all provinces. It is equally paradoxical that, given the same set of facts, these two scholars would arrive at opposing conclusions.

A third possibility is posed by sociologists Szelenyi and Kostello. They suggest that disparities have both increased and decreased. They summarize their argument as follows:

There is substantial evidence that the overall degree of income inequality did indeed decline slightly following the introduction of market reform.

However, there is also evidence that it began to increase not long after.

Data from Eastern Europe and China show a similar pattern: well before a full-fledged market economy is in place, inequality will be higher than it was during the classical model of state socialist redistributive economy ...

In China, the first five years or so of post-1978 reforms produced a slight decrease of inequalities, but since the mid-1980s Chinese society has become increasingly inegalitarian. (Szelenyi and Kostello 1996, pg. 1084)

Economist Martin Raiser agrees with the emphasis of this position, claiming that income levels converged at the beginning of reform but slowed in the second half of the 1980s.

Given the disagreement among scholars it will be important to look at the statistical evidence and determine which argument deserves the most weight. This leads to the specification of this paper's research questions - the topic of the next chapter.

CHAPTER 5

RESEARCH QUESTIONS AND DATA

The Research Questions

The purpose of the discussion up to this point has been to establish two facts regarding China's economy, and then to propose the possibility of two others. The established facts, covered in Chapters 2 and 3, are as follows:

- (1) China's economy has grown rapidly since 1978; and
- (2) 1978 marks the beginning of China's reform era in which concerted effort has been made to liberalize economic policy toward agriculture, industry, and foreign-economic relations.

The potential facts were introduced in Chapter 4. They are:

- (3) Reforms may not have been implemented uniformly throughout the country, as changes have been enacted on a regional basis; and
- (4) China's economic growth has possibly not been uniform throughout the country either; interprovincial disparities may have been on the rise.

The relationship appears straightforward if only the first two facts are observed. China's economy started growing rapidly at the same time that reforms were implemented.

Therefore, reforms led to development. Things become more complicated when one attempts to evaluate precisely what China's reforms were and how they have affected its economic performance. This is why potential facts (3) and (4) are introduced.

Neither reforms nor economic growth may have occurred uniformly throughout China. If this is established, the research question becomes: Specifically which reforms have been successful and which have not? As sociologist Andrew Walder suggests, "The question is not to what degree markets have emerged, but what kind of market economy is emerging in different regions" (Walder 1996, pg. 1068). The reform mix may be different in different provinces, thus resulting in disparate economic consequences. The purpose of this research is to attempt to disentangle the relationship between economic policy change and economic performance in China's reform process. Specifically, the three research questions to be answered are:

- (1) Have reforms been implemented uniformly?
- (2) Has growth and development occurred uniformly?
- (3) What reforms have led to growth and development and what have not?

Questions (1) and (2) lead to question (3). Given an appropriate framework, evidence in the form of China's provincial statistics should suggest a solution to this problem. Such a solution is the goal of this research.

The Data

The first step in providing an answer to these questions is to select the appropriate data. This means selecting quantitative measures that represent reforms and economic performance. In previous chapters, economic performance was measured as real income per capita and the annual growth rate of real income per capita. This is standard in economic literature and will be used here. Quantitative proxies for reforms are not so easily forthcoming and will require a greater explanation. There is no explicit indicator that measures the emphasis placed on different economic policies, so determining quantitative measures for reforms will require some creativity. Recalling Chapter 3, reform was divided it into three main categories: agricultural, industrial, and open-door.

As previously explained, China's agricultural reforms represented a major shift in economic policy. The decision-making unit and the structure of property rights were changed in an effort to promote incentives that would lead to increased productivity and growth. Research has shown that these reforms were largely successful in achieving their goal. These reforms were specific to the agricultural community, however, this sector does not exist independently of other sectors. It is probable that the institutional changes associated with agriculture affected growth in other areas of the economy.

Industrial reform was similar to that of the agricultural sector, though perhaps not as radical. The notoriously low productivity of state-owned firms was improved significantly by introducing new organization and incentive structures. As in agricultural reform, industrial reform focused on the reward structure and the decision-making unit appropriate to that sector of the economy. Industry is not insulated from other sectors either, however, so reforms here may have been more far-reaching in their effects.

Finally, China's open-door policy represents another specific method of reform.

Economic institutions were implemented in certain geographically defined areas different from those of the rest of the country. For example, the Special Economic Zones and Open Coastal Cities were created such that individuals in them were subject to different rules than elsewhere in China. It has been evident that economic life has been vibrant in these areas, but it is likely the effects have diffused throughout the economy and reform efforts have helped areas other than those officially designated.

Table 1: Summary of Variables Used as Proxies for Reform Efforts

<i>Reform Sector</i>	Agricultural	Industrial	Open-Door				
<i>Goal</i>	• <i>less planning, more local decision making</i>	• <i>Better material incentives</i>	• <i>open Chinese economy to rest of world</i>				
<i>Proxy Variable</i>	Bureaucratic Consumption (BUR)	Tax Rate (TAX)	Exports (X)	Imports (M)	Foreign Investment (FDI)	SEZs (SEZ)	OCCs (OCC)
<i>Formula</i>	Public Consumption / Total Consumption	Public Revenue / Prov. Income	Export Level/ Prov. Income	Import Level/ Prov. Income	Foreign Investment/ Prov. Income	# SEZs	# OCCs

See Appendix A for more detailed explanation of variables and formulas

The point being emphasized with respect to reform in agriculture, industry, and foreign economic relations is that dividing these reforms into the three categories does not satisfactorily isolate the different reform efforts. These three categories are historically accurate but they share many of the same principles, making their statistical comparison difficult. As the purpose of this empirical investigation is to analyze specific reforms, variables must be used that usefully isolate the various reform efforts. These variables

cross the boundaries of agriculture, industry, and open doors, and represent specific goals of the reform effort. The goals of agricultural and industrial reforms were to increase incentives and decentralize decision-making, while the goals of the Open-Door Policy were to increase imports, exports, and foreign investment. The variables to be used should, as closely as possible, measure the institutional emphasis placed on these various goals.

A variable measuring tax rates will be used as a proxy for the provincial emphasis placed on increasing material incentives; a goal of both agricultural and industrial reforms. A major disincentive for productivity is the taxing away of profits, and reform leaders recognized the importance of incentives in their reform plans. Marginal tax rates would be most useful, however this data is not available. An estimated average rate is used instead. Another variable that will be used to measure a goal of both agricultural and industrial reforms is the approximate size of provincial bureaucracy. Mao's policies were criticized by reformers for being too centralized and state-controlled. A symptom of decentralization and a diminishing state role should be a reduction in the power of provincial bureaucracies. Provincial bureaucratic levels are estimated here, by the provincial rates of public consumption. The proxies (approximate tax rate and public consumption rate) for these reform goals (better material incentive structure and decentralized decision-making) are similar to those proposed by Gwartney, Lawson, and Block (1996).

The measures for Open-Door Policy reforms are more straight forward. Ratios of exports, levels of imports, and levels of foreign direct investment over provincial income all serve as proxies for China's economic embrace of the outside world. Though they

measure the results, rather than the intentions of foreign economic policy, these variables have become standard in the "economic openness" literature (Dollar 1992). Two other reform measures should be noted, however. Variables for the number of Special Economic Zone and Open Coastal City privileges will be used to capture any effects of these designations that may not be grasped by the other five variables.

It should be explained beforehand, however, that official government statistics regarding China's economy have come under scrutiny with the onset of rapid growth. Like the Soviet Union, it has been suggested that Chinese economic indicators are unreliable and fabricated primarily for use as propaganda. This suspicion has been addressed by Gregory Chow:

Official statistical reporting in China is by and large honest. Several factors in the collection of statistics affect their quality: the limited training of the officials, the limited financial resources of the State Statistical Bureau which is responsible for directing all activities in the collection, processing, storage, and distribution of statistics, possible political pressures to falsify statistics by the reporting units (e.g., rural communes eager to fulfill production targets during the Great Leap Forward of 1958-1962), and on the positive side the ability of the government to reach its population at the level of city blocks and families. I have found Chinese statistics, by and large, to be internally consistent and accurate enough for empirical work ... (Chow 1993, pg. 810)

This discussion shall defer to Chow's expertise in the area. The data source used here is Hsueh, Li, and Liu (1993) which provides a comprehensive set of provincial statistics drawn from China's provincial statistical yearbooks over the period 1949 - 1989. This dataset was computed with the specific aim of providing consistent and comparable inter-provincial data (Raiser 1996).

CHAPTER 6

EMPIRICAL EVIDENCE AND TESTING

Question 1: Have Economic Reforms been Implemented Uniformly?

There does not seem to be much disagreement regarding the provincial nature of China's economic reforms. Chinese leaders made no attempts to conceal their regional approach to liberalization. A few pieces of evidence to support the claim are in order, however.

Figures 2 - 9 suggest that for all but one reform variable, the provincial variance has been increasing in the reform era. Figures 2, 4, 6, and 8 show the provincial levels for each variable, with heavier lines marking the minimum, the mean, and the maximum, while Figures 3, 5, 7, and 9 show the annual variance across provinces for the variables, with a dashed line illustrating the trend. The even-numbered charts are offered to provide the raw data, while the variances are meant to illustrate the convergence or divergence of the provincial levels over the time period. The variance of bureaucratic consumption (Figure 3) shows a rise through the 1970s that finally begins to dip in the late 1980s. This suggests that reform efforts were becoming increasingly less uniform until the late 1980s when they show a slight trend toward less variability. Tax rates (Figures 4 and 5) are the only

