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Measuring Upward Mobility in China：Evidence from 1988-2018

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Abstract

Does economic growth inevitably create inclusive intergenerational upward mobility? Current indicators of intergenerational mobility focus on assessing changes in income status or the likelihood that offspring earn above their parents' earnings. However, limited consideration is given to the extent of economic growth benefits that have been distributed equally throughout society. This paper utilizes the welfare-based mobility framework developed by Ray and Genicot (2023) on nationally representative data of the China Household Income Project (CHIP) from the years 1988 to 2018. It employs a combination of welfare-based mobility, relative mobility, Chetty-style absolute mobility measures, AM-Berman benchmark absolute mobility measures, the Great Gatsby curve, and aggregate and detailed decomposition analysis to present a thorough examination of intergenerational mobility in China's reform era. The findings suggest that the upward mobility increased significantly along with the fast-paced growth but declined systematically as greater value was attached to lower-income households. Such a trend implies that the growth was not evenly distributed among all income groups. However, relative mobility was consistently low, indicating that improvements in mobility occurred due to aggregate income growth, rather than structural improvements in opportunities for the next generations. Moreover, the decomposition analysis shows that structural factors contributed substantially to changes in mobility, and the hukou institutional reform became the dominant factor. These findings indicate that economic growth independently is inadequate for creating an inclusive intergenerational mobility process and reveal the need to measure the development process both on the basis of income growth and how growth increases opportunities for the next generations.

Keywords: Intergeneration Upward Mobility; Inclusive Growth; Economic Opportunity; Great Gatsby Curve

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1. Introduction

Since the start of economic reforms in 1978, China has witnessed one of the fastest sustained economic growths in the modern era. The rapid economic growth of the country has resulted in uplifting hundreds of millions of individuals from poverty and significantly improved levels of education attainment. Despite that, economic development has also resulted in increasing regional disparities, persistent urban-rural inequality, and issues surrounding inequalities in educational and economic opportunities. As China's development model moves from rapid growth to quality development and common prosperity, one of the growing questions that have emerged is whether China's impressive economic growth has been accompanied by intergenerational upward mobility?

Intergenerational upward mobility is often considered the single most significant measure of equality of opportunity and economic development over time (Solon, 1992; Corak, 2013). Upward mobility means that individuals can improve their economic status regardless of family background, while low mobility suggests that economic advantages and disadvantages remain primarily consistent across generations. Besides having consequences for equality of opportunity, upward mobility also impacts incentives for human capital formation, social solidarity, and economic development in the long run. Therefore, understanding the development and determinants of upward mobility has become an important issue in economics.

Empirical advancements over time have significantly enhanced knowledge about intergenerational mobility. Chetty et al. (2014, 2017, 2020) employed tax data to demonstrate significant variations in upward mobility in different geographic and demographic sections of the United States, and that regions with higher levels of income inequality experience lower mobility rates, which is referred to as the Great Gatsby Curve. Such findings imply that economic growth alone does not ensure equality of opportunities for successive generations and have shifted the attention of scholarly discourse towards the question of how growth has been distributed across society as a whole. On the other hand, an emerging body of literature on inclusive growth maintains that development needs to be judged on the basis of both the rate at which growth is achieved and how broadly it is shared (Ali and Son, 2007; Anand et al., 2013). China serves as a particularly significant case study for analyzing this issue considering that the country has experienced notable economic growth in addition to an institutional and structural transformation in the last four decades. Whereas the level of income has increased substantially, income inequality has grown, disparities remain at regional levels, and institutional practices such as the hukou system influence educational and economic opportunities (Knight and Song, 1999; Ravallion and Chen, 2007; Li et al., 2013). These developments pose a critical question: Has economic growth in China created greater opportunities for social mobility across generations, or has there been an uneven distribution of benefits gained through development among its citizens?

Scholars have examined intergenerational mobility using a number of different approaches, including intergenerational income elasticity, rank-rank correlations, transition probabilities, and indices of absolute mobility (Solon, 1992; Chetty et al., 2014, 2017, 2020). The application of these methods led to enhancing the comprehension of equality of opportunity. Nevertheless, these tools are mainly concerned with assessing the change in relative position in income distribution or the likelihood that children will earn more than their

parents' incomes, with limited regard for its consequences on welfare distribution across generations. Therefore, they are unable to differentiate between growth that disproportionately favors higher income individuals and growth that leads to improvement in the standard of living for all individuals equally. In this regard, existing measures offer an incomplete assessment of whether growth has resulted in intergenerational mobility.

In order to overcome this drawback, Ray and Genicot (2023) introduced a new indicator of upward mobility in the context of social welfare. With an inequality-aversion parameter incorporated into their indicator, they assign greater weight to income gains of lower-income groups and assess upward mobility based on social welfare improvement instead of change in average income and income ranking. Considering that the measurement depends exclusively on repeated cross-sectional income distributions implies that the indicator can easily be applied in countries where panel data is not available. The most important aspect of the indicator is that it provides a connection between research on intergenerational mobility and inclusive growth.

The current paper will aim to address three questions. First, has the rapid economic development in China led to inclusive intergenerational upward mobility? Second, how would the measurement of upward mobility be affected when inequality aversion is taken into account? Thirdly, what factor's drive mobility's evolution, and to what degree can variations in mobility be attributed to observed household attributes as opposed to structural shifts in income-generating process?

To address these questions, this study employs the welfare-based upward mobility framework that was developed by Ray and Genicot (2023) using nationally representative household survey data from China Household Income Project (CHIP) covering the years 1988-2018. The paper analyzes the Ray-Genicot mobility index along with relative mobility and two benchmark indices of absolute mobility: the Chetty-type benchmark using intergenerational income distributions and the AM-Berman benchmark of absolute mobility. The study also considers the relationship between inequality and mobility through the Great Gatsby Curve and the sources of mobility changes using decomposition analysis.

This paper contributes to the literature in four ways. First, based on our comprehensive review of the literature, this paper is the first work to use the welfare-based upward mobility concept introduced by Ray and Genicot (2023) in the context of China, thus expanding the scope of research on intergenerational mobility from rank and absolute mobility. Second, through a comparison of welfare mobility, relative mobility, Chetty-style absolute mobility, and AM-Berman absolute mobility, in a consistent framework, the paper demonstrates the differential nature of each type of mobility indicator. Thirdly, it investigates whether China's case is in line with the theory of the Great Gatsby Curve through the examination of the correlation between income inequality and upward mobility at the provincial level and over time. Fourth, it examines the underlying mechanisms of mobility change using aggregate and disaggregate decomposition analysis by identifying the contributions of household attributes, hukou, demography, education, province, and the general income-generating structure.

In addition to documenting China's mobility experience, this study also contributes to development economics literature by demonstrating why growth must be assessed both on the effect on average income

and whether it enhances opportunity across generations. China, given the magnitude of its rapid economic development, stands out as an interesting case study to investigate the connection between economic growth and intergenerational mobility. Therefore, the findings described in this paper will contribute to understanding about the potential and limits of transforming rapid economic growth into intergenerational mobility in developing countries.

The rest of this paper is structured as follows. Section 2 contains the data description and sample formation. Section 3 describes the framework for upward mobility and the methods used for decomposition. Section 4 details the empirical results. Section 5 provides the implications for China's development and development economics of the results found in this study and Section 6 offers a conclusion.

2 Data

This study uses data from the Chinese Household Income Project (CHIP), one of the most comprehensive nationally representative household surveys in China. The CHIP survey has been widely used to examine income distribution, inequality, and social mobility because it provides detailed information on household income, demographic characteristics, education, and employment. The analysis combines six waves of the CHIP survey conducted in 1988, 1995, 2002, 2007, 2013, and 2018, covering the period from the early stage of China's economic reforms to the most recent nationwide survey currently available. The survey covers both urban and rural households and provides consistent information on household income, consumption, education, demographic characteristics, and household composition, making it well suited to studying long run changes in intergenerational mobility. The pooled sample contains 174,742 observations from the six CHIP survey waves conducted between 1988 and 2018. Summary statistics for the pooled sample are reported in Appendix Table A1.

2.1 Sample Construction

The six CHIP surveys were conducted independently and therefore differ in questionnaire design and variable definitions. To construct a comparable dataset, individual and household level files were first merged within each survey wave using the original household identifiers. Variables were then harmonized across survey years by standardizing variable names, coding schemes, and measurement units. Finally, the six survey waves were appended to form a pooled repeated cross-sectional dataset with a consistent data structure. In this study, household income is the primary measure of economic status, while household consumption is employed as a supplementary indicator. Educational attainment was converted into years of schooling according to China's formal education system. Other harmonized variables include age, gender, household relationship, province, and urban-rural residence. Observations with missing or invalid values for key variables, including household income and age, were excluded from the analysis.

2.2 Construction of the Intergenerational Mobility Sample

Considering that CHIP is a repeated cross-sectional survey rather than a longitudinal panel, intergenerational mobility is measured using synthetic cohorts following the approach proposed by Ray and Genicot (2023). Individuals aged 45-60 are defined as the parental generation, while those aged 25-40 are defined as the children's generation. These age ranges approximate two adjacent generations separated by approximately twenty years.

Within each survey wave, households are first divided into urban and rural subsamples. The parental and children's generations are then ranked separately according to annual household income within each urban-rural group. Income percentiles are calculated independently for each generation, producing one hundred percentile groups ranging from the lowest income to the highest income households.

For each survey year, the average household income is computed for every percentile of the parental and children's distributions. These percentile-specific average incomes constitute two comparable intergenerational income distributions, which are subsequently utilized to calculate welfare-based upward mobility, relative mobility, and absolute mobility. This approach allows intergenerational mobility to be estimated from repeated cross-sectional surveys without requiring intergenerational panel data linking parents and children.

3 Measuring Upward Mobility

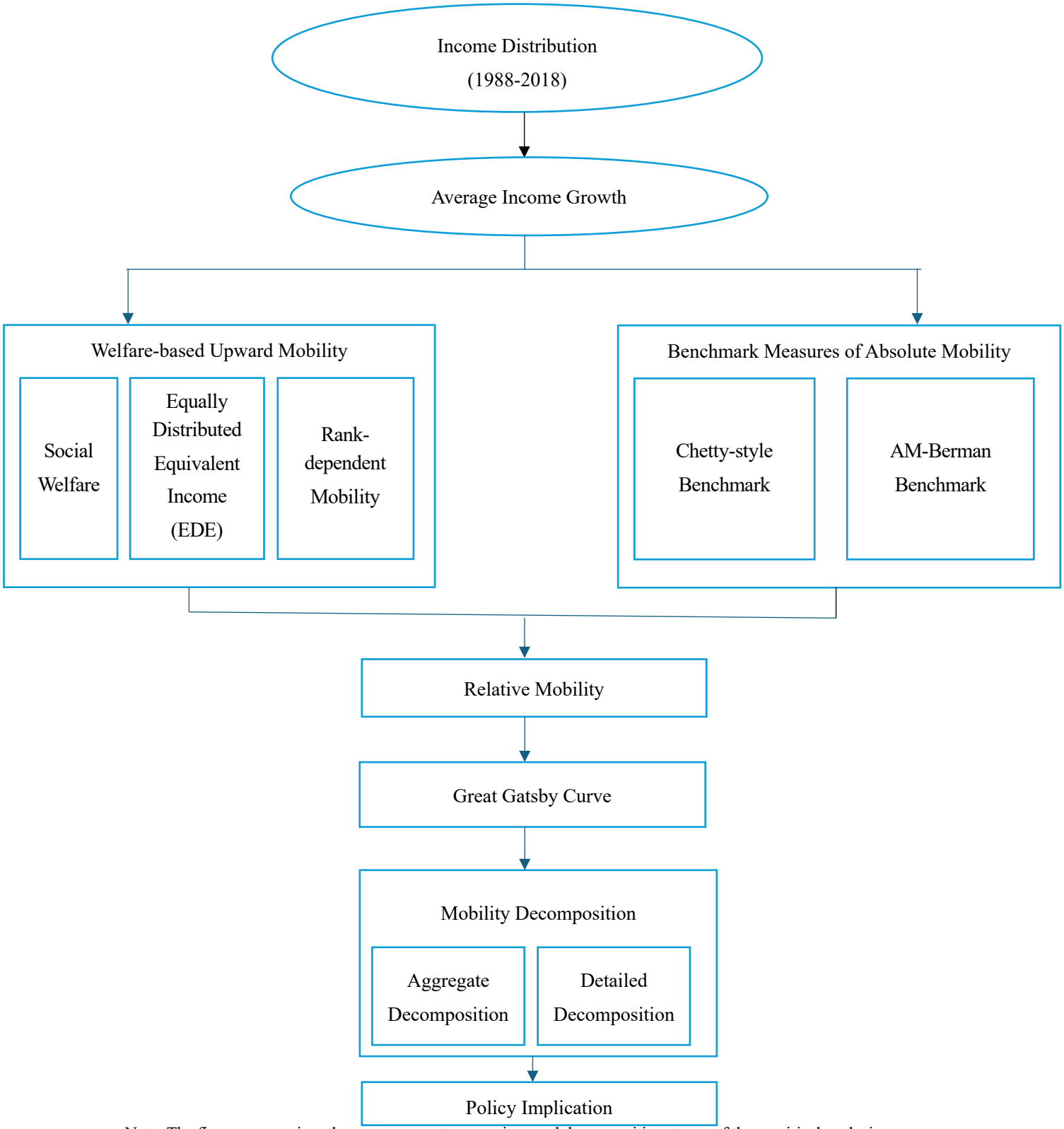
This study examines intergenerational upward mobility using the welfare-based framework proposed by Ray and Genicot (2023) and compares it with two benchmark measures of absolute mobility. First, it employs a Chetty-style benchmark based on intergenerational income distributions, which provides a conventional measure of absolute income growth across generations following the approach of Chetty et al. (2017). Second, it utilizes the AM-Berman measure proposed by Berman (2022), which captures the probability that children achieve higher income than their parents. Together, these benchmark measures provide complementary perspectives on absolute mobility and facilitate comparison with the existing literature.

Unlike these conventional measures, the welfare-based framework evaluates upward mobility from a social welfare perspective by explicitly incorporating inequality aversion. Consequently, upward mobility reflects both improvements in average income and also how the gains from economic growth are distributed across the income distribution. This section first introduces the welfare foundation of the mobility measure, then presents the welfare-based measure of upward mobility, followed by the relative mobility measure, and the AM-Berman measure of absolute mobility. The Chetty-style benchmark is presented in the empirical results as a conventional reference for comparison.

The analytical approach used in this study is summarized in Figure 1. Starting from the intergenerational income distribution measures generated by the CHIP surveys, the study first measures average income growth, welfare-based upward mobility, relative mobility, and absolute mobility benchmarks. It further explores the determinants of upward mobility using both aggregate and decomposition methods, which lay the foundation

for the discussion of its implications for China's development and development economics.

Figure1. Analytical Framework for Evaluating Inclusive Intergenerational Income mobility



Note: The figure summarizes the measurement, comparison and decomposition stages of the empirical analysis.

