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Income and consumption inequality in China

A comparative approach with India

Carlos Gradín[1] and Binbin Wu[2]

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Abstract: We analyse income and expenditure distribution in China in a comparative perspective with India. These countries represent extreme cases in the relationship of inequality to both wellbeing indicators. Income is more highly concentrated than expenditure in India, especially at the top of the distribution. Both types of inequality are similar in China, although expenditure is more unequally distributed than income in urban areas. China has a much stronger correlation in individual ranks and levels between the two wellbeing distributions. As a result, expenditure inequality is higher in China than in India, but income inequality much lower. This results partially from differences in population composition, such as China being more urbanized and having smaller households, but mostly from differences in conditional income distributions, especially by attained education of the household head. We show that hybrid measures of wellbeing combining income and expenditure can be useful for such cross-country comparison.

Key words: income, consumption, inequality, China, India

JEL classification: D31, N35, O15

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[1]UNU-WIDER, Helsinki, Finland, corresponding author: gradin@wider.unu.edu; [2]Beijing Normal University, Beijing, China.

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Information and requests: publications@wider.unu.edu

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Katajanokanlaituri 6 B, 00160 Helsinki, Finland

1 Introduction

China has experienced a profound transformation, maintaining impressive economic growth rates during the last decades. This improvement in wellbeing has particularly allowed millions of Chinese to leave extreme poverty, especially in rural areas. During this transition from a highly egalitarian collectivist model to a more open market economy, economic growth has been accompanied by an important rise in income inequality that has taken the form of a growing gap between urban and rural areas, combined with growing inequality within these areas (Luo et al. 2018).

Income inequality increased between the beginning of the 1980s and 2008, based on National Bureau of Statistics (NBS) household surveys (Luo et al. 2018; Ravallion and Chen 2007). Research based on the Chinese Household Income Project (CHIP) consistently points to increasing inequality between 1988, 1995, 2002, and 2007—the years in which the survey was conducted. This trend was followed by a decline in inequality, according to the different available sources, i.e. NBS surveys, CHIP, and the Chinese Family Panel Studies (Luo et al. 2018; Xie et al. 2015. This recent turnaround was likely the result of 'economic forces and government policy tightening labor markets in rural areas, together with government transfer and social policy mitigating inequality in urban and rural areas' (Kanbur et al. 2017: 12).

Income is the main wellbeing indicator used to measure inequality in China, as in other middle-income countries (e.g. Latin America and South Africa). A measure of consumption is more often preferred for the analysis of inequality among other developing countries, such as in Sub-Saharan Africa or South Asia, for a mixture of conceptual and pragmatic reasons. In the absence of liquidity constraints, consumption is assumed to be a better measure of permanent income and is often less under-reported than current income when the total amounts estimated from surveys are compared with the closest aggregates in national accounts.

The choice of income or consumption for measuring inequality might not be innocuous, though. In general, it is expected that expenditure inequality will tend to be lower than income inequality and its trend flatter as the result of consumption smoothing (e.g. Slesnick 2001 for the US), although some empirical evidence shows otherwise (e.g. Gradín et al. 2008 and references therein). There has been an intense debate about whether or not consumption inequality has followed the same long-term increase as income inequality in the last decades in the United States. The evidence is mixed, as recent discussions (e.g. Meyer and Sullivan 2013) suggest, but when complete and consistent measures of income and consumption are used for the entire population and based on the same survey, the long-term trends are pretty similar—although this changed after the Great Recession because of how consumption reacted to income shocks (Fisher et al. 2015).

The evidence for the long-term trend in consumption inequality in China is more limited than in the case of income, because it is not regularly reported by NBS and because of its several comparability problems over time. Among the few studies, Liu and Li (2013) used the CHIP to report an increase in consumption inequality in China (and in its urban areas) between 1988, 1995, and 2002 along with the increase in income inequality, which was, however, followed by a reduction in 2007 (in contrast with the increase in income inequality during the same period).

China represents an interesting case in this regard too, with inequality in expenditure being similar to or higher than in income (e.g. Cai et al. 2010). This is an element to consider when using expenditure for measuring inequality, even if these paradoxical results might be the consequence of measurement error. They could be related to the practical difficulties of estimating consumption from expenditure information, especially for durables and in the presence of infrequent purchases,

combined with the under-reporting of top and more irregular incomes. There are reasons to think that both income and consumption are under-reported in China, as they are in most household surveys all over the world, with some evidence showing that income is more severely underestimated (e.g. Xu 2014), and this has had an important impact on reported inequality levels (Li et al. 2018; Zhang and Zhu 2015; Zhao et al. 2017).

The choice between income and consumption may also affect how we rank countries in terms of inequality. For example, some studies show lower inequality in India compared with other developing countries, including South Africa, Brazil, and China (e.g. Arnal and Forster 2010; CSO 2013). But very often, these comparisons do not consistently use the same indicator of wellbeing for all countries (they are based on consumption for India and on income for the other countries). Here, we show that the ranking of inequality in China and India, the two most populous countries in the world, depends on what indicator is chosen when the same one is used in both countries. Expenditure inequality is higher in China, but income inequality is markedly higher in India. We also show that inequality is still measured as higher in India using different hybrid measures combining both wellbeing indicators, although by a much smaller percentage.

Regardless of the controversy about how the choice of indicator affects the level and trend of inequality, recent research has emphasized the added value of investigating the joint distribution of income and consumption to better understand the evolution of wellbeing, rather than choosing between them (e.g. Attanasio et al. 2010; Fisher et al. 2015):

> If consumption is lower than income, then part of the latter will be available for future consumption. If a change in income is not reflected in a change in consumption, then it is an indication that the household might be able to smooth out that particular income shock. Therefore, the dynamic aspect of individual choices can be only understood by the joint distribution of income and consumption. (Attanasio et al. 2010: 10)

In this context, the aim of this paper is to investigate the joint distribution of income and consumption in China in order to have a better understanding of inequality in wellbeing. For that, we follow a comparative approach, comparing it with India—a country with a very different pattern in which inequality is much lower for expenditure than for income. We investigate the extent to which the difference between the two countries comes from differences in the composition of the population, given that China is a more developed country with a higher level of urbanization, stronger manufacturing and service sectors, and smaller households. Otherwise, it could result more from structural differences in the conditional distribution of wellbeing among the different population groups in each country. To investigate this, we undertake a descriptive analysis of the joint distribution of income and consumption obtained from the same survey in each country, taking a regression-based approach using counterfactual distributions based on the Recentered Influence Function (RIF), combining the average characteristics and the way these characteristics shape inequality in each country.

The structure of the paper is as follows. Section 2 reviews the main results on consumption inequality in China and Section 3 investigates how exceptional China is in the international context. Section 4 presents the data while Sections 5 and 6 discuss the empirical results. The last section concludes.

2 Income and consumption in the study of inequality in China

There is already a large literature on inequality in China. This literature has mostly focused on income. The lack of adequate and consistent measures of expenditure for the entire country and over time might be the reason for the limited research on consumption inequality. Kanbur et al. (2017: table A) provided a list of significant research on inequality trends in China. Out of 24 highlighted papers, only three studies used consumption as the wellbeing measure, all three focusing on geographical inequalities by measuring either average provincial Ginis (Meng et al. 2005) or between-province inequality (Fan et al. 2011; Kanbur and Zhang 2005).

Meng et al. (2005) showed that urban per capita household income was higher than per capita expenditure, with the difference increasing from 12 per cent in 1986 to 20 per cent in 2000 due to increased savings. They also showed that provincial average Ginis in income and consumption increased, especially in the early 1990s, with average inequality being only slightly lower in consumption than in income after the early 1990s, reaching virtually the same level in 2000. Fan et al. (2011) and Kanbur and Zhang (2005) analysed the long-term trend in provincial inequality in China since 1950, highlighting a substantial increase for the last period considered (between 1985 and 2005), characterized by post-rural reform, decentralization, and opening up to trade and foreign direct investment. On the other hand, weighted average Ginis of rural and urban areas (that do not consider between-group inequality) reported in Wang et al. (2014), citing the World Development Indicators, also point to increasing consumption inequality for 1990–2002, followed by stagnation until 2009.

Luo et al. (2018) provided a recent analysis of income inequality, reviewing the existing literature. There is only a limited set of studies that have addressed the analysis of consumption inequality in mainland China or in its rural and urban areas, summarized in Table A1 in the appendix.

Liu and Li (2011, 2013) provide the only case we are aware of that has measured consumption inequality for China as a whole. Using the Theil index and based on the CHIP, they reported a large increase in inequality between 1988, 1995, and 2002, followed by a reduction between 2002 and 2007, ending below the 1995 level. Like income-based studies, they stressed the importance of the urban–rural gap in driving the trend. They also show different trends (with Theil and Gini) for rural and urban China. While inequality in urban areas followed the national trend, this is not the case for rural areas, with increases between 1988 and 1995, and between 2002 and 2007, and a decline in the middle.

Several studies have analysed only urban areas. Using the CHIP, Xia et al. (2017) found a decline in urban per capita consumption inequality between 1995 and 2002, followed by a larger increase between 2002 and 2013. Other research has found more consistent increases in urban consumption inequality over time until the end of the last decade. Ding and He (2018) showed increasing inequality with the CHIP between the years 1995, 2002, and 2007, showing that Gini in consumption was higher than in income. Other research has been based on different samples of the Urban Household Income and Expenditure Survey (UHIES, NBS): Cai et al. (2010) for 1992–2001; Zhao et al. (2017) for 1993–2007 (based on the Engel curve method); and Ding and He (2018) for the 1986–2009 period. Cai et al. (2010) and Ding and He (2018) also showed that inequality was slightly higher in consumption than in income and, notably, followed the same trend over time.

As for the determinants of urban consumption inequality, Xia et al. (2017) stressed the increasing share of inequality explained by housing consumption (the estimated rental value of owner-occupied housing). Cai et al. (2010) showed that only about one-third of the variance in log urban

consumption (or income) can be attributed to observable individual choices and characteristics, among which education has increasing explanatory power while regional differences became less important over time. The relevance of returns to education has increased, driven by structural changes—especially the reforms in the state-owned enterprises system, but also urbanization and globalization. Zhao et al. (2017) highlighted the relevance of inequality in central and western regions, and among households with higher educational levels, as important driving forces as well.

Evidence using the CHIP shows increasing consumption inequality in rural areas over time—for example, between 1988 and 2002 (Qu and Zhao 2008, estimating inequality in per capita terms among households); 1987 and 1999 (Benjamin et al. 2005, using a survey from the Research Center on the Rural Economy); and 2002 and 2013 (Zhu 2018, estimating inequality among individuals). The first two sources showed that the increasing inequality in expenditure has mimicked a similar increase in income inequality, although with lower levels in the case of expenditure.

There are reasons to think that reported income and consumption or expenditure are both underestimated in China. For example, Xu (2014) showed that income and expenditure in the national accounts were 43 and 17 per cent higher, respectively, than in NBS household surveys. Zhang and Zhu (2015) estimated that consumption was about 60 per cent of GDP, about ten percentage points higher than reported by official statistics, but still lower than other countries' average and with levels like those previously experienced by other fast-growing economies. Zhao et al. (2017) pointed out that consumption inequality was much higher than reported in original sources after correcting for measurement error using the Engel curve method, and that under-reporting of consumption expenditure was more evident for households with higher incomes since 2002. Some studies have also shown significantly higher levels of income inequality after correcting the downward bias in the reporting of top incomes (e.g. Li et al. 2018 and referred literature). Notably, Ding and He (2018) showed that the strong co-movement between income and consumption inequality over time is robust to using alternative definitions of income and consumption and to correcting measurement error problems in consumption data, among other robustness checks.

