Geospatial Analysis of Regional Development in China: The Case of Zhejiang Province and the Wenzhou Model

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Abstract: The paper, based on extensive field work and surveys, analyzes in a GIS environment the multiscale patterns and emerging clusters of regional development in Zhejiang Province (one of China’s most rapidly growing) and Wenzhou Municipality (known for the Wenzhou Model of development based on private enterprise and rural industrialization). The authors first investigate the extent to which a traditional northeast-southwest divide has been replaced by emerging coastal-interior divide and whether intraprovincial inequality in Zhejiang, especially rural intercounty inequality, has intensified as new development clusters have emerged. At a finer scale of investigation, they analyze the Wenzhou Model and explain the resulting patterns of change by addressing the role of localities, the state, and globalization. Journal of Economic Literature, Classification Numbers: O 10, O14, O18, O20. 10 figures, 1 table, 36 references. Key words: transitional institution, multiscale, regional development, regional inequality, Wenzhou Model, China, Zhejiang.

Recent work in economic geography and regional studies has been criticized for failure to address the key concerns of development and inequality (Hamnett, 2003). The debate on trajectories and mechanisms of regional development has been particularly intense in the former socialist countries, where scholars and government officials have continually debated the scope and consequences of reforms and the extent and sources of regional inequality (e.g., Sidaway and Simon, 1990; Grabher and Stark, 1997; Bradshaw and Vartapetov, 2003). As in other former socialist countries, regional inequality has been one of the most important issues confronting China’s leaders. Shortly after establishing the socialist regime in 1949, China launched a development strategy that emphasized urban industries while attempting to promote interior development through resource transfers. However, despite the efforts of the government and the establishment of new industrial bases in the interior, regional inequality persisted during the period of Mao’s rule. Reasons for this include historical legacy, national defense considerations, and regional autarky (Wei, 2000).

Since the late 1970s, China has been undergoing economic reforms, introducing market mechanisms and opening its economy to the outside world. The reform process, however, is spatially uneven and has traditionally emphasized coastal development. Starting in the

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mid-1990s, the government began to make a more concerted effort to foster the development of poorer regions and reduce spatial inequalities through strategies for development of its western regions and, recently, by providing incentives for the development of rural areas. The impacts of economic reforms and transition, including effects on income and spatial inequalities, have been closely monitored by scholars and the Chinese government (e.g., Fan, 1995; Wei, 2000; Akita, 2003; Prime, 2004). Although some maintain that reforms have brought wealth and “trickle-down” effects to the entire country, others have argued that inequalities and social problems have intensified. Although these debates continue, most agree that China is still troubled by rural poverty and spatial inequalities, and that distinctive models of regional development can be identified (Smith, 2000; Ma and Cui, 2002; Wei, 2002).

This paper attempts to contribute to the literature on regional development in China, and advance the research of Wei and Ye (2004) in three areas. First, by focusing on the eastern coastal province of Zhejiang, it further enhances recent research aimed at revealing the complex multiscalar patterns of intraprovincial inequality in China. Second, it applies recent developments in GIS to explore regional inequality and regional clusters in Zhejiang. These analyses illustrate that regional inequality is sensitive to regional trajectories and that emerging clusters of regional development have a tremendous impact on regional inequality. Finally, it seeks to further “scale down” the research and analyze the development of Wenzhou Municipality (especially the development of private enterprises) and its impact on changing regional development in Zhejiang Province.

REGIONAL INEQUALITY IN CHINA

Regional inequality has generated lasting discussion among adherents of the various schools of development (e.g., convergence, divergence, inverted-U, and Neo-Marxist). In the former socialist countries, heated debate has arisen concerning the process and social and spatial effects of reforms and transition, including the issue of whether economic reforms have intensified regional inequality (e.g., Sidaway and Simon, 1990; Grabher and Stark, 1997; Rosefielde and Kuboniwa, 2003). While some maintain that globalization and liberalization have brought wealth to these countries, others argue that the transition is characterized by partial reform, path dependency, and geographical unevenness, and have pointed to persistent or rising income gaps and spatial inequalities (e.g., Petrakos, 2001; Dienes, 2002; Bradshaw and Vartapetov, 2003; Kepka, 2004).

