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How Redistributive Is Fiscal Policy in China?

New Evidence on the Distributional Impacts of Taxes and Spending

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Abstract

How redistributive are fiscal policies in China? This paper applies the standard fiscal incidence analysis to data from the China Family Panel Study 2018 to study the effect of government taxes and spending on inequality in China. The analysis includes fiscal elements, such as personal income tax, contributions to social insurance, value-added tax, consumption tax, cash transfers, contributory pensions, and spending on education and health, and accounts for 63 percent of total revenues and 43 percent of total government spending. Consistent with previous studies, the paper finds that fiscal policy in China continues to redistribute quite effectively, achieving inequality reduction of about 10.3 Gini points, placing China around the median of upper-middle-income country peers on the level of redistribution achieved by fiscal policy. Not unlike several other countries where similar analysis has been done, most of the inequality reduction achieved by China is through education and health spending. Findings from the paper further suggest that while the fiscal system delivers more to those who need the most support, the heavy burden of user fees—relative to disposable income—may prevent some families from accessing needed health care services and imply high costs of raising children. In addition, there is room for the progressivity of the overall package to be enhanced. In particular, the fiscal system could make a greater dent in inequality by collecting more from those who could afford to pay more and leaving more money in the pockets of those who need it the most. This could be done by increasing the share of fiscal revenues collected through progressive taxes such as personal income tax and increasing the level of cash-based social benefits (such as residents' pensions and transfers).

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Introduction

China's impressive economic performance over the last four decades has resulted in unparalleled improvements in living standards and poverty reduction. The rapid transformation of the economy—from agriculture to labor-intensive manufacturing and services, as people moved from rural to urban areas and found better jobs—sustained strong growth over 40 years, raised average incomes, and lifted close to 800 million Chinese out of poverty (World Bank and Development Research Center of the State Council, 2022). On average, increased labor income accounted for around two-thirds of the poverty reduction between 1988 and 2007, with contributions shifting from increased agricultural productivity in the first decades, to increased opportunities and earnings in industry and services in the 2000s. This transformation was supported by a multi-pronged strategy that included investments not only in physical capital, but also in human capital by improving and expanding education and health services. From 2013 to 2018, public transfers among rural households in the bottom quintile almost doubled, driven by the increased coverage of rural pensions, the expansion of social assistance, social insurance and social assistance benefits, and the introduction of universal health care with a basic reimbursement package extended to rural areas.

Since the 2000s, policy makers have turned to place-based fiscal support, public investment targeting rural areas and lagging provinces, and social assistance transfers to address growing concerns over inequality even as poverty kept declining. Disparities between urban and rural areas and between Eastern and Western regions rose in the first two decades of China's economic transformation. In response, starting in the mid-2000s, public investments in lagging regions combined with a rise in the minimum wage, the end of agricultural taxes, and an increased role for social protection policies helped narrow the urban-rural and regional gaps (World Bank, 2020). Income inequality, as measured by the Gini coefficient reported by the National Bureau of Statistics (NBS), peaked in 2008, declined for several years, and has recently stabilized at a relatively high level. Still, with a Gini coefficient at 46.7 in 2022 (latest available estimate), inequality remains high for China's level of development.

Reducing inequality remains an important priority as China pursues its longer-term development objectives. It is well recognized that the economy will need to rebalance from an investment- and export-led model based on high-carbon industry and low-cost, labor-intensive manufacturing toward one led by domestic consumption, services, and increases in productivity (World Bank and DRC, 2019). A larger share of income for the bottom of the distribution could support that transition, as poorer households tend to spend a larger share of their marginal income. China's green transition can also be facilitated through policies to ease labor mobility from high-carbon to low-carbon sectors, as well as measures to strengthen the social safety net to ensure that those adversely affected by the transition are not left behind (World Bank, 2022c). In addition, China's population aging requires further investment in human capital potential to compensate for a shrinking labor force (World Bank and DRC, 2022). Closing gaps in access to quality public services will be key to ensuring equal economic opportunities and increased social mobility for future generations. Recognizing the challenge of inequality, China's government has made achieving "common prosperity" a priority. Policy makers continue to target sufficient economic growth that creates jobs and boosts household incomes. In addition, they also emphasize "the roles of taxation, social security, and transfer payments in regulating income distribution".

How governments spend and collect revenues can have implications for inequality. When essential services such as education are provided free of cost to segments of the population who may otherwise be unable to send their children to schools, public resources are redistributed to close income gaps between the rich and the poor. The same effect is achieved when targeted cash assistance is provided to the poorest and the most vulnerable members of society. Conversely, there may be instances in which certain subsidies provided by the government accrue more to

those who are already relatively rich, in which case the policy may end up widening gaps. Similarly, certain types of taxes that require the rich to pay more (relative to their income) can reduce inequality while, conversely, taxes that fall heavier on the poorer parts of the distribution, can contribute to widening gaps. Thus, how governments spend and raise their revenue directly influences the amount of redistribution the fiscal system achieves, which in turn influences inequality.

There has been relatively little enquiry on the role the *overall* fiscal system can play in reducing inequality in China. One notable exception is Lustig and Yang (2020) which used the Commitment to Equity approach (Lustig, 2018 and 2022) to describe the fiscal redistribution in China using data from the 2014 China Family Panel Studies survey.[2] [3] The main finding of that paper was that while the fiscal system reduced inequality overall, it also widened rural-urban gaps. The study attributed the latter to the differences in contributory pensions between urban and rural areas. These results were consistent with findings from several other studies (Li, Zhu and Zhan 2017 and Xie 2018), and somewhat contrary to Wang and Lou (2017) who found that the VAT had inequality-increasing impacts that were sizeable enough to make the overall fiscal system inequality-increasing.

Against this backdrop, this paper revisits this question using more recent representative data of Chinese households, the 2018 round of the China Family Panel Survey (CFPS). The motivation for the paper is two-fold. First, inequality has continued to remain high even as the emphasis on common prosperity has intensified. As such, continuing to highlight the role fiscal policy has been playing and could play in addressing this challenge using fresh data and evidence is important. Second, since 2014 there have been several policy changes whose impacts can be picked up in the updated analysis, though in some cases this will be confounded by the fact that this paper also introduces some methodological upgrades. For example, Lustig and Yang (2020) treated all income from pensions as government transfers. This paper will depart from this assumption and attempt to treat contributory pensions which have characteristics of deferred income differently than pensions through the resident's system, which are more transfer-like.

Following standard practices of fiscal incidence analysis, the study combines information from administrative sources on government revenues and spending with household survey data. This allows us to identify how much households pay in taxes and receive in transfers and subsidies, across the income distribution. The analysis includes fiscal elements such as personal income tax, contributions to social insurance, value-added tax, consumption tax, cash transfers, contributory pensions, and spending on education and health and accounts for 63 percent of total revenues and around 43 percent of total government spending. Several potentially important components of taxes and spending are not included in the analysis. These include, for example, corporate income taxes and non-tax elements on the revenue side and spending on infrastructure on the spending side. Both instruments can have sizeable redistributive impacts both in the short and medium run, but there is no satisfactory way of determining the incidence of these taxes on individual households. This practice is standard in fiscal analysis exercises and acknowledged as a caveat of the methodology.

First, consistent with previous studies, this paper finds that fiscal policy achieves a sizeable inequality reduction (10.3 Gini points) in China. However, China places around the median of upper-middle-income country peers on

[2] Lustig, Nora and Yang Wang 2020. "The Impact of Taxes and Transfers on Income Inequality, Poverty, and the Urban-Rural and Regional Income Gaps in China," Commitment to Equity (CEQ) Working Paper Series 93, Tulane University, Department of Economics.
[3] The Commitment to Equity approach refers to the methodology developed by the Commitment to Equity Institute at Tulane University. For specifics, consult chapters 1-8 in Lustig (2018 and 2022).

the level of redistribution achieved by fiscal policy, suggesting there is significant room for the country to do more. Second, most of the inequality reduction achieved by China is through in-kind education and health benefits and social security contributions which are highly progressive. Yet, the heavy burden of health user fees -relative to households' disposable income- may discourage families accessing health care services when needed and school related user fees suggest the high cost of raising children. Cash transfers are equalizing but their contribution is rather small. The third main finding is that progressive and effective inequality reduction instruments such as personal income taxes remain relatively under-utilized.

The rest of the paper is organized as follows. The next section provides an overview of the fiscal system. This is followed by a description of the data and the methodology, including the introduction of the various income concepts that are critical for the analysis. The subsequent section describes the main results while the final section summarizes and concludes with a discussion of the implications of these findings for policy.

Overview of China's Fiscal System in 2018

In this section, we provide an overview of China's fiscal system. As discussed in Lustig (2018), the redistributive power of a fiscal system depends on two crucial factors: size and progressivity. We present the size of China's total revenues by source, as well as China's total spending by category.

Total Revenue

Total fiscal revenue in China was 26,197 billion RMB in 2018 (3,950 billion in 2018 USD), representing 29.1 percent of total GDP. Table 1 shows its constituent parts: tax revenues, contributions to social insurance and non-tax revenue. Tax revenues account for almost 60 percent of total revenue. Within taxes, the four largest items are value-added tax (VAT), corporate income tax, personal income tax and consumption tax. Contributions to social insurance amount to 30 percent of total revenue, the majority of which are collected through the employee's social insurance system and only 4 percent is collected through the resident's system. The employee's system is legally required for any type of formal employment while the resident's system covers those not covered by the employee's system.[4]

[4] Non-tax revenue accounts for the remaining 10% of total revenue, and includes special program receipts, charge of administrative and institutional units, penalty receipts, operation income from government capital, income from use of state-owned assets/resources and other non-tax revenue. Source: Statistical Yearbook of China 2019, National Bureau of Statistics, 2019.

Table 1: Size of Government Revenue, China 2018

Categories	Amount (Unit: bln RMB)	% of Total Revenue	% of GDP	Included in analysis
Total Revenue	26,197	**100.0%**	29.1%	
Total Tax Revenue *in which*	15,640	**59.7%**	17.4%	
Direct taxes				
Personal Income Tax	1,387	5.3%	1.5%	Yes
Corporate Income Tax	3,532	13.5%	3.9%	No
Indirect taxes				
VAT (Domestic &Imported)	7777	29.7%	8.6%	Yes
Consumption Tax (Domestic &Imported)	1128	4.3%	1.3%	Yes
Other taxes	1816	6.9%	2.0%	No
Total Contribution to Social Insurance *in which:*	7,861	**30.0%**	8.7%	
Contribution to Employee's System	7,523	28.7%	8.4%	Yes
Contribution to Resident's System	337	1.3%	0.4%	Yes
Total Non-Tax Revenue	2,696	**10.3%**	3.0%	No

Notes: The government budget in China has four categories:

(i) The General Public Budget (GPB) which includes tax and non-tax revenue. This category is included in this table and represented 52.6% of total government revenue* in 2020.

(ii) The social security fund budget (SSFB) which includes contributions of firms and individuals to social security funds and pays for social security benefits. This category is included in this table and represented 18.7% of total government revenue in 2020 (after deducting the subsidies transferred from the other budgets).

(iii) The Government Fund Budget (GFB) which includes revenue from the 24 government funds of which land lease fund revenue is the largest, local government special bonds and others. This category is *not* included in the table; it represented 23.3% of total government revenue in 2020.

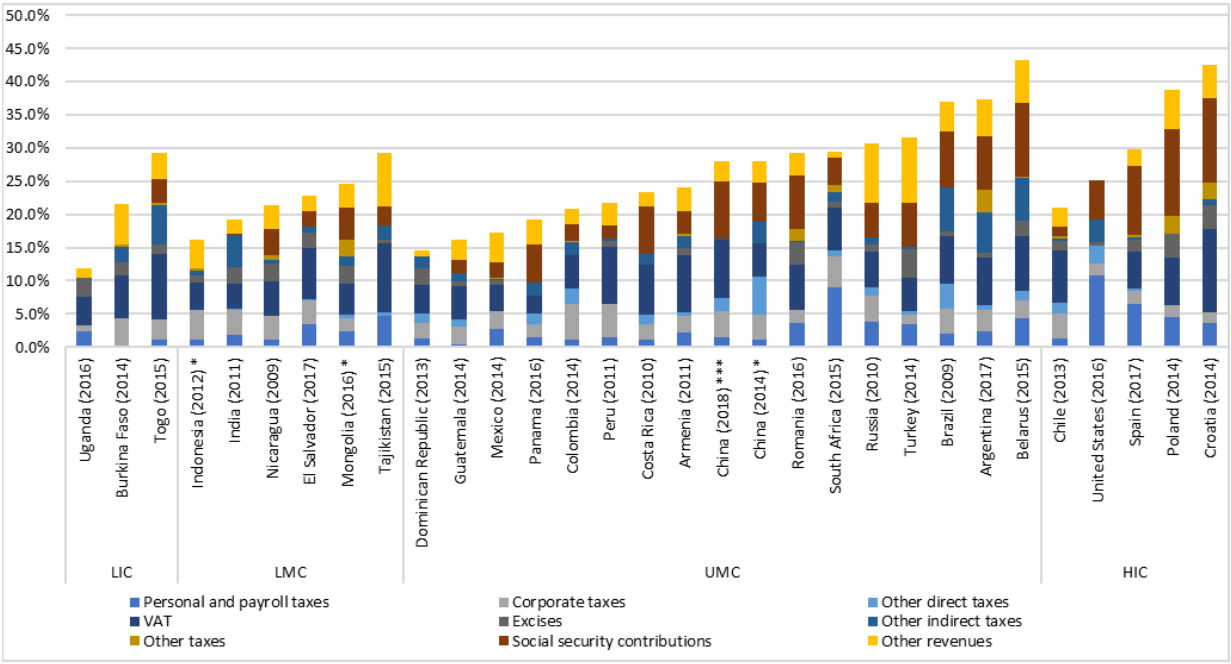
(iv) The state-owned enterprise (SOE) operation fund budget which included revenue accrued through the SOEs. This category is *not* included in the table; it represented 1.1% of total government revenue in 2020.

