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Chen, Xi and Zhang, Xiaobo

Cornell University, International Food Policy Research
Institute

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The Distribution of Income and Well-Being in Rural China: A Survey of Panel Data Sets, Studies and New Directions

Xi Chen*

Department of Applied Economics and Management, Cornell University

Xiaobo Zhang[†]

Development Strategy and Governance Division, International Food Policy Research Institute

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Abstract

This paper reviews the recent literature on inequality and income distribution in rural China utilizing panel datasets. We begin by briefly summarizing and comparing available panel datasets for rural China that can be employed to explore issues on inequality and income distribution, and major data issues that might act as obstacles to research and policy enforcement are then analyzed. The paper then reviews the trend and spatial decompositions of rural income inequality, its major determinants, and its relationship with household welfare. Dimensions other than income inequality, such as income mobility and income polarization, are categorized and reviewed respectively. A recently developed branch of literature on inequality and health is summarized. On the basis of the review, this paper concludes by identifying new research areas with existing panel data sets and a new panel dataset that could shape future research.

Keywords: Inequality, Income Distribution, Rural China, Panel Data.

*Address: 432 Warren Hall, Cornell University, Ithaca, NY 14850, USA, telephone: 1-607-220-4172, e-mail: *xc49@cornell.edu*. We are grateful to Ravi Kanbur for invaluable comments, guidance and encouragement. We also benefited from discussions with Robert Frank. The authors take all responsibility for the remaining errors and omissions. This paper is prepared for presentation at the Inaugural CEA (Europe) and 20th CEA (UK) Annual Conference, University College Dublin, Ireland, July 23-24, 2009. The views expressed herein and any remaining errors are the authors' and do not represent any official agency.

[†]e-mail: *x.zhang@cgiar.org*

1 Introduction and Overview

China has been experiencing impressive growth over the past thirty years, with a commensurate increase in average living standards. However, the strategy of "*Let some people get rich first*" has resulted in a huge income gap between urban and rural, east and west, coastal and inland China. There are mounting concerns that the growing inequality hinders sharing of the fruits of economic development. In addition, social unrest accompanies worsening inequality may slow down economic transition and hinder future growth.

According to China National Bureau of Statistics (NBS), in 2007 the rural population of China is 0.73 billion, accounting for 56 percent of the total population. With unequal access to education, health care, rural financial system and non-farm opportunities, and low returns to agriculture, keeping focus on rural inequality and social class divergence are of utmost importance to maintain economic growth and social stability in contemporary China.

Studies of rural inequality started in the early 1990s when distributional snapshots with cross sectional data became available. Extensive literature has been accumulated on the evolution of inequality in rural China since the onset of reforms in the late 1970s. The primary focus has been on estimating the level of inequality and its changes over time, identifying the underlying sources of the inequality and its changes, and exploring aggregate (disaggregate) level effects of inequality. However, since the late 1990s and the early 2000s, a second wave of inequality studies has started to dominate the discussion as more and more panel datasets in China have become available. To our knowledge, this paper is the first comprehensive review of studies on income distribution and well-being that use available longitudinal datasets from rural China.

Rural and urban household surveys for China are largely independent. In this paper, inequality and income distribution in rural China will be addressed. Two other sources of rising inequality in China, namely inequality between urban and rural areas and inequality within urban areas are not touched upon in this review. Nevertheless, it is worth emphasizing the importance of rural inequality in influencing the other two sources of rising inequality in China. For instance, it is found that much of the increase in the rural-urban gap appears to be the result of a growing difference in incomes between rural households in the coastal and interior provinces. Meanwhile, in standard datasets such as the Urban Household Survey (UHS) sponsored by the NBS, faster growing suburban areas are getting reclassified as urban areas and included in the urban inequality index. Massive migration from rural to urban caused by rural inequality might also influence urban inequality and the rural-urban gap.

The review is organized as follows. In Part 2, we begin by summarizing available panel datasets for rural China that can help explore issues on inequality and income distribution. In Part 3, comparisons among panel datasets are conducted. Major data issues that might

act as obstacles to research and policy enforcement are then analyzed. Part 4 reviews the trend and spatial decompositions of rural income inequality, its major determinants, and its relationship with household welfare. Dimensions other than income inequality, such as income mobility and income polarization, are categorized and reviewed respectively. A newly established branch of discussions on inequality and health is summarized, which sheds light on our proposal for datasets of special features. On the basis of the review, Part 5 concludes by proposing new research areas with previous panel datasets and a new area with a new panel dataset.

2 Panel Data Sources for China

In China, five major household level panel datasets are used to explore rural inequality and distribution, which include RCRE (Research Center for Rural Economy), RHS (Rural Household Survey), CHNS (China Health and Nutrition Survey), CHIPS (Chinese Household Income Project Survey), and CAPM (Chinese Academy of Preventative Medicine). These panel data sets include both balanced and unbalanced panels, and the majority of them are unbalanced because of sample rotation or attrition.

To compare levels of inequality from a country as vast as China, it is crucial that the samples be representative of the same population, and ideally, all of China. In principle, RHS and RCRE are the best datasets to meet this requirement, and both surveys are effectively implemented by sectors in the central government, which are NBS and Ministry of Agriculture (MOA) respectively. RHS is an annual China rural household survey dating from the early 1980s. It is of high quality in many respects, including both sampling methods and the unusual effort made to minimize non-sampling errors. It covers 31 provinces, 7100 villages, and 68190 households. However, in-depth analysis of RHS has been limited to selected sub-samples of provinces, and only for a few years (such as Ravallion and Chen, 1999; Tsui, 1998b). The full sample RHS data has not yet been publicly released and systematically analyzed. Similarly, RCRE is an annual China rural household survey dated from the mid 1980s. It is also nationally representative, covering 31 provinces, 360 villages, and 24000 households. Likewise, all households covered by RCRE are asked to keep detailed diary records of household information.

Different from RHS and RCRE, CHNS, CHIPS, and CAPM are organized by research institutions with relatively limited geographic coverage and/or smaller samples. CHNS is an ongoing international collaborative project between University of North Carolina (UNC) and Chinese Center for Disease Control and Prevention (CCDCP). It is designed to examine the effects of the health, nutrition, and family planning policies and programs implemented by national and local governments and to see how the social and economic transformation of

Chinese society is affecting the health and nutritional status of its population. It covers a 7-year household panel dataset in 9 provinces, 100 villages, and 2000 households. Daily dietary intake is carefully measured in the dataset. CHIPS covers around 20 provinces and 4000-9000 households, which is mainly sponsored by Chinese Academy of Social Sciences (CASS). Three surveys have been conducted in 1988, 1995, and 2002, which include detailed current and retrospective information on households' income and consumption and their components. CAPM is a 2-year social survey of 25 provinces, 138 villages, and around 8,000 households in rural China between 1978 and 1989. The first survey focuses on relationship between nutrition and cancer; the second wave also involves multilevel socioeconomic questionnaires.

Besides the above-mentioned data, some datasets are collected for special research purposes. For example, MORDUCH, used in a study by Morduch and Sicular (2002), is a small random sample survey of 259 farm households in 16 villages in an eastern China county. The survey follows households from 1990 to 1993. The survey was tailored to deliver consistent information on income and other economic, social, and political variables. Another census-type household panel survey, IFPRI-CAAS, is collected by International Food Policy Research Institute (IFPRI) and Chinese Academy of Agricultural Sciences (CAAS). The dataset focuses on three administrative villages in a western China county. The survey reveals detailed information on household incomes and expenditures (including detailed information on social spending). Information is collected for each household member.

Given the limited availability of household panel data, macro level panel datasets are popular in use. For instance, RSESS-NBS (Rural Social and Economic Survey Service of NBS) includes time series (1985-2002) and cross provincial (28 provinces) data from rural China. RSESS-NBS can be found in books such as Poverty Monitoring report of rural China and China yearbook of rural household survey. Compiled aggregate level data can be found on the websites of some research institutions. For example, researchers in IFPRI compiled a dataset mainly from China Statistical Yearbook, China Rural Statistical Yearbook, China Fixed Asset Investment Yearbook, China Education Expenditure Statistical Yearbook, relevant World Bank publications, and China Transportation Yearbook. The dataset provides information on key economic indicators in 29 provinces from 1952 to 2001. Another convenient way to obtain a long-term aggregate panel data is through two statistical yearbooks, Comprehensive Statistical Data and Materials on 50 Years of China and Comprehensive Statistical Data and Materials on 55 Years of China. Some long-term indicators in those two yearbooks have been adjusted to make them the most comparable over time.

3 Panel Data Assessment

3.1 Comparisons among Major Datasets

Before the 1990s, more aggregate level panel data were available than household level panel data. The overall household inequality was understated, since inequality within rural and urban areas of each province was suppressed. Analogously, when we analyze trends and role of contributing factors to inequality such as township and village enterprises, conclusions are valid only insofar as most rural inequality arises from differences in mean incomes across these units. Moreover, they could not say anything about the evolution of household level inequality within those areas.

