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Of Belts and Ladders: State Policy and Uneven Regional Development in Post-Mao China

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Since the late 1970s, unprecedented changes have occurred in the development philosophy and the economic landscape of the People's Republic of China. After decades of redistributive policies that attempted to achieve spatially balanced development, regional policy during the post-Mao period has brought about a spatial restructuring that has resulted in new patterns of uneven regional development. This paper reviews the logic of China's new regional policy and analyzes its relationship with recent patterns of uneven regional development.

There is a fundamental paradox in China's regional development. After 1978, when China shifted its regional policy from one of egalitarianism to one of rapid growth in the coastal region advantaged by large investments and preferential policies, regional inequality seems to have increased. Measures of the inequality of inter-provincial outputs demonstrate, contrary to expectation, that regional development has become more equal. This paper seeks to resolve this paradox by offering a comprehensive and multiscale review of recent patterns and changes in regional output and investment. Analysis of these changes in regional development at multiple scales of resolution shows that the egalitarian interpretations of past studies has been based on coarse scales of analysis which mask local realities and thus reinforce the myth of even development. When these egalitarian findings are examined at finer scales, the effects of selective and concentrated development in designated locations becomes obvious. The analysis presented here identifies a new corridor of growth in coastal provinces and localities that have benefited disproportionately from the new regional policy. Their advances counterpoised by the slow growth of a few older economic centers go a

long way in explaining the apparent declines in regional inequality.

This paper also argues that changes in uneven regional development should be interpreted in the context of Chinese political economy. In a socialist system which accords the ultimate power of resource allocation (especially investment) to the state, China's leadership is constantly confronted by allocation dilemmas—by choices between national economic growth and national integration and stability, and between efficiency and equity. The policies that ensue thus constitute negotiated outcomes between conflicting ideals.

The role of the state and its political economic concerns are seldom addressed, however, in traditional regional development theories, perhaps because these neoclassical economic theories were developed primarily to explain regional development in Western capitalist states. Thus while neoclassical theories have served as influential guides for Chinese regional policy, they are incapable of explaining China's most salient spatial changes. If these theories have predicted the regional concentrations and the ensuing spatial diffusion of growth in many developed countries, they are less likely to do so in China owing to their assumption of high levels of factor mobility—a condition not yet achieved in the Chinese economy—and to their neglect of the role of the state. Nonetheless, the literature on the geography of production does offer some insights that are relevant to Chinese economic development, especially in the open zones. China thus serves as a testing ground for and a challenge to established theories of regional development. Unfortunately, previous studies of China's regional development have tended to divorce theory from the empirical data. By resorting to these empirical data, this paper

identifies and highlights the driving forces behind China's peculiar patterns of uneven regional development—forces that should be accommodated, if not stressed, in contemporary theories of regional development.

A large literature by economists, sociologists, and political scientists has emphasized the state and the government as active agents in the process of economic development as well as the neglect of these agents in narrowly conceived neoclassical economic models (Davis et al. 1972; North 1981; 1990; Skocpol 1979; 1985). But this literature tends to focus on government intervention in capitalist economies (for example, Osterfeld 1992) rather than on state policy in centrally planned economies, where ironically the state is given unparalleled power over economic policy. Furthermore, these studies are preoccupied with the role of the state in national issues, e.g., income distribution, employment, economic growth, and the law (for example, Carson et al. 1973) rather than on the geographic repercussions of state policy, e.g., region-specific economic growth and uneven regional development. In consequence, theories and empirical studies of the role of state policy in regional development in general and in centrally planned economies in particular are lacking.

This paper addresses these issues in four parts. Part one summarizes the evolution of Chinese development philosophy. Part two outlines the main thrusts of post-Mao regional policy between the late 1970s and the early 1990s. Part three describes the patterns of and changes in uneven regional development at three scales of analysis: 1) the provincial; 2) the intra-provincial (for five provinces); and 3) the detailed case study of Guangdong Province. Part four considers the implications of these findings for China and for regional development theory more generally.

The Evolution of Regional Development Theory in China

Maoist China: Egalitarianism and National Defense

Socialist ideology and defense were the driving forces behind Maoist redistributive policies. Inheriting in 1949 a nation in which most of

the developed areas were in the east and some 70 percent of the assets and outputs of Chinese industries were in large coastal cities, the Chinese Communist Party (CCP) came face to face with the problem of spatial inequality.¹ Maoist socialists swiftly devised "corrective" strategies aimed at diverting resources from the coast to the interior. During the First Five-Year-Plan (hereafter FYP) between 1953 and 1957, socialist strategists located two-thirds of the major industrial projects and more than one-half of the total industrial investment in the interior (Kirkby 1985:138). In order to do this, the centralized fiscal system required developed provinces to remit large proportions of their revenues to the central government, while poor provinces were allowed to retain most of their revenues and even to receive subsidies from the state (Lardy 1975).

Domestic turmoil and worsening international relations plagued China in the period after the First FYP. The Great Leap Forward in 1958 turned into disaster as famine hit between 1959 and 1961. And then in 1966, the Cultural Revolution triggered almost a decade of political and ideological warfare within China. The Vietnam War and deteriorating relations with the Soviet Union and the United States in the 1960s compounded China's withdrawal and isolation from international affairs. Not surprisingly, national defense emerged as a priority in Chinese regional policy.

During the difficult years of the 1960s and the early 1970s, Chinese planners relied on a model of resource allocation known as the "Third-Front" (*san xian*). The model was clearly defense-oriented: avoiding the vulnerable large coastal cities (First-Front) and their adjacent areas (Second-Front), this model advocated the construction of industries, especially large capital projects such as iron and steel and military machinery, in interior (Third-Front) locations that were less vulnerable to foreign attacks (Naughton 1988; and Figure 1). These Third-Front industrial projects tended furthermore to be located in inaccessible sites such as lowlands surrounded by mountains—a practice that gave rise to the expression *shan, san, dong* which may be translated as "in mountains, in dispersion, in caves."

Although the First FYP and the Third-Front model prescribed greater investment in interior provinces, these policies differed in goals and locations. The former aimed at regional



Figure 1. Evolution of Chinese regional policy. Sources: *Beijing Review* 1986b; Naughton 1988; and *People's Daily* 1992.

equity and focused investment on large cities in the interior; the latter accented defense and privileged remote interior sites. Neither policy, however, paid much attention to economic efficiency. Both diverted investment from eastern coastal cities despite that region's record of industrial efficiency. To be sure, interior regions had abundant energy and mineral resources, but they were poor in technology and human resources and distant from the main markets in the east. Third-Front projects were even more costly and inefficient, located as they were in remote sites lacking in infrastructure and agglomeration economies.

These problems notwithstanding, the Third-Front model faithfully represented Maoist ide-

ology's preference for human power, manual labor, and mass mobilization over technology, intellect, and efficiency. The Maoist rhetoric also hammered home the notions of "self-reliance" and "self-sufficiency" for all parts of China: regions should be self-reliant in the event that vulnerable locations came under attack; industries should be thoroughly self-sufficient, from the assembly of raw materials to the production of the final product. Official policy thus discouraged horizontal and vertical linkages in industrial production outside of the loci of production.

These policies seem to have achieved some degree of regional equity albeit at the expense of efficiency (Yang 1990). Yet after thirty years

of pro-interior regional policy, the coastal region still produced some 60 percent of China's industrial output. Other studies conclude that uneven regional development had not changed substantially under Mao, despite the regime's spatially biased investment policy (Cole 1987; Luk 1985; Paine 1981; Tsui 1991; Walker 1989).

Third-Front projects cost the Chinese economy dearly. Naughton's (1988) counterfactual analysis indicates that China's industrial output is 10 to 15 percent below what it would have been if the Third-Front had never been undertaken. China thus remained a poor developing country in the late 1970s, and the failures of Maoist regional policy in bringing about national economic growth have been widely criticized (Zhang 1989). The painful lessons learned during the first 30 years of the People's Republic invited dramatic changes in regional development theory and policy.

Post-Mao China: Efficiency and Open Door

Although Marxism-Leninism-Maoism persists as China's guiding philosophy, the interpretations and applications of socialism have changed greatly. The theory of the "primary stage" has been the keystone in the arch of policy change. According to this theory, China adopted socialism as a semifeudal and semi-colonial country with a low level of economic development and thus the nation occupies a primary stage in socialist evolution (Hsu 1991). Incapable of practicing full socialism which presumes "mature" socialist societies, China is compelled to tailor a "socialism with Chinese characteristics," that is, a variant of socialism that respects unique historical contexts. In China's case poverty is the most pressing problem, and development must be directed toward accelerating national economic growth that will alleviate poverty. The paradigmatic shift in Chinese regional development theory that has been underway since the late 1970s involves therefore an emphasis on efficiency rather than equity, on open-door rather than self-reliance.

Efficiency. Egalitarianism at the expense of efficiency is no longer acceptable in post-Mao China. In the literature and among political leaders, the overwhelming preference is for

efficiency over egalitarianism (Zhou and Ru 1986). The tip of the balance has been so skewed that government officials, including China's "paramount leader" Deng Xiaoping, advocate policies that allow some people and some regions to get rich first so that they may set examples and create wealth so that others might get rich (Hsu 1991; Wang and Zeng 1988). In stark contrast to the Maoist regime, therefore, official policy now tolerates uneven development insofar as it is necessary for improving efficiency.

These changes in policy priorities reflected the lessons of past failures (Zhang 1989; 1990). Post-Mao leaders concluded that investments in the interior ignored economic efficiency and yielded low returns and that Maoist redistributive policies were, in a word, a failure (Liu 1986). Comparing Maoist policy to "sprinkling pepper" evenly across China, Yang (1991) observes that slow economic growth was the result.

The post-1978 policy shift toward efficiency also reflected the influence of neoclassical regional development theories derived from the experience of developed countries and their "stages of development" (Hsu 1991). Perhaps the most influential of these theories was the inverted-U model (Kuznets 1955; Williamson 1965) which suggests that uneven development increases initially owing to polarization effects and then decreases in later stages as diffusion effects come into play. Similarly influential were the core-periphery model (Friedmann 1966) and the notions of spread and backwash (Myrdal 1957; Richardson 1976), which predict initial increases in uneven development followed by diffusion and regional convergence. The United States was, of course, the main case in point since that nation's economic history of polarization and depolarization ratified these predictions. From the standpoint of these stages-of-development models, therefore, China occupies an early stage in the development continuum, hence an increase in regional inequality is inevitable in the short term (Zhang 1989).

The stages-of-development perspective served to legitimize Chinese policies aimed at achieving efficiency at the expense of equity. In order to achieve efficiency, and based on the classical and neoclassical traditions exemplified in the works of Smith, Ricardo, and Heckscher-Ohlin, post-Mao regional policy

emphasized comparative advantage, regional specialization, and division of labor (Chen 1987; Leung and Chai 1985; Liu 1987). An especially influential policy in this regard has been the "three-economic-belts" model which I discuss more fully in the next part of this paper.

The Chinese *tidu lilun* or "ladder-step" theory (Yang 1990) has been an equally important guide for post-Mao regional policy makers. This theory assigns priority of development to the eastern coast followed later by a shift toward the interior. This theory maintains that over time economic growth will diffuse from the coast to the interior much like descending the steps of a ladder (Yang et al. 1988). This popular theory represents the antithesis of Maoist redistributive ideology in its applications of the stages of development and inverted-U perspectives in a Chinese geographic context.

