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## GROUP-SPECIFIC REDISTRIBUTION, INEQUALITY, AND SUBJECTIVE WELL-BEING IN CHINA

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Using survey data from the China Family Panel Studies (CFPS) from 2010 to 2018, this paper analyzes the relationship between income inequality, group-specific income redistribution, and subjective well-being among China's urban, rural, and migrant populations. Income redistribution significantly reduces the within-group inequality for urban residents while widening the income gap among urban residents, rural residents, and migrants. Using narrowly defined reference groups, our findings indicate that there is no significant correlation of within-group inequality and subjective well-being of the respective group members. By contrast, the increased income gap between urban and rural residents is positively correlated with the rural residents' subjective well-being. More importantly, the group-specific redistribution inherent in the *Hukou* system that widens the income gap between urban residents and both migrants and rural residents makes both the aforementioned worse off. The existing *Hukou* system thus bars the way to implement the concept of “*common prosperity*” of the Chinese government that aims to foster a more balanced and sustainable development.

**JEL Codes:** D31, D63, I31

**Keywords:** income inequality, income redistribution, subjective well-being

### 1. INTRODUCTION

China has been the world's fastest-growing economy over the last decades, the impressive transition of the Chinese economy, however, came along with increasing inequality, making China one of the most unequal countries nowadays (Jain-Chandra et al., 2018; Xun, 2015). The official Gini coefficient of individual per capita disposable income has grown from 0.29 in 1980 to 0.47 in 2021. One

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of the reasons is the persistently large income disparity between the people who, according to China's household registration (*Hukou*) system, are registered as urban or rural residents, irrespective of where they work and live. In 2021, the average disposable income of registered urban residents was 2.5 times higher than the average disposable income of registered rural residents, including the workers who migrated from rural areas to urban areas.<sup>1</sup>

When starting economic reforms in 1978, the government initially pursued a strategy of letting some people and regions get rich first, hoping that those persons and regions with faster economic development would promote the progress of persons and regions with slower development (see He, 2014). With the adoption of the “*harmonious society*” development strategy in 2003, the government changed its development strategy and attaches greater importance to not leaving the poor too far behind and reducing income inequality across different groups and regions (Geis & Holt, 2009; Zheng & Tok, 2007). Since the 11th Five-Year Plan in 2006, the concept of “*common prosperity*” has become the government's guiding principle in economic development. This principle highlights the significance of balanced and sustainable development, as well as increasing investment in rural and undeveloped areas and the reduction of regional inequalities.

A series of policies were launched to reduce income inequality through enlarged social security programs and narrow the income gap between urban and rural areas. Nevertheless, there are still millions of Chinese people in rural areas and migrants in urban areas without any kind of welfare support (Wang, 2017). Indeed, Huang (2019) reports a sharp stratification of welfare benefits across registered urban and registered rural residents, following the expansion of social welfare provisions since 2003, which even widened the urban–rural income gap (see Lustig & Wang, 2020).

These adverse redistributive effects can be attributed to China's *Hukou* system implemented in 1951 to restrict mass migration from the countryside to the cities (Chan & Wei, 2021). Under the *Hukou* system, individuals are designated part of a regional government responsible for providing fundamental rights to its citizens, such as education, healthcare, and social security (Li & Hu, 2015). Thereby, distinct social security systems are operated in rural and urban areas. Individuals registered in urban areas, urban residents in what follows, have access to various urban welfare and public services, whereas rural residents, who are registered in rural areas, have only very limited access to these services. Rural–urban migrants are those who move from rural to urban areas while remain registered in their rural home area. As it is still difficult for them to change their *Hukou* status from a “rural *Hukou*” to an “urban *Hukou*” when migrating to an urban area, the system has created a mechanism of social exclusion by prohibiting migrants from benefiting from the urban social safety net in the same way as urban residents (Afridi et al., 2015). Although there are some recent *Hukou* system reforms for smaller towns and cities, these strict restrictions remain in place for major cities such as Shanghai and Beijing (Chan, 2019).

<sup>1</sup>The Gini coefficient and average income of urban and rural residents are published by the National Bureau of Statistics of China (<http://www.stats.gov.cn/tjsj/>).

This paper elaborates on the inequality-well-being relationship in China by focusing on how both vertical income inequality within each of these three groups (*within-group inequality*) and horizontal income inequality across these three respective groups (*between-group inequality*) affect subjective well-being (SWB). By simultaneously looking at three distinct populations, urban residents, rural residents, and rural–urban migrants, we complement the insights from previous research on inequality and SWB in China on the interplay between within-group and between-group comparisons. More importantly, to the best of our knowledge, our study is among the first to establish a link between group-specific income redistribution and individuals' SWB in China, shedding light on the potential impact of the redistributive system by comparing pre- and post-transfer inequality indicators and linking each of these indicators to individuals' well-being. Furthermore, employing panel data from the China Family Panel Studies (CFPS) allows for the control of unobserved individual heterogeneity, an advantage compared to previous research often based on cross-sectional data only.

Our main results, in a nutshell, are as follows. We find that within-group inequality shows only small negative though almost always insignificant correlations with SWB for the three population groups. With respect to between-group inequality, we find a positive correlation between the income disparity of urban residents and people living in rural areas. This may indicate the existence of a *tunnel effect*. Rural people take the larger income of urban residents as a positive signal for their own future income. More importantly, when controlling for pre-transfer between-group inequality, the growing income disparity between urban and rural residents, as well as between urban residents and migrants resulting from the asymmetric group-specific redistribution that favors urban residents, is negatively associated with the SWB of both migrants and rural residents.

The remainder of this paper proceeds as follows. Section 2 provides the conceptual framework and relates our analysis to previous literature. Section 3 then explains how the *Hukou* system contributes to Chinese inequality. Section 4 describes the data and provides descriptive statistics. Section 5 introduces the empirical methodology. In Section 6, we then report and discuss the empirical results. Section 7 summarizes and concludes.