* Data for total revenues reflect a small amount of double-counting data because of the transfer of funds among the budget categories and the lack of exact double-counting data. (Qiao, Fan, Rahemtulla, van Rijn & Li, 2022)

***Sources*:** Statistical Yearbook of China 2019, National Bureau of Statistics (2019), Finance Yearbook of China (2019), Ministry of Finance (2019), 2018 Annual Report of Housing Fund, Ministry of Housing and Urban-Rural Development, Ministry of Finance & The People's Bank of China, 2019.

Figure 1 shows that China lies around the middle of the distribution of upper-middle-income countries in terms of revenue collection. It also uses a mix that relies more on social security contributions rather than on personal income taxes or indirect taxes other than VAT. China's social security contributions amount to 8.7 percent of its GDP, second only to Belarus (11.7- percent) among upper-middle income countries and is very close to the average of the high-income countries in the figure (8.8 percent). On the other hand, it collects just 1.5 percent of its GDP through personal income taxes, one of the lowest shares among upper-middle-income countries, far below high-income countries, and just slightly higher than average share of the low-income countries included in the figure (1.2 percent). China's collection of VAT (8.6 percent of GDP) and all other indirect taxes (0.2 percent of GDP) places it around the median of the high-income country average of 8.3 percent of GDP. China's own revenue mix also shows a notable shift between 2014 and 2018, with distinct increase in the share of revenues from social security contributions, VAT and a distinct reduction in the shares of other direct taxes, including personal and payroll taxes.

Figure 1: Components of Revenue, as a share of GDP



Notes:
* Indicates a regional comparator of China.
*** China (2018): the data used in the present analysis.
Source: CEQ Data Center on Fiscal Redistribution (available at www.commitmenttoequity.org)

Our fiscal incidence exercise includes all sources of revenue that are either directly observed in the household survey data or can be imputed or simulated exploiting alternative surveys and administrative data sources that directly impact households. The revenue elements included are thus the personal income tax, indirect taxes (value added and consumption tax), and social contributions. Taken together, these sources of revenue represent 69.3 percent of the government's total revenue in 2018 (Table 1). However, as will be discussed in the next section, due to data limitations, we are not able to capture the entirety of these taxes. We do not incorporate the corporate income tax, other taxes, nor all non-tax revenues in the analysis. These sources of revenue are important but excluded because there is no satisfactory way of determining the incidence of these taxes on individual households. As mentioned, this practice is standard in fiscal analyses and acknowledged as a caveat of the methodology (Lustig, 2018).

A brief description of the revenue components included in the analysis is presented here. The **personal income tax (PIT)** is a tax levied on any income individuals earn throughout the year, including wages or salaries, business operation income, remuneration for services, property income, royalties for authorship and patents, and others. The total PIT collection reached 1,387 billion RMB in 2018, which accounted for 5.3 percent of total revenue and most of this amount came from taxes collected from wages or salaries (67.3 percent).[5] Table 2 shows China's PIT tax

[5] Since we use household survey data from 2018, the measure of PIT used does not include the recent reform of October 2018. This reform aimed to reduce residents' income tax burden and promote consumption by: i) establishing a higher exemption threshold (from 3,500 to 5,000), ii) achieving a smaller taxable object by introducing several deductible items, including children's education expenditure, adult's reeducation expenditure, medical expenditure on serious diseases, expenditure on supporting the elderly, expenditure on housing loan interests and rent; iii) introducing adjustments of the gradual tax rates scheme.

rate structure on wages and salaries. The structure has relatively wide income brackets, as well as a large personal allowance of RMB 42,000. The personal allowance is about twice the level of the average wage, implying that most workers are outside of the tax net (IMF, 2018). Relative to its regional comparators, China's marginal PIT rates are generally applied to lower income levels (Appendix Figure A1). However, the opposite is the case when comparing China to its high-income comparators, especially for the top tax rates. For instance, in China the marginal tax rate of 30 percent applies only to those with wages that are about 12 times the mean nominal wage. That threshold is much lower for several high-income countries where that level of marginal tax rate applies, on average, to workers with just 1.8 times the mean nominal wage.

Table 2: Personal Income Tax (PIT) rates on wage/salary income, China 2018

Taxable Income Range (RMB per year)				Marginal Tax Rate
[	0 ,	18,000	]	3%
[	18,001 ,	54,000	]	10%
[	54,001 ,	108,000	]	20%
[	108,001 ,	420,000	]	25%
[	420,001 ,	660,000	]	30%
[	660,001 ,	960,000	]	35%
More than 960,000				45%
With standard personal allowance of RMB 42,000				

Source: Detailed Rules for the Implementation of the Individual Income Tax Law of the People's Republic of China, 2011

The **value-added tax (VAT)** is levied on goods or services at points at which value has been added, including during the processes of sale, service, and importation. This tax is the largest source of tax revenue in China, accounting for 50 percent of total tax revenue in 2018.[6] In addition to the VAT, China has a **consumption tax** that is imposed on the purchase of items such as fuel, tobacco, alcohol, cosmetics, fine jewelry and precious gems, firecrackers and firework, refined oil, auto tires, motorcycles, automobile, golf equipment, high-end watches, yachts, disposable wood chopsticks, hardwood floor, batteries, and coating materials.[7] Due to data limitations, we only include consumption tax of fuel, tobacco, and alcohol.

Contributions to **social security** vary depending on the program covered. The **employee's system** (also known as *Urban worker scheme)* requires employers to cover five insurance programs for their employees (pension insurance, medical insurance, work-related injury insurance, unemployment insurance, maternity insurance) plus the housing fund. The contributions to each program are made by both employers and employees. Contribution rates vary at the local level, but the degree of variation is relatively minimal. Table 3 shows the contribution rates for some of the

[6] In recent years, there has been a series of reforms relevant to the VAT. Our measure of VAT includes the reform that replaced business tax with VAT. This reform was piloted in several industries and several provinces/municipalities since 2012 and fully implemented in 2016. Soon after that, in 2017, the four-rate VAT scheme (17%, 13%, 11% and 6%) was adjusted to a three-rate scheme (17%, 11% and 6%) to lower the VAT burden.

[7] There has been a series of reforms relevant to this type of tax in recent years. Some of the adjustments are aligned with reducing environmental and health impacts. For instance, battery and coating materials started to be subject to consumption tax in 2015 while environmentally friendly batteries were exempted. That same year the consumption tax levied on the wholesale process of cigarettes increased from 5% to 10%, plus 0.005 yuan/item. Other reforms took place soon after. Starting in 2016, regular cosmetic products were exempted from consumption tax and the rate for high-end cosmetic products was reduced from 30% to 15%. Also, an additional 10% of consumption tax was levied on the retail prices of ultra-luxury automobiles.

main elements of the employee social security system. Wage employees who are not covered by the employee system, including part-time employees, as well as self-employed workers, can opt to contribute to the system by reporting themselves as "flexible workers". In this case, they choose their contribution amounts within a predefined range.

Table 3: Typical contribution rates to the employee social security system, as a share of monthly wage

Program	Contribution rates	
	Employee	Employer
Pensions	8%	18 – 20%
Medical insurance	2%	6 – 10%
Work-related injuries	--	1-2%
Maternity	--	1-2%
Unemployment insurance	0.5-1%	0.5-2%
Housing Fund	5%-12%	5%-12%

The resident's social security system (also known as Rural and Urban Resident Scheme) is a complement of the employee's social insurance system and covers only medical insurance and basic pension insurance programs.[8] In 2018, 55% of contributors of pension schemes contributed to the resident's social security system. The resident programs are targeted at unemployed individuals, as well as at wage employees and self-employed workers who are not contributing to the employee system. These individuals can enroll voluntarily in both programs and can choose their contribution amounts within a predefined range. In addition, there are two groups of individuals covered by both resident's programs whose contributions come exclusively from the local government: adults under 60 years of age who are not covered by the employee's system who either live in households with incomes below the Dibao line or are disabled. The total amount collected from contributions to the resident's program is lower than the contributions collected by the the employee's system (338 billion RMB compared to 7523 billion RMB; see Appendix Table A2).

Total Current Expenditure

China's total public expenditure in 2018, including spending from central and local governments, was 22,090 billion RMB, which represented 24.5 percent of total GDP. Around half of this amount (37 percent) was allocated to social expenditure, about three-fifths to non-social expenditures (60 percent) and the remaining 3.4 percent to debt servicing (Table 4). Note further also that this category excludes spending through the Government Fund Budget (GFB) which is the source of most spending on infrastructure. The fiscal incidence analysis carried out here focuses mainly on allocating the social expenditure to households. The other categories, for instance infrastructure and defense included in non-social expenditure, are excluded from the analysis due to the difficulty of allocating their benefits to individuals. Within the social expenditure category, there are four subcategories: (i) education expenditure, (ii) health care expenditure, (iii) social insurance, social assistance & labor, and (iv) housing assistance.

[8] These resident programs were at first exclusively for rural residents (*rural hukou*), starting in 2003 in the case of the medical insurance program and in 2009 in the case of the basic pension insurance program. Similar programs were created for urban residents in 2007 and 2011, respectively. The urban and rural pension insurance programs were integrated in 2014, while the medical insurance programs were integrated in 2016.

In our analysis, we capture expenditure on education, health, social insurance, and social assistance. Taken together, the subcategories we consider represent 82 percent of the government's total social expenditure, or 30 percent of total expenditures in 2018. Data limitations prevent us to capture accurately these amounts (see section 3 for details).

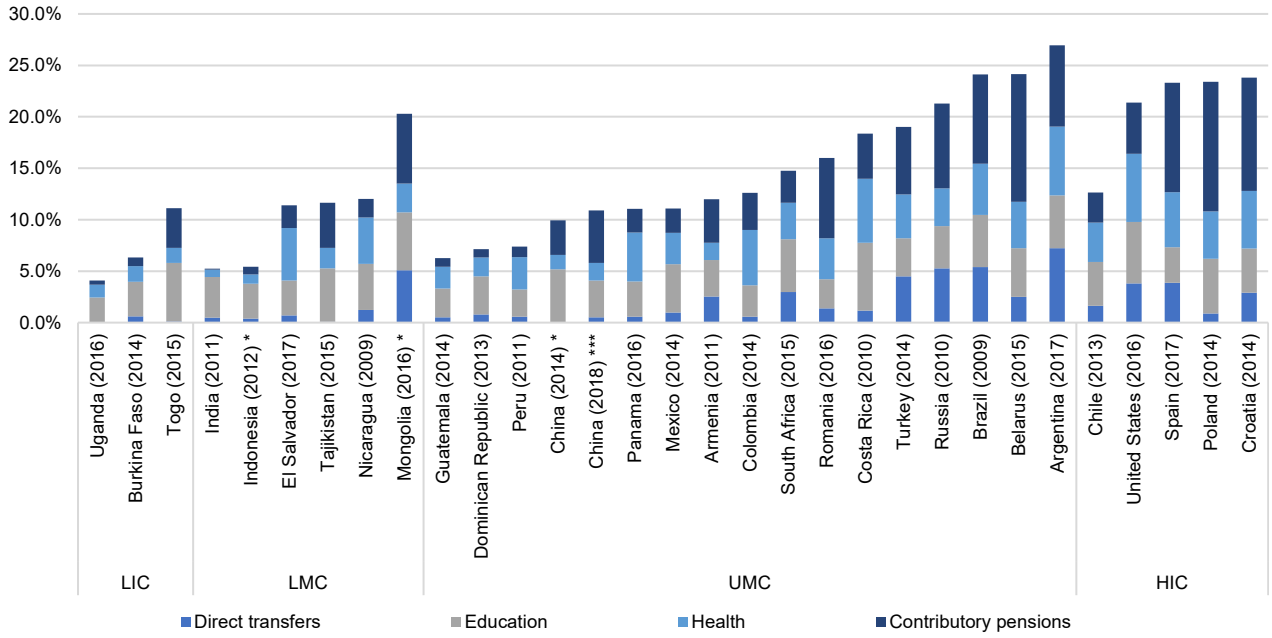
Table 4: Size of the Government Expenditure, China 2018