At a different spatial scale, Western growth-pole theory (Hirschman 1958; Moseley 1973a; 1973b; Parr 1973; Perroux 1955; Richardson 1976) has also influenced Chinese urban policy (Cao 1990; Li 1988; Zhu 1991). This theory which prescribes that economic growth should emerge in selected growth poles before diffusing to the hinterland clearly underlies China's renewed emphasis on medium and large cities (Lin 1985; Zheng 1986) and on heavy investments in selected coastal locations.²

Open Door. Comparative advantage is an important notion underlying the open-door policy and the popular theory of the "grand international cycle" or *guoji da xunhuan lilun*. The theory states that since developed countries and newly industrialized economies (NIEs) have begun to specialize in sectors other than labor-intensive industries, China should take advantage of its large labor force by specializing in labor-intensive, export-oriented industries which will bring in foreign exchange for national economic development (Hsu 1991; *Jingji Guanli* 1988; Yang 1991).

The open-door policy and the commitment to international trade represent China's ultimate departure from Maoist and Soviet self-reliance models of development. Again Western neoclassical theories, especially the staple export theory by Tiebout (1956), have played an important role in the conceptualization and legitimization of this new path of development

(Chen 1987), as has the experience of the NIEs and other developing countries whose recent economic success has been due to export-oriented industrialization in accordance with an export-led strategy of economic growth.

In sum, Western neoclassical theories have served as guides for post-Mao development philosophy. The notions of stages of development and the anticipated progression from polarization to diffusion and convergence constitute especially important building blocks of the new regional policy. Meanwhile, however, Chinese theorists and policy makers have paid little attention to the more recent Western literature on the geography of production—a literature which has some relevance for China and which could be enriched by some attention to the Chinese case. But first it is necessary to scrutinize China's new regional policy.

Post-Mao Regional Policy: Uneven Development

The three-economic-belts model served as the blue-print for Chinese regional policy during the 1980s (Figure 1). The Sixth FYP (1981–1985) first proposed the delineation of the nation into large belts; the Seventh FYP (1986–1990) formally adopted the three-belts model. The model fully embraces the notions of comparative advantage and regional division of labor: the eastern region would specialize in export-oriented industries and foreign trade; the central region would concentrate on agriculture and the energy sector; and the western region would focus on animal husbandry and mineral exploitation (*Beijing Review* 1986a; 1986b; Ji 1989; Lockett 1989). The model manifests elements of the ladder-step theory and the open-door strategy: foreign trade and industrial production in the eastern region will initiate national economic growth, whence growth will eventually diffuse to the central and western regions.

In order to promote foreign trade in the eastern region, Chinese planners established various open zones there to attract foreign investment. These included the four "special economic zones" (hereafter SEZs) of Shenzhen, Zhuhai, Shantou, and Xiamen (1979); Hainan as a fifth SEZ and the newest province (1988); fourteen "open coastal cities" (hereafter OCCs)

(1984); and various other open zones including the Zhujiang (Pearl River), Minnan, and Yangzi deltas. In these designated locations, foreign investors were accorded special treatment such as tax exemptions and tax "holidays."³ To promote these zones, the state allocated large investment to enhance their infrastructures; and as state and foreign investments boosted economic growth, these zones became China's newest growth poles or, more vividly, its "golden coastline" (Figure 1) (*People's Daily* 1992).

If the three-belts model of regional specialization and division of labor does not prescribe increases in regional inequality, the realities are obvious. The state's favoritism of the eastern region implied in the three-belts model has had a direct bearing on the pace of economic growth in China's provinces and cities. A series of spatially biased policies, euphemistically referred to as "preferential policies" or *qing xie zheng ce*, vividly illustrate the state's favoritism of the coastal provinces (Xu 1989; Zhang 1989):

- (1) *Investment policy.* Coastal provinces receive more investment from the state via state appropriations, loans and subsidies, and joint central and local projects.
- (2) *Foreign-exchange retention policy.* Open zones such as SEZs enjoy higher foreign-exchange retention rates.
- (3) *Revenue-remittance policy.* Some coastal provinces such as Guangdong are allowed to remit smaller proportions (or a fixed amount regardless of their gross revenue) of their revenue to the state.
- (4) *Price policy.* Primary and agricultural goods are priced substantially lower than finished and industrial products. This is the well known *jian dao cha* or "scissors differential."
- (5) *Financial policy.* Provinces and enterprises are given greater financial autonomy (Naughton 1987; Ferdinand 1989). But the degree of autonomy is not uniform across the nation; coastal provinces and open zones enjoy greater freedom in currency circulation, credits and loans, issuance of construction bonds, and establishment of private financial institutions.

These preferential policies constitute the institutional mechanisms that have resulted in concentrated and selective growth in certain coastal locations. The greater autonomy of the

open zones in matters of finance and foreign trade facilitates entrepreneurship and foreign trade by removing many of the inefficiencies embedded in central and local bureaucracies. Using various economic levers such as the scissors differential in prices, the state enhances the ability of coastal locations to realize, retain, and reinvest profits and revenues. The dilemma of the interior provinces is apparent. They sell primary and agricultural goods at low prices while they buy industrial goods at high prices from coastal provinces; coastal provinces, on the other hand, enjoy low-priced raw materials from the interior as well as the substantial profits from selling high-priced products manufactured from these raw materials. Chinese scholars describe these results in various ways—as "double losses" for interior provinces, "unequal exchange," "unequal competition" and "transfer of value" from the west to the east (Li 1991; Liu 1991; Zhang 1989; Zhu 1992). But to make things worse, as wealthy provinces have reduced their revenue remittances to the state, the latter's shrinking budget is less capable of subsidizing poorer provinces (Prime 1991; see also note 5). The end result has been a net transfer of revenue from interior to coastal provinces (Tang 1991; Tang et al. 1993).

Most assessments of post-Mao regional policy have emphasized (and predicted) two regional outcomes. First is the rise of local protectionism as interior provinces seek to blunt the negative transfer of value by restricting outflows of raw materials and agricultural goods. Attempts to eliminate the scissors differential has already occasioned a series of "commodity wars" (Feng 1989; Li 1991; Zhang 1992; Zhu 1992). Second is the widening of the development gap between the coast and the interior and between the three-economic-belts. It is the second of these outcomes (and related trends) that constitutes the empirical portion of this paper.

To be sure, strong criticisms of the ladder-step theory and the three-belts model have been made; indeed the Eighth FYP (1991–1995) has adopted new policies aiming at more even regional development. As the 1990s unfold, the state is giving more attention to regional linkages within a context of regional specialization. The planners' emphasis on the Yangzi Valley, dubbed "China's soaring dragon," is a case in point (Yao 1993). These recent changes notwithstanding, post-Mao

policies of uneven regional development have produced profound changes in China's economic landscape and these need to be thoroughly documented and understood.

Toward these ends, this paper moves next to a discussion of the landscape implications of neoclassical theories and post-Mao regional policy, and illustrates them via an empirical study of the salient changes in the pattern of China's regional development during the 1980s.

China's Regional Development in the 1980s

Although Maoist policies explicitly aimed at a redistributive reduction in regional inequality, the scholarly consensus is that they missed the target. Some decline in inter-provincial inequality did occur during the 1960s (Lardy 1980; Lyons 1991; Riskin 1987; Tsui 1991), but the trend did not persist. Wei (1993) reports that regional inequality increased during the 1970s, and others agree that substantial inter-provincial inequalities remained in the 1970s and 1980s (Cole 1987; Paine 1981; Wu and Ip 1980).

Given post-Mao policies and the development theories on which these are based, one would expect a rise in inequality (Ahmad and Wang 1991). The generally accepted models predict a rise in regional inequality during the early stages of economic development (the inverted-U model); a coastal bias in development and investment priorities (the three-belts model); and a core (east)-periphery (west) approach in regional planning (the ladder-step model).

But theory is not so readily transferred to the real world. In the case of the inverted-U model, direct application for explaining China's regional development is problematic. The inverted-U model, with its accent on polarization and diffusion effects, assumes perfect or high levels of factor mobility. Yet factor mobility in China is very low by Western standards. Owing to a legacy of a Maoist ideology of self-reliance, reinforced by post-Mao local protectionism, the flows of resources and raw materials are largely confined to segregated regional markets. Although Chinese policy makers use neoclassical theories for justifying post-Mao policies of uneven development, the theoretic

cal assumptions required simply are not compatible with China's political-economic system. The state and its preferential policies—and not comparative advantage—are the dominant driving forces of factor mobility and hence of selective economic growth in some provinces and cities and not in others.

Empirical studies of regional inequality in the post-Mao period have reported mixed results. Based on analyses of provincial output and income data during the early 1980s, Lakshmanan and Hua (1987) and Tsui (1991) report an increase in regional inequality. In diametrical opposition, Lo (1990) notes a decline in rural income inequality per capita between 1980 and 1983; likewise Lyons (1991) and Wei (1993) report a reduction in inter-provincial output inequality, and Huo (1994) a decline in regional income inequality, during the 1980s. These contradictory findings have led to two opposing evaluations of the impact of the economic reforms: one suggests that state policy has widened the gap in regional development, whereas another suggests that the central government has been an equalizing force of regional development.

These studies' contradictory findings are puzzling because all use similar indicators of output and income and similar measures of inequality (e.g., percentage change and coefficient of variation). One explanation for these differences is that they may reflect the analysis of different though overlapping time periods. Whereas Lakshmanan and Hua, Lo, and Huo examine the 1980s, Tsui, Lyons, and Wei focus on annual time series between 1952 and the 1980s. If regional inequality fluctuated over time, then the selection of different periods may yield different results. In addition, the differences may reflect real divergences in the trends of the different variables. Lyons (1991) hints at this point in noting the different trends in inter-provincial output inequality and inter-provincial consumption inequality.

Perhaps a more important, if seldom-addressed, reason for these conflicting views of inequality trends is the scale of analysis. As geographers are keenly aware, simply shifting the scale of analysis often yields quite different results. Wei (1993) notes the effect of scale when he points out that the inequality between the three-economic-belts has increased, while the inequality between provinces has declined because of the slow growth of the three centrally administered municipalities of Shanghai,

Beijing, and Tianjin. The scale effect is obscured, however, when Tsui (1991) aggregates the three centrally administered municipalities with their respective adjoining provinces. Tang (1991) also recognizes the effect of scale when he hints that an overall inequality is less revealing than analysis of the specific provinces with significantly higher or lower growth than other provinces.

Scale presents larger issues, however, and these have to do with the fact that many empirical studies of China's regional development focus almost exclusively on inter-provincial uneven development. Scholars have given little attention to finer scales of analysis, notwithstanding the state's targeting of investment toward designated growth poles, e.g., the SEZs and OCCs. In the following empirical analysis, I will employ a multi-scale approach to inter-provincial and intra-provincial inequalities. My purpose is to delineate the most salient changes in China's regional development during the 1980s and to explore the relationships between these changes and state policy. Only a thorough investigation of whether regional inequality has increased or decreased (since the economic reforms), and how, may resolve the debate over the impact of state policy on regional development. The analysis consists of three parts: Part A examines changes in inter-provincial inequality and the contribution of individual provinces to these changes; Part B investigates uneven development at the county level in five provinces; and Part C focuses exclusively on the province of Guangdong.