3.1 Social Welfare Foundation

Social welfare is represented by an additive social welfare function:

$$W(F) = \mu(1 - I) \tag{1}$$

where μ stands for average income and I denotes inequality index. Inequality is calculated on the basis of Atkinson index, introduced by Anthony B. Atkinson (1981), where social welfare is assessed in terms of equally distributed equivalent (EDE) income.

Equally distributed income refers to the level of income where, when evenly distributed amongst all people, will give the same amount of social welfare as the existing distribution of income. Let $x = (x_1, \dots, x_n)$ denote the income distribution. The EDE income is

$$\xi_\alpha(x) = \begin{cases} \left(\frac{1}{n}\sum_{i=1}^{n} x_i^{1-\alpha}\right)^{\frac{1}{1-\alpha}}, & \alpha \neq 1 \\ exp\left(\frac{1}{n}\sum_{i=1}^{n} lnx_i\right), & \alpha = 1 \end{cases} \tag{2}$$

where $\alpha \geq 0$ denotes the inequality-aversion parameter.

The parameter α dictates how much weight is attached to increments in income from various positions within the income distribution. The higher the value of α, the more weight is placed on lower income households, making the welfare function increasingly sensitive to any changes at the lower end of the distribution. When α = 0, the welfare index equals average income, indicating that all individuals receive equal weight. As α increases, greater importance is placed on lower income households, enabling the welfare index to judge whether the growth in the economy has helped the lowest income bracket individuals.

The Atkinson inequality index is therefore defined as:

$$A_\alpha = \frac{\xi_\alpha(x)}{\mu} \tag{3}$$

Which implies $W(F) = \xi_\alpha(x)$. Consequently, social welfare is completely summarized by the equally distributed equivalent income.

3.2 A New Measure of Upward Mobility

Although the Atkinson social welfare function offers an assessment of welfare for a specific income distribution, it does not indicate how social welfare varies across generation. It is hence required to compare the level of welfare that arises from the income distributions of both parents and their children. Ray and

Genicot (2023) build on the Atkinson framework of social welfare by developing introducing a measure of upward mobility, which assesses changes in social welfare across generations taking into account society's aversion to inequality.

Instead of prescribing the mobility measure directly, Ray and Genicot (2023) arrive at the measure through an axiomatic method. They first start with the identification of a set of normative principles that any such measure of mobility must satisfy. These characteristics are those of the desired measure of mobility and constitute the theoretical base for deriving an index that is welfare-consistent.

In particular, they state six axioms in order to construct an instantaneous measure of upward mobility $M(y, g)$, which is based on a baseline income vector $y = (y\_1, y\_n)$ and an instantaneous growth vector $g = (g\_1, g\_n)$. The six axioms include the following: Zero Growth Anchoring, Income Neutrality, Growth Progressivity, Growth Alignment, Local Merge, and Binary Growth Tradeoffs.

The first two axioms demand that the measure of mobility be zero when there is no income growth and be invariant to proportional changes in income units. The following two axioms capture the idea of inclusive growth. Specifically, Growth Progressivity stipulates that a shift of income growth from one individual who has more income to another individual who has less income will increase the mobility measure. Formally, let g' denote a growth vector that differs from g only in two elements,

$$g_i' = g_i - \epsilon\,, \qquad g_j' = g_j + \epsilon$$

where $y_i > y_j$ and $\epsilon > 0$. The Growth Progressivity axiom requires that

$$M(y, g') > M(y, g).$$

This postulate indicates that any growth in income in favor of lower income individuals is socially more valuable than the same growth for higher income individuals. The other postulates impose consistency conditions for aggregating the growth in income of each person, and the result is a uniquely defined measure of upward mobility.

According to Ray and Genicot (2023), the unique instantaneous mobility measure satisfying the axioms is given by

$$M_a(y, g) \equiv \frac{\sum_{i=1}^{n} y_{i=1}^{-\alpha} g_i}{\sum_{i=1}^{n} y_i^{-\alpha}} \tag{4}$$

where $\alpha > 0$ denotes the inequality-aversion parameter.

Equation (4) can be viewed as a weighted average of the growth rate of individual incomes with weights that are determined in an inverse relationship with the level of initial income. As a result, individuals with relatively lower levels of income receive higher weights, and this is controlled by the inequality aversion coefficient α. As the value of α increases, the measure of mobility gives increasingly more weight to the

income growth realized by less privileged families. In contrast, as the value of α approaches zero, the weights given to everyone become approximately equal, and the measure becomes the average income growth rate.

Since observations of household surveys occur at discrete instead of continuous times, it is not possible to utilize the instantaneous mobility measure on empirical data. In their work, Ray and Genicot (2023) introduce two additional requirements that include reducibility and additivity in order to obtain a discrete-time measure of upward mobility for repeated cross-sectional surveys:

$$M_{\alpha}^{\Delta}\big(y(s), y(t)\big) \equiv \frac{1}{t-s} ln \left[\frac{\sum_{i=1}^{n} y_i^{-\alpha}(t)}{\sum_{i=1}^{n} y_i^{-\alpha}(s)}\right]^{-\frac{1}{\alpha}} \tag{5}$$

where $y(s)$ and $y(t)$ denote the income distributions of the parental and children's generations, respectively.

The significant advantage of Equation (5) is the absence of the need for panel data. The indicator is based solely on the income distributions in each period, and hence it can be calculated by relying on cross-sectional household survey data that is repeated over time. This is especially relevant for the present study because the Chinese Household Income Project (CHIP) represents cross-sectional national representative surveys rather than a longitudinal panel. Therefore, upward mobility is measured by comparing the income distributions for the parents and children generated from the surveys.

For empirical implementation, the population measure is estimated by its sample analogue,

$$\widehat{M}_{\alpha}^{\Delta}\big(y(s), y(t)\big) \equiv \frac{1}{t-s} ln \left[\frac{\frac{1}{n_t}\sum_{i=1}^{n_t} y_i^{-\alpha}(t)}{\frac{1}{n_s}\sum_{i=1}^{n} y_i^{-\alpha}(s)}\right]^{-\frac{1}{\alpha}} \tag{6}$$

where n_s and n_t represent the sizes of the sample for the parental generation and the children's generation, respectively.

As per Ray and Genicot (2023), the indices for mobility are presented below using $\alpha = \{0, 0.1, 0.3, 0.5, 1, 2\}$. Changing the level of α helps understand if the advantages of economic development are distributed equally among all income groups. Higher levels of α imply greater importance to lower income households and hence a stronger measure of inclusive upward mobility.

3.3 Relative Mobility

Even though the welfare-weighted mobility index considers both the growth of aggregate income and income distribution changes, there are cases where it is desirable to single out the effect of income distribution change. According to Ray and Genicot (2023), relative upward mobility eliminates the effect of income growth and hence measures the extent to which mobility is caused by variations in inequality as opposed to economic

growth.

The relative mobility index is defined as

$$K_{\alpha}^{\Delta}\big(y(s),y(t)\big) \equiv \frac{1}{t-s} ln\left[\frac{\sum_{i=1}^{n}\left(\frac{y_i(t)}{\bar{y}(t)}\right)^{-\alpha}}{\sum_{i=1}^{n}\left(\frac{y_i(s)}{\bar{y}(s)}\right)^{-\alpha}}\right]^{-\frac{1}{\alpha}} \tag{7}$$

where $\bar{y}(s)$ and $\bar{y}(t)$ denote the mean incomes of the parental and children's generations at time s and t, respectively.

According to Ray and Genicot (2023), the relative mobility measure can be expressed as

$$K_{\alpha}^{\Delta} = M_{\alpha}^{\Delta} - g \tag{8}$$

where

$$g = \frac{1}{t-s} ln\left(\frac{\bar{y}(t)}{\bar{y}(s)}\right) \tag{9}$$

Denotes the average income growth rate.

Equation (8) indicates that upward mobility based on welfare considerations can be broken down into two factors, namely, aggregate income growth and income distribution changes. Thus, relative mobility reflects the distribution factor of upward mobility, excluding the effects of income growth. A positive value of K_{α}^{Δ} means that lower income households have faster income growth compared to the national average income growth rate, while a negative value implies that income growth is skewed towards rich individuals.

3.4 AM-Berman Absolute Mobility

Whereas the Ray-Genicot mobility index assesses the extent of intergenerational mobility based on the principle of social welfare, it is also important to note its comparison with a more common measure of absolute mobility. Thus, the present research uses the AM-Berman measure introduced by Berman (2022) that is associated with the probability of children earning more income than their parents.

Whereas the welfare-based mobility index takes into account inequality aversion and depends on the parameter α, the AM-Berman index does not take into consideration inequality aversion. In this case, the AM-Berman index measures directly the fact that children earn more than their parents. Thus, absolute mobility can be measured using the formula

$$AM = P(y > x) \tag{10}$$

where x and y denote the incomes of the parental and children's generations, respectively.

As per Berman (2022), the present study employs the lower half of the parental income distribution. In particular, the parental households are first ranked in order of household income, and only those who rank below the median are used for the analysis. The AM-Berman index is obtained as the share of children whose household income is higher than that of their parents. Thus, the probability that people from less favored backgrounds achieve absolute income gains across generations is obtained.

The AM-Berman index enhances the social welfare-based mobility index in two significant ways. Firstly, while the Ray-Genicot index measures mobility from the perspective of social welfare and gives greater importance to the poor households using the inequality aversion parameter (α), the AM-Berman index is purely probability based and does not consider any welfare weights. Second, while the welfare-based measure is more sensitive to the income growth of the lowest income households as α gets higher, the AM-Berman index measures mobility among the broader lower half of the income distribution. Comparison between these two indices thus enables one to determine whether variations in intergenerational mobility are found among the lowest income or whether there is mobility among economically deprived sections of society as well.

In all the empirical analysis conducted, the AM-Berman Index is presented along with the mobility index that considers welfare and the relative mobility index. It enables a comparative analysis of the trends in intergenerational mobility in China to determine if the country's economic growth has resulted in upward mobility for disadvantaged households.

3.5 Aggregate Decomposition

For the identification of the reasons behind the change in welfare-based upward mobility, the decomposition approach has been applied to the RG index into explained and unexplained parts. The decomposition method used in our paper is based on the counterfactual decomposition of Blinder (1973) and Oaxaca (1973), which was later extended by Ray and Genicot (2023) to include the welfare-based mobility index. In contrast to the traditional method of Blinder-Oaxaca decomposition, which seeks to explain the differences in mean outcomes, the current method focuses on the decomposition of the differences in the mobility measure that is based on welfare. Thus, this enable separating the effect of change in the household's characteristics from change in the income-generating process.

The Blinder-Oaxaca Decomposition starts from the following linear regression model:

$$y_i(\tau) = X_i(\tau)\beta(\tau) + \mu_i(\tau) \tag{11}$$

where $X\_i\ (\tau)$ refers to observable household characteristics, and $\beta(\tau)$ represents their respective return, while $\mu\_i\ (\tau)$ represents the error term. The change in the average outcome between two periods can be broken down into

$$\Delta\mu_O = E[y_i(t)] - E[y_i(s)] \tag{12}$$

Following Blinder (1973) and Oaxaca (1973), this difference can be decomposed into

$$\begin{aligned}\Delta\mu_O &= E[y_i(t)] - E[y_i(s)] \\ &= E\{E[y_i(t)|X_i(t)]\} - E\{E[y_i(s)|X_i(s)]\} \\ &= E[X_i(t)]\beta(t) - E[X_i(s)]\beta(s) \\ &= \{E[X_i(t)] - E[X_i(s)]\}\beta(t) + E[X_i(s)]\big(\beta(t) - \beta(s)\big) \end{aligned} \quad (13)$$

While the first part assesses the contribution due to changes in the distribution of observable attributes (composition effect), the second part captures the contribution due to changes in the payoff to observable attributes (structure effect).

The aggregate decomposition of the upward mobility index is now discussed. Given the definition of upward mobility in equation (4), it is possible to re-write this index as

$$\begin{aligned}\widehat{M}_{\alpha}^{\Delta}\big(y(s), y(t)\big) &\equiv \frac{1}{t-s} ln\left[\frac{\frac{1}{n_t}\sum_{i=1}^{n_t} y_i^{-\alpha}(t)}{\frac{1}{n_s}\sum_{i=1}^{n_s} y_i^{-\alpha}(s)}\right]^{-\frac{1}{\alpha}} \\ &= \frac{1}{t-s}\left\{\left(-\frac{1}{\alpha} ln\left[\frac{1}{n_t}\sum_{i=1}^{n_t} y_i^{-\alpha}(t)\right]\right) - \left(-\frac{1}{\alpha} ln\left[\frac{1}{n_s}\sum_{i=1}^{n_t} y_i^{-\alpha}(s)\right]\right)\right\} \end{aligned} \quad (14)$$

This means that upward mobility index is the change in the distribution statistic

$$v\big(y(\tau)\big) = -\frac{1}{\alpha(t-s)} ln\left[\frac{1}{n_\tau}\sum_{i=1}^{n_t} y_i^{-\alpha}(\tau)\right] \quad (15)$$

Equation (15) is an index that is related to welfare and is used to describe the income distribution in each period. Hence, any change in upward mobility can be viewed as a change in this welfare index across generations.

For the decomposition of the change in the mobility index, the counterfactual income distribution is obtained using the reweighting technique developed by DiNardo et al. (1996). Denoted by $F_{X(\tau)}$ the marginal distribution of household characteristics at period τ, and by $F_{\{Y(\tau)|X(\tau)\}}$ the conditional distribution of income given characteristics. The marginal income distribution for period τ can be written as

$$F_{\{Y(\tau)\}}(y) = \int F_{Y(\tau)|X(\tau)}(y|X)dF_{X(\tau)}(X) \tag{16}$$

The counterfactual distribution is formed by combining the conditional income distribution observed in the later time period t with the distribution of the household characteristic observed in the baseline period s:

$$F_{y^C(t)}(y) \equiv \int F_{y(t)|X(t)}(y|X)dF_{X(s)}(X) \tag{17}$$

This counterfactual addresses the following question: what would the income distribution in period t have looked like if the income-generating process had been that of period t, while the distribution of household characteristics had remained the same as in period s ? Because this counterfactual distribution is not directly observed, it can be expressed as a reweighted version of the observed distribution in period t, specifically,

$$\int F_{y(t)|X(t)}(y|X)dF_{X(s)}(X) = \int F_{y(t)|X(t)}(y|X)\Psi\,(X)dF_{X(t)}(X) \tag{18}$$

where the reweighting factor is

$$\Psi(X)\frac{dF_{X(s)}(X)}{dF_{X(t)}(X)} \tag{19}$$

Using Baye's rule, the reweighting factor can be written as

$$\Psi(X) = \frac{\frac{P_r(\tau = s|X)}{P_r(\tau = s)}}{\frac{P_r(\tau = t|X)}{P_r(\tau = t)}} \tag{20}$$

In empirical implementation, $P_r(\tau = s|X)$ and $P_r(\tau = t|X)$ can be estimated by pooling the data from period s and t, and estimating a flexible binary response model for period membership.