Since then, a few household level data sets have come on stream. Compared to aggregate datasets, household panel data can construct a rich, comparable panel of villages that might be used to address a host of econometric and empirical issues that dog researchers (Benjamin et al., 2005a). Moreover, with access to household level data over time, by exploiting the household dimension of the panel, we can link the evolution of household level welfare to initial conditions in the village.

The first concern is on geographic representation. Among all panel datasets, RHS-NBS covers the broadest areas over the longest time period. In investigating the role of geographic factors for inequality, most of the panel datasets listed in the Appendix such as RCRE, RHS-NBS, CHNS, CHIPS, and CAPM are able to track a panel of villages, even where there has been household attrition. This guarantees geographic comparability over the complete time period. However, discrepancies still exist between datasets, for example, in the rate of growth of farm income between the RCRE and the CHNS. It might reflect the kinds of villages that are selected, with more "suburban" villages possibly included in the CHNS. The CHNS villages may have more acreage in vegetables and other cash crops, and been less exposed to a sharp drop in grain prices that occurred after 1995.

The second concern lies in the availability of historical household data. Ideally, to analyze the evolution of inequality in contemporary China we should have a nationally representative household survey over the entire period. Among all sets of panel data employed to analyze rural inequality and income distribution in China, mainly the RHS-NBS can be ideally representative. Unfortunately, while such household surveys have been conducted throughout the second half of the last century, they are available to researchers only for the post reform period and in any case sporadically, for restricted years with varying but limited coverage. Only aggregate data are published and available for public use,¹ and details of

¹The main aggregate results could be found in: Statistical Year Book of China, Rural Statistical Year Book of China, Yearbook of Household Survey, annual/quarterly statistical analysis report, and relevant research papers.

construction of the RHS-NBS income estimates and Gini coefficient is sketchy. As a result, inequality measures based on the full sample are not comparable with results derived from its sub-sample and other data sources. Besides, the publicly available aggregate RHS-NBS data does not include information on housing, subsidies, income in kind.² In this sense, the major utilized household level datasets such as the RCRE, CHNS, and CHIPS are good complements that provide aforementioned information.

Thirdly, each micro dataset has its own special focus. For example, the RCRE data has been collected from many fixed villages annually. The RHS-NBS data has even longer time period and is nationally representative. The CHNS data is specialized to conduct nutrition and health research. The CHIPS data has more detailed information on household income. The CAMP data has gathered detailed information for nutrition, health, and medicare research.

Deficiencies of major data sets still exist. First, almost no panel datasets available (including RHS-NBS and RCRE) contain detailed enough information at the individual level. However, since the 1990s, driven to some extent by growing policy concerns, considerable work on intra-household allocation has begun around the world. To catch up, we need to improve the quality of our panel data at the individual level and correct policy instruments that may have a gender differentiated impact. Second, refusal rates are likely to be higher among households with a high opportunity cost of time or many illiterates, but neither RCRE nor NBS report refusal rates. Further, by design RHS-NBS, RCRE, and CHNS are not successful in accurately estimating household incomes from family-run business.³ A richer set of questions should be included in the surveys to track this important source of income. Underestimation of this income source might induce a significant underestimate of income inequality due to non-agricultural income growth, especially at the top end of the distribution (Benjamin et al., 2005a).⁴ Finally, while the CHNS contains more details that can facilitate the exploration of the robustness of conclusions to definitions of "income", it does not have detailed expenditure data.

The fourth point relates to treatment of income. Income in RCRE and RHS-NBS data are both defined as income earned from all enumerated sources, including both cash and

²After 1990, RHS-NBS began to value in-kind components of income at approximate market prices (Chen and Ravallion, 2004).

³Both RCRE and CHNS surveys simply ask respondents for total revenue and expenditure from family businesses, while the distinction between fixed and variable costs is often lost in the enumeration process. In general, this is among the most difficult sources of income to enumerate accurately. Considerable efforts were placed in the CCAP 2000 survey by careful enumeration of balance sheets of family businesses. However, CCAP 2000 is only a cross-sectional dataset.

⁴Another interpretation for underestimate of income inequality is that the much higher valuation of in-kind income in the RCRE data for the years 1993-1995 helped dampen the effect of disequalizing growth in wage and business incomes. The effect is temporary. However, once farm prices begin to fall, we see the sharp increase in inequality associated with falling farm incomes in the RCRE data.

imputed values for in-kind income from various sources.⁵ Much of the difference between levels and trends of income among datasets can be explained by differences in the valuation of home-produced grain. For instance, relative to the RCRE, the NBS treatment of the in-kind component likely results in an underestimate of incomes and consumption prior to 1990, and an overestimate of growth in incomes or consumption for 1987 to 1999 period. Given that grain income was valued at a price still systematically related to the quota price after 1990, Benjamin et al. (2005) find a strong positive correlation between the size of gap between the two income series and their estimate of the ratio of the market-to-quota price.⁶ Two other differences in the income series lie in the treatment of taxes and fees and depreciation on fixed assets. Studies using the NBS usually subtract both, while typical studies applying the RCRE (e.g. Benjamin et al., 2005) do not subtract off taxes due to their focus on earnings ability of households. However, they depreciate assets themselves due to the arbitrariness of recorded depreciation expenses in the RCRE.

Further, there has been concern over recall. Records collected from CHIPS data may rely on Respondents' recall. The single-interview approach and respondents' recalling of past incomes may have errors, thus the correlation among incomes across years will embody errors in measurement. For instances, individuals may report the same incomes or the same proportion of incomes in different years, which will end up with more inertia in the income distribution and understate the true income mobility. To the contrary, RHS-NBS data and RCRE data are less likely to suffer from recall error, since each selected household maintains a diary over the entire year as well as two transaction books. Survey has been conducted on an annual basis. An assistant interviewer living in the county seat is supposed to visit each household every two weeks (or every month for RCRE) to check the books. The unusual rigor applied to the collection, checking and processing of the RHS-NBS data and RCRE data means that they are less likely to suffer from a variety of non-sampling errors common to household surveys in many other datasets.

Finally, the definition of household membership is important to note. For households in the RHS-NBS and RCRE, household size is based on registration, but it excludes migrants. However, household membership in CHNS data is defined more on the basis of economic attachment (residency) than registration. Household head and family members who send remittances are included. An increasingly serious omission over time occurs as the size of people who work and live outside grows. To tackle this problem, CHIPS 2002 included a

⁵For instance, income from farm-household production, forestry, animal husbandry, handicrafts, gifts as well as labor earnings and income received as a gift are included. Borrowings from (or loans to) informal and/or formal sources are excluded.

⁶Benjamin et al. (2005) estimate the ratio of the market-to-quota price, which was as high as 1.46 in 1995, and then fell below 1 by 1997. After 1997, the NBS series has been directly related to the market price, and they observe some convergence in the income and consumption series.

subsample of rural migrants living in urban areas, while most datasets still exclude this increasingly important group.

3.2 Relevant Data Issues

In China where market is imperfectly and unevenly developed, studies have discussed a variety of data and methodological issues for comparisons of inequality.

3.2.1 Measurement Errors

Inequality measures, such as the level of inequality, factor decomposition of inequality and its change over time, are seriously affected when income or consumption is measured with error (Ravallion and Chen, 1999). Special attention on income measure should be paid to whether the underlying income concept includes income items such as imputed rents for owner-occupied dwellings, imputed incomes from home production and in-kind income. Besides, allowing for inter-regional cost of living differences and evaluating consumption other than expenditures (e.g. consumer durables) is important. When studying rural-urban inequality, attention should be paid to reclassification of rural areas as urban. Adjust the NBS urban-rural inequality data and strictly follow a panel of rural villages over time is required.

a. Valuing Consumption of Own Production

A significant portion of rural household activity is directed towards production for a household's own consumption, and it tends to account for a high share income of the poor. Its undervaluation due to the downward price biasness from market-clearing level leads to an overestimate of inequality. Meanwhile, prices used by provincial statistics departments diverged progressively from market prices over time, which also lead to an overestimate of the rate of increase in inequality.

The process of imputed price adjustment for RHS-NBS in the 1980s and 1990s serves as an example (World Bank, 1992; Khan et al., 1993; Ravallion and Chen, 1999).⁷ Besides, Benjamin et al. (2005) find that some localities used the same weighted average quota and above quota sales' price calculated in 1990 to value in-kind income between 1991 and 1995, which might render an additional source of downward bias in income and consumption growth between 1991 and 1995.

⁷From 1991 to 1996 NBS instructed survey teams to use an "average contract price" to value non-marketed grain from own production. This average contract price was the weighted average of the quota price and the above quota price for sales over quota to the local grain bureau. Both of these prices were administratively determined. Survey teams were further instructed to use weighted average market prices only if there were no local administrative prices (meaning no local crop procurement). It was not until 1997 that NBS instructed survey teams to value all non-marketed agricultural commodities at market prices.

