Chinese Poverty:
Assessing the Impact of Alternative Assumptions[1]

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This paper investigates how estimates of the extent and trend of consumption poverty in China between 1990 and 2001 vary as a result of alternative plausible assumptions concerning the poverty line and estimated levels of consumption. Our methodology focuses on the following sources of variation: alternative purchasing power parity conversion factors (used to convert an international poverty line), alternative estimates of the level and distribution of private incomes, alternative estimates of the propensity to consume of lower income groups, and alternative consumer price indices. It is widely believed that substantial poverty reduction took place in China in the 1990s, and we find this conclusion to be robust to the choice of assumptions. However, estimates of the extent of Chinese poverty in any year are greatly influenced by the assumptions made.

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1. Introduction

The extent and trend of poverty in China play a crucial role in determining the extent and trend of poverty in the world (Reddy and Minoiu, 2007).[4] However, there is substantial uncertainty concerning Chinese poverty, despite recent studies on the topic. Some of these uncertainties are data-related. For example, nationally representative household consumption surveys are not publicly available for China and poverty analysis is often undertaken on grouped data (Chen and Ravallion 2001a, 2001b, 2004, 2007; Chen and Wang, 2001; Berry and Serieux, 2004; Sala-i-Martin, 2006), or unit data with limited coverage of years or provinces (Khan and Riskin, 2001; Gibson, Huang and Rozelle, 2003; Meng, Gregory and Wang, 2005; Xue and Zhong, 2006; and Zhang and Wan, 2006). Other uncertainties relate to methodology (for example, there is no official national poverty line for China). This study contributes to the literature by presenting the first set of *national* consumption poverty estimates for China covering a *series* of recent years and based on *alternative* plausible assumptions concerning poverty lines and other parameters.

We present consumption poverty estimates for China for selected years between 1990 and 2001 based on alternative choices of poverty lines and assumptions concerning the consumption profile (i.e., the mean consumption levels of income quantiles) in each year. From the outset, it should be noted that our aim is not to present a new set of authoritative point estimates of poverty for China. That task is presently beyond our capabilities due to data limitations. Rather, the aim of the paper is to present a set of poverty estimates based on alternative assumptions which reflect judgments that have been made in other contributions to the literature. As a result, we are able to come to the conclusion that the estimated trend of poverty reduction in China in the 1990s is strong regardless of the assumptions made.

In contrast to this study, other studies focus on only one set of possible assumptions. For example, Chen and Ravallion (2007) and Sala-i-Martin (2002a, 2002b, 2006) produce estimates of household income (rather than consumption) poverty. While Chen and Ravallion (2004) use survey-based average incomes for income quantiles, Sala-i-Martin (2002a, 2002b, 2006) takes the view that the national accounts provide a more appropriate estimate of average household income. Furthermore, these studies use either a national consumer price index (CPI) or separate sectoral (rural and urban) CPIs covering a broad range of consumer goods to express the poverty line in constant prices. However, a CPI that better reflects prices of the commodities necessary to achieve basic human requirements and thereby avoid poverty might be more appropriate to employ in

[4] Chen and Ravallion (2004) (henceforth, 'CR') presented a set of '$1/day' poverty estimates aiming at comprehensive coverage in terms of time span and countries. The '$1/day' poverty line actually refers to the (international) $1.08/day 1993 PPP poverty line referred to in Chen and Ravallion (2001a). For simplicity, we refer to this and the $2.15/day poverty line as $1/day and $2/day. Chen and Ravallion (2004) concluded that between 1981 and 2001, the $1/day poverty headcount (as a share of the developing world population) fell by half if China is included in the analysis (from 40.4 percent to 21.1 percent). However, when China's performance is not accounted for, the reduction in the poverty headcount ratio was from 31.7 percent to 22.5 percent (see Table A1). Furthermore, the absolute number of '$1/day poor' rose slightly outside of China, from 848.1 million in 1981 to 877.4 million in 2001.

poverty assessments. Some analyses of Chinese poverty only present estimates for a small number of years, offering an incomplete picture of the trend in Chinese poverty over the past decade. For example, Khan and Riskin (2001) and Khan (2004) do not present national poverty estimates, and their analysis is limited to two years (1988 and 1995) and three years (1988, 1995 and 2002), respectively. Similarly, Meng, Gregory and Wang (2005) describe the evolution of poverty over the period 1986-2000, but only in urban areas.

Due to the lack of publicly available household survey data for China that are both nationally representative and available for diverse years (see, for example, Khan and Riskin, 2001 on the absence of such data for China[5]), we use publicly available grouped data concerning income shares by decile for selected years during the 1990s. We use the income shares to arrive at a national consumption profile (and consequent consumption poverty estimates) based on the following methodology:

> *First, we estimate a consumption profile from income shares*. We identify alternative estimates of per capita private income and scale the income shares to obtain an income profile (i.e., ten average income levels). We then use alternative estimates of consumption to income ratios to transform the income profile into a consumption profile. We express the consumption profile in a base year's prices using alternative CPIs.
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> *Second, we identify poverty lines expressed in currency units of a base year. First,* we identify alternative poverty lines that span a plausible range that accommodates poverty lines proposed by official sources and experts in the literature on Chinese poverty. Second, we wish to ensure international comparability of the poverty estimates we arrive at for China. Accordingly, we ensure that the poverty lines used can be interpreted as corresponding to the $1/day international consumption poverty line. We translate the $1/day standard into local currency units using alternative purchasing power exchange rates, and express it in constant prices using alternative CPIs.
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> *Third, we estimate the poverty headcount ratio* from the consumption profiles by way of Lorenz curve interpolation using the POVCAL software program.[6]

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[5] Khan and Riskin (2001, p. 63) note that "…income, rather than expenditure, is the variable in terms of which the poverty threshold is defined. It has been argued that expenditure is a better measure of 'permanent income' than is current income. A discussion of the validity or otherwise of this argument is operationally irrelevant because distributional data in China are available only for income."

[6] The program and documentation are available (as of March 22, 2007) on http://www.worldbank.org/research/povmonitor/software.htm and the Lorenz curve parameterizations are discussed in Datt (1998). Minoiu and Reddy (2007) test the accuracy of the interpolation techniques using a wide range of plausible consumption and income distributions and conclude that poverty is generally estimated (from grouped data) to an accuracy of within one percentage point of its 'true' level. The results from that study give us confidence that the Lorenz curve estimation procedures embedded in POVCAL produce poverty estimates which are close enough to their true counterparts to warrant the usage of the software.