The counterfactual welfare statistic is then computed as

$$v\big(y^C(t)\big) = -\frac{1}{\alpha(t-s)}ln\left[\frac{1}{n_\tau}\sum_{i=1}^{n_t}\Psi\big(X_i(t)\big)y_i^{-\alpha}(t)\right] \tag{21}$$

Therefore, the total change in the welfare statistic can be decomposed into the composition and structure

components as

$$\Delta_O^v = v\big(y(t)\big) - v\big(y(s)\big) \tag{22}$$

$$= \big[v\big(y(t)\big) - v\big(y^C(t)\big)\big] + \big[v\big(y^C(t)\big) - v\big(y(s)\big)\big]$$

$$= \Delta_X^v + \Delta_S^v \tag{23}$$

Here, Δ_X^v refers to the composition effect, which represents the influence of changes in observable household traits. On the other hand, Δ_S^v stands for the structure effect and represents the part of the change in welfare-based upward mobility that remains after controlling the distribution of observable trait. The re-weighting method is helpful in the decomposition of aggregate because it enables the formation of the counterfactual distribution without making the linear conditional expectation assumption in the welfare statistics.

3.6 Detailed Decomposition

While the aggregate decomposition separates the total effect on the RG index change into composition and structure effects, it is unable to show the particular features behind such changes. In order to identify the particular contribution of each feature, the current study utilizes the recentered influence function (RIF) regression technique proposed by Firpo et al. (2009). In the RIF technique, it becomes viable to study a distributional measure, such as ν(y), in a regression setting, thus enabling one to carry out a full Blinder-Oaxaca-type decomposition.

In the traditional Blinder-Oaxaca decomposition approach, the full decomposition takes the form of

$$\hat{\Delta}_S^{\mu} = \big[\hat{\beta}_0(t) - \hat{\beta}_0(s)\big] + \sum_{k=1}^{M} \bar{X}_k(t)\big[\hat{\beta}_k(t) - \hat{\beta}_k(s)\big] \tag{24}$$

$$\hat{\Delta}_X^{\mu} = \sum_{k=1}^{M} [\bar{X}_k(t) - \bar{X}_k(s)]\, \hat{\beta}_k(s) \tag{25}$$

In equation (24), the composition effect is attributed to the differences in the values of the characteristics being observed. However, in equation (25), the structure effect is attributed to the differences in the values of the coefficients of the characteristics, including the differences in the value of the intercept.

To apply this approach to the calculation of the upward mobility index, there is a need to derive the recentered influence function of the distribution statistics $v\big(y(\tau)\big)$. The RIF of the above-mentioned statistic is

$$RIF(y(\tau);v) = v\big(y(\tau)\big) - \frac{1}{\alpha(t-s)}\left[\frac{y_i(\tau)^{-\alpha} - E(y^{-\alpha})}{E(y^{-\alpha})}\right] \tag{26}$$

This equation measures the influence of each observation on the welfare statistic ν. The RIF has the property that the expected value of the RIF is equal to the statistic, making it possible to use regression to model the statistic.

This decomposition needs an extra assumption of the linearity of the conditional expectation of the RIF in the covariates:

$$E[RIF(y(\tau);v)|X(\tau)] = X(\tau)\gamma(\tau) \tag{27}$$

Under this assumption, the RIF can be estimated for each observation and then regressed on $X(\tau)$ separately for periods s and t. Let $\hat{\gamma}_s$ and $\hat{\gamma}_t$ denote the estimated coefficient vectors from these RIF regressions. In sample form, the estimated RIF for observation j in period τ is

$$\widehat{RIF}(y_i(\tau);v) = v\big(y(\tau)\big) - \frac{1}{\alpha(t-s)}\left[\frac{y_j(\tau)^{-\alpha} - \frac{1}{n_t}\sum_{i=1}^{n_t} y_i^{-\alpha}(\tau)}{\frac{1}{n_t}\sum_{i=1}^{n_t} y_i^{-\alpha}(\tau)}\right] \tag{28}$$

After estimating the RIF regressions, the overall change in the welfare statistic can be decomposed as

$$\hat{\Delta}_O^v = \bar{X}_t(\hat{\gamma}_t - \hat{\gamma}_s) + (\bar{X}_t - \bar{X}_s)\hat{\gamma}_s \tag{29}$$

The second term in equation (29) is the detailed effect:

$$(\bar{X}_t - \bar{X}_s)\hat{\gamma}_s = \sum_{k=1}^{K}\big(\hat{X}_{k,t} - \hat{X}_{k,s}\big)\hat{\gamma}_{k,s} \tag{30}$$

The first term is the detailed structure effect:

$$\bar{X}_t(\hat{\gamma}_t - \hat{\gamma}_s) = \sum_{k=1}^{K}\bar{X}_{k,t}\big(\hat{\gamma}_{k,t} - \hat{\gamma}_{k,s}\big) \tag{31}$$

Thus, the contribution of the change in the kth characteristic to the composition effect is given by

$$\big(\bar{X}_{k,t} - \bar{X}_{k,s}\big)\hat{\gamma}_{k,s}$$

The corresponding structure contribution is given by

$$\bar{X}_{k,t}\left(\hat{\gamma}_{k,t} - \hat{\gamma}_{k,s}\right)$$

The above-mentioned decomposition is thus able to indicate the factors that lead to a change in welfare-based upward mobility of a family as well as whether such change occurs due to the change in composition or the change in the income generating structure. Compared to the reweighting methodology employed for the aggregate decomposition, the RIF method places greater restrictions on the linearity of the conditional expectation of the RIF. Its strength, on the other hand, lies in the fact that it allows a decomposition of the upward mobility index by variables, which is important in determining the underlying causes of upward mobility.

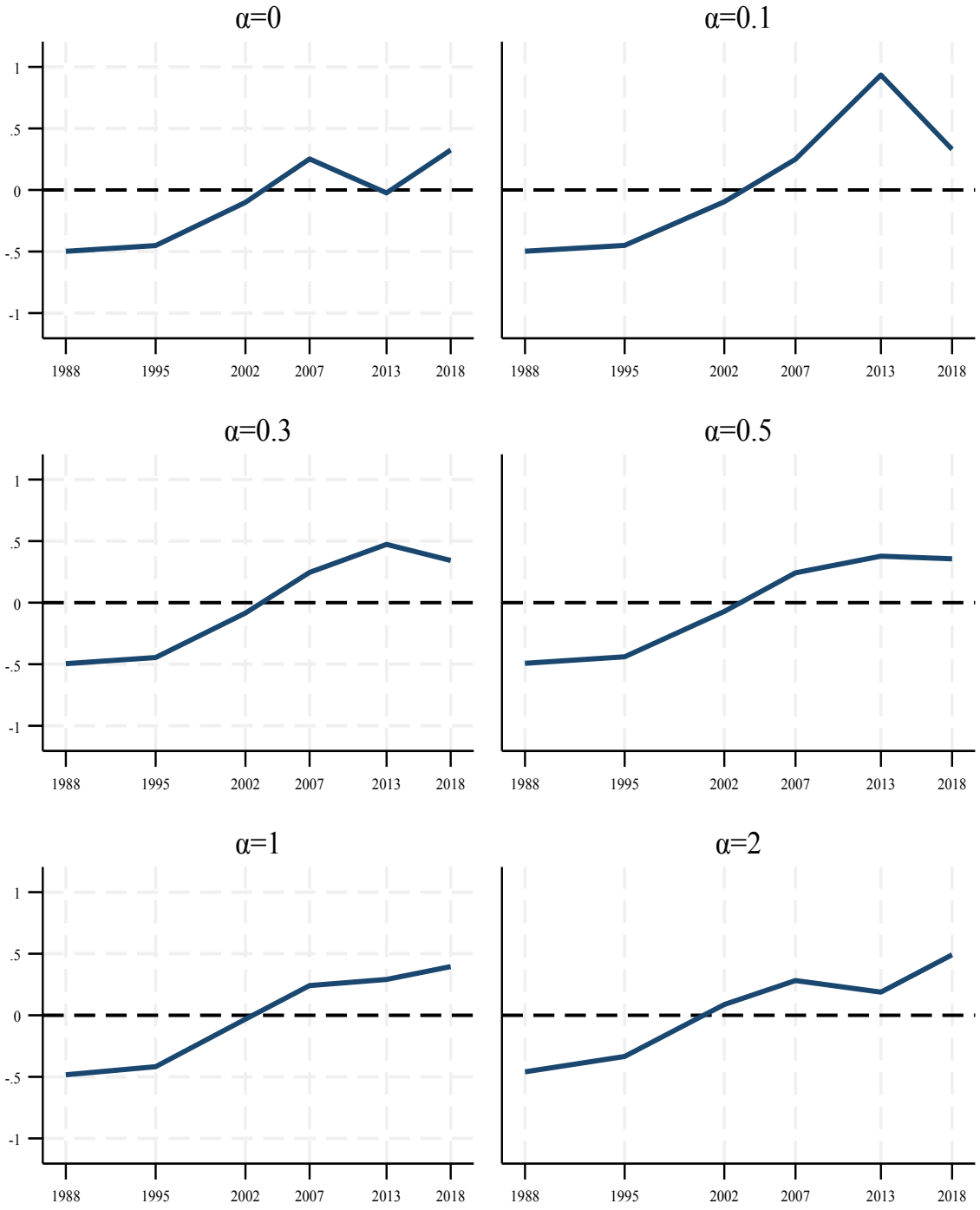
4.1 Absolute Upward Mobility

Prior to discussing the welfare-based measures of mobility, we start with a Chetty-style absolute mobility benchmark, which gives a traditional representation of the income growth of individuals over generations and acts as an important base for comparing it with the welfare-based mobility model by Ray and Genicot (2023). Figure 2 illustrates the dynamics of absolute upward mobility in China between 1988 and 2018 for different α values. There are various common features that reflect themselves for all model settings. First, upward mobility was rather low at the end of the 1980s and in the middle of the 1990s, when all the mobility indexes were negative. Second, mobility was greatly enhanced after the mid-1990s and especially between 2002 and 2007, when all indicators registered an important advance. In 2018, all measures of mobility were already positive, which means that there has been a significant increase in the possibilities to reach higher income levels than those of one's parents.

Despite the fact that the general tendency is strong regardless of the value of α chosen, the extent of improvement will be different depending on the weight given to the lower income individuals. Measures with greater value of α, which gives greater attention to lower income groups, the more positive results are observed in the long term. For instance, the mobility index for $\alpha = 2$ was negative in 1988 and reached its maximum level in 2018. Thus, the result indicates that upward mobility benefits did not only concern those in the middle or top parts of the income distribution but also people with lower income levels.

Figure 3 shows absolute upward mobility of rural and urban population. Urban population has shown higher degree of upward mobility compared to rural population during most of the time periods under consideration. This gap increases significantly during the phase of rapid economic growth after 2002. However, this difference becomes smaller for higher values of α, which implies that the improvement in mobility for lower-income rural families occurred more quickly during the later stages of development. Therefore, the findings suggest a significant progress in absolute upward mobility in China within the last three decades, despite the continuing impact of the urban-rural divide (see Appendix Tables A2 and A3).

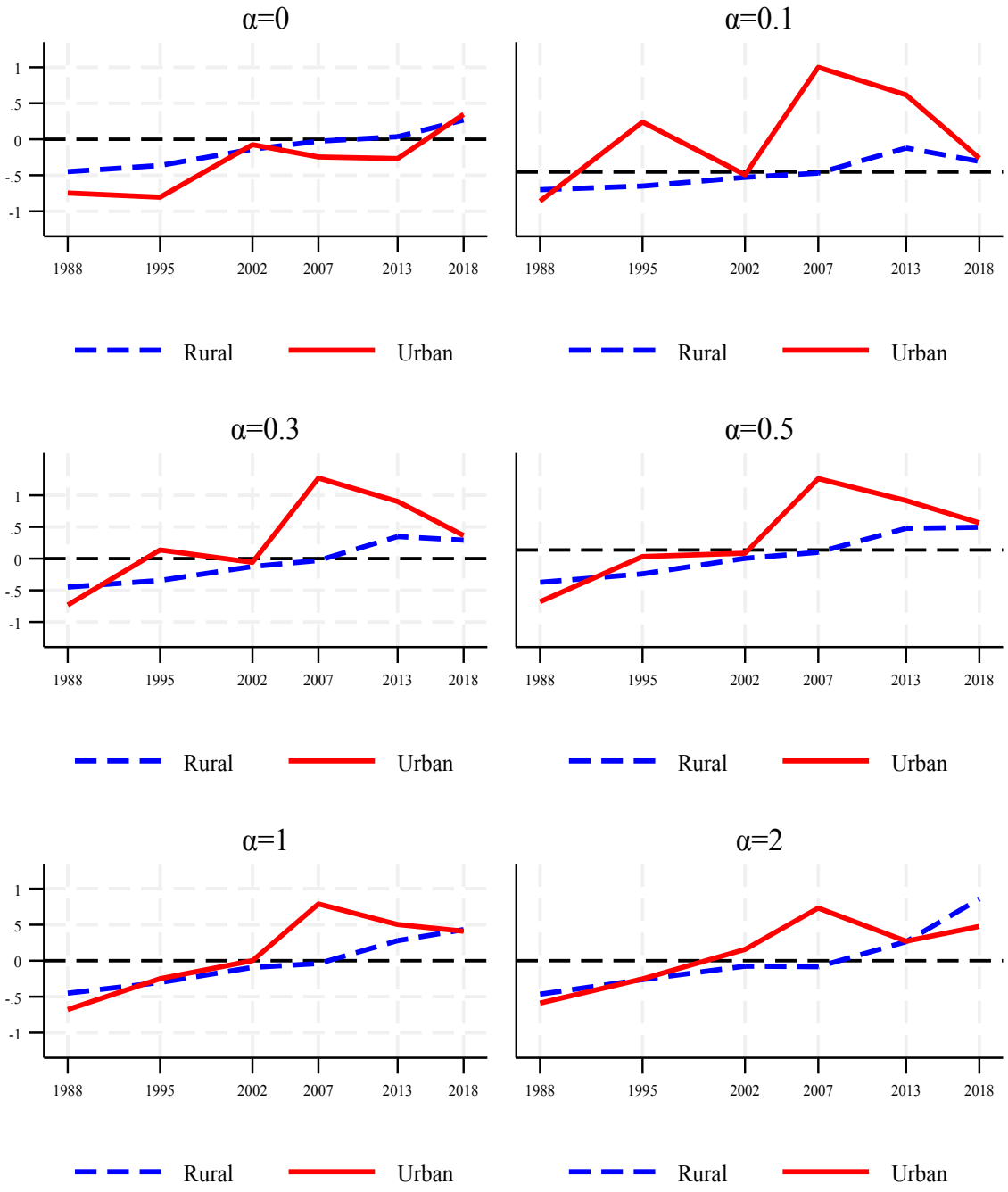
Figure 2. Evolution of Absolute Upward Mobility in China, 1988-2018.