Figure 2: Provincial Bureaucratic Consumption Rates

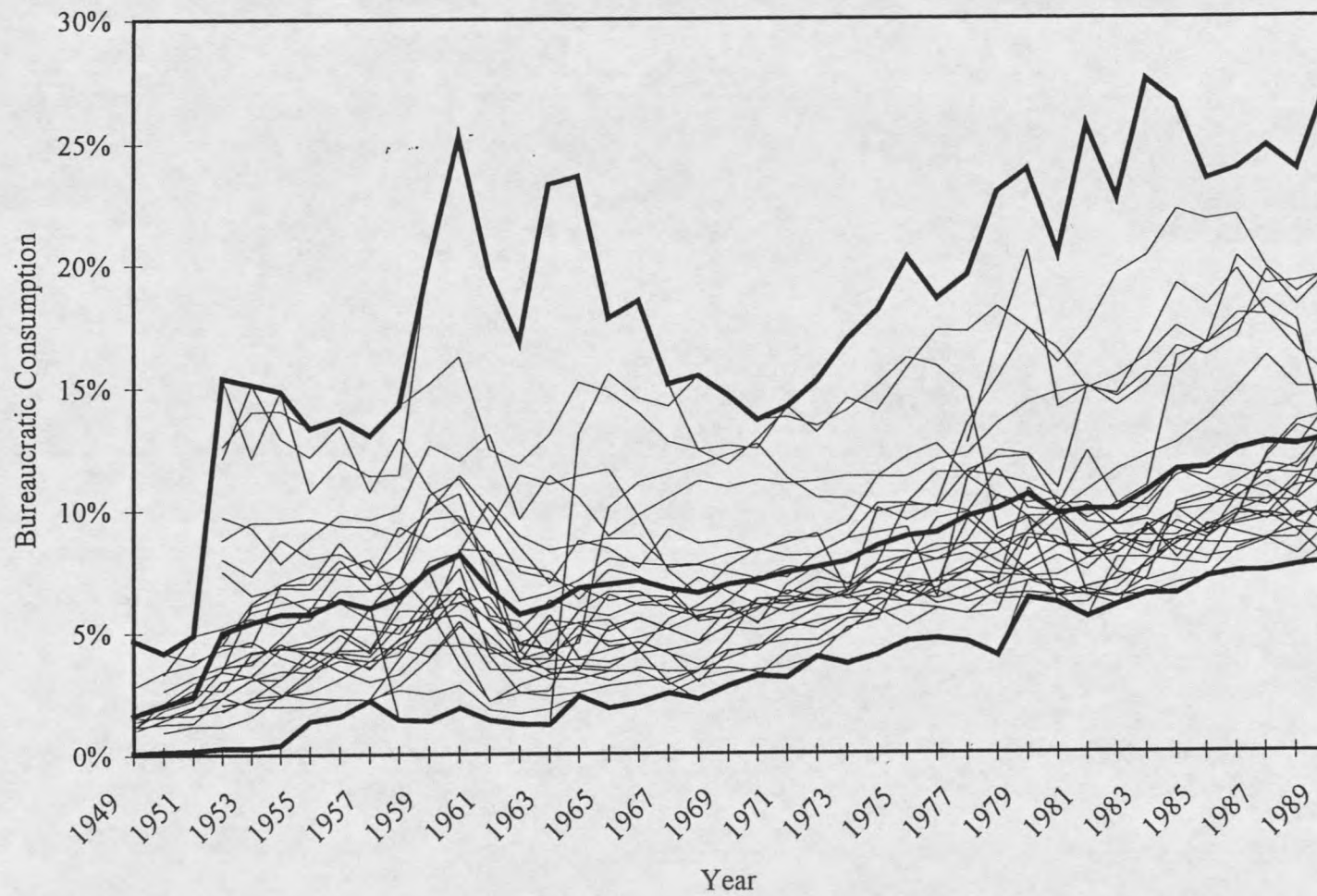


Figure 3: Variance of Provincial Bureaucratic Consumption Levels: 1949 - 1989

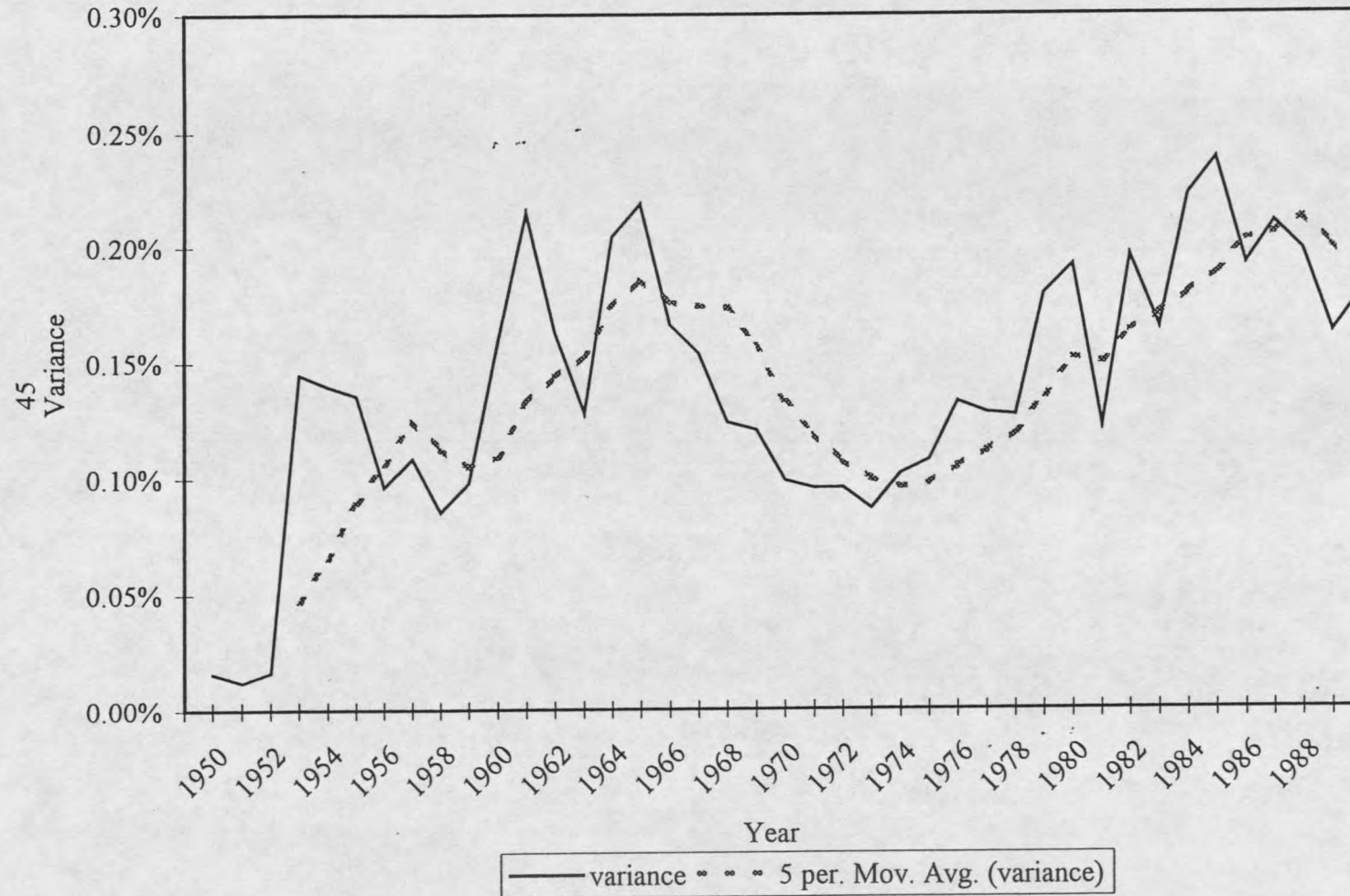


Figure 4: Provincial Tax Rates: 1949 - 1989

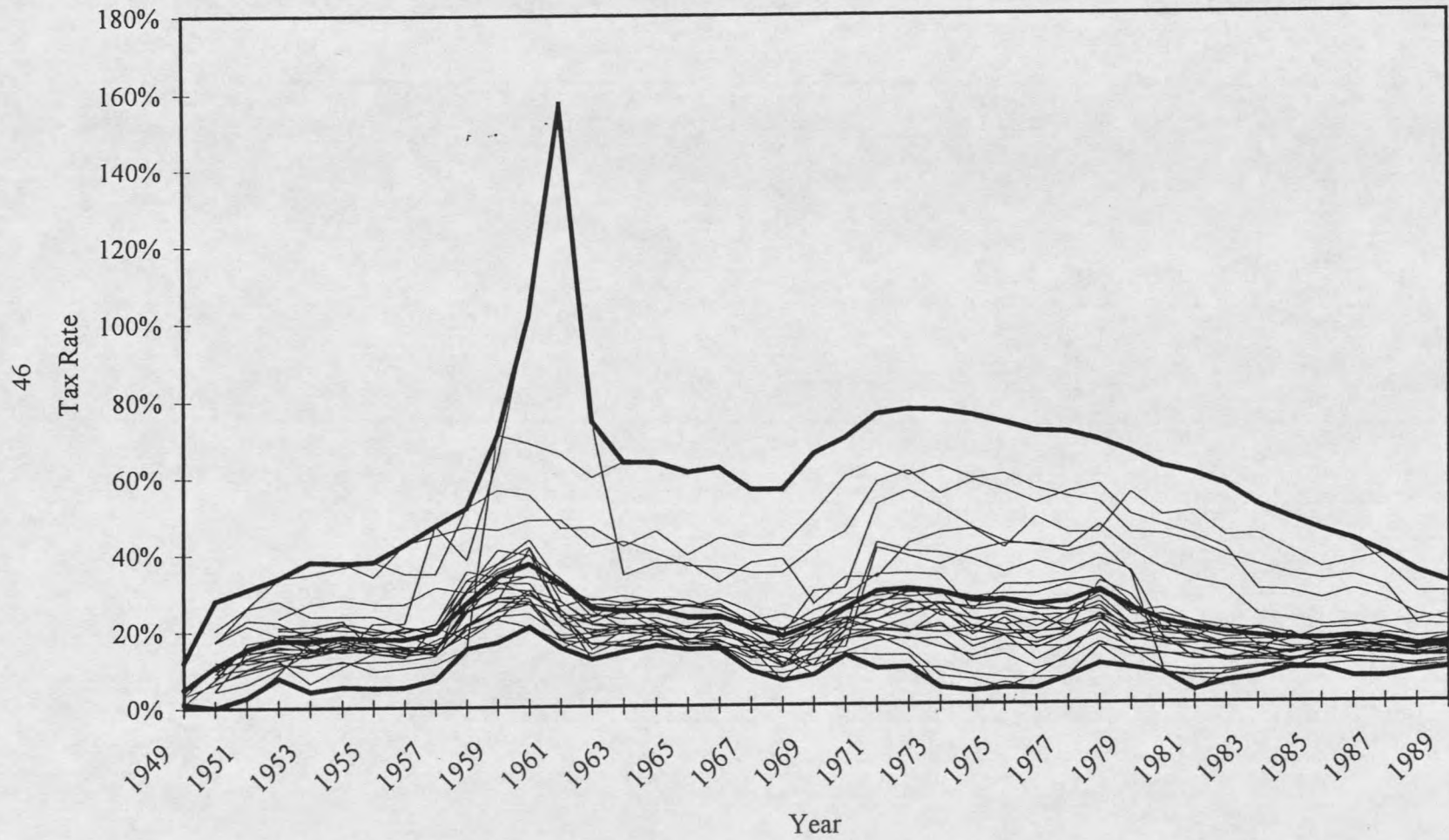


Figure 5: Variance of Provincial Tax Rates: 1949 - 1989

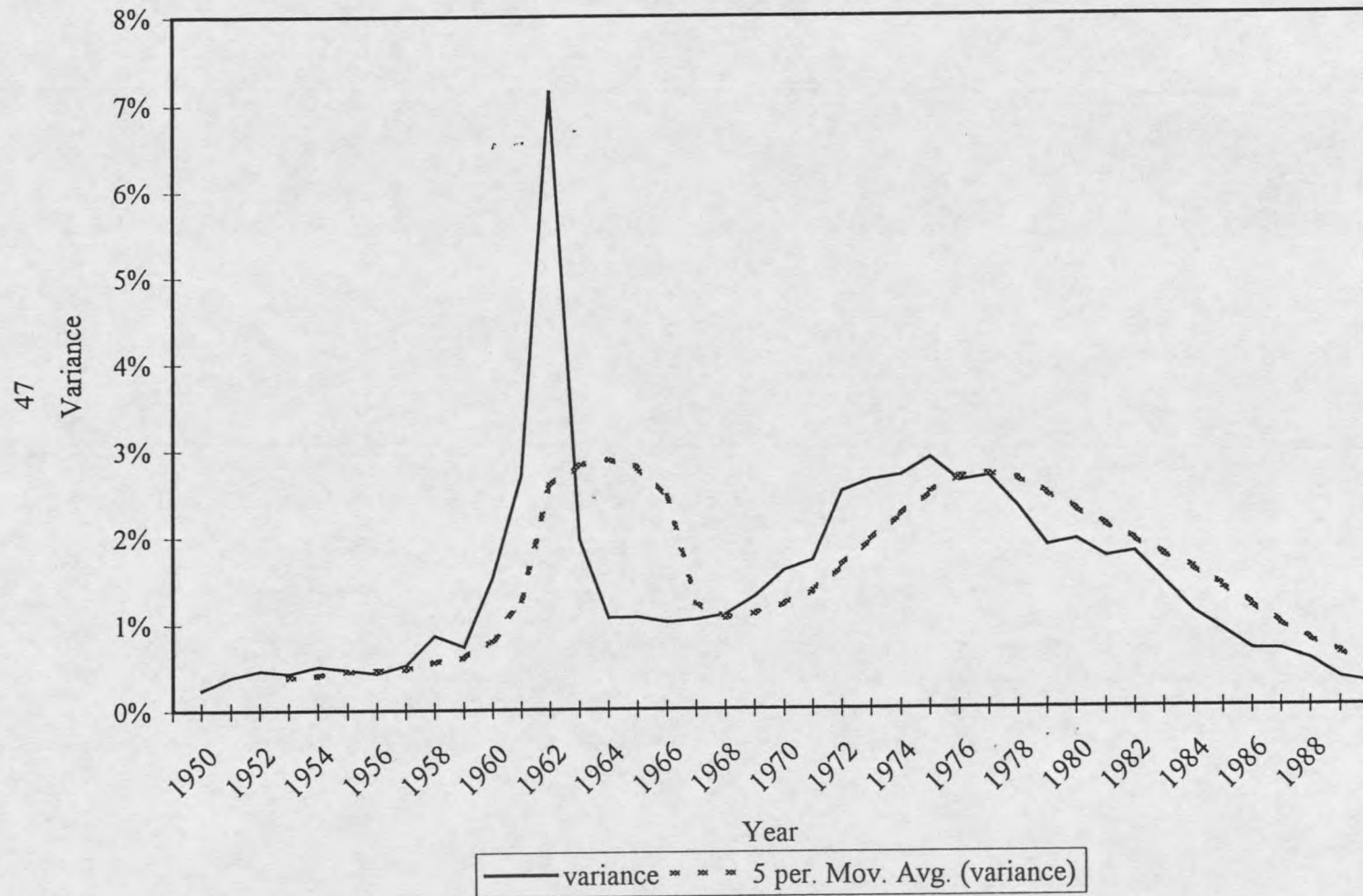


Figure 6: Provincial Export Levels: 1949 - 1989

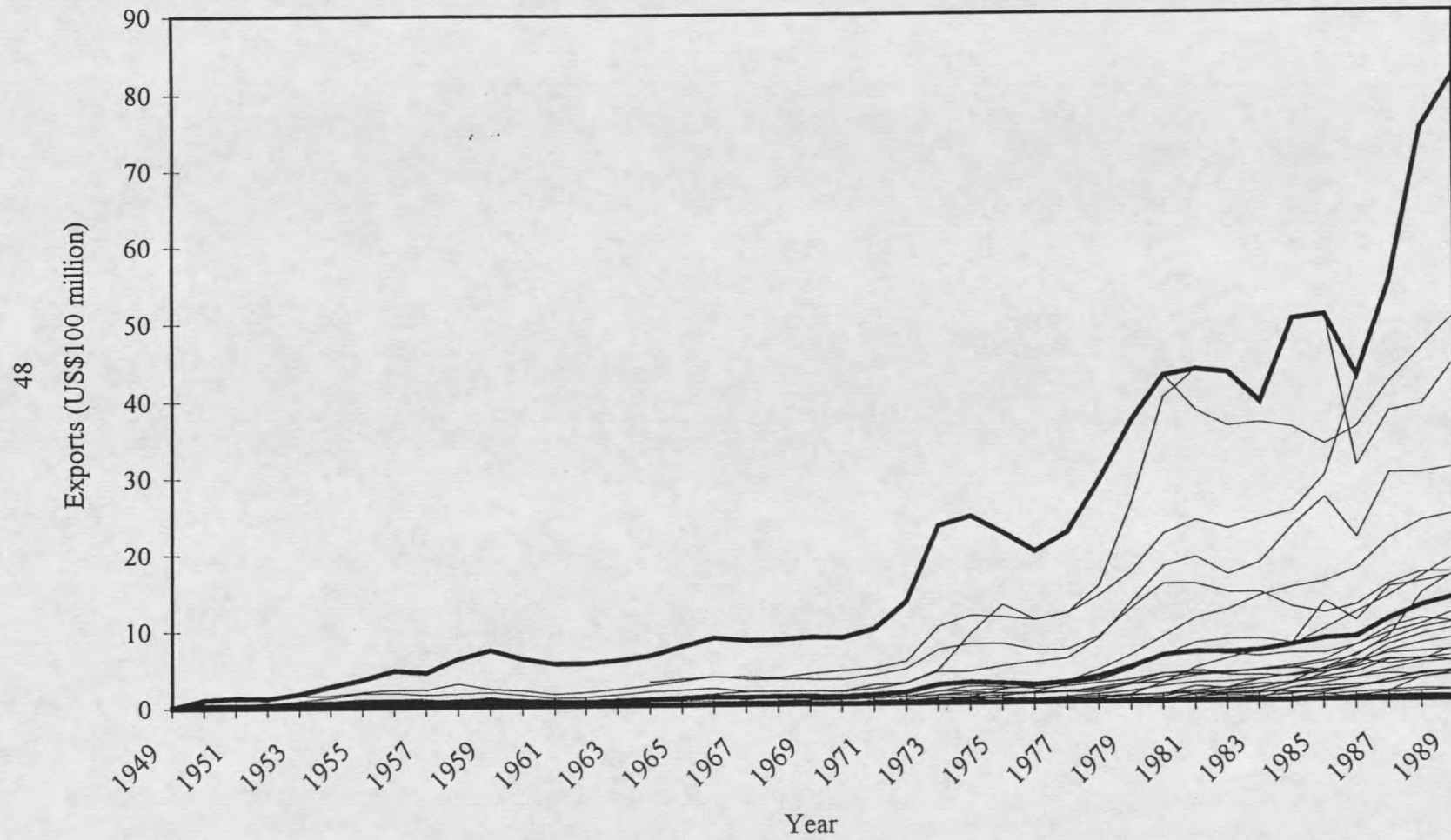


Figure 7: Variance of Provincial Export Levels: 1949 - 1989

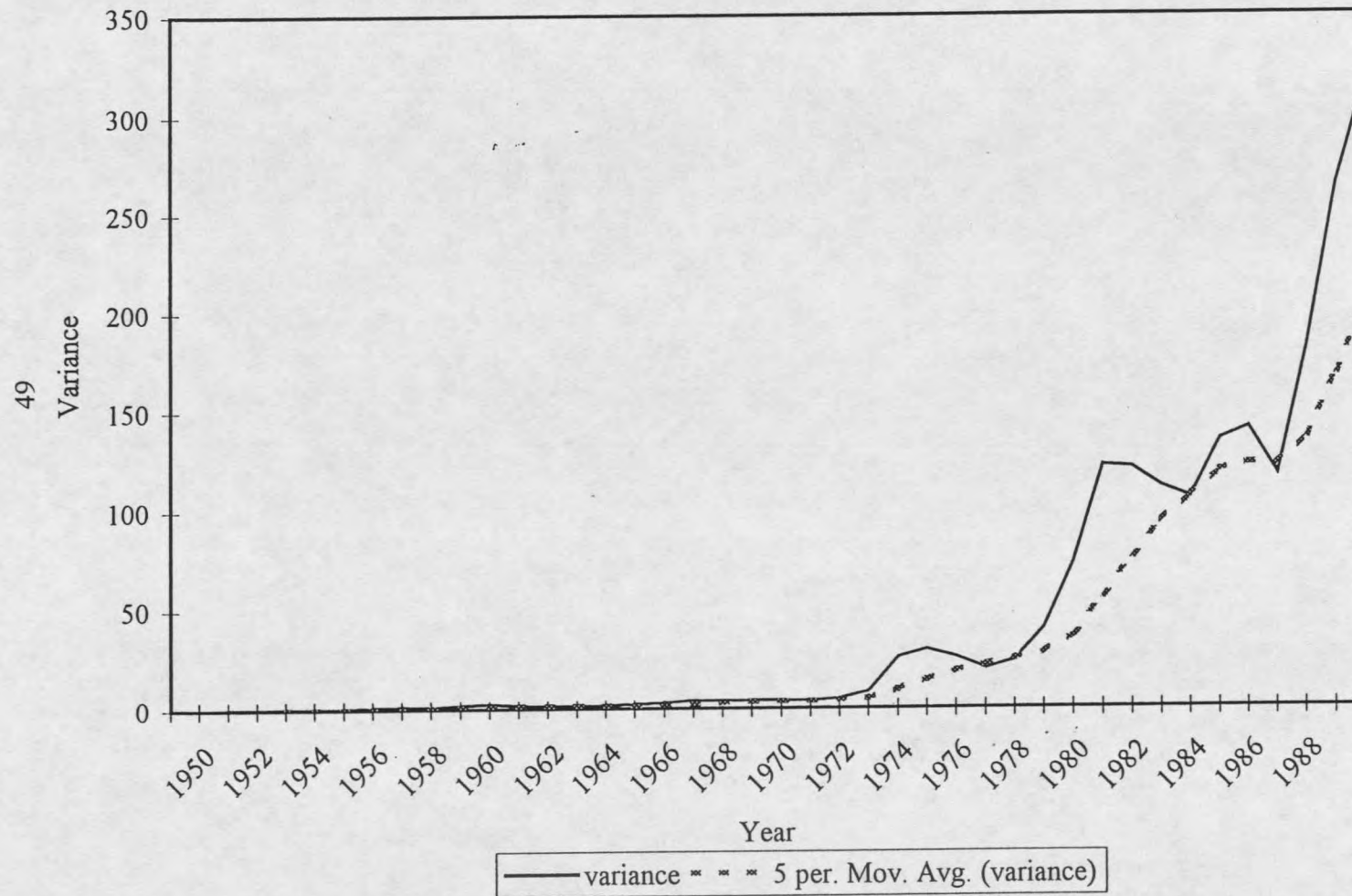


Figure 8: Provincial Import Levels: 1949 - 1989

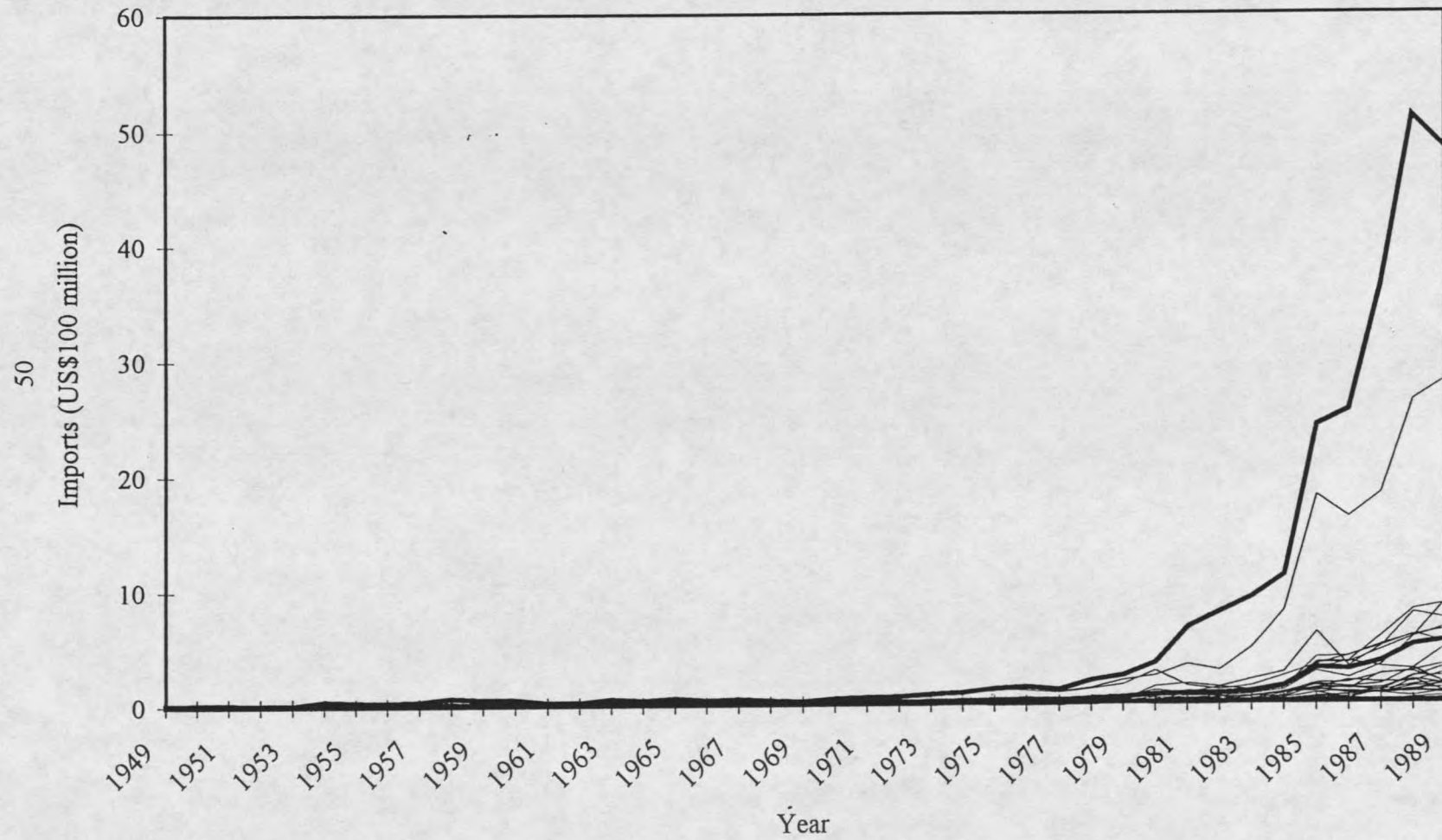
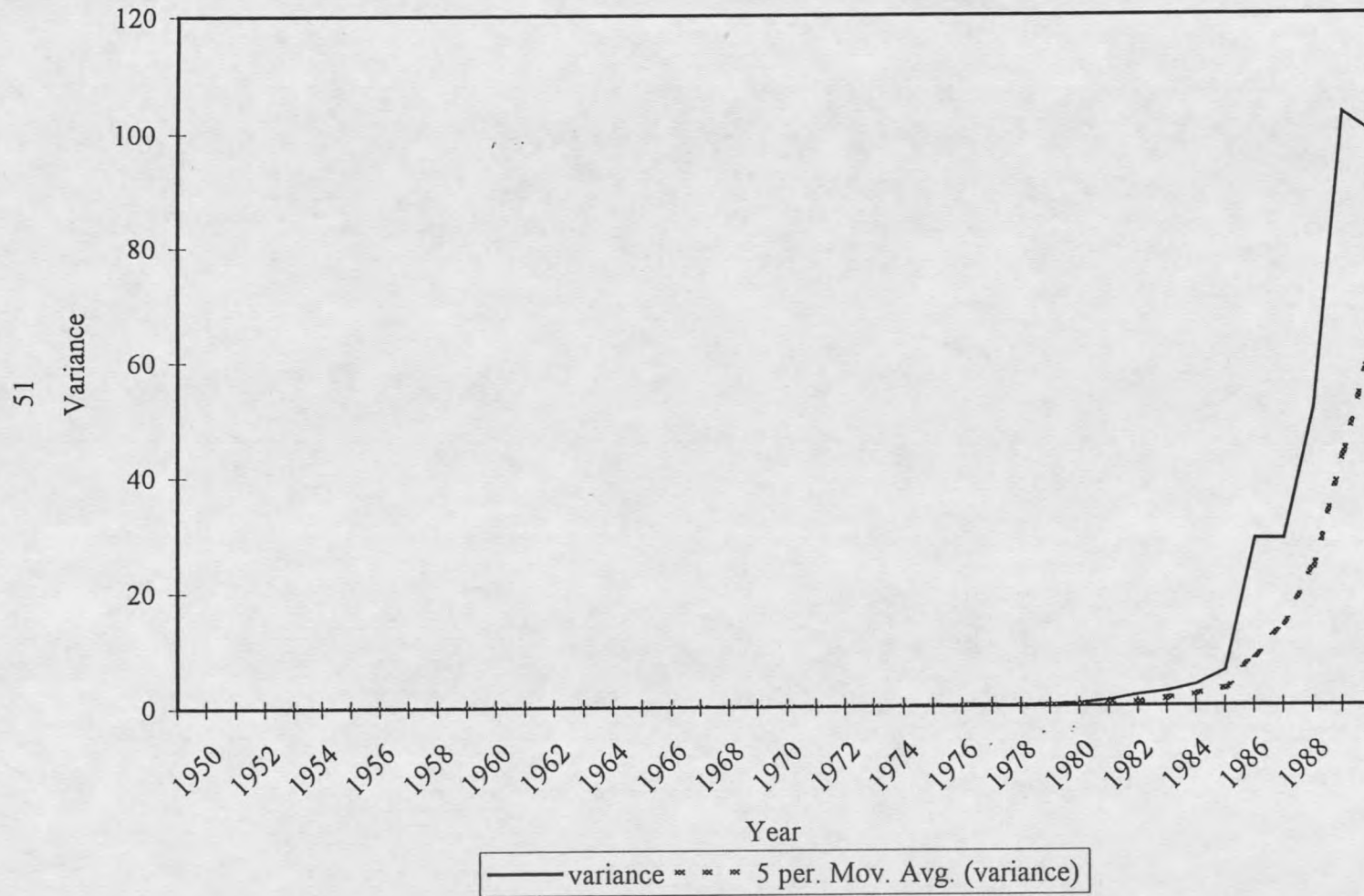


Figure 9: Variance of Provincial Import Levels: 1949 - 1989



indicator whose variance shows a steady decline during the reform era. There appears to have been a relatively high degree of variability in tax rates during the late 1970s, but it has become markedly less distinct during the reform period. The data for exports and imports (Figures 6 - 9) show a clear increase in variance throughout the reforms. The data for foreign investment displays the same tendencies. The conclusion to be drawn from this evidence is that reforms have not been implemented equally across China's provinces, except perhaps, in the case of provincial tax rates, where there appears to be some inter-provincial smoothing. Overall, however, the reform variables show distinct divergence over the reform time period.

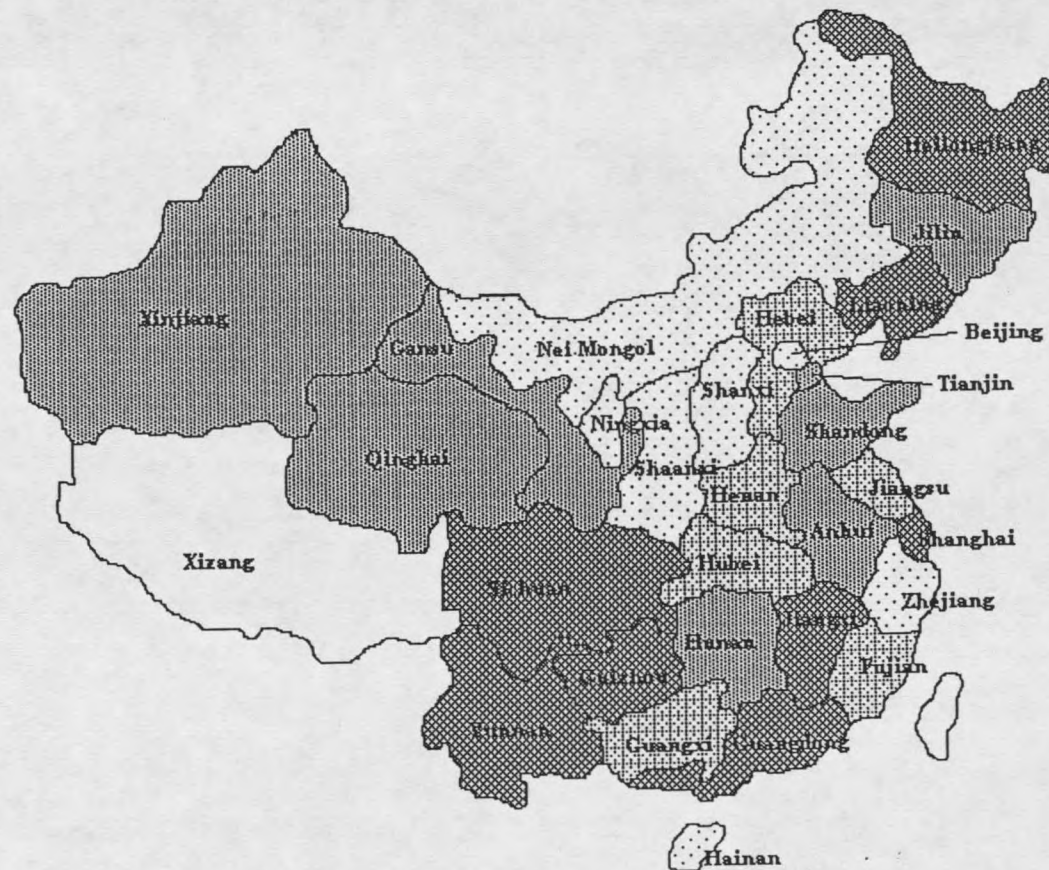
The preceding evidence illustrates that for most reform variables there was unequal implementation, however, it says nothing of specific provinces. Table 2 offers some insight into the reform effects on specific provinces. The table provides provincial rankings of the net effect of the reform period on the appropriate reform variables. This net effect is measured as the difference between the mean of the Mao era (1949 - 1977) and the mean of the Reform era (1978 - 1989), and suggests what provinces fared best in terms of what reform measures. The point of using the net effect, instead of just the reform era means, is to control for previous levels and isolate the effect of reform. The spread of provincial levels per year has already been evidenced in the above using variances over time, so the concern here will be, which provinces received the higher levels of reform. Assuming the upper quartile as the delineation of the top reformers, the rankings in Table 2 show that the top reformers for any variable are also likely to be the top reformers for the other variables. There appears to be an elite club of reform leaders made up of Guangdong,

Table 2: Provincial Rankings of Net Effect of Reform Era

Province	Tax Rate	Province	Bureaucratic Consumption	Province	Exports	Province	Imports	Province	FDI
Shandong	10.70%	Heilongjiang	0.14%	Liaoning	34.91	Guangdong	18.53	Guangdong	17.401
Tianjin	10.04%	Yunnan	1.10%	Guangdong	31.75	Shanghai	10.56	Shanghai	4.64
Guangdong	9.85%	Liaoning	1.51%	Shanghai	29.90	Fujian	3.21	Liaoning	2.94
Heilongjiang	9.50%	Guizhou	1.99%	Shandong	19.33	Jiangsu	2.9	Shandong	2.649
Jilin	9.27%	Guangdong	2.07%	Jiangsu	12.48	Shandong	2.6	Fujian	2.324
Jiangsu	8.29%	Sichuan	2.29%	Tianjin	8.94	Liaoning	2.52	Beijing	1.748
Beijing	8.25%	Jiangxi	2.41%	Hebei	8.07	Tianjin	2.49	Jiangsu	1.562
Hainan	7.84%	Henan	2.48%	Zhejiang	7.98	Zhejiang	1.93	Tianjin	0.9251
Fujian	5.48%	Shanghai	2.52%	Beijing	6.20	Beijing	1.91	Zhejiang	0.8509
Sichuan	5.48%	Fujian	2.72%	Fujian	5.78	Hainan	1.15	Hainan	0.8389
Henan	5.10%	Hebei	3.19%	Hubei	4.73	Sichuan	1.1	Shanxi	0.5816
Liaoning	5.09%	Jiangsu	3.55%	Hunan	3.81	Heilongjiang	1.09	Henan	0.5763
Zhejiang	4.76%	Hubei	3.59%	Heilongjiang	3.66	Jilin	0.99	Heilongjiang	0.3983
Xinjiang	4.67%	Guangxi	3.75%	Henan	3.51	Guangxi	0.95	Anhui	0.3536
Shaanxi	4.65%	Hunan	3.86%	Guangxi	3.32	Henan	0.93	Hebei	0.3454
Hebei	4.64%	Xinjiang	4.10%	Sichuan	3.18	Anhui	0.88	Jiangxi	0.3125
Guangxi	4.30%	Qinghai	4.25%	Jilin	2.68	Hubei	0.88	Hunan	0.3078
Inner Mongolia	3.28%	Anhui	4.77%	Anhui	2.45	Hebei	0.81	Hubei	0.3059
Jiangxi	3.26%	Jilin	5.28%	Jiangxi	2.26	Hunan	0.8	Jilin	0.2486
Gansu	3.01%	Tianjin	5.35%	Shanxi	1.52	Shanxi	0.79	Guangxi	0.198
Hubei	2.72%	Shandong	5.59%	Yunnan	1.42	Yunnan	0.67	Guizhou	0.113
Hunan	2.31%	Gansu	5.81%	Xinjiang	1.27	Shaanxi	0.59	Xinjiang	0.0723
Shanghai	1.95%	Zhejiang	6.12%	Shaanxi	1.20	Xinjiang	0.49	Yunnan	0.0555
Ningxia	1.43%	Shanxi	6.45%	Inner Mongolia	1.13	Jiangxi	0.43	Inner Mongolia	0.0177
Anhui	1.14%	Shaanxi	7.14%	Hainan	0.85	Inner Mongolia	0.37	Ningxia	0.0096
Yunnan	0.73%	Inner Mongolia	7.30%	Gansu	0.48	Gansu	0.19	Gansu	0
Guizhou	0.13%	Beijing	7.94%	Guizhou	0.47	Guizhou	0.18	Qinghai	0
Shanxi	-0.18%	Hainan	8.92%	Ningxia	0.34	Ningxia	0.1	Shaanxi	0
Qinghai	-0.73%	Ningxia	12.80%	Qinghai	0.17	Qinghai	0.1	Sichuan	0

Jiangsu, Liaoning, Shandong, Shanghai, Tianjin, and less so, Beijing, Fujian, and Heilongjiang. Maps 1 - 5 display the quartile breakdown of reform efforts for the provinces. Guangdong alone appears in the top quartile for all five measures, with Liaoning and Shandong close behind appearing in four each. Guizhou, Jiangxi, Jilin,

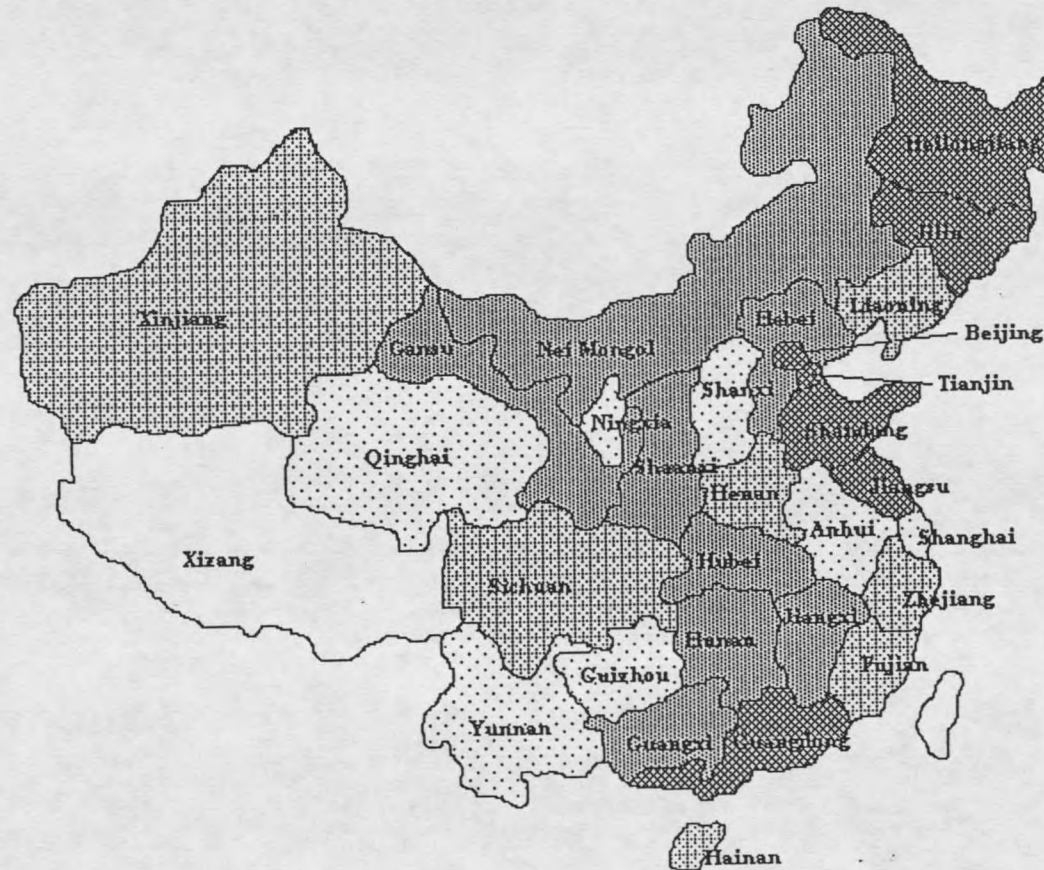
Map 1: Distribution of Reform Efforts in Bureaucratic Reform



Legend: Provincial Ranking

First Quartile Second Quartile Third Quartile Fourth Quartile

Map 2: Distribution of Reform Efforts in Tax Rate



Legend: Provincial Ranking



First Quartile



Second Quartile

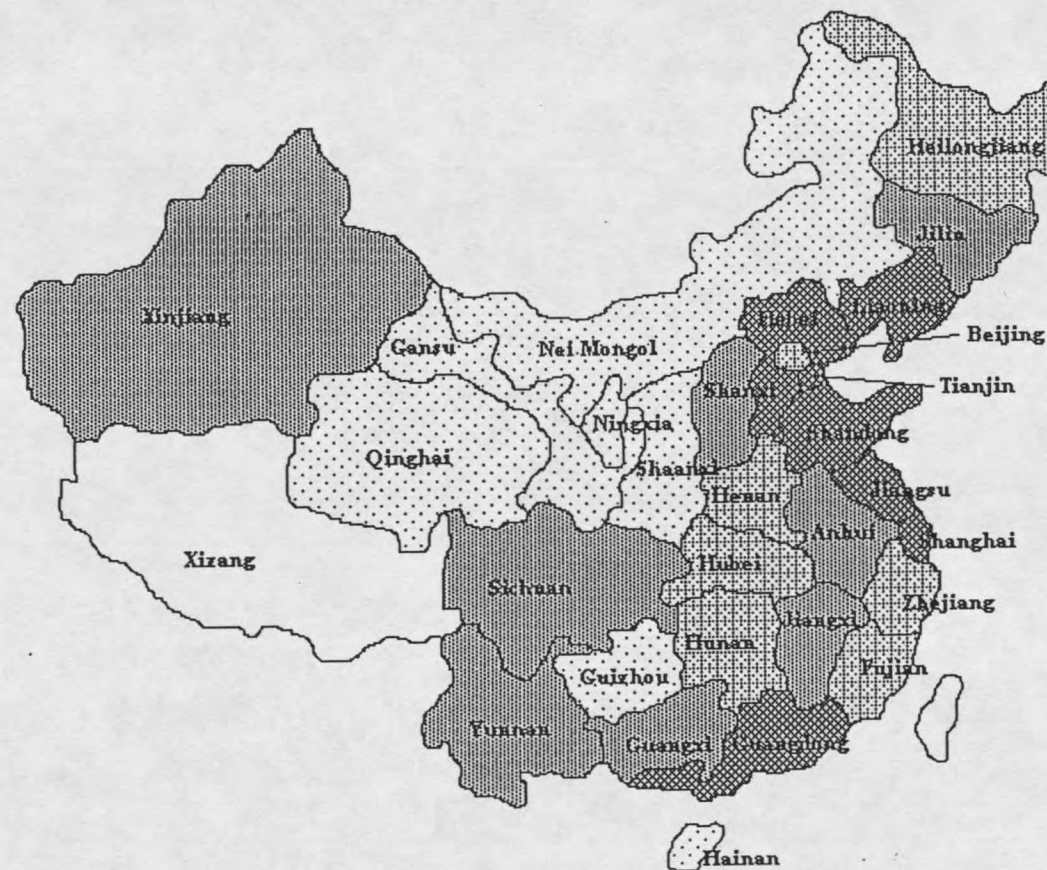


Third Quartile



Fourth Quartile

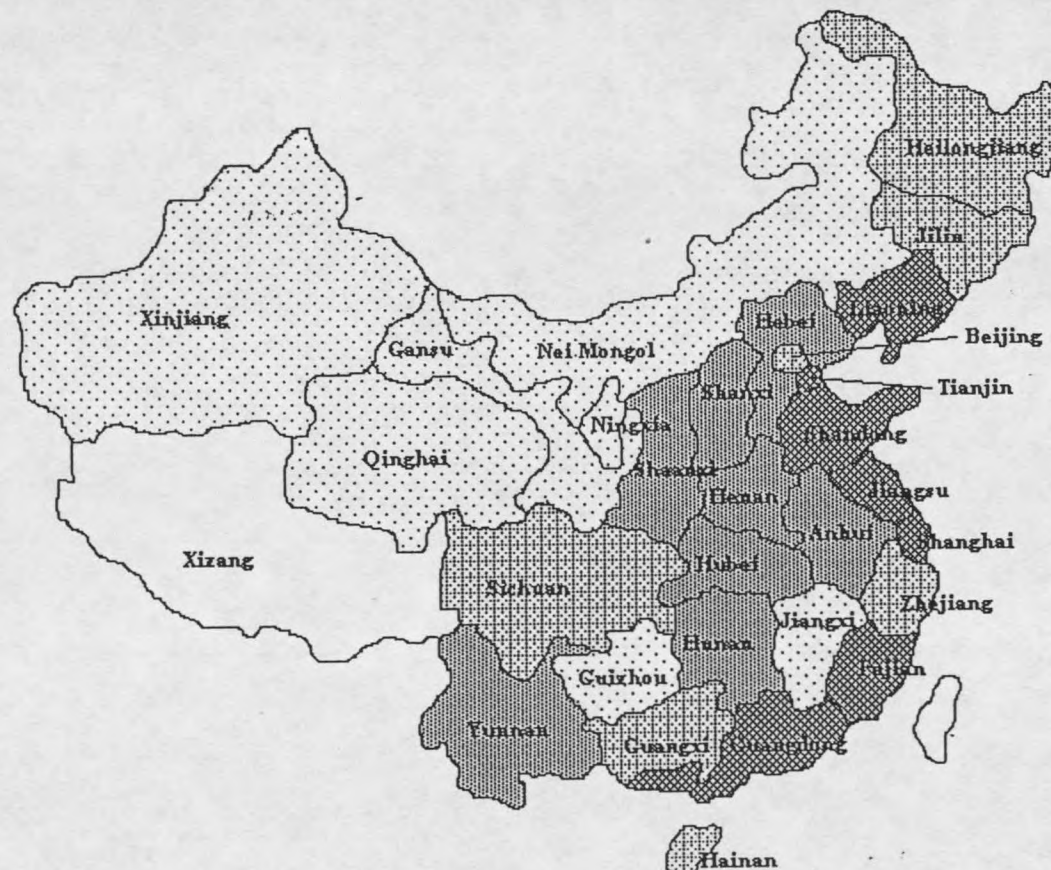
Map 3: Distribution of Reform Efforts in Exports



Legend: Provincial Ranking

First Quartile Second Quartile Third Quartile Fourth Quartile

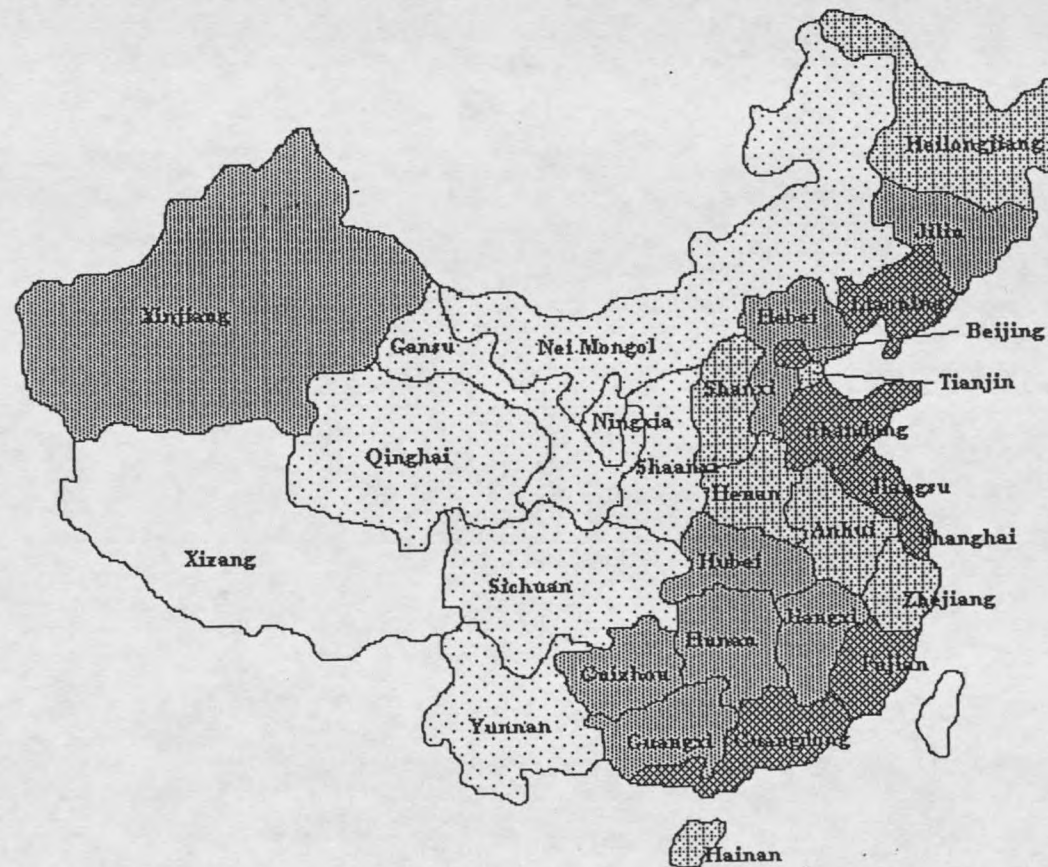
Map 4: Distribution of Reform Efforts in Imports



Legend: Provincial Ranking

First Quartile Second Quartile Third Quartile Fourth Quartile

Map 5: Distribution of Reform Efforts in FDI



Legend: Provincial Ranking

First Quartile Second Quartile Third Quartile Fourth Quartile

Sichuan, and Yunnan make appearances as top performers in only one variable each. The multiple top showings of many provinces adds to the evidence that reform was implemented unequally. Combined with the prior evidence on the provincial variances, the club-like nature of the top reformers illustrated here leads to the conclusion that reform has not implemented uniformly throughout China, thus giving us Proposition 1.