3 How exceptional is China?

It is a well-known fact that inequality tends to be higher in income than in consumption. The rationale for this is that in the absence of liquidity constraints, households smooth their consumption over time, compensating periods of low-income borrowing against future earnings, or using the savings accumulated during better periods. Income tends to be quite irregular, especially in developing countries with high levels of subsistence agriculture, informality, casual or seasonal jobs, and self-employment. Furthermore, the richest households are expected to keep more savings, and their luxury consumption is hardly captured in surveys, helping to substantially compress the expenditure distribution at the top. China departs from this expected pattern of consumption inequality being below the level of income inequality, but it is important to understand how exceptional this fact is.

The case that has been most extensively analysed, the US, follows the expected pattern—with income more unequally distributed than consumption (e.g. Fisher et al. 2015 and its review of the literature). However, there is also evidence that in some other countries a measure of consumption or expenditure is more unequally distributed than income (e.g. Ayala et al. 1993 for Spain; Éltetö and Havasi 2004 for Hungary; Harding and Greenwell 2002 for Australia). Even the lower variability of expenditure over time is not always confirmed in empirical work using longitudinal data (e.g. Gradín et al. 2008 for Spain). Regarding the developing world, the World Bank (2016)

has recently assessed the effects of using income or consumption surveys in Eastern Europe and Central Asia, where it was possible to measure Gini indexes for both welfare aggregates in 2013. Consumption-based Gini indexes are shown to be lower than income-based Gini indexes, although the ranking of countries and trends over time was robust.

We investigate this further using the World Income Inequality Database (WIID 4, 19 December 2018). WIID is a database held at the United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki, that provides cross-country information on inequality (Gini and quantile shares; about eleven thousand observations) obtained from secondary sources, including research studies (23 per cent of all observations), the World Bank (21 per cent), OECD (12 per cent), National Statistical Authorities (12 per cent), the UN (mostly ECLAC, the Economic Commission for Latin America and the Caribbean, and UNICEF; 11 per cent), LIS (Luxembourg Income Study; 10 per cent), SEDLAC (Socio-Economic Database for Latin America and the Caribbean; 7 per cent), Eurostat (5 per cent), and other international organizations (1 per cent).

In a revision of the collection of Ginis since 1980, reported in Table 1, we identified 3,018 cases in which inequality was based on income and 1,141 cases based on consumption. A case is defined here as the Gini for a given year, country area (rural, urban, or total), sharing unit, equivalence scale (per capita, equivalent scale, unadjusted), and resource (income or consumption).[1] When there is more than one reported Gini per case, the average is computed. The larger number of cases using income reflects the usual practices in measuring inequality, but varies regionally. Income predominates, especially in Latin America and the Caribbean, but also in Europe and Central Asia and in North America. It is also used in the majority of cases, but to a much lower extent, in the East Asia and Pacific region (but more clearly in China). Consumption is predominant, however, in Sub-Saharan Africa, the Middle East and North Africa, and South Asia.

The average level of Gini for income is 0.397—that is, 7 per cent higher than for consumption, 0.370 (Table 2). The standard pattern of average income Gini being substantially higher than average consumption Gini can be found in North America, Sub-Saharan Africa, and South Asia (the ratio being 1.20 or higher). Income inequality is also 13 per cent higher in Latin America and the Caribbean, but similar to consumption inequality in the East Asia and Pacific region and even lower in the case of Europe and Central Asia (by 4 per cent). But this is partly the result of the different country composition used to estimate each indicator.

[1] We give preference to net income; gross income is used only when the former is not available. Similarly, we give preference to per capita income, or, if this is not available, to equivalized income; unadjusted income is used only if these adjustments are not available.

Table 1: Number of cases, with Gini of income and consumption, in WIID (1980 onwards)

	All		Income		Consumption		Both		Only income		Only consumption	
Region	N	%	N	%	N	%	N	%	N	%	N	%
East Asia & Pacific	487	12.8	321	10.6	219	19.2	53	14.9	268	10.1	166	21.1
China	119	3.1	102	3.4	47	4.1	30	8.5	72	2.7	17	2.2
Europe & Central Asia	1,498	39.4	1,297	43.0	392	34.4	191	53.8	1,106	41.5	201	25.6
Latin America & Caribbean	1,149	30.2	1,103	36.5	81	7.1	35	9.9	1,068	40.1	46	5.9
Middle East & North Africa	132	3.5	53	1.8	82	7.2	3	0.8	50	1.9	79	10.1
North America	113	3.0	113	3.7	16	1.4	16	4.5	97	3.6	0	0.0
South Asia	133	3.5	50	1.7	99	8.7	16	4.5	34	1.3	83	10.6
India	42	1.1	2	0.1	41	3.6	1	0.3	1	0.0	40	5.1
Sub-Saharan Africa	292	7.7	81	2.7	252	22.1	41	11.5	40	1.5	211	26.8
Total	3,804	100	3,018	100	1,141	100	355	100	2,663	100	786	100
% total			79.3		30.0		9.3		70.0		20.7	

Notes: A case is defined as the Gini for a given year, country area (rural, urban, or total), sharing unit, equivalence scale (per capita, equivalent scale, unadjusted), and resource (income or consumption).

Source: Authors' construction based on WIID 4.

Table 2: Gini of income and consumption in WIID (1980 onwards)

	All cases			Both (income and consumption)				Only one	
Region	Income	Consumption	Ratio	Income	Consumption	Ratio	% cases* (ratio > 1)	Income	Consumption
East Asia & Pacific	0.361	0.357	1.01	0.404	0.375	1.07	60.4	0.352	0.351
China	0.341	0.341	1.00	0.245	0.340	1.02	40.0	0.339	0.341
Europe & Central Asia	0.311	0.325	0.96	0.353	0.331	1.07	68.1	0.304	0.320
Latin America & Caribbean	0.501	0.442	1.13	0.536	0.450	1.20	97.1	0.500	0.435
Middle East & North Africa (Egypt & Jordan)	0.343	0.367	0.93	0.472	0.385	1.23	100	0.335	0.367
North America (US)	0.367	0.288	1.27	0.375	0.288	1.30	100	0.366	
South Asia	0.412	0.338	1.22	0.440	0.347	1.28	100	0.399	0.336
India	0.510	0.326	1.57	0.515	0.355	1.45	100	0.505	0.325
Sub-Saharan Africa	0.556	0.445	1.25	0.600	0.502	1.20	87.8	0.511	0.434
Total	0.397	0.370	1.07	0.413	0.368	1.12	75.2	0.395	0.370

Notes: Cases as defined in Table 1. The ratio is Gini in income divided by Gini in consumption. * Cases with ratio < 1 are shown in Table 3.

Source: Authors' construction based on WIID 4.

Table 3: Cases with Gini higher in consumption than in income

Region	Case
East Asia & Pacific	Rural/urban China (1990–2010), China (2002), Indonesia (2012), Philippines (1985), Singapore (1993)
Europe & Central Asia	Belarus (1995–2006), Bulgaria (1989), Croatia (2009), Estonia (1997, 2004), Hungary (1993, 1997–2007), Latvia (1997), Lithuania (1997, 2003, 2004, 2008), Macedonia (1997, 2002–06, 2008), Poland (1990, 1992, 2008–09, 2015), Portugal (1980, 1990), Russia (1993, 2004, 2007, 2010, 2013), Slovakia (2004–08), Slovenia (1998, 2002–03), Spain (2002, 2003)
Latin America & Caribbean	Mexico (1984)
Sub-Saharan Africa	Botswana (1994, 2003), Ethiopia (2011), Nigeria (1980, 1986)

Notes: Cases as defined in Table 1.

Source: Authors' construction based on WIID 4.

When we restrict the average to the 355 cases in which Gini is reported for both income and consumption in the same year, however, average Gini is strictly higher for income in all regions, but with a high heterogeneity. The average ratio (income Gini/consumption Gini) is 1.12, ranging from only 1.07 in the East Asia and Pacific region and in Europe and Central Asia, to 1.30, or close to 1.30, in North America and South Asia, reaching intermediate levels of 1.23 in the Middle East and North Africa and 1.20 in Latin America and the Caribbean and Sub-Saharan Africa. There is also some heterogeneity across countries. All cases in three regions (South Asia, North America, and the Middle East and North Africa) and almost all in another (Latin America and the Caribbean, except Mexico in 1984) follow the expected pattern of inequality being higher for income. The same occurs in 88 per cent of the cases in Sub-Saharan African and 68 per cent in Europe and Central Asia, with the lowest percentage, 60 per cent, found in East Asia and the Pacific. The cases that do not follow this rule are detailed in Table 3, with China standing out (40 per cent of the Chinese cases, shown in more detail in Table A2), along with some countries in Eastern Europe. The other side of the coin is South Asian countries, including India in the same source and year used in our study, which seem to be the best representation of the rule.

4 Survey data for China and India

We use the 2013 wave of the CHIP for China. This survey has five waves, covering income and expenditure information in 1988, 1995, 2002, 2007, and 2013, and was conducted by Chinese and international researchers, with assistance from the NBS (see Griffin and Zhao 1993; Gustafsson et al. 2008; Li et al. 2013; Riskin et al. 2001). The CHIP surveys are closely related to the NBS household survey and contain surveys of urban and rural households (only the 2002 and 2007 surveys include a survey of rural-to-urban migrants). For 2013, the survey includes information for about 58,000 individuals.

For India, we use the 2011/12 India Human Development Survey-II (IHDS-II) obtained from the Inter-University Consortium for Political and Social Research at the University of Michigan. This is a nationally representative, multi-topic survey of 204,569 individuals, covering 1,503 villages and 971 urban neighbourhoods across India. It is produced by the National Council of Applied Economic Research at New Delhi and the University of Maryland. It mostly consists of re-interviews in 2011/12 of households from the first survey wave (2004/05), with an additional replacement sample.

The main variables of interest are per capita disposable income and per capita expenditure. The magnitudes collected in the surveys are quite comparable across both countries in terms of components.

Disposable income includes take-home wages and salaries (including meals, housing, or bonuses), net business income, net property income, and pensions and other cash benefits. In the Chinese comparable version, it excludes imputed housing rents, not available in India. In the case of India, 'wages' refers to take-home income, while in China there is more detailed information available on gross wages, personal income taxes, and social contributions. 'Expenditure' refers to food and non-food items such as clothing, housing, mortgage payments, communications and transportation, education, health care, and other services, excluding insurance premiums (which are not available for China). The Chinese comparable version excludes owner housing rent (not available for India).

The income and expenditure reference period is the year in both countries, although coming from different timeframes for different items.

Both countries include negative- and zero-income values, especially in rural areas, although they are more frequent in India (around 1.4 per cent of individuals) than in China (0.4 per cent). There are no zero-consumption levels in India, and only a tiny proportion in China (0.015 per cent). They will be used in the analysis. We are using sampling weights in estimates for both countries. In China they are constructed so to reproduce the total population by rural and urban areas for each of the three geographical regions (see Yue and Sicular 2016).

