

UNDERSTANDING REGIONAL POVERTY AND INEQUALITY TRENDS IN CHINA: METHODOLOGICAL ISSUES AND EMPIRICAL FINDINGS

BY GUANGHUA WAN*

United Nations University–World Institute for Development Economics Research, Finland

This paper focuses on methodological and empirical issues in analyzing regional poverty and inequality trends in China. It provides a time profile of China's regional inequality, outlines the latest development in inequality decomposition techniques, introduces six papers in this special issue of the *Review*, and finally offers suggestions for future research.

1. INTRODUCTION

As remarkable as its growth miracle is China's fast rising inequality and emerging urban poverty. The latter reflects the uneven nature of economic growth which has favored some sectors, regions and individuals more than others. While much has been written on the growth aspect, less is known about the causes, consequences and policy measures regarding inequality and poverty in China. This is surprising and regrettable as an accurate assessment of poverty and inequality trends and patterns in the most populous country on earth is central to understanding changes in worldwide inequality and poverty—these differ significantly when China is included or excluded (Milanovic, 2002, 2005). In the same context, China's future performance is crucial to the achievement of the Millennium Development Goals at the global level. Within China, inequality and poverty are amongst the most important social and economic issues. The ongoing campaign of “western development” launched in 1999 and the recent government initiative of “building a harmonious society” highlight the urgency and significance of analyzing these issues. In particular, policy-makers are increasingly concerned about the regional divide and the rural–urban gap, which could undermine social and political stability, and adversely affect long run economic growth in China (Wan *et al.*, 2006).

Earlier research on inequality in China was mostly focused on measurement of regional inequality (Tsui, 1991). This is followed by inequality decompositions, aiming at gauging the broad compositions of regional inequality (Rozelle, 1994;

Note: I would like to thank Stephan Klasen and Bart van Ark, editors of this journal, for their consistent support to the special issue. I am also grateful to anonymous referees for their detailed and timely reports. Many of them undertook second- or even third-round reviews, which were invaluable in shaping up the papers included in this special issue. Finally, I owe a great deal to Janis Vehmaan-Kreula of UNU-WIDER, Project Assistant, who provided tremendous help in running the project.

*Correspondence to: Guanghua Wan, UNU-WIDER, Katajanokanlaituri 6 B, Fin-00160, Helsinki, Finland (wan@wider.unu.edu).

© 2007 The Author

Journal compilation © 2007 International Association for Research in Income and Wealth Published by Blackwell Publishing, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main St, Malden, MA, 02148, USA.

Kanbur and Zhang, 1999; Wan, 2001). More recently, attention is being turned to analyzing inequality and poverty at the disaggregated levels of counties, villages, households and even individuals (Meng *et al.*, 2005; Wan and Zhou, 2005; Zhang and Wan, 2006). These research efforts, aided by the wider availability of household survey data, certainly help enrich our understanding of poverty and the increasing trend in inequality in China. However, there continues to be a lack of analytical work on sources or causes of the rising inequality in China. Speculations are abundant; many attribute the rising inequality to globalization, policy biases, decentralization, and different endowments of geographical or other resources (Kanbur and Zhang, 2005; Cai and Wan, 2006). However, few of these assertions have been substantiated by empirical evidence. Certainly, little is known about the relative importance of these potentially relevant contributing factors.

It is against the above background that in 2004 the World Institute for Development Economics Research of the United Nations University (UNU-WIDER) launched the project on Poverty and Inequality in China. The project, directed by myself, aims at providing a more complete account of the inequality and poverty issues in China, including measurement, causes, consequences and policy implications. Two international conferences were held under this project: one in Beijing in April 2005 (co-hosted by the Institute of Population and Labor Economics, Chinese Academy of Social Sciences) and the other in Helsinki in August 2005. Some 40 papers written in English were selected from over 300 submissions and were presented at these conferences. Selected papers written in Chinese are being published in a book volume in China.