Proposition 1: China's post-Mao reform effort has not been implemented uniformly throughout China, but has instead favored some provinces over others.

The next section will look at the question of provincial uniformity of economic performance.

Question 2: Have Growth and Development Occurred Uniformly?

The disparities in economic performance across China's provinces over the reform era is not as straightforward of a question as was the uniformity of the reform effort. Some scholarship on the subject concludes that there has been convergence (increasing equality) over time, while others suggest divergence (increasing inequality). The evidence provided in the following cannot serve as the final word on the matter, however, it does suggest a reasonable compromise between the competing conclusions.

Using the two common measures of economic performance, real income per capita and the growth of real income per capita, there is evidence of both convergence and divergence since the late 1970s. Figures 10 - 13 show provincial income and provincial

Figure 10: Provincial Income: 1949 - 1989

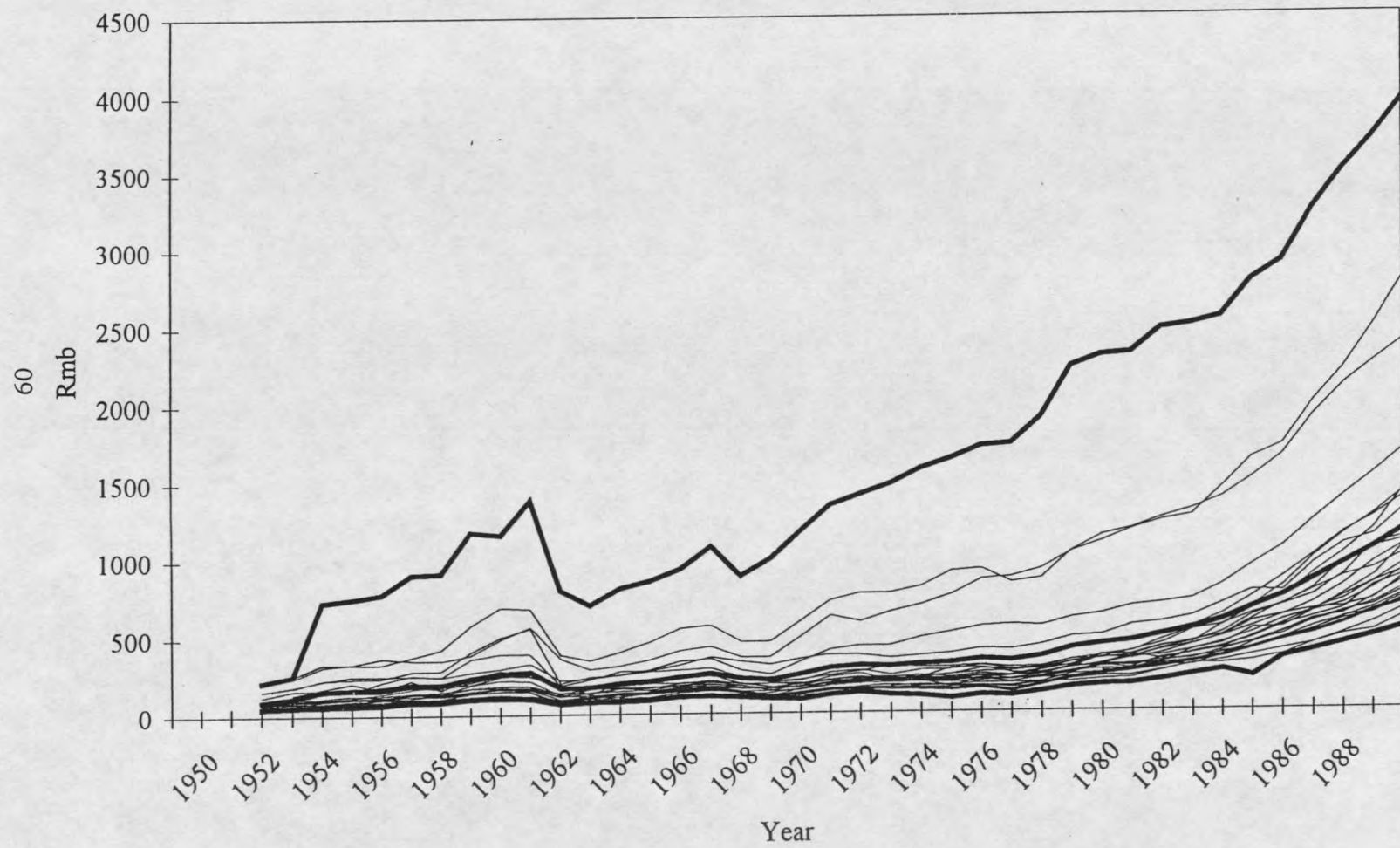


Figure 11: Variance of Provincial Income Levels: 1949 - 1989

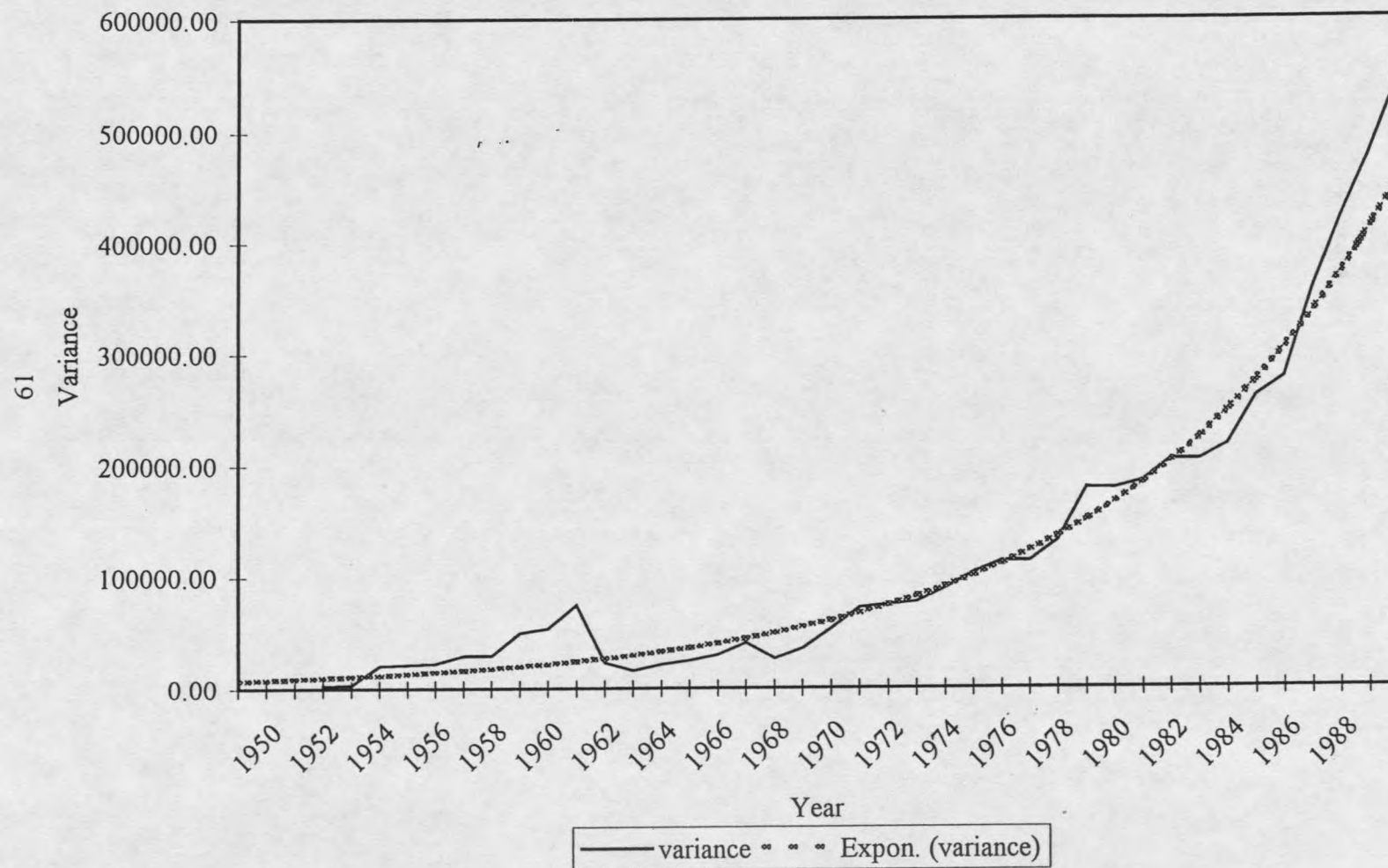


Figure 12: Annual Provincial Growth Rates: 1949 - 1989

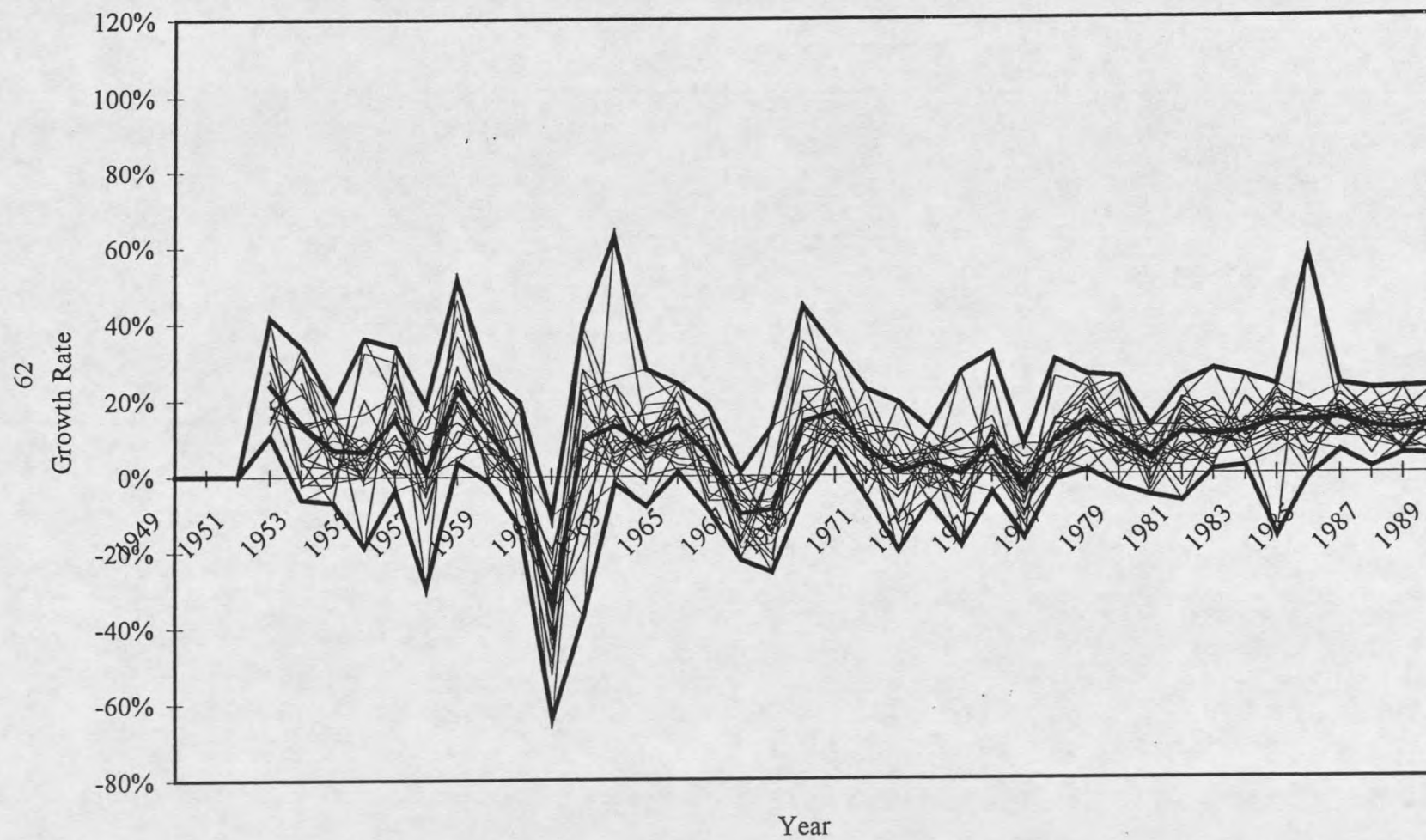
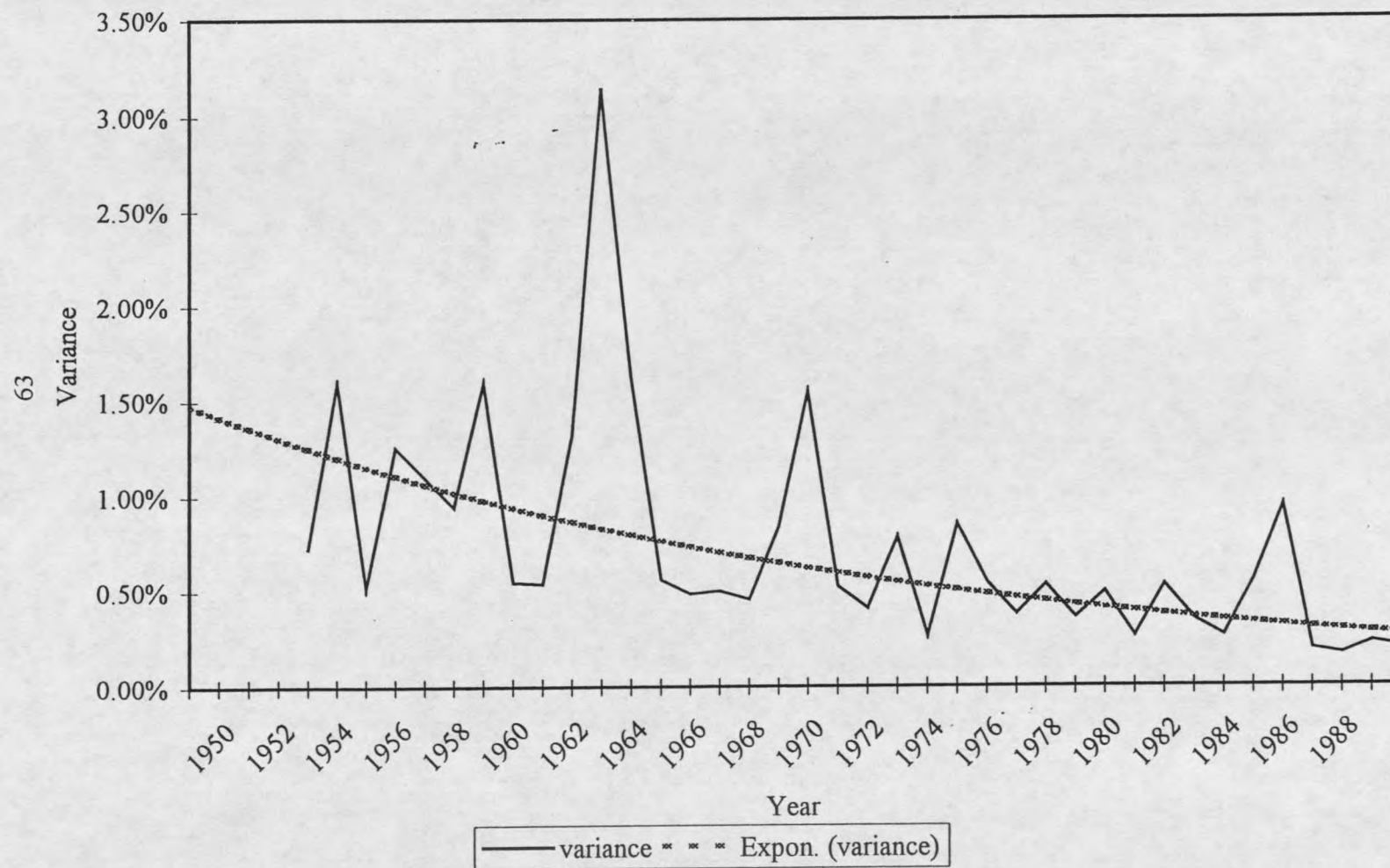


Figure 13: Variance of Provincial Growth Rates: 1949 - 1989



growth over the 1949 - 1989 period (Figures 10 and 12) and the variances of these measures (Figures 11 and 13). The data on real income per capita levels show a clear increase in variance (the dotted line represents the trend) over the time period. Divergence even appears to increase over the 1978 - 1989 reform period. The data on the growth of real income per capita shows the opposite result. There seems to be a decrease in the variance of provincial growth rates over the selected time period. Thus using variance, it appears that there is divergence across provincial income levels, while there is convergence across provincial income growth rates.

This type of convergence is referred to as *sigma convergence* in the economic growth literature. Another type of convergence is termed *beta convergence* and refers to convergence evidenced by the sign on the coefficient of initial income regressed against the appropriate measure of economic performance; where a positive sign suggests divergence and a negative sign suggests convergence. This evidence demonstrates the same conclusion as the previous test. There appears to be divergence in provincial income levels (statistically significant at the 99% level) and convergence in provincial income growth rates. Thus both methods arrive at the same conclusion, suggesting that provincial income levels have become more unequal, while provincial growth rates have become more equal.

Table 3: Provincial Rankings of Net Effect of Reform Era

Province	Income Growth	Province	Income Level	Province	Initial Income
Hainan	13.82%	Shanghai	1706.56	Shanghai	1155.8
Jiangsu	12.39%	Beijing	1186.05	Tianjin	560.34
Zhejiang	12.15%	Tianjin	1024.81	Beijing	481.4
Fujian	11.06%	Jiangsu	803.79	Jiangsu	429.09
Xinjiang	9.44%	Liaoning	629.34	Liaoning	363.55
Anhui	9.09%	Zhejiang	563.95	Heilongjiang	314.68
Guangdong	8.99%	Guangdong	516.71	Hainan	250.73
Guizhou	8.38%	Hainan	513.53	Xinjiang	227.31
Jilin	8.00%	Shandong	470.33	Jilin	217.45
Henan	7.48%	Heilongjiang	463.79	Qinghai	212.98
Inner Mongolia	7.48%	Hubei	422.51	Inner Mongolia	209.59
Shandong	7.35%	Jilin	414.59	Anhui	196.72
Ningxia	6.71%	Fujian	375.21	Ningxia	193.93
Hubei	6.49%	Hebei	368.59	Guangdong	180.85
Yunnan	6.30%	Shanxi	348.29	Shanxi	172.31
Sichuan	6.29%	Xinjiang	342.31	Hubei	171.88
Jiangxi	6.07%	Hunan	309.61	Zhejiang	168.05
Hebei	5.72%	Qinghai	302.12	Hebei	160.89
Hunan	5.34%	Sichuan	286.89	Jiangxi	156.44
Shanxi	5.19%	Henan	282.51	Gansu	155.08
Guangxi	4.46%	Gansu	278.87	Shaanxi	150.22
Heilongjiang	4.23%	Inner Mongolia	270.15	Hunan	145.18
Shaanxi	3.91%	Ningxia	269.78	Fujian	136.88
Qinghai	3.24%	Shaanxi	268.42	Shandong	136.59
Beijing	2.68%	Jiangxi	268.19	Henan	124.56
Liaoning	2.63%	Yunnan	243.27	Yunnan	120.7
Gansu	2.08%	Anhui	239.68	Sichuan	117.52
Tianjin	2.06%	Guangxi	232.51	Guangxi	111.01
Shanghai	1.15%	Guizhou	200.61	Guizhou	95.19

The analysis of unequal economic performance using the above tests does not provide us with insight into the nature of the proposed convergence or divergence. Table 3 lists the provincial rankings of economic performance in terms of initial real income per capita (the 1949 - 1977 mean) as well as the net effect of reform on the two measures of economic performance, provincial income levels and provincial income growth rates. The net effect was measured as the difference between the 1978 - 1989 mean and the 1949 - 1977 mean. This evidence suggests that the top performers in terms of income levels were typically not the top performers in terms of income growth, with the exceptions being Guangdong, Jiangsu, and Zhejiang. Looking more closely at the net reform effect on income levels, the top quartile consists of many of the same provinces that were in the top quartile for the 1949 - 1977 period. Shanghai, Tianjin, Beijing, Jiangsu, and Liaoning had the top provincial income levels over the 1949 - 1977 period, and also showed the highest net effect for the reform period (though in slightly different order as Beijing and Tianjin switch positions). This suggests that those provinces that were already rich, became richer as a result of reform. This is also evidenced in Figures 10 - 13, where the handful of provinces that are consistently above the mean show a trend of increasing their distance from those lower income provinces. Only two provinces make the top quartile in terms of net reform effect on income levels that were not high achievers in the earlier period; these provinces are Guangdong and Zhejiang. Both provinces, however, find themselves among the highest in the net reform effect on income growth rates.

The latter evidence using specific provinces adds insight to the former evidence on convergence and divergence. The former showed divergence in income levels and

convergence in income growth rates. The latter suggests that the provinces with the highest net results over the reform period in terms of growth, were not wealthy provinces prior to reform; however, in terms of income levels most of the highest performers had always been wealthy provinces. The richest provinces showed the highest increases in income per capita from reform, while those who showed the highest growth rates as a result of reform tended not to be rich during the earlier period. These results are not inconsistent with the varied findings of previous research, and lead to the following proposition:

Proposition 2: Provincial economic performance during the reform era diverged in terms of real income per capita while it converged in terms of growth in real income per capita. That is, income levels became more unequal, while income growth became more equal.

The following section will take propositions 1 and 2 and attempt to analyze their relationship in greater detail.

Question 3: What is the Relationship between Unequal Reform Efforts and Divergence and Convergence in Provincial Income Levels and Growth Rates, Respectively?

This question is the most difficult of the three. Given that economic reforms were not implemented uniformly and that income levels have been disparate across provinces while growth rates are equalizing, what is the relationship between reforms and performance? A

number of tests will be examined in order to determine how the evidence answers this question.

Several regressions will be examined to help answer Question 3. The regression equations will be the same in all, however, the data sets will change. Two different dependent variables are used in determining statistical relationships between reform types and provincial growth (YG) and development (Y) for each regression. The independent variables used are as explained before: an approximate tax rate (TAX), a proxy for the size of the provincial bureaucracy (BUR), exports (X), imports (M), foreign direct investment (FDI), a variable measuring the number of Special Economic Zones (SEZ), and one measuring the number of Open Coastal Cities (OCC). The independent variables remain the same in all equations, however, one regression will have growth in per capita national income (YG) as its dependent variable, while the other will have the level of per capita provincial income (Y). (See Appendix A for an exposition of the key variables and their determination.) The regression equations are as follows:

$$(1) YG = \beta_1 + \beta_2 TAX + \beta_3 BUR + \beta_4 X + \beta_5 M + \beta_6 FDI + \beta_7 SEZ + \beta_8 OCC + \varepsilon$$

$$(2) Y = \beta_1 + \beta_2 TAX + \beta_3 BUR + \beta_4 X + \beta_5 M + \beta_6 FDI + \beta_7 SEZ + \beta_8 OCC + \varepsilon$$

The three different tests using these equations will use data from the period 1978-1989.

The first looks at provincial panel data, the second looks at time-series data for each

province, and the third uses provincial cross-sections with measures of net changes in variables (as was used previously).

Regression #1: Panel Data. The results of the first regression are displayed in Table 4.

For economic growth (YG), coefficients on the independent variables suggest that reform efforts on tax level (TAX), Foreign Direct Investment (FDI), Special Economic Zones (SEZ), and Open Coastal Cities (OCC) all have a beneficial effect. On the other hand, improvements in exports (X), imports (M), and bureaucratic frugality (BUR) appear detrimental to growth. Three of the results are statistically significant. A 1% decrease in the tax rate corresponds with a 0.1% increase in growth at the 95% level, a 1% increase in FDI yields a 0.1% increase in YG at the 90% significance level, and the existence of each Open Coastal City yields a 2% increase in growth at the 99% level. R-squared for this panel data regression is quite low at 0.09 which casts doubt on the results.

Table 4: Panel Data Regression Results: 1978 - 1989

	Constant	TAX	BUR	EXP	IMP	FDI	SEZ	OCC	R-square	F-stat	N
Y	-110.92 <i>-2.41**</i>	673.22 <i>3.69***</i>	2943.21 <i>6.94***</i>	2163.15 <i>9.12***</i>	6699.07 <i>8.84***</i>	1478.49 <i>2.06**</i>	-441.15 <i>-11.0***</i>	72.95 <i>2.20***</i>	0.7594	151.48	342
YG	0.13 <i>13.1***</i>	-0.09 <i>-2.24**</i>	0.01 <i>-0.16</i>	-0.09 <i>-1.69*</i>	-0.03 <i>-0.17</i>	0.11 <i>0.67</i>	0.01 <i>0.87</i>	0.02 <i>2.93***</i>	0.0897	4.71	341

T-statistic in italics under coefficient

* = 90% confidence

** = 95% confidence

*** = 99% confidence

The panel data regression on National Income (Y) produces somewhat more reliable results. Positive relationships are evidenced with exports, imports, foreign direct investment, and Open Coastal Cities, while negative relationships occur with reform efforts in tax rate, bureaucratic consumption, and Special Economic Zones. The coefficients on the tax rate, bureaucratic consumption, exports, imports, SEZs, and OCCs are all statistically significant at the 99% level, while FDI is statistically significant at the 95% level. An increase in the tax rate of 1% leads to an increase in per capita provincial income of 6.73 Rmb. A 1% increase in exports and imports yields a per capita income payoff of 21.63 Rmb and 66.99 Rmb respectively. Increasing bureaucratic consumption by 1% corresponds with a 29.43 Rmb rise in per capita income, while the presence of each SEZ and each OCC corresponds with a 441.15 Rmb decrease and a 72.95 Rmb increase respectively. Finally, a 1% increase in FDI results in a 14.78 Rmb increase in real provincial income per capita. R-squared for this regression is 0.7594, suggesting these results are more reliable than those for income growth, though neither produces conclusive evidence.

Regression #2: Provincial Time-Series. The next set of regressions uses time-series data for each province over the reform period. These results are provided in Tables 5 and 6. Regressed on income growth, a summary of the relationships are as follows: 19 of the 29 provinces suggest decreased tax rates lead to increased growth, 17 of the 29 provinces display a negative relationship between exports and growth, 17 of the 29 suggest that increased bureaucratic consumption corresponds with increased growth, 16 of the 29

show an decrease in growth with an increase in imports, the results for foreign direct investment are split half and half, all three provinces with SEZs show negative results, and 8 of the 10 provinces with Open Coastal Cities show positive results. If a majority is the standard, then cross section results agree with panel data results for all the variables: except SEZs. The best results occur for the tax, exports, and imports variables with four displaying statistical significance at 90% or above. Of these four, three agree with the sign of the majority of the provincial coefficients.

The time-series results for the dependent variable Provincial Income are again a little better than those for growth. 21 of the 29 provinces display a increase in income with a decrease in tax rates, 23 of 29 show a positive relationship between exports and income, 22 of 29 suggest increased bureaucratic consumption yields increased income levels, 25 of 29 show rising income with higher import levels, 15 of 25 suggest more FDI is beneficial, all three provinces with SEZs display negative results, while 7 of the 10 provinces with Open Coastal Cities show positive results. Again using majority as the rule, time-series results coincide with the panel data results for exports, imports, FDI, bureaucratic consumption, SEZs, and OCCs. That is, all but tax rates. The best results occur for the variable imports where 9 of the 29 provinces show coefficients statistically significant at the 90% level or higher; all of which are positive. Also with good results are exports, with 8 statistically significant coefficients (7 of which are positive), and bureaucratic consumption, with 7 statistically significant coefficients (of which 6 are positive).