Notes: Figure presents a measure of intergenerational absolute mobility using the intergenerational income comparison method. proposed by Chetty et al. (2017). For each wave of the survey, an average household income of parents and their offspring is computed separately in each income percentile, and mobility is estimated by annualized household income change between the two generations. Unlike the mobility index that is based on welfare, the comparison of parental and children's income distributions is conducted within the survey sample group, meaning that the index can be calculated every year of the CHIP surveys, including 1988. To enable a comparison with the welfare-based mobility approach, the index is presented for different values of the inequality aversion parameter α. Higher values of α mean that relatively greater weight is assigned to lower income households

Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Figure 3. Absolute Upward Mobility by Hukou, 1988-2018



Notes: Table displays a benchmark measure of intergenerational absolute mobility depending on hukou status according to the intergenerational income comparisons methodology of Chetty et al. (2017). Average incomes of parental generation and children in each income percentile are first computed for each survey wave and for each hukou type, and upward mobility is quantified by annualized income growth between generations. Unlike the welfare-based mobility indicator, which contrasts the income distribution of parents with that of children across different years of the CHIP surveys, this benchmark measures mobility between income distribution of parents and children in the same year of the survey. Hence, mobility can be measured in every year of the CHIP survey, including 1988. For comparison purposes with the welfare-based mobility indicator, the benchmark indicator is presented using different values of the inequality aversion parameter α. The higher the value of α, the more weight is given to low-income families.

Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

4.2 Relative Mobility

Figures 4a, 4b, 5a and 5b report the evolution of growth, upward mobility, and relative mobility in China between 1988 and 2018 under alternative values of the inequality-aversion parameter α, using 1988 as the baseline year. Figure 4a and 4b present the aggregate national pattern, while Figure 5a and 5b present the same mobility profiles by hukou status and compare rural and urban households separately. Taken together, the figures reveal three main features of China's mobility process over the reform period: a gradual decline in aggregate upward mobility, a limited and often negative contribution of relative mobility, and a persistent rural-urban divide in mobility outcomes.

Figure 4a and 4b show that both growth and upward mobility were highest during the early reform period and declined steadily thereafter. For instance, when $\alpha = 0$, annual growth dropped from 23.9 in 1995 to 13.7 in 2018, and upward mobility decreased from 27.3 to 14.1 in the same periods. Such a decreasing trend is similarly observed in $\alpha = 0.1, 0.3, 0.5, and\ 1$ .It implies that the exceptionally high mobility improvements made during the early years following the 1988 baseline year have not been sustained at other points in time. Despite the increase in average income, the impact of growth on enhancing mobility decreased significantly with the progression of development in China.

Another important observation from the study is that upward mobility exceeds growth, especially when α is quite low. For instance, where $\alpha = 0$, upward mobility for 1995 is 27.3 while growth is 23.9; when $\alpha = 0.5$, upward mobility is 28.2 while growth is 23.9. This suggests that increases in mobility during the early reform era were not achieved through increases in income growth alone, but also because of shifts in distribution which were at least partially favorable to those who ranked lower. However, the difference narrows down with time, especially from 2002 onwards, and thus the equalization effect on mobility weakened over time.

The behavior of relative mobility further supports this perspective. Relative mobility is found to be small for moderate values of α, and typically even negative since 2002, implying that the rise in upward mobility is due largely to overall increases in income levels rather than to substantial equalizing forces at work within the income distribution. More importantly, as the value of α increases, the value of relative mobility also increases in the negative direction, which shows that the returns to growth have not been distributed evenly and lower-income families have benefited less than average. This is because, as the value of α increases, the importance of lower-income families increases. Hence, as the value of α increases, the gains in mobility have become more pronounced for high income individuals while lower income individuals have experienced lower benefits.

The sensitivity analysis for different values of α demonstrates the same result. For the values of $\alpha = 0, 0.1, 0.3, and\ 0.5$, the growth rate, upward mobility, and relative mobility follow broadly same pattern: The growth rate and upward mobility decrease with time, and relative mobility stays near 0 or negative. The general trend continues when α is increased to 1, although relative mobility becomes slightly more negative in certain years. When $\alpha = 2$, the volatility of the estimates increases substantially with upward mobility becoming highly negative in 1995, and relative mobility becoming highly negative. Given the unusually large

value of the α, it is necessary to consider this result carefully since it gives strong weight to the lower tail of the income distribution. However, it further reinforces the conclusion that mobility outcomes tend to deteriorate when greater weight is given to lower income families.

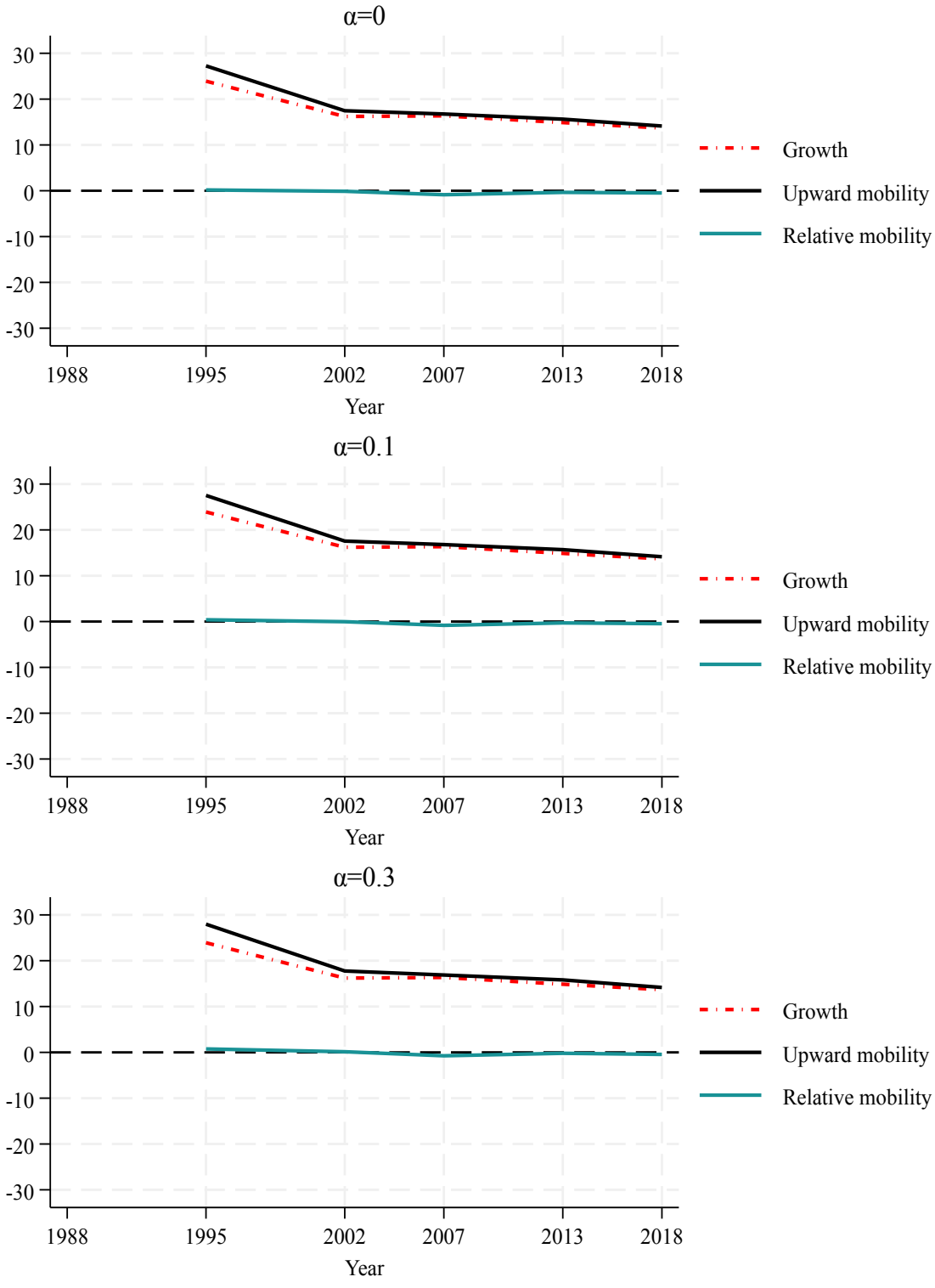
Figure 5a and 5b illustrate that such aggregate trends mask a stark rural-urban disparity. Urban upward mobility is always greater than rural upward mobility in all years and for almost all values of α. When $\alpha = 0$, urban upward mobility reaches 42.0 in 1995, while rural upward mobility stands at only 13.8; even in 2018, urban upward mobility (17.5) is still far greater than rural upward mobility (10.4). The same qualitative pattern is viewed in the cases where α is 0.1, 0.3, 0.5, and 1. This suggests that the benefits provided by the reform process have not been shared evenly in the case of rural and urban China, with households in the latter being greatly favored by economic growth.

There is also a difference in the temporal trends between these two groups. Urban upward mobility begins at a high level in mid-1990s and falls sharply thereafter, while rural upward mobility is considerably lower and varies gradually during the whole period. The above implies that the reason for the high aggregate mobility that was seen during the early reform period in China is that there were significant improvements in urban areas of China. However, with time, the gains weakened and hence the aggregate mobility. In comparison, rural mobility stayed consistently low and did not witness a similar exceptional pattern of increase and decline.

Rural-urban disparities also show up in terms of relative mobility. For rural regions, relative mobility is always negative and becomes more negative as α increases, which demonstrates that while income was growing in rural China, there were no significant distributional changes towards equality. Relative mobility in cities is also negative in most cases, although its size is relatively lower than in the case of rural areas when α is moderately sized. The implication is that even though urban families benefitted more in terms of upward mobility from economic growth, the gains were mainly from growth and not from relative mobility. In addition, however, the negative rural series suggests that lower income rural households continued to be at a distinct disadvantage in sharing the benefits of growth.

In summary, from the Figures 4a, 4b, 5a, and 5b above, it is clear that the fall in China's mobility over time cannot be seen as a general slowdown across the board. On the contrary, it is due to two processes which are related to each other: the erosion of high mobility recorded in the reform era and an unequal distribution of benefits from growth. The lower socio-economic classes and particularly the rural families benefited much lower out of the mobility experience than the average person. Consequently, China's mobility experience in the period 1988-2018 was not only affected by the rate of growth, but it was also influenced by distributional and structural inequalities that kept the rural-urban disparity as a major limitation to equality of economic opportunities. (see Appendix Tables A4 and A5)

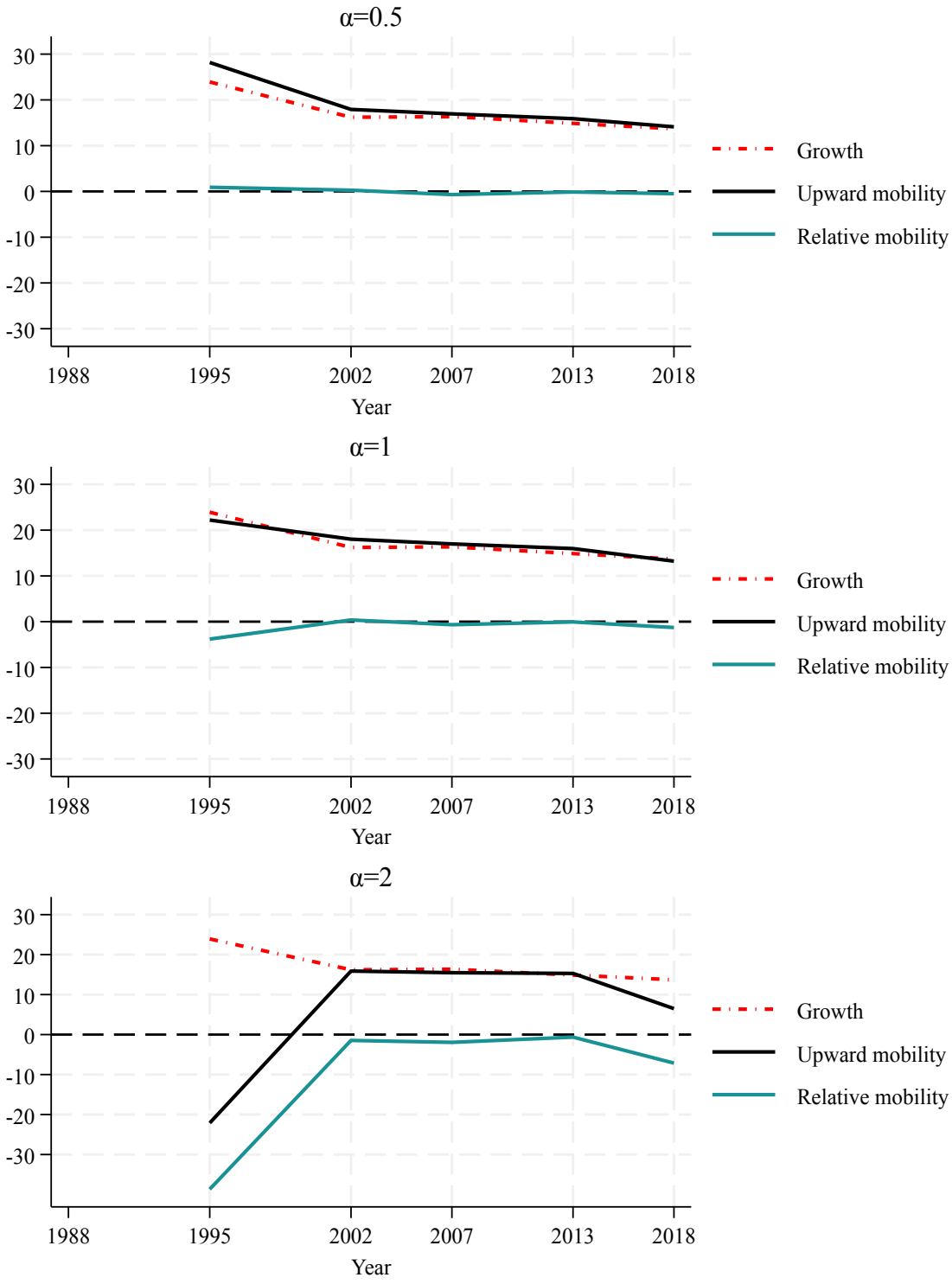
Figure 4a. Trend in Relative Mobility in China, 1988-2018



Note: Figure below shows the comparisons of upward mobility based on welfare criterion, average growth in income, and relative mobility with respect to alternative values of inequality aversion parameter (α = 0, 0.1 and 0.3). Taking 1988 as the benchmark year, upward mobility is based on the Ray-Genicot index, while growth refers to the average annual growth in income and relative mobility is the difference between upward mobility and average growth in income. Higher values of α reflect higher weights for lower-income classes.

Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

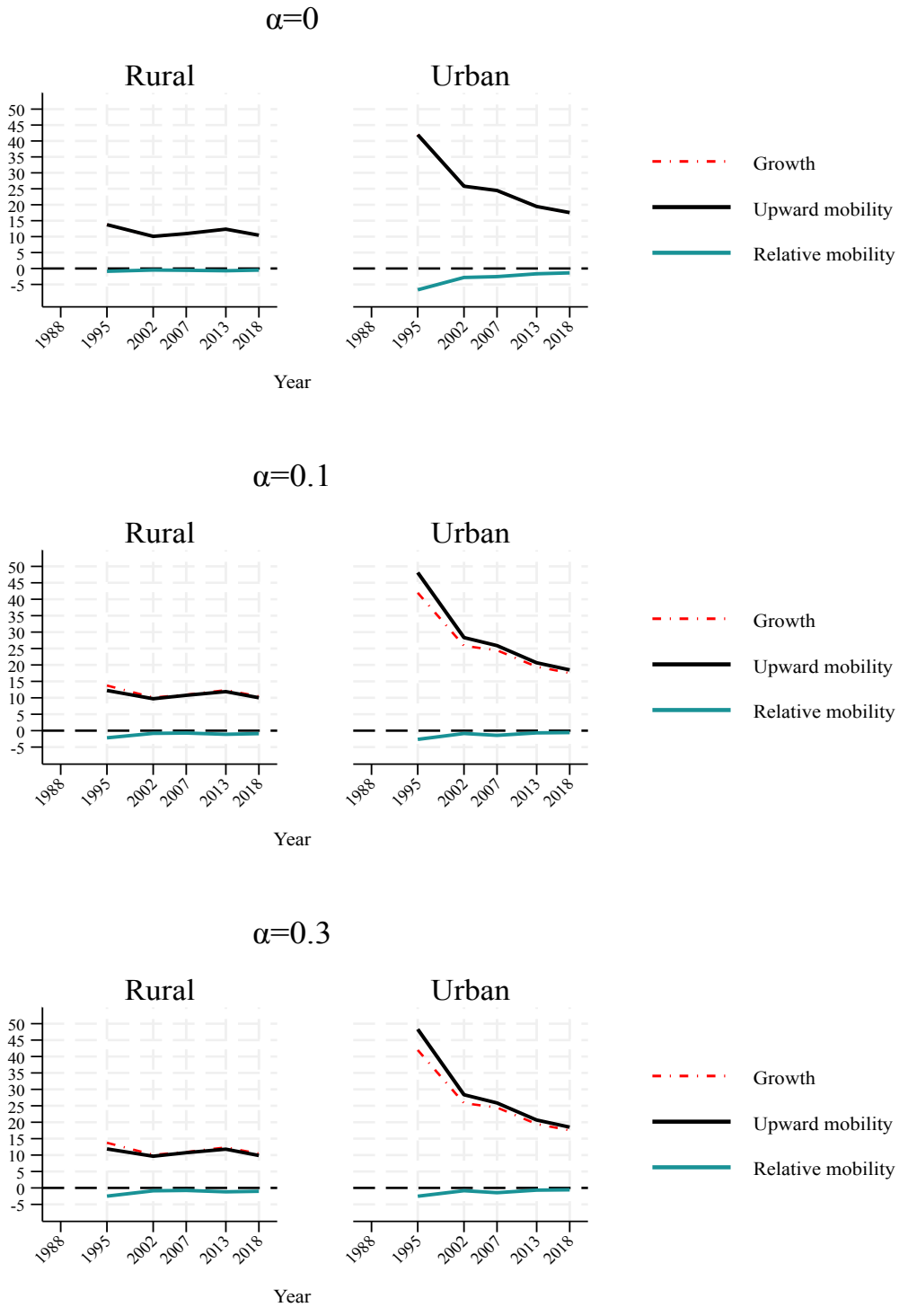
Figure 4b. Trend in Relative Mobility in China, 1988-2018



Note: Figure below shows the comparisons of upward mobility based on welfare criterion, average growth in income, and. relative mobility with respect to alternative values of inequality aversion parameter (α = 0.5, 1, and 2). Taking 1988 as the benchmark year, upward mobility is based on the Ray-Genicot index, while growth refers to the average annual growth in income and relative mobility is the difference between upward mobility and average growth in income. Higher values of α reflect higher weights for lower-income classes.

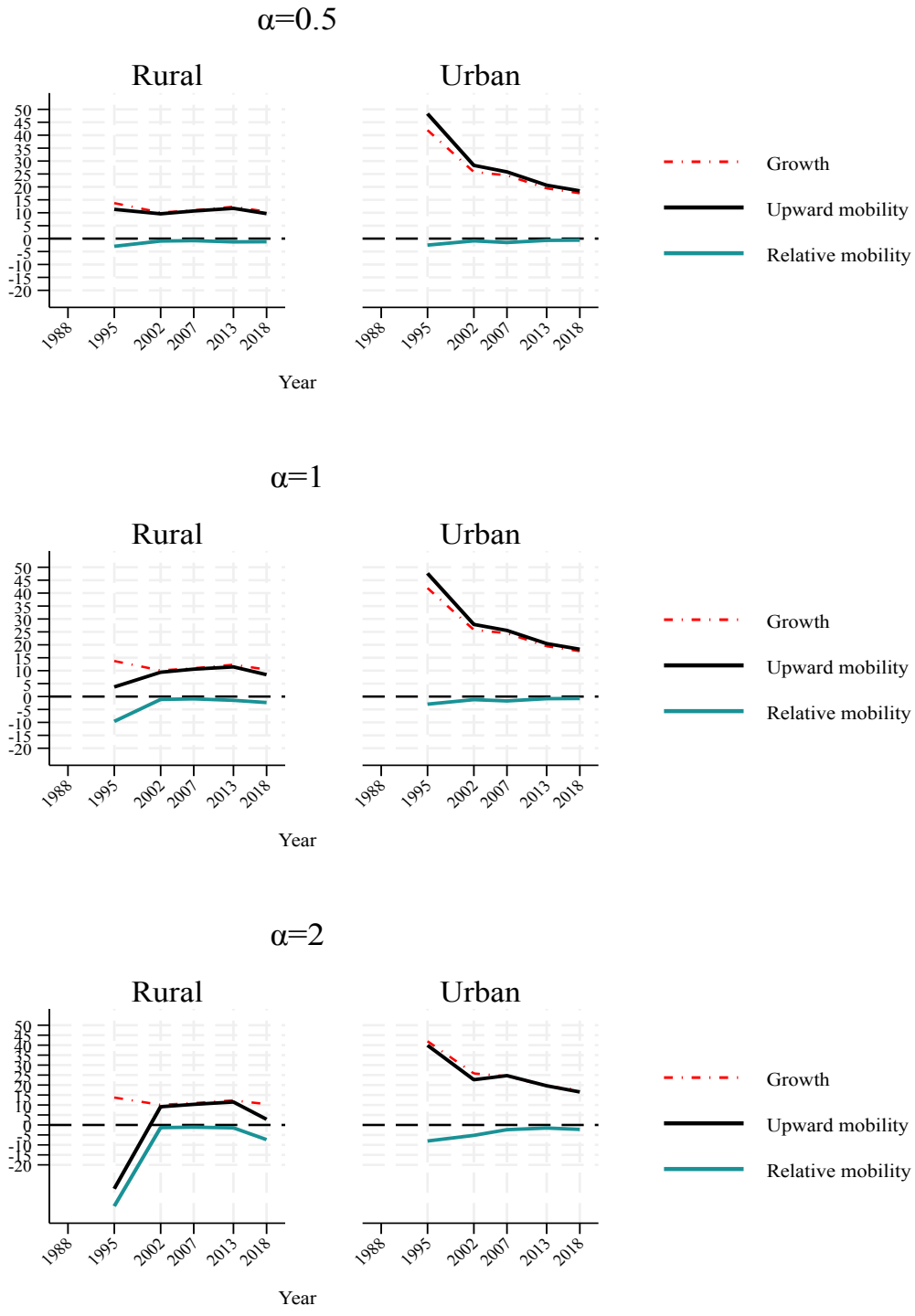
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Figure 5a. Rural-Urban Differences in Relative Mobility, 1988-2018



Note: The figure compares welfare-based upward mobility, average income growth, and relative mobility separately for rural. and urban households under alternative values of the inequality-aversion parameter (α = 0, 0.1, and 0.3). Using 1988 as the baseline year, upward mobility is measured using the Ray-Genicot index, average income growth is measured as the average annual income growth rate, and relative mobility is calculated as the difference between upward mobility and average income growth. Larger values of α place greater weight on lower-income households.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Figure 5b. Rural-Urban Differences in Relative Mobility, 1988-2018



Note: The figure compares welfare-based upward mobility, average income growth, and relative mobility separately for rural and urban households under alternative values of the inequality-aversion parameter (α = 0.5, 1, and 2). Using 1988 as the baseline year, upward mobility is measured using the Ray–Genicot index, average income growth is measured as the average annual income growth rate, and relative mobility is calculated as the difference between upward mobility and average income growth. Larger values of α place greater weight on lower-income households.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

4.3 Inclusive Mobility: A Comparison with Absolute Mobility

Figure 6 compares income growth, upward mobility, and AM-Berman absolute mobility in China between 1988 and 2018 under alternative values of the inequality-aversion parameter α. Several key findings emerge. First, the trend of upward mobility is basically consistent with the development process of income growth. Both the series are at their maximum level in the beginning period of the reforms and decrease thereafter. Under relatively small levels of α, the series of upward mobility remains close to, and in some cases even slightly higher than, the income growth rate in the 1990s and early 2000s, while the difference becomes smaller in the latter period. Such trends indicate that China's upward mobility has been highly related to aggregate income growth, and the effect of income growth on upward mobility has decreased during the process of economic reforms.

Second, the dependency of upward mobility on α shows that the mobility score becomes unfavorable when more weight is put on lower income households. The higher the value of α, the more weight is placed on the lower tail of the income distribution, which makes the measure more sensitive to the income changes of lower-income individuals. At moderately high values of α, the entire time series continues to show reasonable stability, except for the fact that the value of upward mobility remains somewhat lower. However, at $\alpha = 2$, the volatility of the time series increases quite significantly, and upward mobility shows a negative trend from 1995 and then decreases sharply in 2018. These findings indicate that the households that belonged to the lowest economic strata did not gain from economic growth as much as other groups and were less mobile than average data on mobility might have indicated.

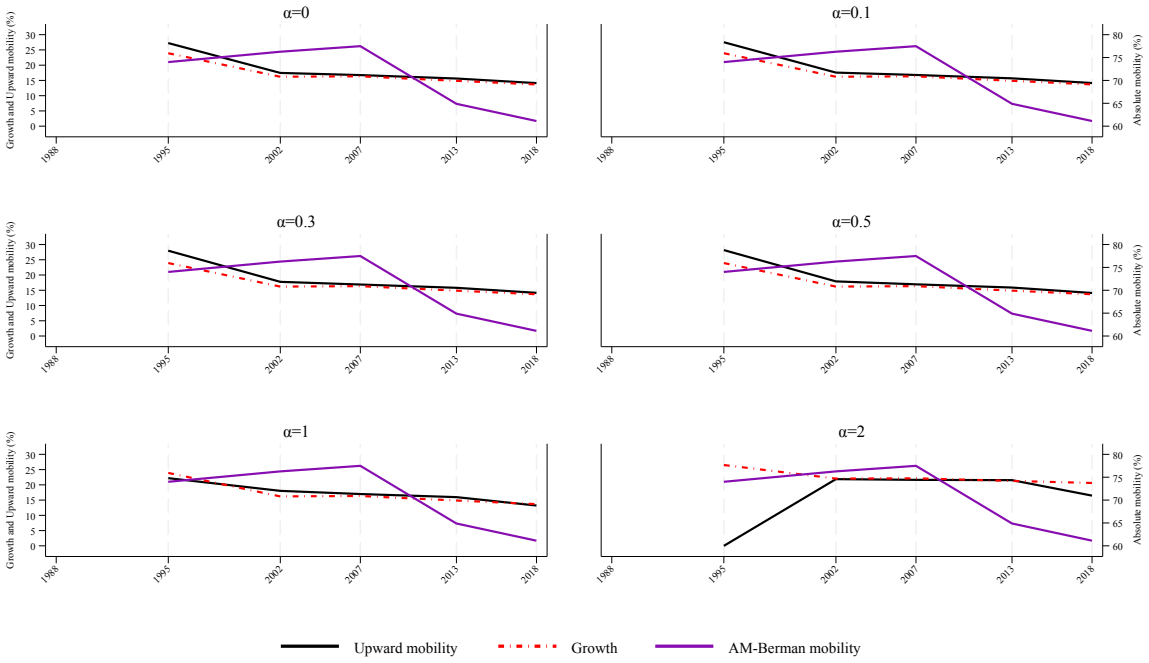
Third, AM-Berman absolute mobility follows a distinct path and reflects a unique dimension of mobility. Unlike upward mobility, which is a function of the welfare approach that emphasizes distribution, AM-Berman mobility can be defined as the likelihood of earning more than one's parents and therefore is independent of α. In addition, the version applied in this analysis captures mobility for individuals from the bottom half of the income distribution instead of the lowest-income tail. This matters significantly for the interpretation of the results. In spite of the rapid decrease in upward mobility for higher values of α indicating the disadvantaged situation of the lowest income households, the fall in AM-Berman mobility in the post-2007 period implies that it was not only the lowest income households but also the bottom half of the income distribution whose mobility was weakened.

Finally, the AM-Berman series provides an interesting trend that is different from that of growth and upward mobility. Absolute mobility increases marginally from roughly 74 percent in 1995 to around 77 percent in 2007, but thereafter falls sharply to around 65 percent in 2013 and 61 percent in 2018. The inverted-U curve suggests that while economic growth in the initial phase of reform created an increasing probability of children exceeding the parents' income, this was greatly reduced during the later phase of the reform era. In other words, economic growth did not imply increasing chances of movement upwards in absolute terms for those at the bottom of the income distribution.

Therefore, figure 6 captures two complementary perspectives on China's mobility experience. First, the way upward mobility moves with high values of α indicates that benefits of growth did not accrue equally

and the lowest income households gained relatively less when distribution is considered. However, the fact that mobility for the AM-Berman group declined indicates that the weakening of mobility opportunities was not confined to the lowest income tail of the distribution, but rather included a wider section of the lower half of the income distribution. In this way, the comparison reveals that China's slowdown in mobility in the latter part of its reforms may have been due to both declining aggregate mobility and the increasing difficulty of disadvantaged groups in translating growth into intergenerational mobility.