The lack of publicly available Chinese consumption surveys for multiple years precludes a direct analysis of poverty using household level data. While the consumption profiles must be estimated in an indirect manner, our methodology has the advantage of enabling us to investigate the impact of variation in several crucial assumptions concerning the yearly consumption profiles and the appropriate criteria for identifying the poor. These key parameters are: (a) alternative choices of the poverty line (while maintaining international comparability according to some interpretation of relative purchasing power), (b) alternative estimates of the level and distribution of private incomes, (c) alternative estimates of the propensity to consume of different income groups, and (d) alternative CPIs.[7]

For notational purposes, we express each alternative set of poverty estimates as corresponding to a vector of four parameters given by:

$$\left\lfloor PL, \hat{Y}, \theta, \pi \right\rfloor$$

where PL refers to the poverty line; $\hat{Y}$ refers to the estimate of per capita private income, θ refers to the fraction of per capita private income devoted to consumption of each income group, and π is the CPI used to express consumption levels (and poverty lines) in constant (1993) prices.

The remainder of the paper is structured as follows. Section 2 contains a review of the literature on income and consumption poverty in China. Section 3 presents the data used in the paper and discusses the alternative assumptions under consideration. Consumption profiles reflecting these alternative assumptions as well as poverty estimates for China are presented in Section 4. We conclude in Section 5.

2. Official and Unofficial Poverty Estimates

China's National Bureau of Statistics (henceforth, 'NBS') monitors only rural poverty. Official estimates of poverty (Table A1 in the appendix) are based on a poverty line loosely related to the cost of meeting a minimum food energy intake requirement of 2400 kcal/day (1984-1997) and 2100 kcal/day (1998 to date) and incorporating an allowance for expenditure on non-food basic necessities (Park and Wang, 2001). The official poverty line was 637 Yuan in 2003 (approximately $0.75/day 1993 PPP). Official estimates based on this poverty line state that, the number of rural poor dropped from 250 million (30.7 percent) in 1978 to 125 million (14.8 percent) in 1985. This has been suggested to be the most successful era of poverty reduction in China's history (Wang

[7] It is important to note that equivalence scales have not been included among the methodological choices we consider. One reason for this is that grouped data precludes the use of equivalence scales in our analysis. However, the issue is important in light of the falling size of the Chinese household in the last decades (e.g., from 3.53 persons in 1988 to 3.13 persons per household in 1995 as noted in Bishop, Luo, and Pan, 2006, p. 631). The study of Bishop, Luo and Pan (2006) assesses the impact of equivalence scales on the estimated extent and trend of poverty in urban China using survey data for the years 1988 and 1995.

and Ren, 2004).[8] According to official estimates, during the 1990s, almost two thirds of the rural population was lifted out of poverty, with the number of poor having fallen from 85 million (9.4 percent) in 1990 to 32.1 million (3.4 percent) in 2000. A new and higher poverty line, referred to as "the lower income line" by the NBS, was created in 2000 based on the assumption of a lower (60 percent) share of food in household consumption expenditure (NBS, 2004). This poverty line amounted to 882 Yuan in 2003 (approximately $1/day 1993 PPP). The poverty headcount ratio corresponding to this poverty line was 9.1 percent in 2003, representing 85.2 million rural inhabitants (NBS, 2004).

Park and Wang (2001) catalogue sources of bias in the official rural poverty statistics. They argue that these heavily underestimate rural poverty, and overstate the pace of poverty reduction (officially estimated at 27 percentage points between 1978 and 2000). It is argued by the authors that increases in the rural cost of living are inadequately accounted for, due to insufficient efforts to capture changes in prices induced by the marketization of the economy, and a failure to adequately account for regional price differences. They also suggest that the exclusive focus on rural poverty provides an incomplete picture of the extent of poverty in China.

A growing literature has presented poverty estimates for China. The contributions to this literature reflect different ways of resolving uncertainties associated with poverty estimates for China (on which see Riskin, 2004). Individual contributions present poverty estimates for specific years, a specific sector (rural or urban China), or selected provinces. Where studies cover multiple years, they are based on a single set of assumptions. We summarize the main features of these studies in Table A2, focusing on the sectoral and temporal coverage of the analysis undertaken in each study, the poverty lines used, whether household surveys or grouped data were used, and the main findings. The broad conclusion which emerges from this literature is that national poverty appears to have decreased during the 1990s (see e.g. Chen and Ravallion 2001a, 2004; Berry and Serieux, 2004; and Sala-i-Martin, 2006). There is considerably less agreement concerning the extent of poverty at moments in time, and in particular at the beginning and end of the 1990s. Furthermore, there is considerable evidence that urban poverty has increased in the second half of the 1990s (Chen and Wang, 2001; Fang, Zhang, and Fan, 2002; Meng, Gregory and Wang, 2005; and Xue and Zhong, 2006), while rural poverty has either decreased at a slower pace (Gustafsson and Zhong, 2000; Chen and Ravallion, 2007) or risen (Zhang and Wan, 2006).

The point estimates of the extent and trend of poverty in China presented in each of these empirical studies are the result of a mixture of methodological choices and data availability constraints which inhibits comparison among them. Our paper brings to the literature the first set of national Chinese poverty estimates for the 1990s which reflect

[8] Yao (2000) contends that more than 200 million people in China were lifted out of poverty between 1978 and 1995 - greater than the poverty reduction implied by government statistics. The author claims that the discrepancy is driven mainly by a large understatement of poverty in 1978 by the government. He argues that the poverty headcount ratio fell from 75.5-100 percent (596-790 million people) to 6.7-13.2 percent (57-114 million) over the period 1978-1996.

alternative plausible assumptions concerning poverty lines and other key parameters, and are notionally internationally comparable.

3. Data and Alternative Assumptions

To obtain consumption poverty estimates for China, we use distributional data in the form of income shares computed from underlying household surveys for the years 1990, 1992 to 1998, and 2001, which we report in Table 1.[9] By assumption, inter-sectoral (in particular rural-urban) and inter-provincial price adjustments have already been undertaken in the process of constructing the income shares, which renders them appropriate for use in a national poverty assessment.

Table 1. Income Shares, China, 1990, 1992-1998 and 2001

Year →	1990	1992	1993	1994	1995	1996	1997	1998	2001
Deciles ↓									
Bottom	3.08	2.57	2.31	2.03	2.22	2.38	2.32	2.39	1.80
Second	4.25	3.60	3.31	3.32	3.28	3.51	3.52	3.47	2.86
Third	5.36	4.64	4.33	4.34	4.34	4.62	4.65	4.55	3.92
Fourth	6.49	5.73	5.40	5.40	5.48	5.75	5.80	5.65	5.08
Fifth	7.65	6.95	6.60	6.57	6.70	6.95	7.00	6.86	6.36
Sixth	8.97	8.34	7.99	7.91	8.15	8.32	8.36	8.24	7.86
Seventh	10.55	10.1	9.74	9.55	9.93	10.01	10.01	9.93	9.74
Eighth	12.66	12.51	12.18	11.79	12.41	12.31	12.27	12.27	12.39
Ninth	16.01	16.55	16.36	15.47	16.61	16.19	16.05	16.23	16.93
Top	24.98	29.01	31.78	33.62	30.88	29.96	30.02	30.41	33.06

With the aim of translating the income shares above into consumption profiles and poverty estimates, we proceed to construct plausible ranges of variation for each of the four parameters underlying the poverty analysis: poverty lines (PLs), per capita private income ($\hat{Y}$), the share of consumption in total income (θ) and inflation rates (π). To obtain survey-based estimates of several parameters, we use the 1995 Chinese Household Income Project survey (Riskin, Renwei, and Shi, 1995).[10]

[9] Source: WB Global Poverty Monitoring http://www.worldbank.org/research/povmonitor/PPP1993.htm (accessed: October 22, 2003). The income shares are from the Chinese National Statistical Bureau and are based on the China Rural/Urban Household Surveys conducted in the respective years (with the exception of the data for 1996, 1997 and 2001, for which the data sources were not listed on the website). These national income shares are based on pooling of urban and rural surveys (after inter-sectoral price adjustments).