Table 5: Time Series Regression Results for Provincial Income Level

Province	Constant	TAX	BUR	EXP	IMP	FDI	SEZ	OCC	R-square	F-stat	N
Anhui	14.56 <i>0.07</i>	783.73 <i>0.72</i>	245.25 <i>0.17</i>	4071.08 <i>1.53</i>	22723 <i>4.05***</i>	-5583.65 <i>-1.09</i>	na	na	0.9602	28.958	12
Beijing	503.29 <i>0.37</i>	-692.08 <i>-0.56</i>	1149.17 <i>0.3</i>	4532.68 <i>1.64</i>	19188 <i>2.79**</i>	-2550.66 <i>-1.07</i>	na	na	0.9274	15.329	12
Fujian	-185.57 <i>-0.37</i>	-2015.14 <i>-1.6</i>	7338.36 <i>1.12</i>	1428.86 <i>0.97</i>	916.14 <i>0.49</i>	1194.58 <i>0.98</i>	-74.4 <i>-0.61</i>	136.57 <i>1.31</i>	0.9691	17.938	12
Gansu	-275.24 <i>-0.81</i>	-17.61 <i>-0.06</i>	3471.58 <i>1.32</i>	5861.98 <i>1.43</i>	-143.46 <i>-0.02</i>	na	na	na	0.8993	15.636	12
Guangdong	-494.33 <i>-2.05</i>	-1122.11 <i>-1.25</i>	14001 <i>8.7***</i>	943.86 <i>2.44*</i>	342.53 <i>0.68</i>	-59.5 <i>-0.2</i>	-18.72 <i>-0.74</i>	-30.63 <i>-1.14</i>	0.9964	156.865	12
Guangxi	1246.52 <i>2.77**</i>	-635.2 <i>-0.85</i>	-13936 <i>-2.61**</i>	21.91 <i>0.01</i>	3525.53 <i>1.23</i>	2554.81 <i>0.73</i>	na	549.99 <i>3.27**</i>	0.905	7.934	12
Guizhou	18.69 <i>0.18</i>	-1160.65 <i>-1.62</i>	4245.78 <i>2.85**</i>	2111.78 <i>0.93</i>	4798.52 <i>0.63</i>	12182 <i>1.69</i>	na	na	0.9682	36.531	12
Hainan	-321.36 <i>-4.03**</i>	-1105.38 <i>-0.77</i>	10763 <i>10.78***</i>	-540.07 <i>-1.16</i>	1207.63 <i>2.29</i>	332.72 <i>0.65</i>	-155.29 <i>-1.16</i>	na	0.9938	79.785	10
Hebei	21.79 <i>0.03</i>	471.05 <i>0.47</i>	162.23 <i>0.02</i>	1013.74 <i>0.59</i>	36376 <i>1.42</i>	-14566 <i>-0.8</i>	na	123.23 <i>1.02</i>	0.9332	11.638	12
Heilongjiang	384.45 <i>5.56***</i>	-398.35 <i>-1.94</i>	2043.38 <i>1.56</i>	3765.33 <i>1.34</i>	4777.72 <i>1.09</i>	-611.66 <i>-0.06</i>	na	na	0.9906	105.169	11
Henan	236.91 <i>1.32</i>	-1007.23 <i>-2.54**</i>	2234.34 <i>1.52</i>	1457.03 <i>1.14</i>	407.41 <i>0.06</i>	12290 <i>1.72</i>	na	na	0.9885	103.525	12
Hubei	-315.91 <i>-0.42</i>	234.41 <i>0.11</i>	3343.59 <i>0.86</i>	9636.47 <i>4.29***</i>	17155 <i>2.58**</i>	-35206 <i>-2.81**</i>	na	na	0.975	46.83	12
Hunan	628.15 <i>1.66</i>	-1210.77 <i>-1.6</i>	-3753.26 <i>-0.94</i>	4117.78 <i>1.93</i>	6660.1 <i>1.54</i>	23103 <i>3.56**</i>	na	na	0.9634	31.602	12
Inner Mongolia	63.08 <i>0.91</i>	156.07 <i>0.3</i>	1082.29 <i>1.77</i>	5751.97 <i>4.45***</i>	5793.53 <i>1.16</i>	-34002 <i>-3.79***</i>	na	na	0.9825	67.388	12
Jiangsu	2242.54 <i>2.237*</i>	-7627.67 <i>-2.67*</i>	1110.64 <i>0.22</i>	-3957.03 <i>-2.22*</i>	16972 <i>5.04***</i>	-7476.61 <i>-2.16*</i>	na	-74.69 <i>-1</i>	0.9942	115.006	11
Jiangxi	274.52 <i>0.898</i>	-152.42 <i>-0.1</i>	-854.61 <i>-0.34</i>	4540.5 <i>2.09*</i>	-605.14 <i>-0.07</i>	5448.18 <i>1.12</i>	na	na	0.9141	12.773	12
Jilin	28.28 <i>0.11</i>	233.55 <i>0.26</i>	4957.65 <i>1.64</i>	3285.6 <i>0.86</i>	-6351.27 <i>-0.6</i>	25701 <i>1.77</i>	na	na	0.9584	27.672	12
Liaoning	993.62 <i>2.26*</i>	-1123.51 <i>-3.50**</i>	928.15 <i>0.23</i>	-306.76 <i>-1.26</i>	12119 <i>4.37***</i>	1927.17 <i>1.76</i>	na	35.93 <i>0.55</i>	0.9939	135.132	12
Ningxia	-39.44 <i>-0.03</i>	-513.38 <i>-0.35</i>	2043.29 <i>0.39</i>	458.79 <i>0.1</i>	7441.48 <i>0.84</i>	9631.18 <i>0.67</i>	na	na	0.5397	1.407	12
Qinghai	511.33 <i>2.08*</i>	-920.35 <i>-1.86</i>	1984.84 <i>1.62</i>	7504.22 <i>3.39**</i>	-7075.38 <i>-1.56</i>	na	na	na	0.9531	35.583	11
Shaanxi	228.74 <i>1.59</i>	-88.34 <i>-0.28</i>	728.84 <i>0.77</i>	-2239.41 <i>-1.27</i>	18905 <i>4.37***</i>	na	na	na	0.9821	96.099	12
Shandong	669.59 <i>4.07***</i>	-2573.91 <i>-3.2**</i>	5677.26 <i>2.2*</i>	-2135.67 <i>-1.85</i>	915.92 <i>0.15</i>	1850.25 <i>1.72</i>	na	38.27 <i>1.33</i>	0.9856	57.184	12
Shanghai	2571.02 <i>3.73**</i>	-1058.99 <i>-1.27</i>	-1452.58 <i>-0.73</i>	1914.45 <i>1.81</i>	3764.7 <i>2.25*</i>	-923.13 <i>-0.24</i>	na	222.02 <i>1.19</i>	0.9891	75.412	12
Shanxi	215.82 <i>0.75</i>	668.93 <i>-0.88</i>	3118.78 <i>1.6</i>	2067.83 <i>0.84</i>	3387.38 <i>0.65</i>	337.44 <i>0.11</i>	na	na	0.9368	17.782	12
Sichuan	132.41 <i>1.11</i>	-4069.44 <i>-3.03**</i>	9270.16 <i>2.39**</i>	1257.69 <i>0.44</i>	11964 <i>1.41</i>	na	na	na	0.9769	74.1	12
Tianjin	1015.85 <i>2.04*</i>	-1537.38 <i>-2.58**</i>	6495.89 <i>3.38**</i>	-633.97 <i>-0.68</i>	4998.57 <i>2.83**</i>	2565.34 <i>1.4</i>	na	-160.19 <i>-0.93</i>	0.9903	85.024	12
Xinjiang	1059.39 <i>1.43</i>	1634.69 <i>1.05</i>	-11756 <i>-1.17</i>	6397.13 <i>3.6**</i>	8523.83 <i>1.42</i>	-21105 <i>-1.95*</i>	na	na	0.959	28.1	12
Yunnan	126.04 <i>0.89</i>	1540.66 <i>0.97</i>	-3748.44 <i>-0.89</i>	3103.74 <i>1.93</i>	9329.48 <i>4.19***</i>	7163.74 <i>0.78</i>	na	na	0.9606	29.262	12
Zhejiang	1053.66 <i>1.41</i>	-1785.43 <i>-0.96</i>	-5305.65 <i>-1.1</i>	3653.92 <i>2.24*</i>	8381.14 <i>0.45</i>	5390.64 <i>0.5</i>	na	83.18 <i>1.67</i>	0.9836	49.943	12
China	-110.92 <i>-2.41**</i>	673.22 <i>3.69***</i>	2943.21 <i>6.94***</i>	2163.15 <i>9.12***</i>	6699.07 <i>8.34***</i>	1478.49 <i>2.06**</i>	-441.15 <i>-11.01***</i>	72.95 <i>2.21**</i>	0.7594	151.485	342

T-statistic in italics under coefficient

* = 90% confidence

** = 95% confidence

*** = 99% confidence

Table 6: Time Series Regression Results for Provincial Income Growth

Province	Constant	TAX	BUR	EXP	IMP	FDI	SEZ	OCC	R-square	F-stat	N
Anhui	0.42 <i>2.12*</i>	-1.73 <i>-1.66</i>	-0.02 <i>-0.01</i>	-2.45 <i>-0.96</i>	1.52 <i>0.28</i>	1.28 <i>0.26</i>	na	na	0.4855	1.132	11
Beijing	-0.98 <i>-0.32</i>	-0.03 <i>-0.09</i>	0.95 <i>1.09</i>	-0.37 <i>-0.58</i>	0.37 <i>0.24</i>	0.2 <i>0.37</i>	na	na	0.3583	0.67	12
Fujian	0.66 <i>1.55</i>	0.92 <i>0.86</i>	-6.79 <i>-1.21</i>	1.47 <i>1.73</i>	-1 <i>-0.62</i>	-0.36 <i>-0.34</i>	-0.14 <i>-1.32</i>	0.11 <i>1.19</i>	0.6286	0.967	12
Gansu	-0.34 <i>-0.97</i>	-0.22 <i>-0.67</i>	3.68 <i>1.34</i>	-5.1 <i>-1.19</i>	-1.85 <i>-0.2</i>	na	na	na	0.4677	1.538	12
Guangdong	0.06 <i>0.17</i>	-0.39 <i>-0.31</i>	1.89 <i>0.83</i>	0.4 <i>0.73</i>	-0.9 <i>-1.27</i>	0.4 <i>0.96</i>	-0.03 <i>-0.79</i>	0.03 <i>0.75</i>	0.6268	0.96	12
Guangxi	0.64 <i>1.11</i>	-0.8 <i>-0.83</i>	-7.81 <i>-1.14</i>	1.24 <i>0.42</i>	-2.6 <i>-0.71</i>	3.05 <i>0.68</i>	na	0.33 <i>1.52</i>	0.4412	0.66	12
Guizhou	0.29 <i>0.68</i>	-4.35 <i>-1.46</i>	8.26 <i>1.33</i>	-25.66 <i>-2.71**</i>	10.44 <i>0.33</i>	42.58 <i>1.42</i>	na	na	0.6627	2.358	12
Hainan	0.44 <i>1.82</i>	-9.85 <i>-2.27</i>	4.08 <i>1.35</i>	-0.27 <i>-0.19</i>	-2.49 <i>-1.56</i>	3.2 <i>2.06</i>	-0.52 <i>-1.28</i>	na	0.671	1.02	10
Hebei	-0.49 <i>-1.08</i>	0.85 <i>1.5</i>	4.11 <i>0.96</i>	-0.59 <i>-0.61</i>	24.33 <i>1.68</i>	-16.21 <i>-1.58</i>	na	0.01 <i>0.16</i>	0.6377	1.467	12
Heilongjiang	-0.09 <i>-0.46</i>	-0.14 <i>-0.25</i>	1.72 <i>0.49</i>	3.43 <i>0.45</i>	-6.29 <i>-0.53</i>	-22.66 <i>-0.88</i>	na	na	0.2769	0.383	11
Henan	0.46 <i>1.1</i>	-0.74 <i>-0.8</i>	-1.5 <i>-0.44</i>	-3.93 <i>-1.32</i>	10.6 <i>0.64</i>	4.12 <i>0.25</i>	na	na	0.3114	0.543	12
Hubei	1.03 <i>0.86</i>	-2.82 <i>-0.81</i>	-3.37 <i>-0.54</i>	-2.5 <i>-0.69</i>	-1.94 <i>-0.18</i>	5.01 <i>0.25</i>	na	na	0.2014	0.303	12
Hunan	0.2 <i>0.31</i>	0.35 <i>0.26</i>	-1.43 <i>-0.2</i>	-1.6 <i>-0.43</i>	3.95 <i>0.52</i>	5.32 <i>0.46</i>	na	na	0.1789	0.261	12
Inner Mongolia	0.02 <i>0.27</i>	-0.8 <i>-1.09</i>	1.47 <i>1.68</i>	4.29 <i>2.32*</i>	-14.4 <i>-2.03*</i>	-8.99 <i>-0.7</i>	na	na	0.6123	1.895	12
Jiangsu	0.7 <i>1.21</i>	-2.47 <i>-1.5</i>	-2.27 <i>-0.76</i>	1.52 <i>1.2</i>	-5.51 <i>-2.52*</i>	-0.98 <i>-0.48</i>	na	-0.004 <i>-0.1</i>	0.9177	5.579	10
Jiangxi	0.21 <i>0.75</i>	0.69 <i>0.5</i>	-2.23 <i>-0.95</i>	0.15 <i>0.08</i>	3.47 <i>0.43</i>	-2.18 <i>-0.48</i>	na	na	0.1763	0.257	12
Jilin	0.27 <i>0.87</i>	-0.38 <i>-0.36</i>	-0.96 <i>-0.28</i>	2.12 <i>0.48</i>	-9.92 <i>-0.82</i>	13.86 <i>0.83</i>	na	na	0.1666	0.24	12
Liaoning	0.26 <i>1.41</i>	-0.45 <i>-3.31**</i>	1.03 <i>0.59</i>	-0.39 <i>3.75**</i>	-2.06 <i>-1.73</i>	-0.56 <i>-1.2</i>	na	0.04 <i>1.38</i>	0.9218	9.829	12
Ningxia	0.23 <i>0.72</i>	-0.12 <i>-0.36</i>	0.12 <i>0.1</i>	-2.43 <i>-2.28*</i>	2.13 <i>1.04</i>	8.45 <i>2.53**</i>	na	na	0.7473	3.549	12
Qinghai	0.49 <i>2.52**</i>	-1.11 <i>-2.85**</i>	0.48 <i>0.49</i>	-1.97 <i>-1.12</i>	2.26 <i>0.63</i>	na	na	na	0.7664	5.741	11
Shaanxi	0.05 <i>0.12</i>	0.09 <i>0.11</i>	0.26 <i>0.11</i>	-1.72 <i>-0.37</i>	6.29 <i>0.55</i>	na	na	na	0.1689	0.356	12
Shandong	0.07 <i>0.66</i>	-1.67 <i>-3.09**</i>	5.49 <i>3.16**</i>	0.02 <i>0.02</i>	-13.56 <i>-3.38**</i>	-2.27 <i>-3.12**</i>	na	0.02 <i>0.29</i>	0.8182	3.749	12
Shanghai	-0.49 <i>-1.23</i>	0.61 <i>1.27</i>	0.58 <i>0.51</i>	0.17 <i>0.28</i>	0.79 <i>0.82</i>	-0.58 <i>-0.26</i>	na	0.09 <i>0.87</i>	0.4174	0.597	12
Shanxi	-0.19 <i>-0.38</i>	0.57 <i>0.43</i>	2.12 <i>0.63</i>	-0.36 <i>-0.08</i>	-0.07 <i>-0.008</i>	-1.19 <i>-0.365</i>	na	na	0.1645	0.236	12
Sichuan	-0.15 <i>-0.87</i>	0.84 <i>0.44</i>	2.6 <i>0.47</i>	0.07 <i>0.02</i>	-2.56 <i>-0.22</i>	na	na	na	0.4889	1.674	12
Tianjin	-0.29 <i>-1.76</i>	0.77 <i>3.89**</i>	1.67 <i>2.61**</i>	-0.58 <i>-1.86</i>	0.63 <i>1.07</i>	0.82 <i>1.35</i>	na	-0.04 <i>-0.65</i>	0.8972	7.271	12
Xinjiang	0.4 <i>2.26*</i>	0.44 <i>1.18</i>	-3.88 <i>-1.61</i>	-0.53 <i>-1.23</i>	4.36 <i>3.03**</i>	-6.96 <i>-2.68**</i>	na	na	0.7065	2.889	12
Yunnan	-0.13 <i>-0.66</i>	1.92 <i>0.87</i>	-1.08 <i>-0.19</i>	0.56 <i>0.25</i>	-2.68 <i>-0.87</i>	-3.19 <i>-0.25</i>	na	na	0.3114	0.543	12
Zhejiang	0.85 <i>1.29</i>	-1.11 <i>-0.67</i>	-4.5 <i>-1.06</i>	-0.96 <i>-0.67</i>	-4.15 <i>-0.59</i>	4.1 <i>0.39</i>	na	0.08 <i>2.29*</i>	0.5896	1.197	12
China	0.13 <i>13.02***</i>	-0.09 <i>-2.24**</i>	0.01 <i>0.16</i>	-0.09 <i>-1.69</i>	-0.03 <i>-0.17</i>	0.11 <i>0.67</i>	0.008 <i>0.87</i>	0.02 <i>2.93***</i>	0.0897	4.716	341

T-statistic in italics under coefficient

* = 90% confidence

** = 95% confidence

*** = 99% confidence

Regression #3: Net Effect. A final regression test uses the net effect of reform for each variable as was used in answering questions #1 and #2. These net variables were calculated by subtracting the 1949-1977 mean from the 1978-1989 mean, thus providing a rough comparison of indicators between Mao's era and Deng's reform era. The purpose of these regressions is to capture the net effects of reform in order to show that higher levels of reform in what variables led to what results in terms of income growth and income levels. These results are provided in Table 7. It should be noted that the variable $Y_{initial}$ has been added to the equation in order to control for the effect of initial income levels. The regression on income growth displays a positive relationship between net growth and reform efforts for tax rates, exports, imports, SEZs, and OCCs, while decreased bureaucratic consumption levels and increased foreign direct investment appear to have slowed net reform-era growth. SEZs show statistical significance at the 95% level where the presence of SEZs raises the net growth rate by 5.56%.

Table 7: Net Reform Effect Regression Results: 1978 - 1989

	Constant	TAX	EXP	BUR	IMP	FDI	SEZ	OCC	R-square	F-stat	N
Y	-6.11 <i>-0.11</i>	1344.32 <i>1.88*</i>	-2.96 <i>-0.55</i>	536.46 <i>0.63</i>	-35.6 <i>-0.89</i>	46.52 <i>1.00</i>	-22.91 <i>-0.26</i>	86.72 <i>1.28</i>	0.9293	32.87	29
YG	0.06 <i>4.36</i>	0.17 <i>0.84</i>	0.0003 <i>0.23</i>	0.16 <i>0.70</i>	0.01 <i>1.13</i>	-0.02 <i>-1.23</i>	0.06 <i>2.30**</i>	0.003 <i>0.16</i>	0.4475	2.02	29

T-statistic in italics under coefficient

* = 90% confidence ** = 95% confidence

*** = 99% confidence

The regressions on net income levels again suggest different relationships. Positive relationships are shown between net income and reform levels for measures of tax rates,

FDI, and Open Coastal Cities. The rest display negative results. Lower tax rates show a statistically significant (at the 90% level) effect, where a 1% decrease in tax reform yields a 13.44 Rmb increase in reform era income per capita. Provinces with more tax reform had better results in terms of increases in income levels per capita. The regression on income level (Y) has a fairly high R-squared at .929, however, both regressions provide few variables with any statistical significance.

Table 8: Summary of Regression Relationships

Y	<i>Tax Rate</i>	<i>Bureaucracy</i>	<i>Exports</i>	<i>Imports</i>	<i>FDI</i>	<i>SEZ</i>	<i>OCC</i>
<i>Panel Data</i>	***	***	***	***	***	****	****
<i>Provincial</i>	-	+	+	+	+	-	+
<i>Time Series</i>							
<i>Net Effect</i>	.*	+	-	-	+	-	+
<i>Cross Section</i>							
YG	<i>Tax Rate</i>	<i>Bureaucracy</i>	<i>Exports</i>	<i>Imports</i>	<i>FDI</i>	<i>SEZ</i>	<i>OCC</i>
<i>Panel Data</i>	.*	+	-	-	+	+	***
<i>Provincial</i>	-	+	-	-	+	-	+
<i>Time Series</i>							
<i>Net Effect</i>	-	+	+	+	-	+	+
<i>Cross Section</i>							

Asterix refer to standard statistical significance levels

Overall, the three regression tests appear to show scattered and inconclusive results, though there are some variables for which all regressions come to agreement. Table 8 summarizes the relationships suggested by these regressions. For the regressions on income levels per capita all three tests suggest that reform efforts in foreign direct investment, and Open Coastal Cities appear to be beneficial, but for bureaucratic consumption and Special Economic Zones they seem detrimental. Regarding the

regressions on income growth, the results suggest reform in tax rates and Open Coastal Cities appears positive, while this is not so for bureaucratic consumption levels. However, regressions only measure correspondences and say nothing of causality. More evidence is required to clarify the relationships determined inconclusive by the regressions.

Further Evidence. The graphs shown in Figures 14 - 20 provide further evidence as to the relationships between reform variables and economic performance. Using the data on the net effect of reform, the mean income levels of the top reformers for each variable are compared to the mean income levels of the others over the period 1949-1989. These charts should provide a graphic picture of how the top reformers have performed. The top reformers in terms of lowering bureaucratic consumption rates have consistently performed less well than the others since 1949. The difference between these provinces and the others appears to stay constant during the reform era; however, suggesting that those provinces who have decreased their bureaucracies the most have lower income levels than the rest, but that their reform has not had the detrimental effect of making them relatively worse off. The provinces with SEZs show a similar story. It appears the three provinces where SEZs are located had mean income levels historically lower than the others. While this still appears to be the case, these provinces have been narrowing that gap consistently since the late 1970s. This suggests that these reforms have been successful. The other five variables (tax rate, exports, imports, OCC and FDI) show that the performance of the top reformers has been consistently higher than the rest and that this difference has been rising during the reform era. This suggests that not only were

these provinces at higher income levels prior to reform, but that reform has pushed them still farther from the rest. Whereas the regressions suggested some relationships, they say nothing of causality. These charts, however, offer some insight into the issue of causality by showing the performance of the top reformers over the entire time period of Communist China. The results show that reforms in tax rates, export levels, import levels, Open Coastal Cities and foreign direct investment, while having been concentrated on provinces with already high income levels, have spurred those provinces to yet higher levels as compared to their lower-reform neighbors. By contrast, reform in bureaucratic consumption rates and the introduction of Special Economic Zones were concentrated on lower income provinces, but these reforms do not appear to have had any negative impact on the income disparity. In fact, the SEZ provinces have done much better. These results provide an insight not offered by the previous regression statistics.

Similar graphs are provided in Figures 21 - 27 illustrate the same comparison as above between top reformers and the other provinces (but for growth rates instead of income levels). These comparisons are not as telling as the others however, as the differences in growth between the two sets is not so drastic. Top reformers in bureaucratic consumption and exports appear to have grown at roughly the same rate as the others, while provinces with OCCs and top reformers in imports and FDI did slightly better. Meanwhile, top tax reformer growth lagged slightly behind the other provinces. Only for those provinces with Special Economic Zones has income growth been markedly higher.

Figure 14: Average Annual Provincial Income of Top Bureaucratic Consumption Reformers* as Compared to the Rest

*[Guangdong, Guizhou, Heilongjiang, Jiangxi, Liaoning, Sichuan, Yunnan]

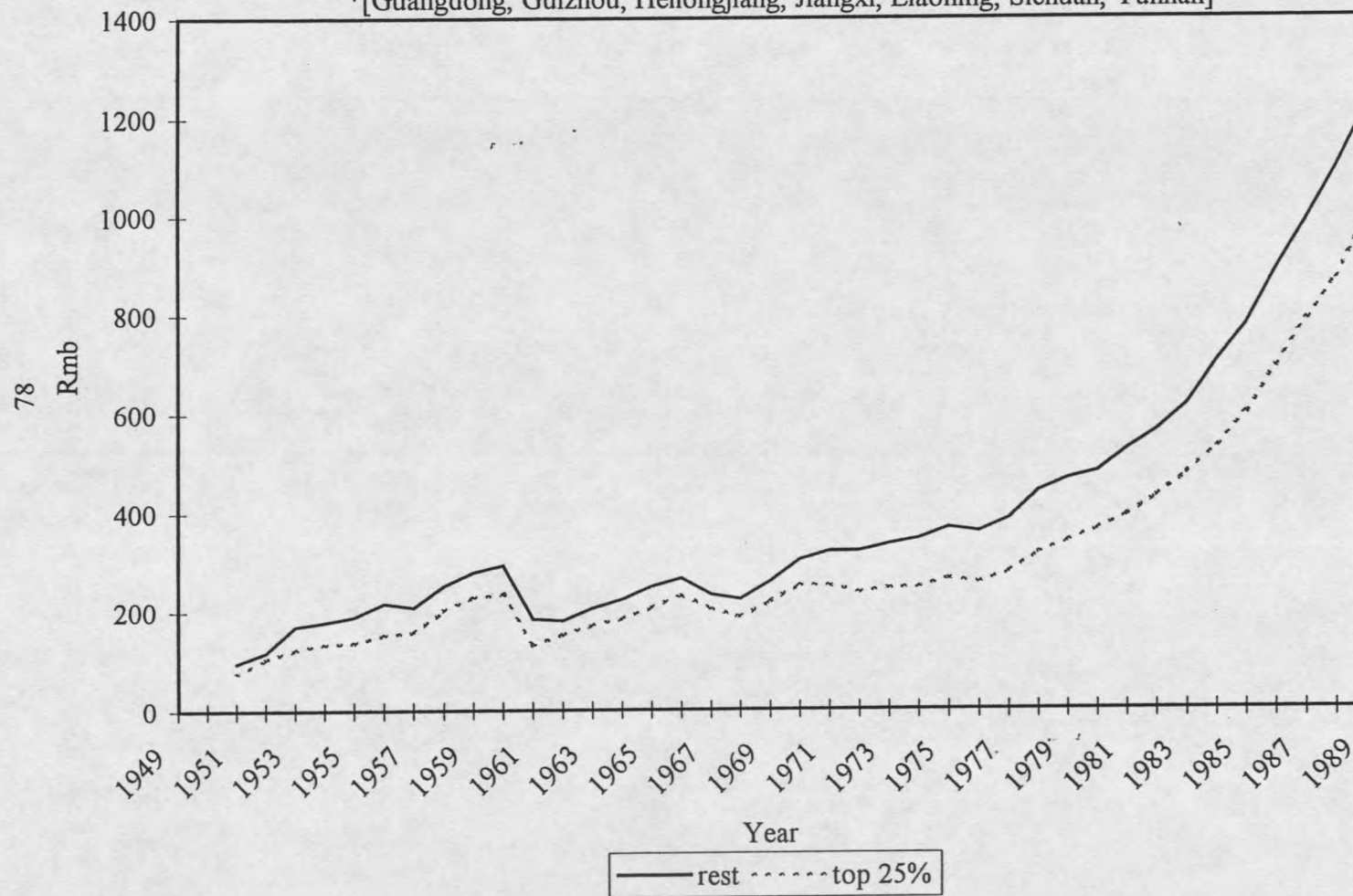


Figure 15: Average Annual Provincial Income of Top Tax Reformers* as Compared to the Rest
 *[Beijing, Guangdong, Heilongjiang, Jiangsu, Jilin, Shandong, Tianjin]

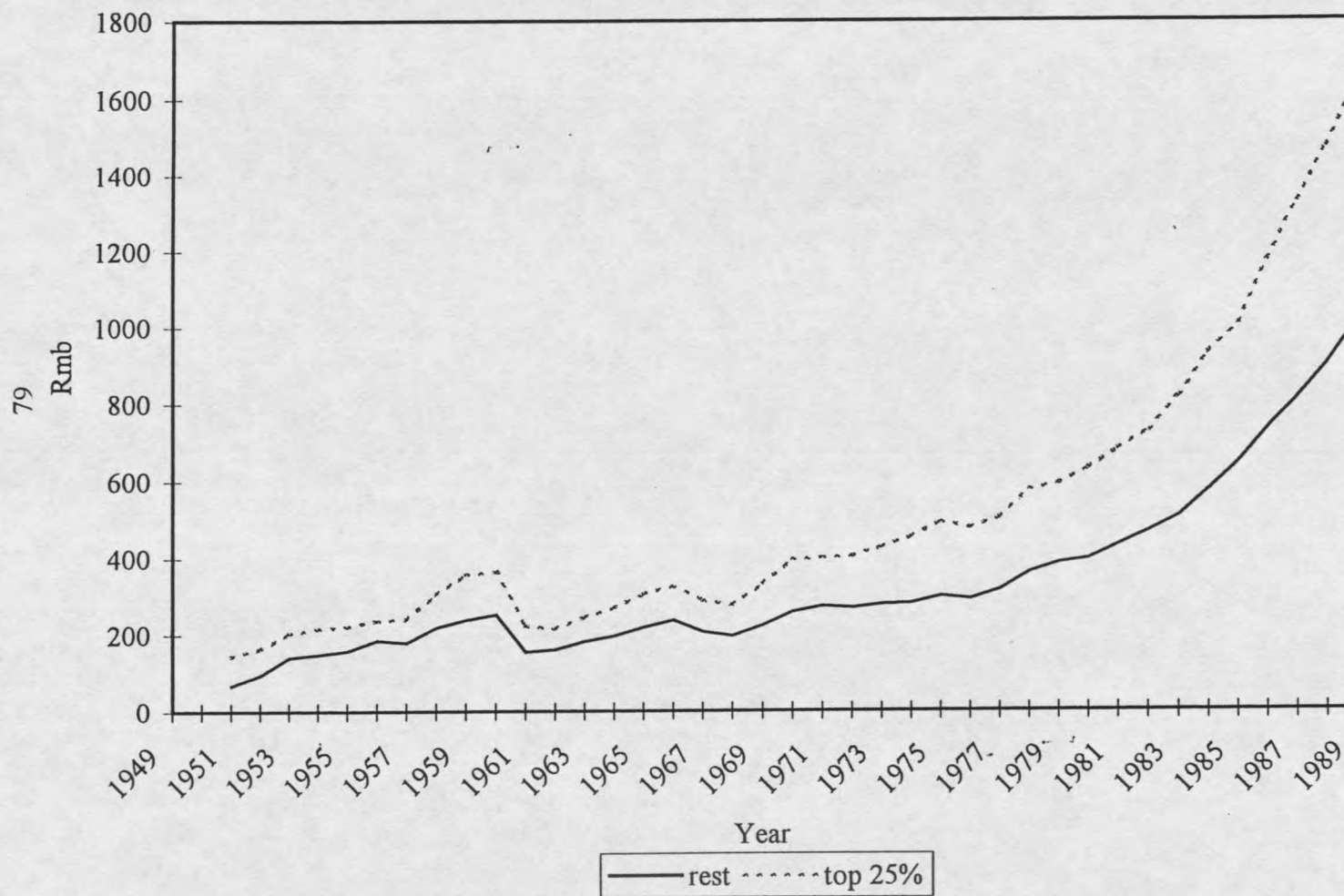


Figure 16: Average Annual Provincial Income of Top Export Reformers* as Compared to the Rest
 *[Guangdong, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin]