Categories	Amount in Admin. (Unit: bln RMB)	% of Total Expenditure	% of GDP	% In Analysis
Total Government Expenditure	**22090**	**100.0%**	**24.5%**	
Primary Government Expenditure	21344		23.7%	
Social Expenditure	**8161**	**36.9%**	**9.1%**	
in which:				
Education Expenditure	*3217*	*14.6%*	*3.6%*	*Yes*
Health Care Expenditure	*1562*	*7.1%*	*1.7%*	*Yes*
in which:				
Medical Assistance	47	0.2%	0.1%	Yes
Social Insurance, Social Assistance &Labor	*2701*	*12.2%*	*3.0%*	
in which:				
Dibao Transfers	146	0.7%	0.2%	Yes
Tekun Transfers	30	0.1%	0.0%	Yes
Temporary Relief	16	0.1%	0.0%	Yes
Natural Disaster Relief	13	0.1%	0.0%	Yes
Complements for Basic Pension Insurances	827	3.7%	0.9%	Yes
Pension for Admin. Institutions Staffs	853	3.9%	0.9%	Yes
Housing Assistance	*681*	*3.1%*	*0.8%*	*No*
Non-Social Expenditure	**13183**	**59.7%**	**14.6%**	**No**
Debt Servicing	746	3.4%	0.8%	No

Source: Statistical Yearbook for China 2019, National Bureau of Statistics 2019; Financia Yearbook of China 2019, Ministry of Financ3, 2019

Compared to other upper-middle-income countries, China's social spending is relatively low, especially on direct transfers. China's spending on direct transfers amounts to 0.5 percent of GDP, which is the lowest share among several upper-middle-income countries and below the average of some lower-middle-income countries. (Figure 2). China's health expenditure as a share of GDP is also one of the lowest among several upper-middle-income countries. However, its expenditures on education and on contributory pensions are closer to the median among these countries.

Figure 2: Components of Social Spending, as a share of GDP



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Source: Own analysis and CEQ Data Center (available at www.commitmenttoequity.org)

As in the case of contributions, the pension/benefit amounts in China differ widely between the employee's and resident's social insurance programs. For the pension programs, the number of contributors and beneficiaries in the resident's program (365 million and 159 million respectively) was relatively similar to the number of enrollees in the employee's program (301 million and 118 million respectively) but the contribution and pension amounts were orders of magnitudes lower for the resident's program (see Appendix A). In the case of the medical insurance program, the number of people covered under the resident's program (1,028 million) was more than three times larger than the number of people covered under the employee's program (317 million), in part because the residents' health insurance includes children (not included in the employees' system), and yet the contribution and benefit amounts were still significantly lower for the residents' program. These numbers indicate that the average contribution and pension or benefit amounts are much lower for those enrolled in the residents' programs relative to what is provided through the employee system.

China's social protection system also includes a social assistance component. Some of the main social assistance programs include the urban and rural Minimum Living Standard Scheme (*Dibao*), assistance for the extreme poor in both urban and rural areas (*Tekun*), temporary and natural disaster relief programs, as well as medical, education, housing and employment assistance programs (see Appendix Table 2 for summary statistics of these programs). The flagship cash transfer program *Dibao* provides cash transfers and employment opportunities to households whose income and living conditions are below local Dibao thresholds. The program is managed at the local level, and the value of benefits varies at the prefectural level. In 2018, 45 million people lived in a household that received Dibao, with average annual benefits of 5,712 Yuan RMB for urban recipients and 3,003 Yuan RMB for rural

recipients. Thresholds for eligibility in 2022 varied from 1330/person per month in Shanghai (equivalent to USD 10/day in 2017 PPP) to 402/person per month in rural Guizhou (equivalent to USD3.7/day in 2017 PPP). The *Tekun* assistance program is aimed at helping the elderly, the disabled, and those aged below 16 without any supporter nor source of income and who are unable to work. The Tekun beneficiaries receive basic living arrangements, tendance, medical treatment, and proper burial. In 2018, 5.28 million individuals benefited from the Tekun assistance program, with average annual benefits of 10,650 yuan for urban recipients and 6,745 yuan for rural recipients. The Dibao and Tekun programs are mutually exclusive so that an individual cannot be a beneficiary of both programs simultaneously. Dibao and Tekun are also considered as the entry to other social assistance programs, such as housing, medical and education supports. Once eligibility for these cash programs is established, a package of services is also provided, according to specific household composition and needs,

Data and Methodology

Data

We exploit several data sources, including a micro-level household survey dataset and aggregate-level statistics from administrative data. The main household survey data used is the 2018 China Family Panel Study (CFPS), which is a biennial longitudinal study with a 2010 baseline. This is a nationally representative survey that collects community, household, and individual sociodemographic characteristics of contemporary China. The estimated geographical distribution of the population using the CFPS is comparable to reports based on official data. For all estimations, we use CFPS individual weights to account for differences in the probability of selection of each group and ensure that the total weighted number of people matches with the population in the country, as reported by the National Bureau of Statistics.[9]

The information collected is suitable for carrying out fiscal incidence analysis as it includes individual labor income, household agricultural and business operation income, household rental income, financial investment profits, private transfers, auto-consumption, household expenditure by category, coverage of social insurance programs, reception of cash transfers and pension, as well as utilization of education and health services. The 2014 round of the CFPS was used in a previous fiscal incidence analysis for China (Lustig and Wang 2018). For the current analysis, we use the 2018 round, which contains the most recent available survey data. The 2018 round has information on 45,310 individuals from 14,218 households in 31 provinces/municipalities/autonomous regions.[10]

To model some of the interventions, we also rely on alternative surveys: the 2012 round of the CFPS and the 2019 China Household Finance Survey. Our second key source of information is administrative data. We use administrative data to validate the consistency of the survey-based estimates, as well as to conduct simulations and imputations when detailed information in the survey is not available. The main sources of administrative data are the Statistical Yearbook of China 2019, China Social Statistical Yearbook 2019, the 2019 Finance Yearbook of China, the 2018 Annual Report of Housing Fund, and 2018 Statistical Bulletin on Development of Human Resources and Social Security and information from the Ministry of Finance, the Ministry of Housing and Urban-Rural Development, and The People's Bank of China.

[9] CFPS-based estimates indicate that 54.1% of individuals are urban residents and 38.5% are rural residents, which is comparable to official reports showing a distribution of 59.6% individuals residing in urban areas and 40.4% in rural areas. Regarding province of residency, 44.2% individuals reside in the Coastal region, 31.4% in the Interior region and 23.9% in the Western region according to estimates using the CFPS. These shares are also comparable to the respective shares in official data of 45.2%, 33.1% and 21.9%.

[10] Hong Kong SAR, Macao SAR, and Taiwan, China are not covered. For more details on the CFPS survey, visit: https://www.isss.pku.edu.cn/cfps/en/index.htm.

CEQ framework

To assess the potential impact of fiscal policy on economic inequality, we follow the framework and methodology developed by the Commitment to Equity Institute (Lustig, 2018). This method involves constructing a set of household income measures starting from pre-fiscal income (market income or market income plus pensions depending on whether contributory pensions are treated as a government transfer or as deferred income) and sequentially adding/subtracting fiscal interventions such as taxes, transfers and subsidies, to obtain several post-fiscal income measures. The distributive impacts of overall fiscal interventions can then be analyzed by comparing inequality indicators using the pre-fiscal and post-fiscal income measures. The unit of analysis is the individual and the welfare measure is the household per capita income.

Four income measures are constructed at different stages (see Figure 5):

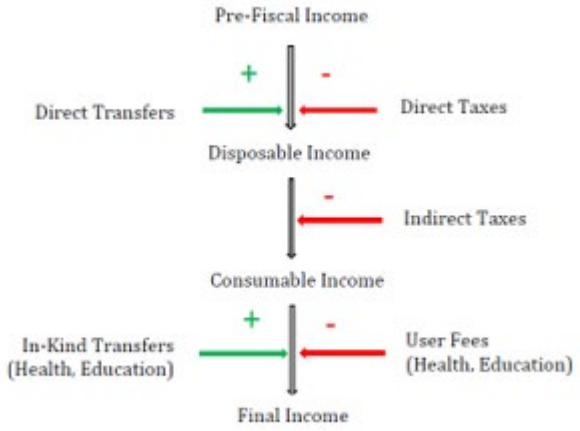
- The household's ***pre-fiscal income*** is the total income a household generates before it encounters the fiscal system. This measure includes the income the household received from wages and salaries, agricultural and business operation income, auto-consumption, property income, private transfers and remittances, and imputed rent of owner-occupied housing. When contributory pension (employee's pension) is considered as deferred market income (PDI scenario), it is also counted towards pre-fiscal income. Alternatively, contribution pension could be considered as government transfers (PGT scenario), in which pre-fiscal income does not include the contributory pension. We conduct the analysis using the PDI scenario while also presenting the PGT results in Appendix C.
- The household's ***disposable income*** reflects how much income the household has available to spend on goods and services, or to save, after direct taxes (personal income tax and contributions to social security) are paid, and direct transfers (including cash transfers and pension receipts) are received. Resident's pension is always considered as transfers in our analysis, thus direct transfers for the PDI scenario include cash transfers and resident's pension benefits, and further include employee's pension benefit for the PGT scenario. Direct taxes include personal income tax and contribution to social security, which is without contribution to employee's pension for the PDI scenario, and with contribution to employee's pension for the PGT scenario. In other words, resident's pension, which has characteristics closer to a government transfer is treated as government transfer even in the PDI scenario.
- The ***consumable income*** corresponds to the amount of goods and services the household can afford, once we consider indirect taxes (value-added tax and consumption tax),[11] and indirect subsidies (for instance, cheaper agricultural inputs).
- The ***final income*** incorporates a household's use of public services, such as public education or health services, which are sometimes accessed at a price below the value of the service received, and thus can be considered an in-kind transfer.

This framework is essentially an "accounting approach" because it ignores behavioral responses and general equilibrium effects. The primary interest of this exercise should be seen as a way to assess the progressivity of each fiscal intervention and overall progressivity of the fiscal system rather than to estimate the impact of the removal or addition of these interventions (Younger, 1997).

[11] The total effect of the value-added tax includes its direct effect on the prices of final goods and services, and its indirect effect, known as the cascading effect, on the prices of intermediate goods. We consider both the direct effect and indirect effects.

It should also be noted that in the analysis we are excluding public spending on, for example, infrastructure and public goods such as defense and some important categories of taxes (such as corporate income tax) because of the methodological challenges of allocating the economic benefit or burden to households. In the case of China, the exclusion of investments in public infrastructure such as rural roads is important to highlight. This means, that, for instance, unfortunately many of the poverty reduction development-oriented programs, which became a hallmark of public policies in the recent years, are not being considered and as such have not been accounted for. If data on the amount of resources spent at a local level were available (for instance, for poverty-stricken counties) as well as the identification of households in the survey as belonging to these areas, we may be able to incorporate these into the analysis.

Figure 3: Construction of Income Measures



Note: Based on Lustig (2018)

Construction of income concepts

For our fiscal analysis, we construct the four income concepts from the CEQ framework as comprehensively as possible. There is one important difference with the general methodology illustrated in Figure 3. Typically, subsidies are added to the disposable income to construct the consumable income. However, in the case of China, some subsidies, especially toward agricultural inputs are distributed in the form of cash and the 2018 CPFS data does not distinguish these subsidies from direct transfers received. Therefore, some of these subsidies are implicitly included in our measure of disposable income that accounts for direct transfers.[12]

[12] The agricultural subsidy is an array of policy instruments and is generally a mixture of cash transfers and price subsidies. Cash transfers are provided for promoting grain production, motivating superior crop varieties, and purchasing agricultural production materials (including fertilizers, diesel oil, seeds, and agricultural machinery). Price subsidies are provided for low-price agricultural machinery and tools. There is no directly identifiable information in the survey about indirect price subsidies. Also, it seems reasonable to assume that most households that benefited from price subsidies do not know the benefit amounts. Therefore, the agricultural subsidies reported as part of direct transfers in the survey are likely to be mostly direct cash payments.

The construction of the four income measures requires putting together several fiscal interventions. Table B2 in the appendix provides a list of all the interventions included in our analysis, indicating whether the information used was directly available in the household survey or needed to be imputed or simulated, when either the status (beneficiary/payer) or the amount received/paid was not reported directly in the survey.