This special issue is part of the output of this project, which mainly focuses on analyzing sources of regional inequality in China. It is commonly known that the worsening regional inequality may undermine the integrity of China as a nation. Focusing on sources of regional inequality is important not only because of its empirical value and relevance to policy-making. Such analyses call for methodological development as well. Therefore, in this paper, we will first provide a time profile of regional inequality in China in Section 2, followed by some remarks on inequality decomposition in Section 3. Summaries of the papers included in this special issue will be given in Section 4. Finally, Section 5 offers a short discussion on major areas for future research.

2. A TIME PROFILE OF REGIONAL INEQUALITY IN CHINA

To provide a time profile of China's regional inequality, we utilize household income data aggregated to the provincial level to calculate the Theil-L inequality index. For details on income data construction, see Wan *et al.* (this issue). According to Figure 1, the inter-regional income disparity has increased considerably since the mid-1980s, as is commonly accepted. What is more revealing of Figure 1 is that it displays a consistently higher regional inequality among rural regions than among urban regions. This in part reflects the egalitarian nature of urban wage setting in the pre-reform period with lagged effects, despite gradual changes (see Ng, this issue). In addition, it can be attributed to a better social welfare system in urban China, which is almost absent in rural China. The higher rural regional inequality also reflects the heavy dependence of income generation on

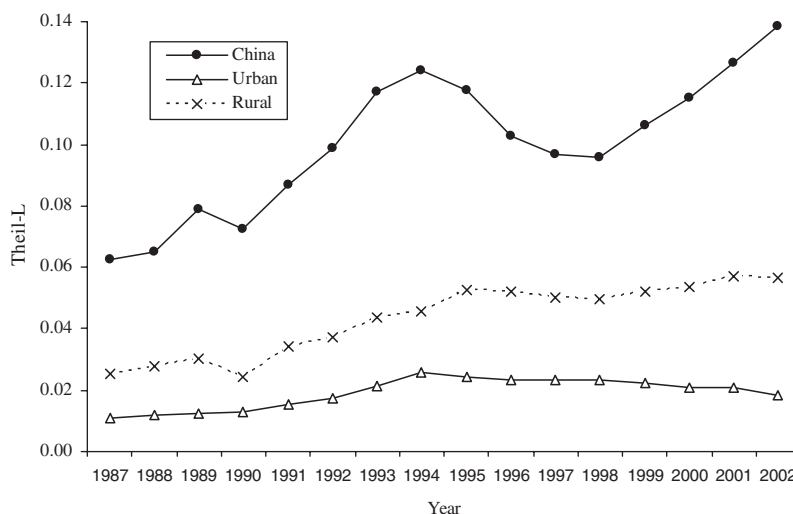


Figure 1. Regional Inequality in China

local weather conditions and local resources. Another observation from Figure 1 is that rural regional inequality appears to grow faster than the urban counterpart, a phenomenon which is interesting and has so far escaped attention from the research community. It should be noted that use of other indices such as the Gini coefficient and squared coefficient of variation produces a very similar picture as Figure 1.

China's regional inequality consists of two dimensions: the east–central–west divide and the urban–rural divide. To gauge their significance, a conventional technique can be used to decompose the overall inequality as measured by the Theil-L index along the two dimensions (Shorrocks and Wan, 2005). The contribution of the urban–rural gap to the overall regional inequality is shown in Figure 2. Clearly, that gap contributes a very large (some 70–80 percent of the total) and increasing proportion to the overall regional inequality. The remaining proportion is explainable by the within-component: inequalities within the rural and within the urban regions. In terms of absolute contributions, the within-component is stable or slightly declining since 1995. Thus, the fluctuations and increase in the overall regional inequality, particular in the late period, is mostly attributable to the urban–rural gap. It is worth noting that using household level data and different definitions of income, Sicular *et al.* (this issue) come up with lower percentage contributions of the urban–rural gap. This is understandable as their use of household data means inclusion of within-province disparities in the estimates of total inequality. Because we use regional averages instead, our estimates of total inequality exclude such within-components and thus must be smaller, rendering a larger percentage contribution of the urban–rural gap. Nevertheless, the finding of Sicular *et al.* continues to support the predominant contribution of the urban–rural gap.