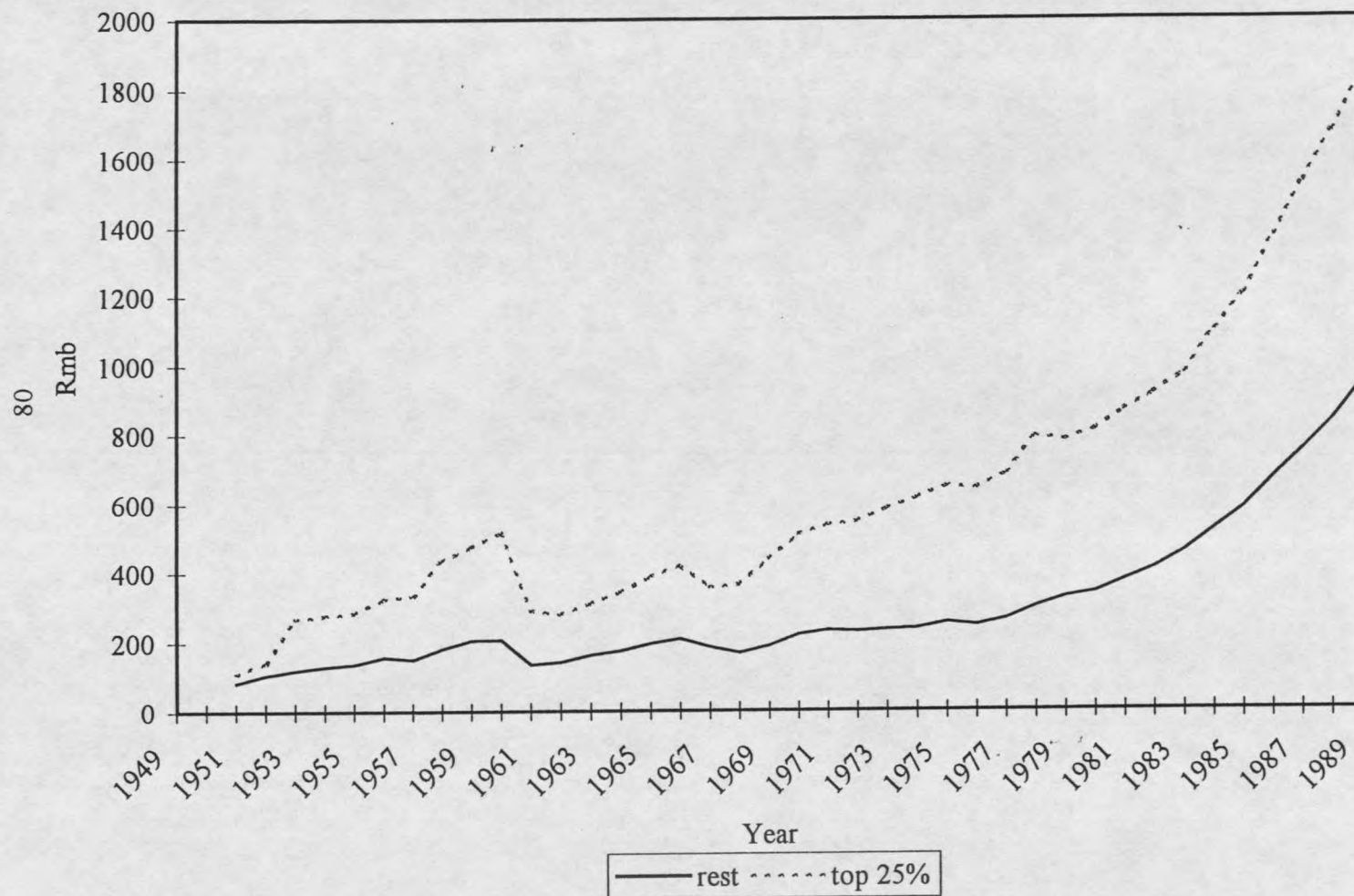


Figure 17: Average Annual Provincial Income of Top Import Reformers* as Compared to the Rest
 *[Fujian, Guangdong, Liaoning, Shandong, Shanghai, Tianjin, Zhejiang]

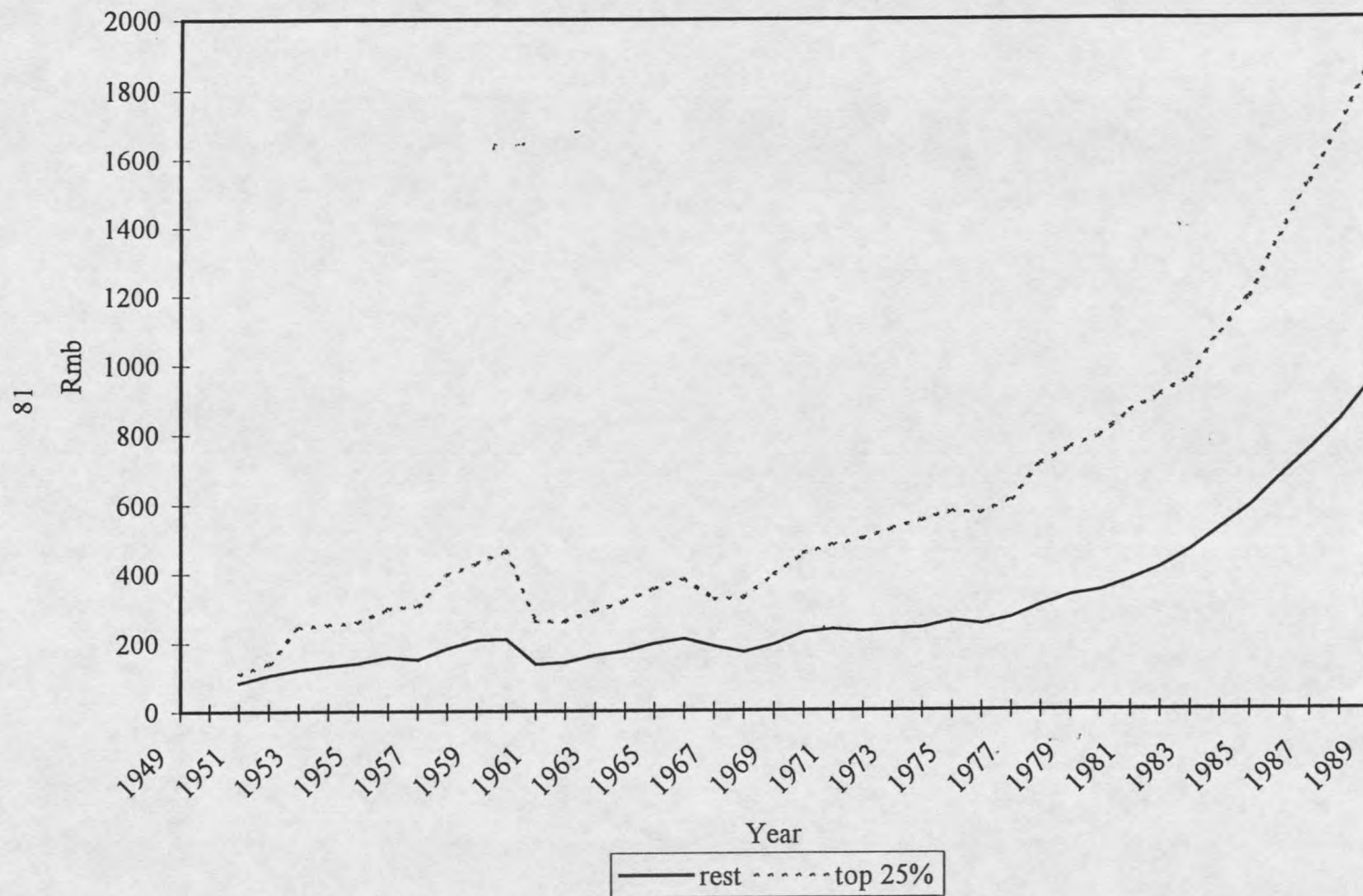


Figure 18: Average Annual Provincial Income of Top FDI Reformers* as Compared to the Rest
 *[Beijing, Fujian, Guangdong, Jiangsu, Liaoning, Shandong, Shanghai]

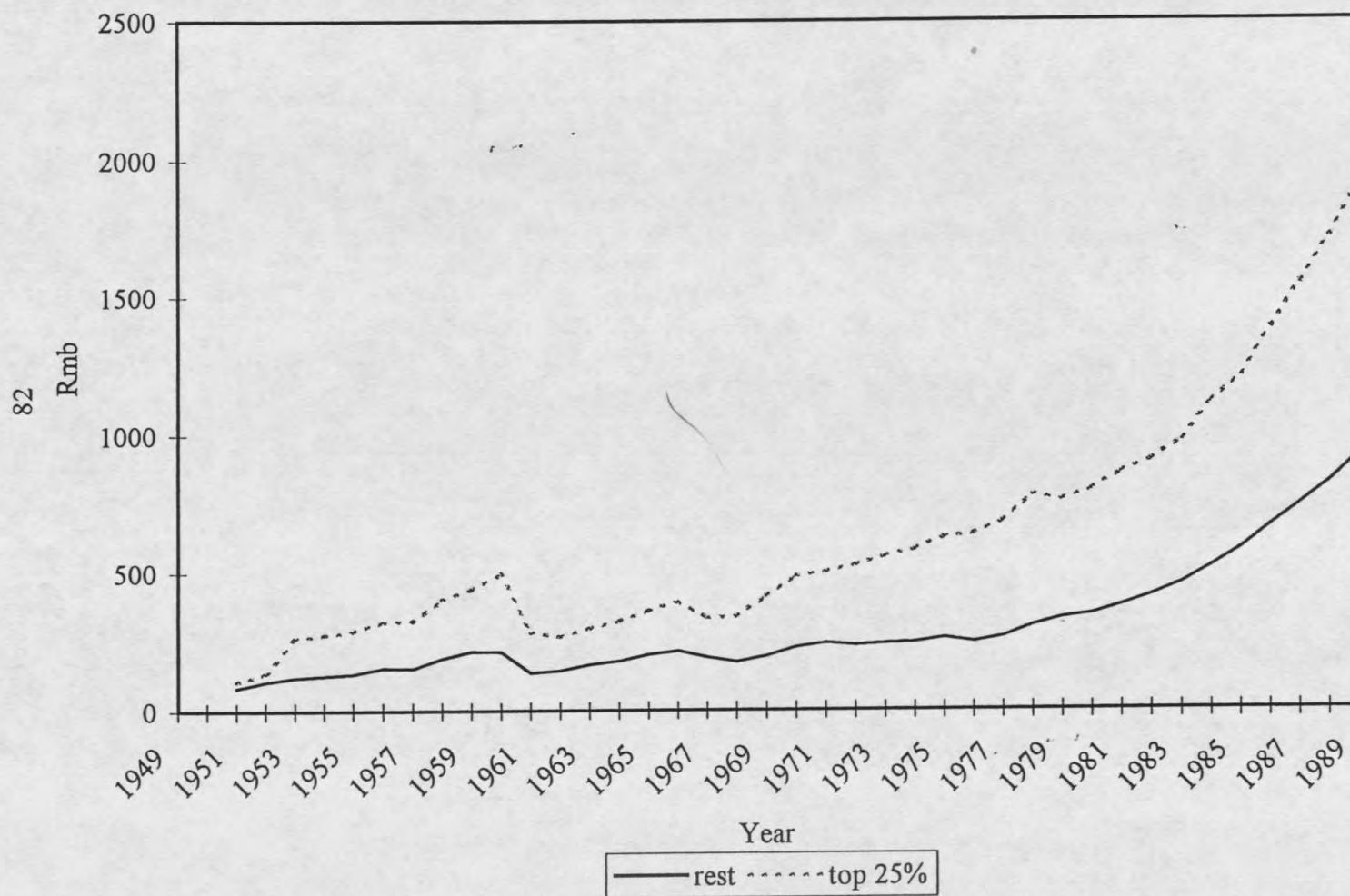


Figure 19: Average Annual Provincial Income of Provinces with SEZs* as Compared to the Rest
 *[Fujian, Guangdong, Hainan]

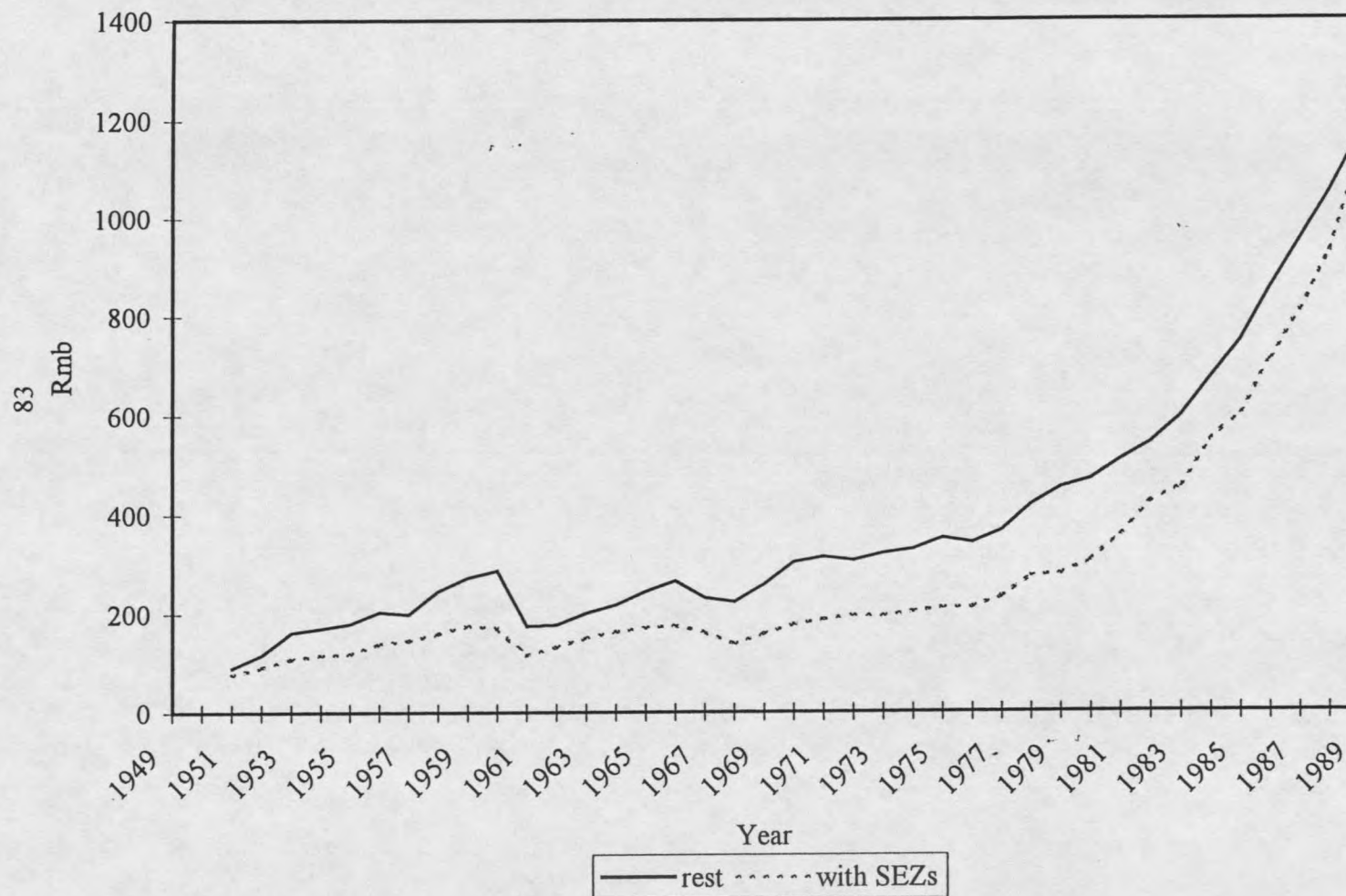


Figure 20: Average Annual Provincial Income of Provinces with OCCs* as Compared to the Rest
 *[Fujian, Guangdong, Guangxi, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin, Zhejiang]

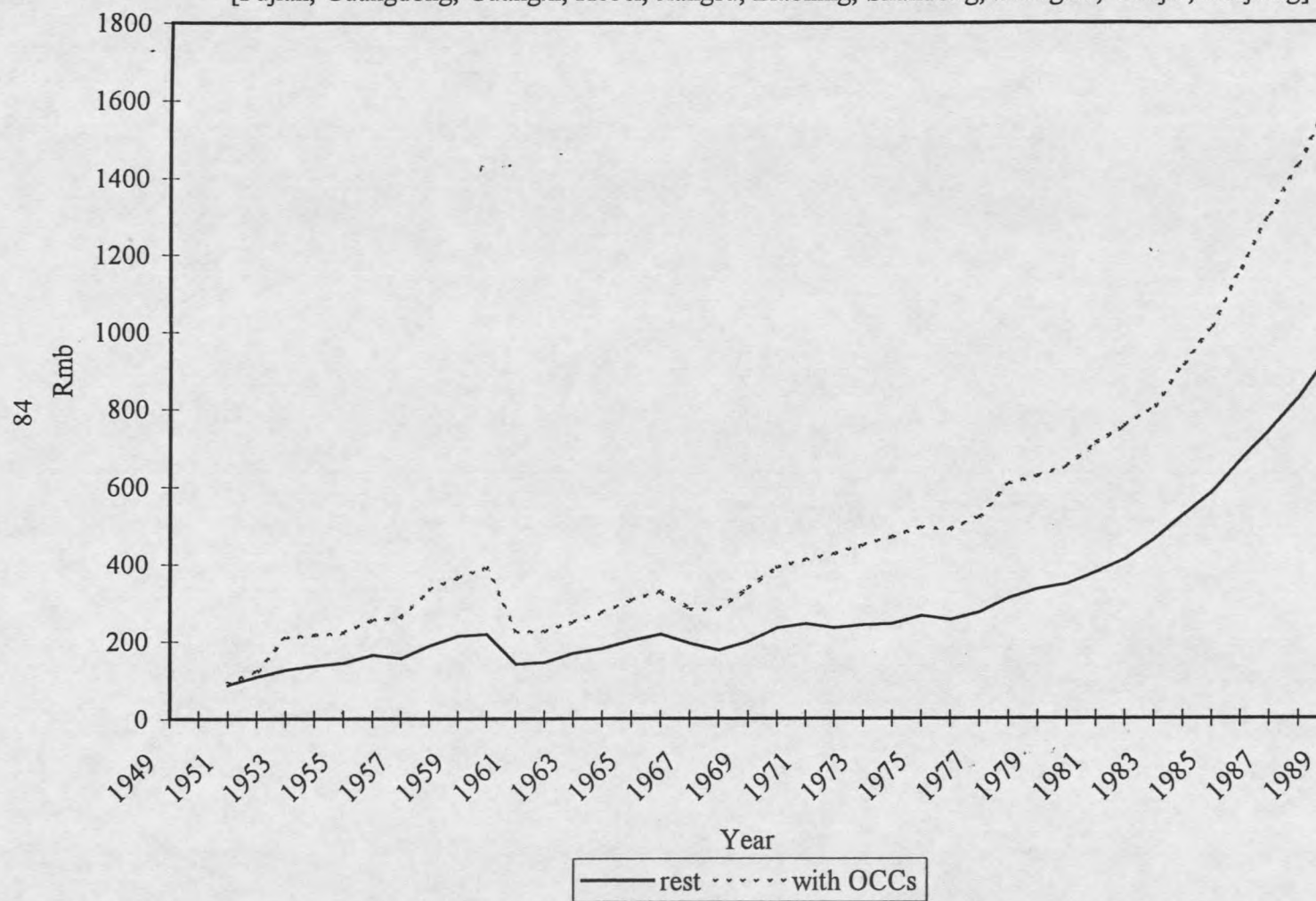


Figure 21: Average Annual Provincial Growth Rate of Top Bureaucratic Consumption Reformers* as Compared to the Rest *[Guangdong, Guizhou, Heilongjiang, Jiangxi, Liaoning, Sichuan, Yunnan]

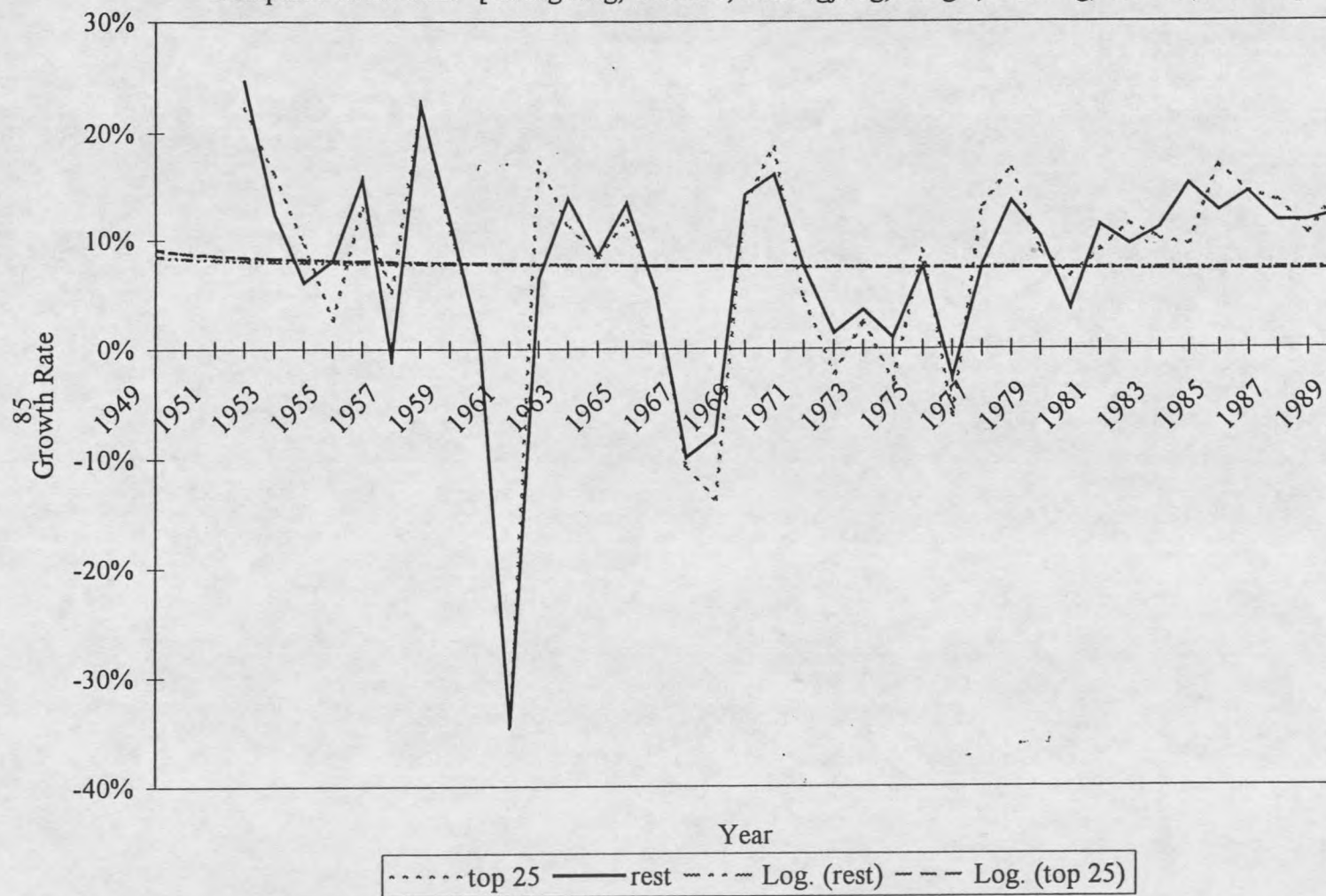


Figure 22: Average Annual Provincial Growth Rate of Top Tax Reformers* as Compared to the Rest
 *[Beijing, Guangdong, Heilongjiang, Jiangsu, Jilin, Shandong, Tianjin]

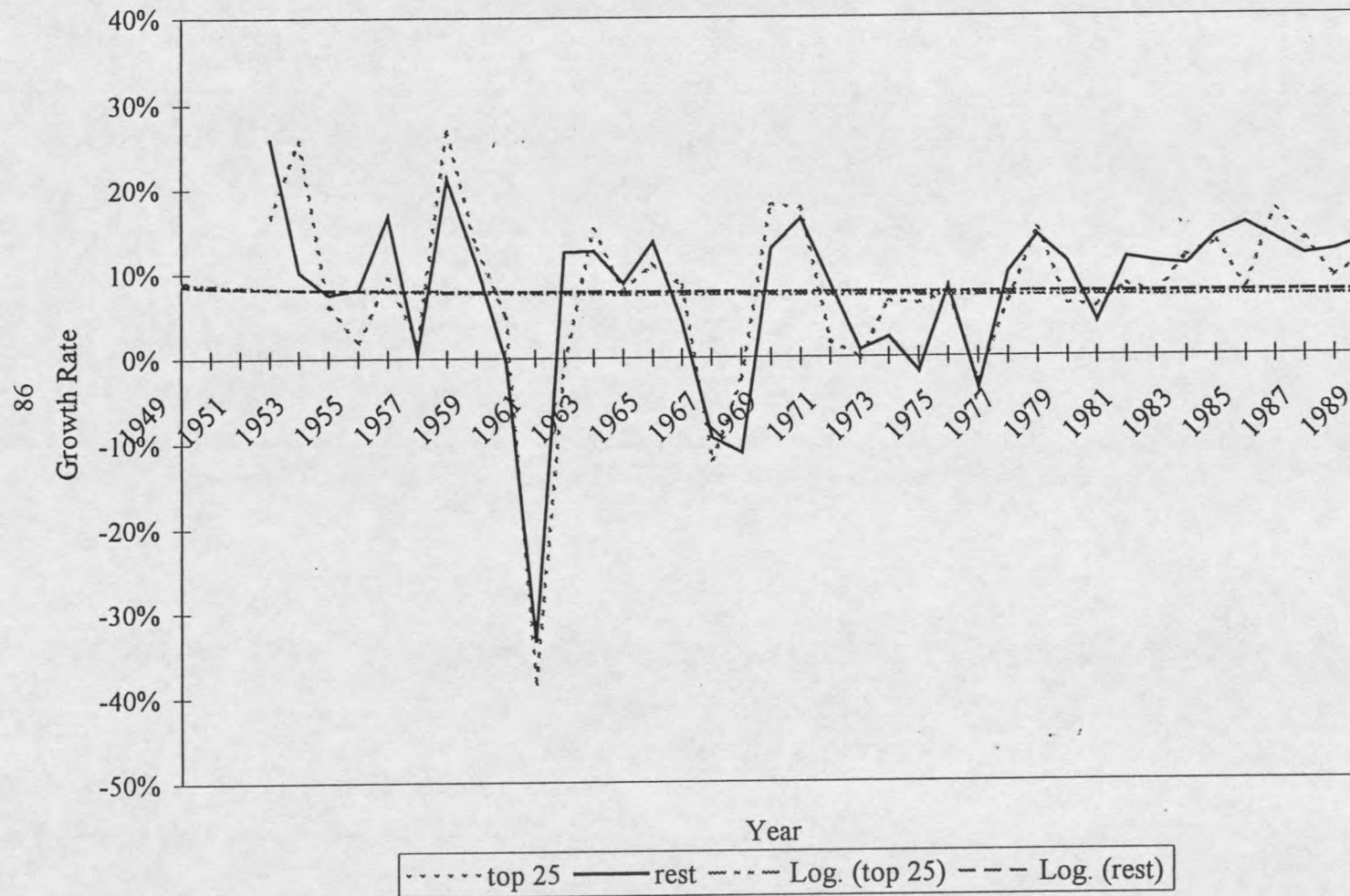


Figure 23: Average Annual Provincial Growth Rate of Top Export Reformers* as Compared to the Rest

*[Guangdong, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin]

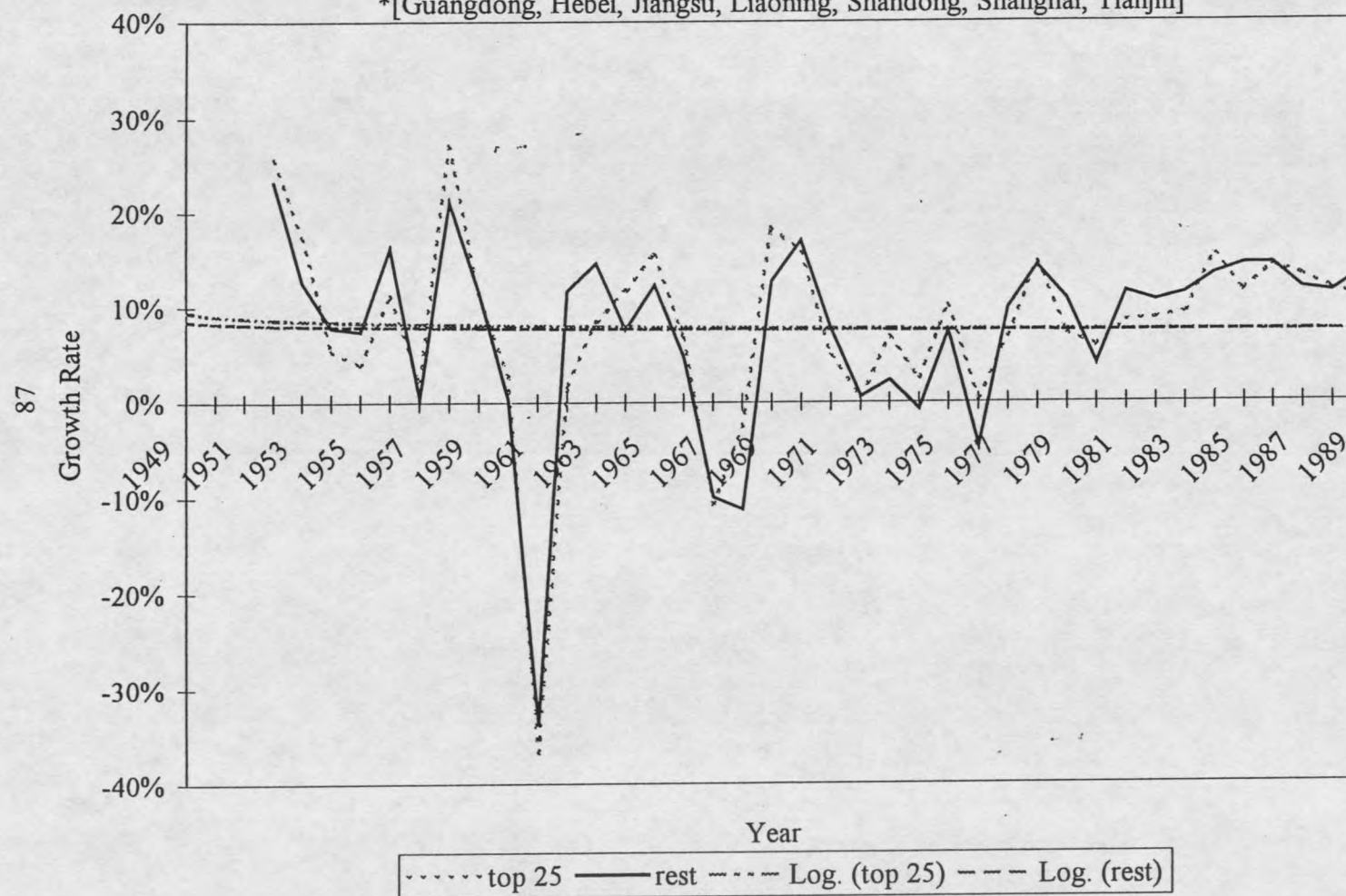


Figure 24: Average Annual Provincial Growth Rate of Top Import Reformers* as Compared to the Rest