[10] The survey is publicly available through the Inter-university Consortium for Political and Social Research. The national survey (obtained by pooling together the urban and rural surveys), contains 56,437 observations.

Poverty Lines (PLs)

First, we identify a set of alternative poverty lines expressed in Chinese currency. In order to maintain notional comparability with poverty estimates for other countries, it is desirable for these poverty lines to correspond to poverty lines in use elsewhere. We therefore focus on the $1/day 'money-metric' international poverty line. The range of variation in the local currency 'equivalent' of the $1/day international standard is generated by alternative consumption PPP estimates which have been presented for China.

Since China has never participated in an official benchmark survey of the International Comparison Programme, judgments concerning the appropriate PPP for China have varied widely. The variation in consumption PPP estimates for China arose as a result of "differences in sectoral PPPs (especially for services), and differences in methodology" (Gulde and Schulze-Ghattas, 1993, p. 117). These widely discrepant judgments in turn can have large implications in regard to estimated Chinese poverty levels corresponding to the $1/day poverty line (as discussed, for example, in Reddy and Pogge, 2006). As a starting point, we identify alternative consumption PPP estimates for China in 1993 that have been presented in the literature. We focus on GDP consumption PPPs derived on the basis of alternative GDP estimates for China reported by two sources: the World Economic Outlook (Taylor, 1991) and Penn World Tables Mark 5.5, respectively.[11] The low 1993 PPP employed is 1.0267 Y/$ while the high 1993 PPP used is 2.1285 Y/$. The World Bank's consumption 1993 PPP for China (set at 1.4185Yuan/$) falls between the two estimates we have chosen for the sensitivity analysis.[12]

Our approach avoids an endorsement of any existing approach to the construction of PPPs, all of which we consider to have a weak conceptual basis and to be grounded in empirical data which is inadequate. The reader who is unimpressed either by the international poverty line or by the use of existing PPPs to convert it into local currency units might consider the poverty lines that we employ simply to reflect a plausible range of variation for poverty lines in China, in the sense that they roughly span the range of poverty lines in the existing literature on Chinese poverty. This does not in itself imply that the poverty lines reflect the cost of avoiding poverty (by establishing command over the commodities needed to achieve basic human requirements) since the poverty lines in the existing literature might well not adequately reflect these costs. There is ultimately no alternative to carefully establishing appropriate criteria for identifying the poor in China. The exercise undertaken in this paper cannot substitute for that effort – which is best

[11] The methodologies associated with the two PPP estimates are discussed in detail in Gulde and Schulze-Ghattas (1993) and Summers and Heston (1991). Since China has never participated in an International Comparison Programme benchmark survey, the estimates are based on detailed expenditure and price data from a quasi-benchmark comparison between China and the United States (Summers and Heston, 1991; Rouen and Kai, 1995). For details on the calculation of consumption GDP PPPs and the local currency 'equivalents' of the $1/day poverty line, see Reddy and Minoiu (2006, Appendix 3).

[12] The World Bank's estimate is derived on the basis of the expenditure and price data from a survey comparing prices in 12 Chinese cities with prices in the US in the mid 1980s (Rouen and Kai, 1995).

undertaken within China on the basis of adequate normative judgments, empirical evidence and relevant contextual considerations.

The upper and lower poverty lines corresponding to the low and high PPPs (and the $1/day international standard) are 404.7 and 839.1 1993 Yuan/year. These two poverty lines are also close to the opposite ends of the range of national poverty lines for China proposed in the literature and therefore reflect bounds for these poverty lines (Table 2).

Table 2. Range of Poverty Lines for China (1993 prices using rural, urban or national CPI)

Study	Type of poverty line	Poverty line (Yuan/year)
NBS (2004)	Rural - official	399.8
Our lower poverty line (PL_{LOW})	**National - low**	**404.7**
Chen and Ravallion (2005)	Rural	542
NBS (2004)	Rural (updated since 2000) - official	553.5
Khan and Riskin (2001)	Rural - low	558.5
Chen and Ravallion (2001a, 2004)	National - $1/day	559.7
Chen and Ravallion (2005)	National	645.8
Chen and Ravallion (2005)	Urban	743.2
Khan and Riskin (2001)	Rural – high	798.3
Our higher poverty line (PL_{HIGH})	**National - high**	**839.1**
Khan and Riskin (2001)	Urban – low	1098.7
Chen and Ravallion (2001a, 2004)	National - $2/day	1,113.6
Xue and Wei (2003)	Urban	1,359.9
Khan and Riskin (2001)	Urban - high	1,569.4

We note that our lower poverty line (404.7 Yuan/year) is lower than the lowest national poverty line proposed by Chen and Ravallion (2001a, 2004). Moreover, our highest poverty line (839.1 Yuan/year) is lower than the highest national poverty line of Chen and Ravallion (2001a, 2004). Nevertheless, in our judgment, we are capturing a broad range of poverty lines that have been viewed as appropriate to employ in the literature on China.

Per Capita Income ($\hat{Y}$)

In this section, we discuss estimates of the *true* per capita private income $\hat{Y}$ on the basis of which we will obtain an income profile from income shares.

There are discrepant views in the literature on what constitutes an appropriate method for estimating per capita real income; in particular, some authors take the view that GDP estimates offer the superior measure of private real income and consumption (Bhalla 2002; Sala-i-Martin, 2006); in contrast, others advocate the use of survey-based income (and consumption) estimates (Deaton, 2005). Deaton presents an extensive analysis of differences between survey and national accounts (NA) estimates of consumption and

income. These discrepancies are observed for both levels and rates of growth. He shows that, on average, survey-based mean income is 60 percent of GDP (based on data from 272 household surveys), and the same ratio is 51 percent in the East Asia and Pacific region (32 surveys). Furthermore, in non-OECD countries, consumption estimates from surveys in the 1990s appear to have grown slower than NA consumption estimates, while for income estimates the situation is reversed.[13] Naturally, discrepancies of this extent between surveys and NA data can generate large differences in the estimated mean income for different population groups (e.g, income deciles), and consequently affect estimated poverty levels.