Doing the same exercise along the east–central–west dimension, we can obtain Figure 3. Contrary to Figure 2, Figure 3 demonstrates that the within-

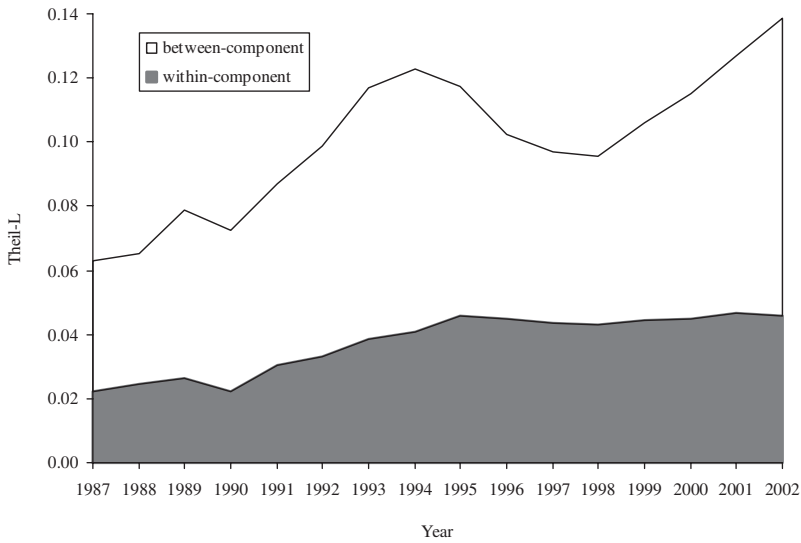


Figure 2. Decomposing Regional Inequality by the Urban-Rural Division

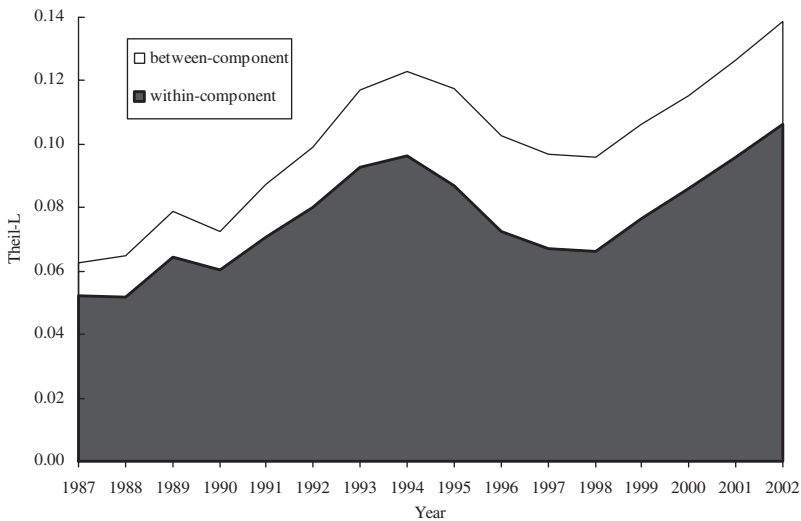


Figure 3. Decomposing Regional Inequality by the East-Central-West Division

component is mainly responsible for the rise in China’s regional inequality while the between-component had been more or less stable since after 1991, with the only exception of 1996–98. Such a finding throws into doubts the popular perception that the east–central–west divide is the most important driving force of China’s regional inequality. It certainly prompts one to question why the east–central–west disparity has received so much more attention than the urban–rural gap. While the campaign of “west development” was launched as early as 1999, few policy

initiatives were designed to narrow down the urban–rural disparity until the “socialism new countryside” program launched very recently. This bias in government policy-making can only be explained by the weak position of farmers as a lobby group, and by the fact that the east–central–west disparity is more relevant to the sovereign integrity of China as a nation, a point mentioned earlier in this paper.

