Research Report

Prefecture-level Statistics as a Source of Data for Research into China's Regional Development*

Carsten Herrmann-Pillath, Daniel Kirchert and Pan Jiancheng

ABSTRACT Analyses of regional economic disparities in China mostly refer to the level of the province. The report provides a survey of the prospects and limitations of using prefecture-level data in order to understand the spatial dynamics of growth. A new database has been built that is based on the original data available in the provincial yearbooks. The data are in the GIS framework. A large set of maps is accessible via www.on-China.de. Preliminary observations on possible new insights include, amongst others, a more complex picture of rural development.

Since the mid-1990s, interprovincial disparities in economic activity and income have become a central issue of Chinese economic policy. This was reflected in the Ninth Five-Year Plan (1996–2000) and will also be given top priority in the Tenth Five-Year Plan. In 1999, the government set up a leading group, headed by Zhu Rongji, to monitor the development of the western region of China. The country is striving to achieve balanced regional development no later than 2010.[1] This challenge is closely connected with the issue of increasing interpersonal inequality of income in Chinese society.[2] With the passing of leadership to Jiang Zemin, much stronger emphasis has been placed on income-equalizing policies, given that the Communist Party needs both to restore political legitimacy and to stabilize society under the shadow of increasing unemployment and social distress.

Yet there is still no clear picture of the nature and causes of these

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1. The State Council has a special co-ordination bureau that supports the leading group; see *China aktuell*, November 1999, p. 1133, and February 2000, p. 125. The west is defined here as including Sichuan, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai, Tibet, Ningxia, Xinjiang and Chongqing. There is intensive collaboration with external development agencies, e.g. the World Bank and the Asian Development Bank.

2. For example, general income inequality in China as measured by the Gini index has significantly increased over the reform period. Based on the official NBS household sample data, the World Bank reports an increase in the Gini index from 0.29 in 1981 to 0.39 in 1995; see World Bank, *China 2020: Disparities in China: Sharing Rising Incomes* (Washington, DC: World Bank, 1997). In an independent nation-wide sample of household incomes, Khan and Riskin observe the same rising trend, but obtain significantly higher estimates on the Gini index of 0.38 in 1988 and 0.45 in 1995; see A. Rahman Khan and Carl Riskin, "Income and inequality in China: composition, distribution and growth of household income," *The China Quarterly*, No. 154 (1998), pp. 221–253, and more recently A. Rahman Khan and Carl Riskin, *Inequality and Poverty in China in the Age of Globalization* (Oxford: Oxford University Press, 2001).

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disparities. In fact, problems begin with the mere description of regional development, which is the concern of this report. Most policy analyses focus on the west–middle–east distinction, or even less differentiated, the distinction between the "coast" and the "interior." Although this is plausible against the historical background of the "third front" (*san xian*) policy, there are clearly important alternatives, one of which, for example, follows the historical distinction between macro-regions and introduces a finer-grained disaggregation of cross-provincial regions.[3]

This research note presents a new database that has been assembled by a team of researchers in Germany and China. This database introduces the perspective of the prefectural level, a level of data aggregation so far neglected by both Chinese and Western research on regional development. We first explain our reasons for selecting this approach and proceed to describe the data and give a preliminary assessment of their usefulness. Further analysis is the topic of future research. The database starts out from the prefectural data available in the provincial statistical yearbooks of China. Efforts have been made to harmonize and augment these, with case-for-case estimates where data are missing and a large number of additional calculations of meaningful relational data (shares and ratios). To complete the analytical framework, the database is supported by a set of provincial data (see Appendix 1 for a complete list of data categories).

Analytical Relevance of Selecting the Appropriate Level of Data Aggregation

On the question of income disparities, one of the most intricate issues is to differentiate between the regional determinants of personal income inequality and other causes.[4] Several studies show that the degree of disaggregation affects the causal analysis quite substantially.[5] This means that before the causes of imbalances can be understood, the best way to describe regional differences (which is by no means a trivial question) must be selected.

3. On the "third front" policy under Maoism in the 1960s and 1970s which favoured remote interior provinces, see the seminal study by Barry Naughton, "The Third Front: defence industrialization in the Chinese interior," *The China Quarterly*, No. 115 (1988), pp. 351–386. Gore provides a useful survey of the long-run path dependencies resulting from the Maoist legacy in general; see Lance L.P. Gore, "The communist legacy in post-Mao economic growth," *The China Journal*, No. 41 (1999), pp. 25–55.

4. Inter-regional and rural–urban inequalities have been identified as the major factors for the increase in overall income inequality between 1985 and 1995. In 1995 these two factors accounted for about 50% of total population inequality; see World Bank, *China 2020*.

5. This point is discussed in C. Cindy Fan, "Of belts and ladders: state policy and uneven regional development in post-Mao China," *Annals of the Association of American Geographers*, Vol. 85, No. 3 (1995), pp. 421–449 or in Kai-Yuen Tsui, "Trends and inequalities of rural welfare in China: evidence from rural households in Guangdong and Sichuan," *Journal of Comparative Economics*, No. 26 (1998), pp. 783–804. The authors have published an comprehensive assessment of aggregation schemes hitherto applied: C. Herrmann-Pillath, D. Kirchert and J. Pan, "Disparities of Chinese economic development comparing approaches to different levels of aggregation," *Wittener Diskussionspapiere*, Nr. 84, Witten/Herdecke University (2001), using the General Measure of Entropy (which is also applied in Tsui's work) as well as the Hoover Index. The paper can be accessed on www.on-China.de in the GIS section. An abridged version is published in the 2002 volume of *Economic Systems*.

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Studies on regional disparities since 1978 have produced mixed and sometimes even contradictory results, depending on the scope of analysis, the indicators and indices of inequality applied, and the time period under observation.[6]

First, the rural–urban divide is obviously one of the major determinants of inequality in China. On the aggregate level, provincial economic structure clearly has a profound influence on measured inequality. Several studies have emphasized that the regional share of township and village enterprises (TVEs) in rural GDP is a key determinant of both intra-provincial and inter-provincial inequalities.[7] Secondly, as long as the province is the unit of analysis, intra-provincial inequalities between regions cannot be taken into consideration. However, it is well known that these disparities can be substantial, even for provinces with a high level of income.[8] Thirdly, there is increasing awareness that the provinces are probably not the optimal unit of analysis as the simple aggregation of provinces can lead to a distorted view of reality. This is because the administrative borders do not always coincide with the boundaries of economic areas. In order to define such economic areas, a finer dis-aggregation is needed, with the smaller units being reshuffled and fitted into newly formed larger aggregates.[9] Finally, provinces manifest stark

6. The trend of inequality is sensitive to the inequality index used; see for example Kai-Yuen Tsui, "Decomposition of China's regional inequalities," *Journal of Comparative Economics*, No. 17 (1993), pp. 600–627. The choice of the unit (province or county) also influences the results derived from the application of regional inequality indicators; see Kai-Yuen Tsui, "Factor decomposition of Chinese rural income inequality: new methodology, empirical findings, and policy implications," *Journal of Comparative Economics*, Vol. 26 (1998), pp. 502–528. Convergence analysis based on growth models and time series regressions clearly shows that per capita incomes have converged, i.e., the poor provinces have grown faster than the prosperous provinces from 1978 until today. Measures like the regional Gini coefficient show an increasing level of inequality because the divergent size of the provincial economies is reflected in the calculations.

7. See, for example, Scott Rozelle, "Stagnation without equity: patterns of growth and inequality in China's rural economy," *The China Journal*, No. 35 (1996), pp. 63–92, and Yusheng Peng, "Agricultural and nonagricultural growth and intercounty inequality in China, 1985–1991," *Modern China*, Vol. 25, No. 3 (1999), pp. 235–263. Peng demonstrates that agricultural growth manifests convergence, whilst non-agricultural growth does not, resulting from the fact that only the latter is beneficiary of urban technological spill-overs. This bifurcation can explain an U-shaped trend in inequality during economic development.

8. Many provincial studies stress this point, apart from the work by Fan, "Of belts and ladders." We should mention two recent studies on Fujian and Jiangsu: Thomas P. Lyons, "Intraprovincial disparities in China: Fujian province, 1978–1995," *Economic Geography* (1999), pp. 404–432, and J. Bruce Jacobs, "Uneven development: prosperity and poverty in Jiangsu," in Hans Hendrischke and Feng Chongyi (eds.), *The Political Economy of China's Provinces* (London: Routledge, 1999). The complexity of the developments in Guangdong is examined in various contributions to the collection by Y.M. Yeung and David K.Y. Chu (eds.), *Guangdong. Survey of a Province Undergoing Rapid Change*, 2nd edition (Hong Kong: Chinese University Press). For an overall assessment, see Dali Yang, *Beyond Beijing: Liberalization and the Regions in China* (London: Routledge, 1997) which includes a chapter analysing intra-provincial inequality in reform-period China.

9. Compare M. Francis Johnston, "Beyond regional analysis: manufacturing zones, urban employment and spatial inequality in China," *The China Quarterly*, No. 157 (1999), pp. 1–21. Johnston argues that a manufacturing-zones approach is better suited to understanding regional development in China, for example, regarding synergies between state enterprises and TVE development crossing conventional administrative borders, as epitomized in the Changjiang delta region. However, he does not reorganize statistical units of analysis, and he sticks to the "three lines" approach to understanding the larger patterns.