In the analysis we will consider several household-level characteristics that might determine household economic opportunities and thus income and expenditure. The geographical variables include area of residence—urban (including migrants in China) or rural—and region. For the latter, we use the three large Chinese regions for which CHIP is representative: East, Central, and Western. For comparability, we collapse Indian geographical regions into three large categories with different degrees of development: North and North East, South and West, and Central and East. We consider information regarding the number of members in the household and the presence of children. We also consider several characteristics of the household head, such as sex, age group, marital status (married or not), migration, education, and industry. Migration includes two variables, inter-provincial (inter-state) and rural-to-urban migration, based on family origin in India and Hukou registration in China. Education is distinguished into three main categories (primary, or up to nine years of schooling, secondary, and college). Industry distinguishes between sector of waged or salaried work (primary; manufacturing; construction, mining, and energy; services) and other (i.e. other type of work, missing information, not working). In the case of China, we also include membership of the Communist Party in some cases.

5 The distribution of income and expenditure

5.1 Levels of inequality

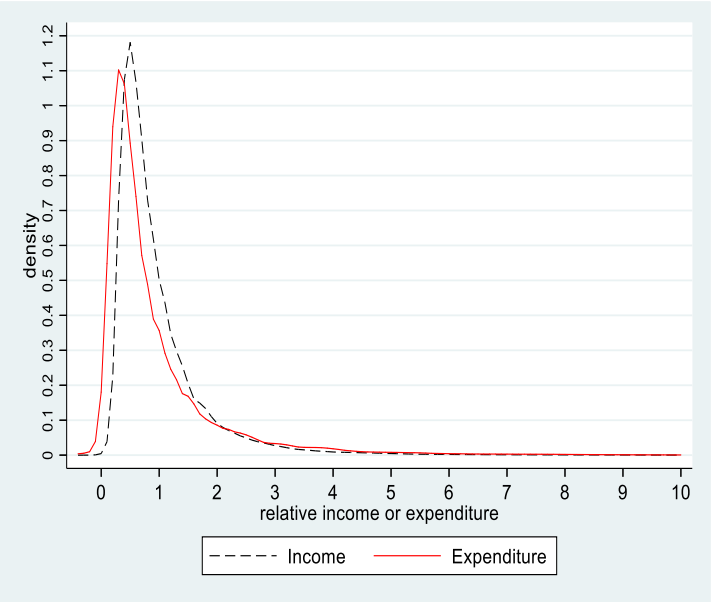
China and India are outstanding examples of countries with different patterns in the relationship between consumption and income inequality, as discussed in Section 3. Figures 1a and 1b show the corresponding densities for comparable income and expenditure, Figure 1c those for the unadjusted variables in China (thus including imputed housing rent, which has been identified as an important element of inequality). Table 4 (Columns 1 and 2) reports the Gini indices for the country and for rural and urban areas.

Inequality in income is 38 per cent higher than in expenditure in India overall, and is higher in both urban and rural areas. However, inequality in income is only 2 per cent higher than in expenditure in China,[2] being also 10 per cent higher in rural China, but 8 per cent lower in urban areas. Expenditure inequality in urban areas is slightly higher than in rural areas in both countries (1 per cent in India, 4 per cent in China), while income inequality is highest in rural areas (7 per cent in India, 14 per cent in China).

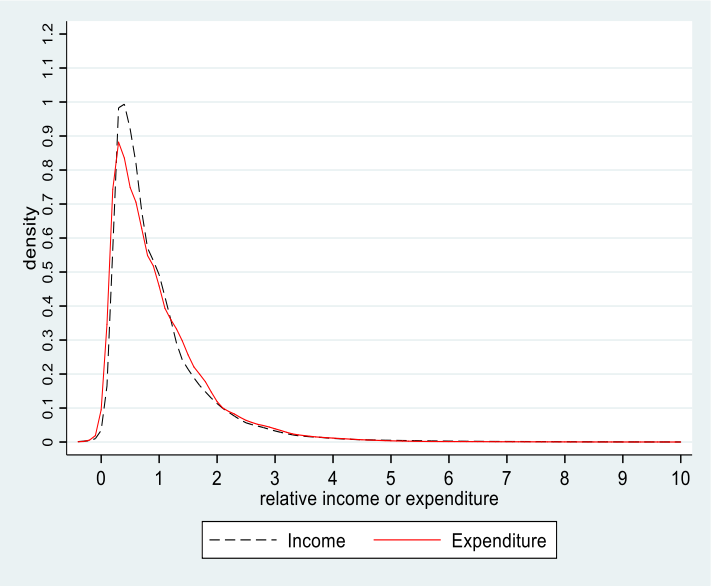
[2] According to our estimates for China using unadjusted income and expenditure, inequality in income was about 5 per cent lower than in expenditure (0.450 versus 0.474) in 2002, 3 per cent in urban areas and 2 per cent in rural areas. Between 2002 and 2013 there was a reduction in expenditure inequality (but an increase in urban areas) that contrasts with the stability in income inequality for the country as a whole (although with increases in both rural and urban areas, compensated by a lower urban–rural gap).

Figure 1: Income and expenditure distribution

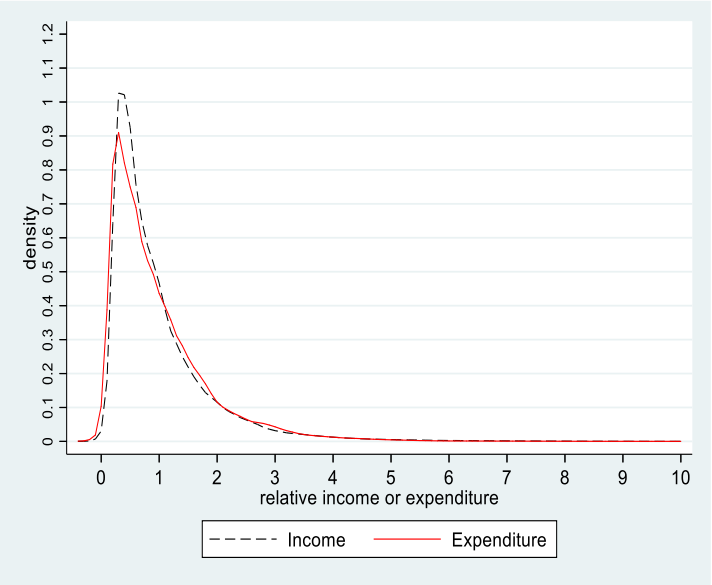
1a: India, 2011



1b: China (comparable with India), 2013



1c: China (unadjusted), 2013



Source: Authors' construction using IHDS and CHIP.

Table 4: Gini index of income, expenditure, and hybrid measures of wellbeing in India (2011) and China (2013)

	Income or expenditure			Hybrid measures		
India	Expenditure (1)	Income (2)	Ratio (2)/(1)	Minimum	Maximum	Mean
Total	0.394	0.543	1.38	0.444	0.452	0.432
Urban	0.376	0.496	1.32	0.399	0.432	0.406
Rural	0.374	0.532	1.42	0.424	0.428	0.405
China						
Total	0.431	0.439	1.02	0.433	0.425	0.415
Urban	0.384	0.355	0.92	0.373	0.352	0.343
Rural	0.368	0.404	1.10	0.364	0.379	0.357

Source: Authors' construction using IHDS and CHIP.

This cross-country variation in inequality measured with both types of resource is a very important factor to consider when assessing which country has more inequality. Inequality is 24 per cent higher in India than in China according to income, but 9 per cent higher in China than in India according to consumption. Something similar is found if we compare urban and rural areas across countries. Urban expenditure inequality is only slightly higher in China than in India, and rural expenditure inequality is slightly higher in India (by 2 per cent in both cases). However, income inequality is much higher in India in both cases (40 and 32 per cent in urban and rural areas, respectively). The larger urban–rural gaps in average income and expenditure found in China, as will be discussed later, substantially reduce the differential in income inequality between the countries and, along with its higher level of urbanization, make China overall more unequal than India in terms of expenditure.

5.2 Income and expenditure shares

A brief analysis of income and expenditure shares in India and China helps to explain the cross-country difference in terms of inequality.

The distribution of relative expenditure by deciles looks very similar in both countries (Table 5, first panel). Expenditure is more equally distributed in India than in China because the shares are slightly higher below the median and lower above. Only in the ninth decile is the cross-country difference greater than one percentage point. The top of the expenditure distribution, which usually has the largest contribution to inequality (e.g. Gradín 2018b), is similar in both countries: a 31–32 per cent share of the richest 10 per cent, and around 21 per cent of the top 5 per cent.

In contrast, the distribution of income by deciles substantially differs between these two countries, with the most striking differences at the top (Table 5, second panel). Income shares are smaller in India than in China below the ninth decile (by at most two percentage points), and higher only in the top 10 per cent of the population, although with a large 11-percentage-point differential (the decile share is 42 per cent in India and 31 in China). The differential is as great as ten percentage points in the top 5 per cent (share of 29 per cent compared with 19). Thus, while there are only minor differences between the income and consumption shares in China, income is much more unequally distributed than consumption in India, with a notable concentration of income in the top 5 per cent.

Table 5: Income and expenditure shares by decile in India (2011) and China (2013)

	% Expenditure				% Income			
	Comparable			Unadjusted	Comparable			Unadjusted
Quantiles	India	China	Diff.	China	India	China	Diff.	China
Bottom 5%	1.2	0.7	0.5	0.8	−0.1	0.3	−0.4	0.3
D1	2.8	1.9	0.9	1.9	0.6	1.3	−0.7	1.2
D2	4.0	3.2	0.8	3.1	2.2	2.8	−0.6	2.7
D3	4.9	4.2	0.7	4.1	3.2	4.0	−0.8	3.8
D4	5.8	5.3	0.5	5.1	4.1	5.3	−1.1	5.1
D5	6.7	6.5	0.2	6.4	5.2	6.7	−1.5	6.5
D6	7.9	8.0	−0.1	8.0	6.5	8.4	−1.9	8.3
D7	9.5	9.9	−0.4	9.9	8.4	10.5	−2.0	10.4
D8	11.7	12.4	−0.7	12.5	11.3	13.2	−1.9	13.2
D9	15.4	16.6	−1.2	16.9	16.6	17.2	−0.6	17.4
D10	31.3	32.0	−0.6	32.1	41.8	30.8	11.0	31.5
Top 5%	20.7	20.6	0.1	20.5	29.1	19.3	9.8	19.7
Total	100	100	0.0	100	100	100	0.0	100

Source: Authors' construction using IHDS and CHIP.

5.3 Joint distribution of income and expenditure

Given that income and expenditure are consistently reported in both countries in the same survey, it is possible to analyse the joint distribution, revealing significant differences. For this, Table 6 reports some summary indices.