The analysis uses both provincial- and county-level data. The provincial analysis is based on State Statistical Bureau data (hereafter SSB) (1985–1991; 1987; 1988–1991; 1990). I omit Tibet because the data for that province are poor in quality and availability; and unless otherwise noted, I aggregate Hainan (since 1988 a separate provincial unit) and Guangdong in order to make valid comparisons between pre-1988 and post-1988 data. The provincial analysis includes therefore 28 provinces. The county-level analysis, meanwhile, includes 397 counties (after aggregation; see Part B) in five provinces: Guangdong (excluding Hainan), Fujian, Zhejiang, Anhui, and Hunan. In this paper the term "county" refers to both county (*xian*) and city proper (*shiqu*);⁴ together these units provide complete and non-overlapping spatial coverage of a province.

A few words are in order on Chinese county-level data. These were not published for most provinces until the late 1980s, and they are still very difficult to obtain. The only comprehensive source for the early 1980s is *The Population Atlas of China* published by China State Council and the Chinese Academy of Sciences (1987). This volume reports selected demographic and economic information from the 1982 census for all of China's counties. I also compiled 1990 county-level data from provincial statistical yearbooks (Anhui, Fujian, Hunan, and Zhejiang Statistical Bureaus 1991; Guangdong Statistical Bureau 1985–1991) and from provincial reports for the 1990 census (Anhui, Hunan, and Zhejiang Census Offices 1991). Part B discusses the rationale for selecting these five provinces.

These data require several adjustments prior to statistical analysis. First, provincial and county economic values are adjusted for inflation, wherever possible, by converting them to 1990 constant prices using provincial price indices. This assumes that a province's level of inflation is applicable to all counties within it. A second series of adjustments involve county boundary changes, and these are discussed more fully in Part B.

Part A: Inter-Provincial Uneven Development

Figure 2 summarizes changes in inter-provincial inequality of output between 1952 and

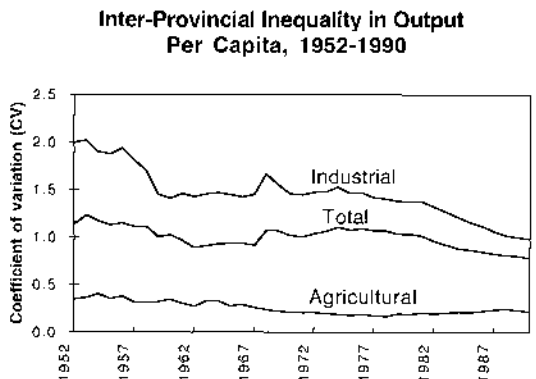


Figure 2. Inter-provincial inequality in output per capita, 1952–1990 (in current prices). Sources: SSB 1987; 1988–1991; and 1990.

1990 as measured by the coefficient of variation (CV) of output per capita. The trends of inequality measured by the CV compare favorably with trends measured by the dissimilarity index and the Shannon entropy index (results not reported here). Figure 2 reports the CV of three types of output: total output (*gross value of society output*, hereafter GVS0); agricultural output (*gross value of agricultural output*, hereafter GVAO); and industrial output (*gross value of industrial output*, hereafter GVIO). GVS0 is greater than the sum of GVAO and GVIO (*gross value of industrial and agricultural output*, hereafter GVIAO) because the former also includes in addition to agriculture and industry the transportation, construction, and commerce sectors. All output data are standardized by population so that PCGVS0 equals total output per capita; PCGVAO equals agricultural output per capita; and so on. The CV's reported in Figure 2 are based on data in current rather than constant prices because time-series of provincial price indices are not available. Since the CV measures the standardized variation about the mean and is not unit-dependent, it is reasonable to suggest: 1) that the spatial variation in inflation has had only modest, if any, effects on the size of the CV; and 2) that Figure 2 approximates the real temporal trends of inter-provincial inequalities.

Figure 2 indicates that the inequality of inter-provincial industrial output between 1952 and 1990 was greater than the inequalities in total output, agricultural output, and the annual changes therein. But because industrial output was an important contributor to total output inequality, both exhibited a wave-like pattern—decreasing in the 1950s and 1960s, increasing in the late 1960s and the 1970s, and decreasing again in the 1980s. The initial decline and the subsequent rise in total output inequality occurred during the Maoist regime, which suggests that forces of equity and efficiency were simultaneously at work. Maoist redistributive policies were apparently successful in reducing uneven regional development during the 1950s and 1960s; but that trend was short-lived as regional inequality escalated again during the late 1960s and the 1970s, perhaps because the Cultural Revolution weakened central control which enabled provinces with better factor endowments to grow faster than poorer provinces. As a result, and despite Maoist redistributive policies, total output inequality in China in the late 1970s was al-

most as large as it had been in the early 1950s.

Despite the pro-coastal regional policy installed in the 1980s, total and industrial inequalities declined. This paradoxical finding has its roots in the variable growth of individual provinces. When measures of total output per capita are indexed biennially to the national average (of 28 provinces) for the period between 1980 and 1990 (Table 1), we find that only six of 28 provinces in 1980 had above average values (indicating a very skewed regional distribution of output). A decade later, the degree of regional inequality remained large as just seven provinces exceeded the national average. Large gaps persisted between rich provinces and poor provinces and between the eastern region and the central and western regions.

Provincial trends in output per capita (relative to the national average) were upwardly converging or stable in 19 of 28 provinces and were downwardly converging in the three municipalities and the northeast provinces of Heilongjiang and Liaoning (Table 1 and Figure 3a). Together the trends in these 24 provinces explained the overall decline in inter-provincial inequality depicted in Figure 2. Of the remaining provinces, only Qinghai was downwardly diverging while Jiangsu, Zhejiang, and Guangdong were upwardly diverging provinces. Note that in 1980 Jiangsu was near the national average, and Zhejiang and Guangdong were below the national average; by 1990, however, all three exceeded the national average and all were growing (Table 1). In addition, Fujian and Shandong, though below the national average in 1990, were rapidly converging to the average. All of these rapidly growing provinces were in the eastern region, but their growth was offset by slow growth in the northeast and in the three municipalities which constituted China's traditional economic core. Their slow pace in conjunction with the relative stability of the central and western regions resulted in an overall decline in inter-provincial inequality. The trends in industrial output per capita are very similar, and there is no need to reiterate them.

To be sure, the decline in inter-provincial inequality masked sharp differences in the growth patterns of individual provinces. The rapid growth of Shandong, Jiangsu, Zhejiang, Fujian, and Guangdong, in particular, confirmed the success of export-oriented industri-

Table 1. Total Output Per Capita, 1980–1990 (National Average = 100).

	1980	1982	1984	1986	1988	1990	Trend ^a
Eastern (Mean)	162	161	159	156	158	157	
Beijing	300	284	291	256	258	256	↓ C
Tianjin	275	276	264	250	254	258	↓ C
Hebei	65	63	64	66	70	72	↑ C
Liaoning	155	149	146	152	152	144	↓ C
Shanghai	559	528	489	448	411	400	↓ C
Jiangsu	104	108	119	136	148	143	↑ D
Zhejiang	83	93	102	118	126	123	↑ D
Fujian	56	62	64	68	74	77	↑ C
Shandong	58	69	76	80	89	97	↑ C
Guangdong	84	89	93	99	109	118	↑ D
Guangxi	46	49	42	42	42	43	-
Central (Mean)	66	68	69	71	69	69	
Shanxi	68	73	78	74	70	73	-
Inner Mongolia	53	58	58	59	61	63	↑ C
Jilin	89	87	95	93	96	90	↑ C
Heilongjiang	109	108	103	106	94	99	↓ C
Anhui	46	50	54	60	57	54	↑ C
Jiangxi	56	53	51	54	54	54	-
Henan	46	46	47	53	54	55	↑ C
Hubei	68	73	79	83	81	77	↑ C
Hunan	60	62	59	61	56	55	-
Western (Mean)	53	53	53	55	55	56	
Sichuan	46	48	49	52	53	53	↑ C
Guizhou	30	33	36	35	35	34	-
Yunnan	39	42	43	41	41	45	↑ C
Shaanxi	55	55	55	57	57	58	-
Gansu	58	53	53	57	56	57	-
Qinghai	75	69	67	68	67	63	↓ D
Ningxia	61	58	60	64	62	63	-
Xinjiang	59	63	65	66	72	77	↑ C
National Average (yuan, in 1990 constant prices)	2,277	2,467	2,984	3,446	3,902	3,978	

^aTrend of output indices from 1980 to 1990:

- ↑ increased by more than 5
- ↑↑ increased by more than 10
- ↓ declined by more than 5
- ↓↓ declined by more than 10
- stable trend with little change
- C converging to the national average
- D diverging from the national average

Sources: SSB 1985–1991; 1987.

alization policy in the eastern region. And the contrasting trends of Shanghai and its adjacent provinces, Jiangsu and Zhejiang, suggest the diffusion of economic growth from older industrial locations to newer and neighboring provinces (see also Part B). Most of the other upwardly converging provinces were located in the Yangtze Valley or Yellow River (Huang He) Delta, which highlights the importance of their factor endowments and government policies






which stressed development in coastal locations and river valleys.

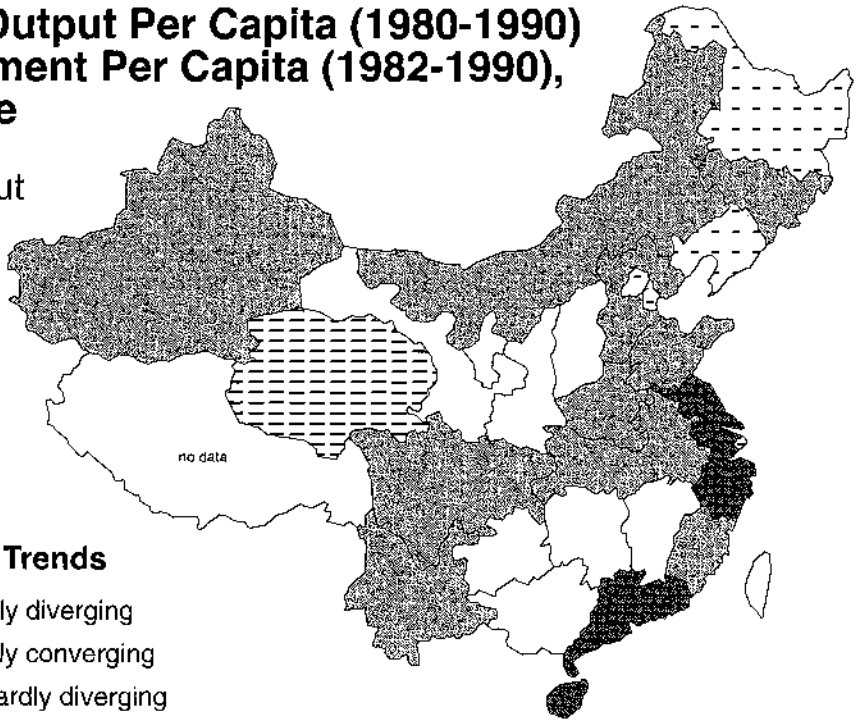
Output is, of course, a function of investment and its channeling via regional policy. Investment equals the total investment in fixed assets which in China involves three kinds of ownership—state-owned, collective-owned, and individual. Indexing provincial data (as in Table 1) reveals the trends and spatial patterns of investment per capita between 1982 and