The total amounts of revenue or spending from the survey (including imputations) do not always coincide with those from administrative data. This is to be expected. For many cases, these total amounts are nevertheless, comparable. But the range is wide and, in some cases, it is worth explaining the possible reasons behind the differences. For instance, the total amount of the personal income tax allocated or retrieved from households in the survey is about 57 percent of the total amount in the administrative dataset. In part, this reflects the limitation of household surveys to adequately capture information on the households at the top of the income distribution due to underreporting or non-response of rich households. The calculation of VAT provides another example of the data limitations. The VAT amount included in the analysis accounts for only 38 percent of the amount in administrative records due to the exclusion of durable goods from the analysis and the fact that final consumption of households only makes up for a portion of the total VAT. This is, however, a limitation that is standard for this type of analysis and as is recommended practice, for each of the fiscal components modeled in the analysis we present a detailed analysis of macro-validation in Appendix B.

Results

Combining households' contributions and benefits to the fiscal system, five key features emerge. These features are summarized in Figures 4 and 5. Figure 4 shows the average taxes and contributions paid per year by each household market income decile (with bars below the horizontal axis), the average benefits received (bars above the horizontal axis) and the net impact (red dots), expressed in RMB. Figure 5 contains the same information, but contributions and benefits are expressed as a share of households' final income.

First, the Chinese fiscal system is overall progressive. In absolute terms, poorer households receive a positive net benefit (receive more from the fiscal system than what they pay into it) while the net benefit position becomes more and more negative higher up the income distribution. Overall, with net fiscal position in the positive, more than 70 percent of the country's population is net beneficiary of the fiscal system. The fiscal system is also progressive in relative terms, especially with respect to in-kind education and health benefits that favor the relatively poor (Figure 5). Two observations are noteworthy. First, in gross terms, the overall value of the benefits received are worth quite a lot to households that receive them. For households in the poorest decile, for example, the total value of benefits received through the fiscal system is almost as large as their pre-fiscal income. Second, the value of the benefits declines as one moves up the income distribution, that is, the benefits account for a smaller share of pre-fiscal income as households become richer.

Figure 4. Averages of fiscal interventions, by pre-fiscal income decile

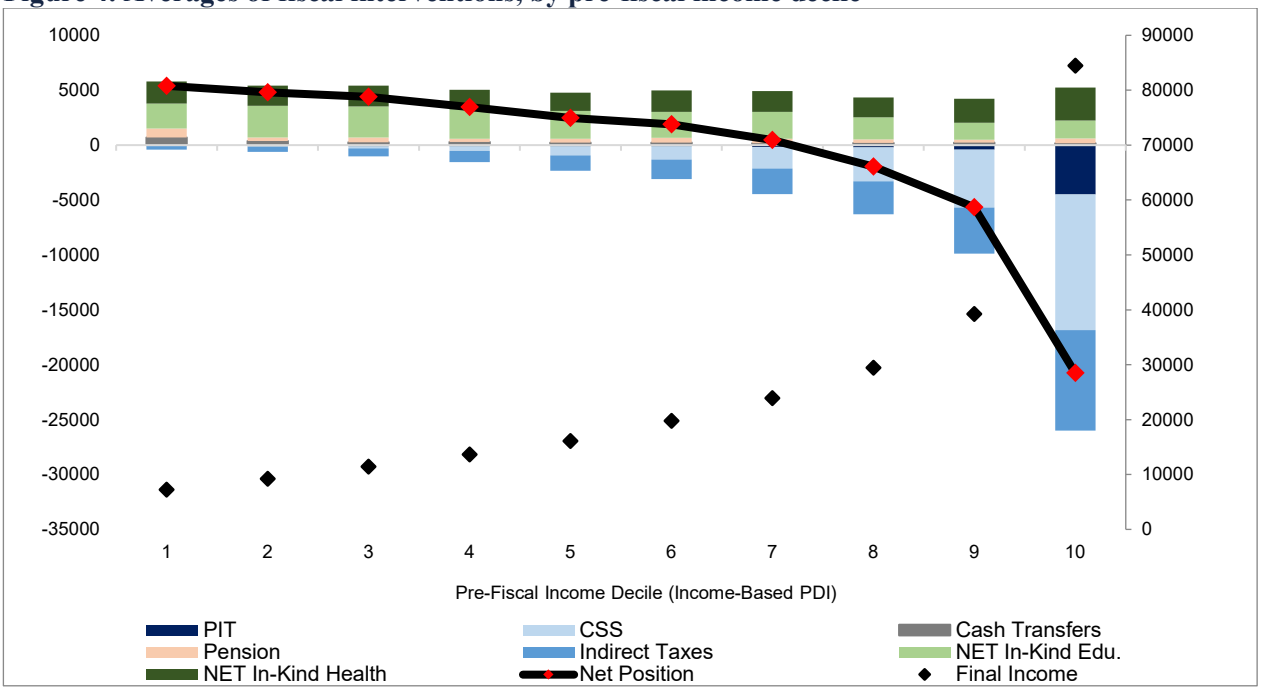
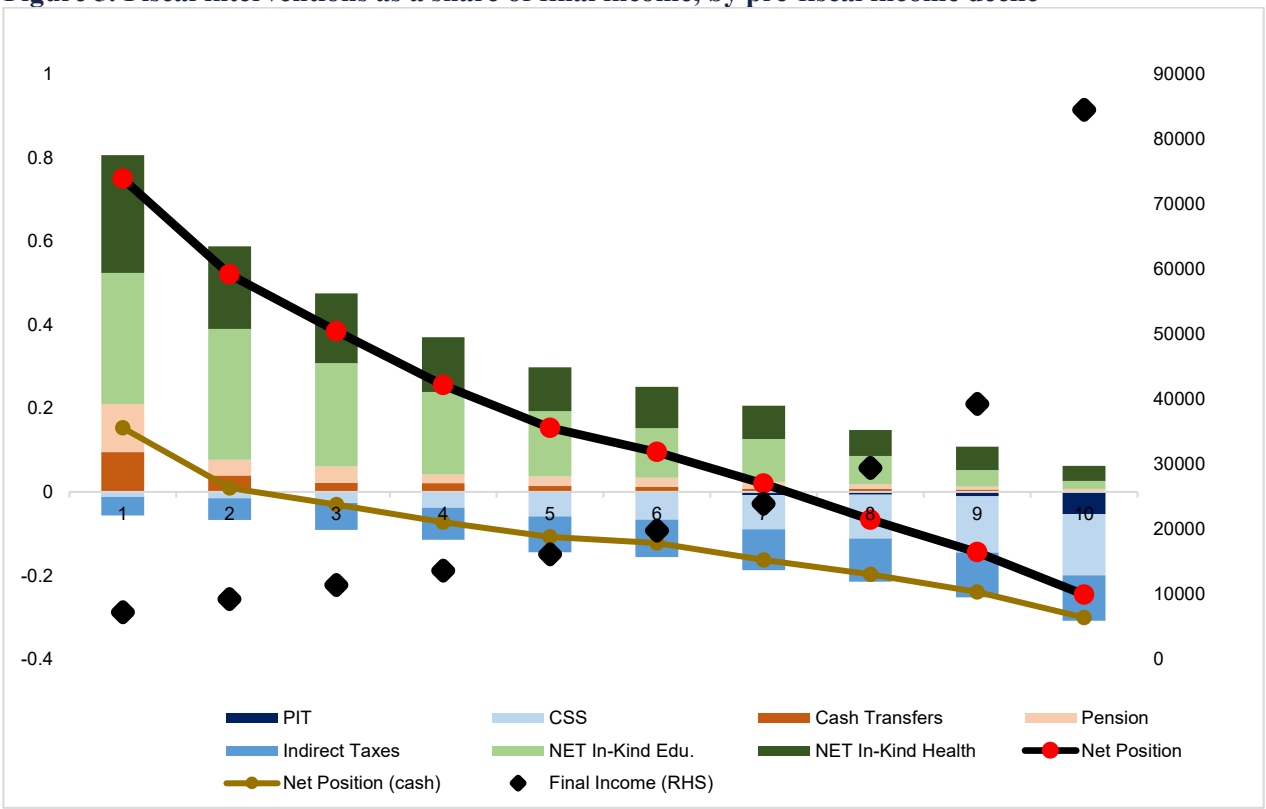


Figure 5. Fiscal interventions as a share of final income, by pre-fiscal income decile



Note: The primary y-axis in Figure 4 denotes averages of fiscal interventions and the unit is Yuan. The primary y-axis in Figure 5 denotes benefits and taxes as a share of final income. The secondary y-axis in both Figures 4 and 5 denote average final income by decile and the unit is Yuan.

Second, the progressivity of the fiscal system is driven for the most part by publicly provided education and health services. The light and dark green bars in Figures 4 and 5 represent net in-kind education and health benefits, respectively. Net in-kind benefits are computed as the difference between the in-kind benefit received (valued at the average cost of provision for those attending public schools or using health facilities) and user fees paid by households. In kind benefits are significantly higher than user fees (Figure 6), so the net effect is large. These benefits are largely progressive in relative terms, with poorer households receiving more than richer ones relative to their own income.

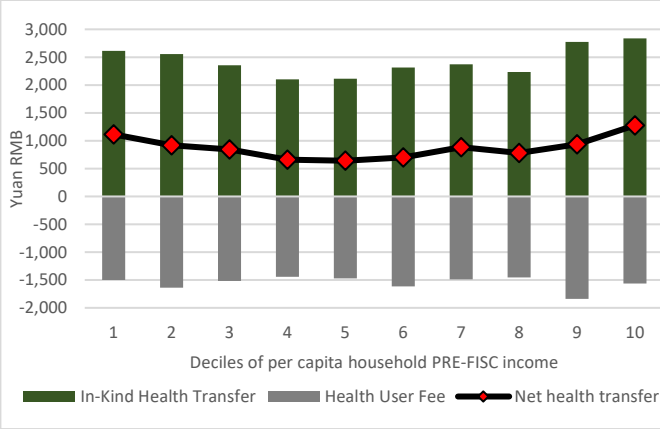
If one leaves out in-kind benefits and focuses purely on the cash-elements, the net fiscal position would be positive only for poorest two deciles suggesting that most Chinese households would be net-payers into the system if these in-kind benefits were not accounted for. The shape of the net benefit chart across the deciles is still downward sloping suggesting that the relatively richer households contribute more into the system as a share of their final incomes, so there is some element of progressivity built in.

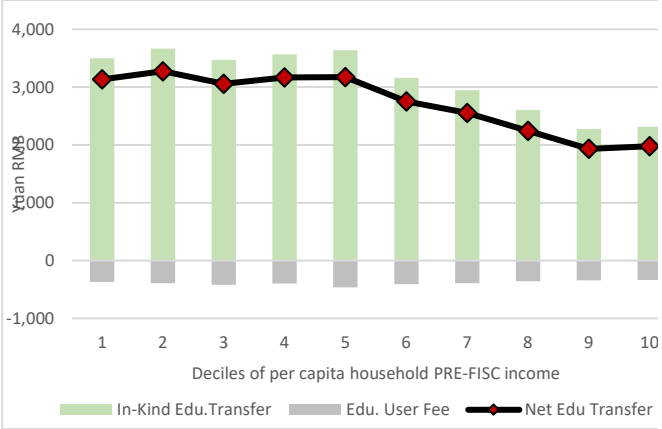
Three important additional remarks may be highlighted. First, while the average amount of net benefits is similar across the distribution, the composition differs: net education benefits are larger in absolute amount for lower income households, while net health benefits are, on average, larger among richer households (Figure 6). Second, the fact that households across income deciles pay on average similar RMB amounts of user fees (around RMB 1,500 in health, 400 RMB in education) means that the burden of these fees is very regressive and lands heavier on the poorer segments of the population, relatively to their total income. For households in the first decile, user fees for health care represent more than 20 percent of their final income. Indeed, despite the large increases in the health expenditure financed by the general government (doubling between 2000 and 2020), the share paid by households out of pocket stands at 35 percent, representing an order of magnitude higher than those observed in most rich countries (WDI 2024). Third, the existence of differences in quality of services provided and in population needs across the distribution can imply that even when the benefit levels received are the same for everyone, the system is not reducing inequality more broadly understood. Indeed, it is likely that public schools in better off parts of the country are able to deliver higher quality education, and that poorer households are in greater need of health services as poor health status is typically negatively correlated with income. Yet, in absolute terms, the poorest households receive higher health net transfers than households in the middle of the distribution but lower than households in the top of the distribution (deciles 9-10). Furthermore, households in the lowest decile spend more in private education than all other deciles except the top two deciles (Figure 6.C).

