

Income distribution trends in Brazil and China: Evaluating absolute and relative economic growth[☆]

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Abstract

Over the past two decades real per capita income has increased significantly in Brazil and spectacularly in China. Relative inequality in the distribution of income, however, has remained high in Brazil and has worsened in China. This paper uses a “stochastic dominance” approach to evaluate the welfare effects of a combination of rising mean per capita income in the context of worsening relative inequality. It concludes that by this criterion economic welfare in Brazil increased slightly in the 1981–2002 period. In China, the rapid increase in mean per capita was more than sufficient to overcome significantly increased relative inequality. Between 1985 and 2001 economic welfare thus increased substantially. The overall increase in welfare in both countries, however, is more complex when analyzed by consideration of specific time periods or by rural–urban decomposition.

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1. Introduction

The recent economic experience of a number of major developing economies has raised the concern that the price of high per capita income growth may be an accompanying worsening inequality in the relative distribution of income. The controversy about both the positive and the negative features of the economic growth process may have been deepened by the fact that each feature is often discussed independently. This is in part due to the fact that aggregate statistics used to characterize each trend, such as per capita income or consumption as a measure of overall

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growth, and the Gini coefficient or the Lorenz curve as indicators of relative income inequality, may indeed be calculated and examined in isolation from each other.

The difficulty with considering each trend in isolation is that it easily leads to arbitrary value judgments about the success or failure of the development process. A more satisfactory approach must consider per capita income growth and relative inequality in the distribution of income simultaneously. Such an evaluation, however, requires an explicit consideration of the preferences that underlie judgments that one kind of economic growth outcome is preferred to another. Economists have traditionally summarized these kinds of preferences using utility functions, while seeking to make the resulting judgments as general as possible. This is the approach of this paper, which uses a utility-based or “stochastic dominance” approach to examine the effects of economic growth in recent decades in Brazil and in China.

The use of stochastic dominance rules to compare income distributions is not new.¹ This paper extends the approach, however, by using stronger and computationally simpler criteria to make such comparisons. Section 2 summarizes the intuition, assumptions, and methodology of the stochastic dominance comparison. Section 3 applies the method to data from Brazil’s *Pesquisa Nacional por Amostra de Domicílios* (PNAD), or National Household Sample Survey, from 1981 to 2002, noting some of the sample-specific and country-specific features of these data. Section 4 is a similar application to China’s State Statistical Bureau Annual Household Survey, using data from 1985 and 2001. The paper concludes in Section 5 with a discussion of some of the empirical and theoretical limitations faced by any utility-based evaluation of income trends.

2. Stochastic dominance comparisons of income distributions

Amartya Sen (1997) has suggested that characterizations of income distributions and inequality fall into two general categories, “objective” and “normative”. The approach of this paper falls into the latter category, since it rests on explicit assumptions about preferences. In this section we outline, without proofs, the stochastic dominance approach to evaluating income distributions.

If we ask if one country’s distribution of personal incomes would be preferred to that of another country, or if it would be preferred to an earlier distribution of income in the same country – in other words, has it improved? – we are essentially asking about choices between probability distributions. This is the intuition of the stochastic dominance criteria when applied to the evaluation of income distributions. It may be seen more clearly in a simple comparison of two alternative distributions ($F(y)$ and $G(y)$) of the incomes (y) of three individuals, as represented in Fig. 1. The two underlying densities ($f(y)$ and $g(y)$) are shown in the lower panel, with the three individual incomes in density $g(y)$ denoted with O and the three incomes in $f(y)$ denoted by X. The corresponding distributions $F(y)$ and $G(y)$ are shown in the upper panel. All six incomes lie in the interval between 0 and some maximum income M .

The poorest of the three individuals in $f(y)$ clearly has a lower income than that of the highest member of $g(y)$. If one could choose to be the highest income member of the $g(y)$ economy, this would be superior to being the poorest person in $f(y)$. But if one could only choose between being a member of the $f(y)$ economy or the $g(y)$ economy, without choosing which member one could be, anyone who prefers a higher income to a lower one (i.e., anyone for whom the marginal

¹ An early theoretical work relating stochastic dominance to choice among income distributions was Atkinson (1970), with subsequent work by Foster and Shorrocks (1988). The method has been used in Brazil by Barros and Mendonça (1995) and Barros and Ramos (2005). It does not appear to have been used with Chinese data.

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