## 2. INCOME INEQUALITY, INCOME REDISTRIBUTION, AND SUBJECTIVE WELL-BEING

Income inequality within a society affects individuals' subjective well-being in very complex and manifold ways. First, people with self-regarding preferences may only prefer a more equal society as they might suffer from income inequality (e.g., Ferrer-i-Carbonell & Ramos, 2014). This may be the case if they are risk-averse and their income position in society is uncertain, a more equal society then works like an insurance against income risks. However, the “prospect of upward mobility” may limit the degree of inequality aversion (Alesina & La Ferrara, 2005; Benabou & Ok, 2001). Inequality aversion may also result from externalities as larger income inequality is associated with various detrimental societal outcomes such as higher crime rates, lower social trust, and economic growth (Alesina & Giuliano, 2011;

Choe, 2008; Karagiannaki, 2017; Ostry et al., 2014). Risk-aversion and the existence of inequality-related externalities would establish a negative relationship of inequality and SWB.

There is also ample experimental evidence that individuals genuinely additionally have other-regarding preferences. Individuals exhibit social preferences such as fairness concerns and reciprocity (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999, 2006; and for a recent review Fehr & Charness, 2023). The happiness literature provides strong evidence that people are status seeking and therefore compare themselves to each other. In particular, income represents a certain status. If this is the case, people see others as negatives (Luttmer, 2005) as their income creates a negative externality on one's own status (Clark & Oswald, 1996, Luttmer, 2005; Weimann et al., 2015; and for recent reviews Clark & d'Ambrosio, 2015). Both types of other-regarding preferences would also explain a negative relationship of inequality and SWB.

However, the comparisons to some external reference income may also provide a positive signal that yields a “tunnel effect” (Hirschman & Rothschild, 1973). The name originates from an analogy: When stuck in a two-lane tunnel, if one lane of cars begins to move, drivers in the other lane may be also pleased because they now expect to start moving soon. Hence, if the reference group's income rises, this may signal future increases of one's own income. The existence of a tunnel effect would imply a positive relationship of inequality and SWB.

The empirical happiness research has found evidence for both negative and positive associations between inequality and SWB. A negative inequality-well-being relationship is confirmed in most developed countries (Alesina et al., 2004; Delhey & Dragolov, 2014; Hajdu & Hajdu, 2014; Oishi et al., 2011; Oishi & Kesebir, 2015; Schwarze & Härpfer, 2007). A positive *signal effect* or the *tunnel effect*, by contrast, is found in high mobility societies with huge uncertainties. Senik (2004, 2008) finds evidence for the tunnel effect in the transition period for Russia, Hungary, Poland and the Baltic states (as well as in the USA) while she finds a negative association in the 15 countries of “Old Europe.” Similar results are found by Caporale et al. (2009) across 19 European countries. Grosfeld & Senik (2010), however, find the positive association only for the early transition period in Poland before 1996, afterwards the association became negative. The findings of Sanfey & Teksoz (2007) for the transition countries for the time from 1999 to 2002 is consistent with this result. This may be indicative that income inequality was not no longer seen as a positive signal for future income rise. Grosfeld & Senik (2010) explain this shift from inequality tolerance of inequality aversion with rising mistrust in the political system and its elites. Inequality aversion rises as people question its legitimacy (Ferrer-i-Carbonell & Ramos, 2014).

Preferences for redistribution first of all depend on preferences concerning inequality. When social mobility is considered, the poor of today may become the rich of tomorrow, and they will not support redistribution because they will be the ones to pay for it; similarly, if the rich fear falling out of the income distribution in the future, they should support redistribution (Alesina & La Ferrara, 2005; Benabou & Ok, 2001). However, preferences for redistribution may also depend on other concerns. They may result from some type of altruism (Morawetz et al., 1977; Thurow, 1971) but may also depend on trust in the efficacy of governmental

redistribution (Alesina & Giuliano, 2011; Algan et al., 2016) as well as fairness concerns (Clark & d'Ambrosio, 2015; Fong, 2001).

There is only limited empirical research concerning the association of individual's SWB and redistribution. Using German panel data, Schwarze & Härpfer (2007) find that income inequality has a negative effect on individual life satisfaction but no significant relationship with income redistribution. Based on the first four waves of the European Social Survey, Hajdu & Hajdu (2014) find a positive association of redistributive measures and subjective well-being in Europe. So far there are only very few studies analyzing the impact of redistribution on happiness in developing countries. Employing the World Values Survey, Haggard et al. (2013) analyze the preferences for redistribution in 41 developing countries and report limited effects of inequality on the demand for redistribution.

Turning to the situation in China, Whyte (2010) indicates that the Chinese are not particularly egalitarian relative to the citizens of Eastern European post-communist transitional societies and some advanced economies such as the US, UK, West Germany and Japan. Employing the World Values Survey data in 2005, He et al. (2019) confirm that the Chinese have relatively similar tastes for equality compared with residents in the U.S. and Europe. The most noticeable feature of the inequality-well-being relationship in China, however, is the divided pattern across urban and rural citizens. Using the Chinese General Social Survey (CGSS), Yan & Wen (2020) show that a higher provincial Gini coefficient reduces the SWB of urban residents but increases the rural residents' SWB. They argue that rural residents regard income inequality as a ladder of upward ascension, that is, they interpret the positive correlation for rural residents as the dominance of a tunnel effect. Akay et al. (2012) found that rural-to-urban migrants also perceived inequality as a positive signal concerning their opportunities in urban areas, but this positive effect faded away the longer the migrants stayed in urban regions. The picture, however, is not clear-cut. Employing the 2015 CGSS, Ding et al. (2021) find an inverted U-shaped association between municipal Gini coefficient and SWB for urban residents, indicating the existence of a tunnel effect as long as inequality is not too high. For rural residents, they only find a negative association. Inequality across different social groups also plays a significant role.

The income disparity across different social groups separated by the *Hukou* system also plays a significant role in Chinese people's SWB. Using the 2002 data from the China Household Income Project, Jiang et al. (2012) report that in urban areas, higher income inequality between the group of migrants without an urban *Hukou* and the group of urban residents (irrespective of whether they are urban residents with or without local *Hukou*) are associated with lower levels of SWB. Zhang & Awaworyi Churchill (2020), using data from the China Family Panel Studies, find negative associations for both province-level income inequality and between-group income inequality between migrants without urban *Hukou* and urban residents on SWB. Within urban areas, residents with urban *Hukou* are treated differently than migrants in the same urban area who belong to a rural *Hukou*. This may also affect a third group, the rural residents with rural *Hukou*. Our paper complements their research by including rural residents in the analysis and discussing within-group inequality and between-group inequality for three rather than two different societal subgroups. Furthermore, it tries to disentangle the association

of inequality with SWB and the association of redistribution and SWB. Following Hajdu & Hajdu (2014), who show that it is not only the post-transfer inequality that matters but also the redistributive procedure, we try to disentangle the association of inequality and SWB from the association of redistribution and SWB, as the Chinese *Hukou* system strongly affects the degree of inequality reduction in different societal groups and may thus be considered as an unfair redistributive procedure.