To correct these deficiencies, Chen and Ravallion (1996), Tsui (1998b), Ravallion and Chen (1999), and McCulloch and Calandrino (2003) apply sub-samples of NBS data and show that all credible estimates of inequality in rural China should correct those biases. For instance, to reflect the increased marketization of the economy, following Chen and Ravallion (1996),⁸ Tsui (1998b) and McCulloch and Calandrino (2003) revalue the own consumption of grain. However, this revaluation can only be implemented for grains due to the lack of relevant information for other goods.

A similar adjustment is conducted in the RCRE data, where grain produced for own consumption or stored was valued at prices reflecting the quota price. Because of lower quota prices than market prices up through the mid-1990s, income from grain production and consumption out of home production are both likely biased downward. Benjamin et al. (2005a) revalue households' non-marketed grain at average village market prices.

b. Price Differences

Inflation/deflation is adjusted for time-series data to convert income and consumption into constant dollars (yuan). McCulloch and Calandrino (2003) use CPI index from China Statistical Yearbook to deflate nominal variables. However, published CPI uses an (unknown) mix of market and official prices, rather than market prices, to value certain goods which may underestimate the rate of increase of consumer prices and therefore overestimate the improvement in real terms.

Spatial differences may also be important. Prices in some parts of the country may be systematically different from those elsewhere, in which case estimates of inequality can be biased. However, most of the past literature has ignored spatial differences, for example, in the cost of living. Two exceptions include Chen and Ravallion (1996) and Tsui (1998b), who construct province-level spatial and inter-temporal spatial deflators for four and two provinces respectively. Recently, research interests have been extended to explore the rural-urban gap. However, it should be noted that adjusting for inflation over time using separate urban and rural consumer price indices does not incorporate the spatial difference at any one point in time. A constructed set of spatial price deflators documented by Holz and Brandt (2004) is widely used to adjust cross-sectional differences in urban and rural prices across provinces, and between rural and urban areas. Overall, adjusting spatial price differences might minimize the problem of overestimation of inequality and the exaggeration of contribution of spatial disparity regarding price differences.

c. Durable Consumption and Income

Housing services and durables are usually relatively equally distributed at the beginning,

⁸Chen and Ravallion (1996) find that after revaluation of income in kind from grain production, a much larger share of the (albeit smaller) increase in rural inequality was due to grain income than past data would have suggested.

but more unequal with different rates of accumulation of housing and an increasing share of consumption as an economy develops. Especially as durables and housing reflect consumption decisions linking permanent income, it is important to consider how they are treated in the construction of consumption and income.

The impact of durables and housing on inequality is significant. The NBS data on consumption expenditure include one-off expenditure on durables in the year in which the purchase decision was made. However, durable goods, by definition, last for a number of years. Meanwhile, owing to the infrequent purchases of consumer durables, the estimated unit values of durable goods might be based on the records of a few households and the prices may not be representative. A similar problem is encountered in relation to housing expenditure as it is difficult to include imputed rental values. The NBS only include all housing expenditure in the year in which the spending takes place, as a result of limited rental market for housing in rural China.

Scholars have made lots of efforts in calculating and adjusting consumptions of durable goods and housing. Khan et al. (1998) and Khan et al. (1999) construct a revised measure for urban and rural China based on the asset valuations available in the primary survey data. Chen and Ravallion (1996) include five percent of the recorded dwelling value for housing and 10 percent for durables in total consumption. Improving upon Chen and Ravallion (1996), Tsui (1998b) adopts the available NBS price data for consumer durables, which consist of average retail price information collected by the urban survey teams of the NBS.

Utilizing the RCRE, Benjamin et al. (2005) and Brauw and Rozelle (2008) also consider inflating the value of the stock of housing and durables to reflect the increase in prices of durable goods. McCulloch and Calandrino (2003) approximate the rental value of the stock of durables in each year in rural Sichuan, and they also impute the rental value of housing expenditure using information about rents in the local area.

3.2.2 Sample Attrition Bias

Attrition bias is present in panel data collection for several reasons. First of all, in some data sets, such as the RCRE, RHS-NBS, and CHIPS, whole villages drop out because they are annexed into a city. In some other cases when panel datasets are based on written records collection, sample attrition may reflect the fact that maintaining diaries of their households' incomes and expenditures makes illiterate households difficult to participate and the opportunity cost of keeping records for the rich are high. Some rich residents might leave their villages for an entire year, some people might show unwillingness to make efforts, and some people do not want to reveal their personal information. To the poor, attrition may also be endogenous to shocks (Lokshin and Ravallion, 2001). It is difficult to distinguish

such households from those that change too much to keep in the panel or those who were replaced by the surveyors for certain reasons (Ravallion and Jalan, 2001). However, to the poor endogenous attrition may be minimized, since sampled households in the RHS-NBS are paid to participate. Khor and Pencavel (2005) find that unmarried, younger and older people are less likely to be represented in CHIPS 1995. Benjamin et al. (2005a) and Brauw and Giles (2008) compare cross sections of the RCRE and RHS-NBS with overlapping years of CHNS and CCAP 2000 that are not based on diary record.

Comparing with other surveys in which households are known randomly sampled, a disproportionate number of households at both ends of the income distribution are excluded from the NBS, CHNS, and RCRE data, which might lead to an underestimate of income inequality (Benjamin et al., 2005a). Sometimes the numbering of the replacements is not properly handled, since a considerable amount of replacements are assigned the same ID number of the survey units as those that are replaced (Shen and Yao, 2008). To check the accuracy of the original ID and the continuity of RCRE, Hoken et al. (2006) develop data matching methods, construct new panel databases and test the sample attrition biases. They demonstrate that a large number of spurious continuities of panel survey appear to exist in the original ID. To compensate for sample attrition, the 1997 CHNS includes all newly-formed as well as additional households in original communities to replace households lost. Faced with more severe attrition such as a drop out of an entire community, a new community in the original province would be added (Chen, 2005).

3.2.3 Units of Measurement

In evaluating inequality, per capita estimates are usually imputed to all members within a given household. Higher level of aggregate analyses base their units of measurement at the village, township, county, or province level, which underestimate inequality because it ignores the internal inequality arising from differences in welfare among households within these administrative units. This simplified treatment also forms a poor basis upon which to evaluate the contribution of cross-unit inequality to the total. This issue has not been effectively addressed in studying inequality in rural China as individual consumption or income data are rarely available.

To deal with the problem of equalizing all family members within each household, estimates of household income and consumption expenditure were divided by the number of adult equivalents in the households using the World Health Organization adult equivalence scale (McCulloch and Calandrino, 2003). This scale is derived from detailed studies of the nutritional requirements of males and females of different ages in developing countries. Meanwhile, income or consumption should be adjusted by household size, as the relative need of

different sized households is different. Ravallion and Chen (1996) provide an example of integrated adjustments.

Unit of measurement also affects the estimated effect of inequality on growth. The dependence of growth rate at household level on the initial log of indicators such as capital stock can induce spurious effects after aggregation process (Ravallion, 1998). Even when the growth rate is linear in the initial capital stock, a term for the change in inequality will be found in the residual of the usual aggregate growth rate regression. More complex forms of nonlinearity and alternative functional forms for the inequality measure relevant to the micro-level externality can yield further spurious effects of measured inequality.

3.2.4 Adjustment for Income Volatility

The impact of income and consumption volatility on inequality has received limited attention in the literature. Compared to urban income, volatility of rural income is substantially higher in China. At present, poor rural households either have no access to capital market or only have access at prohibitively high borrowing rates, which limits their ability to smooth income. Thus, it is vital to adjust for rural income volatility when constructing measures of inequality to obtain a more realistic inequality estimate and to build a more comparable basis for rural-urban inequality. Previous studies on income volatility in rural China (Jalan and Ravallion, 1998; Li, Wang and Yue, 2005) do not make direct adjustments to welfare measures. Whalley et al. (2006) use CHIPS for rural residents to construct measures of certainty equivalent income and calculate summary distributional measures for the modified income data.

4 Major Findings from Panel Data

4.1 Rising Income Inequality and Economic Development

From 1987 to 1999, income distribution improved by most measures during the early part of the period, as average incomes rose substantially with only a modest increase in inequality. However, the distribution worsened significantly over the late 1990s and the early 2000s, with rising inequality and falling absolute incomes, especially at the bottom end of the income distribution (Benjamin et al., 2005a). This situation was attributed to collapsed agricultural income and uneven growth of non-farm income due to the contribution of non-farm family businesses. Within non-farm incomes category, local income was relatively dis-equalizing, while income from outside the village was relatively equalizing (Benjamin et al., 2005b). Almost no studies using household data show the recent trajectory of rural income inequality.