Understanding the agents and factors underlying uneven regional development has been a focus of recent studies of China’s regions (e.g., Han and Pannell, 1999; Wei and Fan, 2000; Wei and Ye, 2004), and three trends have been exposed. First, using recently released data, geographers have revealed that patterns of regional inequality differ at different geographical scales, and that levels of inequality at the interregional, intraprovincial, and intraprovincial scales have changed in quite different ways over time (Fan 1995; Wei and Ma, 1996; Wei, 2000). These multiscalar findings have challenged traditional theories of regional inequality (whether of convergence or divergence, both of which tend to ignore geographical scale) as well as previous research on regional inequality in China that often confuses the issue of scale. Recent efforts have “scaled down” the research by studying intraprovincial inequality, revealing complex patterns and mechanisms of regional development that have rarely been addressed by Western theories of regional development (e.g., Fan, 1995; Wei and Fan, 2000; Gu et al., 2001; Wei and Kim, 2002).
Second, geographical research on regional inequality in post-Mao China has attempted to theorize the transition (Wei, 2000), arguing that economic reform in China can be understood as a triple transition process of decentralization, marketization, and globalization. This process in turn has given rise to three dominant agents of regional development—the state, the locality, and the global investor (Wei, 2000; Wei and Fan, 2000). Researchers have discovered that the traditional (heavy) industrial bases favored by socialist planning and dominated by state-owned enterprises (SOEs) have fallen behind, while a group of coastal regions better positioned to access opportunities related to marketization and globalization have forged ahead. Similar new forms of regional development can also be observed within provinces (Wei and Ye, 2004). The character of economic transition and emerging agents of regional development in transitional countries have rarely been taken into account by orthodox regional development theories, which are therefore less effective in explaining the dynamic processes related to regional development in China. Given the significance of key regions in the observed regional inequality, research has also addressed the trajectories and mechanisms underlying the rise of “winning” regions by investigating the effects of globalization, the state, and local agents (e.g., Shen, 2002; Wei, 2002; Xu and Tan, 2002; Wei, 2004).

Third, since traditional measures of regional inequality mask spatial association and clustering, recent research efforts have countered this effect by using techniques of geographical analysis. GIS, although revolutionizing traditional geographical methods of analysis, is still not widely used in human geography. GIS analyses of regional inequality in China have detected a trend of spatial concentration among China’s provinces, despite declining interprovincial inequality during much of the reform period (Yu and Wei, 2003). Such studies have also determined that less developed provinces have retained their spatial similarity, whereas clustering has strengthened among more developed coastal provinces, thereby intensifying China’s coastal-interior divide.

Despite recent advances in the study of regional inequality in China, additional research appears to be necessary. First, studies of individual provinces remain limited, with the exception of Jiangsu and Guangdong (e.g., Fan, 1995; Wei and Fan, 2000; Gu et al., 2001; Wei and Kim, 2002). Given the extremely large regional differentials in China, the mixed picture of development and inequality at the county level, where bottom-up reforms have been initiated, merits further investigation. Zhejiang is a coastal province spearheading China’s phenomenal growth and is known for its Wenzhou Model of development based on private enterprises and rural industrialization. However, few studies have examined its temporal and spatial development, due largely to the lack of systematic time-series data, and the fact that it is less accessible than Jiangsu and Guangdong.

Second, while multiple agents—locality, state, and global investor—are shaping regional development in China, their configuration varies across regions and geographical scales. China is characterized by a hybrid economy with multiple and complex ownership forms, such as state-owned, collectively owned (e.g., township and village enterprises, or TVEs), and private and foreign shareholding enterprises (Wei, 2004). In contrast to the externally driven development of the Pearl River Delta of Guangdong and the local state–led Sunan Model of development of Jiangsu, the Wenzhou Model of development in Zhejiang features nation-leading rates of marketization and private enterprise growth (Ma and Cui, 2002; Wei and Ye, 2004). The Pearl River Delta Model is characterized by export-processing industries and equipment suppliers established as a result of foreign investment, whereas most enterprises in Zhejiang are in light industries and are operated by local entrepreneurs. In sharp contrast to the Sunan model, in which local governments actively sponsor and operate
TVEs, the Wenzhou model relies heavily on private initiatives and a *laissez faire* style of government (Huang and Di, 2004).