Figure 6. Upward mobility, Income Growth and AM-Berman Absolute Mobility in China, 1988-2018



Note: The figure contrasts the rates of upward mobility on the basis of welfare criteria, average income growth rates, and AM-Berman measures of absolute mobility for various levels of the inequality aversion coefficient (α = 0, 0.1, 0.3, 0.5, 1, and 2). The baseline year taken into consideration is 1988, when upward mobility was calculated with the help of Ray-Genicot index. Absolute mobility (AM-Berman) is measured by the probability of child's income exceeding parent's income in the bottom half of the income distribution of parents and is shown on the right axis. Contrary to the Ray-Genicot measure, AM-Berman absolute mobility is independent of the value of α. The higher the value of α, the more emphasis is placed on lower-income families in the Ray-Genicot measure.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

4.4 The Great Gatsby Curve

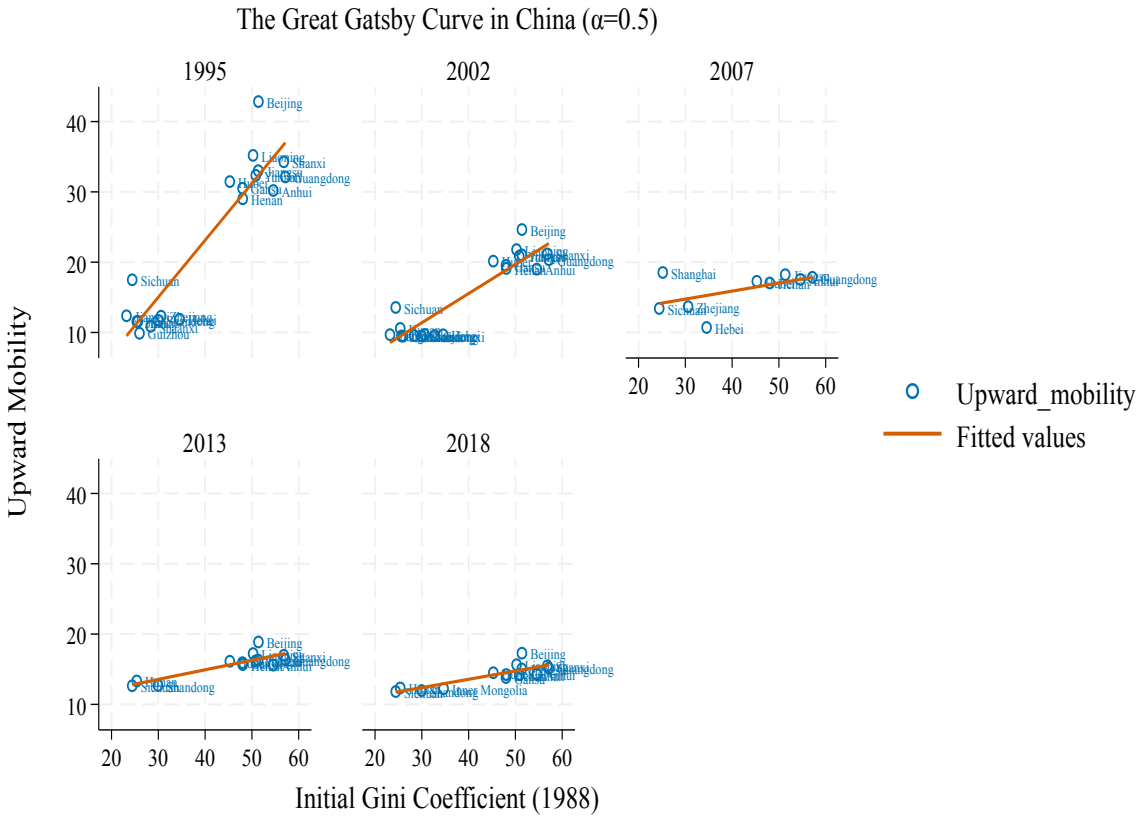
Figures 7a and 7b examine the relationship between initial inequality and upward mobility across Chinese provinces. Figure 7a plots provincial upward mobility ($\mu_{0.5}$) against the provincial Gini coefficient in 1988, while Figure 7b reports the estimated coefficient of initial inequality from separate cross-sectional regressions for each survey year. The results suggest a generally positive association between initial inequality and subsequent upward mobility across provinces. However, this positive association weakened substantially

over time: the estimated coefficient declined from 0.81 in 1995 to 0.42 in 2002, and remained at a much lower level after 2007. The implication is that inequality at the beginning had a positive relationship with social mobility in the early stages of reforms, but its importance became lower with the development process becoming mature.

Figure 8a and Figure 8b move on to examine the link between contemporary inequality and upward mobility. Unlike the case of initial inequality, the association in terms of contemporaneous inequality appears considerably unstable. The estimated coefficient is negative in 1995, then positive in 2002, almost zero in 2007, and negative in 2013 and 2018. This development suggests that the association between contemporary inequality and mobility is highly time-dependent in China instead of being monotonic. On the contrary, in the latter period, this association turns to be increasingly negative in the sense that more contemporary inequality implies less upward mobility in provinces with higher contemporaneous inequality.

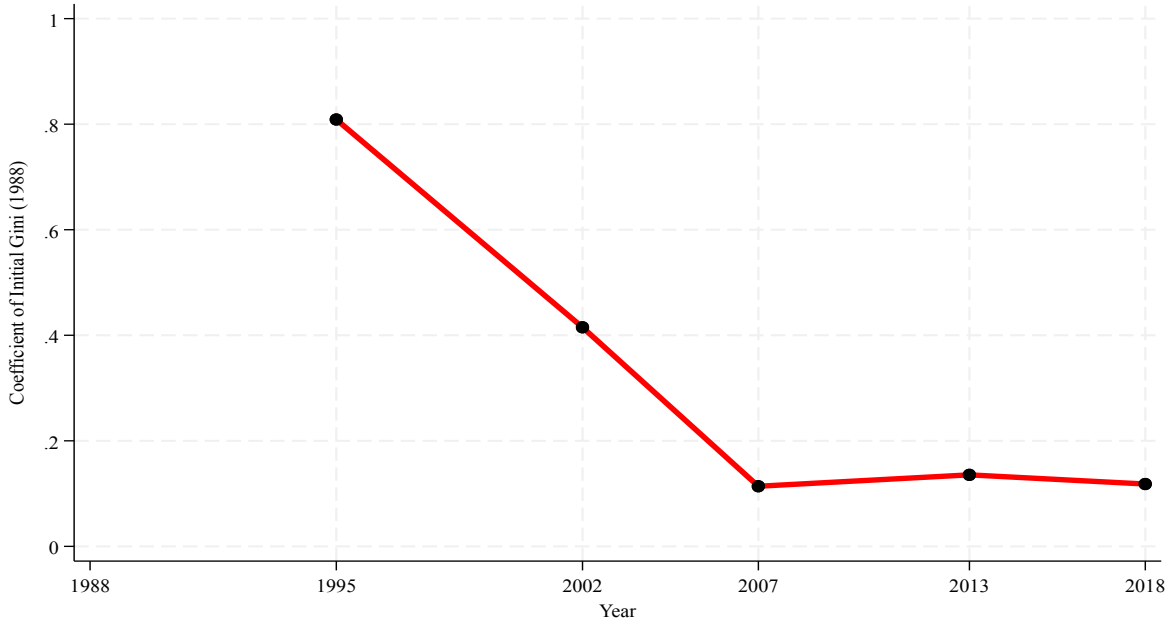
Therefore, the results point to an important distinction between historical inequality and current inequality. Initial inequality in 1988 appears to be positively associated with subsequent upward mobility, especially during the early stage of reform, possibly reflecting the role of market expansion and regional catch-up.

Figure 7a. The Great Gatsby Curve in China: Initial Inequality and Upward Mobility



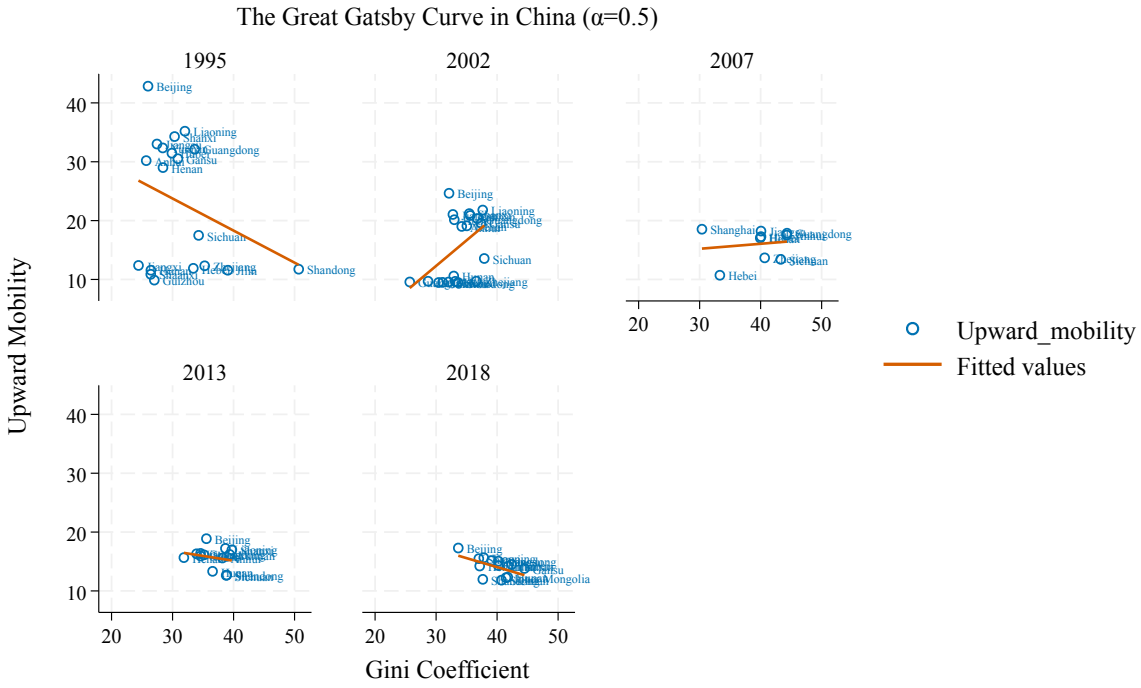
Notes: The figure plots provincial upward mobility against the provincial Gini coefficient in 1988. Each point represents a. province. The fitted line is obtained from an OLS regression. Upward mobility is calculated using the generalized mobility index with α = 0.5.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Figure 7b. Evolution of the Great Gatsby Curve Coefficient in China



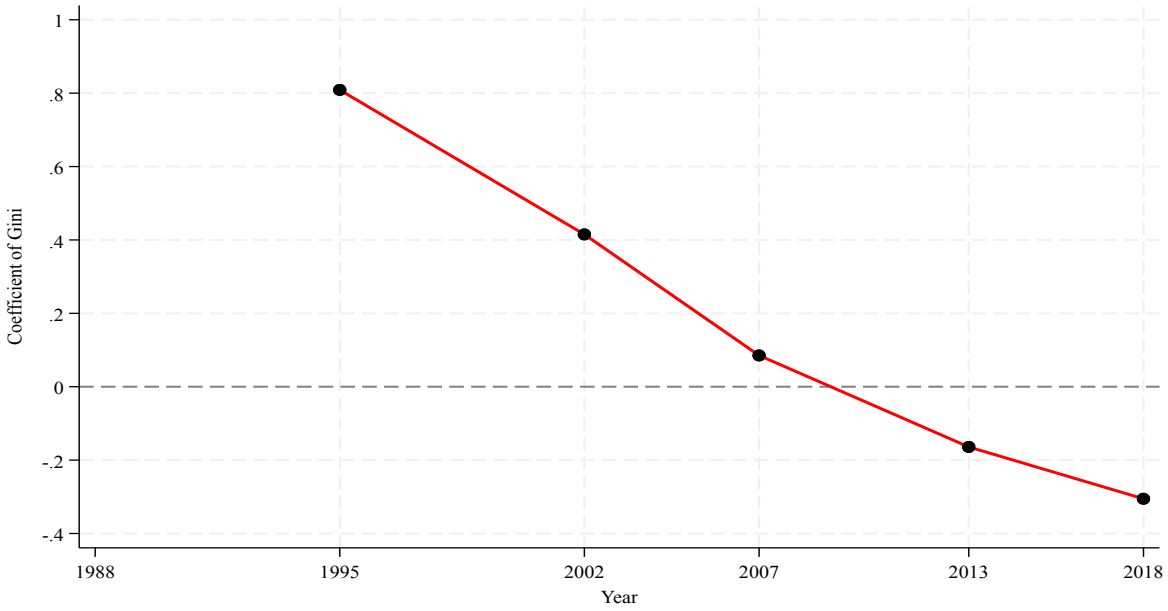
Notes: The figure plots the estimated coefficient from province-level regressions of upward mobility ($\mu_{0.5}$) on the initial. provincial Gini coefficient in 1988. A larger coefficient indicates a stronger negative association between inequality and mobility.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Figure 8a. The Great Gatsby Curve: Contemporaneous Inequality and Upward Mobility in China



Notes: Each point represents a province. The horizontal axis reports the provincial Gini coefficient in the corresponding year, while the vertical axis reports provincial upward mobility. The solid line shows the fitted linear relationship between inequality and upward mobility.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Figure 8b. Evolution of the Great Gatsby Curve in China, 1995-2018



Notes: The figure plots the estimated coefficient on the provincial Gini coefficient from separate cross-sectional regressions of. upward mobility ($\mu_{0.5}$) on inequality for each year. A positive coefficient indicates that provinces with higher inequality exhibited greater upward mobility, while a negative coefficient indicates the opposite.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

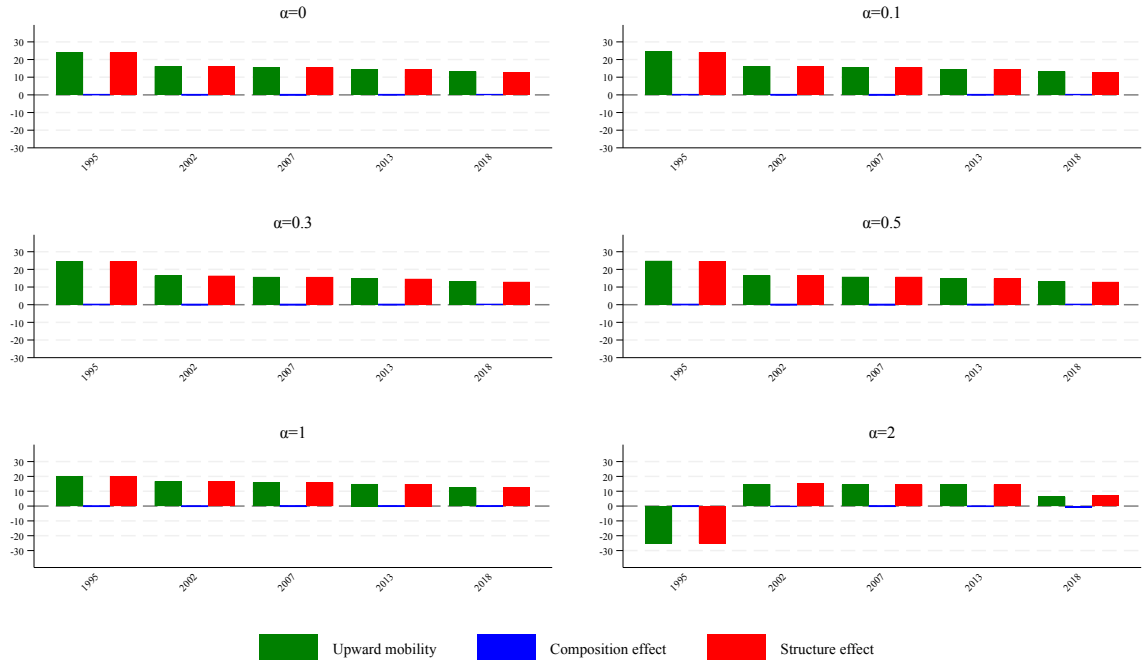
By contrast, contemporaneous inequality does not show a stable positive relationship with mobility and, in recent years, the relationship has become more consistent with the conventional Great Gatsby pattern, where higher inequality is associated with lower mobility. Overall, the findings suggest that the relationship between inequality and mobility in China has changed across development stages, with the mobility-enhancing role of early regional disparities gradually giving way to the mobility-constraining effects of persistent inequality.