4.1.1 Determinants of Income Inequality

Studies on determinants of income inequality can be categorized into two major branches, inequality by income sources and assets and inequality by geography. The first category emphasizes declining agricultural income, dis-equalizing non-farm income (especially family businesses), egalitarian land distribution, physical and human capital and so on. Inequality determinants classified by geographic hypotheses are briefly summarized and followed by an extensive review of spatial decompositions. Besides the above-mentioned two branches, crucial events and development strategies in rural China can explain some of the inequality trend, including urban-biased development policy, rural industrialization, rural financial development, fiscal decentralization, market fragmentation, globalization process, grassroots democracy, and the role of political power and connections.

a. Determinants of Rural Inequality by Income Sources and Assets

In general, changing structure and composition of income generate higher inequality (Tsui, 1998a), which recently has been followed by more specific studies on different components of income and their contributions to inequality. It is unclear whether equality of farm income due to the current egalitarian land distribution policy is necessarily good for overall income inequality, since more inequality of farm income might actually reduce overall income inequality (Benjamin et al., 2006). However, Chen (2005) verifies the negative role of equality of farm income. Within farm income, grain production plays the most important role in rising inequality, and non-farm income plays the secondary role, while other farm incomes are inequality decreasing (Ravallion and Chen, 1999; Benjamin et al., 2005b). Wan and Zhou (2005) conclude that cropping pattern is more crucial than labor and human capital inputs based on dis-equalizing income from non-farm family businesses and the failure of non-farm labor markets in constituting rising income inequality.

Decomposing inequality into land category, farm assets and human capital shows: first, farm assets are inequality-reducing over the period because of their diminishing rate of return cross section and over time (Ravallion and Chen, 1999); second, constraints on farm size implicit in the Chinese administrative allocation of land together with agricultural goods price change may attenuate its contribution to overall inequality (Wan and Zhou, 2005; Benjamin et al., 2006). Although land inequality grew from 1987 to 2002, it is still low by developing country standard (Benjamin et al., 2005b). However, land area is a poor measure of land endowment, given the usual negative correlation between land capacity and farm size. Higher return over time to good quality farm land is inequality-increasing (Ravallion and Chen, 1999). Thus, spatial decompositions based on cultivated area alone exaggerate differences in land across space; third, education is found to have small effect on inequality (Wan and Zhou, 2005) but gaining importance (Wan, 2007). The Rising intra-regional and

urban-rural differential distribution of education and entrepreneurial attributes leads to more intra-regional and urban-rural inequality (Benjamin et al., 2000; Guo, 2007). Improving education and off-farm job market simultaneously leads to success in family businesses and labor markets (Benjamin et al., 2002).

b. Determinants of Rural Inequality by Geography

When encompassing weather, infrastructure and other natural resources, geography would account for a very significant share of total rural inequality. Using provincial level data, Wan (2007) finds that location and location-related factors comprise the largest contributor to total regional inequality although its percentage contribution has decreased over time. Utilizing household survey data, Ravallion and Chen (1999) find that the differences in income between those living in mountainous rural areas and those on the plains have been an important source of rising inequality. However, Benjamin et al. (2005a) rule out geography as the most important factor for understanding the dispersion of incomes, rather, the prevailing inequality is due to inequality between neighbors within a village.

c. Determinants of Rural Inequality by Developmental Strategy

Firstly, urban-biased development policies help us understand the picture behind spatial rural inequality. Before the economic reform, the role of the state sector was important in the interior. However, since then growth of the non-state sector in the interior provinces has been much slower as more resources have gone to support a larger population tied to the state sector. It has handicapped the growth and labor demand in the rural secondary and tertiary industry. In contrast, much faster growth in the non-state sector in coastal provinces has helped provide a wide array of job opportunities for both rural and urban area there. The unbalanced spatial job creation and fragmented capital market have significant negative effect towards rural inequality (Zhang and Tan, 2007). Due to the still fragmented factor markets, fast growing international trade and foreign capital investments have been concentrated in the more developed coastal region rather than vast inland areas, leading to further aggravating regional rural inequality (Zhang and Zhang, 2009).

Evidence shows that most of the rising inequality in rural industrialization is spatial and has increasingly contributed to regional inequality (Wan, 2007; Chen, 2005). However, income from rural industry does not contribute to the rise in local inequality because wages from rural industry, mostly labor intensive sectors, were equalizing. Growing spatial inequality can also be attributed to uneven opportunities represented by the uneven development of TVEs and other markets (Guo, 2007).

How does rural financial development influence income inequality? Theoretical predictions on the finance-inequality nexus are inconclusive and mixed, including an inverted U-shaped relationship (Greenwood and Jovanovic, 1990) and a negative linear relationship (Banerjee and Newman, 1993), both from provincial panel data (Liang, 2006) and house-

hold panel data (Wan and Zhou, 2005).

China's current fiscal system is largely decentralized compared to her centralized governance structure. Due to large differences in initial economic structures and revenue bases, the implicit tax rate and fiscal burden to support the functioning of local government vary significantly across jurisdictions. The regressive nature of the rural taxation system explains why the fiscal decentralization exacerbates the rural-urban gap and gaps among rural areas, and it has been confirmed by county level public finance dataset CCPFSY (Zhang, 2009) and rural household data (Khan and Riskin, 1998; Benjamin et al., 2006).

Does grassroots democracy help mitigate income inequality in rural China? Shen and Yao (2008) utilize village and household level RCRE to find that village elections reduce inequality, and their role is not played through more income redistribution, but through more pro-poor public investment.

Political power and connections captured by party membership, presence of a past or present cadre, or the class labels given to families in the late 1940s and early 1950s are found to facilitate access to uneven opportunities and the resulting rural inequality (Morduch and Sicular, 2002).

4.1.2 Rising Inequality and Household Welfare

Rising income inequality might offset welfare gains in the economic reform. The relationship holds controlling for own resources in the household level specification, which casts doubt on the effect of imperfect credit market. At the village level, Benjamin et al. (2006) explore growth and its potential linkage to various initial conditions. First, low inequality enhances growth in non-farm incomes and tilts the village away from agriculture; second, higher inequality is associated with higher overall tax rates and more regressive taxes, lower levels of revenue and expenditures, insufficient provision of public goods and poorly developed factor markets.

Asset and consumption inequality are sometimes employed to complement the measure of income inequality. Ravallion (1998) finds a significant harmful effect of asset inequality on consumption growth. However, the effect is lost in an aggregate growth regression. At provincial level, rising income inequality is identified to be an obstacle to a steady-state level consumption. Wan (2005) finds slow conditional convergences for total grain, fine grain, edible oil, poultry, aquatic product and sugar and divergences for animal fat and red meat. Testing nonlinear dynamics of household incomes and expenditures simultaneously over time shows negative effect of inequality, especially on mean income (Ravallion and Jalan, 2001).

Absolute poverty falls dramatically in China in the past 30 years' reform, and rural areas account for the bulk of the decline in poverty. However, rising inequality within the rural

sector greatly slows poverty reduction (Yao et al., 2004; Ravallion and Chen, 2007). Yao et al. (2004) provide a poverty reduction simulation under different inequality scenarios and growth rates. It shows that even under the most optimistic scenario, China still have a large number of rural poor before 2015, but even under the pessimistic assumption of income and inequality growth, China can still manage to cut its poverty population. However, Yao's combined data (RCRE and CHIPS) are from different households. Employing RSESS-NBS Data, Huang et al. (2008) find that changes in the incidence of poverty are not only related to overall economic growth, but also depends on the sources and distribution of income growth.

4.2 Spatial Inequality and Decompositions

Many key policy issues on inequality and income distribution show themselves in disaggregated fashion, and the individualistic tendency in inequality measurement is reinforced by the use of decomposable inequality measures (Kanbur, 2000). Spatial inequality and decomposition reflects one of the major concerns. Spatial inequality is often defined at regional, provincial and county level. Some papers cover a single level, others two or three. Relevant studies use proxy variables such as per capita income, (per capita) GDP, gross value of industrial and agricultural output or one of its components, consumption, collective income, or even grain output as indicators of living standard. Most of studies in this field limit their analyses to a snapshot, without a time profile (e.g. Cheng, 1996; Gustafsson and Li, 1998; Hussain et al., 1994; Knight and Song, 1993; Lee, 2000; Tsui, 1993; Griffin and Zhao, 1993; Hu, 1997; Wu, 2000), however, it is rarely seen after 2000.

Among those applying panel data, most of them use provincial level data to decompose spatial inequality. The results include greater consumption equality between 1952 and 1987 (Lyons, 1991), U-shaped inter-provincial income inequality between 1978 (or 1985) and 1993 (or 1994) (Duncan and Tian, 1999; Fujita and Hu, 2001), and increasing inter-regional inequality but decreasing intra-regional inequality between 1985 and 1994 (Fujita and Hu, 2001). Concerning the contribution of inter-regional inequality on the provincial inequality, results show 14-35 percent between 1978 and 1993 (Jian et al., 1996; Kanbur and Zhang, 1999), 38-41 percent between 1986 and 1992, and 50-60 percent between mid 1980s and 1996 (Wan, 2007).