These diverse models of regional development are typical of the transitional nature of post-socialist institutions, and attest to the power of places in the context of globalization. Many areas in the coastal provinces of China have greatly benefitted from the ongoing reform, and regions in coastal Zhejiang are no exception. Although the municipalities of Hangzhou and Ningbo have maintained their leading economic status in Zhejiang, they have been challenged by emerging regions whose growth stems from the policies of decentralization and marketization. Wenzhou, for example, although it struggled under Mao’s leadership, has boomed in the post-Mao period, becoming one of the three largest economic regions in Zhejiang. As the first region in China dominated by the private sector, it has attracted tremendous national and international attention and is the focus for much debate (e.g., Nolan and Dong, 1989; Liu, 1992). Further analysis of Wenzhou should shed additional light on the dynamics of regional development in Zhejiang. The mechanisms underlying such trajectories of regional development and their contributions to intraprovincial inequality merit further investigation as well.

Finally, the use of GIS techniques in regional studies has considerable promise. Such techniques, especially spatial analysis, are very powerful and often reveal complex spatial phenomena that otherwise are not identifiable (Gallo and Ertur, 2003). Yu and Wei (2003), employing recent developments in GIS, argued that conventional measures of regional inequality mask geographical disparities and clustering, and have demonstrated that GIS techniques make it possible to identify otherwise hidden trends of spatial concentration and formation of new clusters. Strengthening the use of GIS in economic geography and regional studies thus could lead to many new findings and represents a major direction for advancing human geography. Application of GIS to the study of local development and intraprovincial inequality has considerable potential. It is especially useful in the identification of emerging regions and clusters within China’s provinces and in examining how these emerging regions have contributed to changing patterns of regional inequality.

The relatively recent release of county-level statistics allows us to use GIS to conduct spatial and temporal analyses within Zhejiang. More specifically, for the first time the Zhejiang Statistical Bureau (ZSB, 2000) has provided consistent and systematic time-series as well as county-level data, including for Wenzhou Municipality. Except where indicated otherwise, the sources of our figures and tables are all based on our calculation of data from ZSB (2000). Years of experience with Zhejiang and Wenzhou, as well as several recent rounds of field work (including interviews and postal surveys), also were essential to our understanding of the complexity of this dynamic province, and thus to our analysis of development in Zhejiang and Wenzhou.

### Multiscalar Patterns of Intraprovincial Inequality

Zhejiang is known in China for the development of non-state (particularly private) enterprises. The contribution of SOEs to industrial output was 61 percent in 1978, significantly

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2 As noted earlier, it leads the nation in private enterprise development.
3 Both authors grew up in Zhejiang, and have been involved in many projects dealing with various cities and regions of the province. For Wenzhou, the authors interviewed dozens of local government officials and private enterprise managers in 1999, 2000, 2003, and 2004. They also collected data from more than 100 firms through surveys, the results of which will be reported elsewhere.
lower than the national average, and by 1998 had declined to only 7 percent. Booming private enterprises have made Zhejiang one of the richest and fastest-growing provinces in China, contrasting sharply with its average performance in the pre-reform period. In 2000, with 3.7 percent of China’s population, Zhejiang accounted for 6.8 percent of China’s GDP.

Traditionally, Zhejiang is divided into Northeast and Southwest regions (separated by the bold boundary line in Fig. 1). Following the administrative hierarchy of China, we have adopted two geographical frameworks for analysis. The first framework consists of the 11 municipalities (identified by capital letters in Fig. 1), and the second of the 75 city districts (shiqu, or central cities), county-level cities, and counties, often referred to here as “counties” for simplicity. City districts are where municipal administrative functions are located and are considered the cores (central cities) of the municipalities. We refer to inequality across all county-level units as overall (intercounty) inequality, and to inequality among counties and county-level cities (excluding the city districts) as rural (intercounty) inequality. Per capita gross domestic product (GDP) is the primary indicator of economic growth, inasmuch as time-series county-level household income data for China’s provinces are still lacking. We will use the coefficient of variation (CV) to measure regional inequality, and the location quotient (LQ) to measure the departure of an individual unit from the mean.