Figure 6. Average Per Capita Amounts of Health and Education Fiscal Interventions, by Decile

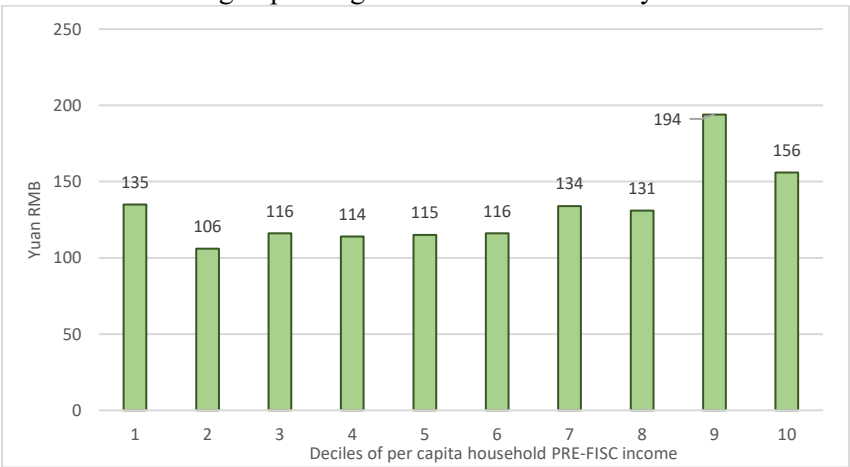
A. Health Fiscal Interventions

B. Education Fiscal Interventions





C. Average Spending on Private Education by Decile



Third, cash benefits are low but are essential for those at the bottom of the distribution. For the poorest households, 20 percent of their final income comes from Residents' pension benefits (11 percent) and cash transfers (9 percent). The average amount received by the first decile is also higher than for the rest of the deciles, in absolute terms. Despite the relatively modest cash amounts of both residents' pension and cash transfers, they do help lower overall inequality as will be shown later. Still, these amounts are low, particularly in poorer provinces and rural areas, where the benefit is a small fraction of average wages. Compared to the average pension received by those that contributed to the Employee System, the average pension for those in the resident's pension system is 10 times lower on average (World Bank, *China Economic Update, December 2023*). Considering cash transfers, overall coverage is low (14 percent of households) and significantly lower if we consider only the flagship cash transfer program Dibao. This program covers less than 4 percent of the population, compared with an average of 17.6 percent of the population among upper-middle-income countries (World Bank, ASPIRE database). Most households in the program are those whose members are unable to work due to age or disabilities. As such, the program has limited reach for households that may experience unexpected fall in income due to loss of employment or business.

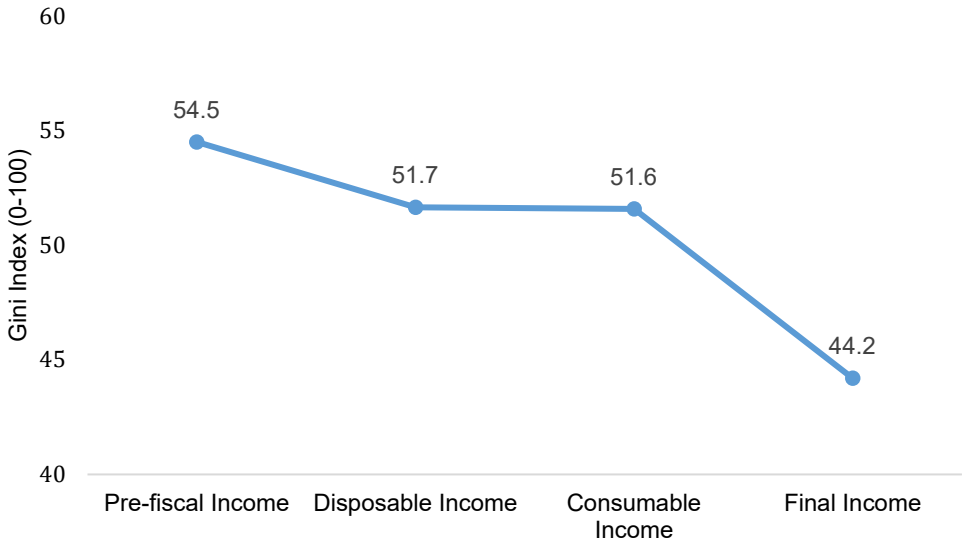
Fourth, and as expected, richer households contribute more to the fiscal system than poorer ones in relative terms, contributing to the progressiveness of the system. Households pay into the fiscal system in the form of PIT, VAT, and consumption taxes on their purchases and through their contributions into the employee or resident

social security schemes. There are several reasons for why richer households contribute more. First, the rich consume more than the poor in monetary terms and, as such, the average per capita value of VAT and consumption taxes paid are also higher. Second, higher earners contribute more to the social security system, as these contributions (particularly the employee scheme) are indexed to earned income. Finally, the PIT accounts for a small share of payments into the fiscal system relative to that collected via indirect taxes and social security contributions and is concentrated mostly among households in the top decile. On average, through personal income taxes, social contributions, and indirect taxes, the top decile accounts for 47 percent of all contributions to the national fiscal system whereas the second-richest decile contributes 18 percent. Together, the top three deciles account for over two-thirds of the total contributions into the fiscal system. The concentration on PIT is even greater, with the top decile alone accounting for 83 percent of the total collected.

Fifth, while PIT is highly progressive in its structure, only few contribute. This narrow fiscal base arises in part from the high-income concentration at the top deciles, with the market income of the top three deciles accounting for three-quarters of total market income. But in addition, as discussed previously, the high standard personal allowance means that a significant share of individuals in the lower deciles do not pay this tax.

Taken together, the fiscal interventions included in the analysis reduce inequality – as measured by the Gini index – by about 10.3 points. Starting from a pre-fiscal or market income Gini of 54.5 points, Figure 7 shows the values of the Gini index using the income measures that sequentially incorporate the fiscal interventions we consider. The index decreases 2.8 points at disposable income, which incorporates direct taxes and transfers. It decreases slightly (0.01 points) when indirect taxes are incorporated to construct the consumable income. The highest decrease of 7.4 points occurs when we get to the measure of final income which incorporates health and education in-kind transfers and user fees. Results for the PGT version of the analysis yield a slightly higher rate of inequality reduction from market to final income (12.1) with an expected larger role played by contributory pensions which the PGT scenario would have regarded as government transfers. The disposable income Gini under PGT would have been 4.7 points lower than market income Gini, which is quite a bit higher than the 2.8-point difference between pre-fiscal and disposable under PDI. Results are qualitatively similar when we use the Theil index as alternative measures of inequality (see Appendix Figure C1).

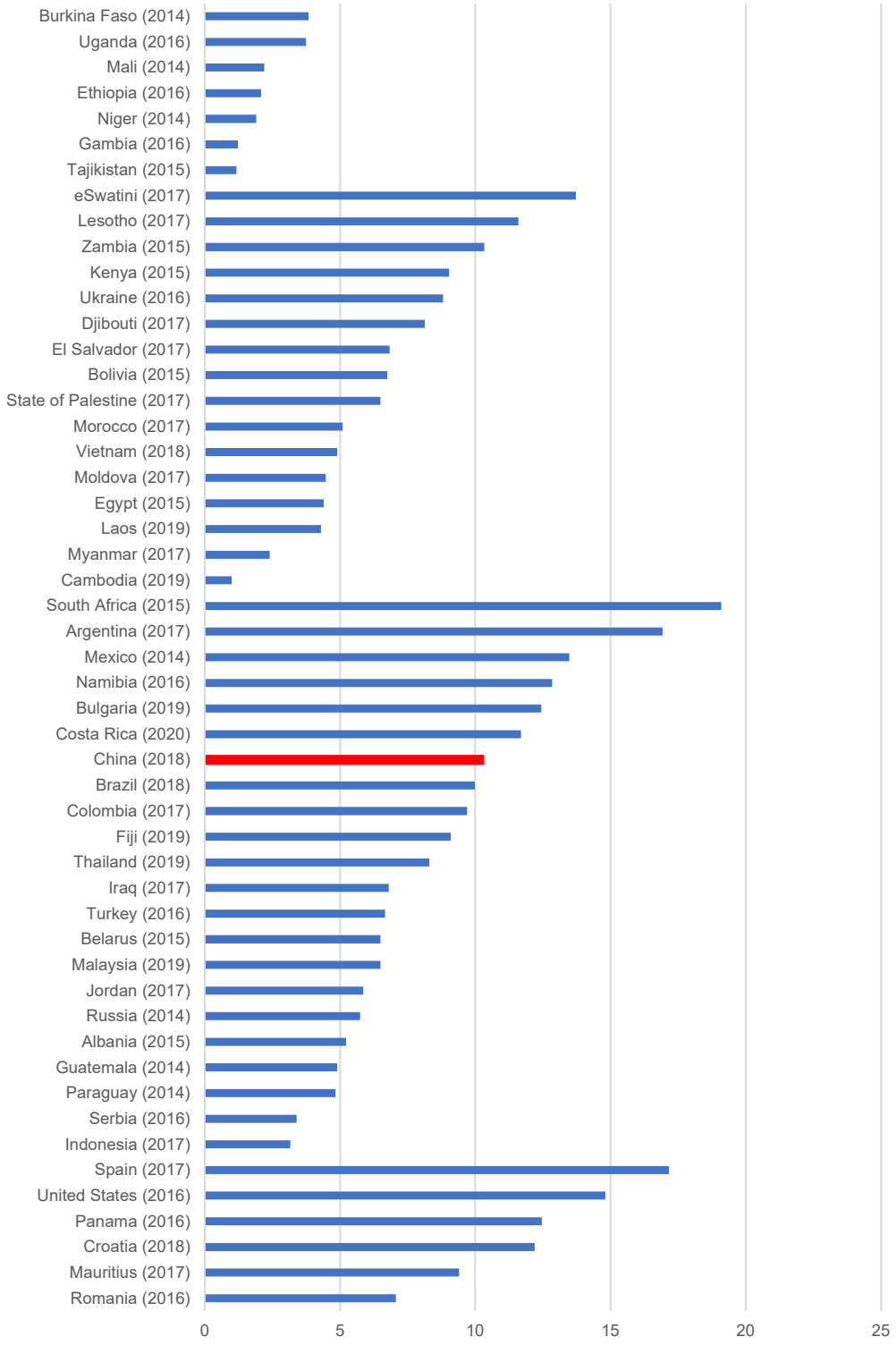
Figure 7. Gini Index, from pre-fiscal to final income



Notes: The figure shows inequality measured using the Gini index at various income concepts. Direct taxes and transfers are applied to pre-fiscal income to get to disposable income. Indirect taxes applied to disposable income yields consumable income and final income is obtained by adding in-kind health and education benefits less user fees paid by households to access these benefits. Contributory pensions are treated as deferred income while resident's pensions are treated as transfer.

The inequality reduction achieved by China is the average of several countries and is around the median for the upper-middle-income countries for which similar analysis has been done (Figure 8). Similar analyses examining the extent to which fiscal systems redistribute effectively and reduce inequality have now been done in more than 80 countries around the world. What has been found is that fiscal systems generally lower inequality in countries at all income levels and all levels of initial inequality. However, the amount of success countries are able to achieve in using fiscal policies to lower inequality varies quite a bit with the country income level seeming to be an important factor. Taking the sample of countries where similar analysis has been done in a comparable manner, we see that the inequality reduction achieved by fiscal policy is in the 0-4 Gini points in low-income countries, 1-14 range in the lower middle-income countries, 2-19 in upper middle-income countries and 7-13 in high income countries. Using this as a benchmark, the 10.3 Gini points in inequality reduction that China achieves is around the median for both the upper middle-income country and the high-income country range.