We investigated the differences in levels and growth rates between NA per capita income (i.e., per capita GDP from the World Development Indicators online database, 2003) and survey-based income (i.e., per capita household disposable income from the 2003 China Statistical Yearbook). We found that the average annual growth rate of survey-based income between 1990 and 2001 was 7.54 percent – a figure very close to the 7 percent reported by Chen and Ravallion (2001a). In contrast, the average annual growth rate of per capita GDP was 8.74 percent. Furthermore, the levels of the two incomes series were markedly different: the ratio between the two estimates varied between 1.81 (1990) and 2.11 (1997, 1998).[14] In our analysis, we choose to accommodate both views concerning the appropriate method of estimating private per capita incomes, without endorsing either, in keeping with our goal of exploring the implications of alternative assumptions. We consider both NA and survey-based estimates of private incomes (denoted in the remainder of the paper as $\hat{Y}_{NA}$ and $\hat{Y}_S$, respectively) to scale the income shares and obtain income profiles.

Shares of Consumption in Total Income (θ)

In this section, we identify estimates of the average propensity to consume, with a view to translating income profiles into consumption profiles. Since the existing international poverty lines are specified in terms of levels of consumption but only grouped *income* data are readily available for China for multiple years, researchers have made a number assumptions to translate income profiles into consumption profiles (Chen and Ravallion 2001a, 2004; Chen and Wang, 2001). Specifically, it has been generally assumed that the consumption to income ratio is decile-invariant and equal to the share of total household consumption in GDP. We denote this approach to estimating shares of consumption in total income, θ, by θ_{NA}. This approach has been widely employed in the recent literature (Bhalla 2002, Sala-i-Martin 2002a, 2002b, 2006), notwithstanding critiques such as those by Sundaram and Tendulkar (2001), Havinga and Kamanou (2003) and Deaton (2005).

[13] Furthermore, Deaton argues that China's ratio of survey-to-NA consumption has been declining in the 1990s, from 95 percent in 1990 to 80 percent in 2000. Growth rates of household consumption series from surveys and NA also differ by 1.7 percent a year during the 1990s.
[14] For details of this analysis, see Reddy and Minoiu (2006, Appendix 4).

We also adopt (in our view more realistic) decile-specific survey-based consumption to income ratios (θ_S) calculated from the 1995 Chinese Household Income Project rural and urban surveys (Table A3).[15] It may be thought that θ_S improves on θ_{NA} in two ways: first, it may be argued that survey-based estimates of the average propensity to consume are more appropriate than national-income based estimates to employ in poverty analysis since national income accounts reflect much information that is irrelevant to estimating the consumption of households (Deaton, 2005). Second, survey-based C/I ratios are specific to each decile of the income distribution. As a result, we can selectively apply those that are most appropriate for estimating the actual consumption of the income groups with which we are most concerned. Due to the fact that there was only a single year (1995) that was surveyed by the China Household Income Project (from which we draw our survey based estimates of consumption to income ratios) in the 1990s, we make the assumption that the decile-specific C/I ratios did not change over time in the 1990s.

Inflation Rates (π)

This section identifies alternative values for the last parameter in our methodological vector: inflation rates (π). One immediate candidate is the official general CPI (π_{off}). However, the official CPI might not accurately reflect the cost of purchasing the commodities needed to achieve elementary human requirements and thereby to avoid poverty.[16] In order to better account for the cost of consuming such commodities, we create a set of adjusted CPIs.

Specifically, we use data from the 1995 China Household Income Project survey to estimate shares of food (and implicitly of non-food) in total expenditure for the lower income groups (Table A3). We use this information to construct an adjusted price index with weights assigned to food and non-food items that correspond to the expenditure shares on these items for the lower income deciles. Although this is not a wholly satisfactory procedure, it does permit us to improve upon the general CPI, by more closely reflecting the average pattern of consumption of lower-income groups. Noting that the share of food expenditure in total expenditure is about 60 percent for the first 6 deciles of the population, we employ this weight on food in the construction of our adjusted price index. We use the food CPI and a proxy for the non-food CPI, as well as a food share of 60 percent, to obtain our adjusted CPI. Although we experimented with several distinct proxies for the non-food CPI[17], we choose this adjusted CPI for the

[15] The income and expenditure variables from the 1995 Chinese Household Income Project rural and urban surveys are described in detail in Reddy and Minoiu (2006, Appendix 5A).

[16] In particular, the official Chinese CPI reflects weights based on an overall average consumption pattern (in which food accounts for only about one third of expenses in the average basket of goods, while expenditures on entertainment, education, culture, transportation and communication for one fifth) (see Singapore Department of Statistics, 2001). This method renders it inappropriate for assessments of the costs of avoiding absolute poverty.

[17] The first-best CPI to apply would be that corresponding to the cost of poverty avoidance in China, but this is unknown since it cannot be specified without first fully defining a criterion for identifying the poor (on the basis of which the cost of poverty avoidance might be determined). Thus, the CPI we apply is a makeshift alternative. Two approaches were used to construct adjusted price indices: the first entails using

analysis (Table A4). This adjusted CPI uses as a proxy for the non-food inflation rate a weighted average of the price indices for clothing, articles for daily use, and durable consumer goods, where the weights are the average weights in total consumption of these items from the 1995 survey (namely, 60 percent for clothing, 30 percent for daily use items and 10 percent for durable consumer goods). We prefer this approach to constructing the non-food inflation rate since it does not rely, in contrast to other approaches we considered, on employing a proxy index for non-food based on producers' prices. We note that the overall trend of prices described by the official CPI and by the adjusted CPI that we construct is similar although not identical. As seen below, the use of an adjusted CPI is unlikely to reverse the conclusion of a downward trend in the estimated poverty headcount ratio and has little effect on the estimated extent of poverty.[18] However, the choice of price index has some effect on our conclusions regarding the pace of poverty reduction during the 1990s.

4. Consumption Profiles and Poverty Estimates

Consumption Profiles for China

As a first step in constructing consumption profiles (estimates of the mean consumption of each decile in each year), we scale the income shares by our estimate of true per capita private income (both per capita GDP ($\hat{Y}_{NA}$) and survey-based per capita income ($\hat{Y}_{S}$)) to obtain income profiles for China in various years. Specifically, we multiply each income share by ten times our estimate of true per capita private income expressed in current local currency units to arrive at an estimated mean income for each decile (Tables 3.1, 3.2).

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the publicly available general and food CPI, as well as the food and non-food expenditure shares to obtain an 'implied' non-food CPI (treating the general CPI as a weighted average of this implicit non-food CPI and the food CPI, with weights based on expenditure shares). We obtained an adjusted general CPI using this implied non-food CPI, the official food CPI, and food/non-food shares in total consumption from the surveys. The second approach uses the food CPI and a proxy for the non-food CPI, as well as a food share of 60 percent. We considered the following two other proxies for the non-food CPI: (a) the ex-factory price index of industrial products, and (b) the means of production price index. These alternative CPIs are reported in Reddy and Minoiu (2006, Appendix 6). We observed no substantial differences in the evolution of prices between the official CPI and the alternative CPIs we derived.