Using data from 16 OECD countries in 2007, Kristjánsson (2011) provides evidence that public transfers account for ~80 percent of the reduction in income inequality. Similarly, Lustig (2011) shows that in developing countries such as Brazil and Mexico, public transfers also account for 75.2 percent of the inequality reductions achieved by redistributive measures. The same pattern is found for China. Using the 2013 China Health and Retirement Longitudinal Study, Xie (2018) reports that the personal income tax and social security contributions account for less than ten percent of the redistributive effect, while the government public transfers (pension benefits included) account for more than 90 percent. This is of particular importance as redistribution of income takes place via the different *Hukou* system so that individuals' preferences for income redistribution may be different for different groups belonging to different *Hukou* systems.

### 3. THE SOCIAL SECURITY SYSTEM IN CHINA

Before the opening-up and the economic reforms, though characterized by a sharp urban–rural divide and a low level of welfare provision, the social security system provided basic social protection for both urban workers and farmers (Leung & Nann, 1995). In urban areas, generous welfare packages were provided for workers through *danwei* (state-owned enterprises, state agencies, government departments, and other organizations in the public sector). It covered more than 80 percent of the urban labor force. In rural areas, farmers worked for the communes through which daily necessities were distributed, but which covered only a tiny fraction of rural residents (see Wong, 2005).

With the break-up of the state-run economy, guaranteed access to jobs and lands was gradually dismantled. According to Gao & Riskin (2009), the average share of social benefits in total household income for urban families shrank from 44 percent in 1988 to 25 percent in 2002. Only since 2003, the Chinese government has undertaken several reforms toward a more inclusive social security system, for example, the initiation of new rural cooperative medical insurance in 2003, the medical insurance for urban residents in 2007, and the basic pension insurance for rural residents in 2009. The current social security system comprises five public insurances: pension insurance, unemployment insurance, medical insurance, work-related injury insurance, and maternity insurance, one housing fund, several other social relief programs like the minimum living standard scheme (*Dibao* program), the rural five guarantees system (*Wubao* program<sup>2</sup>) and others.

<sup>2</sup>The “Five-Guarantee” system refers to a system that provides daily care and subsistence assistance in terms of food, clothing, shelter, medical care, and burial expenses to those who are most deprived and are primarily older, frail, childless, widowed, and disabled in rural China. (State Council 2006).

China's household registration (*Hukou*) system largely determines the access to the different social security systems. It distinguishes urban or rural residents, irrespective of where people work and live. With the rising mobility from rural to urban areas, this led to an increasingly severe asymmetric income redistribution. The public pension insurance reveals how the social security program operates for different *Hukou* holders. It comprises three sub-schemes: the *basic urban employee pension*, which has been provided for employees with a formal working contract in urban areas since 1998; the *basic urban pension*, available but not obligatory for self-employed and unemployed urban residents with local *Hukou* since 2012; the *basic rural pension*, available for rural residents since 2009. In 2014, the basic urban pension and the basic rural pension were merged into one sub-scheme, the *basic rural and urban pension*. According to the Ministry of Human Resources and Social Security, in 2015, this new *basic rural and urban pension* covered 504.7 million people, while the *basic urban employee pension* covered 353.6 million people. Despite the extensive coverage, there is a significant disparity in the benefit levels. In 2018, the average annual benefit was 1836 *yuan* (\$288) for the *basic rural and urban pension*, while it was 37,836 *yuan* (\$5844) for the *basic urban employee pension*. The replacement ratio of the *basic urban employee pension* is about 45 percent of the average urban employee's annual wage income, which is more than three times higher than that of the *basic rural and urban pension* in rural areas in 2018 (Figure A1 in Appendix).

Chinese migrant workers are among the largest group of workers in the informal sector not covered by social insurance (Giles et al., 2021). Even though the Labor Contract Law (2008) and Social Insurance Law (2011) obliges employers to contribute to migrant employees' social security insurance, this provision has proved very difficult to implement. Most migrants working in the urban areas are not protected by the destination city's basic social security program. According to the Ministry of Human Resources and Social Security, in 2017, only 22 percent of migrant workers had a basic pension or medical insurance, 27 percent had work-related injury insurance, and 17 percent had unemployment insurance.

As it turns out, the Chinese social security system is in itself highly unequal as it does not provide comprehensive coverage, nor does it provide equal benefits for different groups. It is thus *a priori* unclear how the social security system affects income inequality in China across different populations (Cai & Yue, 2020; Hoken & Sato, 2017; Lustig & Wang, 2020).

#### 4. DATA AND DESCRIPTIVE STATISTICS

This study uses China Family Panel Studies (CFPS) data, a large-scale, nationally representative, and longitudinal survey of Chinese households. The CFPS surveys 25 provinces/municipals/autonomous regions and gathers data at the individual, household, and community levels. In the 2010 baseline survey, 33,600 adult individuals from 14,798 households were interviewed. Half of the sample was generated by oversampling five large provinces (*Shanghai, Liaoning, Henan, Gansu, and Guangdong*). The other half of the samples were from an independent sampling

frame of 20 provinces. Follow-up surveys were carried out every two years so that we could make use of five waves (2010, 2012, 2014, 2016, and 2018).<sup>3</sup>

CFPS allows us to separate residents according to their *Hukou* statuses and living places. Urban residents are defined as those who hold an urban *Hukou* (local or non-local) and are currently living in an urban area. Rural residents are defined as those who hold a rural *Hukou* and are currently living in rural areas. Migrants are defined as those who hold a rural *Hukou* but are currently living in urban areas.<sup>4</sup> We drop provinces which account for less than 1 percent of the total observations in either of the three population groups (*Beijing, Tianjin, Anhui, Fujian, Jiangxi, Guangxi, Chongqing*, and *Yunnan* provinces) and get a sample composed of 17 provinces. The distribution of respondents by type and province is reported in Table A1 in the Appendix.