Trends in Output Per Capita (1980-1990) and Investment Per Capita (1982-1990), by Province

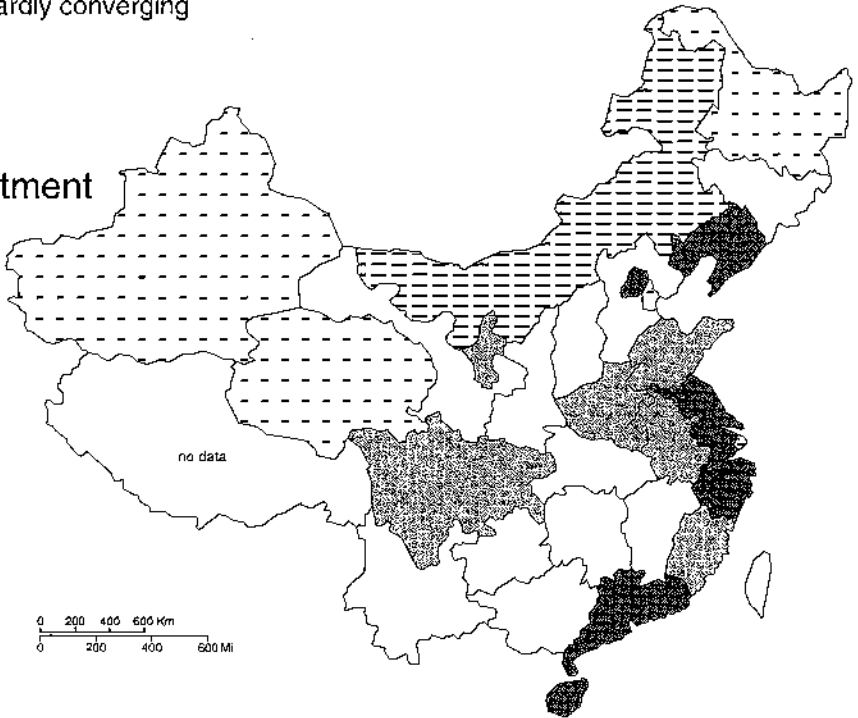
a. Output

Per Capita Trends

-  upwardly diverging
-  upwardly converging
-  downwardly diverging
-  downwardly converging
-  stable



b. Investment



0 200 400 600 Km
0 200 400 600 Mi

Figure 3. Trends in output per capita (1980–1990) and investment per capita (1982–1990), by province. Sources: Table 1 and Table 2.

1990 (Table 2 and Figure 3b). As with total output, investment in most provinces exhibited a converging or stable trend. The downward trends in Inner Mongolia, Qinghai, and Xinjiang reflect the decentralization of fiscal policy and the decline in central government subsidies.⁵ The upwardly diverging trends occurred in five provinces in the eastern region, namely Beijing, Liaoning, Jiangsu, Zhejiang, and Guangdong. Comparison of Figure 3a and

Figure 3b suggests strong investment-output relationships in the east, southeast, and the Yangzi Valley. The two obvious exceptions are Beijing and Liaoning, where large investments are not matched by commensurate increases in output.

The extent of foreign investment affords an even clearer view of the effects of the three-belts model and the open-door policy. These policies resulted in a skewed spatial distribu-

Table 2. Total Investment Per Capita, 1982–1990 (National Average = 100).

	1982	1984	1986	1988	1990	Trend ^a
Eastern (Mean)	147	147	147	155	155	
Beijing	334	360	325	329	378	↑ D
Tianjin	315	265	241	204	208	↓ C
Hebei	58	65	67	80	61	-
Liaoning	129	116	139	140	136	↑ D
Shanghai	470	368	341	420	363	↓ C
Jiangsu	49	93	112	116	111	↑ D
Zhejiang	47	75	94	109	125	↑ D
Fujian	50	59	65	62	74	↑ C
Shandong	44	74	81	91	82	↑ C
Guangdong	84	106	113	124	133	↑ D
Guangxi	32	33	41	38	33	-
Central (Mean)	63	71	68	61	61	
Shanxi	79	110	104	77	87	-
Inner Mongolia	70	83	63	55	62	↓ D
Jilin	83	80	79	79	79	-
Heilongjiang	135	113	105	91	96	↓ C
Anhui	33	52	57	50	45	↑ C
Jiangxi	37	45	43	43	39	-
Henan	34	46	57	50	50	↑ C
Hubei	57	64	59	60	54	-
Hunan	38	48	50	46	40	-
Western (Mean)	78	68	71	67	68	
Sichuan	35	39	44	43	42	↑ C
Guizhou	30	33	29	31	29	-
Yunnan	49	42	49	42	46	-
Shaanxi	61	56	59	56	63	-
Gansu	52	50	51	51	52	-
Qinghai	180	140	123	128	102	↓ C
Ningxia	81	84	107	83	91	↑ C
Xinjiang	134	103	103	102	120	↓ C
National Average (yuan, in 1990 constant prices)	228	418	542	608	488	

^aTrend of investment indices from 1982 to 1990:

↑ increased by more than 5

↑↑ increased by more than 10

↓ declined by more than 5

↓↓ declined by more than 10

- stable trend with little change

C converging to the national average

D diverging from the national average

Sources: SSB 1985–1991, 1987.

tion of foreign investment in 1986, 1988, and 1990—years for which we have adequate data on foreign investment (Table 3). Provincial statistics of foreign investment per capita, indexed to the national average, indicate that the eastern region was clearly the leader with a mean value consistently tenfold or more higher than its counterparts in the central and western regions. There were, however, large variations and changes within the eastern region. Spotting trends in these data is more difficult because of the relatively short period of time and because of the fluctuations in foreign investment from year to year, but what is clear

is that foreign investment per capita in some eastern provinces—Beijing, Tianjin, Liaoning, Shanghai, Fujian, and Guangdong—was many times higher than that in other eastern provinces.

These analyses invite several conclusions about the patterns of regional development in the 1980s. First, overall inter-provincial inequalities in output have declined owing to upwardly converging growth in most provinces and slow growth in the traditional economic core (comprised of the three municipalities and the northeast) which offset upwardly diverging growth in the eastern and southeastern provinces of Jiangsu, Zhejiang, and Guangdong and potentially diverging growth of Shandong and Fujian. Second, investment and output were closely linked especially in the east and southeast. However, investment efficiency seems to have declined in the three municipalities and Liaoning where high levels of investment, domestic and foreign, were not matched by commensurate growth in output. In the east and southeast, the rapid growth of Guangdong and Fujian reflected accelerated state and foreign investments, while growth in Shandong, Jiangsu, and Zhejiang remained more dependent on state investment.

These findings have several implications for any assessment of the impact of post-Mao regional policy on regional development. First is the misleading nature of overall inter-provincial inequality and the three-belts categorization as indicators of differential impacts of policy. The coarseness of these results tends to mask large differences among provinces. Second, preferential policies have generated a new growth corridor in the eastern region. This corridor extends from Shandong in the north to Guangdong in the south; it excludes Liaoning, Hebei, Guangxi, and the three municipalities. This growth corridor received large and growing investments and investment efficiency tended to be high, a reflection of the impact of preferential policies designed to maximize revenues and returns. Third, the SEZ policy and the decentralization of foreign-trade administration further enhanced the role of foreign investment and boosted output growth in Guangdong and Fujian. Fourth, growth in Jiangsu and Zhejiang suggests diffusion from Shanghai as well as an increased policy emphasis on the Yangzi Valley (see also Part B).

Table 3. Foreign Investment Per Capita, 1986–1990 (National Average = 100).

	1986	1988	1990
Eastern (Mean)	219	224	223
Beijing	454	786	618
Tianjin	408	372	185
Hebei	9	6	26
Liaoning	46	102	303
Shanghai	613	467	409
Jiangsu	19	32	61
Zhejiang	19	41	49
Fujian	163	133	232
Shandong	25	18	45
Guangdong	620	492	505
Guangxi	36	22	24
Central (Mean)	20	11	17
Shanxi	4	4	4
Inner Mongolia	12	7	8
Jilin	73	8	21
Heilongjiang	27	27	22
Anhui	27	17	12
Jiangxi	9	12	16
Henan	4	11	7
Hubei	9	12	29
Hunan	14	3	38
Western (Mean)	16	16	12
Sichuan	8	24	10
Guizhou	10	6	6
Yunnan	4	3	5
Shaanxi	55	60	37
Gansu	2	11	1
Qinghai	—	—	—
Ningxia	0	9	1
Xinjiang	30	15	27
National Average (yuan, in 1990 constant prices)	21	34	29

Source: SSB 1985–1991.

Part B: Intra-Provincial Uneven Development

Studies of regional development in China, with their focus on provincial-level analysis, obscure the effects of the new regional policy which targets selective localities within provinces (e.g., the SEZs and OCCs) for rapid economic growth. Discerning these effects requires a shift in the scale of analysis. Accordingly, this portion of the analysis investigates changes in intra-provincial uneven development by focusing on five provinces in south-eastern and south central China: Guangdong, Fujian, Zhejiang, Anhui, and Hunan (Figure 1). These provinces are not representative of China, and deliberately so. Guangdong and Fujian were selected for the many benefits they have enjoyed: the two provinces contain four of China's five SEZs, exercise the greatest autonomy in financial and foreign-trade administration, retain a high proportion of foreign exchange, and generate large state and foreign investments. Historically Guangdong has been more developed while Fujian has been relatively poor, often depending on state subsidies. Zhejiang was selected because the province enjoyed very high growth rates during the 1980s and because it may shed some light on the development of Yangzi Delta and the diffusion of growth from Shanghai. Lastly, Anhui and Hunan in the central region were selected as control observations. As poorer provinces peripheral to the main emphases of post-Mao regional policy, they may be compared with the neighboring provinces of Zhejiang and Guangdong which have experienced rapid changes.

The intra-provincial or county-level analysis uses GVAO, GVIO, and GVIAO as indicators of output. Although GVIAO includes only two (agriculture and industry) of five economic sectors, this measure accounts for the bulk of total output and is the most widely published and readily available county-level economic indicator.⁶ In the analysis all output indicators are standardized by population (PCGVAO, PCGVIO, and PCGVIAO).

These county-level data are adjusted for inflation (as reported in Part A) and boundary changes. To ensure the comparability of economic and demographic statistics, counties with name or boundary changes between 1982 and 1990 are, wherever appropriate, aggregated into new spatial units with uniform boundaries in both years.⁷ One potential drawback of aggregation is underestimation of the actual inequality in these counties. But the effect of underestimation will be modest because aggregation involves only a small proportion of counties (Table 4) and because the degree of underestimation for 1982 and 1990 will be similar since the same territories are subject to aggregation. With these data properly formulated for valid temporal comparisons, we are prepared to use them as a direct measure of the impact of post-Mao policy.

Figure 4 compares inter-county inequality in PCGVIAO between the five provinces and between 1982 and 1990. In 1982 inter-county inequality was higher in Anhui and Guangdong than the other three provinces. But over the next eight years, Guangdong's CV surged by more than 50 percent, Fujian's remained about the same, and Zhejiang's, Anhui's, and Hunan's declined. These deviations suggest that spatial

Table 4. County Boundary Aggregations.