[18] Khan and Riskin (2001) also construct adjusted price indices to reflect better living costs faced by individuals at or near the poverty line. They find that whereas the use of the official CPI leads to an apparent fall in urban poverty between 1988 and 1995, the substitution of an adjusted CPI leads to an apparent increase. A direct comparison between their results and ours is not possible for a number of reasons: we analyze Chinese *national* poverty whereas they disaggregate the analysis at the urban and rural level, using distinct poverty lines for each sector. Our adjusted CPI is different from theirs, and our comparison of poverty in different years is conducted over a distinct time period.

Table 3.1. Income Profile (at current prices), $\hat{Y}_{NA}$

Year →	1990	1992	1993	1994	1995	1996	1997	1998	2001
Deciles ↓									
Bottom	503.3	587.8	678.9	796.4	1077.6	1327.1	1404.5	1507.4	1377.2
Second	694.5	823.3	972.8	1302.4	1592.1	1957.2	2131.0	2188.5	2188.2
Third	875.8	1061.2	1272.6	1702.6	2106.6	2576.1	2815.1	2869.7	2999.2
Fourth	1060.5	1310.5	1587.1	2118.4	2660.0	3206.2	3511.3	3563.5	3886.7
Fifth	1250.0	1589.5	1939.7	2577.4	3252.2	3875.3	4237.8	4326.6	4866.0
Sixth	1465.7	1907.4	2348.3	3103.1	3956.0	4639.2	5061.1	5197.0	6013.7
Seventh	1723.9	2309.9	2862.6	3746.5	4820.0	5581.6	6060.1	6262.9	7452.1
Eighth	2068.6	2861.0	3579.7	4625.2	6023.8	6864.1	7428.3	7738.7	9479.6
Ninth	2616.0	3785.0	4808.2	6068.9	8062.5	9027.5	9716.7	10236.3	12953.1
Top	4081.7	6634.6	9340.1	13189.1	14989.2	16705.7	18174.1	19179.6	25294.2

Table 3.2. Income Profile (at current prices), $\hat{Y}_{S}$

Year →	1990	1992	1993	1994	1995	1996	1997	1998	2001
Deciles ↓									
Bottom	278.4	289.2	319.9	379.5	524.7	669.7	712.2	776.8	730.5
Second	384.2	405.1	458.5	620.7	775.2	987.7	1080.6	1127.8	1160.7
Third	484.5	522.1	599.7	811.4	1025.7	1300.0	1427.5	1478.9	1590.9
Fourth	586.6	644.8	747.9	1009.6	1295.1	1618.0	1780.5	1836.4	2061.7
Fifth	691.5	782.0	914.1	1228.4	1583.4	1955.7	2148.9	2229.7	2581.2
Sixth	810.8	938.4	1106.7	1478.9	1926.1	2341.2	2566.4	2678.2	3190.0
Seventh	953.6	1136.5	1349.0	1785.5	2346.8	2816.7	3072.9	3227.5	3953.0
Eighth	1144.3	1407.7	1687.0	2204.3	2932.9	3463.9	3766.6	3988.1	5028.5
Ninth	1447.1	1862.2	2266.0	2892.4	3925.5	4555.7	4927.0	5275.2	6871.1
Top	2257.9	3264.3	4401.7	6285.8	7298.0	8430.5	9215.5	9884.0	13417.5

Next, from these income profiles we construct our 'least refined' consumption profiles by applying to them the national accounts based decile-invariant C/I ratio (θ_{NA}), expressed in 1993 prices using the official CPI (Tables 4.1, 4.2):

Table 4.1 Consumption Profile (at 1993 prices) ($\hat{Y}_{NA}$, θ_{NA} , π_{off})

Year →	1990	1992	1993	1994	1995	1996	1997	1998	2001
Deciles ↓									
Bottom	308.3	317.5	305.5	286.7	341.9	397.3	410.0	445.6	407.1
Second	425.4	444.8	437.8	468.9	505.1	585.9	622.1	646.9	646.8
Third	536.4	573.3	572.7	612.9	668.3	771.2	821.8	848.3	886.6
Fourth	649.5	707.9	714.2	762.6	843.9	959.8	1025.0	1053.3	1148.9
Fifth	765.6	858.7	872.9	927.9	1031.7	1160.1	1237.1	1278.9	1438.4
Sixth	897.7	1030.4	1056.7	1117.1	1255.0	1388.8	1477.5	1536.2	1777.6
Seventh	1055.9	1247.9	1288.2	1348.7	1529.1	1670.9	1769.1	1851.3	2202.8
Eighth	1267.0	1545.6	1610.9	1665.1	1911.0	2054.8	2168.5	2287.5	2802.1
Ninth	1602.3	2044.8	2163.7	2184.8	2557.8	2702.5	2836.5	3025.8	3828.9
Top	2500.1	3584.2	4203.1	4748.1	4755.2	5001.1	5305.5	5669.4	7476.9

Table 4.2 Consumption Profile (at 1993 prices) ($\hat{Y}_S, \theta_{NA}, \pi_{off}$)

Year →	1990	1992	1993	1994	1995	1996	1997	1998	2001
Deciles ↓									
Bottom	170.5	156.2	144.0	136.6	166.4	200.5	207.9	229.6	215.9
Second	235.3	218.8	206.3	223.5	245.9	295.7	315.4	333.4	343.1
Third	296.7	282.1	269.9	292.1	325.4	389.2	416.7	437.1	470.3
Fourth	359.3	348.3	336.6	363.5	410.9	484.4	519.8	542.8	609.4
Fifth	423.5	422.5	411.4	442.2	502.3	585.5	627.3	659.1	763.0
Sixth	496.6	507.0	498.0	532.4	611.0	700.9	749.2	791.7	943.0
Seventh	584.1	614.0	607.1	642.8	744.5	843.2	897.0	954.0	1168.5
Eighth	700.9	760.5	759.2	793.6	930.4	1037.0	1099.6	1178.9	1486.4
Ninth	886.4	1006.0	1019.7	1041.3	1245.3	1363.8	1438.3	1559.3	2031.1
Top	1383.0	1763.5	1980.8	2262.9	2315.2	2523.8	2690.3	2921.7	3966.2

Finally, we construct our 'most refined' consumption profiles based on survey-based decile-specific C/I ratios (θ_S), expressed in 1993 prices using the adjusted CPI (Table 5.1, 5.2):

Table 5.1 Consumption Profile (at 1993 prices) ($\hat{Y}_{NA}, \theta_S, \pi_{adj}$)

Year →	1990	1992	1993	1994	1995	1996	1997	1998	2001
Deciles ↓									
Bottom	627.7	652.4	678.9	644.5	704.0	790.6	834.9	916.7	901.6
Second	666.9	703.7	749.1	811.6	800.9	897.8	975.4	1024.8	1103.0
Third	808.3	871.6	941.7	1019.6	1018.4	1135.7	1238.3	1291.4	1453.0
Fourth	925.8	1018.2	1110.9	1200.0	1216.4	1337.0	1461.0	1516.9	1781.1
Fifth	1060.1	1199.7	1319.0	1418.3	1444.8	1569.9	1713.0	1789.2	2166.2
Sixth	1389.3	1609.0	1784.7	1908.5	1964.2	2100.5	2286.4	2401.9	2992.1
Seventh	1548.0	1846.0	2061.1	2182.9	2267.2	2394.1	2593.6	2742.2	3512.6
Eighth	1831.8	2254.8	2541.6	2657.5	2794.1	2903.3	3135.0	3341.3	4406.2
Ninth	2186.0	2814.9	3221.5	3290.6	3529.0	3603.3	3869.8	4170.7	5681.6
Top	2799.9	4050.4	5137.1	5870.4	5385.8	5473.7	5941.7	6415.0	9107.6