Fewer studies employ county or village level panel data. Howes and Hussain (1994) and Peng (1999) use county data between 1985 and 1991 to find that inter-county inequality increased by 37 percent and 20-26 percent respectively. Rozelle (1994) employs one-province village panel data between 1983 and 1988 and concludes an increase in inequalities among villages, towns and counties.

Meanwhile, even fewer studies (Tsui, 1998; Gustafsson and Li, 2002; Gustafsson et al., 2007; Ravallion and Chen, 1999; Chen, 2005; Benjamin et al., 2005b; Morduch et al., 2002; Wan and Zhou, 2005; Guo, 2007) explore spatial inequality in China with household panel data. According to Gustafsson and Li (2002), only 4 out of 16 papers summarized use household data, let alone household panel data.

Tsui (1998) finds that inter-provincial inequality only accounts for 6-12 percent in total rural inequality between 1985 and 1990. Guo (2007) further finds that the major part of inequality has changed from inter- to intra-village level from 1986 to 2000. Benjamin et al. (2005b) confirm that province and village respectively only explain 10 percent and 30-40 percent of rural inequality. Most inequality in rural China is within villages.

Overall, only a few studies use household panel data that cover most provinces in China over time, and no study summarized above simultaneously use data at county level, provincial level and regional level. As a special case, Gustafsson and Li (2002) provide a comprehensive study between 1988 and 1995. They show that in rural China inter-county inequality increased from 43 percent to 47 percent of total inequality. Among inter-county inequality, intra-provincial inequality stayed at 18 percent of total inequality, while inter-provincial inequality changed from 25 percent to 29 percent. Among inter-provincial inequality, intra-regional inequality dropped from 13 percent to 6 percent of total inequality, while inter-regional inequality increased greatly from 12 percent to 23 percent. While income inequality within rural counties increased from 1988 to 1995, the uneven income increase across counties was also important for the growth of rural inequality. However, in Gustafsson and Li (2002) the particular counties are not identical, which poses some problems for interpretation.

Two other points should be noted. First, robustness of decomposition should be addressed. Morduch and Sicular (2002) demonstrate how sharply different conclusions can emerge for different decomposition rules. Second, it is dangerous to use data of limited coverage to project the magnitude and change of income inequality in rural China as a whole (Gustafsson and Li, 2002) as income has grown at noticeably different rates in different parts of rural China during the economic reform.

4.3 Income Inequality and Other Dimensions

4.3.1 Income Inequality and Mobility

If a society is characterized by a great deal of income mobility, income inequality derived from comparison of income in a single year may be misleading as an indicator of longer run income inequality. Studies on income mobility are crucial complements to the measure of income inequality, as more and more rural residents are moving from west to east and from inland to coastal region. Even if people stay where they are, institutional transformation

may still bring a drastic change to their relative positions.

There are two categories of income mobility: macro mobility answers how much income mobility exists in the economy and how has it changed over time;⁹ micro mobility defines which individual or group experiences movements of what magnitudes and what the correlates of these movements are.¹⁰

Very few studies are on the macro mobility in rural China. Wang (2005) and Ying et al. (2006) both find that major income mobility indicators (e.g. time independence, positional movement and income mobility as equalizers of longer-term incomes) fall over time in rural China. However, income mobility helped equalize longer-term incomes relative to initial incomes in rural China in the 1990s (Wang, 2005). Nee (1994) finds that positional movement in rural China was higher in 1983-1989 than in 1978-1983, which he interprets as "institutional change resulted in a dramatic shake-up of the rural stratification order."

The only study on micro mobility in rural China we are aware of is Zhang et al. (2006). Using the RCRE in rural China from 1987 to 2002, Zhang et al. (2006) find the possibility of the poorest 25 percent to climb up to higher income status increased. However, the upward mobility of those of the middle-income has gradually become stagnant. The richest 5 percent and 10 percent are the biggest winners during the process. Zhang et al. (2006) also decompose the change of income inequality between the wealthy and the poor into two parts: the income change of those remaining in the wealthy group and the poor group persistently, and the change due to the shift of income status of those who move upward to the wealthy group or downward to the poor group, the latter of which was accompanied by an increasing contribution of income mobility to inequality. To identify factors which may influence the probability of moving upward, downward, or staying stagnant, they find that household dependent population ratio, human capital endowment, land rental market participation, and party membership have significant effects on income mobility in rural China.

4.3.2 Inequality and Polarization

While inequality measures are conceived to assess the expected divergence or disparity among incomes, polarization measures are sensitive to the level of identification of individuals by their income levels. Intuitively, a higher level of between-group inequality is related to the polarization phenomenon. This gives additional information that inequality measures fail to capture.

⁹Six concepts are quantified to measure macro income mobility: time-independence, positional movement, share movement, non-directional income movement, directional income movement, and income mobility as an equalizer of longer-term incomes (Fields, 2007).

¹⁰Two types of micro mobility studies have been conducted. Unconditional micro mobility examines individual correlates of income change as one of the correlates is controlled at a time. Conditional micro mobility gauges the effect of one correlate controlling for the role of others.

Concern over growing polarization has been prominent in policy discussion since the economic reform, when rural-urban gap has been an important dimension in the polarized China (Li, 1996). Utilizing rural and urban components from 1983 to 1995, Zhang and Kanbur (2001) test three typical polarization indices against two standard measures of inequality, which do not show distinct results. An alternative polarization index is also developed to offer more insight. It is found that rural-urban polarization is more serious in levels but modestly decreasing compared with a dramatic increasing inland-coast polarization trend. Wan (2007) finds that the fast increase in regional inequality is accompanied by worsening polarization.

Araar (2008) decomposes the polarization index by population groups and income sources over the period 1986-2002. For policy purpose, those decompositions can help target the apparent poor groups of population and propose corrections on existing distributive policies. Araar's results show that even if inequality has increased sharply during the last two decades, the pure polarization component has remained constant or even decreased on average.

4.4 Income Inequality and Health

Public health studies find relationship between income inequality and adult health outcomes in developed countries. Specifically, there seems to be a correlation between social hierarchy and mortality as well as a correlation between social hierarchy and morbidity. Existing evidences from China show similar results.

Ling (2008) examines the role of relative income and income inequality on anthropometric health outcomes as well as health related behaviors. Reverse causation is dealt with by exogenously introducing statutory retirement age and employing retired samples. The elderly are rapidly aging and most vulnerable to the economic reform. Normally, the elderly in China have mainly relied on intergenerational transfers within families. Besides income shocks due to economic restructuring, health outcome and status competition of the working people may reallocate resources from elderly dependents in households. In addition, relative income of the elderly may be crucial in determining their health. The confluence of these trends and the elderly dependency ratio (EDR) is found to affect their health outcomes such as high waist circumference, overweight or obese, and underweight. Meanwhile, it leads to unhealthy behavior, such as smoking cigarettes or pipes in the past, possibly to cope with stress.

Ling (2007) also conducts a separate study on the relationship between relative deprivation and anthropometric health outcomes for infants and children and still finds strong and consistent evidence of the effects of relative deprivation on health.

Both Ling (2007) and Ling (2008) predict that relative deprivation and unequal growth affect the "social gradient of health" in China by potentially increasing the prevalence of obe-

sity among the rich, while concurrently being unable to reduce the prevalence of underweight among the poor.

Li and Zhu (2006) find an "inverted-U" relationship between self-reported health status (SRHS)¹¹ and community level income inequality. They also confirm that high inequality increases the probability of health-compromising behaviors such as smoking and alcohol consumption. Meanwhile, Li and Zhu (2006) find that relative status has a strong positive effect on self-reported health status, but its protective effect decreases with inequality and is finally offset by extremely high inequality.

Summarizing health outcome indicators utilized, Ling (2007, 2008) attempts to circumvent biases and errors in SRHS in Li and Zhu (2006) by anthropometric measures including self-reported dietary intake and other objective indicators. Errors in self-reported responses lead to imprecise measures. Li and Zhou (2006) adopt objective health measures such as physical functions (PF) and activities of daily living (ADL). Their PF measures include indicators such as heart, lungs, and stomach conditions, and blood pressure. The ADL, only available for individuals over fifty, measures whether the individual is physically restricted or unable to perform daily activities, such as taking a bath, eating and drinking alone, or putting on clothes. To capture health behavior, Ling (2008) uses self-reported measures of past and current smoking behavior, while Li and Zhou (2008) use current drinker and drinking frequency as well as past and current smoking behavior.

5 Conclusion and Discussion: Areas for Further Research

The research on inequality and well-being starts the early 21st century in a vibrant state, with the new conditions raising new questions, and old questions anew. We will put forward important areas with existing panel data that are underdeveloped. A new data set is highlighted followed by a promising direction for future research.