*[Fujian, Guangdong, Liaoning, Shandong, Shanghai, Tianjin, Zhejiang]

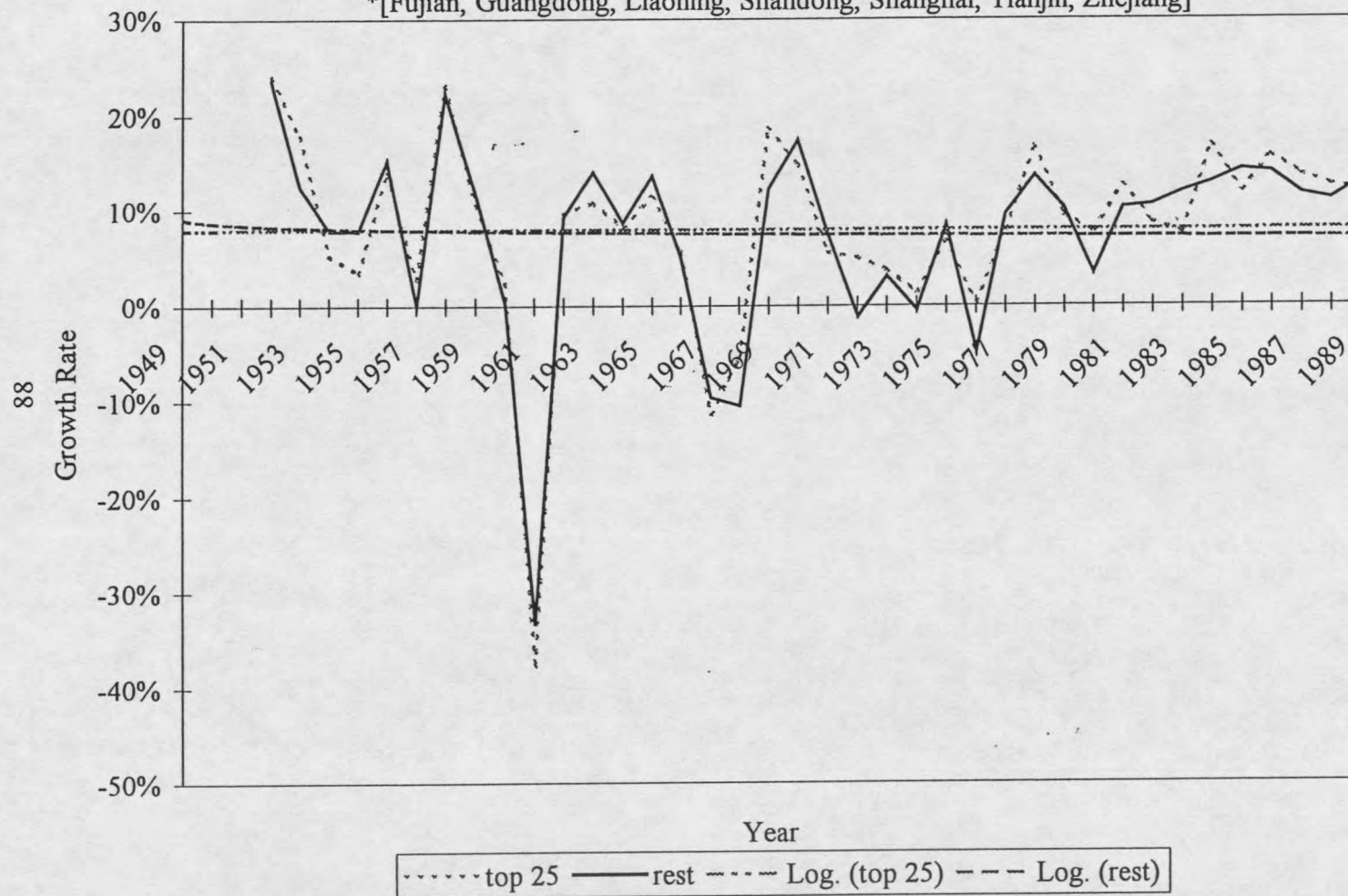


Figure 25: Average Annual Provincial Growth Rate of Top FDI Reformers* as Compared to the Rest

*[Beijing, Fujian, Guangdong, Jiangsu, Liaoning, Shandong, Shanghai]

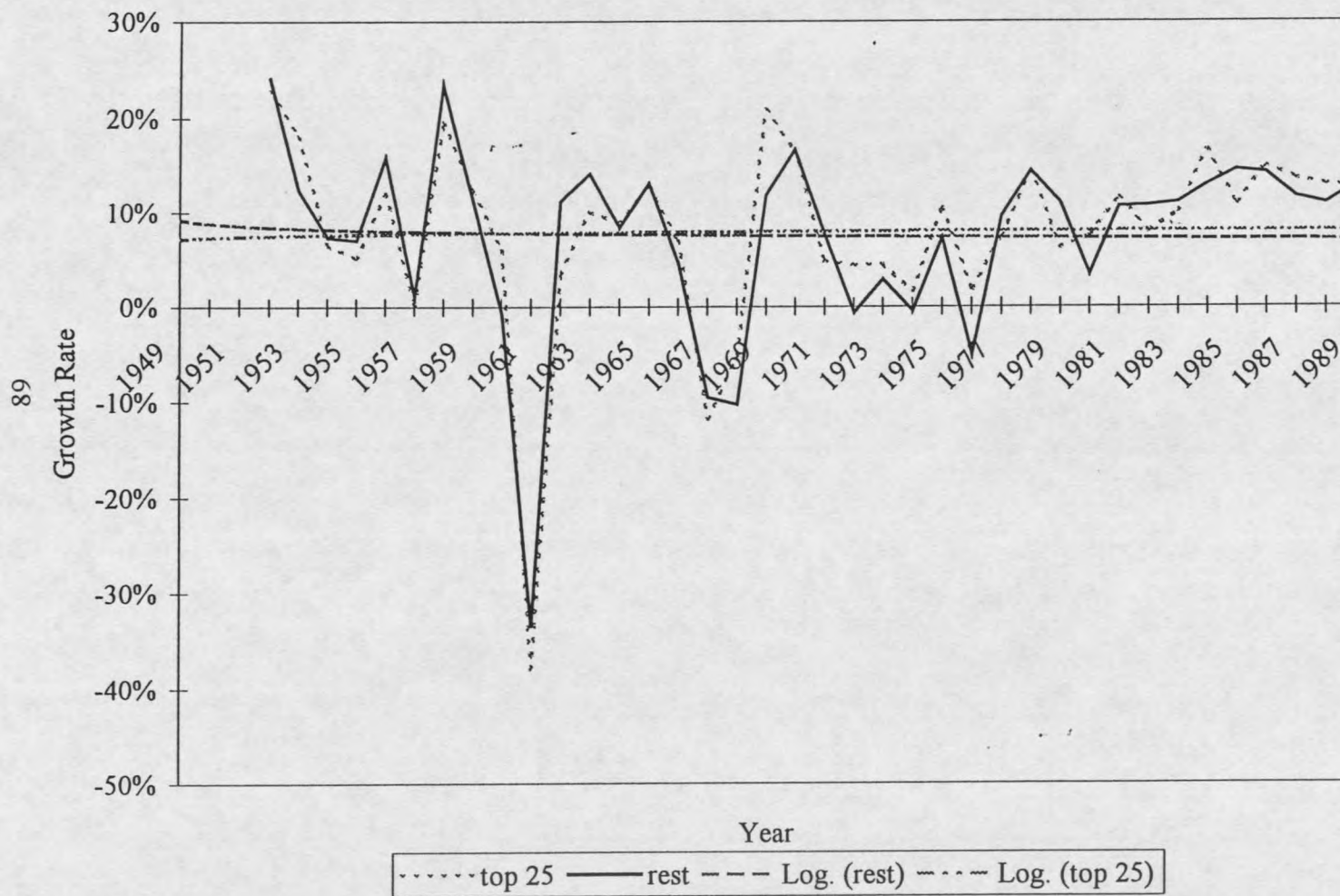


Figure 26: Average Annual Provincial Growth Rate of Provinces with SEZs* as Compared to the Rest
 *[Fujian, Guangdong, Hainan]

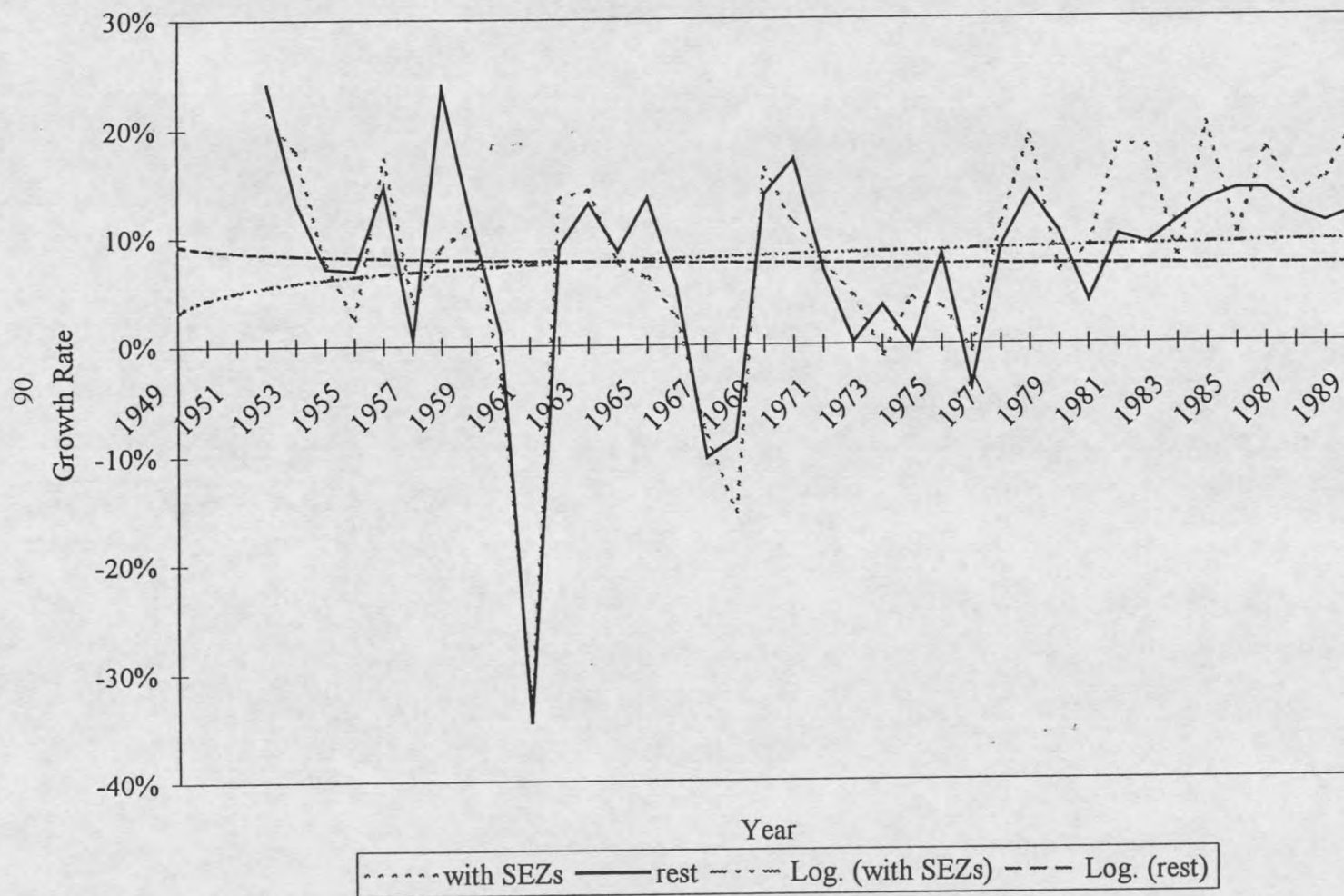
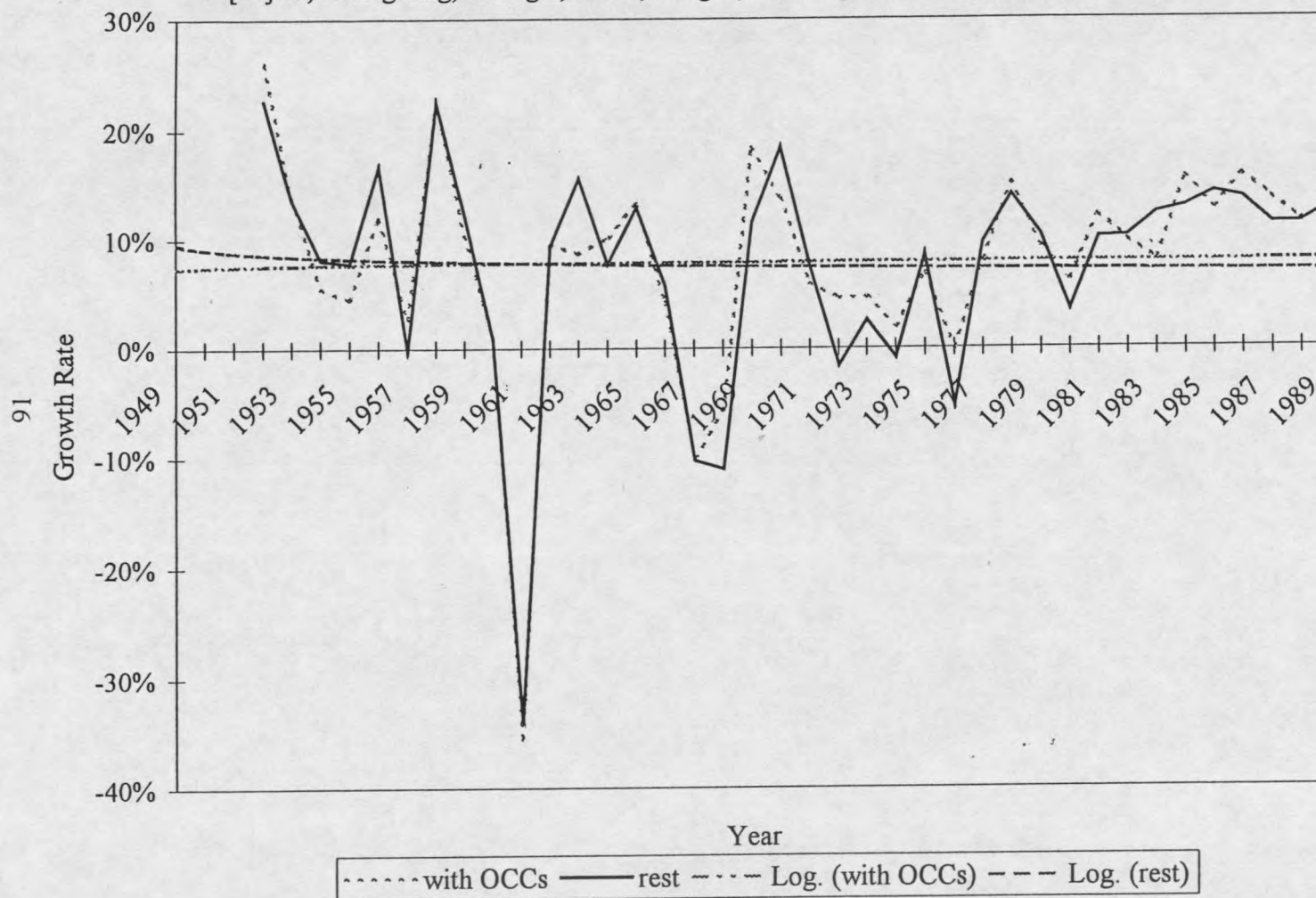


Figure 27: Average Annual Provincial Growth Rate of Provinces with OCCs* as Compared to the Rest
 *[Fujian, Guangdong, Guangxi, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin, Zhejiang]



Mapping the Geographical Patterns. There appears to be a story that can be told by analyzing the maps of provincial reform and provincial growth and development. Maps 1 - 5 illustrate the geographic distribution of the various reform variables under consideration. Each map divides the provinces into quartiles based on the quantitative ranking of their reform efforts. In this way, we can interpret the facts not only of the best reformers, but also of the worst. Map 6 illustrates the overall effort for top reformers in each category. It shows which provinces were top reformers for how many of the measures. From these maps, it can be observed that Guangdong, Jiangsu, Liaoning, Heilongjiang, Beijing, Tianjin, Shandong, Shanghai and Fujian were overall the best reformers. It should be pointed out that other provinces, especially Hainan and Zhejiang, while not top quartile reformers for any variables, do place highly in most reform variables and, in addition, have special SEZ or OCC designations.

Next, Map 7 shows which provinces boasted the highest per capita income levels during the Maoist era. The top performers are (in order of rank): Shanghai, Tianjin, Beijing, Jiangsu, Liaoning, Heilongjiang, and (less dependable due to the scarcity of its historical data) Hainan. The next tier of provinces exhibits a northern bias (excepting Guangdong) and likely reflects Mao's favorable policies toward these historically less-emphasized areas. It should be noted also, that the coastal provinces Fujian, Shandong, and Zhejiang are near the lower end in these rankings.

Map 8 gives the same rankings as Map 7, but for the Post-Mao reform era. At the high end, it does not look so different from the earlier period; Shanghai, Beijing, Tianjin,

Jiangsu, Liaoning, Heilongjiang and Hainan still show the highest per capita income levels. At the lower quartiles, however, there appear to be some changes. Fujian, Zhejiang, Shandong, Hubei and Hebei all improve their rankings by a quartile, while Qinghai, Inner Mongolia, Ningxia, Shaanxi, Jiangsu and Anhui all drop a quartile. The lowest income provinces of Guangxi, Yunnan, Guizhou, Sichuan and Henan stay in the bottom quartile.

Map 9 represents the spatial distribution of the provincial rankings of the net change in per capita income of the reform era over the Maoist era. This map illustrates what provinces have fared best during reforms, net of how they were in the prior period. Those provinces showing the highest gains are: Guangdong, Zhejiang, Shanghai, Jiangsu, Tianjin, Beijing and Liaoning. Coming in the second tier are Hainan, Fujian, Hubei, Shandong, Hebei, Jilin and Heilongjiang. Among these, Guangdong, Fujian, Zhejiang, Shandong, Hebei, Hubei and Jilin are not among the wealthiest provinces for either Mao's era or the reform era. They have, however, displayed large gains since 1978.

Similarly to Map 9, Map 10 displays provincial rankings for net effects, but income growth. Those showing the largest net growth effect are Hainan, Guangdong, Fujian, Zhejiang, Anhui, Jiangsu and Xinjiang. Also of interest are some of the lowest net growth provinces, like Shanghai, Beijing, Tianjin and Liaoning. These provinces are presently and historically among the richest and, while it is harder to maintain consistently high growth rates at higher income levels, it is of interest that these provinces show such slowed growth over the 1978 - 1989 period.

One story to be taken from these geographic illustrations is that most of the rich provinces during the Maoist era show evidence of high reform levels and are still among

Map 6: Distribution of Overall Reform Effort



Legend: Number of Top Reform Rankings

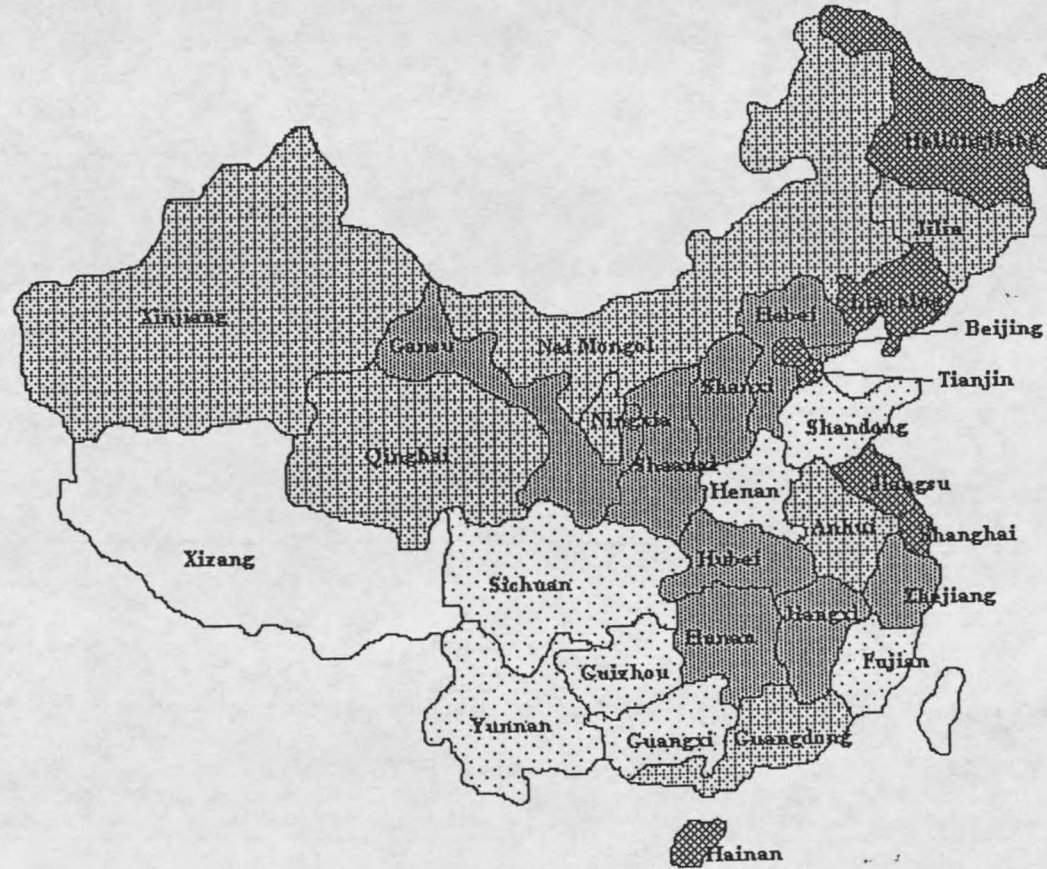
4-5

2-3

1

0

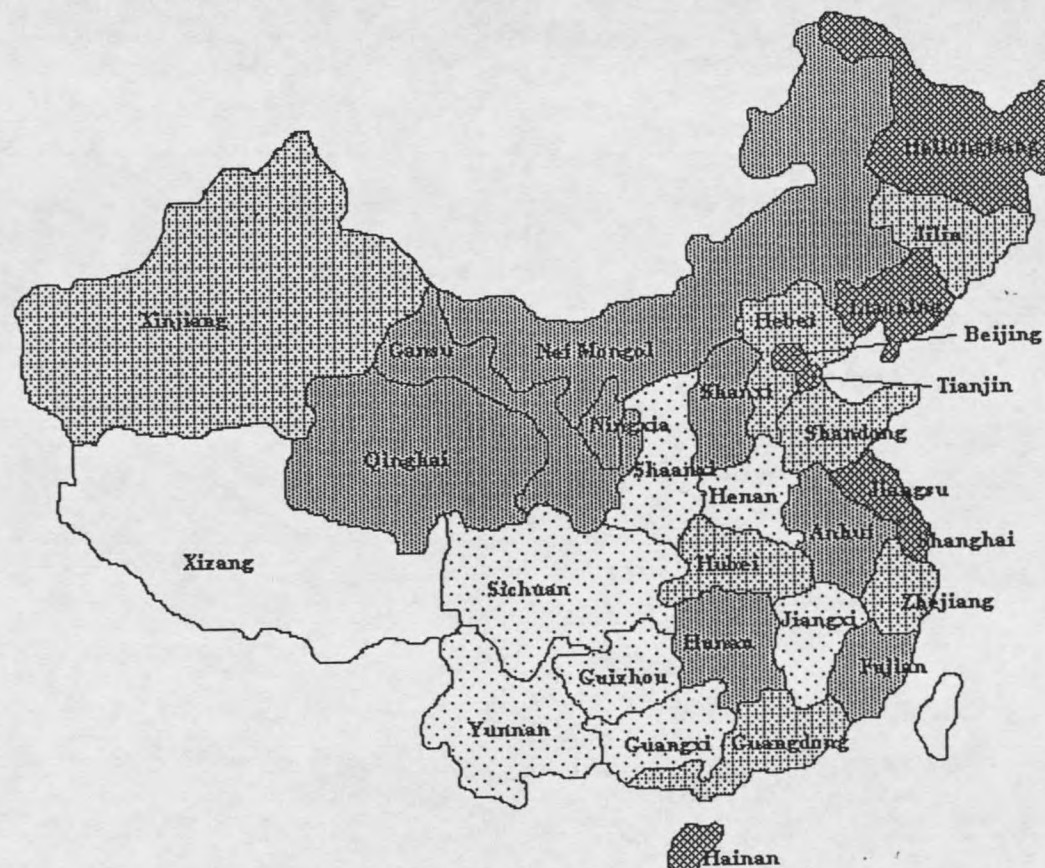
Map 7: Distribution of Provincial Income Rankings



Legend: Provincial Ranking

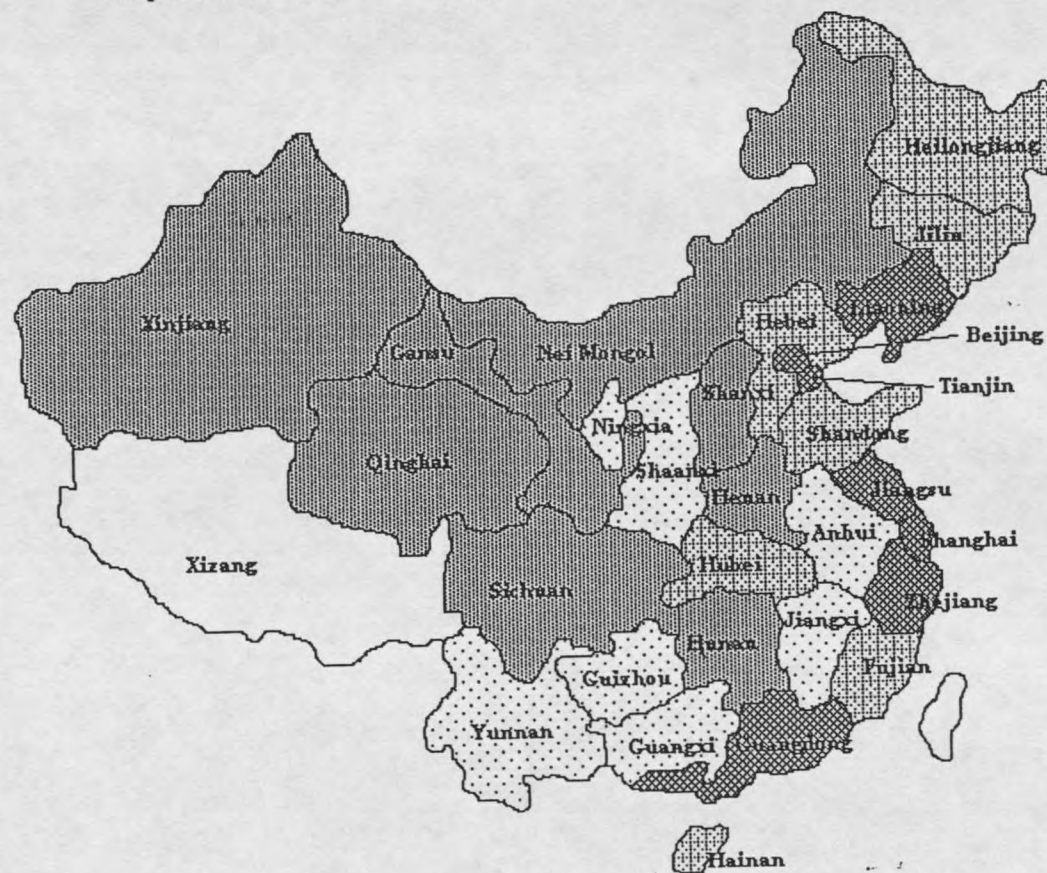
First Quartile Second Quartile Third Quartile Fourth Quartile