Table 5.2 Consumption Profile (at 1993 prices) ($\hat{Y}_S, \theta_S, \pi_{adj}$)

Year →	1990	1992	1993	1994	1995	1996	1997	1998	2001
Deciles ↓									
Bottom	347.2	321.0	319.9	307.1	342.8	399.0	423.3	472.4	478.3
Second	368.9	346.2	353.0	386.8	389.9	453.1	494.6	528.1	585.1
Third	447.1	428.9	443.8	485.9	495.9	573.1	627.9	665.5	770.7
Fourth	512.1	501.0	523.6	571.9	592.3	674.7	740.9	781.7	944.8
Fifth	586.4	590.3	621.6	676.0	703.4	792.2	868.6	922.0	1149.1
Sixth	768.5	791.7	841.1	909.6	956.3	1060.0	1159.4	1237.8	1587.2
Seventh	856.3	908.3	971.3	1040.4	1103.9	1208.2	1315.1	1413.2	1863.3
Eighth	1013.3	1109.4	1197.8	1266.5	1360.4	1465.1	1589.7	1721.9	2337.3
Ninth	1209.2	1384.9	1518.2	1568.2	1718.2	1818.4	1962.3	2149.3	3013.8
Top	1548.8	1992.8	2420.9	2797.8	2622.3	2762.3	3012.9	3305.9	4831.2

Since the official and adjusted CPIs do not differ much, we conclude that most of the difference in consumption means presented in the preceding four tables is explained by

the difference between θ_S and θ_{NA}. When using θ_S, average consumption levels of the bottom income decile are twice as high as those based on θ_{NA}. For the second income decile, the survey-based mean consumption levels are higher by about 50 percent. This difference in estimated means greatly affects the estimated poverty headcount ratios in each year, as we describe in the next section.

Poverty Estimates for China

The poverty headcount ratios corresponding to the two $1/day poverty lines are summarized below. For purposes of comparison, we include the estimates of Chen and Ravallion (2004) and Chen and Wang (2001) in the same tables, the latter being available for a larger number of years.

First, in Table 6 we report poverty headcount ratios for China based on the 'least refined' estimates of the consumption profile (from Tables 4.1 and 4.2):

Table 6 Poverty Headcount Ratios (Consumption profile given by: θ_{NA}, π_{off})

Set of parameters	1990	1992	1993	1994	1995	1996	1997	1998	2001
$\left(PL_{LOW}, \hat{Y}_{NA}\right)$	13.2	11.8	12.5	11.7	8.8	5.40	4.70	3.0	4.9
Chen and Ravallion (2004)	33.0	n/a	28.4	n/a	n/a	17.4	n/a	n/a	16.6
Chen and Wang (2001)	31.5	29.6	29.4	25.0	22.0	17.2	17.0	17.1	17.4
$\left(PL_{LOW}, \hat{Y}_{S}\right)$	42.2	42.8	44.2	40.2	34.4	26.7	23.8	21.9	19.9
$\left(PL_{HIGH}, \hat{Y}_{NA}\right)$	50.8	43.8	43.0	39.5	34.8	28.7	25.8	24.6	23.0
$\left(PL_{HIGH}, \hat{Y}_{S}\right)$	83.3	79.2	79.1	77.7	70.7	64.9	61.5	58.3	49.5

These results show that the trend of substantial consumption poverty reduction identified in the literature is robust to the choice among alternative poverty lines. The poverty headcount fell (between 1990 and 2001) by at least half if per capita GDP is taken to be an accurate measure of private incomes, and by 40-52 percent if survey estimates of incomes are considered instead. Although this picture of the trend of poverty reduction is robust to the choice of poverty line, this is not true of the extent of poverty in any year. In particular, poverty headcount estimates vary, depending on the year, by a multiplicative factor of between 0.3 and 3.7 of the estimates presented by CR.

In Table 7 we report poverty headcount ratios for China based on the 'most refined' consumption profiles (from Tables 5.1 and 5.2):

Table 7 Poverty Headcount Ratios (Consumption profile given by: θ_S , π_{adj})

Set of parameters	1990	1992	1993	1994	1995	1996	1997	1998	2001
$\left(PL_{LOW}, \hat{Y}_{NA}\right)$	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
$\left(PL_{LOW}, \hat{Y}_{S}\right)$	n/a	20.2	19.5	16.6	15.2	9.3	6.7	4.0	3.7
$\left(PL_{HIGH}, \hat{Y}_{NA}\right)$	n/a	21.1	18.4	16.2	15.6	11.0	8.4	6.2	6.1
Chen and Ravallion (2004)	33.0	n/a	28.4	n/a	n/a	17.4	n/a	n/a	16.6
Chen and Wang (2001)	31.5	29.6	29.4	25.0	22.0	17.2	17.0	17.1	17.4
$\left(PL_{HIGH}, \hat{Y}_{S}\right)$	n/a	61.9	58.3	54.1	51.3	44.9	39.7	36.1	27.8

As expected, the scenario $\left(PL_{LOW}, \hat{Y}_{NA}\right)$ corresponding to the lower of the two poverty lines and the higher per capita income estimates produces negligible headcount ratios (which we do not report because these estimates cannot be judged to be significantly different from zero). In contrast, the highest poverty line in association with the lower per capita income estimates $\left(PL_{HIGH}, \hat{Y}_{S}\right)$ produces headcount ratios that are twice higher than those of CR. However, the estimates still robustly display a downward trend.

It is notable that our poverty estimates depart markedly in magnitude from official estimates and those of CR. In particular, the 'most refined' estimates we present differ from CR's by a multiplicative factor varying between 0.2 and 2.6. Of course, this difference partially reflects the choice of poverty lines. The choice between distinct poverty lines cannot, we have suggested above, be made credibly in the absence of a fuller exercise of poverty line construction, based on appropriate normative judgments and empirical evidence.

Is the pace of poverty reduction (measured by the year-on-year percentage decrease in the poverty headcount ratio) different, according to the estimates constructed here, than that recorded in official statistics? According to the official estimates, the pace of poverty reduction was uneven throughout the 1990s, with the highest achievements being between 1995 and 1999 (when it varied between 13 and 20 percent annually). The apparently high rate of poverty reduction in the second half of the 1990s may have been a result of post-1994 grain marketing system reforms, which boosted procurement prices received by poor farmers (Cheng, 1996). According to our estimates, the pace of poverty reduction was generally high throughout the period, although in all of the cases it appears to have fallen in the last three years considered (Table A5).