This paper elaborates on the relationship between income inequality, group-specific income redistribution, and subjective well-being among China's urban, rural, and migrant populations. Both relative income concerns and using information of reference groups' income for assessing ones' own future income prospects require evaluative judgments about how oneself is doing compared to others (see Kahneman & Deaton, 2010 and, in particular Kudrna, 2024 for empirical support). To evaluate the impact on such an evaluation on SWB, we hence follow the standard procedure in the literature and use the life satisfaction measure as indicator for evaluative well-being rather than measures of emotional well-being. Our outcome variable is measured by the response to the survey question "*How satisfied are you with your life?*" with an answer from 1 (very unsatisfied) to 5 (very satisfied). The dataset also provides rich information about respondents' social demographic characteristics, including gender, age, marital status, employment status, years of education, household size, and whether being a member of the communist party of China. More importantly, CFPS has detailed panel data on households' receipts of various public transfer benefits, along with other income sources.

For each household, we distinguish between pre-transfer and post-transfer income. The household's pre-transfer income includes salary income, operating income, property income, and other income.<sup>5</sup> The household's post-transfer income equals pre-transfer income plus transfer income. Transfer income comprises a list of public transfer benefits (including pensions, *Dibao*, agricultural subsidies, *Wubaohu* subsidies, *Tekunhu* subsidies, reforestation subsidies, work injury subsidies to linear relatives, and emergency or disaster relief). All the income data reported in the survey is after-tax. We thus have to focus on the redistributive effects of public

<sup>3</sup>CFPS maintains a relatively good tracking rate. The CFPS 2018 household-level cross-round follow-up response rate is 86.6 percent. The individual sample has a cross-round follow-up response rate of 80.8 percent.

<sup>4</sup>This study exclusively focusses on rural–urban migrants. We cannot distinguish urbans and urban–urban migrants, who hold an urban *Hukou* while living in another urban area, as we do not have information about the birthplace.

<sup>5</sup>Salary income is the wages of all family members. Operating income is the net income of agricultural production, profit from self-employment, or operating private enterprises. Property income is income from renting and selling properties, savings interests, and income from financial investments.

TABLE 1  
PRE- AND POST-TRANSFER INCOME COMPONENTS

(yuan)	Urban residents		Migrants		Rural residents	
	Mean	Share	Mean	Share	Mean	Share
(1) Salary income	26,070	69.35%	19,159	78.97%	11,115	67.50%
(2) Operational income	1264	3.36%	2148	8.85%	3722	22.60%
(3) Property income	630	1.68%	857	3.53%	209	1.27%
(4) Other income	1402	3.73%	802	3.31%	480	2.91%
Pre-transfer income	29,366		22,966		15,526	
(5) Transfer income	8227	21.88%	1295	5.34%	941	5.72%
Post-transfer income	37,593	100%	24,261	100%	16,467	100%

Notes: 5-waves weighted average for 17 provinces. Pre-transfer income equals the sum of (1) to (4), post-transfer income equals the sum of pre-transfer income and (5). The share represents the proportion of each income component in post-transfer total income.

transfers. As Xie (2018) reports that government public transfers (pension benefits included) account for more than 90 percent of the redistributive effect, we nevertheless are able to analyze the association of SWB and redistribution in a meaningful way. The unit of analysis here is annual equivalent household income defined as household income divided by the square root of household size.<sup>6</sup> Official consumer price indices from the China Statistical Yearbook convert 2010, 2012, 2014, and 2016 to constant 2018 values. Only those participants aged between 16 and 80 who answered at least two rounds of the survey are included. After excluding observations with missing information, we obtain a sample of 9142 urban residents, 5314 migrants, 15,984 rural residents, and 85 province-year observations (see Table A1).<sup>7</sup>

Table 1 summarizes the 5-waves average pre- and post-transfer income in constant 2018 values for urban residents, migrants and rural residents separately, aggregated over the 17 provinces under consideration. The annual pre-transfer income is highest for urban residents with an average of 29,366 *yuan* (\$4560) and lowest for rural residents with an average of 15,526 *yuan* (\$2398). Transfer income accounts for about 22 percent of urban people's total income. In comparison, for migrants and rural residents, transfers add up to only about 5 percent of their total income. Income redistribution through public transfers thus substantially increases the income gap between urban residents and migrants, and between urban and rural residents, but does not affect the standing of migrants relative to rural residents.

Next, we consider the within-group and between-group income inequality before and after public transfers. Knight & Gunatilaka (2022) show empirically that for people in China mainly narrowly defined inequality matters, arguing that "a reference group can be defined as a group that frames the social norms, attitudes, values, and behavior of the individual" (Knight & Gunatilaka, 2022, p. 11). To apply this concept, we need group-specific inequality measures at the

<sup>6</sup>This definition is often used in inequality analyses (see OECD, 2011). Our main results do not change when employing either the OECD equivalence scale or the OECD-modified equivalence scale, in which household income is divided by a weighted number of persons living in the household.

<sup>7</sup>People who moved between different provinces during the survey (96 urban residents, 93 migrants, and 110 rural residents) have been excluded.

TABLE 2  
INCOME INEQUALITY INDICATORS OF PRE- AND POST-TRANSFER INCOME

Inequality indicators	Pre-transfer income (1)	Post-transfer income (2)	Percentage change (2)–(1)/(1)
Within-group Gini			
Urban Gini	0.465	0.409	–12.04%
Rural Gini	0.486	0.482	–0.82%
Migrant Gini	0.484	0.482	–0.41%
Between-group mean income ratio			
$BI_{ur}$	1.612	1.913	18.67%
$BI_{um}$	1.300	1.530	17.70%
$BI_{mr}$	1.340	1.410	5.22%

*Notes:* Within-group income inequality is measured by the Gini coefficient based on individuals' pre-transfer and post-transfer income of all individuals belonging to the same group in the same province. Between-group income inequality is calculated as the ratio of mean income of residents belonging to a different group within the same province. The figures are the weighted 5-waves averages for 17 provinces.

provincial level. Unfortunately, the government only publishes the Gini coefficient at the national level. We therefore calculate the respective group-specific Gini coefficients at the provincial level from our sample and report the 5-waves average Gini coefficients in Table 2.<sup>8</sup>

The Gini coefficients are estimated using the pre-transfer income and post-transfer income respectively of those who belong to the same group and live in the same province. As Table 2 shows, public transfers reduce the within-group Gini coefficient for urban residents substantially, while redistribution hardly affects within-group inequality of migrants and rural people. Our findings align with previous research, which shows that Chinese urban residents continuously receive the most generous social benefits (Huang, 2019; Li & Sicular, 2014).