Province	Number of counties						Total Number after Aggregation
	Total Number before Aggregation		1982		1990		
	1982	1990	Aggregated Counties	Result	Aggregated Counties	Result	
Guangdong	93	95	6	3	8	3	90
Fujian	67	69	0	0	4	2	67
Zhejiang	72	76	9	4	14	5	67
Anhui	82	81	4	1	3	1	79
Hunan	105	104	21	10	18	8	94

Inter-County Inequality in PCGVIAO,
1982 and 1990

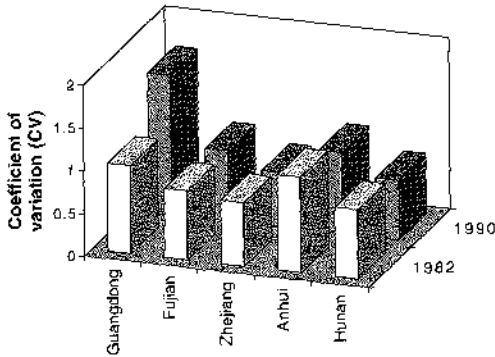


Figure 4. Inter-county inequality in PCGVIAO, 1982–1990. PCGVIAO is gross value of industrial and agricultural output per capita.

Inter-County Inequality in PCGVAO
and PCGVIO, 1990

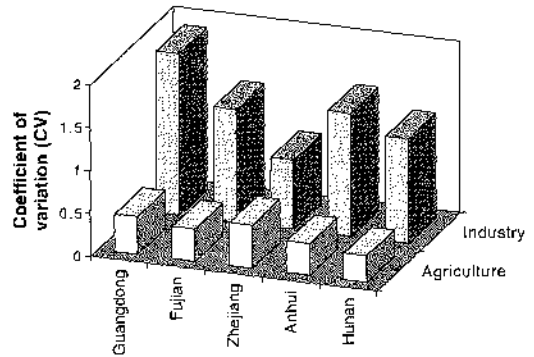


Figure 5. Inter-county inequality in PCGVAO and PCGVIO, 1990. PCGVAO is gross value of agricultural output per capita, PCGVIO is gross value of industrial output per capita.

restructuring at the county level produced a rise in inequality in Guangdong, but a decline or little change in the other four provinces. As Figure 5 shows, spatial inequality was relatively low in 1990 PCGVAO and relatively high and varied in 1990 PCGVIO. Guangdong's large differential in agricultural and industrial inequalities suggests that industry was the main source of the province's increasing spatial inequality.

Trends in county growth may be identified via least-squares regression of 1990 PCGVIAO on 1982 PCGVIAO. Because of the large differences in the level and growth of output per capita between these five provinces, the graphical representations in Figures 6 to 10 employ non-uniform scales for the two axes and between provinces. The slopes of the regression line are: Guangdong, 4.33; Fujian, 2.07; Zhejiang, 1.37; Anhui, 1.46; and Hunan, 1.18. These slopes suggest that the average county growth in output per capita was greatest in Guangdong and smallest in Hunan. But more interesting to us is the spatial variation of growth within provinces. Therefore, special attention is given to the values of r^2 (which reflect the extent to which 1982 data account for the variation in 1990) and to large residuals indicative of locations of significantly higher or lower growth.

In Guangdong, the 1982 county-level

PCGVIAO accounted for just 52 percent (r^2) of the variation in 1990 (Figure 6). The relatively poor fit results from several large residuals. The largest positive residuals occur in Shenzhen and Zhuhai, two of Guangdong's three SEZs, and Shenzhen's northern neighbor, Baoan. The proximity of these three high-growth outliers depicts the emergence of a new SEZ-centered core of development—a core that attests to the favorable impacts of preferential policies allocating large state investment and attracting foreign investment (see also Part C). Counties with large negative residuals experienced slower-than-predicted growth based on their 1982 performance. These include Maoming, a small city in the west; Qujiang, a rural county in the north; and Jiangmen and Guangzhou, two older urban centers. These results suggest, in sum, that Guangdong's spatial restructuring involves the polarization of growth in SEZs and that polarization is the main source for increasing spatial inequality. As yet, no evidence suggests the diffusion of economic growth from this growth pole to the hinterland. But the story of spatial restructuring in Guangdong is more complex still, as Part C will show.

The regression model for Fujian yields a better fit and a higher r^2 (0.89). Figure 7 highlights two small outliers: a positive one in Xiamen (Fujian's only SEZ) and a negative one in San-

Predicting 1990 PCGVIAO: Guangdong

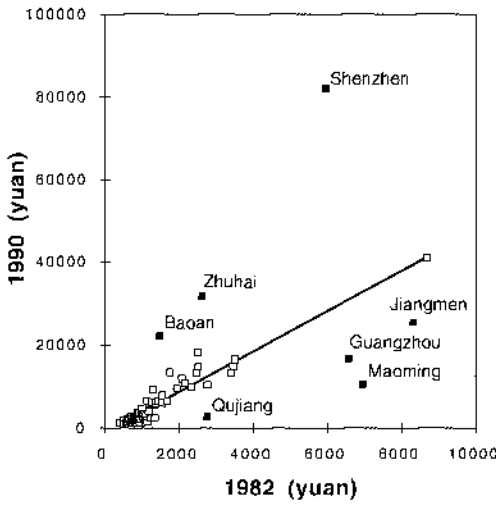


Figure 6. Predicting 1990 PCGVIAO: Guangdong. PCGVIAO is gross value of industrial and agricultural output per capita; $r^2 = 0.52$; slope = 4.33; data are in 1990 constant prices.

Predicting 1990 PCGVIAO: Fujian

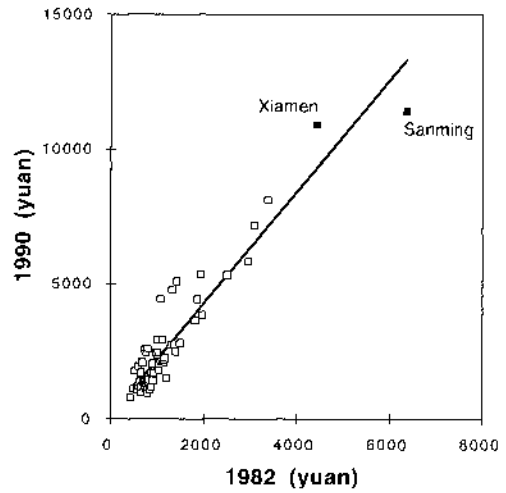


Figure 7. Predicting 1990 PCGVIAO: Fujian. PCGVIAO is gross value of industrial and agricultural output per capita; $r^2 = 0.89$; slope = 2.07; data are in 1990 constant prices.

ming, an inland city in the west of Fujian. This regression model of growth suggests the absence of significant spatial restructuring in Fujian, save for the more speedy economic growth in SEZ-assisted coastal areas.

Zhejiang's regression reports a relatively low r^2 of 54 percent (Figure 8). This is attributable in part to a cluster of outliers at the lower end of the regression line. These include a negative outlier in Kaihua in the western rural part of Zhejiang and six positive outliers in the Yangzi Delta area along the coast of Hangzhou Wan (Gulf) and between the large cities of Ningbo, Hangzhou, and Shanghai. This clustering of low-level growth may be attributable to two factors. First, Chinese planners in the late 1980s identified the Yangzi Delta as a key economic development region and they gradually shifted their emphasis from south China to east China—a state response aimed, in part, at counterbalancing Guangdong's dramatic growth (Chen et al. 1993). The economic and political intents of this policy were quite clear: to achieve more balanced growth among eastern provinces as a strategy to undermine po-

Predicting 1990 PCGVIAO: Zhejiang

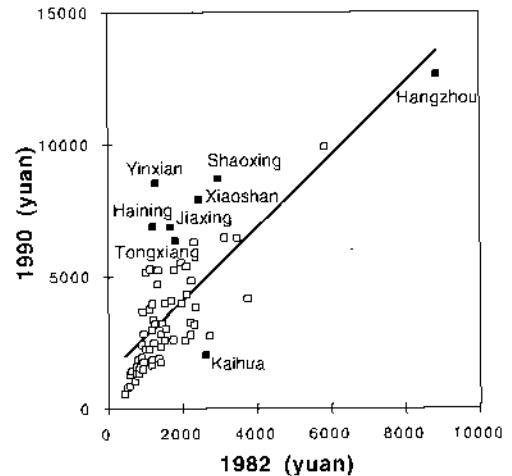


Figure 8. Predicting 1990 PCGVIAO: Zhejiang. PCGVIAO is gross value of industrial and agricultural output per capita; $r^2 = 0.54$; slope = 1.37; data are in 1990 constant prices.

Predicting 1990 PCGVIAO: Anhui

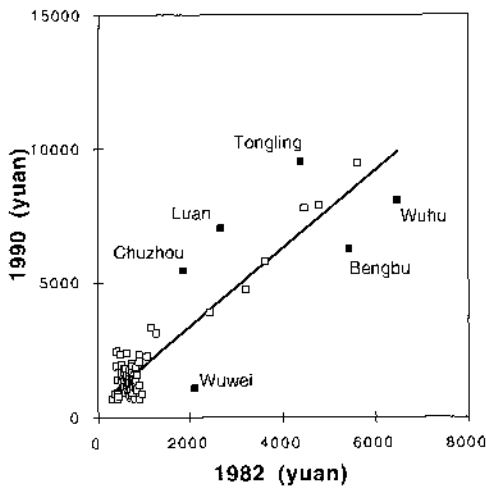


Figure 9. Predicting 1990 PCGVIAO: Anhui. PCGVIAO is gross value of industrial and agricultural output per capita; $r^2 = 0.84$; slope = 1.46; data are in 1990 constant prices.

Predicting 1990 PCGVIAO: Hunan

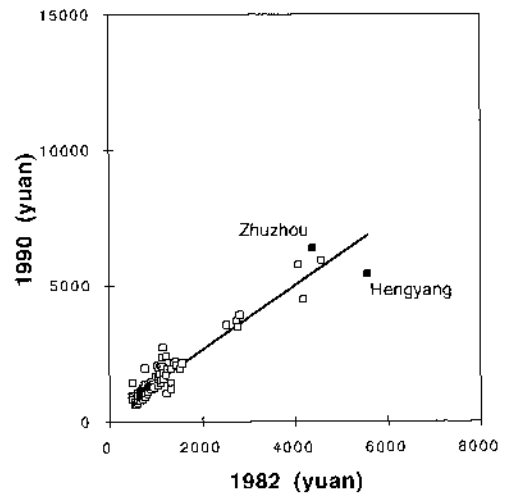


Figure 10. Predicting PCGVIAO: Hunan. PCGVIAO is gross value of industrial and agricultural output per capita; $r^2 = 0.91$; slope = 1.18; data are in 1990 constant prices.

tential militant and regional expansionist forces in the south. Second, the clustering of rapid growth in six smaller Yangzi Delta counties in conjunction with the slow growth of Hangzhou (negative residual) and Shanghai (reported in Part A) suggest the workings of spread effects, i.e., some diffusion of economic growth from large coastal urban centers to smaller coastal counties. In sum, the overall effect of these processes was a decline in inequality in Zhejiang (Figure 5).