Table 6: Indices of persistence between expenditure and income in India (2011) and China (2013)

Index	India			China Comparable			China Unadjusted		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
Pearson linear correlation	0.404	0.476	0.280	0.674	0.644	0.457	0.737	0.708	0.498
Pearson log-linear correlation	0.557	0.570	0.472	0.738	0.685	0.597	0.783	0.744	0.621
Spearman rank correlation	0.557	0.587	0.478	0.736	0.703	0.603	0.779	0.768	0.627
Gini correlation (x, F(y))	0.591	0.601	0.503	0.788	0.743	0.639	0.834	0.801	0.668
Gini correlation (y, F(x))	0.660	0.673	0.579	0.777	0.720	0.638	0.828	0.785	0.667

Source: Authors' construction using IHDS and CHIP.

Income and expenditure are more strongly correlated in China than in India; the cross-country difference is proportionally larger among levels (Pearson linear correlation is 0.674 compared with 0.404 in India) than among logs (0.738 in China compared with 0.557 in India) or ranks (Spearman correlation 0.736 in China compared with 0.557 in India). This indicates that the countries diverge in how the two variables consistently rank individuals, as well as in the magnitude of income–expenditure differentials across individuals (especially among the richest). Correlation between income and expenditure is much stronger in urban than in rural areas, but the between-country gap is larger in the latter case because linear correlation is particularly weak in rural India (0.280).

The Gini correlation indices (Schechtman and Yitzhaki 1987) provide a measure of association between the level of one of the variables and the rank (cumulative distribution F_{x_i}) of the other. For two random variables x_1 and x_2, $\Gamma(x_1, x_2) = Cov(x_1, F_{x_2}(x_2))/Cov(x_1, F_{x_1}(x_1))$, or equivalently, the ratio between the Gini concentration index of x_1 sorted by x_2 and the Gini index of x_1. These measures, also reported in Table 6, reveal that correlation in India is stronger between the level of income and the rank of expenditure (the extent to which income tends to be higher for people with higher expenditure ranks) than between the level of expenditure and the rank of income (the extent to which expenditure tends to be higher for people with higher income ranks). This asymmetry is not found in China, where the two Gini correlation indices are very similar. The stronger relationship between the levels and ranks of income and consumption in China compared with India is further investigated below in different complementary ways.

Table 7 displays the mean relative income and consumption for different expenditure percentile ranges. It shows that the relative expenditure of the top 5 per cent is very similar in both countries (about 4.1 times the average). Their mean income, however, is slightly smaller in China (3.9 times the average) but much higher in India (5.8 times).

The analysis of the transition matrices in Tables 8a–c, with Table 9 providing some summary statistics, allows us to focus instead on rank persistence at different points of the joint distribution of income and expenditure. On average, 28 per cent of Chinese remain in the same decile when shifting between income and consumption, compared with only 20 per cent in India. The proportions rise to 63 per cent in China and 48 per cent in India when persistence refers to the same or adjacent deciles. The most striking difference between the countries, once again, can be found at the extremes—in this case especially at the bottom. About 46 and 57 per cent of Chinese people remain in the same bottom and top decile respectively, compared with only 25 and 45 per cent in India.

Table 7: Relative mean income and expenditure by expenditure percentile ranges in India (2011) and China (2013)

	Average relative expenditure				Average relative income			
		Comparable		Unadjusted		Comparable		Unadjusted
Expenditure percentile	India	China	Differential	China	India	China	Differential	China
Bottom 5%	0.23	0.14	0.09	0.15	−0.02	0.07	−0.09	0.06
6–25	0.40	0.32	0.08	0.31	0.22	0.28	−0.06	0.26
26–75	0.76	0.76	0.00	0.75	0.62	0.78	−0.16	0.77
76–95	1.61	1.73	−0.11	1.76	1.77	1.78	−0.01	1.81
Top 5%	4.14	4.12	0.02	4.09	5.81	3.86	2.0	3.93
Total	1	1	0	1	1	1	0	1

Source: Authors' construction using IHDS and CHIP.

Table 8: 'Transition' matrices between income and expenditure

8a: India (2011)

		Income decile										
		1	2	3	4	5	6	7	8	9	10	Total
Expenditure decile	1	24.7	24.8	18.4	12.1	9.5	4.7	3.0	1.5	0.9	0.5	100
	2	18.6	18.7	17.0	13.3	11.2	8.9	5.5	4.3	2.0	0.5	100
	3	11.2	16.0	15.9	14.2	11.6	11.8	9.3	5.4	3.7	0.8	100
	4	8.6	10.9	13.2	13.7	15.0	13.5	10.5	8.1	4.7	1.8	100
	5	8.1	9.6	10.8	12.8	13.3	12.4	13.6	10.1	6.9	2.4	100
	6	6.8	6.5	8.6	11.1	12.5	13.4	13.8	13.9	9.8	3.6	100
	7	7.0	5.3	5.7	8.2	9.8	13.0	14.4	15.3	13.6	7.8	100
	8	5.8	3.4	5.0	6.9	7.5	11.0	12.8	16.3	18.2	13.2	100
	9	4.8	2.6	3.1	5.2	6.3	7.2	10.1	14.2	22.1	24.2	100
	10	4.4	2.0	2.4	2.5	3.3	4.2	7.0	11.1	18.2	45.1	100
	Total	100	100	100	100	100	100	100	100	100	100	

8b: China (2013) (comparable)

Expenditure decile	Income decile 1	2	3	4	5	6	7	8	9	10	Total
1	45.8	23.1	12.7	8.2	4.7	1.8	1.7	1.1	0.4	0.5	100
2	21.0	28.5	20.1	12.2	8.1	5.4	2.2	1.3	0.6	0.5	100
3	14.0	20.8	22.0	16.4	9.7	6.9	6.0	2.4	1.4	0.5	100
4	7.4	12.6	19.1	18.8	16.4	12.5	6.1	3.6	1.9	1.6	100
5	4.1	6.6	12.3	18.0	17.0	15.6	12.1	8.3	4.1	1.8	100
6	3.3	4.1	6.6	12.9	17.8	18.8	15.6	10.9	8.0	2.3	100
7	1.3	2.2	4.9	7.6	14.3	17.0	20.1	15.8	12.3	4.5	100
8	1.5	1.3	1.1	2.9	7.7	14.0	19.7	24.0	19.1	8.7	100
9	0.9	0.5	0.8	1.8	3.2	5.3	12.4	23.7	28.8	22.8	100
10	0.8	0.2	0.5	1.2	1.1	2.7	4.1	9.0	23.5	56.9	100
Total	100	100	100	100	100	100	100	100	100	100	

8c: China (2013) (unadjusted)

Expenditure decile	Income decile 1	2	3	4	5	6	7	8	9	10	Total
1	47.1	25.1	13.4	7.9	4.2	1.1	0.7	0.2	0.1	0.2	100
2	22.4	31.1	20.5	12.2	6.9	3.7	1.9	0.7	0.4	0.2	100
3	12.7	20.5	22.9	17.6	10.6	7.7	4.9	2.0	0.6	0.4	100
4	6.3	11.1	20.8	21.3	17.4	12.4	5.2	3.9	0.8	0.7	100
5	4.7	6.0	11.5	18.2	20.8	15.4	11.9	7.5	3.3	0.8	100
6	2.4	3.4	6.4	12.7	19.2	20.0	17.3	9.7	7.3	1.7	100
7	2.1	1.5	3.0	5.8	11.4	21.0	22.0	18.3	11.5	3.5	100
8	1.2	0.8	0.9	2.5	6.5	11.8	20.2	28.3	20.1	7.7	100
9	0.6	0.4	0.4	0.9	2.2	5.1	12.8	22.8	33.2	21.6	100
10	0.6	0.2	0.4	1.0	0.8	1.6	3.1	6.6	22.5	63.3	100
Total	100	100	100	100	100	100	100	100	100	100	

Source: Authors' construction using IHDS and CHIP.

The smaller persistence among indicators in India goes in both directions but is substantially stronger between low-income and high-consumption ranks. Although the expenditure distribution is similar in both countries, 15 per cent of Indians in the top expenditure decile have an income falling below the median (6 per cent fall in the first two income deciles), compared with only 4 per cent of Chinese (1 per cent in the bottom 20 per cent). In the opposite direction (low consumption with high income), the population in the bottom expenditure decile having an income above the median is 10 per cent in India, but less than 5.5 per cent in China. These discrepancies among indicators cannot be attributed solely to savings.

Table 9: Summary transition matrix between income and expenditure

	India (2011)	China (2013)	
% population …		Comparable	Unadjusted
remaining in same decile	19.8	28.1	31.0
remaining in same or adjacent decile	48.4	62.6	67.1
in bottom 10% expenditure with income …			
above median	10.5	5.5	2.4
in top 20%	1.4	0.9	0.4
in top 10% expenditure with income …			
below median	14.7	2.8	3.8
in bottom 20%	6.4	1.0	0.7

Source: Authors' construction using IHDS and CHIP.

Finally, Table 10 helps to characterize the population with a mismatch between income and consumption ranks using a multinomial logit of the probability of falling into three possible groups—low expenditure/high income, low income/high expenditure, and other (the base outcome)—with 'low' and 'high' defined here as the bottom and top 40 per cent respectively.

People with high expenditure and low income represent close to 3 per cent of the Chinese population. Compared with the base outcome, they are more likely to live in rural areas or be migrants, live in the most developed region (Eastern), live in smaller and childless households with an unmarried male head, be middle-aged (35–44), have only primary education, and not be employed in the non-primary sector. People with low expenditure and high income (another 3.2 per cent of the population) also tend to live in smaller households with a head with primary education in Eastern China, but in this case they tend to live in urban areas, being rural-to-urban migrants, with older household heads, and to be employed in the primary sector.

The case of India is similar, but differs in various aspects. Both groups are larger than in China (7.4 and 6.2 per cent of the population, respectively) and tend to live in rural areas in the South and West region and to be non-migrants. People with high expenditure and low income are more likely to live in smaller households with a head aged 45–54 (as in China), but also to have secondary education, to be employed in the primary sector, or to not be employed in wage labour. People with low expenditure and high income tend to have older household heads with only primary education, as in China, and to be employed in the construction or primary sectors, in larger households without children. That is, the lower level of development of India compared with China might be responsible, to some extent, for the larger prevalence of this mismatch between income and consumption, particularly in a sector of the population reporting, for whatever reason, low expenditure and high income. This will be explored in more detail in the next section.

Table 10: Multinomial logit for low and high income and expenditure ranks in India (2011) and China (2013)

	India		China	
	Low expenditure/ high income	High expenditure/ low income	Low expenditure/ high income	High expenditure/ low income
Urban area	−0.153***	−0.470***	0.361***	−0.650***
Region				
2 S&W (Ind.); Central (Ch.)	0.317***	0.495***	−0.253***	−0.203***
3 C&E (Ind.); Western (Ch.)	−0.137***	−0.175***	−0.675***	−0.191***
Migration				
Inter-provincial migration	−0.322***	−0.225***	−0.126	0.235**
Rural-to-urban migration	−0.286***	−0.068*	0.210***	0.363***
Age				
35–44	−0.088*	0.103**	0.096	0.417***
45–54	0.100**	0.135***	0.333**	0.317**
55+	0.304***	−0.161***	0.418***	−0.286*
Female (head)	0.039	-0.103	0.053	−0.381***
Married (head)	−0.214***	−0.020	0.110	−0.313***
Education (head)				
Secondary	−0.249***	0.066*	−0.265***	−0.181**
College	−0.615***	−0.227***	−0.677***	−0.777***
Sector (head)				
Manufacture	0.023	−0.404***	−0.537***	0.548***
Construction, M&E	0.097**	−0.144***	−0.589***	0.647***
Services	0.008	−0.384***	−0.234*	0.401**
Other	−0.503***	0.542***	−0.356***	0.698***
Household size				
5–6	0.154***	−0.326***	−0.106	−0.089
7–8	0.267***	−0.647***	−0.755***	−1.114***
9+	0.814***	−0.610***	−15.318***	−15.460***
Household with children	−0.049*	−0.034	−0.048	−0.149*
Intercept	−2.534***	−2.302***	−3.291***	−3.311***
% population	6.2	7.4	3.2	2.9
N	204,535	204,535	58,494	58,494

Notes: Low = bottom 40%; high = top 40%. Base outcome: similar expenditure and income (86.3% in India and 93.9% in China), whether low, high, or intermediate. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' construction using IHDS and CHIP.