As shown in Figure 2, while both overall and rural intercounty inequalities increased from 1978 to 1998, the trend lines are somewhat different. CVs for overall inequality rose slightly and exhibited two inverted U-shaped patterns. More specifically, overall inequality reached a peak of 0.64 in the mid-1980s and declined in the late 1980s, in part because of the Tiananmen incident, which heavily influenced exports, and a conservative ideology that hampered private enterprise development. Some private enterprises suspended planned...
investments or even sought protection by converting to collectively owned enterprises. Overall inequality reached another peak in the mid-1990s, before stabilizing later in the decade.

Rural inequality rose substantially, showing no signs of convergence. Except for stable periods during 1978–1982 and 1986–1991, rural inequality rose dramatically. This indicates the intensification of massive spatial disparities in rural Zhejiang, which have tended to be masked by more modest levels of overall inequality.

Development trajectories of individual municipalities have a substantial impact on overall patterns of regional development. We have calculated the LQ of GDP per capita for each municipality of Zhejiang to demonstrate their diverse fortunes (Table 1). We have classified the municipalities into four groups based on their geographical location and changing LQ patterns.

Hangzhou, Shaoxing, and Ningbo, located in coastal Northeast Zhejiang, are often grouped together (Group I) based on their close economic and cultural connections (Fig. 3).
In general, their LQs are high. Group II includes three municipalities in Southwest Zhejiang: Wenzhou, Taizhou, and Jinhua (Fig. 3). This group has benefited the most from the Wenzhou Model, and during the reform era their status soared from below to above average, led by Wenzhou, which ranks highest. Group III municipalities, Jiaxing and Huzhou, have had huge SOE burdens and their economies have been slow to restructure (Fig. 4). Their status remains above the provincial average level, and since the late 1990s, they have been making efforts to restore their eroding statuses. Group IV includes Quzhou, Lishui, and Zhoushan, which have disadvantageous locations, backward infrastructure, and problematic economies (Fig. 4). The status of Quzhou and Zhoushan has declined quite substantially; their LQs have declined
from 1.13 to 0.59 and from 1.6 to 0.74, respectively, between 1978 and 1998. This is the poorest group and the biggest loser in the reform period.

Uneven development also can be observed at the county level using GDP per capita outlier maps. Outliers are determined in the usual fashion, by computing lower and upper boundaries that are 1.5 times the interquartile range (the difference between the 75 percent and 25 percent values). Outliers thus are lower than the 25 percent value or higher than the 75 percent value. Counties with “extreme” values can be identified using these maps. For 1978, five city districts with extreme high values were identified: Hangzhou, Shaoxing, Ningbo, Jinhua, and Quzhou (Fig. 5A). The former three are traditionally rich cities that benefitted from Mao’s policy of city-centered industrialization, whereas the latter two benefitted somewhat from Mao’s policy of national defense favoring interior areas of Zhejiang. Most of southern Zhejiang was poor. In 1998, while only Hangzhou and Ningbo registered extremely high levels of GDP per capita, three rich clusters can be recognized: Hangzhou-Shaoxing-Ningbo, Central Zhejiang surrounding Yiwu county, and coastal Wenzhou-Taizhou (Fig 5B). The economic health of the latter two clusters can be attributed to the Wenzhou Model. Although low outliers could be identified both in 1978 or 1998, extremely low values were not present in either year.

The changing fortunes of counties can be better shown by changes in the values of their LQs. As shown in Figure 6A, counties in northern, central, and southeastern Zhejiang experienced the most rapid growth during the period from 1978 to 1990. In the 1990s, although the trend continued, all coastal counties in the Wenzhou-Taizhou region formed a cluster exhibiting dramatically increasing economic status (Fig. 6B). Counties in southwestern Zhejiang were the losers in the reform. In the 1990s, Kaihua County, located in far southwestern Zhejiang, was identified as an outlier with regard to LQ change, with an extremely low LQ value, indicating the largest decline in economic status.