Map 8: Distribution of Provincial Income Rankings: 1978 - 1989



Legend: Provincial Ranking

First Quartile Second Quartile Third Quartile Fourth Quartile



Legend: Provincial Ranking

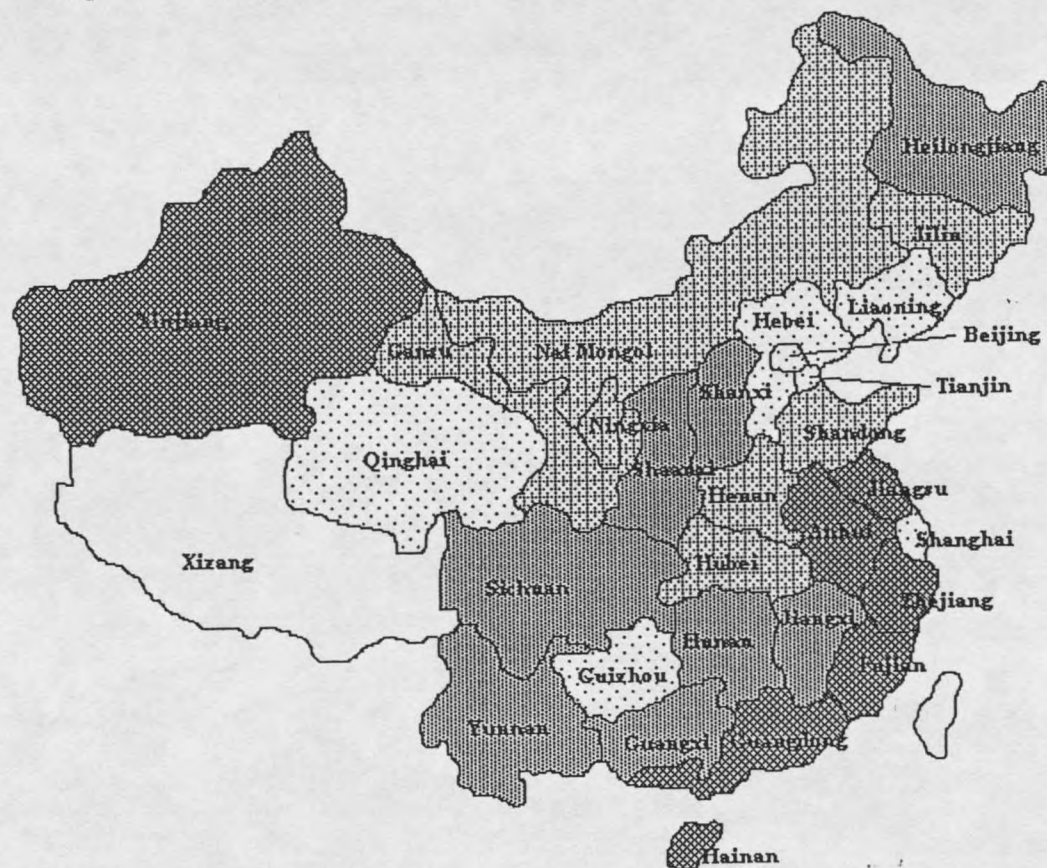
 First Quartile

 Second Quartile Third Quartile

 Fourth Quartile

 Fourth Quartile

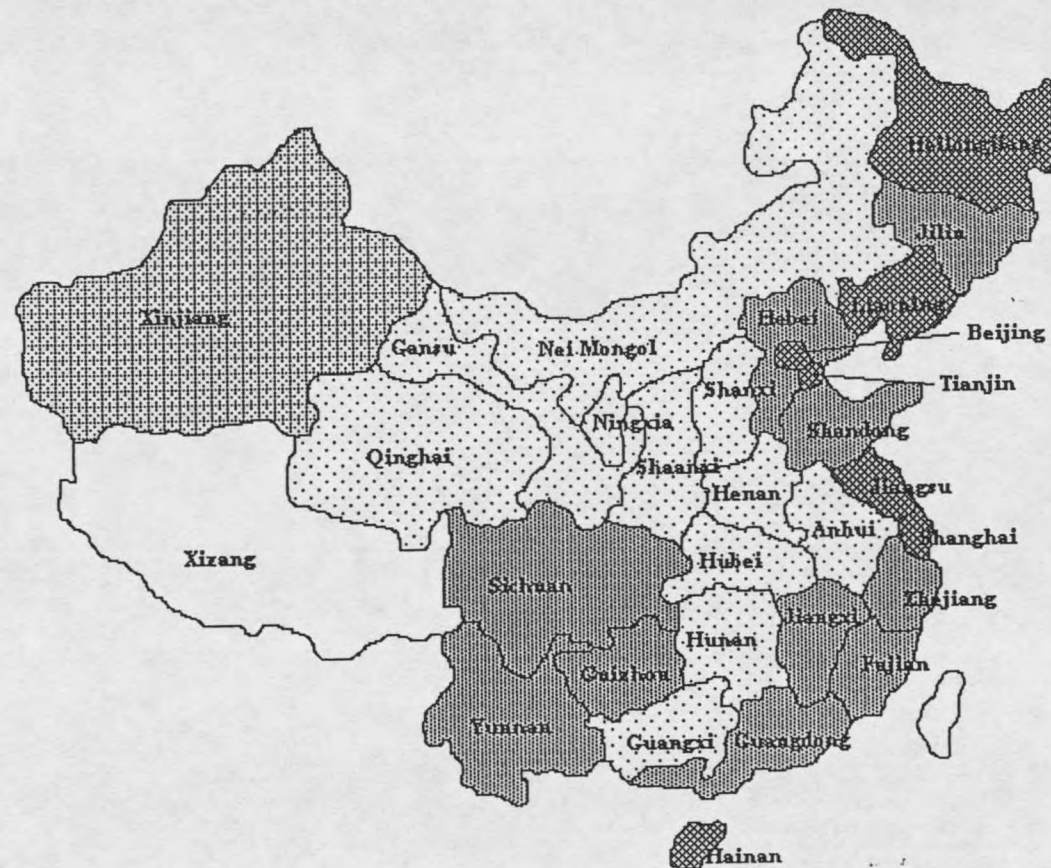
Map 10: Rankings of Net Change in Provincial Income Growth from Reform Era



Legend: Provincial Ranking

First Quartile Second Quartile Third Quartile Fourth Quartile

Map11: Distribution of Correspondence between Initial Wealth and Reform Efforts



Legend:

 Wealth & Reform

 Wealth & No Reform

 No Wealth & Reform

 No Wealth & No Reform

the richest provinces. Heilongjiang, Liaoning, Beijing, Tianjin, Jiangsu, Hainan and Shanghai are in this elite group. They were rich, they had reforms, and they are still rich. This does not tell much about the effect of reforms, however. More interesting cases are exhibited by the provinces that show large changes. Provinces like Guangdong, Fujian, Zhejiang, Shandong and, less so, Hebei were less well-off before 1978 but they show evidence of relatively high reform levels. In the 1978 - 1989 period, they become more well-off and also show the highest net benefits during the reform era. Alternatively, provinces such as Qinghai, Inner Mongolia, Ningxia and, less so, Xinjiang appear to have placed little emphasis on reform and their economic performance has lagged from its prior levels. Map 11 supports this interpretation, showing the distribution of the correspondence between initial wealth and reform efforts. While provinces with initial wealth and high reform efforts maintained their economic status, the real winners were many of the provinces that were not initially among the most well-off but show signs of high reform efforts. Many of these provinces have shown significant improvements over the pre-reform era.

Mapping the geographic distribution of the phenomena under consideration adds to the richness of this empirical investigation. A more concrete understanding can be gained than is allowed by the statistical techniques that offer less in terms of spatial context.

Conclusion. This section has examined a number of pieces of evidence in an attempt to understand what the effect of reform has been on the provincial economic performance in

China. Not all the results concur, but there should be enough evidence to support the following statements regarding the effect of each reform variable.

Tax. Tax reform has concentrated on already high income provinces and greater tax reforms (i.e. larger tax cuts) have led to increasing provincial incomes and growth.

Bureaucracy. Reforms in bureaucratic consumption have largely targeted poorer provinces and have made them no worse off relative to the other provinces.

Exports. The top export reformers were overall wealthier provinces to start with and have performed increasingly better over the reform period.

Imports. Top import reformers were also wealthier provinces overall, and these provinces have performed increasingly better over the reform period.

FDI. Reforms in FDI also concentrated on already wealthy provinces and have led to increasing economic growth and development over the reform period.

SEZ. Provinces granted Special Economic Zones were traditionally lower income and lower growth provinces. Reforms have increased their growth rates and their income levels are converging toward the others.

OCC. Provinces granted Open Coastal Cities were overall more prosperous at the outset and have continued this trend since reforms were implemented.

The evidence provided in the previous sections is by no means unanimous, however, the above statements are supported. These conclusions for specific reform proxies lead to a proposition regarding the third research question under investigation.

Proposition #3: Economic reforms in China have been beneficial, except for possibly bureaucratic consumption which appears to have had little effect. Those provinces where reforms have been concentrated have, on the whole, performed better than those where reform has lagged behind. Reforms have maintained the relative prosperity of traditionally wealthy provinces and, where implemented, have raised the growth rates and incomes of previously less well-off provinces.

This proposition, while supported by the evidence, fails to explain the complicated nature of the issues in enough detail. It does illustrate the role of reforms in the divergence/convergence issues brought up in Proposition #2, but, in order to make some policy prescriptions, a more detailed examination of the facts is required. Such an analysis will be the goal of the next chapter.

CHAPTER 7

DISCUSSION AND CONCLUSION

The empirical evidence provided in the last section sought to answer three questions regarding (1) the uniformity of China's economic reforms, (2) the interprovincial disparity of its economic performance, and, finally, (3) the relation between these two phenomena. Answers to these questions were presented in the form of propositions based on the weight of the evidence.

It appears that Chinese reforms were implemented prejudicially province by province, with different areas receiving differing degrees of liberalization. It also appears that income levels have become more and more disparate over the reform era. That is, there has been divergence in income levels. Most of the wealthiest provinces in the present were also the wealthiest provinces prior to Mao's death. Only a few provinces have risen from lower income levels to achieve any significant degree of economic success. The majority of the provinces are still below the mean, as they have always been. On the other hand, growth rates appear to have been converging over the reform time period. Several lower growth provinces have picked up their rates, while the more well-off provinces have been experiencing some slow down.

The relationship between reform efforts and economic performance is more difficult to decipher. There does seem to be ample evidence to support the claim that reforms have aided

growth and development. This last proposition uncovers the nature of interprovincial economic disparities in China. Reforms have been beneficial, but only where they have been implemented. They have not been implemented uniformly, however, and the income gap has grown.

One problem for policy is how to close the disparity between China's wealthy provinces and its poorer provinces. These disparities did exist before, but they have grown since the late 1970s. Reform have sometimes been targeted as the culprit for this rising gap (Fan 1994), but the evidence presented here suggests that reform is only the cause of income inequality inasmuch as it has *not* been exercised in many less well-off regions. Thus *lack of reform* is more likely the cause of slow economic performance than *reform*. Deng Xiaoping's liberalizing reforms benefited wealthier regions like Shanghai and Tianjin more than poorer ones like Hunan and Shanxi because they were implemented in the former and not the latter. Provinces such as Guangdong and Fujian were not historically wealthy, but have witnessed high growth in the past two decades because they were granted reforms.

Assuming the goal of policy is to make income levels more equal across provinces, the more immediate aim should be to raise the growth rates of the lower income provinces. Growing at the same rate, provinces with initially higher income levels will continue to widen the disparities. Thus, the less developed areas need accelerated growth rates.

While the poorer provinces are catching up in terms of growth rates, incomes will continue to diverge over time. Even after the growth rates have equalized, this divergence will continue. In order for income levels to converge as desired, growth rates will have to diverge such that the poorer provinces continue to grow faster than the others. Income levels will not converge if

Figure 28: Provincial Income Levels with respect to Level of Initial Incomes and Reforms: 1949-1989

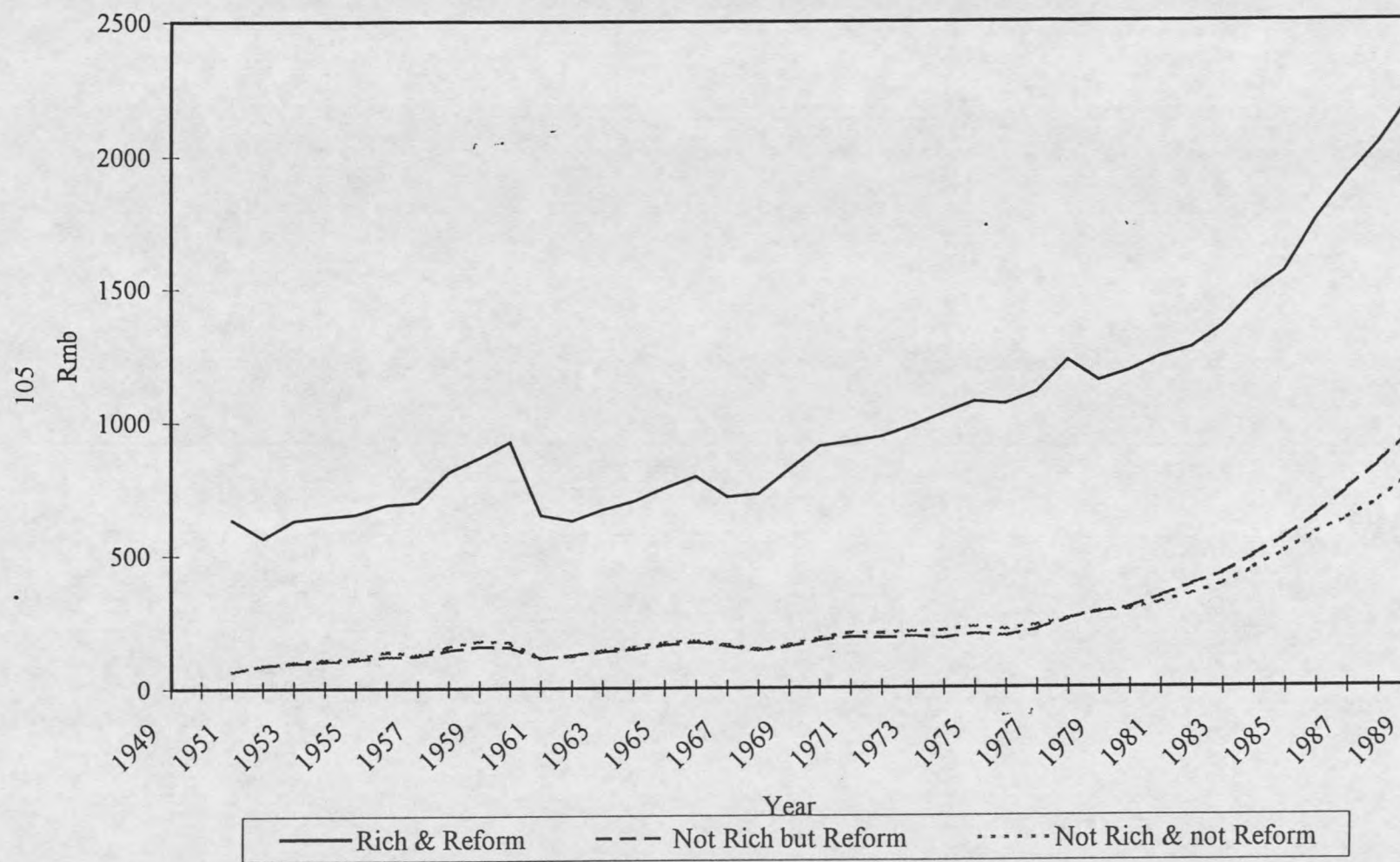
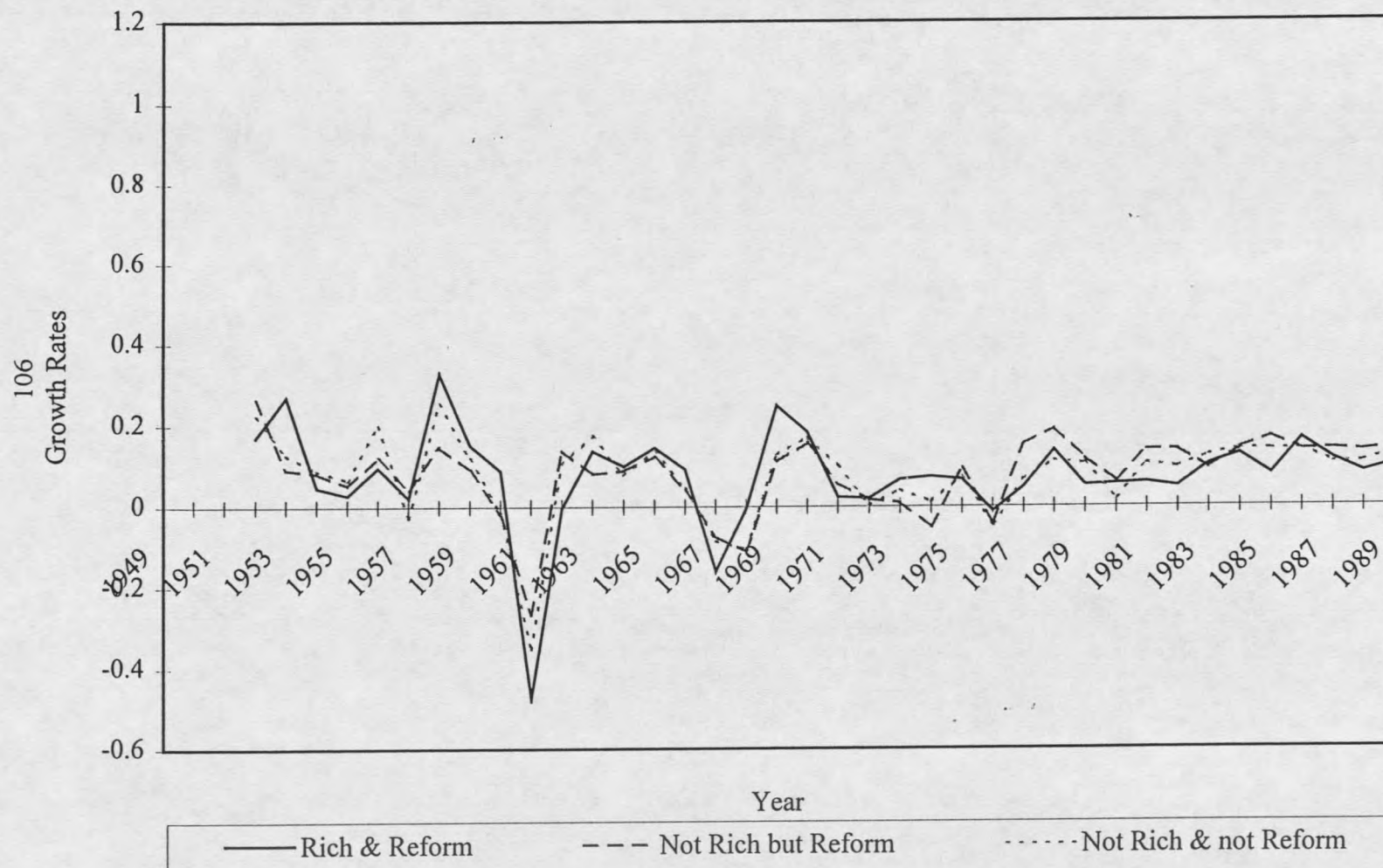


Figure 29: Provincial Growth Rates with respect to Level of Initial Incomes and Reforms: 1949 - 1989



lower income growth rates do not first catch up and then surpass those of the better-off provinces.

Continued reform is the best way to raise provincial growth rates. The main difference from past reform efforts, however, is that all provinces should be allowed to reform, not just a handful of (mostly) rich ones. Figure 28 shows that historically better off provinces that implemented reform are easily the richest provinces. It also shows, however, that those provinces that were historically less well off, but were allowed reforms, have begun to catch up, whereas, poorer provinces that did not implement reform are not catching up. Figure 29 shows that, overall, growth rates have also been highest for these poor but reforming provinces. The discussion of the mapped data in the last chapter also supports these remarks. In order for all poor provinces to have the best chances of catching up with income levels of the wealthiest, they should be subject to equal reform efforts.

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APPENDICES

APPENDIX A

EXPOSITION OF THE KEY VARIABLES

(1) $TAX = PUBLIC\ REVENUES\ BY\ LOCAL\ GOVERNMENTS / NATIONAL\ INCOME$

(2) $BUR = BUREAUCRACY = PUBLIC\ CONSUMPTION / TOTAL\ CONSUMPTION$

(3) $X = TOTAL\ EXPORTS / REAL\ INCOME\ PER\ CAPITA$

(4) $M = TOTAL\ IMPORTS / REAL\ INCOME\ PER\ CAPITA$

(5) $FOREIGN\ INVESTMENT / REAL\ INCOME\ PER\ CAPITA$

(6) NUMBER OF SEZs

(7) NUMBER OF OCCs

(8) $REAL\ NATIONAL\ INCOME\ PER\ CAPITA = (NATIONAL\ INCOME / TOTAL\ POPULATION) * PRICE\ INDEX$

National Income: National income refers to the newly created value in a given period by the five major material production sectors, i.e. industry, agriculture, construction, transport, post and telecommunications and domestic trade (catering and supply and marketing of raw materials included). hence, it is also the sum of net output value of all material production sectors.

Gross Domestic Product: Gross domestic product (GDP) refers to the total value of goods and services produced for final usage by local and foreign residents in a certain period of time within a country or region.

Total Consumption: Total consumption refers to the sum of material products consumed inside and outside the country (region) by residents and non-productive institutions within a certain period of time. generally speaking, consumption refers to the fact that goods are transferred to consumers, but not necessarily actually consumed. Total consumption includes two major categories: personal consumption by residents and public collective consumption.

Public Consumption: Public consumption includes all material consumption by such non-productive organizations as government administrative institutions and institutions related to national defense and public order, education, health services, sports, social welfare, scientific research, television and broadcasting, etc. Consumption of these institutions

includes fuels, water, electricity, stationary, material depletion being charged to the administration fees, and depreciation associated with fixed assets such as institutions' housing and equipment, etc.

Public Revenues of Local Governments: Public revenues of local governments include:

- (1) Revenues from enterprises, which include the profit of subordinate state-owned enterprises and the income of subordinate institutions that are surrendered to the government.
- (2) Various taxes including industrial and commercial tax (or product tax, value-added tax), resource tax, enterprises income tax, salt tax, customs duties, farming and animal husbandry taxes, tax on animal slaughtering, tax on livestock trading, tax on country fair trade and revenues from penalties and payment of overdue taxes.

Total Population: Total population refers to the total number of persons who live in a given area at a given point in time.

Total Exports: Generally speaking, Chinese exports can be categorized into three types:

- (1) General exports refers to exports and agency exports unifiedly planned by the state through import and export corporations, industrial-agricultural import and export corporations and local import and export corporations; as well as exports by self-run and joint-run enterprises. It includes exports processed from imported materials; commodities sold domestically at foreign exchange settlement price by various kinds of import and export corporations to the supplier companies catering for foreign ships, friendship stores, the Guangzhou Trade Center, and shops providing services to people heading overseas, as well as exports to SanZi QiYe.
- (2) SanLai YiBu (Three comings-in and one compensation) exports include the value of exports processed and assembled from imported materials, which is the actual wages and other expenses paid to the processing and assembly work; as well as the value of exports by medium and small scale enterprises of compensation trade.
- (3) Exports by SanZi QiYe (Three foreign-involved enterprises) report only those products manufactured and exported by the SanZi QiYe. Export items commissioned to import and export trade companies are not included.

Total Imports: Imports refer to the purchases from abroad, once entered China's port or territory.

Total Value of Foreign Capital through Signed Contracts or Agreements: It is the total value accrued by contracts and agreements, signed with the permission of the authorities in charge by all sectors and localities in China, on foreign loans, direct foreign investment and other foreign investments. Excluded are letters of intention, oral promises, draft agreements and the like.

General Retail Price Index: General retail price index is an economic indicator which reflects extensively the trend in and the degree of fluctuations of general retail price levels. In calculating the retail price index, a weighted arithmetic mean formula is used. The weights used are adjusted once a year according to the household survey data. Over the past years, the markets selected for the calculation of index have been on the increase. In 1987, 195 cities (shi) and 203 county towns (xian cheng) were selected as the basic units for data collection. The average price of a standard commodity was used to calculate the index for each commodity.

APPENDIX B
ECONOMIC INDICATORS BY PROVINCE
(1978-1989)

Anhui

Year	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	220.26	4.84%	21.65%	0.2782	8.89%	0	0	0	0
1979	235.30	6.82%	18.14%	0.3982	9.55%	0	0	0	0
1980	252.74	7.41%	15.86%	0.8769	6.10%	0	0	0	0
1981	298.18	17.98%	13.75%	1.4164	6.11%	0.2432	0	0	0
1982	318.72	6.89%	13.61%	1.7047	7.33%	0.2453	0	0	0
1983	352.53	10.61%	12.43%	2.4377	9.33%	0.2369	0.155	0	0
1984	424.91	20.53%	11.02%	3.0693	7.89%	0.4736	0.0839	0	0
1985	495.46	16.60%	11.10%	3.6738	9.31%	1.232	0.2846	0	0
1986	565.81	14.20%	11.42%	5.2296	8.95%	1.2222	1.6341	0	0
1987	617.02	9.05%	10.85%	5.5373	8.64%	1.0307	0.7466	0	0
1988	679.14	10.07%	9.53%	5.2438	8.03%	1.5	0.8095	0	0
1989	776.69	14.36%	10.25%		9.18%	1.7492	0.5289	0	0

Beijing

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	1031.00	11.69%	57.25%	2.8524	22.89%	0.1227	0	0	0
1979	1094.92	6.20%	49.21%	4.1757	23.85%	0.3279	0	0	0
1980	1168.63	6.73%	46.44%	5.9277	20.37%	0.7003	0	0	0
1981	1228.47	5.12%	43.78%	6.323	25.65%	0.6861	0	0	0
1982	1258.34	2.43%	40.11%	6.1339	22.64%	0.7582	0	0	0
1983	1441.20	14.53%	29.45%	5.9009	27.49%	1.0612	0	0	0
1984	1630.49	13.13%	28.99%	6.2632	26.54%	1.3671	1.3826	0	0
1985	1711.96	5.00%	26.96%	6.2075	23.43%	3.5285	4.0788	0	0
1986	1988.40	16.15%	29.29%	7.2485	23.87%	3.6007	5.5888	0	0
1987	2200.18	10.65%	26.92%	8.8236	24.80%	3.1339	6.6515	0	0
1988	2472.26	12.37%	22.57%	10.0275	23.82%	2.9442	1.8533	0	0
1989	2783.46	12.59%	21.10%	11.6157	27.30%	4.8754	1.4253	0	0

Fujian

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	233.32	24.78%	26.36%	1.9014	11.29%	0.1246	0	0	0
1979	246.22	5.53%	20.22%	2.4649	10.98%	0.2752	0.5261	1	0
1980	275.11	11.74%	21.04%	3.6366	10.34%	1.4177	0.1372	1	0
1981	339.29	23.33%	16.17%	3.9818	9.40%	1.6707	0.2485	1	0
1982	365.27	7.66%	13.87%	3.7913	9.24%	1.3761	0.3945	1	0
1983	394.72	8.06%	11.70%	3.947	9.48%	2.0448	0.4537	1	0
1984	471.83	19.54%	13.04%	4.2372	9.10%	2.7009	2.5408	1	1
1985	549.77	16.52%	15.20%	4.9148	8.70%	6.2544	4.3909	1	1
1986	630.64	14.71%	15.87%	5.7854	10.46%	3.152	1.1499	1	1
1987	738.38	17.08%	14.66%	8.4933	11.00%	4.9189	2.189	1	1
1988	854.61	15.74%	13.06%	14.0574	10.28%	7.8952	6.2497	1	1
1989	1045.88	22.38%	14.73%	16.6171	11.27%	7.3531	9.6134	1	1

Gansu

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	290.62	6.90%	37.59%	0.2521	13.43%	0	0	0	0
1979	280.77	-3.39%	34.41%	0.3972	14.29%	0	0	0	0
1980	301.34	7.33%	18.95%	0.3927	14.69%	0	0	0	0
1981	290.27	-3.67%	17.00%	0.4336	14.94%	0.0793	0	0	0
1982	309.56	6.64%	20.12%	0.443	14.52%	0.0739	0	0	0
1983	371.41	19.98%	14.68%	0.4612	15.46%	0.1083	0	0	0
1984	400.13	7.73%	15.93%	0.4573	15.46%	0.2058	0	0	0
1985	459.45	14.83%	16.19%	0.7098	16.75%	0.2906	0	0	0
1986	533.49	16.11%	16.87%	1.0107	20.21%	0.3541	0	0	0
1987	587.38	10.10%	17.01%	1.266	19.05%	0.2844	0	0	0
1988	647.78	10.28%	15.22%	1.5205	19.19%	0.0756	0	0	0
1989	735.22	13.50%	16.96%	1.5338	19.47%	0.2408	0	0	0

Guangdong

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	316.22	13.44%	24.54%	13.8755	6.25%	2.039	0	0	0
1979	340.70	7.74%	19.08%	17.0196	6.31%	2.4295	2.2889	3	0
1980	383.66	12.61%	16.59%	21.9472	6.42%	3.5612	13.892	3	0
1981	431.05	12.35%	15.73%	23.7254	6.73%	6.6543	16.7507	3	0
1982	515.30	19.55%	14.20%	22.5648	7.03%	8.0106	15.5916	3	0
1983	548.13	6.37%	13.94%	23.8524	7.55%	9.3144	7.266	3	0
1984	649.01	18.40%	12.33%	24.8731	8.52%	11.1728	14.4489	3	2
1985	727.30	12.06%	14.01%	29.5267	9.05%	24.2622	25.6521	3	2
1986	873.52	20.10%	15.19%	42.5129	9.87%	25.5754	18.348	3	2
1987	1007.37	15.32%	14.16%	54.4417	9.47%	36.2775	20.175	3	2
1988	1158.97	15.05%	12.02%	74.8382	10.43%	51.1018	38.2748	3	2
1989	1419.59	22.49%	13.23%	81.6767	12.31%	48.3121	36.2311	3	2