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structural differences, especially with regard to the role of municipalities, and the general measurement of disparities is heavily influenced by the inclusion or exclusion of certain provinces from the data set.[10]

The existing literature relies mainly on county-level data to obtain a detailed view of the regional disparities in China. However, most investigations advancing to this level of disaggregation focus on case studies of a single or small number of provinces.[11] Handling more than 2,000 items of county-level data (in the 2000 yearbook, for instance, a total of 2,109) is an extremely tedious task. Nation-wide studies also face the problem that complete and internally consistent data sets are not yet available for more recent years. However, it is generally considered that the analysis of disparities should focus on a level of aggregation where the units are comparable in structural terms, particularly with reference to the rural–urban dualism. This is not true of county data, making it extremely difficult to include municipalities and metropolitan areas in an unbiased way. In other words, the measurement of disparities on the basis of county data entails major problems with regard to making allowance for the impact of administrative and structural differences across counties and urban areas.[12]

Although the prefectural level is also becoming more difficult to handle (there is an increasing number of new, so-called *fu* units between the provincial and the prefectural level as well as between the prefectural and

10. For example, a number of authors find evidence for weak convergence in provincial output in the 1980s and only an increase in inter-provincial inequality at the beginning of the 1990s. See Tianlun Jian, Jeffrey D. Sachs and Andrew M. Warner, "Trends in regional inequality in China," *NBER Working Paper* 5412 (1996) and Jian Chen and Belton M. Fleisher, "Regional income inequality and economic growth in China," *Journal of Comparative Economics*, No. 22 (1996), pp. 141–164. These findings are sensitive to the treatment of the three coastal municipalities. If Beijing, Tianjin and Shanghai are excluded, a steady increase in inter-provincial inequality can be observed. The same is true of the gap between coast and interior. The general trend in the 1980s towards inter-provincial convergence is therefore due mainly to convergence among the subset of coastal provinces.

11. A tremendous effort to collect nation-wide county-level data for 1990 and 1991 from the provincial yearbooks has been undertaken in the CITAS (China in Time and Space) project at the University of Michigan; see Robert Dernberger, "Provincial yearbooks' CITAS county level data files. Personal comments and evaluation," 1996, http://citas.csde.washington.edu/data/provyrbk/yrbkdoc.htm. Today, the Chinese government has already published several collections of county level data, e.g. *Zhongguo xian shehui jingji tongji gaiyao* (*Compendium of Social and Economic Indicators for Chinese Counties*) (Beijing: China Statistics Press 2000) which contains indicators for 1992, 1995 and 1999. However, these collections are mostly incomplete and do not include important categories of data relevant for economic research. Examples of provincial studies using county data are Lyons, "Intraprovincial disparities in China: Fujian province, 1978–1995," or, for Jiangsu province, Scott Rozelle, "Rural industrialization and increasing inequality: emerging patterns in China's reforming economy," *Journal of Comparative Economics*, No. 19 (1994), pp. 362–391. For a nearly nation-wide study of the impact of county-level economic structure on convergence versus divergence of growth rates see Yusheng Peng, "Agricultural and nonagricultural growth and intercounty inequality in China, 1985–1991."

12. Most researchers in the field agree that even if the county is regarded as the basic statistical unit, the analysis of disparities should be based on clusters of counties, see, for example, Li Yining (ed.), *Qucheng fazhan xin silü: Zhongguo shehui fazhan bupingheng dui xiandaihua jincheng de yinxiang yu duice* (*A New Approach to Regional Development: Impact and Counter-strategies of Regional Disparities on China's Social Development*) (Beijing: Jingji ribao chubanshe, 1999), pp. 19ff. As long as there is no convincing proposal to redraw the economic map of China starting out from this proposition, the prefecture seems to be a viable and "low-cost" alternative.

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the county level, with 15 sub-provincial *fusheng* cities alone whose relation to the prefectures is not altogether clear), there is still a strong case for statistical analysis on this level. The use of prefecture-level data might be a reasonable compromise between aggregation and disaggregation. However, so far, prefecture-level data have been mostly used in studies of individual provinces and rarely in quantitative analyses of China's economic development.[13] There are no national cross-prefectural statistical analyses of Chinese regional development.

Advantages of Working with Prefecture-level Data

The prefecture (*shiqu*) is an intermediate administrative unit, consisting either of prefecture-level municipalities (*di ji shi*) or prefectures with urban areas and counties (*diqu*). Special cases are the autonomous districts (*zizhizhou*) and the banners (*meng*) in Mongolia. There are some divergent cases with counties directly subordinated to provinces (Hainan with 17 counties), and in one case with an additional layer between prefecture and province (Xinjiang). These distinctions are more or less terminological. The number varies depending on the year in question: in 1998, there were 330 prefecture-level units in China (229 *shi*, 71 *diqu* (including *meng*) and 30 *zizhizhou*); our data set encompasses only 312 prefectures due to mergers and omissions, with an average population of 3.8 million (1998) and area of 29 thousand km^2. In principle, the prefecture is a unit belonging to the provincial administration as a "field unit" (*paichu jigou*). For statistical research, this is a special advantage because we suppose with some confidence that on this level the crucial step is taken to harmonize and adjust the county-level data for statistical purposes.

The major cause of confusion in this system is the fact that there are municipalities (*shi*) on each level of province, prefecture and county. Moreover, when data from different years are compared, administrative changes must be considered, such as, for example, the introduction of new names, the establishment of new prefectures, changes of affiliation or mergers and other shifts of boundaries.[14] When constructing time series,

13. For example, Jae Ho Chung, "Shandong: the political economy of development and inequality," in David S.G. Goodman (ed.), *China's Provinces in Reform: Class, Community and Political Culture* (London: Routledge, 1997), and Jacobs, "Uneven development."

14. In the time of our comparison between 1993 and 1998/1999 there have been the following changes in the prefecture-level administrative structure. In 1997 the four prefectures Chongqingshi, Wanxian, Fulin and Qianjiang in Eastern Sichuan became the new province-level municipality Chongqing consisting of 27 counties and 14 urban districts under direct municipal administration. In Liaoning the prefecture Jingxi was renamed Huludao (Jilin: Hunjiang changed to Baishan, Hunan: Dayong and Ningning changed to Zhangjiajie and Yongzhou respectively). A number of new prefectures were formed out of existing prefectures: in Jiangsu, Taizhou and Suqian were formed out of Yangzhou and Huaiyin (Anhui: Bozhou out of Suzhou, Henan: Jiyuan out of Jiaozuo, Guangdong: Yunfu out of Zhaoqing, Sichuan: Meishan and Ziyang out of Leshan and Neijiang respectively, Guangxi: Guigang out of Yulin). In Hebei, Baoding *qu* was put under the administration of Baoding *shi* (Heilongjiang: Songhuajiang to Ha'erbin). In Hubei, the four counties Suizhou, Xiantao, Tianmen and Tianjiang were put under direct provincial administration. The two prefectures

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it is vital to define and delineate stable units which, of course, will not always be identical with the official ones (see map, Appendix).[15]

The advantages of using prefecture-level data for the analysis of regional development from a nation-wide perspective are numerous. The prefecture is a unit of spatially close rural and urban areas. Although this precludes a disaggregate spatial analysis of rural/urban disparities, we can nevertheless pinpoint the relative position of rural/urban regional subsystems which are presumably closely integrated internally via factor movements (such as intra-regional migration) and trade flows that are not fully reflected in the county-level statistics. We can safely suppose a causal connection between this relative position and internal rural/urban structural indicators, so that we are by no means prevented from understanding the role of the rural sector in overall economic inequality. On the contrary, we are able to distinguish neatly between spatial and institutional determinants of rural–urban inequalities, since we can distinguish between institutional characteristics of prefectures and their geographic location.

Of course, for some research issues, the county will be the appropriate unit, as in the context of examining local development within single provinces. This is especially true of provinces where, because of the low population density, there are only very large prefectures, or in the case of metropolitan provinces where prefectures are not included as a subprovincial administrative level. Yet, even in the context of local investigations the interaction between urban units and rural counties poses analytical difficulties. Hence, on the national and macro-regional level, there is no compelling reason why the micro-perspective would be an additional benefit because local disparities will always result from complex interactions within integrated subsystems, which as a rule will be larger than the county. Only in rare cases (such as mountainous areas with low accessibility) can counties be justifiably regarded as such integrated, relatively closed units.[16] In all other cases, the economic and

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Shashe and Xuanyang were split up and added to other prefectures. In Guangxi, Wuzhou *qu* and Wuzhou *shi* were regrouped to Wuzhou *shi* and Hezhou. Sources: *Provincial Statistical Yearbooks 1993* for all 30 provinces and *Provincial Statistical Yearbooks 1998* for all 31 provinces (Beijing: Statistical Publishers, 1994 and 1999) and *Zhongguo xingzheng quhua tu ce* (*Maps of the Administrative Division in China*) (Tianjin: China Cartographic Publishers, 1999). In the wake of administrative changes between 1998 and 1999 Zhelimu in Inner Mongolia was renamed Tongliao; Guilin *qu* and Guilin *shi* in Guangxi were merged together again, and in Yunnan, Dongchuan was amalgamated with Kunming.

15. For example, in our comparison between 1993 and 1998 we have constructed 17 artificial aggregated units to accommodate the mentioned administrative boundary changes. Because of their special administrative structure or relatively small size in terms of population, we have also treated the municipalities Beijing, Tianjin and Shanghai and the provinces Hainan, Qinghai, Ningxia and Tibet as single units. Apart from the cases where there are no prefectures, the main reason for this procedure is to achieve an acceptable degree of comparability of prefectures in terms of economic size (as opposed to territorial size), i.e. population, GDP etc. In that regard, the sparsely populated north-western provinces are not comparable to many prefectures in other parts of China.