GEOGRAPHICAL CLUSTERING AND REGIONAL INEQUALITY

Although CV and LQ are useful in depicting changing patterns of regional development, both types of indexes cannot effectively analyze more complex spatial associations and clustering. Analysis of the latter can shed more light on changes in regional inequality (Yu and Wei, 2003). In the following section, we will employ Moran’s I spatial autocorrelation statistic and Moran’s scatter plot using GeoDa, a software package developed by Anselin and his colleagues (2005) to analyze spatial clustering and its contribution to regional inequality.4

The first step is to construct a spatial weights file that contains information on the “neighborhood” structure for each location. First-order contiguity weights are considered here. We have checked the spatial weights for the presence of “islands” (unconnected observations) and other undesirable characteristics, and generated a histogram with the distribution of the number of neighbors for a given weights file. Based on the connectivity index, three island counties are found to be unconnected: Shengshi, Daishan, and Dongtou. Six

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4Moran’s I spatial autocorrelation statistic is visualized as the slope in the scatter plot with the spatially lagged variable on the vertical axis and the original variable on the horizontal axis—that is, treating global Moran’s I as a regression coefficient of the spatial lag against the observed value. The variables are standardized to facilitate interpretation and categorization of the type of spatial autocorrelation (cluster or outlier). A spatially lagged variable (a sum of spatial weights multiplied with values for observations at neighboring locations) is an essential part of any analysis of spatial autocorrelation.
cities or counties have only one neighbor, among which, Putuo District and Dinghai District are in one island; Xiangshan County and Yuhuan County are peninsula counties; and Shaoxing City and Quzhou City are surrounded by their suburban counties. In this research, we use topological contiguity as a standard to retrieve the spatial neighbor matrix. Since

Fig. 5. Outliers for per capita GDP outliers, 1978 and 1998.
Shengsh, Daishan, and Dongtou counties do not have any direct spatial connection with the mainland, the calculation treats them as islands and ignores them. Also, Putuo District and Dinghai District are together one island and are omitted in the calculation.

Figure 7 depicts the Moran scatterplot with the corresponding GIS maps for 1978 and 1998. In 1978, two “rich” spatial clusters were located in Northeast Zhejiang, composed of traditional rich zones (Fig. 7A). However, most of the counties are identified as poor clusters. Four suburban counties neighboring Hangzhou City, Shaoxing City, Jinhua City, and Quzhou City are classified as Low-High spatial outliers. In other words, they are surrounded by rich neighbors. Four central cities—Wenzhou, Jinhua, Quzhou, and Shaoxing—are surrounded by poor rural areas. These maps clearly indicate the primary status of Northeast Zhejiang and the central cities under Mao.

The points in the Moran’s scatterplot cluster map for 1998 (Fig. 7B) are much more scattered than those for 1978. This indicates greater complexity and local variation in the development trajectories of counties. In 1998, two rich spatial clusters are identified: a “cross shape” of clusters in north-central Zhejiang and an emerging Wenzhou-Taizhou cluster (Leqing, Wenling, and Yuhuan counties). The emerging central and coastal counties in particular warrant attention; they are all rural areas benefiting from the Wenzhou Model. Compared with 1978, the number of counties identified as poor clusters declined. We also note that most poor clusters are located in interior Southwest Zhejiang, with successful poverty reduction in coastal Wenzhou-Taizhou. Three Low-High spatial outliers are fringe counties of the north-central rich cluster. A broader spatial cluster across municipality borders has been formed in sharp contrast to the case in 1978, when a rich-poor relationship existed between central cities and their surrounding rural areas. Now more counties, instead of central cities, are surrounded by poor areas, indicating widening inequality among rural areas. Several coastal regions such as Wenzhou’s Ruian County are surrounded by poor areas. This further indicates the intensification of inequality between coastal areas and their interior neighbors. As shown in the scatter plots below (Fig. 8), from 1978 to 1998 Global Moran’s I in Zhejiang increased from 0.17 to 0.51, indicating a massive clustering trend (divergence) among counties.

The rapid growth of rural counties based on the Wenzhou Model during the reform period has not only dramatically changed their positions on the Moran scatterplot, but also radically reorganized Zhejiang’s spatial structure. The emergence of central Zhejiang and coastal Wenzhou–Taizhou very much accounts for increasing regional inequality in the province. Although some counties remain less developed, those oriented toward the Wenzhou Model appear to be the biggest winners in the reform.