4.5 Aggregate Decomposition of Upward Mobility

Figure 9 reports the aggregate decomposition of upward mobility in China between 1988 and 2018 under alternative values of the inequality-aversion parameter α. Upward mobility is decomposed into a composition effect, which reflects changes in the distribution of observed household characteristics, and a structure effect, which captures the remaining component associated with changes in the income-generating process. Several conclusions can be drawn from the findings. Firstly, the findings reveal that upward mobility is attributed almost entirely to the structure effect, while the contribution of the composition effect is extremely small. With moderate values of α, the composition effect is almost zero in all comparison years, accounting for only an insignificant fraction of total upward mobility. However, by contrast, the structure effect can consistently account for nearly all the mobility. For instance, in cases where $\alpha = 0$, the structure effect explains 98.9% of upward mobility in 1995, 99.5% in 2002, 99.9% in 2007, and 97.2% in 2018. Similar results have been found in instances where α=0.1, 0.3, and 0.5. This analysis suggests that upward social mobility in China has

developed mainly due to changes in structure as opposed to changes in composition of families.

Figure 9. Aggregate Decomposition of Upward Mobility in China under Alternative Values of the Inequality-Aversion Parameter α, 1988-2018



Notes: Upward mobility is decomposed into a composition effect and a structure effect using a reweighting-based aggregate. decomposition. The composition effect captures the part of mobility changes attributable to shifts in the distribution of observed household characteristics, including education, age, gender, hukou status, and province. The structure effect captures the remaining part associated with changes in the income-generating process, holding the distribution of observed characteristics constant. All mobility measures are calculated relative to the 1988 cohort, which serves as the baseline year. Larger values of α place greater weight on lower-income households.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Second, the contribution of the composition effect becomes even weaker as α increases. As larger values of α place greater weight on lower-income households, the composition effect declines further and, in some cases, becomes negative. For α = 1, the composition effect is slightly negative in several years, while for α = 2 it becomes negative in most comparison years and reaches a particularly large negative value in 2018. Such a pattern implies that the changes in the observable features of the household did not enhance mobility among the lower-income groups but rather had a slight effect on reducing it. On the other hand, the structure effect is still positive and explains more than 100 percent of total mobility upward in some high-α settings, suggesting that structural effects more than compensate for the negative effect of compositional change.

Third, the findings from the decomposition analysis support the understanding of the previous mobility patterns. Figures 3 and 4 showed that relative mobility declined when greater weight was assigned to lower-income households, while Figure 5 indicated that the decline in mobility over time could not be understood solely in terms of absolute mobility trends. Figure 6 adds an important dimension to this evidence by showing

that the observed changes in upward mobility were not mainly driven by shifts in the demographic or socioeconomic composition of the population. Rather, they were associated much more strongly with structural changes in the broader income-generating environment.

Overall, Figure 9 suggests that the rise and subsequent slowdown of upward mobility in China were shaped primarily by structural effects rather than by composition effects. Changes in observed household characteristics contributed very little to aggregate mobility, and their role became even smaller when attention shifted toward the lower tail of the income distribution. Taken together, these findings imply that the evolution of mobility in reform-era China was driven mainly by structural economic forces, while lower-income households benefited less from compositional change than the population as a whole.

4.6 Detailed Decomposition of Upward Mobility

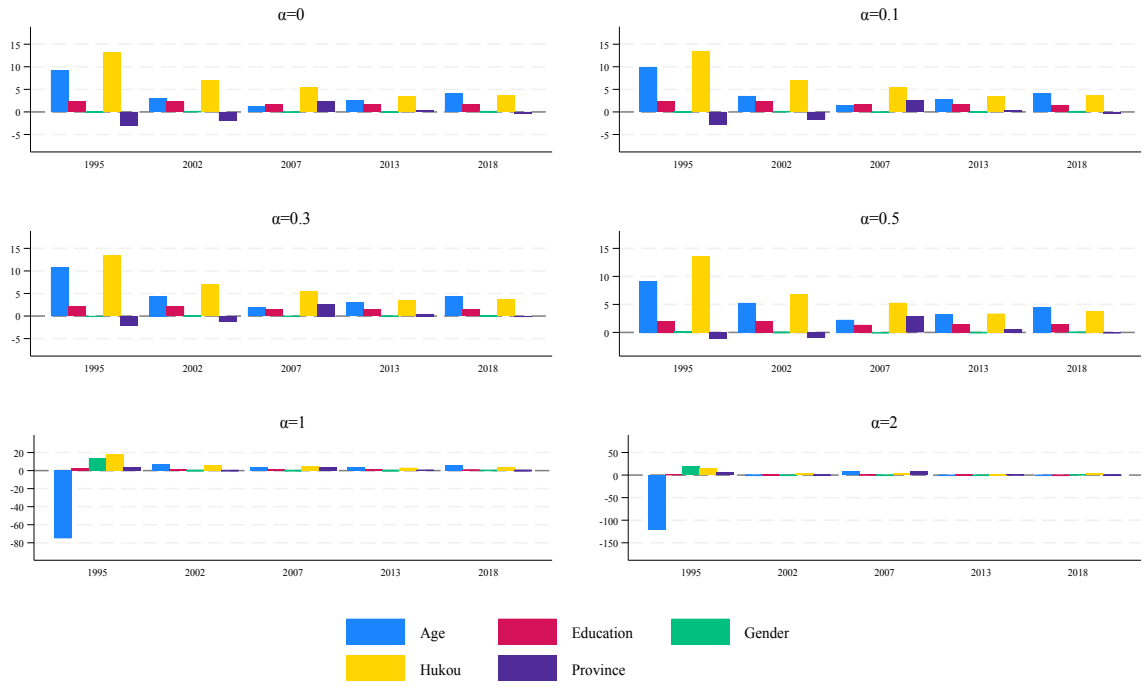
Figures 10 and 11 extend the aggregate decomposition reported in Figure 9 by examining the sources of upward mobility in significant detail. Figure 10 presents the detailed decomposition of upward mobility into the contributions of age, education, gender, hukou status, province, and the constant term. Further, Figure 11 aggregates these detailed results into composition and structure effects, thus providing a consistency check against the reweighting-based aggregate decomposition reported in Figure 9. Therefore, the two figures highlight a common pattern. Upward mobility declined over time for low and moderate values of the inequality-aversion parameter α, falling from roughly 25-30 percent in the mid-1990s to around 13-18 percent by 2018, while the decline was much sharper when greater weight was placed on lower-income individuals. From the aggregate decomposition in Figure 11, it can be realized that structure effect contributes to an overwhelming majority of upward mobility for all years and all values of α, while the composition effect stays close to zero all along. As seen from Figure 10 below, this effect of structure dominance is mainly caused by hukou and age, with education being less important and gender having little influence.

From the set of detailed factors, the hukou system and age stand out as the key determinants of upward mobility despite their different natures in terms of stability and orientation. The hukou system is the most stable positive determinant in both years and across all values of α. When $\alpha = 0$, the overall impact of hukou is 13.21 percentage points in 1995, still significant at 6.97 in 2002 and 5.49 in 2007, and remains positive at 3.36 and 3.63 in 2013 and 2018, respectively. An almost identical trend emerges when using α=0.1, 0.3, and 0.5, and the impact of hukou still remains positive when α=1 and 2, but magnitude becomes smaller. The implication from this is that the changes in institutions linked to the rural urban dichotomy and redistribution of opportunities among hukou groups played a critical role in mobility growth during the reform period. By contrast, the age factor is large but highly dependent on the value chosen for α. With $\alpha \leq 0.5$, age plays a positive role in each year and can also be considered quantitatively important for some of the years, especially in 1995 and 2018. Once higher weight is given to the left tail of the income distribution, the age component becomes highly unstable. In 1995, it takes a value of -75.08 with α =1 and even -120.21 with α =2 before becoming positive or moderately negative for later years. The implication is that the mobility experience of lower income people during the early reform era was particularly susceptible to structural influences related

to age.

Education, gender, and province play more limited and less systematic roles. Positive contribution of education can be seen in almost all years and almost all values of α, although it is quite small compared with hukou and age. Usually, the education coefficient is between around 1 and 2.5 percentage points, which means that there was some effect from better education or higher educational returns on upward social mobility. On the other hand, gender is quantitatively insignificant in most cases. The contribution of gender is almost zero, whether positive or negative, suggesting that differences in gender did not form an important source of changes in overall mobility over time. The provincial variable is relatively more significant compared to gender but remains less significant and more unstable compared to hukou and age. At smaller values of α, there is a negative contribution by province in some years such as 1995 and 2002 but a positive contribution in others such as 2007 and 2013. In other words, regional differences acted to reduce mobility gains in some periods and enhance mobility gains in others. In light of all these findings, it can be concluded that the increase in upward mobility and its stabilization in China has been influenced by institutional factors and demographics greater than education, gender ratios, or provincial population size.

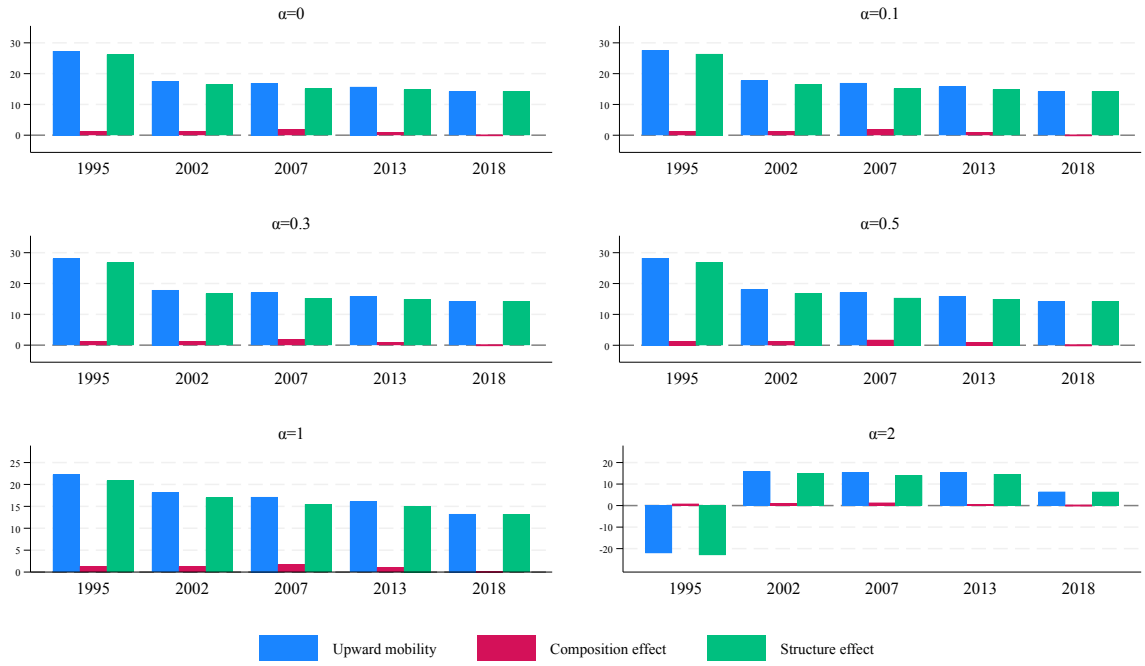
Figure 10. Detailed Decomposition of Upward Mobility by Source Over Time Across Inequality-Aversion. Parameter α, 1988-2018



Notes: The figure reports the dynamic detailed decomposition of upward mobility across inequality-aversion parameters α = 0, 0.1, 0.3, 0.5, 1, and 2. For each value of α, the total contribution of each source, including age, education, gender, hukou status, and province, to upward mobility is shown for each target year relative to the 1988 baseline. Upward mobility is expressed in annualized percentage terms, and each bar represents the contribution of a given factor to the overall mobility change in the corresponding year. The reported total effects combine both composition effects (changes in the distribution of characteristics)

Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Figure 11. RIF-Based Aggregate Decomposition of Upward Mobility Across Inequality-Aversion Parameters, 1988-2018



Note: The figure presents the aggregate composition and structure effects obtained by summing the corresponding components from the RIF-based detailed decomposition. Each panel corresponds to one value of the inequality-aversion parameter α. The figure provides a consistency check against the reweighting-based aggregate decomposition reported in Figure 9. Upward mobility is measured in annualized percentage terms. Larger values of α place greater weight on lower-income households.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Another aspect that requires mention is the sensitivity of the decomposition with respect to the inequality aversion parameter α. With low to moderate α values, the outcomes are quite robust: upward mobility persists positively, the structure effect dominates the overall decomposition, and hukou and age stand out as major detailed factors. As the value of α rises to 1 or 2, nevertheless, decomposition becomes significantly more volatile, especially during the initial years. This can be observed from the extreme negative age contribution in 1995 and also the relatively low degree of mobility at α=2. It needs to be emphasized that the age factor for 1995 takes on an exceptionally high negative value for α=1 or 2. However, since the values of α make a large difference in how much weight is placed on people at the lower end of the income distribution, the sensitivity of the decomposition is much higher due to the structural difference by age among the low-income observations in the first comparison year. This is why the exceptionally high values are treated as tail sensitivity for the high-α specification and not a sign of changing the importance of age in determining the mobility trends. Notably, however, such instability is limited only to some particular estimates and does not affect the key conclusion that structural factors, notably hukou-based structural transformation, are overwhelmingly important for explaining the development of upward mobility. From a practical viewpoint, it means that while there were quite impressive instances of upward mobility in China during the period of

reforms, those were not equally distributed among the lower income segments of the population. Thus, the reasons of upward mobility become somewhat unstable when mobility is assessed with respect to the bottom sensitivity criterion.

5 Discussion

5.1 Implication for China's Development

The findings from this study have wider implications with regard to China's journey towards becoming a country characterized by high-quality development. In the last four decades, the outstanding success achieved by China economically has been largely measured by the high GDP growth rate, increases in the incomes of the people, and a record reduction in poverty levels. Although these accomplishments cannot be understated, the findings of this study clearly indicate that economic growth by itself is not adequate to measure the success of development efforts. With China currently entering a new phase of development, the more fundamental question is whether growth continues to create opportunities for social mobility over generations. Accordingly, development should be evaluated not only in terms of the level of wealth that is being generated, but also on the basis of how much growth creates opportunities for people from various family backgrounds.

What is more important, the findings indicate that the challenge which China faces in the future is not only how to maintain economic growth, but how to ensure that economic growth will be translated into upward social mobility across generations. While there have been remarkable increases in incomes in China since the reforms were introduced, the trend showing a reduction in welfare sensitive mobility with an increase in the value of the inequality-aversion parameter implies that the growth that has been experienced has become more unevenly distributed, especially amongst households at the lower part of the income scale. In other words, high rates of economic growth do not always guarantee the provision of equal opportunity for upward mobility. Therefore, for sustainable and inclusive development, it is essential to develop a policy to create more opportunities for upward mobility in addition to the generation of higher income.

These observations are also directly relevant to the common prosperity approach advocated by China. Common prosperity cannot be merely viewed as more equitable income distribution since it also involves more equitable opportunity distribution. If children from lower income families do not have equal access to quality education, services, and job opportunities, mere improvements in average income may not be sufficient for achieving intergenerational mobility. In this context, common prosperity does not only need to be considered as sharing of economic results, but also the sharing of possibilities of socioeconomic upward mobility. The mobility framework in terms of welfare that is used in this study is a useful instrument for assessing the inclusiveness of development.