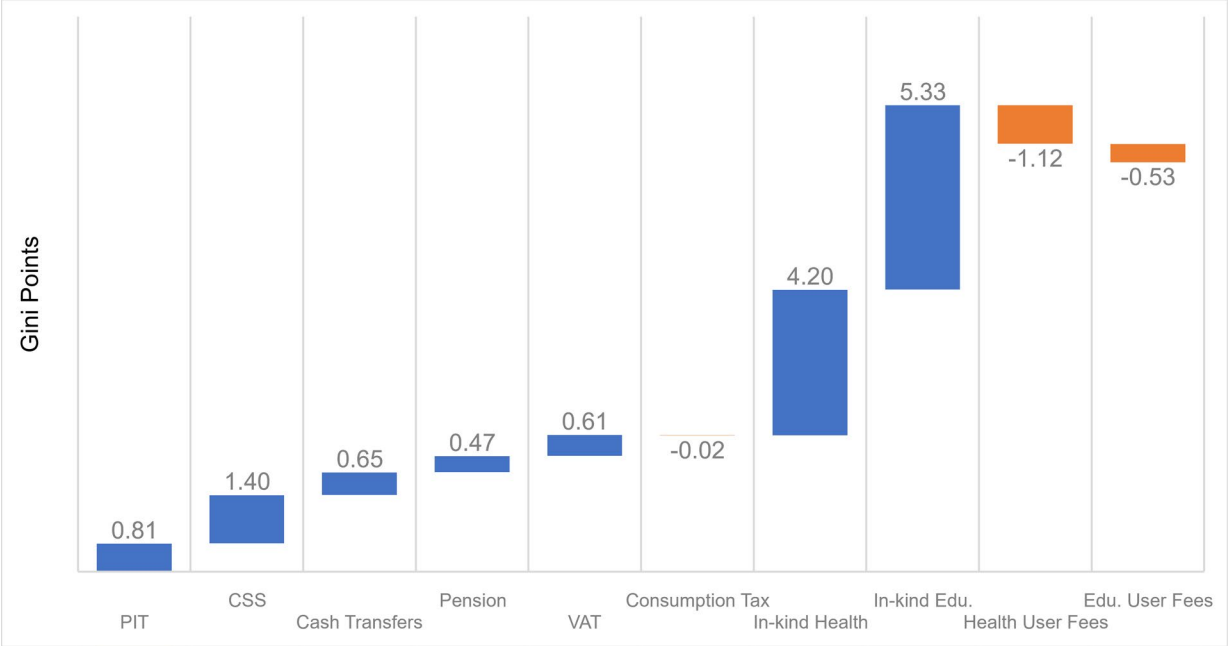
Figure 8. Change in the Gini Index, from pre-fiscal to final income



Notes: Original estimates based on data from CEQ Institute, CEQ Data Center on Fiscal Redistribution, https://commitmentoequity.org /datacenter; OECD data; World Bank data. Countries are grouped according to World Bank Income classification system starting with Low Income Countries (LIC), Lower Middle Income Countries (LMIC), Upper Middle Income Countries (UMIC) and High Income Countries (HIC)

Education and benefits drive redistribution while the role of progressive tax policy instruments such as PIT is modest. To assess the marginal contribution of each fiscal intervention to the reduction of inequality, we calculate the difference between the Gini index of final income with and without the specific fiscal intervention (Figure 9). A positive marginal contribution means the intervention item was equalizing, i.e., contributed to lowering inequality, while a negative marginal contribution means the intervention had an inequality increasing impact. Several observations stand out. First, consistent with what we saw in terms of the size of the benefits in absolute and relative terms, in-kind benefits provided through health and education services turn out to be strongest drivers of the inequality reduction China's fiscal system achieves accounting for Gini reduction of 4.2 and 5.3 points respectively. In contrast, the role played by progressive tax instruments such as PIT is somewhat more modest. PIT is equalizing but its contribution to inequality reduction is a fraction of what is achieved through spending on education and health. This limited role is a consequence of China's relatively low collection of PIT, and the fact that most of it is paid by the richest decile with little variation across the other deciles.

Figure 9. Marginal contribution to inequality reduction



Notes: The figure shows marginal contribution each of the fiscal instrument makes to the reduction of inequality

User fees in both education and health have an inequality increasing impact suggesting that the burden of these fees lands heavier on the poorer segments of the population. In fact, the magnitude of inequality reduction achieved by cash transfers and residents' pension put together is not large enough to offset the increase in inequality due to regressive user-fees. This points to a possible room for improvement in these programs, both in terms of being more generous and perhaps also better targeted in the case of cash transfers.[13] Finally, the mild positive contribution of VATs to inequality reduction is intriguing as VATs are often regarded as regressive, at least in relative terms. This

[13] It is also worth bearing in mind that as discussed earlier, our measure of cash transfer captures elements of assistance other than cash transfers (e.g., agricultural subsidy) which is probably exaggerating its benefit size while at the same time understating the level of targeting.

is likely because of the adjustment we make to account for possible informality of consumption, which is likely to be more prevalent among households at lower parts of the income distribution. This would be consistent with other recent evidence that shows that VATs can be progressive when informality of consumption is accounted for. (Bachas et al 2023). Had we not accounted for the possible informality of purchases as we do here, the marginal contributions of VAT would be closer to -0.60, which suggests that the informality of purchases in rural areas (which we proxy for using measures from Thailand) shields poorer households from VAT to a certain extent.

Discussion and Conclusion

In this paper we have applied the standard fiscal incidence analysis to data from the China Family Panel Study 2018 to study the effect of government taxes and spending on inequality in China. The analysis includes fiscal elements such as personal income tax, contributions to social insurance, value-added tax, consumption tax, cash transfers, contributory pensions, and spending on education and health and accounts for 63 percent of overall total revenues and 43 percent of total government spending. The findings suggest that China already achieves quite a bit of inequality reduction through its fiscal policies but there is ample room for the country to do more. Greater reliance on progressive fiscal instruments such as PIT would not only enhance redistribution but also generate fiscal resources China could use to address future drivers of inequality such as population aging and climate change. In addition, there is scope to make social assistance more effective in responding to economic transitions and demographic trends. Cash transfer programs could expand dynamic monitoring systems (currently being piloted in a few cities such as Chongqing and Hangzhou) to be able to quickly respond to vulnerable families that experience unexpected income falls or increases in critical spending (such as on health care). Rapid aging of the population also requires reconsidering reforms to increase the adequacy of the resident pension system while ensuring its sustainability.

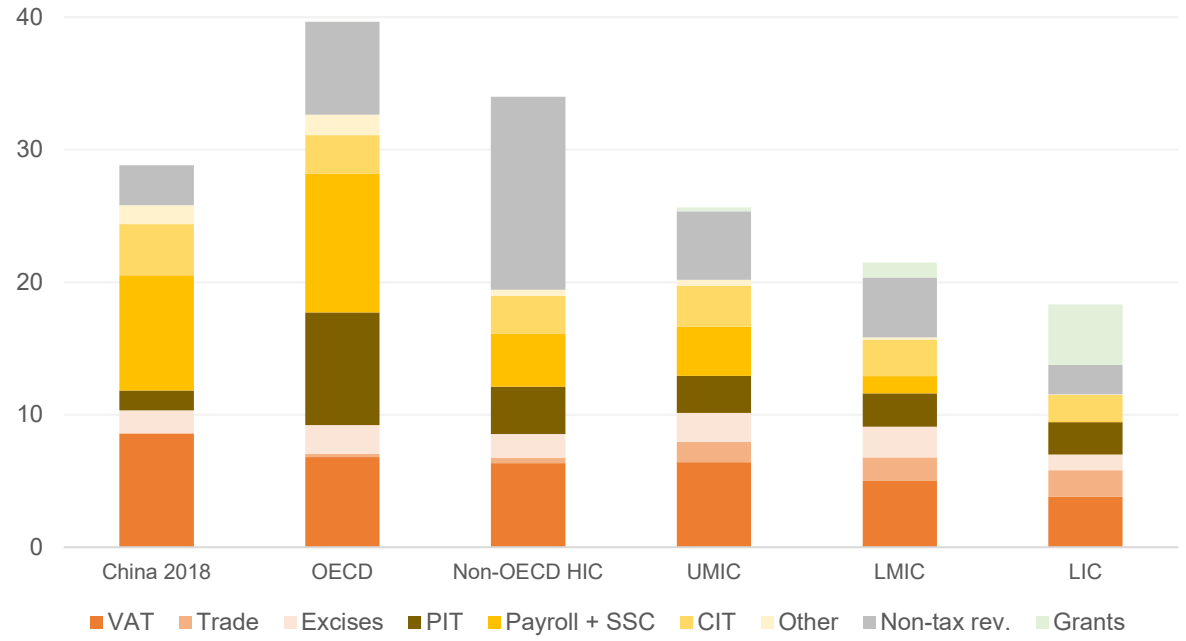
Social spending and human capital investment already contribute significantly to reducing inequality, but the hard task of shifting China's growth model, decarbonizing the economy, and dealing with population aging will require further investment in human capital. China has more than doubled its spending on education over the last 15 years, but at 3.6 percent of GDP in 2018 it was still lower than the average for the upper-middle-income countries (UMICs) of 4.5 percent. Spending on health (1.7 percent of GDP) was similarly about half of the UMIC average of 3.4 percent. Spending better would be just as important to close access and quality gaps across economic sectors and geographic regions. Expanding coverage of social assistance programs to cover those beyond the extreme low-income families unable to work, controlling rising health care costs, addressing gaps that exist within the two-tiered social insurance system (for instance, by increasing the benefits of the resident pension system, particularly in rural areas), and ensuring portability of social benefits, are all improvements that could lower the burden of out-of-pocket spending for the relatively less well-off (World Bank and DRC 2022).

Turning to the revenue side of the budget, China's domestic revenue mobilization level is higher than the upper-middle-income country average, though still below the OECD average. As countries develop, their ability to collect revenue from domestic sources improves. The tax base broadens, greater numbers of workers and firms engage in formal economic activities and administrative capabilities of the state improve, making it easier to collect different types of taxes effectively and efficiently. Average revenue collection for low-income countries (LIC) is 18.3 percent of GDP. This increases to 21.5 for lower-middle-income countries (LMICs), 25.6 percent for the UMICs, and 39.6

percent of GDP for OECD countries. At 29.1 percent of GDP, China's overall domestic revenue mobilization in 2018 was above the UMIC average (Figure 10).

However, China collects a greater share of revenues in indirect taxes compared to richer countries. China's heavy reliance on indirect taxes such as the VAT and its relative underutilization of direct tax instruments such as the PIT make its revenue mix somewhat inconsistent with its level of development. As countries develop, their reliance on broad consumption-based indirect taxes declines. For example, VAT and excise taxes account for 34 percent of total revenue for LMICs, 33 percent for UMICs, and 23 percent in OECD countries. In China, indirect taxes accounted for 35 percent of total revenue in 2018. Richer countries also collect more in PIT. PIT accounts for 2.5 percent of GDP in LMICs, 2.8 percent in UMICs, and 8.5 percent of GDP in the OECD. As share of total revenue, PIT is 21 percent in the OECD. By comparison, only 5 percent of total revenues come from PIT in China.

Figure 10. Richer countries rely more on direct taxes such as PIT; reliance on indirect taxes such as VAT is higher among poorer countries
(Revenue as % of GDP)



Source: International Centre for Tax and Development. Numbers for China are based on Finance Yearbook of China 2019.
Note: The figure shows the composition of government revenue as a percentage of GDP, aggregated by income group. OECD countries form a separate group. Data by revenue type are from 2020 when available or the most recent available year back to 2015. The sample includes 155 economies. CIT = corporate income tax; GDP = gross domestic product; HICs = high-income countries; LICs = low-income countries; LMICs = lower-middle-income countries; OECD = Organization for Economic Co-operation and Development; PIT = personal income tax; CSS = contribution to social security; UMICs = upper-middle-income countries; VAT = value added tax.

Indirect taxes are generally regressive, as the burden of these taxes falls disproportionately on the lower deciles of the income distribution. Indirect taxes are applied on the level of consumption and, because poorer households spend a larger share of their income on consumption (compared to richer ones), indirect taxes paid account for a greater share of their incomes too. Even though informality of purchases plausibly shields some of the lower income

consumers, this is likely to be an increasingly weakening cover as greater use of e-commerce and other digital platforms expands the share of formal transactions. In contrast, personal income taxes are progressive and have the potential to significantly enhance the progressivity of the entire fiscal system. China's PIT, despite a relatively progressive structure (comparable to OECD countries), has relatively wide income brackets and a large personal allowance. The personal allowance is twice the size of the average per capita income from wages and salaries and several times the average wage in many cities. (IMF 2018) Hence, the tax base is small, given that most workers do not pay income tax at all, while those with slightly higher wages pay only little, given the low introductory tax rates and the wide salary bands. The top marginal tax rate of 30 percent applies only to those with about 5 times the average wage, affecting only a small minority of workers with very high incomes. This is reflected in the relative incidence of PIT. In China, the top 10 percent of the income distribution pays just 2.8 percent of pre-fiscal income in PIT in comparison to 8.1 percent in UMICs and 27.5 percent in the OECD.

In sum, there are opportunities on both the revenue and expenditure sides of China's budget to make fiscal policies more progressive and help address inequality. The analysis presented in this paper shows that the fiscal system delivers great value to those who need the most support, but the progressivity of the overall package could be substantially enhanced. In particular, the fiscal system could make a greater dent in inequality by collecting more from those who could afford to pay more and leaving more money in the pockets of those who need it the most. This could be done by increasing the share of fiscal revenues collected through progressive taxes such as the PIT and property taxes. Property taxes also put resources directly in the hands of local governments, which are responsible for 80 percent of public spending in China. On the expenditure side, China's fiscal system is already contributing significantly to reducing inequality, especially via in-kind health and education benefits. Further improvements could focus on closing the remaining gaps in access to high-quality public services (e.g., for migrant workers and rural residents). In addition, increasing the level of social benefits and ensuring that they are portable could help make China's green transition fair by assisting those most vulnerable to adverse weather and job losses related to climate change.

