Building Social Safety Net in a Transitional Society: Inequalities in Public Transfers in China

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Abstract

Chinese government has made great efforts to build a social safety net with rapidly increasing public spending during its economic and social transformations. Utilizing the National Transfer Account (NTA) approach, we analyze the benefit incidence of public transfers across generations and across income groups. We focus on three types of public transfers: education, health care, and pension. Our results reveal inter-generational as well as intra-generational imbalances in the incidence of public transfers. Public transfers in China as a whole are unevenly distributed across generations, with spending on the elderly twice as much as that on the young. Public education spending is equally distributed by income groups at the primary and secondary levels, but tilted toward the rich at the tertiary level. Public health care spending benefits relatively equally people from different income groups at the young and mid-ages. However, there is a strong tilt toward the higher income groups at senior ages. Public pension is highly regressive, with lower income groups receiving much lower pension benefits than the economically more advantaged groups.

Introduction

A distinctive feature of public transfers in societies across the world is to reallocate resources from working-age population to both children and the elderly (Lee 2012, Lee and Mason 2011, Folbre and Wolf 2012). Such a feature implies that public transfers are unevenly distributed across the generations. Downward transfers from older to younger cohorts such as education might crowd out the upward transfers such as pension and health care, and conversely, upward transfers in the forms of pension and health care may crowd out downward transfers to the younger generation. In the Unites States, for instance, per capita public spending on the elderly is 2.4 times the amount on children in 2004, due to heavy government spending in Social Security and Medicare (Isaacs 2009).

Population aging has been often cited as a source of increased intergenerational inequalities favoring the older members of the society, due largely to the political clout of the older population (Preston 1984, Kotlikoff and Burns 2012). Cross-national examinations using the National Transfer Account (NTA) methodology reveal that in countries with an upward intergenerational wealth flow that favors the elderly population, population aging plays a prominent role. Among a group of 23 countries, five countries (Germany, Austria, Japan, Slovenia, and Hungary) that have upward wealth flow toward the elderly population all have a share of the elderly population at 15% or higher (Lee and Mason 2011).

With its highly compressed mortality and fertility declines, China stands out as one of the most rapidly aging societies in the world. It took China only half of the time, 50 years versus roughly one century time it took for Western developed countries, to increase the life expectancy of its population from the 40s to over 70, and only less than a third of the time, 20 years versus over 75 years, to reduce its fertility level from 5 children per couple to 2 (Wang 2011). China's share of the elderly population aged 65 and over has already doubled between 1980 and now, from less than 5% to nearly 10%, and is expected to reach 17% by 2030. With an accelerated population aging process, the aggregate lifecycle deficits (consumption minus labor income) at old ages will grow fast in the coming years. Such deficits will need to be financed through increasing intergenerational public transfers (Cai et al. 2014). Hence, the balance of public benefits across generations will become even more prominent.

In addition to its rapid demographic change, China has also been a global poster child of "growth with inequality" since the closing decades of the twentieth century. Three decades of virtually uninterrupted economic hyper-growth since 1980 has propelled China into the ranks of upper-middle income countries. China's rapid economic growth has been accompanied by an equally rapid increase in inequality. Official Chinese statistics put its latest Gini coefficient of income inequality at 0.469 in 2014, among the highest in the world. One major source that underlies the persistent and rising inequality is the sharp urban-rural divide in Chinese society, with the urban-to-rural income ratio reaching 2.53 in 2014.

China's state-led economic growth model has also disproportionately fattened the state fiscal coffer. In the first decade of the twenty-first century, for example, whereas the size of China's economy measured by nominal GDP quadrupled, government revenue rose

by nearly six times. Expanded fiscal capacity, in the backdrop of heightened concerns of inequality and stability, led the Chinese state to initiate and to expand major social welfare programs with rapidly increasing public spending, targeting the vulnerable groups, promoting equality, and improving the welfare of the population. These programs include mandating public funding for nine-year compulsory education launched in 2001, the New Cooperative Medical System (NCMS) for the rural population beginning in 2003, the new rural old age security scheme piloted in 2009, and most recently, merging the pension systems of urban government and non-government employees. In spite of intensive public spending, their redistributive impacts however are not well known. One study using household survey data reports that over the two decades between 1988 and 2007, public benefits contributed to reducing income inequality among urban residents, while for rural residents and migrant workers, such programs actually increased income inequality (Gao et al. 2013).