Turning to Anhui, Zhejiang's neighbor in the central region, the regression model yields an r^2 of 84 percent (Figure 9). Large positive residuals occur in Luan, a city in the west, and Tongling and Chuzhou along the Yangzi upstream of large urban centers such as Nanjing and Wuhu. Large negative residuals include Wuhu, an older urban center along the Yangzi; Bengbu, an urban center on the Huai River; and Wuwei, a primarily rural county. On the whole, spatial restructuring in Anhui was modest, though it should be stated that rapid growth tended to cluster in less developed locations along the Yangzi Valley.

The regression for Hunan, another central region province, and Guangdong's northern neighbor, exhibits an r^2 of 91 percent (Figure 10). Deviations from the model are few, most notably in Hunan's major urban centers of Hengyang and Zhuzhou. As compared with Guangdong and Zhejiang, Hunan's spatial pattern of development remained intact with little evidence of spatial restructuring.

These county-level analyses of growth offer some insights on the process of uneven development within provinces. First is the varied paths of spatial development taken in geographically adjacent provinces. This variety underscores the crudity of provincial-level and "belt-level" analyses. Our county analyses indicate that the degree of spatial restructuring in the eastern region was greater in Guangdong and Zhejiang and smaller in Fujian. Between Guangdong and Zhejiang, spatial restructuring also differed substantially. In Guangdong, economic growth polarized with the emergence of a new core of economic growth centering on SEZs; while in Zhejiang, growth seems to have diffused from older, more developed lo-

cations to newer and less developed sites. Second, the location of new growth reflects two spatial-selectivity processes: 1) the state's designation of growth poles (this is most noticeable in the positive outliers in Guangdong and Fujian); and 2) the clustering of new growth in coastal sites and Yangzi Valley locations. Although rapid growth occurred in relatively new locations, these tended to be close by already developed urban centers and seemed to indicate an expansion of growth in already developed sites rather than diffusion of growth into the hinterland.

Part C: Guangdong

Amongst the provinces in China, Guangdong represents something of a special case. First, the province has benefited from preferential policies, e.g., the most relaxed financial policy and the first locations set aside for foreign trade (see Figure 11 which illustrates the various open zones in Guangdong). Second, the economy of Guangdong has grown very rapidly since the reforms. Between 1980 and 1990, when the average province grew at an annual rate (output per capita) of 6.7 percent, Guangdong (excluding Hainan) grew at a rate of 9.5 percent. Within that decade, the province's output per capita shifted from below average to an upwardly diverging trajectory (Table 1 and Figure 3a); and in 1990, it ranked seventh among all provinces. Third, Guangdong's location in south China has uniquely important political-economic and social-cultural implications. The province's proximity to Hong Kong and the incentive of low production costs have underlain the transformation of the Zhujiang Delta into an "out-processing" hinterland (Sit 1989). Equally important are the strong *tong-xiang* bonds ("having the same native place"; see Skinner 1976; 1977) between the earlier immigrants to Hong Kong, who were primarily from Guangdong, and their home towns (Leung 1993). The presence of trust, perceptions of less risk, and similar social and cultural backgrounds which facilitate business transactions help to explain the flows of labor-intensive industries and foreign investment from Hong Kong into Guangdong. Moreover, the impending restoration of Hong Kong to China (1997) has prompted Chinese planners to prepare Guangdong for absorbing and diffusing Hong Kong's dynamic economic en-

dowments and growth. Fourth, the economic structure in Guangdong has undergone an extraordinary transformation. Between 1980 and 1990, labor shares in provincial agriculture and industry shifted from 71 percent to 53 percent and from 17 percent to 25 percent, respectively.⁸ Despite industry's smaller labor shares, this sector accounted for the largest share of Guangdong's total output and the share is growing—industry accounted for 50 percent and 62 percent of Guangdong's total output in 1980 and 1990, respectively. Like many developing countries, therefore, industry assumes the role of a leading sector which, though small to begin with, absorbs labor from agriculture and plays an increasingly important role in the generation of economic growth (Lewis 1974).

In Part B, I reported an increase in inter-county inequality in Guangdong as the CV for PCGVIAO rose from 1.03 in 1982 to 1.63 in 1990. At the scale of the prefecture,⁹ the increase in CV was even more striking—from 0.60 in 1982 to 1.40 in 1990. The following analysis explores not only the level of inequality but also the specific locations whose growth accounts for the increase in inequality and for the forces underlying spatial restructuring in Guangdong. Figure 12 maps the spatial variations of county-level PCGVIAO and documents the remarkable growth of the Zhujiang Delta between 1982 and 1990. This map in conjunction with the regression model in Part B (and Figure 6) clearly depicts a three-tier pattern of uneven development: an inner core centering on Shenzhen and Zhuhai SEZs at the southern tip of Zhujiang Delta; an outer core in Zhujiang Delta; and a periphery of counties located in the eastern, northern, and western portions of the province.

The acceleration of uneven development and the evolving three-tier pattern have their origins in preferential policies and their spatial differentials in state and foreign investments. To ascertain the effects of investment on uneven development, I conducted two separate regression analyses (of 1990 data) in which PCGVIAO is the dependent variable and various investment measures are the independent variables (Table 5). The first regression uses county-level data and employs three independent variables: PCCCINV is the per capita investment in capital construction; PCTUINV is the per capita investment in technical updating and transformation;¹⁰ and NAGPOP is the non-agricultural population as a proportion of total

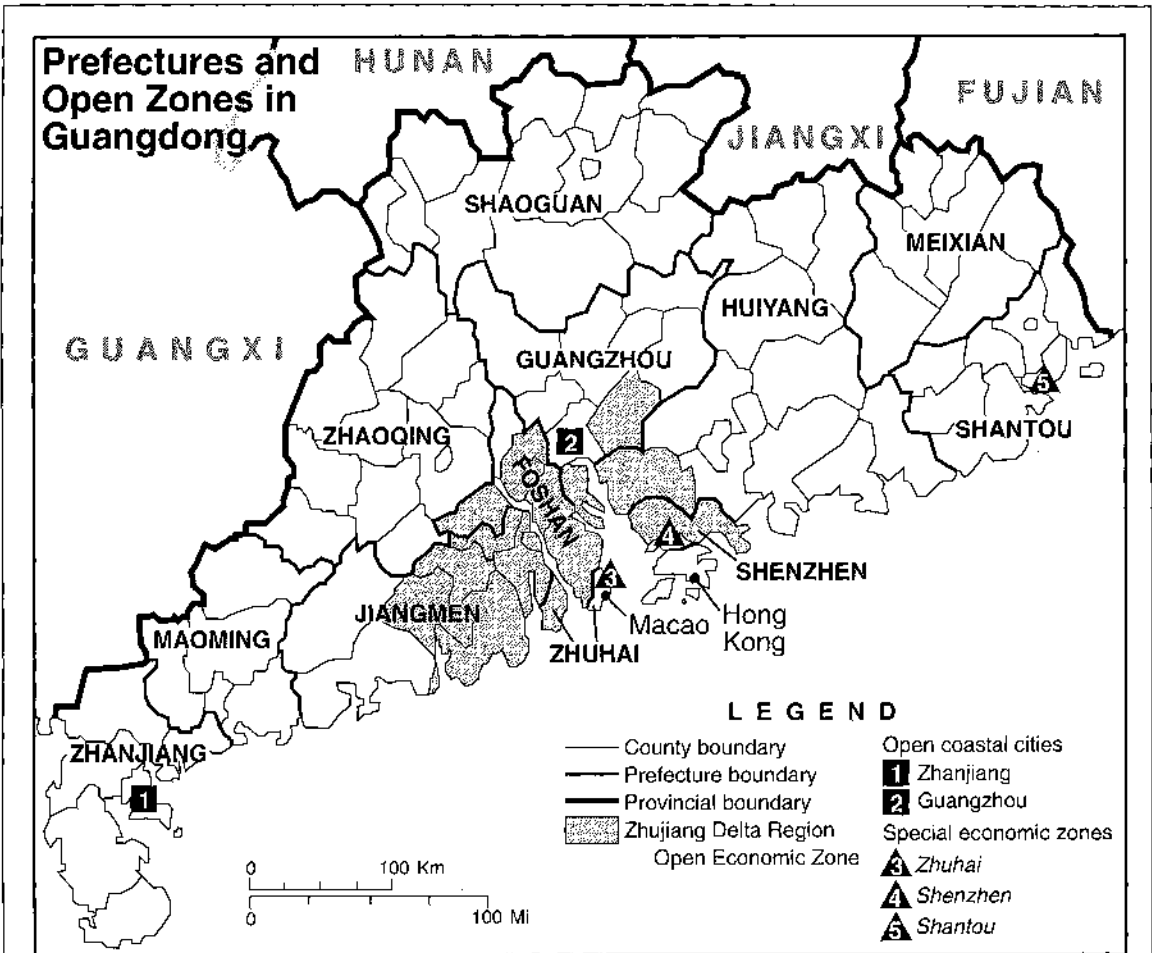


Figure 11. Prefectures and open zones in Guangdong. Prefecture boundaries are as of 1984; Zhujiang Delta Region Open Economic Zone is as of 1985. Source: Guangdong Statistical Bureau 1985–1991.

population. The last of these is included in order to control for the effect of urban-rural differences¹¹ because these differences are one of the most permanent elements of uneven development in China. These three independent variables together account for 76 percent of the variation in PCGVIAO, and all regression coefficients are positive and significant. The regression coefficients associated with PCCINV and PCTUINV are 3.96 and 15.66, respectively. In other words, when NAGPOP is held constant, one yuan of capital construction investment yields 3.96 yuan of GVIAO and one yuan of technical updating and transformation investment yields 15.66 yuan of GVIAO. These large slope differentials suggest two conclusions: first, Guangdong's

heavy involvement in light and labor-intensive industries crucially depends on technology-related investment for bringing about productivity increase, and second, this form of investment is more efficient than capital construction.