For between-group comparison, we apply the approach developed by Jiang et al. (2012) and Zhang & Awaworyi Churchill (2020). In Table 2, our measure of between-group inequality  $BI_{ij}$ ,  $i, j = u$  (urban residents),  $m$  (migrants),  $r$  (rural residents), is calculated as the 5-waves average ratio of the mean pre-transfer income and post-transfer income respectively of residents belonging to different groups within the same province, shown as:

$$BI_{ur}^p = \frac{\text{Mean income of urban residents in province } p}{\text{Mean income of rural residents in province } p},$$

$$BI_{um}^p = \frac{\text{Mean income of urban residents in province } p}{\text{Mean income of migrants in province } p},$$

$$BI_{mr}^p = \frac{\text{Mean income of migrants in province } p}{\text{Mean income of rural residents in province } p},$$

<sup>8</sup>The 5-waves average post-transfer Gini-coefficient for the whole sample equals 0.472, the respective average official Gini-coefficient based on individual disposable income equals 0.474. To further rule out the possibility that the variation in our Gini coefficient is merely due to attrition, we estimate the Gini coefficient based on respondents who have attended at least two waves, three waves, four waves, and all five waves separately in Table A3 in the Appendix, the Gini coefficients turn out to be very stable.

As it turns out, the group-specific redistributive system substantially widens the income gap between urban and rural residents as well as between urban residents and migrants (Figure A2 in the Appendix shows the development of these ratios over time).

## 5. EMPIRICAL STRATEGY

Our empirical approach links province-level income inequality and income redistribution through public transfers to individuals' SWB. A linear relationship is estimated separately for three groups, namely the urban residents, migrants and rural residents, using the following specification, following Hajdu & Hajdu (2014) and Schwarze & Härpfer (2007):

$$(1) \quad LS_{ipt} = \alpha + \beta Gint_{pt}^{post} + BI_{pt}^{post} \gamma + Y'_{ipt} \eta + X'_{ipt} \theta + \lambda_{pt} + \mu_p + \sigma_i + \varepsilon_{ipt}$$

In the baseline model, an individual's SWB is regressed by post-transfer income inequality and a set of explanatory variables. The post-transfer within-group income inequality  $Gint_{pt}^{post}$  is estimated using the post-transfer income of those who belong to the same group and live in the same province. The post-transfer between-group income inequality  $BI_{pt}^{post}$  is calculated as the mean income ratio of residents belonging to different groups within the same province. For each group, we have then two  $BI$  measures. For instance, the urban residents have  $BI_{um/pt}^{post}$  for the mean income ratio between urban residents and migrants, and  $BI_{ur/pt}^{post}$  for the mean income ratio between urban and rural residents. We have 85 observations for each measure, that is,  $p$  multiplied by  $t$ .

Individuals' income information is considered in vector  $Y_{ipt}$ . Absolute income (in 2018 values) is controlled as the log of post-transfer income, the relative income position is indicated by a dummy variable showing whether the absolute income of  $i$  is higher than the average group income in the same province. The vector  $X$  refers to a set of characteristics, including gender, age, age squared, education, marital status, employment status, household size, and membership of the China Communist Party.  $\mu_p$  is a provincial fixed effect,  $\sigma_i$  is an individual fixed effect, and  $\varepsilon_{ipt}$  is an error term. The exogenous variations on SWB are taken into account by controlling for the province-specific time trends  $\lambda_{pt}$ .<sup>9</sup> A summary of all the control variables can be found in Appendix Table A2.

To investigate the role of income redistribution through public transfers, we follow Schwarze & Härpfer's (2007) method and decompose post-transfer income inequality into pre-transfer income inequality and the extent of redistribution by

<sup>9</sup>We present the results of the parsimonious model in the main text. In Table A5 and A6, we show the results for the whole sample using between-group interaction terms. Furthermore, in Table A7, we add three additional control variables at the provincial level, the provincial GDP per capita, the provincial unemployment rate, and the province-level prices index obtained from China's National Bureau of Statistics and normalized to 100 at the provincial level for the 2018 wave, to explicitly account for changes in living cost over time. Our main conclusions remain robust when both using the whole sample approach and taking additional provincial information into account.

the government public transfers. Income redistribution  $R_{pt}^I$  is the income inequality reduction by public transfers, computed as the percentage change between inequality indices based on pre-transfer income and post-transfer income in province  $p$  at time  $t$ .  $I$  represents different income inequality indicators, including within-group Gini coefficient and between group income gaps across the three groups.

$$(2) \quad R_{pt}^I = \frac{I_{pt}^{pre} - I_{pt}^{post}}{I_{pt}^{pre}} \cdot 100; I = Gini, BI_{ur}, BI_{um}, BI_{mr}.$$

Thus, in equation (3), the estimated model includes a measure of pre-transfer income inequality ( $I_{pt}^{pre}$ ) and a measure of income redistribution by the government ( $R_{pt}^I$ ) as follows:

$$(3) \quad \begin{aligned} LS_{ipt} = & \alpha + \beta Gini_{pt}^{pre} + \gamma R_{pt}^{Gini} + BI_{pt}^{pre} \delta + R_{pt}^{BI} \epsilon \\ & + Y'_{ipt} \eta + X'_{ipt} \theta + \lambda_{pt} + \mu_p + \sigma_i + \varepsilon_{ipt}. \end{aligned}$$

The inequality-well-being relationship is explained by the sign of the coefficients of pre-transfer income inequality indicators,  $\beta$  and  $\delta$ . A positive coefficient might be interpreted as the tunnel effect dominating the status effect. If it is negative, it might be interpreted as the status effect dominating the tunnel effect; if the coefficient turns out not to be statistically significant, there may be opposing interactions that have a net effect of approximately zero. The redistribution-well-being relationship is captured by the sign of the coefficients of income redistribution  $R_{pt}^I$ ,  $\gamma$  and  $\epsilon$ . If a coefficient is positive, redistribution from rich to poor is positively correlated with SWB. We estimate equations (1) and (3) using panel fixed effect estimators.