16. There are further theoretical considerations in regard to the concept of subregional integration, referring to the possible impact of size on growth rates via size-dependent

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societal interaction between the rural and the contingent urban areas has to be taken into account when positioning a region within the broader Chinese context.[17]

From the policy perspective, the prefecture might be the appropriate unit even if the problem areas are located in the counties, because the administration of funds and co-ordination of policies takes place in upper-level units, and because there can be some scope for intra-prefectural policies based on the economic potential of the entire prefecture. Since the mid-1980s, there has been a clear policy to enhance the structural and co-ordinating role of cities in their larger territorial environment (according to such formula as *shi guan xian*). Although this also raises some questions about the relationship between prefectures and urban/rural circles of influence, we believe that the prefecture is the most stable frame of reference, until the current multifarious shifts among old and new administrative structures have stopped, especially with regard to the inter-level movements resulting from the creation of the *fu* level for each conventional level respectively.

Introducing the ICCE Database

Taking stock of all these considerations, at the Institute for Comparative Research Into Culture and Economic Systems we built a complete and integrated "Geographic Information Systems" (GIS) prefecture-level database for the years 1993, 1998 and 1999 which brings together all kinds of indicators which are available almost without exception for all provinces, and which can be reconstructed in some cases by means of statistical estimates. We assembled an extended set of relational data linking the limited number of basic data, which generates some very interesting new information. We selected the year 1993 simply because of the five-year distance to 1998 and 1999, for which the most recent data are available, and to start out from a baseline offering a reasonably large number of data. Furthermore, 1993 was the last year of the old fiscal

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externalities. In the research on China, the possible role of this factor has not yet been clarified. See, for example, Denise Hare and Loraine A. West, "Spatial patterns of China's rural industrial growth and prospects for the alleviation of regional income inequality," *Journal of Comparative Economics*, Vol. 27 (1999), pp. 475–497. Hare and West show that there are even effects of labour productivity in the coastal provinces across industries, with some interior provinces even moving toward higher capital intensity than the coastal industries. This hints at the impact of externalities, e.g. of human capital formation, on labour productivity. See also Belton M. Fleisher and Jian Chen, "The coast–noncoast income gap, productivity, and regional economic policy in China," *Journal of Comparative Economics*, Vol. 25 (1997), pp. 220–236.

17. Yusheng Peng, "Agricultural and nonagricultural growth and intercounty inequality in China, 1985–1991," uses a county-level data set to demonstrate that urban proximity is a crucial determinant of inter-county divergence of non-agricultural growth, i.e. rural industries. This results from positive externalities generated by the urban economy. Within prefecture-level aggregates, these externalities are internalized in statistical terms. Urban–rural linkages might also shape the prefecture as a socio-cultural unit, as famous cases like Wenzhou prefecture demonstrate. Indeed, the question of regional identities in China is not yet settled in a satisfactory way, though it seems to be clear now that the province is not the primordial unit but lower-level units, like the county; see D.S.G. Goodman, "Centre and periphery after twenty years of reform," *China Perspectives*, No. 31 (2000), pp. 4–18.

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system, which seems to be of significance because there are certain interdependencies between the statistical work and the fiscal processes. The website www.on-China.de includes more than 170 maps based on our prefectural and provincial data, grouped under the major categories of population, GDP, employment, public finance, foreign trade, income and consumption, investment and enterprises (see Appendix 1).

A much larger number of indicators is available for some provinces, so that for provincial studies or interprovincial regional studies additional information can be included. For investigations into national developments, however, the available data of the 1990s are limited to the set that is presented here. The following section describes this database in more detail. The article then considers some illustrative maps of China's economic geography and highlights trends that seem out of line with established views on the problem of regional economic development. This is only the first step towards a comprehensive analysis of the data based on the application of advanced statistical methods within the GIS framework.[18] But even a first scan of trends in the maps will suffice to raise interesting questions and suggest further research issues.

Prefecture-level Data Sets for 1993, 1998 and 1999: Organization, Availability and Scope

Prefecture-level data are published regularly in the provincial statistical yearbooks (PSYs), which have been available since the mid-1980s. Until quite recently the yearbooks have not been structured uniformly, which makes their use onerous and, in the context of comparative longitudinal studies, even impossible for many data categories. There is a clear correlation between quantity/quality of information and the level of economic development and openness to the world, with the Guangdong yearbook being the one with the richest data, English explanations and numerous advertisements, compared, for example, with the mere listing of tables in those of less-developed provinces. Many of the yearbooks are structured very loosely, and even chaotically in some cases. To mention just one simple, yet tiresome problem: there is no set place for prefectural data, which occur at random throughout the volume and are only rarely put into a special prefecture or county-data chapter.

However, in the year 2000 there was a quantum leap for the development of prefectural statistics in China, following a campaign-like effort in the context of the 50-year jubilee of the PRC's foundation. Most of the PSYs are now much more uniform in structure, and some of the Provincial Statistical Bureaus have implemented a central guideline issued by the National Bureau of Statistics (NBS) on the structure of the yearbook and the selection of indicators. Six of the 31 PSYs even include a CD containing the data from the printed volume. Nevertheless, there is still

18. A comprehensive study is just being prepared for publication: Daniel Kirchert, *Spatial Economic Disparities in China – an Evolutionary View on Technology Gaps, Distance, and Absorptive Capacity*, PhD thesis, Witten/Herdecke University, 2001.

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considerable divergence, and in some cases key indicators are missing on the prefecture level.

The reason for this inconsistency lies in the underdevelopment of a unified statistical system in China.[19] It is well known that the statistical system follows the general administrative principle of dual leadership; in other words, the local statistical departments are staffed and funded by the respective local governments, whereas the NBS is responsible for establishing the guidelines for their statistical work. The dual leadership system implies, first, that the employees in the prefecture-level statistical bureaus are paid out of local funds, secondly, that the personal files (*dang'an*) are kept on the same level of government, and thirdly, that the respective local governments exert considerable influence on the promotion of local-level directors, even though, formally, the upper-level units of the Statistical Bureau control career advancement. In short, there is no unified career ladder in the statistical system. This fact is related to the regional approach in the Chinese planning system in general, and despite efforts by the central government since the early 1980s to tackle the major deficiencies, mostly by centralizing nomenklatura control, the local governments have not been stripped of their dominant position.[20]

19. Compare the recent assessment by Doris Fischer, "Chinesische Statistik im Umbruch: Konsequenzen für die wirtschaftswissenschaftliche Forschung am Beispiel der Unternehmensund Industriestatistik," *Asien*, No. 75 (2000), pp. 20–43. Fischer emphasizes, amongst other points, that the transition to the SNA system has not yet been completed, that measurement of newly emerging sectors is very inadequate (e.g. the real estate business), and that there are serious limitations to the comparability of categories during the course of time. The well-known phenomena of faked statistics and secrecy add to these problems. Many comments by Robert Dernberger on the CITAS database still apply, "Provincial yearbooks' CITAS county level data files. Personal comments and evaluation." As recently as 1998, there was a "wind of falsification and embellishment" shaking the entire statistical system; see the analysis in Thomas G. Rawski, "China by the numbers. How reform has affected China's economic statistics," *China Perspectives*, No. 33 (2001), pp. 25–34.

20. See Huang Yasheng, "The statistical agency in China's bureaucratic system. A comparison with the former Soviet Union," *Communist and Post-Communist Studies*, Vol. 29, No. 1 (1996), pp. 59–75. Huang emphasizes the enhancement of central control, despite his general conclusion that the Chinese system is a territorial one. Although this seems to be true of the formal level (i.e. the Law on Statistics as well as the related administrative regulations), our assessment in the 1990s is of the "half full, half empty" kind, because the oscillation between professional and administrative leadership has evidently caused considerable problems for central guidance. For example, the NBS continued to rely on the practice of sending work-teams all over the country to put local statistical offices back on the right track. Our informal interviews support the view that formal centralization and informal fragmentation coexist. With regard to nomenklatura control, we should add that there have also been waves of decentralization in the last two decades, possibly leading towards a bifurcation between more centralized control on upper levels and less central control on lower levels. In their recent analysis, Heilmann and Kirchberger emphasize that the central government is able to impose policy measures in the regions via the nomenklatura system; see Sebastian Heilmann and Sarah Kirchberger, "The Chinese nomenklatura in transition, a study based on internal cadre statistics of the Central Organization Department of the Chinese Communist Party," *China Analysis*, No. 1, Center for East Asian and Pacific Studies, Trier University, June 2000. However, they also show that the centralization drive after 1992 did not reach below the provincial level, affecting only 700 positions on the level of prefecture/bureau which is our concern. We cannot exhaustively identify the reasons why the central government faces this kind of trouble in streamlining the national statistical system. There are impacts of organizational costs, path dependencies resulting from the demolition of the statistical system in the Maoist era, and the political economy of centre–local

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Furthermore, as a result of the administrative reforms in the second half of the 1990s, there is now a distinction between government departments and service departments, the latter including the survey units which collect primary data outside the official statistical system. The service departments have to rely increasingly on income that is generated from profit-seeking activities, that is statistical information and consultancy for the public. Since survey data are frequently used to correct the official data, this is a significant trend, because it inevitably directs attention away from the original duties of these departments. Even the salaries of government officials increasingly have to be supplemented by additional income generated from services, which likewise implies a diversion of activities and resources.