Leaving geo-political issues aside, there is every justification to tackle the urban–rural gap as a first priority. A contrast of Figures 2 and 3 shows that China can only cut its regional inequality by 20–30 percent if the east–central–west disparities were eliminated. On the other hand, a drop of 70–80 percent (or over 50 percent according to Sicular *et al.*, this issue) can be achieved by eliminating the rural–urban gap. Clearly, a smart move is for China to target the rural areas in the poor western and central China.

3. INEQUALITY DECOMPOSITION TECHNIQUES: A BRIEF REVIEW

The above results are obtained by employing the traditional inequality decomposition technique of Shorrocks (1980, 1984). This so-called decomposition by population subgroups requires breaking sample data into mutually exclusive groups according to one or more category variables. Conversely, inequality decomposition by income sources requires an identity to express income as the sum of several components (Shorrocks, 1982). A major limitation of these traditional techniques lies in the restriction on the inequality measure that can be used. For example, the subgroup decomposition is usually only possible with the Theil-L index. The Gini index cannot be used for this purpose unless incomes from different subgroups do not overlap at all (Shorrocks and Wan, 2005). Another limitation is that the decomposition results are usually contaminated by other factors as these methodologies are unable to incorporate control variables. For example, not all income gaps between city and country residents are due to the rural–urban divide in China or elsewhere; there are differences in human capital and other characteristics and so on. As another example, regional inequality is essentially determined by a number of variables such as weather, culture, physical and human capital. But decompositions along the geographical dimension usually assume location as the only contributor.

One solution to these problems is the regression-based decomposition, which allows inclusion of any number or type of variables or even proxies, including social, economic, demographic, and policy factors. The flexibility of this approach, particularly its ability to accommodate endogeneity of income determination and random errors, makes it rather attractive. Oaxaca (1973) and Blinder (1973) are the pioneers of this approach; they focus on the difference in mean income between two groups, attributing it to differences in resource endowments as represented by sample averages of regression variables, and in returns to the endowments as represented by parameter estimates of the regression equations. This decomposition technique is modified and implemented by Ng and Sicular *et al.* in this special issue.

In a different strand of literature using semiparametric and nonparametric techniques, DiNardo *et al.* (1996) and Deaton (1997) describe and compare the

entire distribution of the target variable in terms of the density function, rather than attempting to decompose a summary measure of inequality. Although they impose few structural assumptions, the findings are less conclusive than economists and policy makers would prefer, as Morduch and Sicular (2002) argue. Fields and Yoo (2000) and Morduch and Sicular (2002) start with specifying and estimating parametric income-generating functions and then derive inequality decompositions based on the estimated regression equations. Their conceptual frameworks also have some limitations. For example, they impose restrictions on the inequality measures and on the model specification. See Wan (2002, 2004) for details.

One may ask if it is possible to undertake inequality decomposition under *any* inequality measure. The answer is *yes*. The recently developed Shapley decomposition (Shorrocks, 1999) can be used for inequality decomposition by population sub-groups or by factor components as long as one can express income as a function of factor incomes or as deviations within and between population sub-groups. Wan (2004) makes an attempt to marry the conventional regression models with the Shapley procedure of Shorrocks (1999). The regression model establishes a relationship between a target variable such as consumption or income and its determinants such as human capital, family characteristics, and locality. The Shapley procedure relies on the estimated function to attribute inequality in income or consumption to the various determinants. Relative to earlier methods, this approach of Wan (2004) has a number of advantages. First, it is applicable under any inequality measure. Relative inequality measures such as the Gini and generalized entropy indices or absolute measures such as the Kolm index can all be used. Second, it can control for as many variables as data availability permits, rendering decomposition results more precise and reliable. For example, in studying the urban–rural gap, we can control for education, age and so on. Third, it does not require a pre-defined identity to express income as a sum of its components although such an identity can be treated as a special regression model without the residual term. Finally, it imposes few constraints on the regression model; the model can be highly nonlinear, can include interactive terms and can be one of the equations in simultaneous systems. The regression-based decomposition technique is used by Wan *et al.* as well as Tsui in this special issue.