We report the rates of poverty reduction and income elasticity of poverty (often referred to as the 'growth elasticity of poverty') implied by our estimates in Table A6. We observe that, for estimates based on the official CPI, the pace of poverty reduction increased in 1995 and remained higher than at the beginning of the period until around 1997, regardless of the parameters adopted. However, when the adjusted inflation rate is used the estimated pace of poverty reduction fell between 1993/94 and 1994/95 and rose

thereafter. This is an instance in which the choice of CPI is quite consequential. Furthermore, under all of the assumptions considered, a trend of uninterrupted poverty reduction is observed until 2001, with two exceptions: the cases corresponding to the lowest poverty line and the use of the official CPI, for which a very small increase in poverty is observed between 1990 and 1993, and a slightly larger increase in poverty is observed between 1998 and 2001.[19] Finally, we note that there is no clear trend in the 'growth elasticity of poverty'.

5. Conclusions

The record of poverty reduction in China has a substantial impact on assessments of global poverty. In this paper we have analyzed the extent to which the level and trend of consumption poverty in China are sensitive to the choice of assumptions concerning poverty lines and concerning the method applied to estimate the profile of consumption (dependent on assumptions concerning the propensity to consume of lower income groups, inflation rates, and the source of per capita income estimates). We have identified a range of poverty lines for a base year (1993) that is plausible in the sense that it spans the range of poverty lines proposed in the existing literature. The poverty lines enjoy notional comparability with poverty lines used in current international poverty assessments, which are defined in 'international dollars' of the same base year. We have used both surveys and national accounts to estimate consumption levels. Finally, we have expressed the quantities of interest in constant prices using both the Chinese official consumer price index and an adjusted price index that more closely reflects changes over time in the costs of purchasing the basic goods (needed to achieve elementary human requirements and thereby avoid poverty).

We find that the conclusion that China has achieved substantial reductions in consumption poverty during the 1990s is robust to variation in assumptions. This conclusion may not appear surprising, but could not have been assumed *ex ante*. We find also that there is no clear evidence that the rate of reduction in the poverty headcount ratio has fallen over time.

Unlike the trend of poverty, the *extent* of poverty estimated to prevail in any year is greatly influenced by the assumptions made, and often differs markedly from estimates reported in other sources, such as Chen and Ravallion (2004). In particular, some of the assumptions we consider result in poverty estimates that are as large as 2.6 times Chen and Ravallion's. However, in view of the prevailing uncertainties concerning the appropriate assumptions to apply, and the absence of adequate information on the real costs of achieving basic human requirements in China, there is reason for caution in accepting any one set of poverty estimates as correct.

[19] In the official statistics, a possible reversal of the trend of falling (rural) poverty is observed only later, between 2002 and 2003. Studies which document rising urban poverty during the 1990s include Khan and Riskin (2001), Fang, Zhang and Fan (2002), Xue and Wei (2003), and Meng, Gregory and Wan (2007).

Three cautionary notes are in order. First, it should be noted here that after the completion of our research, China's NBS upwardly revised historical data for GDP for the years between 1993 and 2004. This revision affects our estimated consumption profiles in the years 1993-1998 and 2001 and consequently the poverty rates for these years that depend on national accounts estimates of income. However, we found that this revision did not materially affect our conclusions.[20]

Second, when interpreting the patterns found at the aggregate level, one should keep in mind that such figures might conceal important lower level variations (at the sectoral, provincial, or county levels), which we have not been considered at all in this analysis, and which are likely to be of great importance in China. There is considerable evidence of poverty trends differing between (rural and urban) sectors and provinces in China.[21]

Third, in light of our findings concerning China's success in reducing consumption poverty, it is important to know whether China has had comparable achievements in other dimensions of development. Some evidence on health outcomes is provided by Reddy (2007), who notes that province-level rates of improvement in male and female life expectancy were generally higher in the 1990s than in the previous two decades. However, the author shows that it took China a larger number of years to obtain the same improvements that other countries obtained, starting from similar initial life expectancies and levels of income.

Despite these cautionary notes, it is clear that the reduction in consumption poverty in China is remarkable and provides a perhaps unique instance of dramatic poverty reduction over a short period of time. It is also clear that Chinese poverty reduction is a central reason why poverty reduction might have taken place worldwide (Reddy and Minoiu, 2007).

[20] According to the revised GDP data, the average annual GDP growth rate between 1993 and 2001 is higher by 1.4 percentage points as compared to the earlier reported GDP growth rate. Furthermore, the revised GDP is higher than the earlier reported GDP for each year by multiplicative factors monotonically rising from 1.02 in 1993 to 1.13 in 2001. Taking account of this upward revision, therefore, would lead (for those poverty rates dependent on income estimates from the national accounts, i.e., GDP) to the conclusion that (a) the estimated average consumption levels were slightly higher and poverty levels were correspondingly lower than shown in this paper, and (b) poverty reduction rates were higher throughout the period. Due to the relatively small magnitude of the revision, however, we judged that it was not warranted to re-estimate poverty as a consequence of the upward revision of GDP data.

[21] The literature on poverty in urban China, for which official estimates of poverty do not exist, offers interesting examples. Meng, Gong, and Wang (2004) find evidence based on survey data in urban China that the nutritional intake for lower income groups has been decreasing throughout the 1990s. Rising food prices between 1993-1996 induced by the liberalization of the grain marketing system and the abolition of the food coupon system are cited as the main causes of nutrition worsening. Rising urban consumption poverty in the 1990s has also been reported by Khan and Riskin (2001), Fang, Zhang and Fan (2002), Xue and Wei (2003), and Meng, Gregory, and Wang (2005).

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APPENDIX

Table A1. Official poverty estimates

	Official (rural) poverty line ~$0.75/day PPP			Official updated (rural) poverty line ~$1/day PPP		
	% poor	# of poor (mil.)	Year on year % decrease in headcount ratio	Average pp decrease in head-count ratio	% poor	# of poor (mil.)
1978	30.7	250.0				
1984	15.1	128.0	-0.11	-2.6		
1985	14.8	125.0	-0.02	-0.3		
1986	15.5	131.0	0.05	0.7		
1987	14.3	122.0	-0.08	-1.2		
1988	11.1	96.0	-0.22	-3.2		
1989	11.6	102.0	0.05	0.5		
1990	9.4	85.0	-0.19	-2.2		
1992	8.8	80.0	-0.03	-0.3		
1994	7.7	70.0	-0.06	-0.6		
1995	7.1	65.4	-0.08	-0.6		
1997	5.4	49.6	-0.13	-0.9		
1998	4.6	42.1	-0.15	-0.8		
1999	3.7	34.1	-0.20	-0.9		
2000	3.4	32.1	-0.08	-0.3		
2001	3.2	29.2	-0.06	-0.2	9.7	90.3
2002	3.0	28.2	-0.06	-0.2	9.2	86.5
2003	3.1	29.0	0.03	0.1	9.1	85.2