These observations suggest why compliance with the central rules varies. Moreover, there is known to be strong reluctance at the local level to provide access to information to higher-level bodies, for example, in the fiscal system. Especially in the less developed regions, qualified personnel are in short supply. On average (with a large degree of variance) there are about 30 staff members in the prefectural statistical bureaus. Only the government officials are required to pass an entrance examination, a principle which is not always observed in less developed regions where "connections" often secure access to the benefits of government employment. Better qualified statisticians are attracted to the better developed regions where salaries and living conditions are higher. The recruitment freeze in the government sector since 1998 has immobilized the existing personnel structure and qualification levels. There is also a "brain drain" out of the government sector in general, with many of the most talented and highly-qualified staff leaving for better-paid positions, in, for example, Sino-foreign joint ventures.

The central government has thus not been fully able to impose a common approach throughout the country, although standard procedures are regularly promoted at national conferences for the provincial bureaus, which in turn organize co-ordinating activities on the lower level. There are also clear regulations on definitions, procedures, forms and most important aspects of statistical work.

Tables 1 to 3 provide a complete overview of the national availability of prefectural data (black), distinguishing explicitly between the original data and the number of cases (grey) in which it is possible to apply estimation procedures to close the gaps (white).[21] Table 4 indicates

footnote continued

interaction. Perhaps there are also cultural forces at work; see Carsten Herrmann-Pillath, "Strange notes on modern statistics and traditional popular religion in China: further reflections on the importance of sinology for social sciences as applied on China," in Lutz Bieg, Erling von Mende and Martina Siebert (eds.), *Ad Seres et Tungusos. Festschrift für Martin Gimm* (Wiesbaden: Harrassowitz, 2000), pp. 171–190.

21. Detailed information about regression results can be obtained from the authors on request. This kind of information has only been included if the results are statistically sound. Two examples: we use data on urban wages (*chengzhen jumin renjun gongzi shuiping*) to estimate urban income. For this purpose we made a regression using the provincial ratio of urban income to wages to obtain the prefecture estimates for urban income. The fit with existing data was very high in all provinces (adjusted $R^2 > 0.8$). To obtain the missing rural

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Table 1: **Statistical Indicators Available on the Level of Prefecture, 1993**

1993	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Anhui																	
Beijing*																	
Fujian																	
Gansu																	
Guangdong																	
Guangxi																	
Guizhou																	
Hainan*																	
Hebei																	
Heilongjiang																	
Henan																	
Hubei																	
Hunan																	
Jiangsu																	
Jiangxi																	
Jilin																	
Liaoning																	
Neimeng																	
Ningxia*																	
Qinghai*																	
Shaanxi																	
Shandong																	
Shanghai*																	
Shanxi																	
Sichuan																	
Tianjin*																	
Tibet*																	
Xinjiang																	
Yunnan																	
Zhejiang																	
total missing	0	1	2	4	11	15	12	2	1	13	17	0	13	16	5	7	11
after estimation	0	0	1	2	11	15	12	0	1	10	17	0	13	1	1	7	11

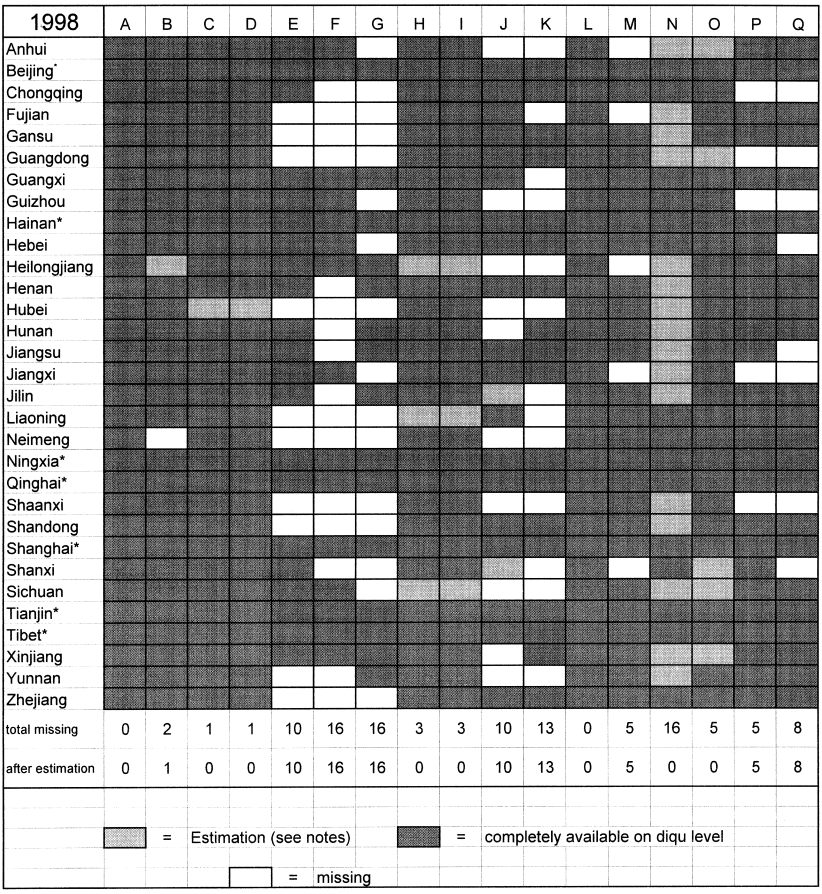
= only available for some prefectures of the province or estimated (see notes)
= completely available for all prefectures of the province
= missing

Notes:
A Total number of year-end population (*niandi zong renkou shu*)
B Number of agricultural/non-agricultural population (*nongye renkou shu/fei nongye renkou shu*)
C Total gross domestic product (GDP) (*guonei shengchan zongzhi*)
D GDP by primary/secondary/tertiary sector (*guonei shengchan zongzhi di yi/er/san chanye fen'e*)
E Total number of employed persons (*congye zhigong renshu*)
F Number of persons employed in primary/secondary/tertiary sector (*di yi/er/san chanye congye renyuan renshu*)
G Number of persons employed in state-owned enterprises (*guoyou danwei congye renyuan renshu*)
H, I Local government fiscal revenue/expenditure (*difang caizheng shouru/zhichu*)
J FDI (amount of foreign capital actually used) (*waishang zhijie touzi, shiji liyong waizi e*)
K Local export value (*an jingying danwei suozaidi huafen de chukou*)
L Total retail sales of consumer goods (*shehui xiaofeipin lingshou zong'e*)
M Total investment in fixed assets (*guding zichan touzi*)
N Annual disposable income per capita of urban residents (*chengzhen jumin renjun ke zhipei shouru*)
O Annual net income per capita of rural population (*nongcun jumin renjun chun shouru*)
P, Q Profits before/after tax of all state-owned industrial enterprises and non-state owned industrial enterprises with annual sales value above 5 million RMB (*guoyou ji guimo yishang feiguoyou gongye qiye lishui zong'e he lirun zong'e*)

footnote continued
income data we made a regression on the prefecture rural expenditure data, taking the provincial ratio of rural income to rural expenditure as coefficient (all adj. $R^2 > 0.85$).

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Table 2: **Statistical Indicators Available on the Level of Prefecture, 1998**



1998	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Anhui																	
Beijing*																	
Chongqing																	
Fujian																	
Gansu																	
Guangdong																	
Guangxi																	
Guizhou																	
Hainan*																	
Hebei																	
Heilongjiang																	
Henan																	
Hubei																	
Hunan																	
Jiangsu																	
Jiangxi																	
Jilin																	
Liaoning																	
Neimeng																	
Ningxia*																	
Qinghai*																	
Shaanxi																	
Shandong																	
Shanghai*																	
Shanxi																	
Sichuan																	
Tianjin*																	
Tibet*																	
Xinjiang																	
Yunnan																	
Zhejiang																	
total missing	0	2	1	1	10	16	16	3	3	10	13	0	5	16	5	5	8
after estimation	0	1	0	0	10	16	16	0	0	10	13	0	5	0	0	5	8

= Estimation (see notes) = completely available on diqu level

= missing

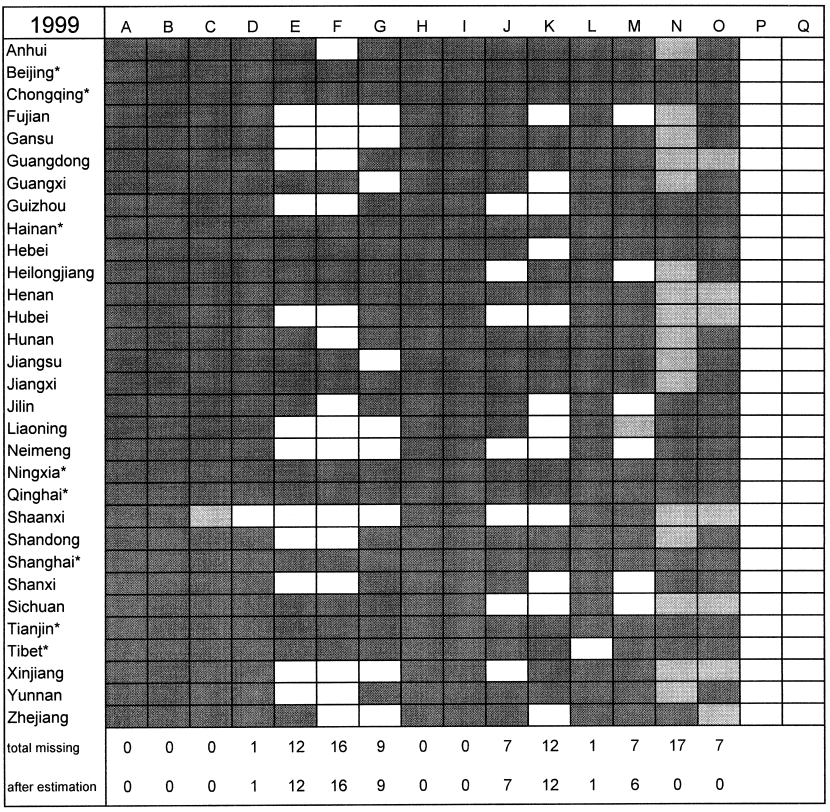
Notes:
See Table 1.