4. PAPERS IN THIS SPECIAL ISSUE

The special issue begins with the paper by Wan *et al.* They extend the regression-based inequality decomposition technique of Morduch and Sicular (2002) and Fields and Yoo (2000), and then provide an accounting of China's regional inequality for the period 1987–2001, with a special emphasis on the contribution of globalization. A striking finding is that globalization as represented by trade and FDI variables are among the most influential factors causing fast rises in regional inequality in China. Uneven distributions of domestic capital, FDI and trade account for almost 50 percent of the total regional inequality. These findings imply a need for the development of sound financial systems, particularly capital markets in rural China. They also beg for policy initiatives to bring more

benefits of globalization to the interior regions. In passing, it is noted that the role of location is found to have declined over time.

What is developed in Wan *et al.* can be termed level accounting, which enables quantification of contributions to the overall level of inequality. Related to this is difference accounting which can be used to explain changes/differences in the overall level of inequality. This is the focus of the second paper, by Tsui, who proposes a framework under which a change in total inequality can be expressed as a sum of changes in spatial variations in the growth of total factor productivity (TFP) and in factor inputs. Applying this technique to China, it is found that the increase in regional inequality from the mid-1960s to the mid-1970s is mainly due to the contribution of TFP overwhelming that of physical capital. The opposite is true for the 1980s. The increase in the 1990s is mainly driven by the skewed distribution of investment in favor of the richer coastal provinces reinforced by the increasing contribution of TFP. These echo the findings of the first paper regarding the increasing importance of physical capital.

While the first two papers mainly focus on the inter-province disparities, the other dimension of regional inequality—the urban–rural gap is taken up by Sicular *et al.* in the third paper. Their major contributions include a better measure of income, consideration of migrants and empirically decomposing the urban–rural gaps using a modified Oaxaca–Blinder framework. By including housing-related income and employing the regional price deflators of Brandt and Holz (forthcoming), they find a smaller contribution of the urban–rural gap to the overall regional inequality. As expected, the incorporation of the migrant population leads to a narrower urban–rural gap. Regarding components of the urban–rural gap, they find that differences in the endowments of household characteristics contribute about half of the gap with the remaining half due to differences in the returns to these endowments. The contribution of location is found to have declined from 1995 to 2002, which accords well with the finding of Wan *et al.* (this issue).

In all the above papers, authors either construct new data sets or caution about various data problems which are notoriously known to many. The fourth paper by Chotikapanich *et al.* tackles the data problem head-on. The paper develops a technique which enables use of grouped data to examine inter-household or inter-person income distribution. Such a technique is important because no nationwide household income data are available for China or many other countries. Interestingly, their empirical application of the proposed technique to China produces results that are consistent with those presented in Section 2. That is, rural inequality is higher than urban inequality and that both inequalities have increased over time.

Needless to say, rising regional inequality must be rooted in the enlarged income gaps between individuals, due to more pronounced differences in human resources or in the returns. From this perspective, the fifth paper by Ng is complementary to the earlier papers in this special issue. To be precise, Ng addresses the issue of gender discrimination in wages in urban China. A salient feature of this paper lies in its use of a large and publicly inaccessible data set at the individual level. Based on an extended Oaxaca–Blinder decomposition technique, Ng finds that gender discrimination, although limited, is evident in more developed areas and has increased over time. These are likely to be caused by wage decentralization

and possibly enhanced market competition. An interesting discovery is that resource endowments of females are found to have increased more than those of males, offsetting some of the effects of discrimination in returns to personal characteristics against women in the labor market.

Finally, Meng *et al.* explore the role of regional inequality in affecting urban poverty and poverty determinants during the 1986–2000 period. They decompose the difference in the probability of being poor over time and attribute the difference to three sets of factors: the demographic structure of households, human capital stock and regional effects. Due largely to changes in food prices and the provision of welfare services, large family size and few workers per family are associated with an increasing poverty risk over time in urban China. Conversely, education plays an increasing role in reducing the poverty risk. The poverty of a region as a whole as well as the cost of amenities in a region have a significant influence on the regional profile of urban poverty.