To detect the contribution of individual counties to the global index, we use Local Moran’s I. When it is compared for 1978 and 1998 (Fig. 9), several interesting findings emerge. In 1978, local Moran’s I in 62 of 70 counties fell within the range from –0.8 to 0.5, whereas in 1998, 61 counties’ values were between –0.8 and 2.2. This indicates that a greater number of counties are contributing to widening inequality. In 1978, Quzhou City (–1.9) and Shaoxing City (–0.8) were the largest negative contributors, whereas three north-central cities (Jiaxing, Hangzhou, and Ningbo) and three rural counties in Wenzhou (Cannan,

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5 The Moran scatter plot was developed as an exploratory spatial data analysis (ESDA) tool to assess local instability in spatial association. The four quadrants in the scatter plot correspond to different types of spatial correlation. Spatial clusters are in the upper right (high-high, HH) and lower left (low-low, LL) quadrants, and spatial outliers are in the lower right (high-low, HL) and upper left (low-high, LH) quadrants. HH denotes high values surrounded by high values and LH indicates low values surrounded by high values, etc.
Taishun, and Wencheng)⁶ made the greatest positive contributions, ranging between 0.5 and 0.9. This indicates that at the beginning of the reform, poor spatial clustering could be identified in Wenzhou. Indeed, Quzhou, the largest negative contributor to the global index, greatly

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⁶The latter two were national-level poverty counties in 1978.
leveled the regional imbalance prior to economic reform. In 1998, seven counties are identified as the largest contributors to spatial equality.7

We tested the LISA (Local Indicators of Spatial Association) cluster map at the significance level of 0.05 for 1978. Yuhan County and Xiaoshan County were classified as HH, which means that regions around Hangzhou Bay were enforcing regional inequality.

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7Five are rural areas whose development is based on the Wenzhou Model: Wenzhou City, Ruian County, Taizhou City, Shenzhou County, and Yiwu County.
However, Wenzhou City is identified as a LH center, and helped smooth out overall inequality. In 1998, clear-cut spatial patterns were evident, which explained well the soaring rural intercounty inequality during the reform period (Fig. 10B). The Hangzhou-Shaoxing-Ningbo region is a rich cluster, while interior south Zhejiang forms an obvious poor cluster, exacerbating intraprovincial inequality.

(Fig. 10A)
As we have argued above, changing patterns of regional inequality are associated with the changing fortunes of regions (Wei, 2000). This becomes evident when moving to a finer scale of analysis (scaling down) by focusing on the dramatic ascent of Wenzhou and its

**Fig. 10.** LISA clusters in 1978 and 1998.

**REGIONAL DEVELOPMENT IN WENZHOU AND IMPLICATIONS FOR ZHEJIANG**

As we have argued above, changing patterns of regional inequality are associated with the changing fortunes of regions (Wei, 2000). This becomes evident when moving to a finer scale of analysis (scaling down) by focusing on the dramatic ascent of Wenzhou and its
impact on regional development in Zhejiang. Although the municipality showed few signs of activity during Mao’s era, it has since then become one of the wealthiest areas in China.

During the Southern Song Dynasty (AD 1138–1276) Wenzhou was one of the national centers of commerce, and more specifically, handicraft production and international business. In the late Qing Dynasty and with the development of marine transportation, modern industries were established and Wenzhou’s port district began to flourish. By the early 1930s, Wenzhou was known as one of China’s major coastal ports and a national center for craft production and light industry. Wenzhou’s star subsequently waned as a result of Mao-era proscriptions on the development of private enterprises, and de-emphasis on state investment in coastal locations vulnerable to potential foreign invasion; many residents managed to stay just above the poverty line. The communist emphasis on autarky led to a reduction in maritime trade, thus severing the lifelines of the port. Due to the city’s lack of strategic significance to the state, no railroad or airport was built to ameliorate its poor transportation conditions. The lack of investment eroded the light industrial and services sector, the core of the municipality’s traditional economy. Moreover, activities in Wenzhou were closely monitored by state officials as a consequence of its reputation for engaging in underground trade and private enterprise development (Whiting, 2001).

While Wenzhou thus was not favored by economic development policy under Mao, the fact that its economy was less dominated by SOEs left Wenzhou with a more favorable environment for implementing reforms and developing private enterprises in the post-Mao period. While many cities have been burdened by layoffs of workers from SOEs, private enterprises in Wenzhou were able to move ahead smoothly without major disruption. Known for “petty commodities, large markets,” the Wenzhou Model is centered on small-scale, manufacturing-oriented, and often family-owned, private enterprises, with distribution networks linking producers and consumers all over the country and extending to the global market. Nonetheless most producers are small, focus on domestic markets, and are located in rural areas.