Guangxi

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	187.51	1.08%	22.45%	2.4885	6.63%	0.2046	0	0	0
1979	203.00	8.26%	16.72%	2.8662	6.97%	0.2137	0	0	0
1980	209.99	3.45%	15.15%	3.6579	6.99%	0.1244	0	0	0
1981	252.01	20.01%	13.74%	3.662	6.41%	0.3229	0	0	0
1982	293.59	16.50%	11.69%	3.4259	6.32%	0.3355	0	0	0
1983	300.27	2.28%	11.79%	3.4269	7.09%	0.5779	0	0	0
1984	316.22	5.31%	10.74%	3.2216	10.18%	0.9171	0	0	1
1985	351.28	11.09%	13.34%	3.7205	10.54%	1.5105	0	0	1
1986	424.47	20.84%	14.33%	4.3036	10.28%	1.1492	0.8452	0	1
1987	478.50	12.73%	14.72%	5.4331	10.29%	2.482	0.4437	0	1
1988	509.11	6.40%	13.46%	5.4427	10.18%	2.638	1.0886	0	1
1989	596.27	17.12%	13.79%	5.843	9.15%	1.7005	0	0	1

Guizhou

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	154.49	22.79%	15.04%	0.0285	6.41%	0.136	0	0	0
1979	168.90	9.33%	13.87%	0.0703	6.52%	0.1408	0	0	0
1980	174.28	3.19%	12.81%	0.1926	6.40%	0.1156	0	0	0
1981	196.75	12.89%	11.11%	0.2204	5.53%	0.1165	0	0	0
1982	228.75	16.26%	11.48%	0.299	7.94%	0.1166	0	0	0
1983	257.52	12.58%	12.71%	0.3522	7.91%	0.1015	0	0	0
1984	214.65	-16.65%	18.31%	0.3851	7.75%	0.1836	0.0408	0	0
1985	337.40	57.18%	14.07%	0.3554	7.62%	0.3241	0.2083	0	0
1986	382.68	13.42%	14.00%	0.6496	9.68%	0.1381	0.1196	0	0
1987	430.18	12.41%	15.15%	0.9296	9.76%	0.2057	0.1642	0	0
1988	473.90	10.16%	14.50%	1.1615	9.49%	0.3931	0.4285	0	0
1989	530.17	11.88%	16.21%	1.3201	10.17%	0.5359	0.3747	0	0

Hainan

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978			10.26%	0.1019		0	0	0	0
1979	250.73		9.63%	0.1698		0	0	0	0
1980	256.36	2.25%	7.84%	0.1829	6.36%	0	0.2037	0	0
1981	305.77	19.27%	6.18%	0.4571	6.77%	0	0.3087	0	0
1982	389.14	27.27%	5.51%	0.2027	7.05%	0	0.0378	0	0
1983	425.43	9.32%	6.50%	0.1577	7.53%	0	0.1433	0	0
1984	521.41	22.56%	9.80%	0.4113	8.53%	0	1.23	0	0
1985	529.39	1.53%	8.85%	0.8113	9.06%	0	0.6132	0	0
1986	626.84	18.41%	6.57%	0.384	9.87%	0	0.0777	0	0
1987	676.57	7.93%	6.50%	1.1545	9.65%	0.6547	0.1438	0	0
1988	774.86	14.53%	7.76%	2.9496	11.00%	1.9177	3.9868	1	0
1989	892.31	15.16%	8.64%	3.6082	13.41%	0.864	3.3213	1	0

Hebei

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	313.42	18.20%	28.51%	2.7636	8.11%	0.2216	0	0	0
1979	338.53	8.01%	24.46%	4.1628	8.91%	0.1939	0	0	0
1980	346.13	2.24%	18.59%	6.088	8.76%	0.2082	0	0	0
1981	353.07	2.01%	18.00%	7.6663	7.92%	0.382	0	0	0
1982	388.77	10.11%	15.04%	8.0988	8.75%	0.5083	0	0	0
1983	434.16	11.67%	15.25%	8.1693	8.27%	0.5187	0	0	0
1984	497.06	14.49%	13.87%	7.6047	9.41%	0.7683	0.0904	0	1
1985	575.28	15.74%	13.25%	12.9854	8.85%	1.1755	0.4804	0	1
1986	634.67	10.32%	13.62%	10.5312	9.40%	0.7822	0.1751	0	1
1987	725.15	14.26%	12.85%	14.8475	9.69%	1.1099	0.4539	0	1
1988	814.41	12.31%	11.60%	15.4626	8.99%	2.3206	1.9962	0	1
1989	933.06	14.57%	11.72%	16.3743	7.77%	2.299	0.9487	0	1

Heilongjiang

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	483.03	12.03%	41.76%	0.45	10.35%	0	0	0	0
1979	493.96	2.26%	33.93%	0.74	11.77%	0	0	0	0
1980	554.18	12.19%	9.09%	0.98	7.01%	0.32	0	0	0
1981	570.79	3.00%	8.28%	1.34	7.08%	0.26	0	0	0
1982	607.74	6.47%	8.44%	1.75	8.39%	0.24	0	0	0
1983	689.25	13.41%	9.34%	2.73	10.02%	0.5	0	0	0
1984	769.79	11.69%	10.10%	3.39	10.21%	0.9	0.15	0	0
1985	761.73	-1.05%	13.28%	4.13	11.08%	0.97	0.53	0	0
1986	938.65	23.23%	13.09%	6.05	14.18%	1.33	0.53	0	0
1987	1066.50	13.62%	14.06%	7.98	16.03%	1.01	1.16	0	0
1988	1118.58	4.88%	13.96%	9.49	15.64%	2.21	1.11	0	0
1989	1287.35	15.09%	14.32%	10.27		3.14	1.3	0	0

Henan

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	204.19	12.33%	23.49%	1.0231	7.47%	0	0	0	0
1979	232.54	13.88%	20.07%	1.3422	7.41%	0	0	0	0
1980	255.41	9.84%	16.42%	2.0448	8.01%	0	0	0	0
1981	284.35	11.33%	16.02%	2.4948	7.42%	0	0	0	0
1982	288.81	1.57%	15.19%	2.5471	8.52%	0	0	0	0
1983	346.39	19.94%	13.57%	2.7963	8.04%	0	0	0	0
1984	391.04	12.89%	12.82%	3.4174	9.99%	0	0.1003	0	0
1985	459.69	17.55%	13.10%	3.671	10.35%	0.8231	0.7534	0	0
1986	506.26	10.13%	13.16%	4.5263	11.01%	0.3408	0.9308	0	0
1987	588.85	16.31%	12.45%	6.5434	11.75%	0.9298	1.3066	0	0
1988	620.86	5.44%	11.75%	7.5052	11.54%	0.9099	1.3128	0	0
1989	706.45	13.79%	11.77%	8.1897	12.78%	1.6642	2.5122	0	0

Hubei

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	293.82	13.50%	23.22%	1.5901	5.78%	0.1432	0	0	0
1979	361.97	23.20%	18.60%	2.255	8.75%	0.1361	0	0	0
1980	354.86	-1.96%	19.56%	2.5109	8.49%	0.156	0	0	0
1981	410.07	15.56%	18.71%	3.3064	8.37%	0.2245	0	0	0
1982	447.74	9.19%	16.83%	3.6423	8.13%	0.2349	0	0	0
1983	480.93	7.41%	17.15%	4.1192	9.00%	0.3141	0	0	0
1984	584.17	21.47%	14.36%	4.5852	9.85%	0.5868	0	0	0
1985	676.26	15.76%	14.02%	5.2985	10.02%	1.5958	0	0	0
1986	767.96	13.56%	14.42%	7.2547	10.28%	1.3612	0.5845	0	0
1987	853.97	11.20%	14.06%	9.5495	10.03%	1.6019	1.0089	0	0
1988	904.80	5.95%	12.41%	10.742	11.21%	2.9166	1.5992	0	0
1989	996.21	10.10%	12.63%	10.2749	10.85%	1.6558	0.4781	0	0

Hunan

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	247.18	13.03%	21.91%	1.32	6.84%	0.27	0	0	0
1979	295.20	19.43%	18.20%	2.23	7.66%	0.1	0	0	0
1980	285.34	-3.34%	17.88%	3.14	8.42%	0.12	0	0	0
1981	333.38	16.84%	17.28%	3.55	8.31%	0.8	0	0	0
1982	366.00	9.79%	14.95%	3.84	8.72%	0.43	0	0	0
1983	393.24	7.44%	13.19%	4	8.47%	0.57	0	0	0
1984	432.32	9.94%	13.25%	4.17	8.64%	0.45	0.3799	0	0
1985	481.61	11.40%	13.03%	3.96	8.51%	1.29	0.5438	0	0
1986	570.40	18.44%	13.99%	5.03	8.48%	1.21	0.3259	0	0
1987	627.31	9.98%	13.55%	6.19	8.68%	1.27	0.5155	0	0
1988	664.66	5.95%	11.42%	6.39	8.71%	1.95	0.4135	0	0
1989	760.78	14.46%	12.74%	6.66	10.48%	1.59	1.5146	0	0

Inner Mongolia

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	252.60	8.47%	14.84%	0.1026	12.01%	0.0526	0	0	0
1979	266.16	5.37%	9.08%	0.1263	12.11%	0.0753	0	0	0
1980	266.52	0.14%	7.83%	0.2663	10.05%	0.1735	0	0	0
1981	311.88	17.02%	6.89%	0.4884	12.32%	0.162	0	0	0
1982	370.28	18.72%	7.08%	0.7211	10.16%	0.0897	0	0	0
1983	405.19	9.43%	8.67%	0.571	10.88%	0.3291	0	0	0
1984	462.25	14.08%	8.80%	0.7895	16.13%	0.3017	0	0	0
1985	541.06	17.05%	11.31%	1.371	16.65%	0.474	0	0	0
1986	593.59	9.71%	12.59%	1.7104	17.88%	0.6832	0.0426	0	0
1987	644.73	8.61%	13.49%	2.2654	17.82%	0.7744	0.1697	0	0
1988	786.63	22.01%	12.60%	2.9393	16.40%	0.8575	0	0	0
1989	855.98	8.82%	13.62%	3.363	15.35%	0.9682	0	0	0

Jiangsu

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978			29.33%	4.1846	7.27%	0.0903	0	0	0
1979	429.09		22.98%	6.1898	7.17%	0.5777	0	0	0
1980	438.52	2.20%	22.88%	8.5401	7.24%	0.9208	0	0	0
1981	491.38	12.06%	21.11%	10.9685	7.90%	0.9638	0	0	0
1982	544.19	10.75%	19.88%	11.9536	8.09%	0.8368	0	0	0
1983	618.36	13.63%	19.11%	13.7242	9.10%	0.7894	0	0	0
1984	730.09	18.07%	16.16%	14.8704	8.23%	1.4446	0	0	2
1985	852.61	16.78%	15.18%	15.5851	7.94%	2.9492	2.0218	0	2
1986	994.36	16.63%	14.87%	17.1991	8.17%	3.6175	2.2553	0	2
1987	1137.43	14.39%	13.58%	21.186	8.61%	5.8385	2.2684	0	2
1988	1237.03	8.76%	11.92%	23.4987	9.71%	8.1511	7.2991	0	2
1989	1368.59	10.63%	11.75%	24.4111	9.78%	8.6563	4.894	0	2

Jiangxi

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	240.41	12.32%	15.95%	0.5088	8.73%	0	0	0	0
1979	284.35	18.28%	12.67%	0.8558	8.23%	0	0	0	0
1980	290.12	2.03%	12.60%	0.9274	9.51%	0	0	0	0
1981	310.16	6.91%	12.30%	1.9386	10.09%	0.0542	0	0	0
1982	339.09	9.33%	10.55%	1.6489	8.85%	0.0465	0	0	0
1983	364.20	7.40%	10.83%	2.1631	8.82%	0.0892	0	0	0
1984	403.93	10.91%	10.60%	2.3384	8.83%	0.1145	0.0952	0	0
1985	461.68	14.30%	11.29%	2.7525	9.83%	0.486	0.3196	0	0
1986	510.00	10.47%	12.71%	3.0527	10.84%	0.4796	0.7962	0	0
1987	575.47	12.84%	12.88%	4.0218	10.54%	0.8178	0.3697	0	0
1988	611.87	6.33%	11.93%	4.8938	9.35%	1.0912	1.2807	0	0
1989	704.32	15.11%	12.15%	5.1578	8.86%	0.7149	0.8891	0	0

Jilin

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	330.01	15.85%	23.09%	0.2357	3.98%	0.1347	0	0	0
1979	354.85	7.53%	16.12%	0.4413	7.00%	0.1654	0	0	0
1980	362.00	2.02%	16.92%	0.6625	6.60%	0.4483	0.0081	0	0
1981	412.59	13.97%	11.45%	1.2896	6.41%	0.43	0.0106	0	0
1982	436.76	5.86%	11.79%	1.3207	6.02%	0.4546	0.0765	0	0
1983	548.55	25.60%	11.05%	1.6661	7.76%	0.5223	0.0674	0	0
1984	618.71	12.79%	10.33%	2.4972	8.47%	0.9074	0.0669	0	0
1985	672.85	8.75%	12.78%	4.2712	9.20%	1.236	0.2454	0	0
1986	777.81	15.60%	15.55%	5.2515	9.83%	1.9201	0.4317	0	0
1987	948.07	21.89%	15.76%	4.6766	10.28%	1.718	0.7079	0	0
1988	1037.35	9.42%	14.77%	5.3214	10.84%	1.7552	0.559	0	0
1989	1084.86	4.58%	16.21%	6.8447	11.06%	2.6012	0.8099	0	0

Liaoning

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	603.67	8.66%	46.62%	15.1767	10.44%	0.6121	0	0	0
1979	630.59	4.46%	39.76%	26.0328	10.18%	0.7045	0.0113	0	0
1980	675.81	7.17%	34.83%	39.7989	10.32%	0.7438	0.0487	0	0
1981	694.46	2.76%	31.86%	43.4198	9.54%	0.8675	0.0138	0	0
1982	719.70	3.63%	30.07%	42.975	10.19%	0.7039	0.2448	0	0
1983	809.03	12.41%	22.78%	39.181	10.05%	0.7813	0.1458	0	0
1984	935.28	15.61%	21.77%	49.9154	11.27%	1.2362	0.6366	0	1
1985	1049.97	12.26%	20.02%	50.4217	11.67%	3.478	2.4213	0	1
1986	1218.95	16.09%	20.54%	30.7989	11.50%	3.4886	4.3852	0	1
1987	1375.76	12.86%	19.07%	37.88	11.28%	4.6142	5.6494	0	1
1988	1521.51	10.59%	16.69%	38.7431	11.72%	5.7584	13.2271	0	1
1989	1679.93	10.41%	17.37%	44.4571	13.28%	8.8813	8.496	0	1

Ningxia

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	278.37	11.90%	31.89%	0.2271	15.28%	0.0691	0	0	0
1979	294.79	5.90%	28.06%	0.3731	17.29%	0.1054	0	0	0
1980	297.96	1.07%	17.30%	0.4352	15.87%	0.0322	0	0	0
1981	321.76	7.99%	11.46%	0.438	17.28%	0.0837	0	0	0
1982	332.65	3.38%	11.34%	0.4266	19.52%	0.0399	0	0	0
1983	380.53	14.39%	11.60%	0.2956	20.26%	0.0783	0	0	0
1984	434.98	14.31%	12.64%	0.3128	22.16%	0.1013	0	0	0
1985	498.69	14.65%	14.07%	0.3416	21.76%	0.201	0	0	0
1986	580.97	16.50%	14.16%	0.5338	21.95%	0.2127	0	0	0
1987	607.92	4.64%	14.39%	0.631	19.77%	0.24	0	0	0
1988	711.45	17.03%	13.63%	0.8221	18.73%	0.2503	0.1157	0	0
1989	824.46	15.88%	14.32%	0.6248	19.61%	0.16	0	0	0

Qinghai

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	331.94	13.62%	44.60%		16.82%	0.0988	0	0	0
1979	336.15	1.27%	55.01%	0.0076	20.50%	0.0723	0	0	0
1980	354.69	5.51%	48.95%	0.0017	14.12%	0.0485	0	0	0
1981	329.23	-7.18%	49.99%	0.0402	14.88%	0.0457	0	0	0
1982	363.43	10.39%	43.38%	0.0793	14.62%	0.0402	0	0	0
1983	408.59	12.43%	43.90%	0.1077	16.69%	0.1033	0	0	0
1984	469.36	14.87%	39.32%	0.1247	19.11%	0.1729	0	0	0
1985	546.00	16.33%	34.99%	0.1406	18.24%	0.1288	0	0	0
1986	639.61	17.14%	36.77%	0.2123	19.70%	0.172	0	0	0
1987	701.15	9.62%	38.47%	0.2643	17.80%	0.1127	0	0	0
1988	810.05	15.53%	33.91%	0.4015	17.04%	0.0826	0	0	0
1989	890.94	9.99%	31.03%	0.4558	13.35%	0	0	0	0

Shaanxi

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	254.88	13.42%	27.75%	0.119	8.52%	0	0	0	0
1979	287.98	12.99%	20.46%	0.0856	8.96%	0	0	0	0
1980	271.25	-5.81%	19.66%	0.0973	9.84%	0	0	0	0
1981	286.45	5.60%	15.91%	0.2616	10.68%	0.0444	0	0	0
1982	316.22	10.39%	14.62%	0.5	11.57%	0.1067	0	0	0
1983	340.00	7.52%	14.37%	0.5426	12.12%	0.1287	0	0	0
1984	394.95	16.16%	12.58%	0.9662	12.62%	0.2723	0	0	0
1985	457.75	15.90%	13.87%	1.0359	13.60%	0.5353	0	0	0
1986	501.71	9.60%	15.00%	1.7158	14.81%	0.6294	0	0	0
1987	558.84	11.39%	15.04%	2.6582	16.15%	0.8103	0	0	0
1988	632.53	13.19%	14.33%	3.6006	14.88%	1.3291	0	0	0
1989	721.07	14.00%	14.22%	3.8273	14.86%	1.4936	0	0	0

Shandong

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	273.06	10.91%	32.80%	8.2951	11.56%	0.4191	0	0	0
1979	300.33	9.99%	25.90%	13.0569	9.97%	0.545	0	0	0
1980	335.56	11.73%	19.08%	17.6313	9.83%	1.0929	0	0	0
1981	396.35	18.12%	17.16%	18.9116	8.73%	0.8536	0	0	0
1982	439.53	10.89%	14.83%	16.5841	7.30%	1.3281	0	0	0
1983	499.00	13.53%	13.29%	18.0778	6.97%	1.1661	0	0	0
1984	609.86	22.22%	11.22%	22.8817	7.32%	1.3651	1.047	0	2
1985	670.24	9.90%	12.23%	26.6669	8.71%	3.9703	1.0994	0	2
1986	735.37	9.72%	10.43%	21.3507	9.61%	4.0776	1.2887	0	2
1987	863.39	17.41%	9.90%	29.7582	12.04%	5.069	3.052	0	2
1988	1055.21	22.22%	9.03%	29.8019	13.28%	5.9103	5.9553	0	2
1989	1105.12	4.73%	9.56%	30.5167	12.81%	6.3877	19.3441	0	2

Shanghai

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	2224.28	16.69%	68.93%	28.93	18.19%	1.33	0	0	0
1979	2296.27	3.24%	65.77%	36.75	17.31%	2.03	0	0	0
1980	2312.94	0.73%	61.87%	42.66	16.47%	2.4	0.34	0	0
1981	2465.00	6.57%	59.93%	38.07	14.85%	3.43	0.5	0	0
1982	2491.36	1.07%	56.95%	36.05	15.32%	2.88	0.86	0	0
1983	2539.23	1.92%	51.53%	36.48	16.14%	4.92	1.41	0	0
1984	2771.09	9.13%	48.05%	35.87	17.34%	8.13	4.69	0	1
1985	2893.11	4.40%	44.96%	33.61	16.63%	18.13	8.16	0	1
1986	3232.80	11.74%	42.22%	35.82	17.41%	16.22	6.24	0	1
1987	3483.79	7.76%	35.68%	41.6	18.46%	18.35	10.92	0	1
1988	3697.54	6.14%	28.54%	46.05	17.57%	26.4	10.55	0	1
1989	3940.93	6.58%	28.38%	50.32	12.40%	28.16	12.02	0	1

Shanxi

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	280.20	19.45%	28.92%	0.0731	6.90%	0	0	0	0
1979	347.15	23.89%	23.76%	0.1328	10.78%	0	0	0	0
1980	331.35	-4.55%	24.68%	0.1513	9.65%	0	0	0	0
1981	366.92	10.74%	20.92%	0.2852	8.58%	0	0	0	0
1982	421.06	14.75%	18.50%	0.3307	9.42%	0	0	0	0
1983	475.30	12.88%	19.52%	0.2835	10.30%	0.5017	0	0	0
1984	567.77	19.45%	17.87%	1.6654	11.50%	0.8414	0	0	0
1985	609.39	7.33%	14.51%	2.2679	11.27%	1.1364	0.721	0	0
1986	644.15	5.70%	15.90%	3.0226	12.29%	0.8625	0.85	0	0
1987	653.63	1.47%	17.78%	3.4551	12.54%	0.7129	1.604	0	0
1988	706.01	8.01%	16.73%	3.2954	12.43%	0.5261	2.355	0	0
1989	844.32	19.59%	17.32%	4.0001	14.07%	0.9183	1.449	0	0

Sichuan

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	212.15	26.01%	18.19%	0.1905	8.51%	0.2162	0	0	0
1979	237.86	12.12%	14.34%	0.2784	7.35%	0.1979	0	0	0
1980	254.16	6.85%	12.83%	0.3746	6.35%	0.4256	0	0	0
1981	281.10	10.60%	11.10%	0.7834	6.48%	0.315	0	0	0
1982	313.66	11.58%	11.05%	0.9588	6.29%	0.3783	0	0	0
1983	345.40	10.12%	11.51%	1.2294	6.74%	0.2804	0	0	0
1984	395.92	14.62%	11.32%	2.1674	6.47%	0.9032	0	0	0
1985	451.61	14.07%	11.96%	3.4939	7.26%	1.6991	0	0	0
1986	492.73	9.10%	12.75%	4.8873	7.35%	1.7208	0	0	0
1987	556.00	12.84%	12.14%	7.303	7.39%	2.4521	0	0	0
1988	628.74	13.08%	11.46%	8.6287	7.60%	2.7245	0	0	0
1989	683.64	8.73%	13.26%	9.4917	8.41%	3.3392	0	0	0

Tianjin

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	1032.18	19.99%	52.52%	8.6474	12.33%	1.2364	0	0	0
1979	1132.74	9.74%	44.48%	12.2081	12.20%	1.624	0	0	0
1980	1178.19	4.01%	43.97%	15.4222	10.80%	2.8478	0	0	0
1981	1244.49	5.63%	41.88%	15.367	14.97%	1.466	0	0	0
1982	1300.59	4.51%	38.21%	14.2411	14.14%	1.1318	0	0	0
1983	1373.64	5.62%	35.75%	14.2734	15.02%	1.5083	0	0	0
1984	1501.61	9.32%	33.25%	12.3365	16.54%	2.3384	0	0	1
1985	1645.88	9.61%	31.95%	11.5274	16.17%	3.365	1.5618	0	1
1986	1899.44	15.41%	32.84%	12.5494	16.92%	4.0911	2.9612	0	1
1987	2095.01	10.30%	30.09%	15.1712	19.65%	4.9569	1.0283	0	1
1988	2238.88	6.87%	20.12%	16.8268	18.20%	5.9578	3.0976	0	1
1989	2379.18	6.27%	19.83%	16.82	19.51%	5.32	2.4517	0	1

Xinjiang

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	272.58	13.17%	20.95%	0.0937	10.52%	0.1409	0	0	0
1979	305.78	12.18%	13.81%	0.0868	9.61%	0.1568	0	0	0
1980	344.38	12.62%	8.75%	0.171	8.47%	0.145	0	0	0
1981	388.56	12.83%	3.21%	0.473	8.03%	0.1526	0	0	0
1982	425.14	9.41%	7.81%	0.9032	8.52%	0.1594	0.0536	0	0
1983	472.06	11.04%	8.81%	0.9697	9.17%	0.2047	0	0	0
1984	535.92	13.53%	9.72%	1.5966	9.88%	0.7747	0.0987	0	0
1985	604.71	12.84%	9.43%	1.802	9.03%	1.1177	0.4027	0	0
1986	687.47	13.69%	10.05%	2.0535	9.26%	0.7877	0.1074	0	0
1987	798.50	16.15%	9.63%	2.2291	9.52%	0.9244	0.0794	0	0
1988	944.62	18.30%	10.01%	2.9887	9.59%	1.0888	0.0668	0	0
1989	1055.80	11.77%	10.86%	3.6093	10.08%	1.2545	0.0588	0	0

Yunnan

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	200.41	20.91%	18.96%	0.6948	7.79%	0	0	0	0
1979	218.53	9.04%	16.54%	0.8891	7.15%	0	0	0	0
1980	223.38	2.22%	15.54%	0.9601	6.66%	0.1436	0	0	0
1981	255.97	14.59%	15.20%	1.0331	6.61%	0.3143	0	0	0
1982	291.12	13.73%	16.08%	1.0927	6.38%	0.2687	0	0	0
1983	315.52	8.38%	16.18%	1.1852	6.46%	0.2872	0	0	0
1984	354.14	12.24%	16.09%	1.1138	6.87%	0.3938	0.0764	0	0
1985	390.04	10.14%	19.04%	1.2901	7.15%	0.8052	0.1751	0	0
1986	425.37	9.06%	19.31%	1.6893	8.30%	0.9644	0.0361	0	0
1987	488.87	14.93%	20.36%	2.6226	8.73%	0.7991	0.1422	0	0
1988	558.20	14.18%	21.06%	3.4196	9.11%	1.0192	0.193	0	0
1989	646.18	15.76%	22.50%	3.7442	9.01%	1.7326	0.0436	0	0

Zhejiang

YEAR	Y	YG	TAX	EXP	BUR	IMP	FDI	SEZ	OCC
1978	287.72	22.11%	25.41%	0.524	7.12%	0.1771	0	0	0
1979	360.75	25.39%	18.52%	0.9075	8.99%	0.1715	0.112	0	0
1980	383.10	6.19%	19.66%	2.4273	10.12%	0.1811	0.0614	0	0
1981	455.61	18.93%	19.18%	4.4062	10.18%	0.5992	0.0818	0	0
1982	517.46	13.57%	17.88%	5.5696	9.30%	0.5301	0.0614	0	0
1983	544.70	5.26%	18.98%	6.5201	9.61%	0.707	0.054	0	0
1984	670.18	23.04%	16.87%	7.3689	11.52%	1.0801	0.8527	0	2
1985	796.50	18.85%	15.92%	9.3768	10.91%	2.7315	0.8916	0	2
1986	978.40	22.84%	16.25%	11.5608	10.36%	2.1638	0.5274	0	2
1987	1126.54	15.14%	15.02%	13.7028	11.41%	3.281	1.4335	0	2
1988	1254.41	11.35%	13.39%	16.2023	11.32%	5.7102	2.6815	0	2
1989	1408.60	12.29%	14.06%	18.7919	11.56%	6.6021	3.4535	0	2

APPENDIX C

NET EFFECT OF REFORM BY PROVINCE

Database: Net Effect of Reform Era on Selected Variables

Province	Ygrowth	Y	FDI	BUR	EXP	IMP	TAX	Yinitial	SEZ	OCC
Anhui	9.09%	239.68	0.3536	4.77%	2.45	0.88	1.14%	196.72	0	0
Beijing	2.68%	1186.05	1.748	7.94%	6.20	1.91	8.25%	481.4	0	0
Fujian	11.06%	375.21	2.324	2.72%	5.78	3.21	5.48%	136.88	1	1
Gansu	2.08%	278.87	0	5.81%	0.48	0.19	3.01%	155.08	0	0
Guangdong	8.99%	516.71	17.401	2.07%	31.75	18.53	9.85%	180.85	1	1
Guangxi	4.46%	232.51	0.198	3.75%	3.32	0.95	4.30%	111.01	0	1
Guizhou	8.38%	200.61	0.113	1.99%	0.47	0.18	0.13%	95.19	0	0
Hainan	13.82%	513.53	0.8389	8.92%	0.85	1.15	7.84%	250.73	1	0
Hebei	5.72%	368.59	0.3454	3.19%	8.07	0.81	4.64%	160.89	0	1
Heilongjiang	4.23%	463.79	0.3983	0.14%	3.66	1.09	9.50%	314.68	0	0
Henan	7.48%	282.51	0.5763	2.48%	3.51	0.93	5.10%	124.56	0	0
Hubei	6.49%	422.51	0.3059	3.59%	4.73	0.88	2.72%	171.88	0	0
Hunan	5.34%	309.61	0.3078	3.86%	3.81	0.8	2.31%	145.18	0	0
Inner Mongolia	7.48%	270.15	0.0177	7.30%	1.13	0.37	3.28%	209.59	0	0
Jiangsu	12.39%	803.79	1.562	3.55%	12.48	2.9	8.29%	429.09	0	1
Jiangxi	6.07%	268.19	0.3125	2.41%	2.26	0.43	3.26%	156.44	0	0
Jilin	8.00%	414.59	0.2486	5.28%	2.68	0.99	9.27%	217.45	0	0
Liaoning	2.63%	629.34	2.94	1.51%	34.91	2.52	5.09%	363.55	0	1
Ningxia	6.71%	269.78	0.0096	12.80%	0.34	0.1	1.43%	193.93	0	0
Qinghai	3.24%	302.12	0	4.25%	0.17	0.1	-0.73%	212.98	0	0
Shaanxi	3.91%	268.42	0	7.14%	1.20	0.59	4.65%	150.22	0	0
Shandong	7.35%	470.33	2.649	5.59%	19.33	2.6	10.70%	136.59	0	1
Shanghai	1.15%	1706.56	4.64	2.52%	29.90	10.56	1.95%	1155.8	0	1
Shanxi	5.19%	348.29	0.5816	6.45%	1.52	0.79	-0.18%	172.31	0	0
Sichuan	6.29%	286.89	0	2.29%	3.18	1.1	5.48%	117.52	0	0
Tianjin	2.06%	1024.81	0.9251	5.35%	8.94	2.49	10.04%	560.34	0	1
Xinjiang	9.44%	342.31	0.0723	4.10%	1.27	0.49	4.67%	227.31	0	0
Yunnan	6.30%	243.27	0.0555	1.10%	1.42	0.67	0.73%	120.7	0	0
Zhejiang	12.15%	563.95	0.8509	6.12%	7.98	1.93	4.76%	168.05	0	1

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