Though measuring how public transfers are distributed across socioeconomic class is a matter of long-standing concern in the economics literature (Meerman 1979, Selowsky 1979, Willis 1988, van de Walle and Nead 1995), limited research has combined the intra-generational inequalities of public transfers with inter-generational inequalities. Studies of Latin American countries show that the distribution of public transfers across income groups and the distribution of these transfers across generations are not independent. Instead, they are closely related with each other. They have found that much of the regressive nature of public expenditures across income groups in Brazil and Chile is due to generational allocations, as public spending is almost neutral in education, lightly progressive in health care and strongly regressive in public pension (Turra et al. 2011).

China in this context serves as a good example in examining both inter-generational and intra-generational distributions of public transfers. Chinese government has made great efforts to build a social safety net and to combat inequality via public transfers during the first decade of the twenty-first century. Utilizing the National Transfer Account (NTA) approach, in this paper we examine the benefit incidence of public transfers across generations and across income groups in China. We focus on three types of public transfers: education, health care, and public pension. In all three areas, public transfer serves essential functions. Government spending on education serves as both a means of society building and as an investment in future generations. Spending on health care serves to promote health and to combat poverty. Public pension, one important form of public cash transfers, is expected to provide livelihood support for the elderly people.

Analytical Approach and Data Sources

To examine the benefit incidence of public spending, we adopt the analytical approach of National Transfer Account (Lee and Mason 2011). NTA captures a fundamental feature of all societies: the economic lifecycle. The lifecycle deficit generated by the mismatch between consumption and labor income across ages should be financed through intergenerational transfers, asset income or dis-savings. Essentially, the national transfer flow account is based on the following identity:

$$C(x)-Y^{l}(x)=\tau^{+}(x)-\tau^{-}(x)+Y^{A}(x)-S(x)$$

The left-hand-side of the equation above represents lifecycle deficit at age x, the difference between consumption $C(x)$ and labor income $Y^l(x)$. The right-hand-side represents the age reallocation system that consists of two economic mechanisms: net transfers $\tau^+(x)$-$\tau^-(x)$, and asset-based reallocations equal to asset income $Y^A(x)$ net of savings $S(x)$. All items in the equation above, except for labor income, can be distinguished by public and private sectors, such as private versus public consumption, and private and public transfers.

We focus in this study on public transfers, through which the government attempts to fill up the gap between consumption and labor income across generations. Public transfer is comprised of two components: in-kind transfers such as public education spending and public health care spending, and cash transfers, such as public pensions.

Our study utilizes micro-level household data from the 2010 wave of China Family Panel Studies (CFPS), and macro-level data from System of National Accounts (SNA) and government administrative records. CFPS, a nationally representative household survey, is conducted every year since 2010 (Xie and Hu 2014). The 2010 survey, covering 25 out of 31 provinces in China, targeted 14,798 households, including adults and children under age 16. The 2010 wave of CFPS provides detailed information on household structure, income and expenditures in 2009, which facilitate our estimates.

Our examination contains three steps: the first step is to estimate age profiles of public expenditures on education, health and pension. To estimate the age profile of public education consumption, administrative (government statistical) data are used to input the public cost per enrolled student by level of education, and CFPS data are used to estimate the age-specific enrollment rates at each level of education. Age profile of public pension expenditures is based on survey responses on pension benefits received in 2009. However, CFPS only provides pension benefits on a household basis. Therefore, pension benefits are assumed to be equally distributed among the elderly living in the same household. Age profile of public health care consumption is more complex. The macro control for public health consumption in NTA is comprised of two parts: medical expenditures reimbursed by public health insurance and government health care spending. The age-specific reimbursed health consumption directly originates from the responses in CFPS survey. However, CFPS has no information on inpatient and outpatient utilization rates, which is essential to estimate the age profile of government health care spending, as in the case of Brazil and Chile (Turra et al. 2011). Instead, we calculate out-of-pocket medical expenditures based on CFPS data to substitute for utilization rates, with the assumption that medical expenditures are proportional to utilization rates. Finally, we combine the age profile of reimbursed health consumption and age profile of out-of-pocket medical expenditures to formulate the age profile of public health consumption.