The Wenzhou Model has been conceptualized as development/urbanization from below, with little intervention from above (Nolan and Dong, 1989; Liu, 1992; Ma and Cui, 2002). Indeed, the municipality’s development is heavily embedded in a strong local culture and institutions emphasizing practical approaches and financial achievements. Small enterprises based on entrepreneurship and rural markets have traditionally formed the backbone of Wenzhou’s economy. The family forms the main production unit, which relies on traditional social networks for acquiring raw materials and information, as well as for production and marketing. Historically rooted and geographically based Wenzhounese networks of producers and traders help to integrate local economies with broader markets.8

However, the development of Wenzhou has also been facilitated by the local state and global forces. Local government in Wenzhou, as a post-socialist institution and through local learning, is transitional in nature (Wei, 2005), yet remains a step ahead of other local Chinese states in accommodating the grassroots push for marketization, protection of private enterprises, and improvement of the business environment. The transitional state in Wenzhou has effectively taken advantage of opportunities afforded it as a laboratory for policy experiments legalizing its underground economies.9 Local leaders creatively managed to save face

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8Through our interviews, we discovered that traders, through their trading activities, had become increasingly knowledgeable about the products needed by the markets, gain experience with market activities, and build networks of producers, traders, and customers. Many of them, such as Aokang’s Wang Zhengtao, Delixi’s Hu Chengzhong, and Baoxiniao’s Wu Zhengsheng, eventually opened their own businesses.
for central government authorities by labeling local privatization as “socialism with Chinese characteristics.” As the political climate changed to one encouraging the development of private enterprise in the 1990s, the Wenzhou government shifted its focus to improving the business environment, quality of output, education, and infrastructure. Moreover, globalization and exports also have played a role in the growth of Wenzhou. Although the focus of Wenzhou companies is the domestic market, their production networks are global in scope, and international trade has been an important part of their bottom line.

The explosive growth of private enterprise in Wenzhou during the reform period has not only reshaped the municipality’s spatial structure, but also contributed significantly to regional development in Zhejiang as a whole. Booming Wenzhou has challenged traditionally rich areas in the north, in the process both lessening the rise of overall inequality in the province, but intensifying rural inequality. It has also contributed significantly to the emergence of the coast-interior divide in Zhejiang, replacing the traditional Northeast-Southwest one.

In addition to the growth of coastal counties (e.g., Wenzhou-Taizhou) of Zhejiang, the economic transformation of central counties, largely unexpected and exemplified by the experience in Yiwu County, also has contributed to the increasing spatial disparity. Yiwu, a part of Jinhua Municipality, was traditionally agricultural, as other counties in the municipality, such as Dongyang and Yongkang. Yiwu, however, has emerged as one of the fastest-growing counties in the province, and along with nearby counties such as Yongkang has made central Zhejiang an emerging cluster of regional growth.

Yiwu’s rise points to the importance of understanding development as a synthesis of forces operating at the global, national, and local scales. Yiwu has long been a trading center, for hundreds of years serving the local periodic markets rooted throughout rural China, even during the difficult years of the Mao era. In the early years of reform, Yiwu’s traders were engaged in informal local market activity, a venture that demonstrated signs of promise. Such a historically embedded development pattern was recognized by local authorities, who quickly intervened after the economic reforms, constructing sites for officially sanctioned markets and encouraging more people to open stores there and produce for these markets.

The local efforts and growing trading activities attracted national attention. In the early years of reforms when China’s markets were poorly developed, Yiwu served as a market place for industrialists looking for raw materials and semi-products, and for vendors/salespersons purchasing in large quantity at low prices. Such activities were supported by good transportation linkages; the Zhengan Railroad connects Yiwu with the Yangtze Delta, as well as northern, southern, and other parts of China. Moreover, Yiwu’s military airport was converted to civilian use. The cost advantages and national publicity of Yiwu drew traders not just from China, but other parts of Asia (especially Southeast). As local officials had hoped, the development of markets also prompted the development of industries to produce for them. Yiwu today thus can be considered both as a national trading center and a new center of regional development in Zhejiang.

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9The first local regulation promoting and guiding the development of private enterprises in China was implemented in Wenzhou in 1987. “Tentative Regulations for the Management of Rural Shareholding Enterprises,” also implemented in 1987, became the blueprint for the national regulation in 1992.