5.4 Hybrid measures of inequality

In this context, the use of hybrid measures of income and expenditure might be a reasonable alternative to the choice between the two, especially when it comes to cross-country comparisons.

Along with the standard measures, Table 4 also reports inequality measures based on the joint distribution of income and expenditure.

The first measure is a measure of the minimum amount of resources available to the household (minimum between income and expenditure); the other two measures are the corresponding maximum and average values. Inequality is consistently higher in India than in China on all three hybrid measures, indicating that the inequality effect of income dominates over that of expenditure when the two are combined. However, the cross-country differential is much smaller (3–6 per cent) than it is using income alone (24 per cent). The fact that adding expenditure information to income has a larger equalizing impact in India than in China, especially in rural areas, is not surprising given the larger share of its population with low levels of one indicator but high levels of the other, as discussed above.

6 Determinant factors of the income and expenditure distributions

6.1 Cross-country differences in characteristics and in socioeconomic inequalities

The different ways in which income and expenditure are distributed in China and India might be, at least to some extent, the result of the different composition of the population in each country, as might be implied from the preceding analysis. China is at a later stage of development in terms of urbanization, economic structure, and the population's access to education. Despite some limitations imposed on internal mobility through a registration system (the Hukou), China has experienced a more intense rural-to-urban migration triggered by the rapid growth of the urban manufacturing and service sectors during the transition from a planned to a market economy.

Indeed, according to the population shares reported in Table 11 (first two columns), larger shares of the Chinese population are living in urban areas (54 per cent, versus only 32 per cent in India) and in the most developed region (East), as well as in households whose head has attained higher education or is employed in the service or manufacturing sectors. China and India also differ in household size and composition, whether as a result of the former's higher levels of development, population ageing, cultural background, or the one-child policy. More specifically, Chinese are more likely than Indians to live in smaller and childless households. Only 17 per cent live in households with children and 30 per cent live in households with five or more members (about half of the corresponding Indian shares). Similarly, Chinese are also more likely to live in households whose head is middle-aged, female, or married.

Alternatively, the divergence between the countries could be the result of the different conditional distribution of income and expenditure both within and between the different population groups. These differences could be the result of persistent historical inequalities (e.g. the caste system in India), how remote areas were integrated into the national market (e.g. public infrastructure), or the different paths followed to liberalize the economy during the last decades and to open markets to foreign investment and trade. These initial inequalities in market income are modified by the limited redistributive effect of taxation and other social policies (e.g. employment guarantee schemes in India, China's rural dibao cash transfer programme, etc.).

In particular, China and India are both characterized by large geographical and socioeconomic inequalities between population groups, but there are notable differences in their magnitudes. Table 11 (Columns 3–10) reports the average values of per capita income and consumption for different population groups. While China stands out for its urban–rural gap and for several demographic inequalities (by household size, sex of household head, and marital status), India

stands out for its gaps across regions and socioeconomic characteristics, such as education or economic sector, especially when it comes to income.

Table 11: Population shares and per capita income and expenditure by household characteristics in India (2011) and China (2013)

	Population		Expenditure				Income			
	India	China	India		China		India		China	
Area	%	%	Mean	Share	Mean	Share	Mean	Share	Mean	Share
Rural	68.4	46.0	0.84	57.5	0.60	27.7	0.76	52.1	0.54	24.8
Urban	31.6	54.0	1.34	42.5	1.34	72.3	1.51	47.9	1.39	75.2
Region										
1 N&NE (Ind.); East (Ch.)	17.1	41.7	1.25	21.3	1.21	50.6	1.38	23.5	1.26	52.7
2 S&W (Ind.); Central (Ch.)	35.3	31.7	1.21	42.7	0.85	26.8	1.21	42.6	0.84	26.6
3 C&E (Ind.); Western (Ch.)	47.6	26.6	0.76	36.0	0.85	22.6	0.71	33.9	0.78	20.8
Inter-provincial migration (head)										
No	97.5	96.2	1.01	98.4	1.01	97.6	1.01	98.9	1.02	98.1
Yes	2.5	3.8	0.64	1.6	0.64	2.4	0.45	1.1	0.51	1.9
Urban to rural migration (head)										
No	91.4	75.9	0.96	87.7	0.96	72.5	0.94	85.8	0.94	71.0
Yes	8.6	24.1	1.43	12.3	1.14	27.5	1.65	14.2	1.20	29.0
Communist Party (head)										
No		82.9			0.93	77.3			0.92	76.7
Yes		17.1			1.33	22.7			1.37	23.3
Education (head)										
Primary (<10 years)	76.0	66.0	0.85	64.4	0.76	50.0	0.76	57.7	0.75	49.3
Secondary	17.5	20.2	1.32	23.0	1.19	24.1	1.43	24.9	1.21	24.3
College	6.5	13.8	1.94	12.6	1.87	25.9	2.67	17.3	1.91	26.4
Industry (head)										
Primary	15.1	3.4	0.74	11.1	0.66	2.3	0.58	8.8	0.69	2.4
Manufacture	8.9	12.0	0.97	8.7	1.05	12.6	1.00	9.0	1.07	12.9
Construction/mining/energy	15.6	14.9	0.70	10.9	0.76	11.2	0.65	10.0	0.70	10.5
Services	15.0	37.4	1.30	19.6	1.27	47.3	1.56	23.4	1.28	48.0
Other	45.4	32.3	1.09	49.7	0.82	26.6	1.08	48.8	0.81	26.2
Sex (head)										
Male	88.3	83.5	1.00	88.0	0.93	77.8	1.00	88.6	0.93	77.4
Female	11.7	16.5	1.02	12.0	1.35	22.2	0.98	11.4	1.37	22.6
Age (head)										
<35	11.9	8.7	0.80	9.5	1.32	11.6	0.70	8.4	1.33	11.6
35–44	24.2	24.9	0.93	22.6	1.05	26.2	0.82	19.8	1.04	25.8
45–54	26.6	31.4	1.11	29.5	1.00	31.3	1.12	29.8	0.98	30.9
55+	37.3	35.0	1.03	38.5	0.89	31.0	1.13	42.0	0.91	31.7
Married (head)										
No	16.0	7.2	1.02	16.4	1.15	8.3	1.02	16.3	1.10	7.9
Yes	84.0	92.8	1.00	83.6	0.99	91.7	1.00	83.7	0.99	92.1
No.of members										
1–4	33.5	70.5	1.31	43.9	1.16	81.4	1.30	43.6	1.16	82.1
5–6	35.6	26.3	0.92	32.9	0.65	17.1	0.92	32.7	0.63	16.6
7–8	17.4	3.1	0.77	13.5	0.44	1.4	0.77	13.5	0.40	1.3
9+	13.5	0.2	0.72	9.7	0.30	0.0	0.76	10.2	0.26	0.0
Children										
No	64.7	82.9	1.10	71.3	1.03	85.2	1.12	72.7	1.03	85.4
Yes	35.3	17.1	0.81	28.7	0.87	14.8	0.77	27.3	0.85	14.6

Source: Authors' construction using IHDS and CHIP.

The largest unconditional gap among all characteristics in both countries is in relation to the educational level of the household head, indicating high returns to college education. The difference between the average income of people in households whose head has attained tertiary education in India and those whose head has only primary education is almost twice the country's average (2.77 versus 0.76 times the mean respectively), more than twice the Chinese gap (91 per cent of the mean, with lower relative income of the affluent group, 1.87 versus 0.76). By economic sector, the income gap between households in which the head is employed in the service sector and those in which the head is employed in the primary sector is also much larger in India (97 per cent of the country's mean, versus 53 per cent in China).

In geographical terms, China shows the larger urban–rural income gap, accounting for 85 per cent of the country's income mean (relative mean is 1.39 in urban areas, 0.54 in rural areas), compared with 75 per cent in India (1.51 versus 0.76). However, India shows the larger gap between the most and least developed geographical regions: 67 per cent of the country's mean, higher than the 48 per cent in China.

Regarding demographic factors, income gaps tend to be larger in China, where households with unmarried and female heads tend to be more affluent, likely the result of a sorting process, and large households are much poorer in relative terms. The exception is that India tends to show larger income gaps by presence of children in the household. Furthermore, both countries show similar income gaps by householder age, but with the sign reversed (the youngest are the richest in China but the poorest in India). In China, membership of the Communist Party is associated with higher income.

The above-mentioned geographical and socioeconomic gaps tend to be smaller using expenditure instead of income in India, except by household size, but similar in the case of China. For example, the educational consumption gaps are about 110 per cent of the mean in India and 87 per cent in China, while the urban–rural consumption gap is still larger in China (74 per cent versus 50 per cent in India). The expenditure gap between the most and least developed geographical regions is 49 per cent in India and 37 per cent in China. By economic sector, the consumption gap between households in which the head is employed in the service sector and those in which the head is employed in the primary sector is more similar in the two countries (56 per cent of the mean in India, 60 per cent in China).

6.2 Income and expenditure regressions

Table 12 reports the regressions of the log of per capita income (lny) and expenditure (lnx) on the set of household characteristics. Ceteris paribus, consumption and income tend to be higher in both countries in households with better-educated heads who are not employed in agrarian activities, and in smaller and childless households. Some cross-country differences arise in relation to certain demographic characteristics, but these are in line with the unconditional gaps discussed above. Ceteris paribus, female-headed households tend to have higher income and consumption in China but not in India. Similarly, households with married heads tend to have lower per capita income and consumption in India, but not in China, where they enjoy similar consumption and higher income.