5.1 New Research Areas with Existing Panel Data Sets

5.1.1 Factors Influencing Rural Inequality

Is geography one of the most important factors for rural inequality? Existing provincial level panel studies find it true, especially when weather, infrastructure and other natural

¹¹SRHS is a subjective measure of individual health, which suffers from measurement errors. However, studies show that SRHS is highly correlated with subsequent mortality, even when controlling for more objective health measures (Idler and Benyamini, 1997; Deaton and Paxson, 1998).

resources are encompassed. However, studies utilizing household survey data rule out geography as the most important factor and conclude that the prevailing inequality is within village. Within-village inequality is crucial or not matters, since if it is we should turn our attention to determinants of within-village inequality, such as village-level institutions, village produce and labor market development, rural industrialization, informal mutual insurance, and distribution of household endowments. One important avenue for future research is to assess causal linkages between village growth and inequality considering comprehensive set of factors.

How does financial development influence income inequality? Theoretical predictions on the finance-inequality nexus are inconclusive. Empirical evidence with provincial panel data shows a negative role. However, if we believe that financial market is not neutral to every rural resident, as poor residents own low amount and types of collateral, relationship between rural finance and inequality might be nonlinear. Meanwhile, there has been no household level empirical test in rural China, the relationship is still undecided and waits for further exploration.

Education distribution is likely to improve at a slower pace than market institutions and opportunities, which might disproportionately benefit the better educated. Is education unequally distributed among generations (cohorts), or is there considerable inequality of education within age groups? The answers to these questions have crucial implications for how education and income distribution evolve.

5.1.2 Rural Inequality Decomposition

Most studies do not net out spatial dimensions of income composition other than confirming the significant contribution of non-farm income to inequality. For example, wage income from local and non-local sources are usually lumped together, while total wage income is sometimes combined with income from family-run businesses. Grouping imperfectly correlated incomes together conceals important aspects of emerging inequality and their links to household attributes and the external economic environment with which these households interact.

5.1.3 Effects of Inequality on Growth

In studying the link between inequality and the following growth, household level estimation has been conducted and a set of instruments been used to address measurement error. Explanations ruled out include imperfect credit market, artifact relationship of aggregation, and measurement error among other explanations. Although we observe a negative impact of higher village inequality on household economic growth, we cannot rule out the existence

of an unobserved third factor correlated with both initial inequality and subsequent growth. Further, we do not know whether the link between inequality and growth is in the short run or long run.

5.1.4 Income Inequality and Mobility

Is more mobility always better than less mobility, no matter to what extent? As we know, Rural China is now experiencing a rapid transformation with incomplete social security. Too much mobility may make rural residents feel more risky and welfare reducing given their insufficient ability to smooth income and consumption.

To better understand macro income mobility in rural China, future studies might be directed to answering two questions: First, how much income mobility is there with different mobility measures? Second, how does macro mobility change over time for each of these measures? In parallel, to improve our knowledge of micro income mobility, further discussions are on two aspects: First, how do changes in income differ from changes in log-income and position concerning unconditional micro mobility? How has income mobility profile changed over time in the course of China's rapid economic growth? Second, what are the conditional determinants of income change and how do these determinants change over time?

5.1.5 Inequality and Health

Studies have found impacts of income inequality on health outcomes and health related behaviors among older adults in rural China. Although reverse causation is dealt with by exogenously introducing statutory retirement age in urban China and employing sampled population above the statutory retirement age, however, scholars are still concerned about reverse causation in urban China that unhealthy behavior may cause subsequently lower socio-economic status.

5.2 New Research Areas with New Panel Data Set

Can popular inequality indices capture the large picture of rural inequality? A second thought on how to bridge the gap between inequality and the inequality spectrum might reveal an untouched area with far reaching implications.

5.2.1 Neoclassical Utility and Relative Concern

A longstanding assumption in economics is that an agent's utility depends solely on the absolute level of well-being. However, Smith implicitly put forward the idea in *The Wealth of Nations* in 1776, where he claimed that people should be endowed with the ability to appear

in public without shame. Since Veblen's seminal work in 1899, a few people started to believe that utility or happiness depends in part on the comparison of one's own consumption to that of others, and it was first formally modeled by Duesenberry (1949) in his relative income hypothesis. Since the 1970's, compelling evidence on relative concern has been accumulated (Easterlin, 1974; Sen, 1983; Frank, 1985; Van de Stadt et al., 1985).

Most people have a highly localized reference group with which they compare themselves, and people tend to make comparisons with others similar to themselves but above them (Runciman, 1966; Frank and Levine, 2008). Deaton (2001) argues that relative deprivation defined in terms of the relative weight of all incomes of people within the reference group who are better off can be positively linked to mortality. Relative deprivation much better predicts the US states mortality rates than either income or Gini coefficient. However, the ordinary inequality measures do not explicitly distinguish idiosyncratic deprivation each agent perceives and inequality in a society, leaving out rich implications (Chen and Zhang, 2009).

Relative concern matters in developing countries. While Heffetz (2007) argues that relative concern through conspicuous spending is only relevant for rich context, evidence from designer-label goods consumption in Bolivia (Kempen, 2003), festivals' budget in India (Banerjee and Duflo, 2007), "splendid" funerals in Ghana (Economist, 2007), relative deprivation and migration in Mexico (Stark et al., 1991), bride-prices and dowries in south Asia and Africa (Rao, 1993; Dekker and Hoogeveen 2002), marriage payments in Bangladesh (Anderson, 2007), and community level consumption in Nepal (Fafchamps and Shilpi, 2008) show strong support for relative concern. Fafchamps and Shilpi (2008) further notice that isolation from market is associated with a significant increase in relative concern.

5.2.2 Relative Concern in Rural China and the Proposed Research Data

Rural western China is an ideal region to observe relative concern, because the dense population guarantees close social contacts among local residents and facilitates a sound definition of reference group. Vast mountainous landscape and thousands years of rural culture lead to isolation from the market. Meanwhile, status seeking and face-saving have been one of the centerpieces throughout Chinese history.

Recently, drastic socioeconomic transformation from a rural society to an industrialized one has shown a great divergence in social classes, high income mobility and competitions for status. It becomes difficult to well define their social reference groups, since Chinese farmers are now more and more divided by their diversified occupations as well as income sources, social networks and entitlements.

The escalation in conspicuous consumptive investment is particularly reflected in hous-

ing, but no increases in productive investment that would secure durable increases in welfare (Brauw and Rozelle, 2008; Brauw and Giles, 2008). Relative share of rural residents' incomes allocated to gift-giving, dowry, bride price and funerals are thought of as vehicles for social prestige that might challenge social status (Yan, 1996; Liu, 2000). Such spending also facilitates social networks, which may be relied upon for mutual assistance, personal financing, or other forms of help.

On the other hand, the welfare consequences of "positional externalities" associated with status seeking are severe for Chinese households living close to subsistence. The highly-ritualized practices of gift-giving compel villagers to offer gift to avoid isolation from local networks. Since farm income is limited and grows slowly and nonfarm income is highly unequal and favorable to the rich, for poor residents large portions of income facilitating gift exchange cannot be compensated with limited labor resources. For example, field record shows oral evidence that inflows of remittances to some households set in motion status contests with adverse consequences of the others through their long-term blood donation (Brown et al., 2008). Worse still, in an isolated context, the severer isolated from outside, the more pervasive status seeking activities, and the less equal opportunities to migrate out.

Studies on relative deprivation need detailed information on household social spending in major events that previous data sets do not have. In addition, most of the data sets do not have factor market information, such as wage rate, interest rate, bride price, and land rental rate.

Further, household panel data are needed to capture dynamic behaviors of status competitors. The panel data might also alleviate simultaneity and omitted variable bias that may arise in a cross-section. Among the panel data available, only a small portion of households in each village are interviewed. Among the interviewed, households in the tails of income distribution are tended to be overlooked. Although such datasets are helpful for measuring overall rural inequality, they are less useful for discerning inequality in a village. More importantly, despite its high costs and the resulting limited coverage, conducting a census-type panel survey provides a feasible way through which we acquire a complete picture of relative deprivation without relying on sampling. An ideal dataset further requires isolation from market access.

Therefore, an in-depth panel dataset for a particular community complements the previous panel data. IFPRI-CAAS is an example that satisfies the aforementioned major requirements: (1) third waves of census-type panel survey; (2) detailed information on social network, social spending and status; (3) a geographically isolated region; (4) a large share of ethnic minorities.

Applying IFPRI-CAAS, Chen and Zhang (2009) explore the causality between social norm, status seeking and blood donation behavior. They find that social status seeking is

intensified through positional spending and relative deprivation, which renders more blood donation. Relative deprivation complements the measure of income inequality. Further, social norms matter through social pressure and imitation in networks. Contrary to the well-received idea, shocks do not consistently induce blood donation, which might suggest the link between blood donation compensation and other spending that deserves further research.