10Field work in Yiwu was conducted in 1996 and 1998 by the lead author and in 1999 by both authors.

11Yongkang, which the second author visited in June 2004, has been transformed from an agricultural county to a booming national center of hardware production (including machinery, tools, and small electrical appliances).
DISCUSSION AND CONCLUSION

In this paper, we have examined intraprovincial inequality in Zhejiang by adopting a multiscalar approach and using recently released data and GIS analytical methods. Rural intercounty inequality has soared, accompanied by a more modest increase in overall intercounty inequality. Development centered on private enterprises, referred to here as the Wenzhou Model, has resulted in the emergence of a group of rapidly growing counties in the municipalities of Wenzhou, Taizhou, and Jinhua. Because of an excellent location and strong industrial bases, the Hangzhou-Shaoxing-Ningbo cluster also has embarked upon a dramatic spatial transformation, featuring a massive inflow of domestic and foreign investment. Traditional industrial bases in the province’s interior and many other rural areas, however, have fallen behind due to locational disadvantages and slow restructuring of SOEs and local economies. Consequently, the gap between coastal and southern interior Zhejiang has widened dramatically, directly contributing to a pronounced increase in rural inequality. In addition, we have detected a trend of increasing spatial concentration among Zhejiang’s counties, with the formation of three clusters: (1) emerging coastal Wenzhou-Taizhou; (2) central Zhejiang; and (3) the traditional Hangzhou-Shaoxing-Ningbo cluster.

The Wenzhou, Pearl River Delta, and Sunan models have been widely recognized as the three major regional development models in China. Reflecting transitional institutions and hybrid economies, each has developed under different circumstances, characterized by diverse mechanisms of development. Unlike the FDI-led Pearl River delta Model and the TVE-centered Sunan Model, Wenzhou, densely populated but with an isolated location, has led China in the development of private enterprises. Despite recent successes, Wenzhou is not problem free; it faces challenging issues of increasing competition, rent-seeking behavior on the part of the local state, and potential institutional capture. Local bureaucrats still are attempting to control economic development process through bureaucratic regulations and protracted project approval processes, often acting as rent-seekers. Private entrepreneurs have to network with and even bribe local government officials to shield themselves and/or benefit from government policies.

Regional inequality in post-Soviet economies has been the subject of extensive research and competing interpretations. Our study of Zhejiang and the Wenzhou Model strives to enrich our understanding of the dynamics and significance of trajectories of regional development. As the paper reveals, the complexity and rapid pace of spatial change in Zhejiang share some common features with other Chinese regions and transitional economies. As scholarly observers of China and Central and Eastern Europe have shown (e.g., Grabher and Stark, 1997; Wei, 2000; Bradshaw and Vartapetov, 2003), economic reform and transition have led to the decline of SOEs and the growth of non-state enterprises, especially private and foreign-invested enterprises, and have conferred advantages upon regions receptive to globalization and liberalization. Those slow to reform and more heavily influenced by the legacies of state socialism are lagging behind. Wenzhou has benefitted from the triple processes of decentralization, marketization, and globalization, which have led to the demise of SOEs and TVEs elsewhere in China, and the emergence of private and foreign enterprises.

While there is evidence of convergence in regulation and ownership structure, the trajectory of regional inequality is more complex, and differs with geographical scale and regional

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12The Wenzhou Model of development is more dynamic and successful than the orthodox Sunan Model, which is being re-conceptualized as a result of the problems experienced by TVEs in attracting foreign investment (Wei, 2002).
configurations. Unlike the cases of Jiangsu and Guangdong provinces, where core-periphery structures (Sunan vs. Subei, Pearl River Delta vs. the remainder of Guangdong Province) are intensified, the traditional Northeast-Southwest divide in Zhejiang has given way to an emerging coast-interior divide. The phenomenal growth of private enterprise in Zhejiang is behind the emergence of new growth centers and the coast-interior divide, which are changing the economic landscape of the province. Such massive levels of spatial restructuring are hardly matched by any other province or country. This suggests that although the literature tends to argue for the persistence and intensification of core-periphery structures, such structures may be convergent in some regions and divergent in others, subject to changing geographies and development mechanisms.

REFERENCES