5. SUGGESTIONS FOR FUTURE WORK

Limited space allows only a small selection of papers to be included here and many issues remain unexplored. First, there is an urgent need to study the impact of incomplete reforms on inequality and poverty. Sector segregation was rather minimal in pre-reform China in terms of wage structure. As wage setting has decentralized while monopoly power has developed in some sectors due to incomplete reform or lack of second-generation reforms, salary gaps across sectors have increased significantly. In the earlier days, bank staff were highly paid. Now, those working in telecommunication or energy-related sectors are being relatively over-remunerated. It would be important and interesting to analyze this kind of impact and its role in affecting poverty and inequality outcomes.

Second, the consequences of the rising inequality seem to have been overlooked by the research community. This is rather disappointing given the increasing coverage of inequality-related incidents in the public media. For example, rural migrants are being blamed for crime increases in urban China. However, few realize a main root cause of this being unacceptable inequality in income and access to school, health care and many other benefits between urban residents and migrants. As another example, the Chinese society is overwhelmingly shocked by two phenomena which have recently been exposed to the public: student prostitution and student homicide. Both are known to grow out of relative deprivation and envy, but debates on these phenomena are seldom, if at all, placed in the context of inequality and poverty.

Third, the size of the middle-class in China is considered to be crucial for the stability of the country, and its dynamics may impinge on political reforms. Yet, analytical studies have not appeared which provide an assessment of the middle-class population, its composition and relevant dynamics. Given the huge difference in political strength, it is necessary to examine rural and urban China separately, taking into account the urbanization process. Clearly, such work requires household or individual data which are not publicly available. However, the data generation technique proposed by Chotikapanich *et al.* (this issue) and Shorrocks and Wan (2006) may offer promising solutions to the data problem.

Finally, it is imperative to evaluate policy recommendations or policy measures from research outputs in terms of feasibility and results. As one example, the campaign of “west development” has been in full swing with tremendous inputs, financial or non-financial. However, its impact on regional inequality is yet to be properly analyzed. Another example relates to the urban–rural gap. Despite the initiative of “building a socialism new countryside,” how to improve the living standard of the rural poor remains an open question. The *Hukou* or household registration system has been blamed for the persistent urban–rural gap (Whalley and Zhang, 2004). This, in fact, is not a minority view. However, it is not clear how eliminating this restriction would help close the rural–urban or regional gap. An obvious counter example is the persistent gap in India where such administrative restriction is not instituted.