Table 12: (Log) per capita income (y) and expenditure (x) regressions in India (2011) and China (2013)

	India				China			
	lny	lny	lnx	lnx	lny	lny	lnx	lnx
Urban area	0.387***	0.264***	0.209***	0.124***	0.730***	0.424***	0.548***	0.148***
Region								
2 S&W (Ind.); Central (Ch.)	−0.141***	−0.099***	−0.068***	−0.040***	−0.262***	−0.145***	−0.213***	−0.067***
3 C&E (Ind.); Western (Ch.)	−0.518***	−0.299***	−0.376***	−0.260***	−0.292***	−0.212***	−0.148***	0.013*
Migration (head)								
Inter-provincial	−0.162***	−0.155***	−0.013	0.024***	−0.356***	−0.263***	−0.161***	0.031**
Rural-to-urban	0.097***	0.047***	0.087***	0.064***	−0.167***	−0.056***	−0.195***	−0.106***
Communist Party (head)	-	-	-	-	0.096***	0.047***	0.085***	0.033***
Age (head)								
35–44	0.073***	0.020**	0.088***	0.073***	−0.097***	−0.060***	−0.066***	−0.011
45–54	0.294***	0.173***	0.208***	0.141***	−0.030**	−0.017*	−0.027**	−0.007
55+	0.370***	0.271***	0.168***	0.087***	0.030**	0.061***	−0.054***	−0.069***
Female (head)	0.001	0.024**	−0.040***	−0.040***	0.168***	0.102***	0.121***	0.027***
Married (head)	−0.079***	−0.067***	−0.021***	−0.002	0.086***	0.077***	0.018	−0.030***
Education (head)								
Secondary	0.388***	0.229***	0.276***	0.186***	0.137***	0.031***	0.183***	0.111***
College	0.825***	0.510***	0.540***	0.355***	0.421***	0.166***	0.443***	0.218***
Sector (head)								
Manufacture	0.241***	0.161***	0.136***	0.082***	0.171***	0.069***	0.186***	0.088***
Construction, M&E	0.093***	0.086***	0.012**	−0.008*	0.133***	0.020	0.202***	0.129***
Services	0.361***	0.240***	0.206***	0.127***	0.196***	0.058***	0.243***	0.136***
Other	0.130***	−0.026***	0.267***	0.238***	−0.031*	−0.077***	0.084***	0.100***

Household size								
5–6	−0.248***	−0.095***	−0.261***	−0.206***	−0.339***	−0.172***	−0.295***	−0.111***
7–8	−0.371***	−0.137***	−0.403***	−0.319***	−0.643***	−0.324***	−0.565***	−0.215***
9+	−0.386***	−0.101***	−0.488***	−0.403***	−0.929***	−0.481***	−0.794***	−0.288***
With children	−0.116***	−0.068***	−0.081***	−0.055***	−0.082***	−0.038***	−0.077***	−0.032***
Ln (income)	-	-	-	0.226***	-	-	-	0.543***
Ln (expenditure)	-	0.582***	-	-	-	0.567***	-	-
Intercept	−0.528***	−0.389***	−0.236***	−0.120***	−0.690***	−0.340***	−0.613***	−0.242***
N	201,857	201,792	204,478	201,792	58,209	58,112	58,368	58,112
R2	0.295	0.388	0.370	0.454	0.480	0.642	0.387	0.576

Source: Authors' construction using IHDS and CHIP.

There is a notable age profile, with the level of income being highest among the eldest in both countries, but the level of expenditure largest among middle-aged householders in India and among the youngest in China. Table 12 also shows the regression in which the log of income is included as a control variable for the log of expenditure. Expenditure tends to be higher for households reporting a higher income, with the conditional elasticity being much higher in China (0.54) than in India (0.23). For a given value of income, most coefficients are reduced but the profile is very similar to the case before controlling for income.[3]

The results allow us to confirm the extent to which the previously discussed income and expenditure gaps by population groups remain after controlling for other characteristics. The regressions show that the conditional gaps between urban and rural areas and between small and larger households are still much larger in China than in India, while the regional and educational gaps remain much larger in India, especially when it comes to income.

6.3 Gini and Recentred Influence Function regressions

The Gini index of inequality G can be expressed as the product of a row vector $\bar{X} = (\bar{X}_1, .., \bar{X}_K)$ of the average household characteristics ($\bar{X}$) and a vector of parameters $\beta = (\beta_1, .., \beta_K)$ indicating the impact on inequality of a marginal increase on each of these characteristics, ceteris paribus. The latter are estimated by regressing the Recentred Influence Function (RIF_G) of the Gini index (of income or expenditure) on household characteristics (including the intercept).[4]

$$G(z) = \frac{1}{n}\sum_{i=1}^{n} RIF_G(z_i) = \bar{X}\beta^z; z = x \text{ or } y$$

Given that the RIF of the Gini index is a U-shaped transformation of income or expenditure, we can expect that characteristics with a higher concentration of their population at the extremes of the distribution, especially at the top, will be more strongly associated with higher inequality in general. The RIF regressions are reported in Table 13.

There are some common patterns across countries and wellbeing indicators, but with some differences in the magnitude, statistical significance, and even the sign of the effect. The regressions show, for instance, that marginally increasing the proportion of people in households whose heads are working in the manufacturing sector has a large equalizing effect in all cases. On the other hand, a large disequalizing effect is associated with marginally increasing the proportion of people whose heads attained college education.

These regressions help to identify how distinctively certain characteristics shape inequality in each country (based on the conditional distribution of income and expenditure). On the one hand, China stands out for a strong equalizing effect associated with a higher degree of urbanization (i.e. rural people are largely concentrated at the bottom of the distribution, ceteris paribus) and, to a lesser extent, of married householders. It also stands out for the large disequalizing effect of increasing the proportion of inter-provincial migrants. On the other hand, India stands out for a larger disequalizing effect of household heads having higher education (largely concentrated at the

[3] However, when the log of expenditure is included as a control variable for the log of income, the conditional elasticity shown in Table 12 is similar in both countries (0.58 in India, 0.57 in China), given the higher level of dispersion in incomes in India.

[4] The RIF regression and decomposition are based on Firpo et al. (2007, 2009). They are based on the concept of Influence Function introduced by Hampel (1974), measuring the influence of a small contamination in a particular value of income on the statistic of interest. See Gradín (2018a) for details.

top of the distribution, ceteris paribus), as well as of their being older. Increasing the size of households is strongly associated with higher inequality in China, but lower in India.

Table 13: RIF regressions for Gini of per capita income and expenditure in India (2011) and China (2013)

	India		China	
	Expenditure	Income	Expenditure	Income
Urban area	0.007*	−0.047***	−0.045***	−0.115***
Region				
2 S&W (Ind); Central (Ch)	−0.036***	−0.027***	−0.034***	−0.024***
3 C&E (Ind); Western (Ch)	−0.012***	0.012**	−0.028***	−0.007
Migration (head)				
Inter-provincial	0.033***	0.062***	0.093***	0.133***
Rural-to-urban	0.000	0.011	−0.036***	−0.015***
Communist Party (head)			−0.018***	−0.013**
Age (head)				
35–44	0.020***	0.004	−0.012*	0.005
45–54	0.052***	0.031***	0.005	0.006
55+	0.043***	0.030***	0.019**	-0.010
Female (head)	0.016**	−0.024**	0.025***	0.004
Married (head)	−0.004	0.002	−0.053***	−0.039***
Education (head)				
Secondary	0.035***	0.055***	0.003	0.007
College	0.239***	0.371***	0.145***	0.117***
Sector (head)				
Manufacture	−0.042***	−0.049***	−0.051***	−0.043***
Construction, M&E	−0.010**	−0.009	−0.028**	−0.017
Services	−0.025***	−0.028***	−0.020*	−0.015
Other	−0.020***	0.043***	−0.007	0.023*
Household size				
5–6	−0.055***	−0.037***	0.036***	0.059***
7–8	−0.042***	−0.039***	0.109***	0.136***
9+	−0.045***	−0.060***	0.173***	0.202***
Household with children	−0.005	0.008*	−0.006	−0.002
Intercept	0.407***	0.522***	0.508***	0.517***
N	204,478	204,568	58,494	58,494
R2	0.019	0.022	0.029	0.047

Source: Authors' construction using IHDS and CHIP.

The regressions also highlight important differences across wellbeing indicators. For example, the proportions of urban population and inter-provincial migrants have stronger effects on income than on expenditure inequality. Notably, the disequalizing effect of higher education levels in India is largest for income, while in China it is largest for expenditure. The household head not being in

wage labour increases income inequality in both countries, and reduces expenditure inequality in India (with no effect in China).

6.4 Change in inequality in counterfactual distributions

To understand the cross-country gap in inequality, the representation of the Gini index in terms of the RIF coefficients and average characteristics can be used to produce two counterfactual distributions in which we combine the characteristics of one country and the coefficients of the other. That is, either the Indian characteristics or coefficients replace the corresponding Chinese values, i.e. $\bar{X}_I\beta_C$ or $\bar{X}_C\beta_I$, where the subscripts I and C indicate India and China respectively.[5]

The corresponding expected changes in income or expenditure Gini inequality in China are given, respectively, by the following equations:

$$\Delta_X G_C^z = (\bar{X}_I - \bar{X}_C)\beta_C^z$$

$$\Delta_\beta G_C^z = \bar{X}_C(\beta_I^z - \beta_C^z);\ z = x \text{ or } y$$

The first effect refers to a change in the proportion of the population by characteristics (i.e. compositional effect), the second to a change in how characteristics shape inequality (i.e. structural effect).[6]

There is a large income inequality gap between India (0.543) and China (0.439). In the first case, after bringing in Indian characteristics ($\Delta_X G_C^y$), income inequality would increase in China by 18 per cent (Table 14, Columns 1 and 2) or 0.078 Gini points, reaching a Gini of 0.517 (Table 18). This would still be below the Indian level, but 75 per cent of the original between-country gap (0.104) would be gone. As the detailed decomposition of the inequality change shows, the reduction in the inequality gap would be, basically, the result of the disequalizing effect of increasing the household size (12 per cent increase in inequality) and reducing the share of the urban population (6 per cent increase in inequality). That is, it is the divergence in the demographic composition rather than sectoral differences that explains the higher level of income inequality in India compared with China. Only another 2 per cent of increase in inequality would be associated with changes in the sectoral composition (mostly, the smaller proportion of heads employed in the manufacturing sector and the increased proportion of heads not in wage labour), exactly compensated by the reduction in inequality by the same amount after reducing the level of attained education of household heads to accommodate Indian levels.

The separate analysis by urban and rural areas (one counterfactual is estimated for each area; Table 15) shows that the compositional effect mentioned above occurs only in rural areas (mostly by household size, but also by region and, to a lesser extent, industry), reducing the inequality gap with Indian rural areas by two-thirds, while inequality would actually decline (by a third) in Chinese

[5] Note that the same counterfactuals could be used for the reverse exercise, giving India either Chinese coefficients ($\bar{X}_I\beta_C$) or characteristics ($\bar{X}_C\beta_I$).

[6] $\Delta_X G_C^z$ and $\Delta_\beta G_C^z$ are, respectively, the characteristics and the coefficients effect of two alternative decompositions of the India–China differential in inequality using as reference β_I^y and β_C^y, respectively, as analysed in Section 6.5. Note that the detailed coefficients effect depends on the omitted categories in any set of dummies.

urban areas with urban Indian characteristics (mostly the result of the change in the regional and educational composition).

Table 14: Change in income inequality in China (2013) with either Indian characteristics or Indian coefficients

	Characteristics $\Delta_X G_C^y$	% Gini $(100\Delta_X G_C^y / G_C^y)$	Coefficients $\Delta_\beta G_C^y$	% Gini $(100\Delta_\beta G_C^y / G_C^y)$
Total change	0.078***	17.8	0.125***	28.5
By characteristic				
Area	0.026***	5.9	0.037***	8.4
Region	−0.002**	−0.5	0.004	0.9
Migration	0.001	0.2	0.004*	0.9
Age (head)	−0.001*	−0.2	0.023***	5.2
Sex (head)	−0.000	0.0	−0.005**	−1.1
Married (head)	0.004***	0.9	0.039***	8.9
Education (head)	−0.008***	−1.8	0.046***	10.5
Industry (head)	0.008***	1.8	0.002	0.5
Household size	0.052***	11.8	−0.031***	−7.1
Children	−0.000	0.0	0.002	0.5
Intercept			0.004	0.9

Source: Authors' construction using IHDS and CHIP.