the general trend in terms of data availability. More specific comments are:

- Inner Mongolia (Neimeng) has introduced indicators O, P, Q; however, indicator J was deleted in 1998; in 1999 L was removed, but indicator B was re-introduced. A similar movement in both directions can be observed, for example, in Liaoning, Zhejiang and Henan.
- Between 1993 and 1998 the gaps in prefecture-level data for Liaoning, Hubei and Sichuan became increasingly conspicuous, and there is little evidence of efforts to included missing indicators, with notable examples as, for example, Guangxi and Shandong.
- In some cases (such as Guangdong) there is no evidence of efforts to develop the set of indicators further. For single indicators, there are inconsistencies in availability across all provinces, as M. For other indicators, there seems to be a systematic reluctance to further increase availability (E, F and G, with the latter showing improvements in 1999).
- In general, although the layout and systematic composition of the yearbooks were

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Table 3: **Statistical Indicators Available on the level of Prefecture, 1999**



1999	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Anhui																	
Beijing*																	
Chongqing*																	
Fujian																	
Gansu																	
Guangdong																	
Guangxi																	
Guizhou																	
Hainan*																	
Hebei																	
Heilongjiang																	
Henan																	
Hubei																	
Hunan																	
Jiangsu																	
Jiangxi																	
Jilin																	
Liaoning																	
Neimeng																	
Ningxia*																	
Qinghai*																	
Shaanxi																	
Shandong																	
Shanghai*																	
Shanxi																	
Sichuan																	
Tianjin*																	
Tibet*																	
Xinjiang																	
Yunnan																	
Zhejiang																	
total missing	0	0	0	1	12	16	9	0	0	7	12	1	7	17	7		
after estimation	0	0	0	1	12	16	9	0	0	7	12	1	6	0	0		

Notes:
See Table 1.

improved substantially in 2000, there has still been no commensurate change in the general availability of data categories across the provinces. On the contrary, some new gaps are in evidence.

An important symptom of the lack of an integrated regulatory system is that the definitions of statistical indicators often differ across the PSY and among the PSY and National Statistical Yearbooks. Examples include:

- Differences in the definition of annual disposable income of urban residents. In the Heilongjiang PSY for 1998 it is defined as total income minus income tax, while other PSYs stipulate additional factors that have to be subtracted from total income, such as expenditure for household sideline production or survey subsidy.
- Significant differences in the definition of the annual net income of the rural population. In the Guangdong PSY for 1998 net income is defined as total income minus expenses for household production minus expenses for depreciation of household productive fixed assets minus tax payments minus contracted profits with the collective minus survey subsidies. Total income is therefore defined as total cash income and income in kind from production and services, including income obtained from government revenue and other non-rural residents. For

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Table 4: **Total Availability of Prefectural Data after Estimations, 1993/98/99 (312 prefectures)**

	A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*	*M*	*N*	*O*	*P*	*Q*	*TOTAL*
1993	312	300	296	285	161	114	145	306	295	153	74	309	147	298	293	219	165	0,745
1998	312	300	312	312	174	112	113	312	312	162	131	312	252	312	312	260	227	0,799
1999	312	311	312	302	154	104	206	312	312	204	168	311	233	308	311			0,825
change 1993/98	0	0	16	27	13	− 2	− 32	6	17	9	57	3	105	14	19	41	62	
change 1998/99	0	11	0	− 10	− 20	− 8	93	0	0	42	37	− 1	− 19	− 4	− 1			
change 1993/99	0	11	16	17	− 7	− 10	61	6	17	51	94	2	86	10	18			

Notes:
See Table 1.

examples of inconsistencies in the definition of total income see the Heilongjiang PSY for 1998, p. 181 and the Shandong PSY for 1998, p. 474. It is not clear whether the definitions are simply inexact or whether the methods and calculation of the rural income survey really differ among the provinces. This problem seems to have been tackled in 2000.

- In general, definitions of local prefecture government fiscal revenue and expenditure are incomplete. They list a number of the taxes included, but give no information about the mode of revenue sharing with the provincial or central government or about extra-budgetary funds.
- The prefecture-level income data from the PSY are based on samples taken by the provincial statistical bureaus. Details on the methodology used and on the size of the samples are rarely given. This should be kept in mind when comparing prefectures across provinces. For some provinces, the prefecture-level data have to be calculated as an aggregation of the county-level data sets.
- There is frequent use of "et cetera" (*deng*) as the final word in definitions. This vagueness makes comparison difficult, though the general suspicion might be that this actually means nothing.

The NBS tries to remedy the problem of non-comparability of provincial data by means of large-scale sample surveys, the results of which are used to correct the reported data. The surveys are implemented by national survey units, such as the Enterprise Survey Organization at the NBS, which are independent of the administrative hierarchy of government. However, these samples cannot be used to analyse regional differences since the criteria of representativeness (if observed at all) only apply on the national level. Therefore, resulting amendments can only refer to the national data, and are of no help when considering the disaggregate level. This difficulty is duplicated when including independent survey data on the provincial level because there is no information about the sampling procedures used below the national level.

Additional problems result from the fact that there are also separate ministerial statistics and that some data seem to be reported to certain levels and lines exclusively. This means that the reporting procedure of a unit is determined not only by its location but also by its administrative affiliation. For example, a company affiliated with the provincial government may only report to that level, so that it is excluded from the statistical reports of the prefecture in which it is in effect located. Thus, data on prefectural exports do not agree with provincial figures because companies with provincial affiliation report their export data only to the provincial statistical bureau.

Finally, it is not possible to discover what has been omitted if there is simply no information on definitions and measurement conventions. Even if definitions of indicators vary only marginally across the yearbooks, one cannot determine whether the data are constructed by the same procedure. This is particularly worrying in cases where there are known to be very strong incentives for the local units to fake data and to conceal information from the upper-level authorities. One of the most conspicuous examples, of course, is the fiscal data. The lack of data on extra-budgetary funds, for instance, seriously distorts the picture of intra-regional fiscal capacity. As is well known, extra-budgetary funds are

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much larger in the coastal regions, and there is also a correlation between their magnitude and the share of TVEs in economic activity. The latter is an important determinant of the share of sub-county fiscal revenue in the total revenue of a province, with provinces as diverse as Hunan, Sichuan, Anhui, Jiangsu and Fujian manifesting a share of *xiangzhen* revenue in total provincial revenue of more than 40 per cent.[22] Related to the fiscal data are the data on state-owned companies. Since the government on all levels is still heavily dependent on the state enterprise sector for generating revenue, there are strong incentives to conceal SOE income. Thus, a big question mark has to be put behind the reliability of the indicators of profits before and after tax of state-owned and other large enterprises (P and Q).

In conclusion, with regard to the most recent yearbooks for the year 2000, it is acknowledged that the number of indicators available on the prefecture level for more than ten of the provinces has been substantially increased. Many PSYs now include prefecture data on education, infrastructure, price indices, investment in fixed assets grouped by ownership, and so on. There has been a similar improvement on the county level, with the most important indicators (population, GDP per sector) now available on that level for the majority of provinces. However, since the available collections of time-series data (especially on county level) remain selective and incomplete, this progress does not benefit the longitudinal analysis of regional developments. Nation-wide time-series analysis is constrained by the limitations of earlier versions of PSYs. These limitations are reflected in the composition of the institute database.

Learning from the Prefectural Data for Assessing the State of the Nation: Examples from GDP and Income Statistics

This research note makes only some cursory remarks to illustrate the added value gained by moving beyond the provincial level, particularly with regard to the level of analysis that will best contribute to understanding the causes and consequences of disparities and making the optimal policy response. Although a thorough statistical analysis will be needed to extract all the information contained in the vast quantity of data, even the sketchy observations presented below should suffice to shed new light on the disparity issue.

Basically, there are three different kinds of new insights to be derived from the analysis of prefectural data:

- First, prefectural data reveal convergent trends in cross-border regions as well as

22. For more detail, see Carsten Herrmann-Pillath and Zhu Qiuxia, "Stille Föderalisierung oder kalte Desintegration? Zum institutionellen Wandel des chinesischen Steuerstaates," *Welttrends. Zeitschrift für internationale Politik und vergleichende Studien*, No. 21 (1999), pp. 1903–30, as well as the extended discussion of the recent tax reforms by Le-Yin Zhang, "Chinese central–provincial fiscal relationships, budgetary decline and the impact of the 1994 fiscal reform: an evaluation," *The China Quarterly*, No. 157 (1999), pp. 115–141.

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divergent trends of intra-provincial economic development. These observations cannot be extracted from an analysis of provincial data, whilst county data would cut across integrated urban–rural regional subsystems.
- Secondly, sectoral analysis can be enriched by a more varied regional perspective. This is especially important for the analysis of rural economic development where there are very pronounced inter-regional disparities which are masked either by applying a much coarser regional partition like "coast" and "interior" or by averaging across sectors when using general indicators like per capita GDP.
- Thirdly, there are scale effects of the level of aggregation which directly influence the results obtained by applying general indicators of inequality.