Lastly, the decomposition findings have major policy implications in relation to the origins of upward mobility. The dominance of the structure effect suggests that the changes in the institutional and economic conditions of China have been more important than the composition changes of households. Additionally, the conclusion drawn from the observation that the composition effect becomes increasingly smaller, and

even negative when more weight is placed on low-income families, implies that changes in observable features such as educational attainment and composition have not been sufficient to enhance mobility among the lowest income members of society. The further decomposition provides additional evidence that hukou structure changes have the highest positive effect on upward social mobility, while education has a lower positive impact, and gender has little effect. This conclusion means that future policy makers need to put greater effort into institutional innovations that increase access to opportunities through hukou reform, equalizing public services, improving the quality and availability of education, and regional development balance.

5.2 Implication for Development Economics

In addition to what this research adds to our knowledge about China specifically, this research also provides valuable insights about development and intergenerational mobility in developing nations in general. In much of the development literature, the performance of an economy has usually been evaluated using metrics such as growth in GDP, reduction in poverty, and income equality. Though important, these measures can offer an incomplete perspective on whether economic development creates opportunities for future generations. Through the inclusion of a welfare-based indicator of social mobility, this paper posits that in addition to the creation of economic opportunities through growth, the success of economic development must also be measured through its ability to create opportunities for socioeconomic mobility across generations.

The case of China demonstrates that economic growth does not necessarily lead to higher levels of intergenerational mobility. Even though economic growth led to a rise in income levels and the decline in poverty, the welfare-weighted upward mobility measure indicates that the gains from growth were distributed even more unequally as greater weight was assigned to lower-income population. This indicates that economic growth and opportunities are two separate aspects of development that are however correlated. This means that development policies which concentrate mainly on raising incomes of people may not take into account the challenges that prevent low-income households to benefit from economic growth.

Such results have implications that extend beyond China and can be applied more broadly to numerous other developing nations, which are experiencing rapid structural changes. Similar to China, various developing nations have registered rapid economic growth along with increased inequality, urbanization, and institution building. The findings of this study imply that evaluation of development on the basis of economic growth alone may exaggerate the extent of social welfare gains when opportunities of mobility are not equally available to everyone. Therefore, the inclusion of welfare-related measures of upward mobility offers a more comprehensive approach to measure inclusiveness of economic growth.

In a more general sense, this research underscores the significance of shifting the policy of development towards the issue of opportunity creation rather than merely concentrating on income growth. While sustainable development involves the expansion of economic resources, it also involves ensuring that disadvantaged people are able to engage in economic change. In this respect, intergenerational mobility can be considered both as a product of development and an important sign of its social sustainability.

6 Conclusion

China has witnessed rapid periods of growth over the last four decades. However, an important challenge in this regard is whether this unprecedented growth has been accompanied by intergenerational upward mobility. This paper aimed to address the issue by analyzing data from the China Household Income Project (CHIP) household surveys covering the period between 1988 and 2018. Extending the concept of upward mobility by Ray and Genicot (2023), this paper assesses intergenerational upward mobility from the point of view of social welfare and introduces inequality aversion into the measurement of mobility. As opposed to traditional metrics that consider only the increase in income levels and income ranks separately, this approach considers the extent to which the benefits of economic growth have been shared by people across the income distribution. In order to conduct a more robust analysis, this paper also compares the upward mobility of the Ray-Genicot measure with relative mobility and AM-Berman measure of absolute mobility. Determinants of upward mobility are also analyzed in the aggregate and decompositions approaches.

Various key findings have emerged from the empirical analysis. Firstly, there was an increase in upward intergenerational mobility during the reform period of China due to the significant improvement in people's lives due to rapid economic development. Nevertheless, the rate of improvement slowed down considerably after the early 2000s. Second, despite the continuous increase in income per capita, relative mobility was consistently low and often even negative, indicating that higher mobility came mainly from general economic growth rather than greater equal opportunity for all incomes. Thirdly, upward mobility decreased systematically due to higher importance of lower income groups, meaning that the gains from economic development were not evenly shared, and the lower income families benefited much lower than the average population. This was consistent with the Great Gatsby Curve where the more unequal a province is in terms of income distribution, the lower its level of upward mobility, while wide rural-urban gaps existed throughout the sample.

The decomposition analysis provides more information on how these trends are achieved. Aggregate decomposition reveals that the development of upward mobility was mostly driven by the structure effect, whereas the composition effect of household characteristics changed little during the reform era. In any case, the importance of the composition effect became increasingly less, and even turned negative in some instances, as the value of the inequality aversion parameter increased. This means that changes in the household observable characteristics such as educational attainment and demographic composition did not enhance the upward mobility of lower income households. In other words, even though the household's attributes were gradually improving, these improvements failed to make up for the growing inequality in terms of economic opportunities.

The analysis shows in detail which factors cause these structural shifts. In comparison to all other explanatory variables, hukou status proved to be the most significant factor for upward social mobility, and age was the second most significant source of variation. Education, on the contrary, has been found to be positively, although much less significantly, contributing to upward mobility, while gender had a small effect and regional effects were rather insignificant. The continuing significance of the hukou shows the critical

importance of institution reform in relation to the urban-rural transition in China. On the other hand, the growing sensitivity to the age dimension for larger values of the inequality aversion parameter implies that social mobility for lower income households became increasingly heterogeneous. From these results, it can be concluded that the development of upward mobility in China has been mainly due to changes in institutions and structures and not due to better household features alone.

In summary, from the findings, rapid economic development appears to be an important but insufficient factor in ensuring intergenerational mobility. Although the economic transition in China led to improved living standards, the existence of unequal intergenerational mobility implies that the future course of development in China needs to pay greater attention to opportunity. From this standpoint, realizing high-quality development and common prosperity means maintaining high economic growth and it also entails institutions which ensure that advantages of such economic growth are widely distributed across generations.

In a broader perspective, this research implies that the effectiveness of development is measured by economic growth, alleviation of poverty, or income disparity, as well as through the level of growth that provides opportunities to the future generation. The experience of China shows that even though a country has rapidly-growing economies, it may not always promote social inclusiveness in the case of intergenerational mobility. This paper utilizes a welfare approach to assess upward mobility along with decomposition to provide a way of determining whether an economy is both successful and socially inclusive.

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Appendix

Table A1. Descriptive Statistics

	Mean	SD	p25	Median	p75	N
income	38518.49	59251.71	5177	16945	50000	174742
educ	8.51	3.85	6	9	11	170391
age	42.05	10.46	33	40	51	174742
female	.5	.5	0	0	1	174742
hukou	.42	.49	0	0	1	174742

Notes: The table reports descriptive statistics for the pooled sample from the China Household Income Project (CHIP) covering. the survey waves from 1988 to 2018. Household income is measured as annual household income (RMB). Female is a dummy variable equal to one for women and zero for men. Hukou is a dummy variable equal to one for rural hukou and zero for urban hukou. Education is measured in years of schooling, and age is measured in years.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Table A2. Absolute Upward Mobility in China, 1988-2018.

year	0	0.1	0.3	0.5	1	2
1988	-0.498	-0.497	-0.496	-0.493	-0.483	-0.459
1995	-0.451	-0.450	-0.446	-0.440	-0.417	-0.334
2002	-0.100	-0.095	-0.084	-0.072	-0.031	0.087
2007	0.252	0.250	0.246	0.242	0.242	0.282
2013	-0.024	0.934	0.473	0.377	0.291	0.188
2018	0.325	0.330	0.343	0.356	0.396	0.491

Note: The table reports the Chetty-style benchmark measure of absolute upward mobility for China over the period 1988–2018. under alternative values of the inequality-aversion parameter ($\alpha = 0, 0.1, 0.3, 0.5, 1,$ and 2). The benchmark is constructed using 1988 as the base year. To facilitate comparison with the welfare-based mobility framework, the benchmark is reported under alternative values of α. Larger values of α place greater weight on lower-income households.
Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Table A3. Rural-Urban Differences in Absolute Upward Mobility, 1988-2018

year	group	0	0.1	0.3	0.5	1	2
1988	Rural	-0.450	-0.449	-0.449	-0.449	-0.451	-0.465
1988	Urban	-0.746	-0.743	-0.732	-0.719	-0.679	-0.589
1995	Rural	-0.364	-0.357	-0.344	-0.332	-0.302	-0.262
1995	Urban	-0.805	1.277	0.136	-0.091	-0.250	-0.253
2002	Rural	-0.139	-0.134	-0.125	-0.115	-0.092	-0.076
2002	Urban	-0.075	-0.070	-0.059	-0.045	0.001	0.158
2007	Rural	-0.027	-0.028	-0.030	-0.032	-0.040	-0.083
2007	Urban	-0.246	2.676	1.272	0.992	0.789	0.732
2013	Rural	0.035	0.615	0.348	0.301	0.279	0.265
2013	Urban	-0.269	1.971	0.902	0.687	0.503	0.272
2018	Rural	0.267	0.273	0.291	0.317	0.432	0.859

2018	Urban	0.347	0.352	0.365	0.377	0.410	0.477

Note: The table reports the Chetty-style benchmark measure of absolute upward mobility separately for rural and urban. households in China over the period 1988–2018. The benchmark is constructed using 1988 as the base year and is reported under alternative values of the inequality-aversion parameter (α = 0, 0.1, 0.3, 0.5, 1, and 2) to facilitate comparison with the welfare-based mobility framework. Larger values of α place greater weight on lower-income households.

Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Table A4. Growth, Upward mobility and Relative Mobility in China, 1988-2018

Comparison year	α	Growth	Upward mobility	Relative mobility
1995	0	23.925	27.254	0.177
2002	0	16.210	17.461	-0.116
2007	0	16.352	16.754	-0.859
2013	0	14.877	15.632	-0.352
2018	0	13.694	14.130	-0.476
1995	0.1	23.925	27.526	0.391
2002	0.1	16.210	17.569	-0.024
2007	0.1	16.352	16.798	-0.821
2013	0.1	14.877	15.696	-0.297
2018	0.1	13.694	14.152	-0.457
1995	0.3	23.925	27.976	0.746
2002	0.3	16.210	17.764	0.142
2007	0.3	16.352	16.882	-0.750
2013	0.3	14.877	15.810	-0.199
2018	0.3	13.694	14.166	-0.445
1995	0.5	23.925	28.180	0.906
2002	0.5	16.210	17.921	0.275
2007	0.5	16.352	16.953	-0.690
2013	0.5	14.877	15.900	-0.121
2018	0.5	13.694	14.117	-0.488
1995	1	23.925	22.204	-3.799
2002	1	16.210	18.036	0.372
2007	1	16.352	16.991	-0.658
2013	1	14.877	15.979	-0.053
2018	1	13.694	13.222	-1.268
1995	2	23.925	-22.105	-38.679
2002	2	16.210	15.883	-1.458
2007	2	16.352	15.478	-1.942
2013	2	14.877	15.302	-0.636

2018	2	13.694	6.498	-7.132

Notes: all mobility measures are calculated relative to the 1988 cohort, which serves as the baseline year. Growth denotes the. annualized growth rate in mean income. Upward mobility and relative mobility are computed under alternative values of the inequality-aversion parameter α.

Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

Table A5. Rural-Urban Differences in Growth, Upward Mobility and Relative Mobility, 1988-2018

Comparison year	hukou	α	growth	Upward mobility	Relative mobility
1995	Rural	0	13.750	13.750	-0.863
2002	Rural	0	10.092	10.092	-0.476
2007	Rural	0	10.953	10.953	-0.558
2013	Rural	0	12.331	12.331	-0.701
2018	Rural	0	10.446	10.446	-0.509
1995	Urban	0	41.966	41.966	-6.690
2002	Urban	0	25.813	25.813	-2.810
2007	Urban	0	24.468	24.468	-2.547
2013	Urban	0	19.456	19.456	-1.664
2018	Urban	0	17.549	17.549	-1.371
1995	Rural	0.1	13.750	12.238	-2.181
2002	Rural	0.1	10.092	9.724	-0.809
2007	Rural	0.1	10.953	10.770	-0.722
2013	Rural	0.1	12.331	11.890	-1.090
2018	Rural	0.1	10.446	10.023	-0.890
1995	Urban	0.1	41.966	48.128	-2.640
2002	Urban	0.1	25.813	28.338	-0.860
2007	Urban	0.1	24.468	25.900	-1.426
2013	Urban	0.1	19.456	20.672	-0.663
2018	Urban	0.1	17.549	18.504	-0.569
1995	Rural	0.3	13.750	11.877	-2.495
2002	Rural	0.3	10.092	9.658	-0.869
2007	Rural	0.3	10.953	10.737	-0.751
2013	Rural	0.3	12.331	11.801	-1.169
2018	Rural	0.3	10.446	9.887	-1.012
1995	Urban	0.3	41.966	48.305	-2.524
2002	Urban	0.3	25.813	28.373	-0.833
2007	Urban	0.3	24.468	25.874	-1.446
2013	Urban	0.3	19.456	20.676	-0.659
2018	Urban	0.3	17.549	18.502	-0.572
1995	Rural	0.5	13.750	11.329	-2.973

2002	Rural	0.5	10.092	9.590	-0.930
2007	Rural	0.5	10.953	10.702	-0.783
2013	Rural	0.5	12.331	11.709	-1.251
2018	Rural	0.5	10.446	9.691	-1.189
1995	Urban	0.5	41.966	48.334	-2.505
2002	Urban	0.5	25.813	28.342	-0.857
2007	Urban	0.5	24.468	25.816	-1.492
2013	Urban	0.5	19.456	20.651	-0.680
2018	Urban	0.5	17.549	18.474	-0.595
1995	Rural	1	13.750	3.704	-9.619
2002	Rural	1	10.092	9.391	-1.110
2007	Rural	1	10.953	10.593	-0.881
2013	Rural	1	12.331	11.472	-1.460
2018	Rural	1	10.446	8.451	-2.307
1995	Urban	1	41.966	47.656	-2.950
2002	Urban	1	25.813	27.892	-1.205
2007	Urban	1	24.468	25.564	-1.689
2013	Urban	1	19.456	20.478	-0.823
2018	Urban	1	17.549	18.287	-0.752
1995	Rural	2	13.750	-31.951	-40.693
2002	Rural	2	10.092	9.135	-1.342
2007	Rural	2	10.953	10.328	-1.118
2013	Rural	2	12.331	11.501	-1.435
2018	Rural	2	10.446	2.847	-7.354
1995	Urban	2	41.966	39.928	-8.029
2002	Urban	2	25.813	22.685	-5.227
2007	Urban	2	24.468	24.723	-2.347
2013	Urban	2	19.456	19.628	-1.522
2018	Urban	2	17.549	16.551	-2.208

Notes: all mobility measures are calculated relative to the 1988 cohort, which serves as the baseline year. Growth denotes the. annualized growth rate in mean income. Rural and urban groups are defined by hukou status. Upward mobility and relative mobility are computed under alternative values of the inequality-aversion parameter α.

Sources: Calculated Based on the Chinese Household Income Project (CHIP) in 1988-2018.

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