The second regression assesses the effects of foreign investment (PCFRINV) at the prefecture level (county-level foreign investment data are unavailable). As reported in the bottom half of Table 5, PCFRINV alone accounts for 96 percent of the variation in prefecture-level PCGVIAO.¹² Foreign investment is, moreover, an efficient form of investment given that one yuan of foreign investment yields 14.83 yuan of GVIAO. Although detailed statistics on foreign investments are unavailable, much of this

Spatial Variations of PCGVIAO in Guangdong

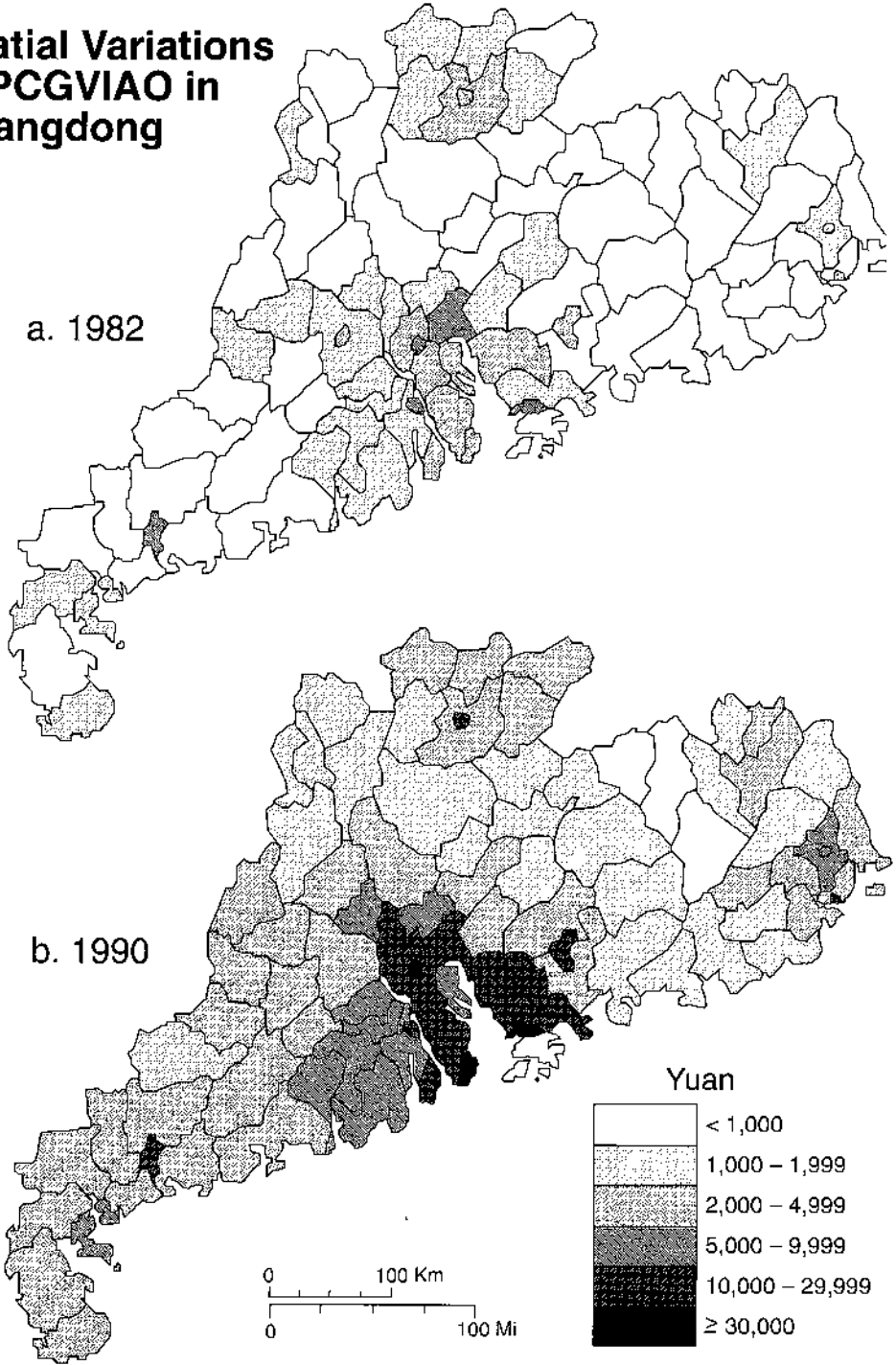


Figure 12. Spatial variations of PCGVIAO in Guangdong. PCGVIAO is gross value of industrial and agricultural output per capita. Sources: China State Council and the Chinese Academy of Sciences 1987; Guangdong Statistical Bureau 1985-1991.

Table 5. Predictors of Guangdong's PCGVIAO by County and Prefecture, 1990.

Dependent Variable	Independent Variable	Parameter Estimate	t-value
County-level PCGVIAO	constant	-736.81	-.79
	PCCCINV	3.96	9.31 ^a
	PCTUINV	15.66	2.83 ^a
	NAGPOP	181.90	4.10 ^a
R ² = .7636	d.o.f. (reg) = 3		
F = 92.5831	d.o.f. (res) = 86		
Prefecture-level PCGVIAO	constant	4277.65	4.11 ^a
	PCFRINV	14.83	15.57 ^a
r ² = .9604	d.o.f. (reg) = 1		
F = 242.3462	d.o.f. (res) = 10		

Notes: PCGVIAO is gross value of industrial and agricultural output per capita; NAGPOP is proportion of nonagricultural population; PCCCINV is capital construction investment per capita; PCTUINV is technical updating and transformation investment per capita; and PCFRINV is foreign investment per capita.

^asignificant at the 1 percent level.

Source: Guangdong Statistical Bureau 1985-1991.

investment probably has gone into technology-related development. In sum, foreign investment is perhaps the single most important determinant of uneven spatial development within Guangdong.

Table 6 offers an overview of prefecture outputs and foreign investments in Guangdong. When these prefectures are ranked by average annual growth rate (compounded) of PCGVIAO between 1982 and 1990 (column 3), the ranking again highlights the mini-core in Shenzhen and Zhuhai. That these prefectures in 1990 ranked highest in PCGVIAO, PCGVIAO growth, and PCFRINV is further evidence of the importance of foreign investment in Guangdong.

The case of Shenzhen SEZ vividly illustrates the close relationship between spatial restructuring and post-Mao regional policy. Prior to Shenzhen's becoming a SEZ in 1979, this northern neighbor of Hong Kong was an underdeveloped and rural portion of Baoan county. Following a decade of large state investments in infrastructure and preferential SEZ terms for foreign investors, Shenzhen has become Guangdong's wealthiest area and its most important channel for foreign investment. As of 1990, foreign investment in Shenzhen accounted for 24 percent of the total in Guangdong and nearly 60 percent of the total in Zhujiang Delta (Guangdong Statistical Bureau 1985-1991).

Shenzhen's quick success reflected both the

political-economic concerns on the part of the state and the calculated moves by foreign investors. The state's choice of Shenzhen as one of the first SEZs was not accidental. As early as the mid-1980s, the Chinese government had begun conceptualizing a special administrative zone comprising Hong Kong and part of the Zhujiang Delta which would ease Hong Kong's transition from a British colony into a socialist state. The forging of strong economic linkages prior to 1997 would help to dilute ideological differences on both sides of the border. Shenzhen was also meant to serve as a showcase for exhibiting the principle of "one country, two systems" for skeptics in Hong Kong and Taiwan (Phillips and Yeh 1989).

Foreign investors, many from or via Hong Kong, came to Shenzhen because of cheap labor, cheap land, and preferential terms such as tax exemptions and tax holidays. SEZ offered therefore a mechanism for cost savings. In order to take advantage of low production costs, foreign investors adopted a vertical disintegrated production structure in which labor-intensive processing is completed in Shenzhen and neighboring Zhujiang Delta localities where labor cost is low, while research, marketing, and producer services are carried out in the internationally well-connected Hong Kong. Subcontracting thus has become a common form of production in Hong Kong's out-processing hinterland in Zhujiang Delta. Here investors translated China's open-door oppor-

Table 6. Growth Trends of Guangdong Prefectures.

Prefecture	PCGVIAO		PCGVIAO growth ^a 1982– 1990 (percent) (3)	PCFRINV 1990 (4)	PCFRINV growth ^b 1985– 1990 (percent) (5)
	1982 (1)	1990 (2)			
Shenzhen	2,916	56,550	44.86	3,613	.29
Zhuhai	2,320	21,792	32.31	1,031	-4.80
Foshan	3,329	17,039	22.64	333	24.88
Jiangmen	1,558	6,614	19.81	75	23.33
Huiyang	898	3,624	19.05	156	33.97
Shantou	962	3,653	18.15	76	32.29
Zhaoqing	1,035	3,915	18.10	48	27.28
Zhanjiang	946	3,280	16.82	22	-7.83
Guangzhou	3,741	9,990	13.06	177	17.95
Meixian	750	1,929	12.53	21	37.91
Maoming	1,294	2,930	10.76	10	83.34
Shaoguan	1,318	2,944	10.57	30	13.34

Notes: PCGVIAO is gross value of industrial and agricultural output per capita; and PCFRINV is foreign investment per capita.

^aAverage annual growth rate (compounded) of gross value of industrial and agricultural output per capita.

^bAverage annual growth rate (compounded) of foreign investment.

Sources: China State Council and the Chinese Academy of Sciences 1987; Guangdong Statistical Bureau 1985–1991.

tunities into profits based on low-cost production and simultaneously effected spatial, international, and social divisions of labor across the border.

But the very high incidence of subcontracting across the Hong Kong-Shenzhen border is only possible because of strong social, cultural, and business ties that date back in some cases to the late 1940s and early 1950s when refugees fled from communist China to Hong Kong. Many of these expatriates have since sent (and continue to send) remittances back to their home towns in China, most of which are in nearby counties of Guangdong. The open-door and SEZ policies further encouraged direct investment in the expatriates' home towns. Leung's (1993) study confirms the important role of personal contacts and kinship ties in creating and maintaining linkages within and between firms whose operations are characterized by a spatial division of labor. Moreover, he argues that the role of personal relations, though often downplayed in the literature of production, is one of the critical underlying factors behind Guangdong's spatial restructuring.

Throughout the 1980s and early 1990s the state has continued to expand open zones in Guangdong. The foreign investment once confined to the SEZs and Zhujiang Delta has now begun to penetrate into Guangdong's more rural and peripheral counties. Table 6

(column 5) illustrates the high growth rates of foreign investment in many non-SEZ and non-Zhujiang Delta prefectures, including rural prefectures such as Maoming and Meixian. Although investment amounts in these areas are relatively small, the evidence of growth between 1982 and 1990 indicates that investors are continuously seeking out new production sites where: 1) wages are lower than in the built-up parts of Guangdong; and 2) subcontracting may be facilitated by existing social relations and ties.

Theory, Policy, and Uneven Regional Development

The paradox of post-Mao regional policy is that a policy designed to favor China's most developed eastern region has reduced inequality among all provinces in the nation. The empirical analysis in this paper has attempted to resolve this paradox by showing that the curious decline in inter-provincial inequality has come about because post-Mao regional policy favored provinces that were not among the most developed prior to the reforms. These provinces now constitute a corridor of high growth along China's eastern coast stretching from Shandong in the north to Guangdong in the south. This growth corridor

thus emerged out of state policy and, more specifically, from large state investments and the establishment of preferential terms for attracting large and more efficient foreign investments. Excluded from this corridor is an older (and slowly growing) core centered on the three municipalities and the northeast. It is this arrangement of rapid growth in less-developed coastal provinces and slow growth in more-developed provinces that explains the reduction in regional inequality despite strong spatial concentration of economic growth in post-Mao China. If this concentration of growth continues, so that provinces like Guangdong diverge further from the national average, inter-provincial inequality may increase in the future.

China's reduction of regional inequality is also paradoxical from the standpoint of Western theories of regional development. While these theories have been influential guides for China's new regional policy, Chinese experience since 1978 affords no evidence for the inverted-U trajectory of first increase and then decrease in regional inequality. In fact, very little of China's regional development experience over the last several decades can be explained by neoclassical theories, and for several good reasons. Neoclassical theories are, in the first instance, built upon an assumption of high factor mobility which does not apply in China. Second, neoclassical theories' concern with the flows of factors of production virtually excludes the role of the state which in socialist China (during both the Maoist and post-Mao periods) has been the chief determinant of regional allocations of investment. During the Maoist regime, the state achieved some degree of balanced development via centralized fiscal management and direct state investment in interior provinces. When confronted by the pressing need for economic development, post-Mao leaders refined these priorities and opted for efficiency over equity. This change in state priorities was the fundamental driving force behind the new pattern of uneven regional development. Utilizing the ladder-step theory, the three-economic-belts model, various open zones, and preferential policies, state planners were able to target and trigger economic growth in selected coastal provinces such as Zhejiang, Jiangsu, and Guangdong and in designated growth poles such as the SEZs and OCCs.