This note presents examples of the first two types of benefits; the third aspect is treated in the companion paper mentioned above (footnote 5). Scale effects result from the mathematical properties of certain indicators and are not directly linked with properties of the object set. This would involve a technical discussion which cannot be pursued here. The coloured maps referred to in the discussion below cannot be reproduced in this note, but can be found on the website http://notesweb.uni-wh.de/wg/wiwi/wgwiwi.nsf/contentbykey/edrr-5F9K4D-en-p; see also the Appendix.

Trends, levels and divergent dynamics of regional growth. A brief look at the provincial patterns of 1999 per capita GDP (map 1), which are familiar from the Chinese debate, reveals the outstanding performance of certain regions like the larger Shanghai/Lower Chang (Yangtzi) region, the Zhu (Pearl) River delta and interior metropolitan areas. However, another look at the related prefecture-level map (map 2) immediately reveals that there is much more variety in regional performance which cannot be straightforwardly interpreted within the "three lines" framework, in particular with reference to the western/central distinction. It is even more illuminating to scrutinize relative performance over time. In the Chinese debate the relative performance of regions is of greater significance than the absolute current levels of development. Map 3 shows the deviation from the national mean of average prefectural real GDP growth rates between 1993 and 1999.[23] These rates provide a very useful perspective on the importance of divergent growth dynamics for national economic development. Three important observations may be noted for further research.

First, cross-provincial areas in which the growth engine has "stalled" are easily recognized (especially if the broadly accepted opinion that there is considerable overestimation of Chinese growth rates is taken for granted). This observation points to the need to redefine economic areas for policy purposes, independent of existing administrative groupings.

23. The "deviation from the mean" is reflected in our maps using the analogy of temperature. All regions with a value below the national mean are shown in blue and those with above-average values in red, with progressively darker shades indicating increasing distance from the mean. The group of prefectures close to the national mean is coloured in white. The length of intervals in the maps is roughly based upon standard deviations. In our maps real values are obtained by using the provincial deflators because there are no prefectural deflators available. As deflators (1993 as the base year) we have used the provincial consumer price indices (CPI) from the National Statistical Yearbooks 1994–2000, which is one of the most commonly used procedures.

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One such area is the triangular border region between Zhejiang, Fujian and Jiangxi. To focus on absolute levels of provincial development can be misleading in such cases: in terms of intra-provincial prefectural GDP per capita averages, Zhejiang and Fujian are both way ahead of Jiangxi, whereas a closer look at the prefectural level reveals that interior prefectures in Zhejiang and Fujian are following the trends observed in their Jiangxi cross-border prefectures, albeit on a different level. Hence, there is a clear need to distinguish between trends and levels, since lower levels of development do not necessarily imply a lack of dynamics, as is obvious from the existence of a growth core in Jiangxi.

The need to distinguish between trends and levels is particularly important for analysing the convergence issue. This becomes obvious when considering performance in the Lower Chang delta. The conventional view emphasizes the stark discrepancies in absolute levels of development that reflect relative distance from the Shanghai growth core (map 4). Superficially, the map mirrors the patterns that were already evident in 1993 pointing at the resilience of patterns of inequality. From this perspective, simple stories as on the Subei/Sunan (north/south) divide in Jiangsu would be accepted.

However, since there are pronounced structural and institutional differences across the prefectures, there is no easy way towards a generalization. In fact, map 3 reveals that Subei achieved above-average performance between 1993 and 1999 which seems to reflect the relative decline of the famous "Sunan model" during that period. In other words, it is a clear indication of the performance gap being closed which cannot be observed when taking only absolute levels into consideration. This story of convergent growth in the Lower Chang provinces is confirmed by the observation of structural trends, which are one of the most reliable indicators of qualitative growth.

In terms of the share of primary production in GDP (map 5), it is northern Jiangsu which shows a stronger decline in the second half of the 1990s, an indicator of the accelerated rate of structural change there.[24] This matches the increase in non-agricultural population. Both trends, especially the former, parallel the trends in coastal and southern Zhejiang.[25] The comparison between Zhejiang and Southern Jiangsu high-

24. Northern Jiangsu is a another case in point for the need of "thick" description, as provided by Jacobs, "Uneven development." On the one hand, the GDP PC map shows that the "coastal belt" with Lianyunyang was the leader between 1993 and 1999, which, given the infrastructural policies adopted in that period, is not unexpected. However, it is surprising that the RPCI map (see below) shows vigorous growth spread across the entire northern area. Whether this is the result of the special development policies launched in that period remains to be investigated.

25. We are well aware of the difficulties associated with the distinction of "non-agricultural population"; see the detailed elaboration of this point in Kam Wing Chan and Li Zhang, "The *hukou* system and rural–urban migration in China: processes and changes," *The China Quarterly*, No. 160 (1999), pp. 818–855, a follow-up to earlier work by Kam Wing Chan. These cannot be resolved for a data set like ours. However, the most serious problem arises for the distinction between "rural" and "urban" population which by definition is irrelevant for the prefecture as an integrated rural–urban unit. Hence, we believe that this is an additional advantage for taking the prefecture as a unit. However, difficulties emerge for prefectures that

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lights the divergent dynamics also in the high-income areas, with Zhejiang gaining momentum and Sunan slowing down. Rather surprisingly, therefore, it seems to be Sunan and not Subei that shows a loss of qualitative dynamics. This example is a demonstration of the general argument presented above that prefecture-level data open up the perspective on integrated urban/rural systems, because regional urban/rural economic integration is the driving force of structural change. The conventional negative assessment of performance in Subei emphasizes the poor performance of particular low-income rural counties and neglects important aspects of the overall picture.[26]

This perspective also provides valuable insights for the assessment of regional policies which are also structured along urban/rural subsystems. In the case of Jiangxi, the relative depression of its border region may simply be a negative reflection of the regional policies adopted by the Jiangxi provincial government to foster the industrial core in the Changjiu region (northern Jiangxi), shortly after Deng Xiaoping's famous southern tour. It is interesting to observe that such a connection between policies and regional imbalances on the national level is reduplicated on a smaller scale on the provincial level, as is also obvious from county-level data on Fujian.[27] Fujian is a conspicuous example of the coastal development policies implemented after 1978, preparing the ground for the emergence of high-performance prefectures. However, preferential policies do not seem to cause "trickle-down" effects for its "interior" prefectures. Hence, two structurally different policy forces in Jiangxi and Fujian work together to produce a structural weakness in the contingent border regions. The result is an "interior" of the broader coastal region.

These first reflections so far suggest that development policies directed at weak performers cannot be conclusively designed on the level of larger aggregates. On the other hand, the second observation is that provincial high performers as Guangdong can show serious intra-provincial imbalances. For example, there is the surprising case of Guangxi, where growth performance (map 3) is on a par with the majority of Guangdong prefectures, apart from the few high performers that emerged out of the preferential coastal development strategy in Guangdong. Guizhou, by contrast, matches the conventional perception of backwardness. This

footnote continued

absorb a very strong in-migration of rural labourers from other prefectures, i.e. where intra-prefectural rural–urban migration represents the minor share of total migration. In our work, this became evident when comparing the 1998 and 1999 data. In 1998, we had to calculate GDP and income data independently, based on the population figures, which led to obviously inflated values for some coastal locations. In 1999, the data had already been processed by the Chinese authorities who had evidently eliminated this source of error.

26. In recent discussions Subei, however, has been identified as a possible case of a misdirected fiscal bubble in infrastructure development. Therefore, our assessment awaits a more detailed examination. See Zhou Qin, "Subei guo du," *Jingjixue xiaoxi bao*, No. 453 (2001).

27. See Feng Chongyi, "Jiangxi in reform: the fear of exclusion and the search for a new identity," in Hans Hendrischke and Feng Chongyi (eds.), *The Political Economy of China's Provinces* (London: Routledge, 1999), pp. 249–276, and Lyons, "Intraprovincial disparities in China."

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contrast is striking when comparing the structural indicators, especially sectoral change (map 5), where Guangxi manifests a stronger decline of the rural share than Guizhou. In 1999 (map 2), Guangxi seems to be on the same level as the backward areas of Guangdong, although relative growth performance indicates a regional divide, with the western part of the province making much better headway in closing the performance gap than the eastern part. Interestingly, while the western part seems to have some impact on southern Guizhou, performance in the majority of Guizhou prefectures is on a par with the low-performing Guangxi prefectures. Hence, this is another cross-border area with common growth patterns, this time a growth triangle encompassing contingent parts of Yunnan, Guizhou and Guangxi, which distinguishes itself from the low-performing prefectures in these provinces.

In a similar vein, broad categorizations like the "north-east" are not helpful in understanding the national growth divergences as there are clear medium to long-term differences across the north-eastern prefectures. For example, the Heilongjiang/Jilin cross-border region is an above-average perfomer, the much-debated issue of state-owned enterprises notwithstanding (map 3). This is also mirrored in the strong increase of non-agricultural population, which is remarkable because the north-east is traditionally the most urbanized area in China, apart from the metropolitan provinces and regions (map 6). When comparing this with the structures shown in map 2, it is clear that this divergent performance has caused an increasing disparity within the north-eastern region, which might be more important in terms of political perceptions than national disparities across provinces.