References

- Anderson, S., 2007. "The Economics of Dowry and Bride Price," *Journal of Economic Perspectives* 21(4): 151-74.
- Araar, A., 2008. "On the Decomposition of Polarization Indices: Illustrations with Chinese and Nigerian Household Surveys," *Cahier de recherche/Working Paper* 08-06.
- Banerjee, A. V. and E. Duflo, 2007. "The Economic Lives of the Poor," *Journal of Economic Perspectives* 21(1):141-167.
- Benjamin, D., L. Brandt, P. Glewwe, and L. Guo, 2002. "Markets, Human Capital, and Inequality: Evidence from Rural China," in *Inequality around the World*. Richard Freeman ed. London: Palgrave, pp. 87-127.
- Benjamin, D., L. Brandt, and J. Giles, 2005a. "The Evolution of Income Inequality in Rural China," *Economic Development and Cultural Change*, vol. 53(4), 769-824.
- Benjamin, D., L. Brandt, J. Giles, S. Wang, 2005b. "Income Inequality During China's Economic Transition," *Working Papers* tecipa-238.
- Benjamin, D., L. Brandt and J. Giles, 2006. "Inequality and Growth in Rural China: Does Higher Inequality Impede Growth?" working paper.
- Brown, P., E. Bulte, and X. Zhang, 2008. "Positional Spending and Status Seeking in Rural China," working paper.
- Chen, S. and M. Ravallion, 1996. "Data in transition: Assessing rural living standards in southern China," *China Economic Review*, Vol. 7, pp. 23-56.
- Chen, X. and X. Zhang, 2009. "Blood for Social Status: A Tale of Three Villages in Rural China," Paper presentation at Agricultural and Applied Economics Association (AAEA) 2009 Annual Meeting, Milwaukee.
- Chen, Y., 2005. "The impact of Agricultural and Industrial Development on Income inequality in Rural China," *Doctoral Dissertation*, Chapter 3. Boston College.
- Chen, F., 2005. "Residential Patterns of Parents and Their Married Children in Contemporary China: A life Course Approach," *Population Research and Policy Review* 24: 125-148.

- Deaton, A., 2001. "Relative Deprivation, Inequality, and Mortality," NBER Working Paper 8099, Cambridge, MA: National Bureau of Economics Research.
- De Brauw, A. and J. Giles, 2008. "Migrant Labor Markets and the Welfare of Rural Households in the Developing World: Evidence from China," Policy Research Working Paper Series 4585, the World Bank.
- De Brauw, A., J. Huang, S. Rozelle, L. Zhang, and Y. Zhang, 2002. "The Evolution of China's Rural Labor Markets during the Reforms," *Journal of Comparative Economics* 30: 329-353.
- De Brauw, A. and S. Rozelle, 2008. "Migration and household investment in rural China," *China Economic Review*, Elsevier, vol. 19(2), 320-335.
- Dekker, M. and H. Hoogeveen, 2002. "Bridewealth and Household Security in Rural Zimbabwe," *Journal of African Economies* 11(1): 114-145.
- Duesenberry, J., 1949. *Income, Saving, and the Theory of Consumer Behavior*, Cambridge, Mass.: Harvard University Press.
- Duncan, R. and X. Tian, 1999. "China's inter-provincial disparities: an explanation," *Communist and Post-Communist Studies* 32, 211 - 224.
- Easterlin, R., 1974. "Does Economic Growth Improve the Human Lot? Some Empirical Evidence," in *Nations and Households in Economic Growth*, ed. by David, P. and Reder, M., pp. 89-126. Academic Press, New York.
- Easterlin, R., 1995. "Will Raising the Incomes of All Increase the Happiness of All?" *Journal of Economic Behavior and Organization* 27: 35-48.
- Fafchamps, M. and F. Shilpi, 2008. "Subjective welfare, isolation, and relative consumption," *Journal of Development Economics*, Elsevier, vol. 86(1), 43-60, April.
- Fields, G., 2007. "Income Mobility," ILR Working Paper, Cornell University.
- Frank, R., 1985. *Choosing the Right Pond*, New York: Oxford University Press.
- Frank, R. and A. Levine, 2008. "Expenditure Cascades," working paper, Cornell University.
- Fujita, M. and D. Hu, 2001. "Regional disparity in China 1985- 1994: the effect of globalization and economic liberalization," *Annals of Regional Science* 35, 3- 37.
- Guo, J., 2007. "Changing Income Inequality: Evidence from Rural China," Working Paper, Department of Economics, University of Warwick.
- Gustafsson, B. and S. Li, 1998. "Inequality in China at the end of the 1980s: Locational Aspects and Household Characteristics," *Asian Economic Journal*, 35-63.
- Gustafsson, B. and S. Li, 2002. "Income inequality within and across counties in rural China 1988 and 1995," *Journal of Development Economics* 69, 179-204.

- Gustafsson, B., S. Li., and T. Sicualar, 2007. *Inequality and Public Policy in China*, New York: Cambridge University Press.
- Heffetz, O., 2007. "Conspicuous Consumption and the Visibility of Consumption Expenditures," Mimeo, Cornell University.
- Hoken, H., T. Senda, Y. Matsuda, H. Tsujii, and L. Cao, 2006. "Statistical Matching for Longitudinal Data of Rural Households in China: Construction of MHTS Panel Data Set and Estimation of Attrition Bias," NO. E2006013, CCER Working Paper, Peking University, China.
- Holz, C. and L. Brandt, 2004. "Spatial Price Differences in China: Estimates and Implications," Manuscript, University of Toronto.
- Howes, S. and A. Hussain, 1994. "Regional Growth and Inequality in Rural China," Working paper, London School of Economics.
- Huang, J., Q. Zhang, and S. Rozelle, 2008. "Economic growth, the nature of growth and poverty reduction in rural China," *China Economic Journal*, 1:1, 107 - 122.
- Jalan, J. and M. Ravallion, 1998. "Transient poverty in postreform rural china," *Journal of Comparative Economics*, 26(2), 338-57.
- Jian, T., J. Sachs, and A. Warder, 1996. "Trends in regional inequality in China," *China Economic Review* 7 (1), 1-21.
- Ravallion, M. and J. Jalan, 2001. "Household Income Dynamics in Rural China," Policy Research Working Paper Series 2706, the World Bank.
- Kanbur, R. and X. Zhang, 1999. "Which regional inequality? The evolution of rural-urban and inland - coastal inequality in China from 1983 to 1995," *Journal of Comparative Economics* 27, 686-701.
- Kanbur, R., 2000. "Income Distribution and Development," In: A.B. Atkinson and F. Bourguignon (eds.) *Handbook of Income Distribution*, Vol 1, North Holland.
- Kempen L., 2003. "Status consumption and ethnicity in Bolivia: Evidence from Durables Ownership," *International Journal of Consumer Studies*, Vol. 31, Issue 1, pp. 76-89.
- Khan, A., K. Griffin, C. Riskin, and R. Zhao, 1993. "Sources of Income Inequality in Post-Reform China," *China Economic Review*, Vol. 4, pp. 19-35.
- Khan, A., K. Griffin, and C. Riskin, 1999. "Income Distribution in Urban China during the Period of Economic Reform and Globalization," *American Economic Review* v89, n2: 296-300.
- Khan, A. and C. Riskin, 1998. "Income and Inequality in China: Composition, Distribution and Growth of Household Income 1988 to 1995," *China Quarterly* v0, n154: 221-53.

- Khor, N. and J. Pencavel, 2005. "Income Disparities and Income Mobility in China," paper delivered at the Conference on China's Policy Reforms: Progress and Challenges, Stanford University Center for International Development, 1 October.
- Khor, N. and J. Pencavel, 2006: 'Income Mobility of Individuals in China and the United States'. IZA research paper, No. 2003.
- Li, H. and Y. Zhu, 2006. "Income, Income Inequality, and Health: Evidence from China," *Journal of Comparative Economics*, vol. 34, issue 4, 668-693.
- Li, S., P. Wang, and X. Yue, 2005. "The Causes of Chronic and Transient Poverty and Their Implication to Poverty Reduction Policy in Rural China," Final Report to Poverty and Economic Poverty (PEP) network, <http://www.pep-net.org/>.
- Liang, Z., 2006. "Financial Development and Income Inequality in Rural China 1991-2000," WIDER Research Paper, 2006/96.
- Ling, D., 2008. "Do the Chinese 'Keep Up with the Joneses'? Implications of Growing Economic Disparities and Relative Deprivation on Health Outcomes among Older Adults in China," working paper, California State University, Fullerton.
- Ling, D., 2007. "Relative Deprivation and Children's Health in China," working paper, California State University, Fullerton.
- Liu, X., 2000. In *One's Own Shadow: An Ethnographic Account of the Condition of Post-Reform China*, Berkeley: University of California Press.
- Lokshin, M. and M. Ravallion, 2001. "Nonlinear Household Income Dynamics in Transition Economies," mimeo, Development Research Group, the World Bank.
- Lyons, T., 1991. "Interprovincial disparities in China: output and consumption, 1952- 1987," *Economic Development and Cultural Change* 39, 471-506.
- McCulloch, N. and M. Calandrino, 2003. "Vulnerability and Chronic Poverty in Rural Sichuan," *World Development*, Volume 31, Issue 3, 611-628.
- Morduch, J. and T. Sicular, 2002. "Rethinking Inequality Decomposition, with Evidence from Rural China," *Economic Journal* (112): 93-106.
- Nee, V., 1994. "The Emergence of a Market Society: Changing Mechanisms of Stratification in China," *American Journal of Sociology*, Vol 101, No.4: 908-949.
- Peng, Y., 1999. "Agricultural and nonagricultural growth and intercounty inequality in China 1985 - 1991," *Modern China* 25 (3), 235- 263.
- Rao, V., 1993. "The Rising Price of Husbands: a Hedonic Analysis of Dowry Increases in Rural India," *Journal of Political Economy*, 101: 666-677.
- Ravallion, M., 1998. "Does aggregation hide the harmful effects of inequality on growth?" *Economics Letters* 61, 73-77.