REFERENCES

- Blinder, A. S., “Wage Discrimination: Reduced Form and Structural Estimates,” *Journal of Human Resources*, 8, 436–55, 1973.
- Brandt, L. and C. A. Holz, “Spatial Price Differences in China: Estimates and Implications,” *Economic Development and Cultural Change*, forthcoming.
- Cai, F. and G. H. Wan, *Poverty and Inequality in Transition China*, Social Sciences Academic Press, Beijing, 2006.
- Chotikapanich, D., D. S. Prasada Rao, and K. K. Tang, “Estimating Income Inequality in China Using Grouped Data and the Generalized Beta Distribution,” *Review of Income and Wealth*, 53(1), 129–49, 2007.
- Deaton, A., *The Analysis of Household Surveys: A Microeconomic Approach to Development Policy*, Johns Hopkins University Press, Baltimore, 1997.
- DiNardo, J., N. M. Fortin, and T. Lemieux, “Labor Market Institutions and the Distribution of Wages, 1973–1992: A Semiparametric Approach,” *Econometrica*, 64, 1001–44, 1996.
- Fields, G. S. and G. Yoo, “Falling Labor Income Inequality in Korea’s Economic Growth: Patterns and Underlying Causes,” *Review of Income and Wealth*, 46, 139–59, 2000.
- Kanbur, R. and X. Zhang, “Which Regional Inequality: Rural–Urban or Coast–Inland? An Application to China,” *Journal of Comparative Economics*, 27, 686–701, 1999.
- , “Fifty Years of Regional Inequality in China: A Journey through Revolution, Reform and Openness,” *Review of Development Economics*, 9(1), 87–106, 2005.
- Meng, X., R. G. Gregory, and Y. Wang, “Poverty, Inequality, and Growth in Urban China, 1986–2000,” *Journal of Comparative Economics*, 33(4), 710–29, 2005.
- Meng X., R. Gregory, and G. Wan, “Urban Poverty in China and its Contributing Factors, 1986–2000,” *Review of Income and Wealth*, 53(1), 171–93, 2007.
- Milanovic, B. “True World Income Distribution, 1988 and 1993: First Calculation Based on Household Surveys Alone,” *Economic Journal*, 112(476), 51–92, 2002.
- , “Half a World: Regional Inequality in Five Great Federations,” *Journal of the Asia and Pacific Economy*, 10(4), 408–45, 2005.
- Morduch, J. and T. Sicular, “Rethinking Inequality Decomposition, with Evidence from Rural China,” *The Economic Journal*, 112, 93–106, 2002.
- Ng, Y. C., “Gender Earnings Differentials and Regional Economic Development in Urban China, 1988–97,” *Review of Income and Wealth*, 53(1), 151–69, 2007.
- Oaxaca, R., “Male–Female Wage Differentials in Urban Labour Markets,” *International Economic Review*, 14(3), 693–709, 1973.
- Rozelle, S., “Rural Industrialization and Increasing Inequality: Emerging Patterns in China’s Reforming Economy,” *Journal of Comparative Economics*, 19, 362–91, 1994.
- Shorrocks, A. F., “The Class of Additively Decomposable Inequality Measures,” *Econometrica*, 48, 613–25, 1980.
- , “Inequality Decomposition by Factor Components,” *Econometrica*, 50, 193–211, 1982.
- , “Inequality Decomposition by Population Subgroups,” *Econometrica*, 52, 1369–85, 1984.
- , “Decomposition Procedures for Distributional Analysis: A Unified Framework Based on the Shapley Value,” Unpublished manuscript, Department of Economics, University of Essex, 1999.

- Shorrocks, A. F. and G. H. Wan, "Spatial Decomposition of Inequality," *Journal of Economic Geography*, 5(1), 59–81, 2005.
- , "Ungrouping Income Distributions: Synthesising Samples for Inequality and Poverty Analysis," Unpublished manuscript, UNU-WIDER, 2006.
- Sicular, T., X. Yue, B. Gustafsson, and L. Shi, "The Urban–Rural Income Gap and Inequality in China," *Review of Income and Wealth*, 53(1), 95–128, 2007.
- Tsui, K. Y., "China's Regional Inequality, 1952–85," *Journal of Comparative Economics*, 15, 1–21, 1991.
- , "Forces Shaping China's Interprovincial Inequality," *Review of Income and Wealth*, 53(1), 61–93, 2007.
- Wan, G. H., "Changes in Regional Inequality in Rural China: Decomposing the Gini Index by Income Sources," *Australian Journal of Agricultural and Resource Economics*, 45(3), 361–82, 2001.
- , "Regression-Based Inequality Decomposition: Pitfalls and a Solution Procedure," UNU-WIDER Discussion Paper No. 2002/101, Helsinki, 2002.
- , "Accounting for Income Inequality in Rural China," *Journal of Comparative Economics*, 32(2), 348–63, 2004.
- Wan, G. H. and Z. Y. Zhou, "Income Inequality in Rural China: Regression-Based Decomposition Using Household Data," *Review of Development Economics*, 9, 107–20, 2005.
- Wan, G. H., M. Lu, and Z. Chen, "The Inequality–Growth Nexus in the Short and Long Runs: Empirical Evidence from China," *Journal of Comparative Economics*, 34, 654–67, 2006.
- , "Globalization and Regional Inequality: Evidence from Within China," *Review of Income and Wealth*, 53(1), 35–59, 2007.
- Whalley, J. and S. Zhang, "Inequality Change in China and (HUKOU) Labour Mobility Restrictions," NBER Working Paper Series, No. 10683, Cambridge, 2004.
- Zhang, Y. and G. H. Wan, "The Impacts of Growth and Inequality on Rural Poverty in China," *Journal of Comparative Economics*, 34, 694–712, 2006.