The last remark reinforces the conclusion that the simple tripartite approach to regional policies in China is misleading (map 1). The third observation is that the prefecture-level maps convey the impression that the most serious shortfalls in economic development are found in the south-western region, whereas some of the north-western prefectures are in the same bracket as some coastal regions. This, of course, is the result of the strong central infrastructural support of these areas as compared to the south-west.[28] Approaching the north-west in terms of provincial averages will not highlight this important difference and may unduly justify Western development strategies. However, as noted above, the prefectural approach reaches its limitation in this area because prefectures

28. In Carsten Herrmann-Pillath and Zhu Qiuxia, "Stille Föderalisierung oder kalte Desintegration? Zum institutionellen Wandel des chinesischen Steuerstaates," we present data on the per capita difference between revenues and expenditures across the provinces (1995 and 1996). The picture which emerges is that level of income is by no means the crucial determinant of fiscal redistribution. In the mid-1990s, Xinjiang, Tibet, Qinghai and Ningxia showed a negative difference (the largest being in Tibet), whereas Yunnan, Sichuan and Anhui have less expenditures than revenue. These different balances show that in spite of the fact that the central government could successfully enhance its control over fiscal resources, the entire amount that can be deployed for alleviating regional disparities remains small. Resources are being concentrated on politically sensitive provinces, whilst the rest of the country is only marginally affected by fiscal redistribution. Compare Jae Ho Chung, "Regional disparities, policy choices and state capacity in China," *China Perspectives*, No. 31 (2001), pp. 36–51.

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cover very large territories. More detailed analysis presupposes the inclusion of county-level data.

Rethinking relative rural performance. Adopting the prefectural point of view also gives a very different view of structural trends, in particular of the hotly debated rural issue. Conventionally, there is the perception that the 1990s have seen a long-run relative decline of the rural income position. This provides the basis for the pessimistic predictions of medium-term agricultural development after WTO entry. However, the prefectural data on rural income show a much more complex and diversified picture which is striking when comparing the GDP and the rural income maps. Of course, per capita income cannot be directly compared with GDP, but nevertheless the different trends are significant. The first insight to be gained from map 7 is that there is also a north/south divide that runs counter the east/west divide commonly emphasized in policy analyses. In short, the majority of (central)-northern Chinese prefectures show above-average performance, whereas the picture in southern China is very complex. A lagging western subregion can be identified most clearly when using map 8, although even this view on relative levels on income does not support the simple east/west distinction. But the pattern of regional growth performance shows an even distribution of high- and low-performing prefectures across the national territory.

Prominent examples are, first, the large cross-provincial area including Guizhou and Yunnan, where the rural population achieved a better-than-average rate of income growth, as compared with Guangxi which was identified as a high performer in terms of GDP, pointing at a strong impact on the non-rural sector in the latter province. Moreover, Hebei's good overall performance seems to be based on a strong increase in rural incomes, which is likewise true of Jiangsu.

The implication of this is that in the second part of the 1990s, TVE development indeed lost momentum, which is also demonstrated by the remarkable fact that southern Jiangsu, star performer of the past, is on par with the northern part in terms of the relative growth of rural income. In this respect, southern coastal Zhejiang is ahead of northern Zhejiang as well as southern Jiangsu. These new trends mirror the problems of the TVE, which have long been developing in the context of rural–urban subsystems. In contrast, the famous "Wenzhou" model increasingly dominates the entire Zhejiang provincial economy.[29]

There is a large area of rural poor performers across Shanxi, Shaanxi and Hubei, which qualifies the central region of China as a special problem area in agricultural development, a conclusion which is not that evident when comparing the absolute levels of income between Hubei and other provinces (map 8). In Guangdong the rural population seems to be facing serious obstacles to increasing their income levels further,

29 Meanwhile, the burst of the Sunan collective bubble economy is a hot topic in Chinese journals, see, for example, the special theme in *Caijing*, No. 38 (May 2001), pp. 33ff.

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resulting from the structural disparities in economic development between coastal and interior prefectures.

The acute structural challenges confronting Guangdong province are also highlighted by another map on the urban–rural income difference in 1999 (map 9), which shows two of the most extreme cases among all prefectures to be located in Guangdong. This map is also an illustration of how well the integrated prefectural approach lends itself to investigations into the rural–urban issue, precisely because it facilitates the disaggregated analysis of comparative rural–urban data, which is not straightforwardly possible when operating on the county level. As we demonstrate in our companion paper (see footnote 5), the prefectural analysis allows a neat distinction between intra-provincial impacts on rural–urban disparities and the impact that results from the geographic location of provinces and/or prefectures on the entire Chinese territory. While the disparity is very pronounced in northern Guangdong, although this is a coastal province, Jiangsu falls into the category of relative low disparities. Patterns of disparity in geographically contingent provinces like Hubei and Hunan can vary substantially.

Map 9 is also illuminating because it highlights one possible explanation for the recent emphasis on the West in Chinese economic policies: rural–urban disparities may be one of the most destabilizing forces in the political economy of China, and this is indeed a "Western" issue. However, other data also show that this may foremost be a result of urban preferential policies, and not of rural developmental problems per se. Hence, the "Go West" slogan in Chinese policies can be interpreted as the attempt to increase the cake for all parties involved, without hurting the entrenched regional interest groups.

All in all, these examples highlight the potential of the prefectural approach towards regional development in China. Available data allow a host of interesting questions to be posed, and we are confident that the data will also provide the answers.

Conclusion: Between Statistical Generalization and Thick Description

There is no dispute over the need to use disaggregate data in order to understand the complexity of economic and social, and perhaps even political, changes in the vast country of China. Problems arise when we consider ways of handling the necessarily increasing amount of information as we move on to lower levels of the systems, and how to assess the reliability of the conclusions derived from data of an uncertain and varying quality. This research note has introduced the approach on the level of the prefecture, which is one of the most promising venues to understand regional development in China. That being said, however, the choice of approach clearly depends on the research issue in question. In our companion paper we attempt to prove, in more conclusive formal terms, what level of aggregation might be the most appropriate to analyse the development of disparities on the national level if we wish to disentangle the effects of mere spatial location from other determinants of inequalities, and if we aim at constructing a "pure" indicator of inter-

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regional inequality. We can finally prove, for example, that the common "three lines" partition of China is particularly misleading in this regard, because one of the decisive factors influencing the choice of the appropriate level is the structural similarity of the constituent units. In general, the "three lines" approach hides more than it reveals.

But having selected the optimum degree of disaggregation to describe disparities and trends in regional development, we need to move a step further towards understanding the causal forces. Even the brief discussion above demonstrates that the development of general hypotheses depends on knowledge of institutional and structural similarities among the provinces and prefectures. This is the background against which the singular determinants peculiar to each location are brought into focus. This knowledge cannot be obtained simply by analysing the accessible data. We have to rely on much more fine-grained and "thick" descriptions of the different regional systems in China. This is indeed the rationale behind the recent upsurge in provincial research in Chinese studies. It cannot be taken for granted that there are structural and institutional affinities powerful enough to impose analytical regularities on the movements of disaggregate indicators with national scope, even though there are clear examples of these, like the nation-wide scope of the politics of urban privileges and the *hukou* system.[30] In the past, this was assumed because the political centre was perceived as a unifying force in the institutional context, and because the planned economy was believed to imply structural linkages across the country. After having "deconstructed" China in the mid-1990s, researchers now need to prove whether or not such analytical premises are justified and then move on to testing generalizations. The prefecture seems to offer a workable compromise between the "local" and the "national" levels, being the "regional" unit *par excellence*.[31]

A sound mix of statistical analysis and "thick" local and regional studies is the ideal way to understand the complexities which underlie one of the most challenging developments in contemporary China, namely the regional imbalances in economic development.[32] It is the only

30. For example, Herrmann-Pillath *et al.*, "Disparities in Chinese economic development," shows for the General Measure of Entropy that performance of the GDP and the income data is uneven, leading to the conclusion that more nationally homogenous forces work on the latter, whereas province-specific structural properties affect the former much more strongly. Indeed, personal income is much more influenced by the nation-wide system of privileges and indirect subsidies than GDP.

31. Compare Wing-shing Tang, Si-ming Li and Reginald Yin-wang Kwok, "Space, place, and region and the study of contemporary China," in Si-ming Li and Wing-shing Tang (eds.), *China's Regions, Polity & Economy, A Study of Spatial Transformation in Post-Reform China* (Hong Kong: Chinese University Press, 2000), pp. 4–31. The authors emphasize the far-reaching impact of the state on spatial structures, which is particularly true for higher-level units. Extracting societal, physical and economic patterns from the official geography of China remains an important task which might finally result in a re-mapping of the entire national territory. The prefecture or a kindred regional unit seems to be the appropriate building bloc.

32. Compare the rich methodological reflections by Daniel Little, who also argues for a medium-level approach towards abstraction, and interestingly takes Skinner's macroregion approach as a starting point. Daniel Little, *Understanding Peasant China, Case Studies in the Philosophy of Social Science* (New Haven & London: Yale University Press, 1985).

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way to overcome the fundamental problem of any statistical analysis, that it is based on past data, and that the assumption of stable regularities governing past performance is necessary to generate statistical inferences that constitute the basis for forecasting future trends. "Thick" description is the only way to draw inferences from observed changes in the reference frame of complex developments like the Chinese transition. It is very difficult, for instance, to assess whether today's imbalances will evolve into tomorrow's competitive advantages, the latter simply still being suppressed by ongoing government intervention in, for example, agriculture. China's admission to the WTO and the implied liberalization and opening of regional markets will further increase the complexities of regional development. Therefore, the establishment of regional information systems on economic and societal changes is of utmost importance not only for a better understanding of these historical changes, but also for the determination of appropriate and effective policy measures.