Table 15: Change in income inequality in China (2013) with either Indian characteristics or Indian coefficients (urban and rural areas)

	Characteristics $\Delta_X G_C^y$		Coefficients $\Delta_\beta G_C^y$	
	Urban	Rural	Urban	Rural
Total change	−0.045***	0.086***	0.289***	0.019***
By characteristic				
Region	−0.031***	0.020***	−0.014**	−0.029***
Migration	0.001	−0.004***	0.005	−0.006***
Age (head)	0.001	0.002**	0.044***	0.002
Sex (head)	−0.003***	−0.002***	−0.014**	0.002*
Married (head)	0.004***	0.004***	0.016	0.050***
Education (head)	−0.013***	−0.001***	0.122***	0.005***
Industry (head)	−0.006**	0.009***	0.040	0.016*
Household size	0.005	0.056***	−0.024***	−0.040***
Children	−0.002	0.003***	0.001	0.000
Intercept			0.114**	0.019

Source: Authors' construction using IHDS and CHIP.

In the case in which we give China the effect of characteristics on inequality (coefficients) estimated for India, while keeping the average values of Chinese characteristics, also shown in Table 14 (Columns 3 and 4), the increase in income inequality in China ($\Delta_\beta G_C^y$) would be even larger—0.125, or 28 per cent (reaching 0.564, or 4 per cent, higher than the level observed in India; Table 18). As the detailed decomposition shows, this would be the result of the more disequalizing effect of higher education level (11 per cent increase) and older householders (5 per cent associated with head's age) in India compared with China. It would also be the result of the smaller equalizing effect of the proportion of urban population (8 per cent of increase) and the null equalizing effect of the proportion of married householders (9 per cent) in that country. Table 15 shows that the increase would be larger in urban areas (the gap with India would be totally reversed) due to the huge impact of urban Indian returns to education, with a more moderate increase in rural areas (14 per cent), driven by the impact of marital status.

We repeat the same exercise for expenditure inequality (which is higher in China) in Table 16. This shows that bringing in the Indian characteristics (the compositional effect is now evaluated with Chinese expenditure coefficients) would widen the cross-country gap, because expenditure inequality would increase by about 11 per cent in China. That is, the compositional effect goes in the same direction as for income (increasing inequality) but by a smaller magnitude. As in the case of income, the main effects are found in relation to household size (10 per cent) and area of residence (2 per cent), with small effects in relation to migration, marital status, and industry (around 1 per cent each). There would also be small negative impacts (decreasing inequality) in relation to education (2.3 per cent) and region (1.6 per cent). The separate analysis for urban and rural areas (Table 17) shows that, as in the case of income, expenditure inequality would increase only in rural areas, and would decrease in urban areas. However, bringing to China the Indian expenditure coefficients, instead, would have only a statistically insignificant effect overall (increase of less than 1 per cent, after several effects are cancelled out). The analysis for urban and rural areas shows, however, that the latter is the result of a large increase in urban inequality compensated by a large decline in rural inequality.

Table 16: Change in expenditure inequality in China (2013) with either Indian characteristics or Indian coefficients

	Characteristics $\Delta_X G_C^x$	% Gini $(100\Delta_X G_C^x / G_C^x)$	Coefficients $\Delta_\beta G_C^x$	% Gini $(100\Delta_\beta G_C^x / G_C^x)$
Total change	0.047***	10.9	0.004	0.9
By characteristic				
Area	0.010***	2.3	0.028***	6.5
Region	−0.007***	−1.6	0.004	0.9
Migration	0.004***	0.9	0.006***	1.4
Age (head)	0.000	0.0	0.034***	7.9
Sex (head)	−0.001***	−0.2	−0.002	−0.5
Married (head)	0.005***	1.2	0.047***	10.9
Education (head)	−0.010***	−2.3	0.021***	4.9
Industry (head)	0.005***	1.2	−0.002	−0.5
Household size	0.042***	9.7	−0.029***	−6.7
Children	−0.001	−0.2	0.000	0.0
Intercept			−0.103***	−23.9

Source: Authors' construction using IHDS and CHIP.

Table 17: Change in expenditure inequality in China (2013) with either Indian characteristics or Indian coefficients (urban and rural areas)

	Characteristics $\Delta_X G_C^x$		Coefficients $\Delta_\beta G_C^x$	
	Urban	Rural	Urban	Rural
Total change	−0.041***	0.065***	0.124***	−0.080***
By characteristic				
Region	−0.028***	0.008***	−0.005	−0.023***
Migration	0.005***	−0.002***	0.011**	−0.004***
Age (head)	0.003***	0.001**	0.050***	0.029***
Sex (head)	−0.005***	−0.001***	−0.015***	0.004***
Married (head)	0.007***	0.002***	0.057***	0.023***
Education (head)	−0.016***	0.001**	0.060***	0.002***
Industry (head)	−0.008***	0.008***	0.068**	−0.007
Household size	0.005	0.044***	−0.026***	−0.034***
Children	−0.003*	0.002**	−0.000	−0.002*
Intercept			−0.076*	−0.069***

Source: Authors' construction using IHDS and CHIP.

Simplifying the above, one could say that income inequality is higher in India than in China as a result of the larger disequalizing effect of higher education in Indian urban areas (structural effect), combined with a smaller degree of urbanization and larger households in Indian rural areas (compositional effect). There is a similar but smaller compositional effect when it comes to expenditure inequality, but with virtually no structural effect overall. Thus, it is the latter that most significantly contributes towards the different ratio in income and expenditure inequality in the two countries. Indeed, Indian characteristics would increase the differential between income and expenditure Ginis in China by 0.031, while Indian coefficients would increase it by 0.121, raising the ratio between inequality in income and in expenditure from 1.02 to 1.08 and 1.30 respectively (Table 18). This points to structural factors rather than composition by household characteristics as being responsible for the smaller income/expenditure inequality ratio found in China than in India (even if the Indian distribution of characteristics partially explains higher inequality in India, both in income and in expenditure).

Table 18: Gini in income and inequality under different counterfactuals

	Expenditure (1)	Income (2)	Differential (2)-(1)	Ratio (2)/(1)
India				
Original: $\bar{X}_I \beta_I^z$	0.394	0.543	0.149	1.38
China				
Original: $\bar{X}_C \beta_C^z$	0.431	0.439	0.008	1.02
Indian characteristics: $\bar{X}_I \beta_C^z$	0.478	0.517	0.039	1.08
Indian coefficients: $\bar{X}_C \beta_I^z$	0.435	0.564	0.129	1.30

Source: Authors' construction using IHDS and CHIP.

6.5 Decomposition of the between-country gap in income and expenditure inequality

One consequence of the results in the previous section is that the extent to which the compositional and structural effects account for income and expenditure inequality gaps between India and China strongly depends on which counterfactual, $\bar{X}_I\beta_C$ or $\bar{X}_C\beta_I$, is used as a reference (Table 19):[7]

$$\Delta G^z \equiv G_I(z) - G_C(z) = \Delta_X G_C^z + \Delta_\beta G_I^z = (\bar{X}_I - \bar{X}_C)\beta_C^z + \bar{X}_I(\beta_I^z - \beta_C^z)$$

$$\Delta G^z \equiv G_I(z) - G_C(z) = \Delta_X G_I^z + \Delta_\beta G_C^z = (\bar{X}_I - \bar{X}_C)\beta_I^z + \bar{X}_C(\beta_I^z - \beta_C^z); z = x \text{ or } y$$

In one case, the compositional effect is obtained by evaluating the difference in characteristics $(\bar{X}_I - \bar{X}_C)$ using the Chinese coefficients β_C^z, while in the other case it is evaluated using the Indian coefficients β_I^z instead. Similarly, the structural effect is obtained by evaluating the difference in coefficients $(\beta_I^z - \beta_C^z)$ using the Indian and Chinese characteristics, $\bar{X}_I$ and $\bar{X}_C$ respectively.

Table 19: Decomposing the inequality gap (and gap of gaps) between India and China

	Income gap		Expenditure gap		Gap of gaps	
	ΔG^y	%	ΔG^x	%	$\Delta G = \Delta G^y - \Delta G^x$	%
$\Delta G^z = G_I(z) - G_C(z)$	0.104	100	−0.037	100	0.141	100
Reference $\bar{X}_I\beta_C^z$						
$\Delta_X G_C^z = (\bar{X}_I - \bar{X}_C)\beta_C^z$	0.078	75.0	0.047	−127.0	0.031	22.0
$\Delta_\beta G_I^z = \bar{X}_I(\beta_I^z - \beta_C^z)$	0.026	25.0	−0.084	227.0	0.110	78.0
Reference $\bar{X}_C\beta_I^z$						
$\Delta_X G_I^z = (\bar{X}_I - \bar{X}_C)\beta_I^z$	−0.021	−20.2	−0.040	108.1	0.019	13.5
$\Delta_\beta G_C^z = \bar{X}_C(\beta_I^z - \beta_C^z)$	0.125	120.2	0.004	−10.8	0.121	85.8

Source: Authors' construction using IHDS and CHIP.

The compositional effect accounts for most (75 per cent) of the income inequality gap between India and China when the reference counterfactual is $\bar{X}_I\beta_C^y$, but for none of it (−20 per cent) when the reference is $\bar{X}_C\beta_I^y$: in other words, depending on whether β_C^y or β_I^y is used to evalauate it. On the other hand, the compositional effect does not explain the gap in expenditure inequality when the reference counterfactual is $\bar{X}_I\beta_C^x$ (−127 per cent), but explains all of it when the reference is $\bar{X}_C\beta_I^x$ (108 per cent). This is the result of the important differences in the estimated coefficients and distribution of characteristics between the two countries.

Nevertheless, when it comes to explaining the cross-country mismatch in inequality when measured with income or expenditure, i.e. the differential between ΔG^y and ΔG^x, the results are more robust regardless of what reference is used:

$$\Delta G \equiv \Delta G^y - \Delta G^x = \left(\Delta_X G_C^y - \Delta_X G_C^x\right) + \left(\Delta_\beta G_I^y - \Delta_\beta G_I^x\right)$$

$$\Delta G \equiv \Delta G^y - \Delta G^x = \left(\Delta_X G_I^y - \Delta_X G_I^x\right) + \left(\Delta_\beta G_C^y - \Delta_\beta G_C^x\right)$$

[7] Note that a solution based on using the pooled sample as the reference distribution for the decomposition would be more difficult to interpret in the context of the analysis of cross-country differences.

Between 14 and 22 per cent of this 'gap in gaps' is explained by cross-country differences in characteristics (compositional effect, first term in the decomposition above) and between 78 and 86 per cent by differences in the structural effects (second term). The detailed decomposition is shown in Table A3 in the appendix. That is, as implied in the previous sub-section, the reason for the large inter-country discrepancy in the ratio between income and expenditure inequality lies in the structural effect, with only a relatively small compositional effect.