- Ravallion, M. and S. Chen, 1999. "When Economic Reform Is Faster Than Statistical Reform: Measuring and Explaining Income Inequality in Rural China," *Oxford Bulletin of Economics and Statistics* v61, n1: 33-56.
- Ravallion, M. and S. Chen, 2007. "China's (Uneven) Progress Against Poverty," *Journal of Development Economics*, 82(1): 1-42.
- Rozelle, S., 1994. "Rural Industrialization and Increasing Inequality: Emerging Patterns in China's Reforming Economy," *Journal of Comparative Economics* 19, 362- 391.
- Runciman, W.G., 1966. *Relative Deprivation and Social Justice*, Routledge and Kegan Paul.
- Sen, A., 1983. *Poor, Relatively Speaking*, Oxford Economic Papers. New Series, Vol. 35, No. 2, pp. 153-169.
- Shen, Y and Y. Yao, 2008. "Does Grassroots Democracy Reduce Income Inequality in China?" *Journal of Public Economics* Vol. 92, Issues 10-11, 2182-98.
- SSB (various years). *China Statistical Yearbook*. Beijing: China Statistical Publishing House.
- Stark, O. and J.E. Taylor, 1991. "Migration Incentives, Migration Types: The Role of Relative Deprivation," *Economic Journal* 101: 1163-1178.
- The Economist*, 2007. "Can Ghanaians afford such splendid funerals?" May 24.
- Tsui, K.-Y., 1993. "Decomposition of China's Regional Inequality," *Journal of Comparative Economics* 17, 600- 627.
- Tsui, K.-Y., 1998a. "Factor Decomposition of Chinese Rural Income Inequality: New Methodology, Empirical Findings, and Policy Implications," *Journal of Comparative Economics* 26(3): 502-528.
- Tsui, K.-Y., 1998b. "Trends and Inequality of Rural Welfare in China: Evidence from Rural Households in Guangdong and Sichuan," *Journal of Comparative Economics* 26, 783-804.
- Van de Stadt, H., A. Kapteyn, and S. Van de Geer, 1985. "The Relativity of Utility: Evidence from Panel Data," *Review of Economics and Statistics*, 67(2), 179-187.
- Veblen, T., 1899. *The Theory of the Leisure Class*, MacMillan, New York.
- Wan, G., 2005. "Convergence in Food Consumption in Rural China: Evidence from Household Survey Data," *China Economic Review*, Vol. 16, No. 1, 90-102.
- Wan, G., 2007. "Regional Income Inequality in Rural China, 1985-2002: Trends, Causes and Policy Implications," WIDER Research Paper, 2007/05.
- Wan, G. and Z. Zhou, 2005. "Income Inequality in Rural China: Regression-based Decomposition Using Household Data," *Review of Development Economics*, Vol. 9, No. 1, 107-120.
- Wang, H., 2005. "The Household Income Mobility and its Equalizing Longterm Income in China," *Economic Research Journal* (in Chinese), No. 1: 56-66.

- Whalley, J. and X. Yue, 2006. "Rural Income Volatility and Inequality in China," NBER Working Paper No. W12779.
- World Bank, 1992. "China: Statistical System in Transition," the World Bank, Washington DC.
- Yan, Y., 1996. *The Flow of Gifts: Reciprocity and Social Networks in a Chinese Village*, Stanford: Stanford University Press.
- Yao, S., 1997. "Industrialization and spatial income inequality in rural China 1986- 92," *Economics of Transition* 5(1), 97- 112.
- Yao, S., Z. Zhang, and L. Hanmer, 2004. "Growing inequality and poverty in China," *China Economic Review*, vol. 15, issue 2, 145-163.
- Ying, H., S. Li, and Q. Deng, 2006. "Income Mobility in Urban China," *Economic Research Journal* (in Chinese), 10: 30-43.
- Zhang, Q., J. Huang and J. Mi, 2006. "Income Inequality and Economic Mobility in Rural China: Who Can Move Up the Ladder of Success?" Working Paper, Northwestern University.
- Zhang, X. and R. Kanbur, 2001. "What Difference Do Polarisation Measures Make? An Application to China," *Journal of Development Studies*, Vol. 37, No. 3, 85-98.
- Zhang, X. and K. Y. Tan, 2007. "Incremental Reform and Distortions in China's Product and Factor Markets," *The World Bank Economic Review*, Vol. 21, No. 2, 279-299.
- Zhang, X., 2009. "Fiscal Decentralization and Political Centralization in China: Implications for Growth and Inequality," In: S. Fan, R. Kanbur and X. Zhang (eds.). *Regional Inequality in China: Trends, Explanations and Policy Responses*. London and New York: the Routledge.
- Zhang, X. and K. Zhang, 2009. "How does Globalization Affect Regional Inequality within a Developing Country? Evidence from China" In: S. Fan, R. Kanbur and X. Zhang (eds.). *Regional Inequality in China: Trends, Explanations and Policy Responses*. London and New York: the Routledge.

Appendix: A Comparison of Panel Datasets Utilized in Analyzing Inequality and Income Distribution in Rural China

Data Source	Category**	household	Village	Province	Sample Period	Major Characteristics	Authors
<i>Micro Level Panel Data</i>							
RCRE	Planned panels	24,000	360	31	1986-present (except 1992, 1994)	<ol style="list-style-type: none"> 1. diary book + visiting 2. nationally representative 3. 1/3 sample attrition over the period 1986-1999 4. collected on an annual basis 5. from fixed rural survey sites 	Benjamin et al. (2005a, 2006); Wan and Zhou (2005); Araar (2008); Brauw et al. (2008); Zhang et al. (2006)
RHS-NBS	Planned panels	68,190	7,100	31	1981-present (annually)	<ol style="list-style-type: none"> 1. sample rotation on a 5-year basis 2. diary book + visiting 3. detailed household income and consumption 4. nationally representative 5. micro data publicly unavailable 6. collected on an annual basis 7. the only data source covering a reasonably long period of time 	Ravallion (1998)* Chen and Ravallion (1996)*
CHNS	Planned panels	1920/2160	96/108	9	1989, 1991, 1993, 1997, 2000, 2004, 2006	<ol style="list-style-type: none"> 1. a 3-day period in each survey 2. detailed information for nutrition and health research 3. poor income and expenditure information 4. include rural and urban samples 5. county names not revealed 	Benjamin et al. (2002, 2005b); Ling (2008); Li et al. (2006); Wang (2005)

CHIPS	Retrospective panels	4178/7888 /9200***	-	18/22	1988, 1995, 2002	1. a single-interview in each wave relying on recall 2. more detailed information about household income 3. include a subsample of rural migrants 4. combine rural and urban samples	Khan et al. (1998); Yao et al. (2004); Chen (2005); Khor et al. (2006); Ying et al. (2006); Brauw and Rozelle (2008); Brauw and Giles (2008)
CAPM	planned panels	7,950	130/138	25	1983, 1989	detailed information for nutrition, health, and medicare research	Nee (1994)
MORDUCH	Planned panels	259	16	1	1990-1993	deliver consistent definitions of income	Morduch and Sicular (2002)
IFPRI-CAAS	Planned panels	805/823	3	1	2004, 2006	1. census-type panel survey 2. detailed info on social spending 3. geographically isolated 4. multi-ethnic populated	Brown et al. (2008)
Macro Level Panel Data							
RSESS-NBS	Macro Panels	-	-	28	1985-2002	time series and cross provincial data	Huang et al. (2008)
IFPRI	Macro Panels	-	-	29	1952-2001	longer time series and more cross provincial data	Fan et al. (2005)
RHS Statistic	Macro Panels	-	-	28	1982-1998	detailed categories of food consumption items	Wan (2005)
CCPFSY	Macro Panels	-	1860 counties	-	1993-2000	detailed information on public sector at the county level	Zhang (2009)

* They have access to the official household survey data NBS but only for four provinces between 1985 and 1990. ** Besides planned panels and retrospective panels, there have been no inadvertent panels and pseudo panels. *** Only rural samples in each wave of the CHIPS are included here.