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Appendix

Appendix A: Additional information on China's Fiscal System

Figure A1: Taxable income threshold (expressed as a multiple of the mean nominal wage) at which the PIT rate first applies

PIT rate		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Low-middle income countries	Indonesia										0										2.8							12			23
	Vietnam							0					0.8				1.5						2.7					4.8			8
	Philippines																						1.4					2.3			5
Upper-middle income countries	Malaysia	0.1				0.5				0.9						1.3							1.8		3	7	10	16		26	52
	Thailand						0.8						1.6				2.7						4.1					5.5			11
	China						**0**								**0.5**								**1.6**					**3.2**			**12**
High-income countries	Singapore		0.4			0.5				0.7			1.5			2.2		**3**	**4**	**4**	**5**						**5.8**				
	Japan														0.5							0.9						1.9			
	Korea										0									0.3								1			
	Australia																									0.3					
	UK																									0					
	US										0					0.2							**0.8**				1.8				

Notes:
Information is from 2019 or latest available year.
For China, each taxable income threshold has a different color, and the same color is applied to taxable income thresholds of other countries that are equal or lower than the corresponding one for China.
Source: Ahmad, Ghorpade, Houts, Purnamasari, and Wai-Poi (2022)

Table A1: Social Insurance Programs, China 2018

Programs	Revenue (Unit: Billion RMB)	*in which: Contribution Collected*	Expenditure (Unit: Billion RMB)	*in which: Expenditure on Pension/Benefit*	Enrollment (Unit: Million Persons)	*in which: Size of Contributors*	*Size of Beneficiaries*
Employee's System							
Pension	5,097	3,881	4,425	4,285	419	301	118
Medical Insurance	1,336	1,278	1,052	1,052	317	233	84
Work-Related Injury Insurance	89	83	73	72	239	NA	2
Unemployment Insurance	117	101	92	45	196	NA	5
Maternity Insurance	78	74	76	76	204	NA	11
Housing Fund	NA	2,105	NA	1,474	NA	144	52
Sub-total		**7,522**		**7,004**			
Resident's System							
Pension	387	88	294	286	524	365	159
Medical Insurance	797	249	727	721	1,028	NA	NA
Sub-total		**337**		**1,007**			
Total		7,860		8,011			

Source:
Finance Yearbook of China 2019, Ministry of Finance, 2019;
China Social Statistical Yearbook 2019, National Bureau of Statistics, 2019;
2018 Annual Report of Housing Fund, Ministry of Housing and Urban-Rural Development, Ministry of Finance &The People's Bank of China, 2019;
2018 Statistical Bulletin on Development of Human Resources and Social Security, Ministry of Human Resources and Social Security, 2019.

Table A2: Social Assistance Programs, China 2018

Programs	Size of Beneficiaries (Unit: Million Individuals/Times)	Annual Total Expenditure (Unit: Billion RMB)	*in which: Transfers* *(Unit: Billion RMB)*
Urban Dibao	10	58	146
Rural Dibao	35	106	
Urban Tekun	0.3	3	30
Rural Tekun	5	31	
Temporary Relief	11	13	16
Natural Disaster Relief	NA	13	12.6
Compensation	NA	.	100.5
Medical Assistance	88	47	.
Education Assistance	NA	146	.
Housing Assistance	NA	681	.
Employment Assistance	NA	85	.
Total	149	1,181	305

Source of all measures in this table:
Finance Yearbook of China2019, Ministry of Finance, 2019;
2018 Statistical Bulletin on National Economy and Social Development, National Bureau of Statistics, 2019;
2018 Statistical Bulletin on the Development of Civil Affairs, Ministry of Civil Affairs, 2019;
Notice on the 2018 Annual Budget of Assistance for Compulsory Education, Ministry of Finance & Ministry of Education, 2018.

Appendix B: Methodology to construct income measures

To construct all the fiscal interventions in our analysis, we rely directly on information reported in the survey when available or we conduct simulation and imputations when the information we need is not available. If the status of a household or individual as beneficiary or payer of a fiscal intervention is reported in the survey but the amount received or paid is not reported, then we need to impute the amount. If the status is not reported, we need to first simulate that status and then impute the amount. We conduct imputations or simulations following policy rules and exploiting available information in household surveys and statistics from administrative data. Appendix Table B2 provides a list of all the interventions included in our analysis, indicating whether the information used is directly available in the household survey or needed to be imputed or simulated.

Personal income tax

To impute personal income tax, we follow the tax rate schedule and account for non-compliance. The amount included in the analysis represents 61% of the total amount in the administrative dataset (Appendix Table B2). Part of the explanation relies on the well-known limitation of household surveys failing to adequately capture information on the households in the top of the income distribution.

Post-tax labor income, business operation income and property income are reported in CFPS 2018, from which PIT are backward imputed applying corresponding personal income tax rates. For the post-tax labor income, regular monthly wage, annual bonus and income from internship/part-time job are all subject to PIT, we calculate PIT related to each income component by applying relevant personal income tax rates (see Table B1). Partial compliance assumption is imposed, assuming those who work in government units, administrative institutions and state-owned enterprises pay PIT, as well as other employees who have formal job contracts and those who reported contributions to social insurances. For the business operation income, we assume the effective personal income tax rate in 2018 is 78.5 / (3,840+78.5) = 2%, where 78.5 billion is the PIT related to self-employed business operation income according to China Tax Yearbook 2019, and 3,840 billion is urban residents' total disposable operation income according to National Bureau of Statistics. For the property income, it is composed by rent and financial investment profits. We assume rent fully evade PIT, and PIT of financial investment profit is calculated applying 20% tax rate.

Table B1. Imputation of PIT using CFPS 2018

Income Category	Income Items Available in Survey	Imputation Method	Imputed Total (bln RMB)	Total in Admin. Data (bln RMB)
1. Individual Labor Income	1.1 Wage, Cash Benefits, In-Kind Benefits, Monthly Bonus	3%-45% PIT Rate	671	861
	1.2 End-of-Year Bonus	3%-45% PIT Rate		
	1.3 Wage from Internship/Part-Time Job	3%-45% PIT Rate		
2. Household Agricultural	2.1 Agricultural Operation Income	Does Not Pay PIT	NA	NA

&Business Operation Income	2.2 Net Profit of Own Business	2% effective rate	74	PIT of Self-Employed Business Income =78.5
3. Household Property Income	3.1 Financial Investment Profit	20%	88.6	PIT of Interest, Dividend, and Bonus=114.2
	3.2 Rent Income: House, Land, Other Properties	Assume Full Evasion	NA	PIT of Leasing Properties=8.6

Note: Admin. data is collected from China Tax Yearbook 2019.

Contributions to social security to the employee system

The survey has information on whether individuals contribute to the employee's system and the amount they contribute. Respondents who do not declare as contributing to any of the systems, we assume that those who work in government units, administrative institutions, and stated-own enterprises, as well as other employees who reported having a formal job contract, are formal employees contributing to the employee system and we impute the amount contributed. Moreover, there is a significant share of contributors to the employee system who did not report the amount and therefore needs to be imputed; we impute the amounts for the formal employees among those.[14] The contributions are imputed using reported salary and contribution schemes of the capital city corresponding to the individual's province of residence. We further impute the contributions from the employer side, while self-employed are assumed to pay all contributions out-of-pocket. The total amount of contributions to social security included in the analysis is similar to that in administrative records, accounting for 102% of that amount (Appendix Table B2).

Contributions to social security to the resident system

The survey has information on whether individuals contribute to the resident's system but lacks information on the amount contributed. To impute these amounts, we use average contributions to the residents' medical insurance reported in the China Household Finance Survey 2019 by geographic location (rural/urban and province) and age groups. Given the contribution is exempted for Dibao or Tekun recipients and residents with disabilities in most provinces, we assume enrollers from households reported receiving any type of cash transfers pay 0 to the resident's medical insurance. The national average contribution to resident's pension insurance can be obtained from administrative data, and provincial level variations are generated based on provincial maximum and minimum statutory contribution levels. The total amount of contributions to social security included in the analysis is similar to that in administrative records, accounting for 62% of that amount (Appendix Table B2).

Direct cash transfers

[14] We do not impute the contribution amounts of self-employed individuals nor of informal employees. Self-employed individuals join the employee social security system as free-lancers and can choose from several contribution levels based on their own preferences and own financial capacities. We do not estimate their preferences. Regarding informal employees, it may be that some employers pay regular contributions for informal employees, but it is also possible that the employers don't pay CSS for the informal workers and the workers join the employee's programs as free-lancers.

The CFPS 2018 does not distinguish direct cash transfers from reforestation and agricultural subsidies. Therefore, in our case, the disposable income measure implicitly includes subsidies, as opposed to the typical case where subsidies are incorporated in the measure of consumable income. We cannot properly compare the amount of cash transfers included in the analysis to its administrative counterpart because we lack administrative information on transfers regarding rural five guarantees, reforestation and agricultural subsidies, which are included in the total aggregated amount reported in the survey. Excluding those subsidies, the administrative transfer amounts of all the remaining programs that are explicitly listed in the survey add up to 305 billion RMB, which is close to the 383 billion RMB amount included in the analysis.

Pensions

The survey report pensions received without specifying whether it comes from the employee's or the resident's pension system. Given pension type is available in CFPS 2014 data, we try to match individual samples in both 2014 survey and 2018 survey in order to identify pension type. Among those whose pension type is still unidentified after the matching, we assume those retired from government units or admin institutions and those reported last employment as employee receive employee's pension not resident's pension. Total pension in analysis accounts 71% of its administrative counterpart.

VAT

In the CFPS 2018, household monthly or annual expenditures are reported by categories. The estimated relevant VAT rate for each reported expenditure category is a weighted effective VAT rate, including the VAT rates of all the sectors in the IO matrix related to that expenditure category. The VAT rates of each sector are those reported by the tax authority and the weights are obtained using the value-added of the sectors in the IO matrix. Imputed total VAT in the analysis equals 2,940 billion RMB, and total 2018 VAT in admin. data is 7,777 billion RMB (including VAT of domestic and imported goods).

VAT burden assignment proceeds in the following steps.

- Consumption expenditure by category is reported at household level in CFPS 2018.
- For each consumption expenditure category, locate its relevant productions sectors in the Input-Output table and assign the proper statutory VAT rate to each production sector
- Then, VAT paid by each production sector= value-added produced by the sector*statutory VAT rate, and VAT rate (direct effect) for each consumption expenditure category=VAT paid by all relevant production sectors/value-added produced by all relevant production sectors
- The indirect effect of VAT is further considered in our analysis, which refers to how the VAT may affect inputs prices thus increase consumer's burden. The rate of indirect effect for each consumption expenditure category can be obtained by solving the price-shifting model (Lustig, 2022).
- Using Thailand's rural informal purchase rates by decile we further adjust the imputed VAT of rural residents.

Following the CEQ methodology framework, we exclude VAT of durable goods (including costly goods such as real estate and automobiles) in order to avoid overestimation of VAT for the current period given that these goods are likely to have been purchased before the survey period. This exclusion partly explains

why the VAT amount included in the analysis accounts for only 38% of the amount in administrative records (see Table B2), since some durable goods may have been purchased during the relevant period. Another important reason for the underestimation of the VAT is that final consumption of households only contributes a portion of the total VAT collected by the government. A study of 26 European Union countries and Japan finds that more than a third of total VAT is attributable to intermediate consumption and capital formation by non-taxable and exempted activities (Ueda, 2017).

Consumption tax only part of the consumption tax can be included into analysis due to data limitations. Using statutory tax rates, we impute consumption tax paid on alcohol, tobacco, and fuel. Our imputed amounts add up to 62% of the total consumption tax amount in administrative records.

The survey only reports information on household expenditure on cosmetic products, so we need to simulate expenditure on alcohol and tobacco, as well as on fuel. For alcohol and tobacco, we estimate the relationship between the consumption of these items and sociodemographic characteristics using data from the CFPS 2012 and then use those parameters to predict the amounts consumed in 2018. For fuel, we assume households who reported car ownership bear consumption tax on fuel and use and then we assume that 70.26% of the expenditure on local transportation of those households can be attributed to fuel. The share 70.26% is the ratio between 857.6 billion RMB (which is the value-added in the sector of refined petroleum products, nuclear fuel processing products in the 2018 IO matrix, which is our estimate of expenditure on fuel) and the sum of 362.9 billion RMB and 857.6 billion RMB (where 362.9 billion RMB is the value-added in the sector of urban public transport and highway passenger transport in the 2018 IO matrix).

Once the imputed VAT and consumption tax are available, following page 273 of Vol.1, CEQ 2022 Handbook (Lustig, 2022), a rescale factor need to be applied to the imputed indirect taxes, which is 'Household Disposable Income/Household Total Consumption'.

In-kind health transfers and user fees

Total cost of health services and copayments shouldered by households are reported in the survey. The in-kind health transfer is the reported total cost of medical care in the past year plus provincial level per capita government expenditure on public health.[15] We assume all health care received is public given that the survey does not allow to distinguish the type of provider. This assumption is reasonable given that most of the health care in China is provided by public institutions.[16] The health user-fee is the reported out-of-pocket payments paid directly by the family, that is, the amount that was not reimbursed. The total in-kind health transfers and user fees reported in the survey add up to 86% and 133% of the respective amounts reported in administrative data (Appendix Table B2).