## 6. RESULTS

### 6.1. Post-Transfer Income Inequality and Life Satisfaction

The regression results from equation (1) are shown in Table 3. Post-transfer within-group inequality shows negative though insignificant correlations with SWB for the three population groups.<sup>10</sup> This correlation is relatively small compared to findings reported in the literature. Schwarze & Härpfer (2007) find that a one-percentage increase in the post-government Gini index is associated with a 0.036–0.048 lower life satisfaction (11-point scale) in West Germany (1985–1998). Hajdu & Hajdu (2014) report that a one-percentage point increase in the post-government Gini index results in 0.036-point lower life satisfaction (11-point scale) for 29 European countries (2002–2008).

Our results for the between-group inequality indicate that rural residents' life satisfaction is higher when the income disparity between urban and rural residents is larger. For the rural residents, a one-point increase in the between-group income

<sup>10</sup>We also checked the square term of income inequality (both for Gini and  $BI$ ), but there is no significant non-linear relationship between income inequality and SWB.

TABLE 3  
POST-TRANSFER INEQUALITY AND LIFE SATISFACTION

	Urban residents	Migrants	Rural residents
Post-transfer within-group inequality			
Post-transfer within-group Gini	−0.002 (0.003)	−0.005 (0.007)	−0.006 (0.005)
Post-transfer between-group inequality			
Post-transfer BI: Urban vs. Rural	0.079 (0.046)		0.154* (0.077)
Post-transfer BI: Urban vs. Migrant	−0.117 (0.089)	−0.003 (0.160)	
Post-transfer BI: Migrant vs. Rural		0.113 (0.094)	−0.029 (0.038)
R-squared	0.087	0.065	0.070
Observations	9142	5314	15,984
Respondents	3663	2329	6471

Notes: \*denotes significance at the 10% level. Dependent variable: Life satisfaction. Robust standard errors adjusted for clustering by province are in parentheses. CFPS sample weights are used in the regression. See Table A4 in the appendix for all coefficients.

gap with urban residents is associated with a 0.154-point increase in well-being. The positive effect for the rural residents might be interpreted as a tunnel effect: urban residents' high income may signal rural residents' rising income in the future. Similar findings can be found in low-income countries (Bookwalter & Dalenberg, 2010; Kingdon & Knight, 2007). This finding is also consistent with the literature that finds a positive association of income inequality and individuals' SWB in volatile and high mobility societies (Clark, 2003; Grosfeld & Senik, 2010; Ohtake & Tomioka, 2004). However, a larger post-transfer income gap between migrants and rural people is associated with lower (though the result is not significant) SWB for rural residents, which might be indicative for negative status concerns dominating when comparing with migrants. Our results concerning the comparison of urban residents and migrants in the same province do not confirm the findings by Zhang & Awaworyi Churchill (2020), who report that the income gap between urban residents and migrants in the same city is associated with lower individual's SWB in both groups.

Akay et al. (2012) report that for Chinese migrants, the tunnel effect towards urban residents decreases with their duration of urban stay. Our results complement this interpretation as migrants are not positively affected by urban residents' income anymore after recognizing the hardship and discrimination they encountered in the urban areas. For the rural residents, by contrast, who may still consider migrating to an urban area in the future, the higher income of urban residents still seems to be considered as a positive signal, being not fully aware of the manifold difficulties they would face in urban areas as well as the fact that the discriminating *Hukou* system contributed to the widening income gap between urban and rural residents, which the migrants are already aware of.

In Europe and the U.S., impoverished people may suffer more from income inequality than those better off (see Alesina et al., 2004). To analyze in how far a similar pattern emerges for China, we look at the relative individual income

TABLE 4  
POST-TRANSFER INEQUALITY AND LIFE SATISFACTION BY INCOME TERCILES

	Urban residents	Migrants	Rural residents
Post-transfer within-group inequality			
Post-transfer within-group Gini * T1	−0.008* (0.004)	−0.010 (0.008)	−0.006 (0.004)
Post-transfer within-group Gini * T2	−0.002 (0.004)	−0.003 (0.009)	−0.004 (0.006)
Post-transfer within-group Gini * T3	0.000 (0.004)	−0.001 (0.008)	−0.008 (0.005)
Post-transfer between-group inequality			
Post-transfer BI: Urban vs. Rural * T1	0.070 (0.075)		0.124 (0.093)
Post-transfer BI: Urban vs. Rural * T2	0.046 (0.067)		0.225** (0.085)
Post-transfer BI: Urban vs. Rural * T3	0.102 (0.060)		0.125 (0.080)
Post-transfer BI: Urban vs. Migrant * T1	−0.014 (0.088)	0.085 (0.211)	
Post-transfer BI: Urban vs. Migrant * T2	−0.076 (0.105)	−0.033 (0.180)	
Post-transfer BI: Urban vs. Migrant * T3	−0.205** (0.086)	−0.065 (0.155)	
Post-transfer BI: Migrant vs. Rural * T1		0.170 (0.137)	−0.001 (0.061)
Post-transfer BI: Migrant vs. Rural * T2		0.094 (0.102)	−0.175** (0.073)
Post-transfer BI: Migrant vs. Rural * T3		0.065 (0.182)	0.080 (0.071)
R-squared	0.090	0.066	0.071

*Notes:* \*denotes significance at the 10% level, \*\* at the 5% level. Dependent variable: Life satisfaction. Robust standard errors adjusted for clustering by province are in parentheses. CFPS sample weights are used in the regression.

positions by using terciles of the pre-transfer income distribution; T1 denotes the lowest pre-transfer income tercile, T2 the middle, and T3 the highest. Table 4 summarizes the coefficients for the interaction terms between post-transfer income inequality depending on the individuals' relative income positions. With respect to within-group inequality, we find a similar pattern as in Europe and the U.S. for urban residents but find no similar pattern for migrants and rural residents.