7 Concluding remarks

China is more unequal than India in the distribution of expenditure, but much less unequal in the distribution of income. This cross-country difference is even more striking in terms of inequality within urban and within rural areas, but the larger urban–rural gap in China absorbs part of the overall differential. China and India, indeed, represent two opposite sides of the relationship between inequality in reported income and expenditure in the developing world. While inequality is much higher in income than in expenditure in India, the two forms of inequality tend to be similar in China.

The joint distribution of income and expenditure differs between the two countries because there is a higher prevalence of people with a large mismatch between their ranks in income and consumption in India—more clearly in rural areas, and particularly among those reporting low income and high expenditure. This indicates that income might not be a good measure of wellbeing for these households—likely the result of its irregularity over time. But the large mismatch is also the result of rich people having much higher relative income than expenditure in India, pointing to the fact that reported expenditure, more than income, might be heavily underestimating the living conditions of the rich—likely the result of underestimation of the luxurious consumption and the savings of the rich. There is, certainly, some mismatch in the distribution of income and expenditure in China too, but the affected share of the population is smaller than in India, and unlike in that country the richest tend to report similar relative income and expenditure.

We have provided evidence to conclude that both the distinct distribution of characteristics in each country (compositional effect) and the conditional distribution of the different population groups (structural effect) are important to keeping income inequality lower in China than in India, although the impact is much larger in the latter case.

The main compositional effects that can be identified are the different demographic and geographical composition of the countries' populations, mostly the smaller households (especially in rural areas) and the higher level of urbanization in China than in India. While both reflect that these two countries are at different stages of development, the low fertility rate in China is also the consequence of its more radical solutions adopted to slow down population growth. However, it is interesting to note the relatively small role played by the higher level of industrialization in China.

The largest structural effect identified is the more disequalizing impact of higher education in India—the result of the much higher income returns, especially in urban areas. But there are also large geographical effects, such as the fact that increasing urbanization seems to be more equalizing in China, as well as demographic effects by age (urban areas) or marital status (rural), as older household heads are associated with more inequality only in India, while a higher proportion of married heads is associated with less inequality only in China.

On the other hand, the compositional effect also indicates higher expenditure inequality in China, with the same average characteristics observed in India (thus increasing the observed cross-country

gap), but to a smaller extent than in income inequality, while there is no net structural effect. Thus, the different joint distribution of income and expenditure in the two countries (reflected in the different ratio of Gini in both measures and the change in the ranking of both countries) is more strongly related to the conditional distribution of income and expenditure in these two countries—especially in urban areas, although there is also an important compositional effect that mostly affects rural areas.

The lack of consistency of cross-country comparisons based on income or expenditure calls for the use of hybrid inequality measures combining data on both, provided they are available in the same survey. These hybrid measures allow for some kind of smoothing in the measured wellbeing of households with a mismatch between income and consumption that will be especially relevant at the extremes of the distribution. Not surprisingly, this turned out to be more relevant in India. Inequality in wellbeing is pretty similar in both countries in terms of these hybrid measures as a result. Inequality is higher in India, but only by about 3–6 per cent.

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Table A1: Consumption inequality for China, urban and rural areas (and income inequality if in the same study)

Urban	Source	Index	Notes	1987	1988	1991	1992	1995	1998	1999	2001	2002	2003	2007	2013
Xia et al. (2017)	CHIP	Gini	a					0.342				0.325			0.371
	CHIP	Gini	b					0.334				0.318			0.358
	CHIP	Gini	c					0.336				0.326			0.358
Cai et al. (2010)	UHIES	Gini					0.25	0.29	0.31		0.33		0.33		
	UHIES	*Gini*	*income*				*0.24*	*0.28*	*0.29*		*0.32*		*0.33*		
Liu and Li (2013)	CHIP	Gini	d		0.268			0.333				0.358		0.343	
	CHIP	Gini	e		0.220			0.304				0.321		0.316	
	CHIP	Theil	d		0.124			0.245				0.268		0.213	
	CHIP	Theil	e		0.084			0.221				0.230		0.171	
Rural															
Liu and Li (2013)	CHIP	Gini	d		0.279			0.340				0.325		0.366	
	CHIP	Gini	e		0.252			0.304				0.303		0.347	
	CHIP	Theil	d		0.123			0.330				0.190		0.228	
	CHIP	Theil	e		0.106			0.309				0.168		0.219	
Qu and Zhao (2008)	CHIP	Gini	f		0.258			0.274				0.294			
	CHIP	Gini	f, income		0.267			0.309				0.323			
Zhu (2018)	CHIP	Gini	g									0.334			0.341
Benjamin et al. (2005)	RCRE	Gini	h	0.25		0.27		0.27		0.31					
	RCRE	Gini	I	0.22		0.24		0.25		0.29					
	RCRE	*Gini*	*h, income*	*0.32*		*0.33*		*0.33*		*0.37*					
	RCRE	*Gini*	*i, income*	*0.29*		*0.30*		*0.30*		*0.35*					
China															
Liu and Li (2013)	CHIP	Theil	d		0.197			0.447				0.527		0.438	
	CHIP	Theil	e		0.113			0.337				0.363		0.294	

Notes: Household expenditure or consumption per capita (unless *income* indicated): (a) before using the equivalence scale; (b) OECD equivalence scales and weighted; (c) overall household; (d) CPI (Consumer Price Index) adjusted; (e) CPI adjusted, sample weight, OECD equivalence scale, regional PPP (Purchasing Power Parity); (f) unit of analysis is the household; (g) deleted 0.05% richest and regional PPP; (h) not spatially deflated; (i) spatially deflated. RCRE = Research Centre on the Rural Economy.

Source: Authors' construction.

Table A2: China in WIID 4 (per capita disposable income and consumption in the same year)

	Rural			Urban			All		
Year	Income	Consumption	Ratio	Income	Consumption	Ratio	Income	Consumption	Ratio
1987	0.250	0.292	0.86						
1990	0.306	0.310	0.99	0.256	0.230	1.11			
1991	0.270	0.316	0.85						
1992				0.250	0.245	1.02			
1993	0.321	0.320	1.00	0.285	0.270	1.05			
1995	0.270	0.365	0.74	0.316	0.276	1.15			
1996	0.336	0.330	1.02	0.291	0.285	1.02			
1998				0.310	0.290	1.07			
1999	0.332	0.355	0.94	0.316	0.297	1.06	0.474	0.454	1.04
2001				0.330	0.320	1.03			
2002	0.374	0.366	1.02	0.332	0.320	1.04			
2003				0.330	0.330	1.00	0.428	0.491	0.87
2008	0.394	0.380	1.04	0.352	0.340	1.03			
2010	0.406	0.380	1.07	0.357	0.330	1.08			
2011	0.385	0.390	0.99	0.356	0.370	0.96			
2012							0.422	0.474	0.89
2013	0.352	0.401	0.88	0.372	0.374	0.99	0.436	0.455	0.96

Source: Authors' construction using WIID 4.

Table A3: Decomposing the inequality gap (and gap of gaps) between India and China

Reference	Income, ΔG^y				Expenditure, ΔG^x				Gap of gaps, $\Delta G \equiv \Delta G^y - \Delta G^x$			
	$\bar{X}_I\beta_C^y$		$\bar{X}_C\beta_I^y$		$\bar{X}_I\beta_C^x$		$\bar{X}_C\beta_I^x$		$\bar{X}_I\beta_C^z$		$\bar{X}_C\beta_I^z$	
	Estimate	%	Estimate	%	Estimate	%	Estimate	%	Estimate	%	Estimate	%
Gap	0.104***	100	0.104***	100	−0.037***	100	−0.037***	100	0.140***	100	0.140***	100
Compositional effect												
Area	0.026***	25.0	0.010***	9.6	0.010***	−27.0	−0.001*	2.7	0.016***	11.4	0.012***	8.6
Region	−0.002**	−1.9	0.002	1.9	−0.007***	18.9	−0.004***	10.8	0.005***	3.6	0.005***	3.6
Migration	0.001	1.0	−0.002**	−1.9	0.004***	−10.8	−0.000	0.0	−0.004***	−2.9	−0.002	−1.4
Age (head)	−0.001*	−1.0	−0.001***	−1.0	0.000	0.0	−0.002***	5.4	−0.001***	−0.7	0.001***	0.7
Sex (head)	−0.000	0.0	0.001**	1.0	−0.001***	2.7	−0.001**	2.7	0.001***	0.7	0.002***	1.4
Married (head)	0.004***	3.8	−0.000	0.0	0.005***	−13.5	0.000	0.0	−0.001*	−0.7	−0.000	0.0
Education (head)	−0.008***	−7.7	−0.029***	−27.9	−0.010***	27.0	−0.018***	48.6	0.002***	1.4	−0.010***	−7.1
Industry (head)	0.008***	7.7	0.013***	12.5	0.005***	−13.5	0.004***	−10.8	0.002	1.4	0.009***	6.4
Household size	0.052***	50.0	−0.017***	−16.3	0.042***	−113.5	−0.017***	45.9	0.010	7.1	0.000	0.0
Children	−0.000	0.0	0.001*	1.0	−0.001	2.7	−0.001	2.7	0.001	0.7	0.002***	1.4
Total	0.078***	75.0	−0.021***	−20.2	0.047***	−127.0	−0.040***	108.1	0.030***	21.4	0.019***	13.6
Structural effect												
Area	0.022***	21.2	0.037***	35.6	0.016***	-43.2	0.028***	−75.7	0.005**	3.6	0.009**	6.4
Region	0.008*	7.7	0.004	3.8	0.007	−18.9	0.004	−10.8	0.001	0.7	0.001	0.7
Migration	0.000	0.0	0.004*	3.8	0.002**	−5.4	0.006***	−16.2	−0.001	−0.7	−0.003	−2.1
Age (head)	0.023***	22.1	0.023***	22.1	0.032***	−86.5	0.034***	−91.9	−0.009	−6.4	−0.011	−7.9
Sex (head)	−0.003**	−2.9	−0.005**	−4.8	−0.001	2.7	−0.002	5.4	−0.002	−1.4	−0.003	−2.1
Married (head)	0.035***	33.7	0.039***	37.5	0.042***	−113.5	0.047***	−127.0	−0.007	−5.0	−0.008	−5.7
Education (head)	0.026***	25.0	0.046***	44.2	0.012***	−32.4	0.021***	−56.8	0.013***	9.3	0.025***	17.9
Industry (head)	0.008	7.7	0.002	1.9	−0.003	8.1	−0.002	5.4	0.011	7.9	0.004	2.9
Household size	−0.100***	−96.2	−0.031***	−29.8	−0.088***	237.8	−0.029***	78.4	−0.011	−7.9	−0.002	−1.4
Children	0.004	3.8	0.002	1.9	0.001	−2.7	0.000	0.0	0.003	2.1	0.002	1.4
Intercept	0.004	3.8	0.004	3.8	−0.103***	278.4	−0.103***	278.4	0.107***	76.4	0.107***	76.4
Total	0.026***	25.0	0.125***	120.2	−0.084***	227.0	0.004	−10.8	0.110***	78.6	0.121***	86.4

Source: Authors' construction using IHDS and CHIP.