Post-Mao economic reforms thus involved a paradigmatic shift from ideology to pragmatism as Deng Xiaoping and his associates sought to consolidate power following Mao's death. Their emphases on efficiency, rapid economic growth, and quick returns must be understood therefore in the context of China's political economy, and their success will be gauged by the outcome of Deng's reforms. Indeed, the need for economic growth is all the more urgent since the 1989 Tiananmen student demonstrations and the ensuing crackdown which blemished Deng's long political career.

The state is further confronted by the antagonistic tendencies of regionalism which have led to provincial competition, local protectionism, and commodity wars. Successful responses to the challenges of regionalism are crucial for maintaining national integration and for achieving a balance of power between regions and between the central and the local. Toward that end, recent development projects in the Yangzi Valley and Shanghai may be viewed as state attempts to counterbalance Guangdong's dramatic growth.

The pattern of China's spatial development since 1978 looks quite different when analysis shifts from the provincial to the county scale. The findings at this scale suggest that inter-provincial analysis is not adequate for explaining uneven regional development in China. The story is more complex. Our case study of five provinces provides some evidence of the diffusion of growth from Shanghai to neighboring coastal areas. Guangdong, meanwhile, moved in the direction of growth polarization, especially at the new mini-core centering on Shenzhen and Zhuhai which outgrew older urban centers as a result of SEZ and preferential policies. Polarization within the province yielded a three-tier spatial pattern comprised of a mini-core, an extended core in Zhujiang Delta, and a periphery in the surrounding hinterland. Polarization was also the most important source of rising spatial inequality within Guangdong. By contrast, polarization was not evident in Fujian, Zhejiang, Anhui, or Hunan where spatial inequality either declined or changed little.

Guangdong's unique pattern of spatial restructuring is attributable to post-Mao reforms and their spatially biased preferential policies. These policies are evident in the close relationships between output and investment, both state and foreign. Indeed foreign investment in

Guangdong is perhaps the single most important predictor of output at the prefecture level. These sorts of changes entailed sizable risk for China's reformers, and they undertook them advisedly. Their preference for transforming Guangdong and especially the SEZs and Zhujiang Delta into attractive sites for foreign investment seems not unreasonable in the context of Chinese political economy. The siting of SEZs in the immediate vicinity of Hong Kong not only accomplished political demonstration and transition effects, but it also afforded an economically sound means of tapping the vast investment opportunities in and via Hong Kong.

The importance of the state, its policy, and its political-economic concerns is not unique to China nor to socialist states. Yet research on regional development has been based, by and large, on neoclassical theories that downplay or ignore the effects of the state, the political system, and the institutional environment. The findings in this paper reaffirm the wisdom of Skocpol's (1985) appeal to "bring the state back in" to our explanations of economic change. In China, the state rather than the firm is the prime mover of regional development. By committing China to an open-door policy, the state has made it possible for capitalist firms to extend their impacts on China's economic landscape, especially in the eastern region. On the heels of these market reforms, firms in Hong Kong and multinational corporations have adopted vertical disintegration production and diverted labor-intensive production tasks to SEZs and Zhujiang Delta where costs for these tasks are low. Simultaneously, Hong Kong has been transformed from an industrial economy to one that specializes in producer services. The vertical disintegration of production thus has led to a spatial division of labor between SEZs and Zhujiang Delta, on one hand, and Hong Kong, on the other.

In this process of restructuring unleashed by post-Mao reforms, foreign investment in south China has played a key role. The empirical analysis in this paper indicates that foreign investment in Guangdong is (and has been) geographically uneven. Doubtless state policy and local endowments are important factors attracting foreign investment to some locales and not others, but existing studies also hint at kinship ties as a factor in the diffusion and localization of foreign investment and economic growth.

In the large, this study of post-Mao economic reforms has documented two spatial effects. First, the reduction of inter-provincial inequality in China is the result of rapid growth in previously less developed coastal provinces—growth that was orchestrated by state policy and reinforced by foreign investment—and slow growth in older and more developed coastal provinces. Second, significant spatial restructuring and polarization at the intra-provincial level in Guangdong are the result of the interplay between state policy and the larger social, cultural, and political environment in south China, while the absence of significant spatial changes in several other adjacent provinces suggests the lack of that interplay there. These findings have at least two implications. First, neoclassical regional development theories are insufficient for explaining past patterns of regional development in China. Second, the state and its leaders endure as the decisive factors shaping regional policy and the ensuing patterns of regional development in the Chinese socialist economy. Since 1978, these policies have resulted in highly uneven patterns of economic growth and economic inequality in China. Future studies aimed at explaining these uneven regional patterns in China's selectively mixed economy will need to pay close attention to the political economy and the state apparatus, to the economic geography of the capitalist firm, and to the social and cultural geography of kinship and investment flow.

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Notes

1. Li Fuchun's 1955 address to the National People Congress (Wu 1967:17) stressed the skewed spatial distribution of industrial output in China.
2. Recently, a new school of growth-pole theory has appeared as an alternative to the much debated ladder-step theory. The new school argues

- for a strategy of "concentration-deconcentration," that is, of concentrated investment in growth poles but with diffusion of growth poles across China (Wang and Zeng 1988).
3. In these open zones, some imports (e.g., equipment, raw materials) may enjoy exemptions from import tax. New firms also enjoy relatively low enterprise income tax or none at all in the initial years; these exemptions may be subject to renewal for future periods (Phillips and Yeh 1989).
 4. In Chinese statistical terminology, *shi* is directly translated as "city"; the term may represent either: 1) the combined territory of *shiqu* ("city proper") and adjacent counties; or 2) the city proper. Unless otherwise specified, I use city to refer to city proper or *shiqu*.
 5. Tang (1991) and Tang et al. (1993) estimate the amounts of government subsidies by dividing provincial budgetary expenses by provincial budgetary revenues; a ratio above 1 indicates that the province receives subsidies from the government, while a ratio below 1 indicates that revenue is transferred out from the province. Interior and poorer provinces traditionally have budgetary ratios above 1, and coastal and more developed provinces have ratios less than 1. Based on this method and using data from SSB (1990), I found that between 1978 and 1989 these ratios declined for Inner Mongolia and Xinjiang and remained stable for Qinghai (although all three provinces continued to have ratios greater than 1), all of which suggest a general decline in government subsidies to these inland provinces. By contrast, the increasing ratios for coastal provinces such as Guangdong and Beijing indicate a reduction in revenue transfers from these more developed provinces to the state.
 6. For example, in both 1980 and 1990, GVIAO accounted for 83 percent of China's total output. The 1990 proportions for the five selected provinces were 81 percent in Guangdong, 83 percent in Fujian and Hunan, and 85 percent in Zhejiang and Anhui.
 7. For example, Chaozhou city and Chaoan county in Guangdong constituted two separate units in 1982, but these were later merged to become a new political unit also called Chaozhou city. I aggregated the two 1982 units so that their outer boundary corresponded with Chaozhou city's in 1990. Similarly, counties split after 1982 were aggregated to reflect 1982 boundaries. Most other cases involved extension of city boundaries into neighboring counties. Boundary aggregations are based on provincial statistical yearbooks. China Min Zheng Bu (1987; 1992) and Chen and Wang (1991).
 8. Agriculture, industry, and services represent China's primary, secondary, and tertiary sectors, respectively. The primary sector also includes forestry, animal husbandry, and fishery; the secondary sector comprises mining, manufacturing, and utilities; and the tertiary sector includes the rest of the economy such as trade, communication, and services.
 9. Both "prefecture" (*diqu*) and "metropolitan region" (also *shi*) refer to administrative aggregations of counties within Chinese provinces. For a description of these terms and related issues see Vogel (1989:4, 454). Although all of Guangdong's prefectures had been turned into metropolitan regions by the late 1980s, in this paper I use the term prefecture to represent aggregations of counties (Figure 11), thereby avoiding confusing *shi* as metropolitan region and *shi* as cities (also see note 4). The prefecture boundaries are as of 1984 (Guangdong Statistical Bureau 1985-1991).
 10. Capital construction investment refers to investment in new assets and includes construction of completely new facilities or new additions to existing facilities. Technical updating and transformation investment refers to investments that renew, modernize, or replace existing assets (SSB 1985-1991).
 11. Because of the frequent changes of and confusion over Chinese definitions of urban population, a wide range of statistics have been used to measure urbanization. Among the preferred are "nonagricultural population" (Lo 1989a) and "total population of cities and towns (TPCT)" (Chan and Xu 1985). Both are problematic, however. In the case of nonagricultural population, this category is designed for the purpose of grain distribution and residence control in the Chinese household register (*hukou*), hence it may not reflect an individual's occupation and residential location. Similarly TPCT is heavily dependent on official criteria for designation of cities and towns. The recent process of rural industrialization has produced an interesting variant of urbanization, which involves commerce and industry scattered in the countryside (Lo 1989b; Pannell 1987; Quan 1991; Taylor and Banister 1991; Veeck and Pannell 1989; Zweig 1987). Because this is an increasingly widespread phenomenon and is not reflected in official designations of cities and towns such as TPCT, I employ the proportion of nonagricultural population as a proxy for the level of urbanization: the higher the proportion, the more urban the county.
 12. Although the number of observations and the degree of freedom are small, the very high r^2 is suggestive of a strong relation between PCFRINV and PCGVIAO.

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Fan, C. Cindy. 1995. Of Belts and Ladders: State Policy and Uneven Regional Development in Post-Mao China. *Annals of the Association of American Geographers* 85(3):421-449. Abstract.

This paper investigates the driving forces that have brought about recent changes in China's regional development. I review the dramatic shifts in development philosophy during the post-Mao period, and discuss the role of Western neoclassical theories in influencing state regional policy and their relevance in predicting patterns of regional development in China. In contrast to the Maoist period, Chinese development philosophy since the late 1970s has emphasized efficiency rather than equity, and open-door rather than self-reliance. The regional policy that ensued has favored the eastern region and selected coastal provinces and cities.

Despite this spatially biased regional policy, the literature has observed a decline in regional inequality in China. The empirical analysis in this paper resolves this paradox by investigating changes in uneven development at multiple scales of resolution. Specifically, inter-provincial inequality declined because a new growth corridor emerged along the southern and southeastern coast as a result of large state and foreign investments and state preferential policies, while the old economic core in the north and northeast experienced much slower growth.

State policy is critical in bringing about regional selectivity in economic growth. That the strong spatial restructuring found in Guangdong is not found in other provinces underlines the differential impacts of regional policy and illustrates the importance of foreign investment and the state's specific political-economic concerns in south China. These findings suggest that neoclassical theories based on market economies are not capable of predicting or explaining regional development in China, and that contemporary regional development theories should give greater attention to the role of the state. Future studies need to scrutinize the relevance of the literature on the geography of production and investigate the ways that capitalist firms may impact the economic landscape of China's open zones. **Key Words:** China, economic reforms, regional development theory, regional policy, uneven development.

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