For between-group income inequality, the positive association of between-group inequality between urban and rural residents and the rural residents' SWB is only statistically significant for the middle-income group. The potential negative status effect identified for the rural residents with respect to migrants also seems to be mainly driven by the middle tercile. They might be the group most likely to migrate in the future as the richest rural residents may have settled in the rural area while the poorest rural residents lack opportunities. If this is the case, which may be a question of further research, this would lend additional support to both the tunnel-effect hypothesis concerning the comparison with urban residents and the status effect hypothesis concerning the comparison with migrants.

## 6.2. Pre-Transfer Income Inequality, Income Redistribution and Life Satisfaction

Next, we decompose the post-transfer income inequality into the pre-transfer income inequality and the income redistribution through public transfers as suggested by equation (3). For urban residents, we consider first the pre-transfer within-group inequality measured as the within-group Gini coefficient and within-group income redistribution  $R_{pt}^{Gini}$  (see equation (2)); second, the pre-transfer between-group inequality is measured by  $BI_{ur/pt}^{pre}$  when comparing with rural residents and  $BI_{um/pt}^{pre}$  when comparing with migrants respectively (see column (1) in Table 2 for the average values). The between-group income redistribution is measured, according to equation (2), as

$$R_{ur/pt}^{BI} = \frac{BI_{ur/pt}^{pre} - BI_{ur/pt}^{post}}{BI_{ur/pt}^{pre}},$$

$$R_{um/pt}^{BI} = \frac{BI_{um/pt}^{pre} - BI_{um/pt}^{post}}{BI_{um/pt}^{pre}},$$

when comparing urban residents with rural residents and migrants respectively. We then proceed in the same way for migrants and rural residents. The estimates are shown in Table 5.

For pre-transfer within-group income inequality, we find the same signs for the coefficients as reported in Table 3 for the post-transfer within-group inequality.

TABLE 5  
PRE-TRANSFER INEQUALITY, INEQUALITY REDUCTION AND LIFE SATISFACTION

	Urban residents	Migrants	Rural residents
Pre-transfer within-group inequality & redistribution			
Pre-transfer within-group Gini	−0.014*** (0.005)	−0.009 (0.007)	−0.006 (0.004)
Within-group redistribution $R_{rt}^{Gini}$	−0.001 (0.002)	−0.016* (0.008)	−0.004 (0.006)
Pre-transfer between-group inequality & redistribution			
Pre-transfer BI: Urban vs. Rural	0.060 (0.041)		0.068 (0.078)
BI redistribution $R_{rt}^{BI}$ : Urban vs. Rural	−0.001 (0.003)		0.007*** (0.001)
Pre-transfer BI: Urban vs. Migrant	−0.019 (0.083)	−0.023 (0.139)	
BI redistribution $R_{rt}^{BI}$ : Urban vs. Migrant	0.004 (0.003)	0.004** (0.002)	
Pre-transfer BI: Migrant vs. Rural		−0.007 (0.074)	−0.045 (0.073)
BI redistribution $R_{rt}^{BI}$ : Migrant vs. Rural		−0.006 (0.006)	−0.006* (0.003)
R-squared	0.096	0.076	0.083

Notes: \*denotes significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level. Dependent variable: Life satisfaction. Robust standard errors adjusted for clustering by province are in parentheses. CFPS sample weights are used in the regression.

However, they are larger and for the urban residents highly significant. They may indicate status effect of pre-transfer incomes that is no longer found in the post-transfer inequality. However, the role of within-group redistribution remains unclear as the coefficients for the urban residents are close to zero and for the migrant there is even a significant negative association between within-group redistribution and individuals' life satisfaction.

The pre-transfer between-group coefficients BI in Table 5 show the same signs as the respective post-transfer BI coefficients reported in Table 3.

Concerning the between-group income redistribution, lowering both the mean income gap between the rural residents and the urban residents as well as lowering the mean income gap between migrants and urban residents is strongly positively associated with rural residents' and migrants' SWB. As Table 2 indicates, however, since the urban residents receive much larger public transfers, the income gap between urban *Hukou* holders and rural *Hukou* holders (rural residents and migrants) has been substantially enlarged after income redistribution. The specific Chinese redistributive system inherent in the *Hukou* system makes both migrants and rural residents, the two relatively impoverished population groups, relatively worse off, which is associated with a lower SWB for both groups. These results lend support for the finding that the life satisfaction of the Chinese disadvantaged population in 2015 remains below its 1990 level as reported by Easterlin et al. (2021). The discriminating redistribution scheme in China is harmful to its rural residents and migrants as it widens the between-group inequality. Note that the redistribution system also widens the income gap between migrants and rural residents (Table 2), which is also associated with lower SWB for the disadvantaged group. For completeness, we report the interactions between pre-transfer income inequality and income redistribution depending on the relative individual income position in Table A8.

### 6.3. Robustness Checks

Our results should be interpreted with caution. The relatively small cell size on the provincial level makes it hard to assume income representativeness. Consequently, some of our results might be frangible and indecisive, and some potential reasons may not be thoroughly clarified. This section will therefore examine the robustness of our regression results.

First, we look at a subsample of the five largest provinces, *Shanghai*, *Henan*, *Gansu*, *Liaoning*, and *Guangdong*, which allows us to calculate the inequality measures on the basis of more observations per province, presented in Table A9 and A10. We find stronger effects for the urban residents but with respect to the potential tunnel effect we reported in Table 3 for the rural residents, the sign and size are similar but become statistically insignificant. The discriminating *Hukou* system that widens the income gap between urban residents and both migrants and rural residents is also negatively associated with the SWB of both migrants and rural residents (Table A10).

Second, to make the results more representative of the entire Chinese population, we re-run the estimations including all 25 provinces. The analysis reported in Tables A11 and A12 confirm the qualitatively similar results concerning the association between income inequality and life satisfaction for all three groups. As shown

in Table A12, the link between life satisfaction and between-group income redistribution remains robust.