Source: NBS (2004)

Table A2. Selected Chinese poverty analyses

Spatial Coverage	Sectoral coverage	Poverty line	Temporal coverage	Type of data	Notable findings
NBS (2004)	rural	Official (approx. $0.75/day and $1/day)	1978-2000	Unit	- substantial reduction in rural poverty
Zhang and Wan (2006)	rural	Official, $1/day	1988-1999	Unit	- rural poverty increase in the second half of the 1990s
Fang, Zhang, and Fan (2002)	urban	$1/day, $1.5/day	1992-1998	Unit	- urban poverty increased in the second half of the 1990s
Xue and Zhong (2003)	urban	Official NBS income standard	1988, 1995, 1999	Unit	- urban poverty increased in the second half of the 1990s
Bishop, Luo, and Pan (2006)	urban	$4/day, $5/day, $6/day	1988, 1995	Unit	- urban poverty declined but there are regional differences
Meng, Gregory, and Wang (2005)	urban	"cost of basic needs" approach	1986-2000	Unit	- substantial increase in urban poverty in the 1990s
Gustaffson and Zhong (2000)	rural, some cities	50% of 1988 median equivalent income	1988, 1995	Unit	- slight decrease in poverty
Khan and Riskin (2001)	rural, urban	nutritionally-based high and low PLs	1988, 1995	Unit	- slight decrease in rural poverty and increase in urban poverty by 1995
Chen and Wang (2001)	rural, urban, national	$0.50-$2.50/day	1990-1999	Grouped	- urban and national poverty increased in the second half of the 1990s
Chen and Ravallion (2007)	rural, urban, national	Official and urban-"equivalent" of rural PL	1980-2001	Grouped	- "poverty reduction stalled in the late 1990s" (Chen and Ravallion, 2007, p. 2)
Berry and Serieux (2004)	national	$500/year, and $1500/year	1980, 1990, 2000	Grouped	- reduction by 50 percent in poverty according to the higher poverty line and by 75% according to the lower poverty line
Chen and Ravallion (2001a, 2004)	national	$1/day and $2/day (consumption)	1981-2001	Grouped	- substantial reduction in national poverty
Sala-i-Martin (2006)	national	$1.5/day (income)	1970-2000	Grouped	- tenfold decrease in the share of poor

Table A3. Survey-based consumption to income ratios and food shares in total expenditure, 1995

Income deciles ↓	Average consumption to income ratio	Food share in total expenditure
Bottom	100%[22]	62%
Second	77%	63%
Third	74%	62%
Fourth	70%	61%
Fifth	68%	59%
Sixth	76%	58%
Seventh	72%	56%
Eighth	71%	54%
Ninth	67%	52%
Top	55%	49%

Table A4. Adjusted CPIs (1993=100):

	Official CPI NBS (2003)	Adjusted CPI
1990	79.25	80.18
1991	81.94	82.95
1992	87.18	90.09
1993	100.00	100.00
1994	124.10	123.57
1995	146.07	153.07
1996	158.19	167.86
1997	162.62	168.23
1998	161.32	164.44
1999	159.06	157.73
2000	159.70	152.95
2001	158.42	152.75
1990-2001 price increase	199.91%	190.51%

[22] In our calculations, individuals in the bottom income decile appeared to consume, on average, 124 percent of their income. Our procedure requires us to assume that this ratio is representative of the true C/I ratio throughout the 1990s. We were therefore concerned that the 124 percent figure implies a degree of persistent dissaving that is implausibly high. This figure also implies that consumption levels for the bottom income decile are greater than for the second income decile, which is also implausible. To address both of these problems, we assume that the consumption to income ratio for the bottom decile is 100 percent.

Table A5. Average annual % change in headcount ratios

Set of parameters	90/92	92/93	93/94	94/95	95/96	96/97	97/98	98/01
	'Least refined' consumption profile given by: θ_{NA} , π_{off}							
$\left(PL_{LOW}, \hat{Y}_{NA}\right)$	-5.5%	5.9%	-6.4%	-24.8%	-38.6%	-13.0%	-36.2%	17.8%
$\left(PL_{HIGH}, \hat{Y}_{NA}\right)$	-7.1%	-1.8%	-8.1%	-11.9%	-17.5%	-10.1%	-4.7%	-2.2%
$\left(PL_{LOW}, \hat{Y}_{S}\right)$	0.7%	3.3%	-9.0%	-14.4%	-22.4%	-10.9%	-8.0%	-3.1%
$\left(PL_{HIGH}, \hat{Y}_{S}\right)$	-2.5%	-0.1%	-1.8%	-9.0%	-8.2%	-5.2%	-5.2%	-5.3%
	'Most refined' consumption profile given by: θ_{S} , π_{adj}							
$\left(PL_{LOW}, \hat{Y}_{NA}\right)$	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
$\left(PL_{LOW}, \hat{Y}_{S}\right)$	n/a	-3.5%	-14.9%	-8.4%	-38.8%	-28.0%	-40.3%	-2.6%
$\left(PL_{HIGH}, \hat{Y}_{NA}\right)$	n/a	-12.8%	-12.0%	-3.7%	-29.5%	-23.6%	-26.2%	-0.5%
$\left(PL_{HIGH}, \hat{Y}_{S}\right)$	n/a	-5.8%	-7.2%	-5.2%	-12.5%	-11.6%	-9.1%	-8.3%

Table A6. 'Growth elasticity of poverty' (Consumption profile given by: θ_{NA} , π_{off})

Set of parameters	90/92	92/93	93/94	94/95	95/96	96/97	97/98	98/01
	'Least refined' consumption profile given by: θ_{NA} , π_{off}							
$\left(PL_{LOW}, \hat{Y}_{NA}\right)$	-0.53	0.49	-0.56	-2.66	-4.57	-1.69	-5.34	2.66
$\left(PL_{HIGH}, \hat{Y}_{NA}\right)$	-0.70	-0.15	-0.72	-1.28	-2.07	-1.31	-0.69	-0.33
$\left(PL_{LOW}, \hat{Y}_{S}\right)$	0.07	0.27	-0.80	-1.55	-2.65	-1.41	-1.18	-0.47
$\left(PL_{HIGH}, \hat{Y}_{S}\right)$	-0.46	-0.17	-0.11	-0.85	-0.65	-0.60	-0.53	-0.66
	'Most refined' consumption profile given by: θ_{S} , π_{adj}							
$\left(PL_{LOW}, \hat{Y}_{NA}\right)$	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
$\left(PL_{LOW}, \hat{Y}_{S}\right)$	n/a	-0.28	-1.31	-0.91	-4.59	-3.63	-5.95	-0.38
$\left(PL_{HIGH}, \hat{Y}_{NA}\right)$	n/a	-1.05	-1.05	-0.40	-3.49	-3.07	-3.87	-0.08
$\left(PL_{HIGH}, \hat{Y}_{S}\right)$	n/a	-0.48	-0.64	-0.56	-1.48	-1.51	-1.34	-1.25