In-kind education transfers and user fees

[15] Given the definition of government expenditures on public health obtained from National Bureau of Statistics, we know it is in addition to the net benefit received by households (net benefit=total cost of health services minus copayment). We decided to include per capita government expenditure on public health as an additional part of in-kind health transfers as there does not seem to be any double counting.

[16] In 2015, public institutions accounted for 85 percent of admissions, and 88 percent of outpatient visits (World Bank; World Health Organization. 2019).

For education, survey respondents report whether each household member is attending public schools and which instruction level they are currently attending. Using this information, we impute in-kind education transfers for each public-school student as the reported provincial per pupil government expenditure by instruction level from administrative records. We impute education user fees as the national average tuition by instruction level from administrative records. Given that we use administrative data to impute all in-kind education transfers and user fees, in both cases the amounts in analyses are quite close to the administrative amounts (82% and 96% respectively).

Table B2: Sizes of Fiscal Interventions in 2018 Analysis (scenario: employee's pension as deferred income)

Measure of income	Fiscal Interventions to construct measures of income	Identification Method	Total in Admin. (bln RMB)	Total in Analysis (bln RMB)	Ratio Analysis Amount / Admin Amount
	Direct Taxes		**5,367**	**4,761**	**88.7%**
	in which:				
	Personal Income Tax	Imputation	1,387	841	60.6%
	Contribution to Social Insurances	Survey+Imputation	3979	3920	98.5%
	in which:				
	Employee's System	Survey+Imputation	3642	3707	101.8%
Market Income (Pre-fiscal Income) = Reported survey income *net of taxes* **+ Direct Taxes**	*in which:*				
	Medical	Survey+Imputation	1,278	1160	90.8%
	Unemp. and Maternity	Survey+Imputation	259	307	118.5%
	Housing Fund	Survey+Imputation	2,105	2240	106.4%
	Resident's System	Survey + Imputation	338	208	61.7%
	in which:				
	Pension	Survey+Imputation	89	65	73.3%
	Medical	Survey+Imputation	249	143	57.5%
	Direct Transfers		**NA**	**951**	**NA**
	in which:				
	Cash Transfers	Survey	NA	383	NA
Disposable income = Market Income **- Direct Taxes + Direct Transfers**	*in which:*				
	Dibao, Tekun, Temporary Relief and Natural Disaster Relief Transfers		305	NA	NA

	Reforestation and Agricultural Subsidy Transfers		NA	NA	NA
	Resident's Pension	Survey	286	568	198.7%
Consumable Income = Disposable Income **- Indirect Taxes**	**Indirect Taxes**		**8905**	**3640**	**40.9%**
	in which:				
	Value-Added Tax	Imputation	7777	2940	37.8%
	Consumption Tax	Imputation+Simulation	1128	698	61.9%
	User Fees:		**2,281**	**2818**	**123.6%**
	in which:				
Final Income = Consumable Income **- User Fees (Health, Educ.) + In-Kind Transfers (Health, Educ.)**	Health User fee	Survey	1,691	2250	133.0%
	Education User fee	imputation	590	568	96.3%
	In-Kind Transfers		**10526**	**8850**	**84.1%**
	in which:				
	In-kind Health	Survey +imputation	5912	5080	85.9%
	In-kind Education	Imputation	4,614	3770	81.7%

Notes:

Admin. data for all taxes (direct taxes, contributions, and indirect taxes) is the same as data reported in Table 1.

Admin. data for cash transfers are the reported transfers in Appendix Table A1.

Admin. data for pensions correspond to the sum of the distributed employee's and resident's pension amounts in Appendix Table A2.

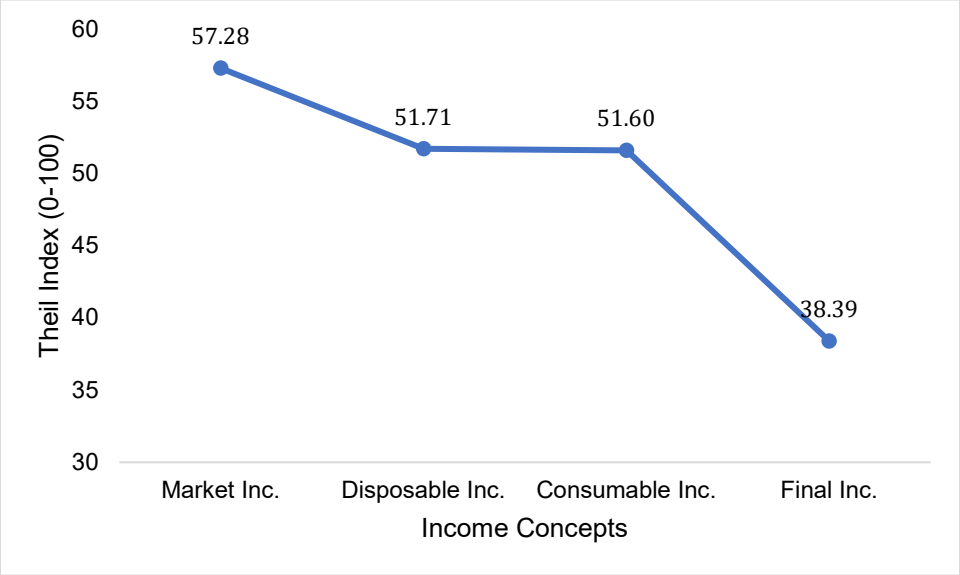
Admin. data for health and education user-fees are part of the total aggregated non-tax revenue amount reported in Table 1.

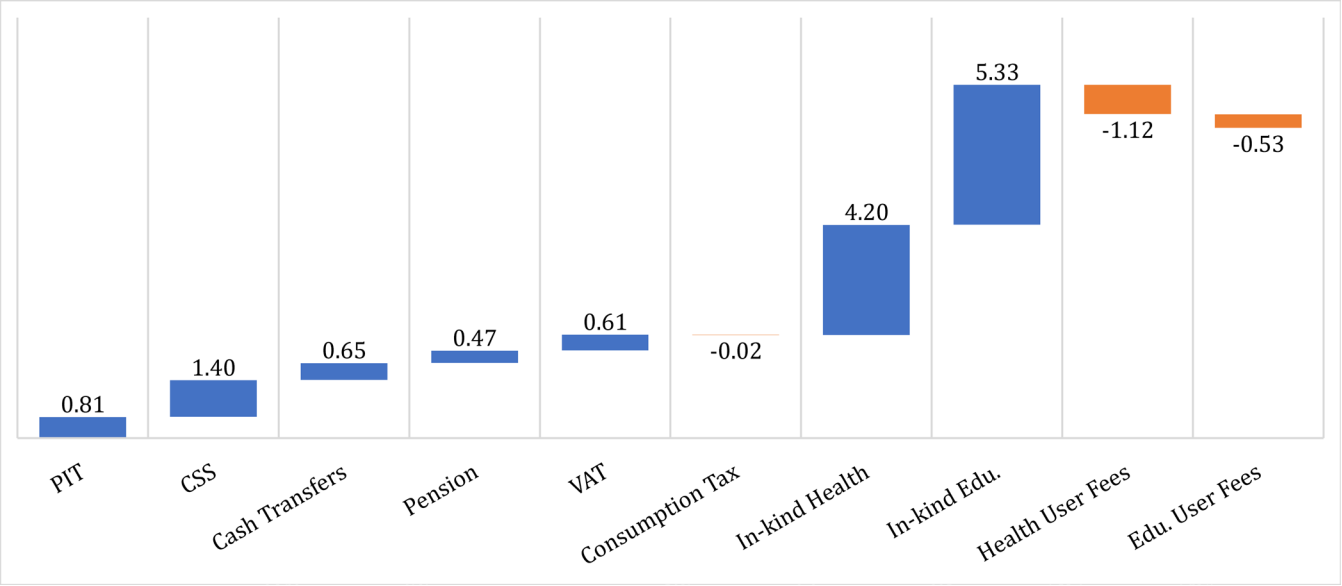
Admin. data for in-kind health transfer correspond to the sum of the distributed employee's and resident's medical insurance benefits in in Appendix Table A2, plus the health user fees.

Admin. data for in-kind education transfer correspond to budget expenditure amount in Table 2 (since education should be entirely covered by budget expenditure), plus amounts corresponding to funds from sponsors of non-public schools, social donations, and regular school income. These amounts were added because in the analysis we include user-fees which are included under regular school income. Unfortunately, it is not possible to exclude funds from sponsors of non-public schools and social donations.
Sources: Admin. data is collected from Statistical Yearbook of China 2019 and Finance Yearbook of China 2019. China Family Panel Study 2018 data is employed for our own analysis.

Appendix C: Additional results

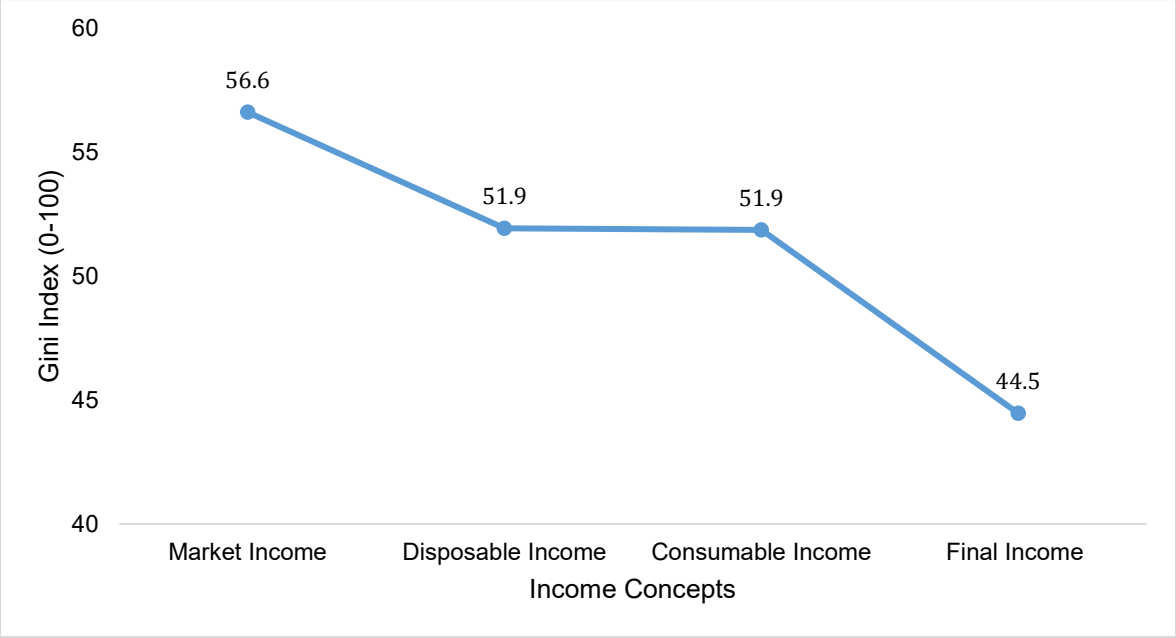
Appendix Figure C1. Theil Index
From Market Income to Final Income (PDI scenario)





Appendix Figure C2. Inequality under PGT Scenario

From Market Income to Final Income



Appendix Table C3: Average Household Per Capita Income and Ratios

From Market Income to Final Income (PDI scenario)

	National	Urban	Rural	Coastal	Interior	Western	Urban/Rural	Coastal/Western	Interior/Western
Variables			***Average Values***					***Gaps***	
Market Income	27,861	36,433	17,247	32,338	26,662	20,964	**2.11**	**1.54**	**1.27**
+ Cash Transfers	274	234	337	218	268	391	0.69	0.56	0.68
+ Contributory Pension	407	525	282	475	341	371	1.86	1.28	0.92
- Direct Taxes	3,413	4,936	1,538	4,273	3,085	2,286	3.21	1.87	1.35
Disposable Income	25,130	32,256	16,328	28,758	24,186	19,440	**1.98**	**1.48**	**1.24**
- Indirect Taxes	2,610	3,488	1491.902	2,983	2,512	2,033	2.34	1.47	1.24
in which:									
Value-Added Tax	2110	2867	1125	2433	2021	1608	2.55	1.51	1.26
Consumption Tax	500	621	367	550	491	426	1.69	1.29	1.15
Consumable Income	22,522	28,767	14,838	25,777	21,674	17,407	**1.94**	**1.48**	**1.25**
+ In-Kind Education Transfer	2,699	2,758	2,655	2,919	2,290	2,855	1.04	1.02	0.80
+ In-Kind Health Transfer	3,638	3,895	3,463	3,878	3,469	3,451	1.12	1.12	1.01
- Education User Fee	407	429	358	405	393	429	1.20	0.94	0.92
- Health User Fee	1,613	1,708	1,638	1,737	1,612	1,409	1.04	1.23	1.14
Final Income	26,840	33,283	18,960	30,432	25,428	21,875	**1.76**	**1.39**	**1.16**