Third, we present the regression based on non-weighted samples, shown in Tables A13 and A14. The main results concerning the income redistribution between urban and rural residents remain robust, rural residents are negatively influenced because of the increasing income gap with urban residents after government public transfers. However, in the unweighted regression the significance of some of the coefficients is different.

Fourth, we use the Theil index as an alternative measure of the within-group income inequality, as shown in Table A15 and A16.<sup>11</sup> As it shows, we obtain qualitatively similar results for the Theil index: the three societal groups are not positively affected by the income redistribution within their groups, whereas rural residents are negatively affected by the larger mean income gap to urban residents, as a result of the unequal income redistribution.

Fifth, we estimate the results using ordered-probit (Table A17 and A18) and ordered-logit (Table A19 and A20) regressions. The results show that our main conclusions about the between-group income redistribution remain unchanged.

Finally, one could argue that we should not use individual fixed effect if there is little variation in income inequality and inequality reduction ( $I_{pt}^{pre}$ ,  $I_{pt}^{post}$ ;  $R_{pt}^I$  ( $I = Gini, BI_{ur}, BI_{um}, BI_{mr}$ )) within each province across time. We thus compare the fixed effect estimations with pooled OLS estimations in Table A21 and A22, and, once again, obtain similar results as for the fixed effect estimation.

## 7. CONCLUSIONS

Using five waves of the China Family Panel Studies (2010–2018), we investigate the link between income inequality, group-specific income redistribution, and individuals' SWB for three societal subgroups in China, urban residents, rural–urban migrants, and rural residents. Income redistribution through government public transfers substantially reduces the within-group income inequality only for urban residents, while inequality within the groups of rural residents and migrants is hardly affected. Using narrowly defined reference groups, we explore how within-group and between-group inequality are related to the respective group members' SWB. Our findings suggest mainly insignificant correlations of within-group inequality with SWB for the three population groups. By contrast, between-group inequality matters a lot for rural residents in a similar way as income inequality mattered in the East European countries directly after the fall of the iron curtain. A larger income gap between urban and rural residents is positively correlated with the rural residents' SWB. We interpret this correlation as a tunnel effect, that is, the gap is interpreted as a positive signal for rural residents concerning their own future income. When they compare themselves to migrants, however, our results hint at a negative (though not significant) status effect for the rural residents.

<sup>11</sup>For a comparison of the different inequality measures see Trapeznikova (2019).

Urban residents benefit substantially more from public transfers. Hence, the Chinese redistributive system makes people with rural *Hukou*, that is, rural residents and rural–urban migrants, relatively worse off. The widening post-transfer income gap between urban residents and both migrants and rural residents is associated with lower SWB for the two latter groups. The existing *Hukou* system thus bars the way to implement the concept of “*common prosperity*” of the Chinese government that aims to foster a more balanced and sustainable development. It reflects a severely unequal provision of public transfers in China. Nevertheless, we corroborate the presence of a tunnel effect for the rural residents. Chinese rural residents seem to be positively motivated by between-group inequality between urban and rural residents. Since the group-specific redistribution that favors urban residents apparently reduces the tunnel effect, rural residents seem to perceive the income gap resulting from pre-transfer market incomes as a positive signal. However, at the same time, they do not see a similar positive signal concerning income changes resulting from the redistributive system.

Being fully aware of the fact that our results cannot be interpreted as causal effects, our results nevertheless indicate that distinguishing between within-group and between-group inequality effects when assessing the influence of income inequality on SWB is important. This has far-reaching implications for the development strategy of the Chinese government. In particular, for the stratified Chinese society, the negative correlation between group-specific redistribution inherent in the existing *Hukou* system and SWB should raise concerns about how the government pursues the objective to foster a more balanced and sustainable development. Rather than linking social benefits to individuals’ *Hukou* status as in the existing system, the government should aim for a more inclusive social security system that ensures all populations receive similar advantages in terms of coverage and benefit level. To make the most disadvantaged group better off, it must first abolish the adverse between-group effects of within-group-specific redistribution.

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article at the publisher's web site:

**Data S1:** Supporting Information.

**Figure A1:** Replacement Ratios of Public Pension Insurance Schemes.

**Figure A2:** Between-Group Mean Income Ratio: 5 Waves 2010–2018.

**Table A1:** Distribution of Individuals by Type and Across Provinces.

**Table A2:** Descriptive Statistics.

**Table A3:** Comparison of Gini Coefficients.

**Table A4:** Post-Transfer Inequality and Life Satisfaction with All Controls (Split Sample).

**Table A5:** Post-Transfer Inequality and Life Satisfaction with All Controls (Full Sample).

**Table A6:** Pre-Transfer Inequality, Inequality Reduction and LS, (Full Sample).

**Table A7:** Post-Transfer Inequality and Life Satisfaction with Additional Province Controls.

**Table A8:** Pre-Transfer Inequality, Inequality Reduction and Life Satisfaction by Income Terciles.

**Table A9:** Post-Transfer Inequality and Life Satisfaction, Five Largest Provinces.

**Table A10:** Pre-Transfer Inequality, Inequality Reduction and LS, Five Largest Provinces.

**Table A11:** Post-Transfer Inequality and Life Satisfaction, All Provinces.

**Table A12:** Pre-Transfer Inequality, Inequality Reduction and LS, All Provinces.

**Table A13:** Post-Transfer Inequality and Life Satisfaction, Unweighted Sample.

**Table A14:** Pre-Transfer Inequality, Inequality Reduction and LS, Unweighted Sample.

**Table A15:** Post-Transfer Inequality and Life Satisfaction, Theil Index.

**Table A16:** Pre-Transfer Inequality, Inequality Reduction and Life Satisfaction, Theil Index.

**Table A17:** Post-Transfer Inequality and Life Satisfaction, Ordered-Probit.

**Table A18:** Pre-Transfer Inequality, Inequality Reduction and LS, Ordered-Probit.

**Table A19:** Post-Transfer Inequality and Life Satisfaction, Ordered-Logit.

**Table A20:** Pre-Transfer Inequality, Inequality Reduction and LS, Ordered-Logit.

**Table A21:** Comparison of Pooled OLS Estimation with Fixed Effect Estimation From Table 3.

**Table A22:** Comparison of Pooled OLS Estimation with Fixed Effect Estimation From Table 5.