Appendix: **The Institute for Comparative Research Into Culture and Economic Systems data base as accessible via www.on-China.de**

Map: **China's Prefectures**



I. Administrative division

Borders of prefectural administrative division 1993–99 (including merged units due to administrative border changes)
The three belts regional framework
Seven Macroregions (working paper definition)

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II. Population

Prefecture-level:

Population density (population per sq km), 1993
Population density (population per sq km), 1998
Total population growth rate in %, 1993/98
Share of non-agricultural population to total population in %, 1993
Share of non-agricultural population to total population in %, deviation from national mean, 1993
Share of non-agricultural population to total population in %, deviation from national mean, 1998
Growth rates of the share of non-agricultural population to total population in %, deviation from national mean, 1993/98
Absolute growth rates of the share of non-agricultural population to total population in %, 1993/98
Share of non-agricultural population, 1999
Share of agricultural population, 1999
Population growth rate, 1993/99
Absolute growth of share of non-agricultural population, 1993/99

Province-level:

Total population in millions, 1999
Share of non-agricultural population, 1993
Share of non-agricultural population, 1998
Absolute growth of the share of non-agricultural population, 1993/98
Total population growth rate, 1993/99

III. GDP and its composition

Prefecture-level:

GDP per capita (GDPPC) in RMB, 1993 (in 1998 deflated prices quintile)
GDP per capita (GDPPC) in RMB, 1998 (1993 prices), quintile
Average annual growth rates of GDP per capita (GDPPC), deviation from national mean, 1993 to 1998 (1993 prices)
Share of primary sector to total GDP in %, 1993
Share of primary sector to total GDP in %, 1998
Growth rates of the share of primary sector to total GDP in %, deviation from national mean, 1993/98
Share of secondary sector to total GDP in %, 1993
Share of secondary sector to total GDP in %, 1998
Growth rates of the share of secondary sector to total GDP in %, deviation from national mean, 1993/98
Share of tertiary sector to total GDP in %, deviation from national mean, 1993
Share of tertiary sector to total GDP in %, deviation from national mean, 1998

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Growth rates of the share of tertiary sector to total GDP in %, deviation from national mean, 1993/98
GDP per capita (GDPPC) in RMB, deviation from national mean, 1993
GDP per capita (GDPPC) in RMB, deviation from national mean, 1998
Total GDP in 10,000 RMB, 1999
GDP per capita, deviation from mean, 1999
Share of primary sector in GDP, 1999
Share of secondary sector in GDP, 1999
Share of tertiary sector in GDP, 1999
GDP per capita growth rate, 1993/99
GDP per capita growth rate, 1993/99, deviation from mean
Absolute growth of primary GDP share, 1993/99
Absolute growth of secondary GDP share, 1993/99
Absolute growth of tertiary GDP share, 1993/99

Province-level:

GDP per capita, deviation from mean, 1993
GDP per capita, deviation from mean, 1999
GDP per capita real growth, deviation from mean, 1993/99
Primary share of GDP, 1993
Primary share of GDP, 1999
Absolute growth of primary share of GDP, 1993/99
Secondary GDP share, 1993
Secondary GDP share, 1999
Absolute growth of secondary GDP share, 1993/99
Tertiary GDP share, 1993
Tertiary GDP share, 1999
Absolute growth of tertiary GDP share, 1993/99

IV. Employment

Prefecture-level:

Share of employed population to total population in %, 1993
Share of employed population to total population in %, 1998
Share of employment in state-owned enterprises to total employment in %, 1993
Share of employment in state-owned enterprises to total employment in %, 1998
Employment share (total employment/total population), 1999
Share of employment in SOE, 1999
Total employment in SOE in 10,000, 1999

Province-level:

Employment/population, 1993
Employment/population, 1999
Primary share in employment, 1993
Secondary share in employment, 1993
Tertiary share in employment, 1993
Share of SOE employment, 1993
Share of rural workforce in total employment, 1993

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Primary share in employment, 1999
Secondary share in employment, 1999
Tertiary share in employment, 1999
Share of SOE employment, 1999
Share of rural workforce in total employment, 1999

V. Public Finance

Prefecture-level:

Local government fiscal revenue per capita in RMB, 1993
Local government fiscal revenue per capita in RMB, 1998
Growth rates of the share of local government fiscal revenue to total GDP in %, 1993/98
Local government fiscal expenditure per capita in RMB, 1993
Local government fiscal expenditure per capita in RMB, 1998
Local government fiscal deficit (fiscal expenditure – fiscal revenue) per capita in RMB, 1993
Local government fiscal deficit (fiscal expenditure – fiscal revenue) per capita in RMB, 1998
Share of local government fiscal expenditure to total GDP in %, 1993
Share of local government fiscal expenditure to total GDP in %, 1998
Growth rates of the share of local government fiscal expenditure to total GDP in %, 1993/98
Fiscal revenue per capita in RMB, 1999
Fiscal expenditure per capita in RMB, 1999
Fiscal deficit per capita in RMB, 1999
Fiscal expenditure to GDP ratio, 1999

Province-level:

Fiscal revenue per capita, 1993
Fiscal expenditure per capita, 1993
Fiscal revenue per capita, 1999
Fiscal expenditure per capita, 1999
Fiscal deficit per capita, 1993
Fiscal deficit per capita, 1999
Fiscal expenditure/GDP, 1993
Fiscal expenditure/GDP, 1999

VI. Foreign trade

Prefecture-level:

FDI (amount of foreign capital actually used) in 10,000 US$, 1993
FDI (amount of foreign capital actually used) in 10,000 US$, 1998
FDI in 10,000 US$, 1999
FDI per capita in US$, 1999
Export in 10,000 US$, 1999

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Province-level:

FDI in 10,000 US$, 1993
FDI in 10,000 US$, 1999
Export in 10,000 US$, 1993
Export in 10,000 US$, 1999
FDI per capita in US$, 1993
FDI per capita in US$, 1998
FDI per capita in US$, 1999
Cumulative FDI per capita 1978–98

VI. Income and consumption

Prefecture-level:

Total retails sales of consumer goods per capita in RMB, 1993
Total retails sales of consumer goods per capita in RMB, 1998 (1993 prices)
Growth rates of total retails sales of consumer goods per capita in RMB, 1993/98
Annual disposable income per capita for urban population (UPCI) in RMB, deviation from national mean, 1993
Annual disposable income per capita for urban population (UPCI) in RMB, deviation from national mean, 1998
Growth rates of UPCI in %, deviation from national mean, 1993/98 (1993 prices)
UPCI in RMB, 1993 in quintile of 1998 UPCI (1993 prices)
UPCI in RMB, 1998 (1993 prices) in quintile
Annual net income per capita for rural population (RPCI) in RMB, deviation from national mean, 1993
RPCI, deviation from national mean, 1993
RPCI, deviation from national mean, 1993 in quintile of 1998 RPCI (1993 prices)
RPCI, deviation from national mean, 1998 (1993 prices) in quintile
Growth rates of RPCI in %, deviation from national mean, 1993 to 1998 (1993 prices)
Urban-rural income disparity (UPCI/RPCI), 1993
Urban-rural income disparity (UPCI/RPCI), 1998
Growth rates of urban-rural income disparities (UPCI/RPCI), deviation from national mean, 1993/98
Total retail sales per capita in RMB, 1999
Total per capita income (TPCI) in RMB, 1999
Urban per capita income (UPCI) in RMB, 1999
Rural per capita income (RPCI) in RMB, 1999
Rural-urban disparities (UPCI/RPCI), 1999
Wages of urban workers in RMB, 1999
Growth rate of total per capita income (TPCI), 1993/99
Growth rate of rural per capita income, 1993/99

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Growth rate of urban per capita income, 1993/99
Absolute growth of rural-urban disparities (UPCI/RPCI ratio), 1993/99

Province-level:

Retail sales per capita, 1993
Retail sales per capita, 1999
Rural per capita income (RPCI), 1993
Rural per capita income (RPCI), 1998
Rural per capita income (RPCI), 1999
Real growth of rural per capita income (RPCI), 1993/98
Urban per capita income (UPCI), 1993
Urban per capita income (UPCI), 1998
Urban per capita income (UPCI), 1999
Real growth of urban per capita income (UPCI), 1993/99
Total per capita income (TPCI), 1993
Total per capita income (TPCI), 1998
Real growth of total per capita income (TPCI), 1993/98
Rural-urban disparities (UPCI/RPCI ratio), 1993
Rural-urban disparities (UPCI/RPCI ratio), 1998
Rural-urban disparities (UPCI/RPCI ratio), 1999
Absolute growth of (UPCI/RPCI ratio), 1993–99
Consumer price index 1993/99 (used to deflate all 1999 prices)

VII. Investment

Prefecture-level:

Investment in fixed assets per capita in RMB, 1993
Share of investment in fixed assets to total GDP in %, 1993
Investment in fixed assets per capita in RMB, 1998
Share of investment in fixed assets to total GDP in %, 1998
Total investment in fixed assets per capita in RMB, 1999
Savings rate (fixed investment to GDP), 1999

Province-level:

Investment in fixed assets per capita, 1993
Investment in fixed assets per capita, 1999
Investment in fixed assets/GDP, 1993
Investment in fixed assets/GDP, 1999

VIII. Enterprises

Profits before tax of all state owned industrial enterprises and non-state owned industrial enterprises with annual sales value above 5 million RMB in million RMB, 1993

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Profits after tax of all state owned industrial enterprises and non-state owned industrial enterprises with annual sales value above 5 million RMB in million RMB, 1993

Profits before tax of all state owned industrial enterprises and non-state owned industrial enterprises with annual sales value above 5 million RMB in million RMB, 1998

Profits after tax of all state owned industrial enterprises and non-state owned industrial enterprises with annual sales value above 5 million RMB in million RMB, 1998

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