The second step is to estimate age profiles of public transfers across income groups. We split the CFPS household data by per capita household income quartiles. We estimate the age profiles of education, health care, and pension for each income group following the above-mentioned method. Subsequently, most age profiles are smoothed except for education, as age patterns of public education spending have too many discontinuities, which are not random but are the product of specific ages of entering and leaving schools (United Nations Population Division 2013).

The last step of our work is to adjust the smoothed and non-smoothed profiles to macro controls, or to match the total public transfers as reported in government expenditures. As NTA method only imputes macro controls for pubic transfers by purpose for the whole nation, we further need to calculate corresponding macro controls for each sub-sample. Taking the public education spending as an example, we use the share of average value of spending per capita in each income quartile to divide the macro control for public education spending. These macro controls are then used to scale NTA age profiles so that the NTA aggregate estimates match the estimates from the official expenditure data in the System of National Accounts (SNA) of the United Nations.

Income groups in China have varying demographic characteristics, as shown in Table 1. In 2009, children are more likely to be placed in lower income groups, with only 17% of children living in the richest quartile families and over 30% in the lowest quartile. The concentration of children in lower income groups has several complementary reasons. First, per capita income in our analyses is estimated through dividing household income by the number of household members. Thus households with more dependent children are more likely to be placed in lower income class. Second, in the fast urbanization process, rural young people flock into the cities for better employment while their children are more likely to be left behind in villages and taken care of by grandparents with lower income. Third, poorer families tend to have higher fertility, given that birth control policies are more lenient in rural areas and in western part. For example, Chinese urban couples strictly follow the one-child per couple rule, while rural couples in most provinces are allowed to have a second child if the first child is a girl (Gu et al. 2007). The proportions of elderly in the richest quartile (29.1%) and in the poorest quartile (33.4%) are much higher than the proportions in middle-income groups, indicating a larger income inequality within older adults.

Table 1 CFPS sample distribution by age and income groups

Age Group	By per capita household income quartiles				Total
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	
0-15	30.2%	29.1%	24.1%	16.6%	21.1%
16-64	22.4%	24.4%	26.2%	27.0%	68.4%
65+	33.4%	19.0%	18.6%	29.1%	10.5%
Total	25.2%	24.8%	25.0%	25.0%	100%

A note of caution is due here before we proceed with our analysis and results. Our study, while presenting abundant evidences on the benefit incidence of public transfers, should also be interpreted with caution. First, both our data and the NTA method necessitate the making of a variety of assumptions in the calculations. Accordingly, the results should be taken as indicative rather than definitive. Second, those placed in lower income groups in our study are also more likely to reside in rural areas and in backward regions. Due to price differentials by urban and rural areas and across provinces, the differences in real values of public spending would be smaller than the differences in nominal values. Thus social welfare programs might have better targeted those in low-income groups than we have observed in our estimation.

Inequality in Public Education Transfer

We begin our investigation of inequalities in public transfers by examining age distributions of public education transfers across the four income groups. Education has long attracted government subsidies in China, because of equity considerations and high externalities involved. The government is the main provider of education, with over 90% of student in primary and secondary education attending public schools. Government spending per student normally increases with the level of education. Typically, the outlays for college education are nearly three times the amount spent on primary schools.

As shown in Figure 1, there is a clear difference in the age patterns of per capita public education transfers, primarily between the top income quartile and the three below it. The three lower income quartiles share a rather similar age pattern before the peak public education consumption age, which stands at around age 15, the age of entering senior high schools. A majority of Chinese households with children, in other words, receive similar public transfers during the period of compulsory education, which is for the first nine years of education. This is largely attributed to the government endeavor in promoting balanced development of compulsory education. The Chinese government has mandated public funding for nine-year compulsory education since 2001. By 2005, about one-third students receiving compulsory education in western and central rural areas were waived of textbook fees and miscellaneous fees. This preferential program reached all rural students in primary and junior high schools by 2007 and further covered all urban students by 2008. The compulsory education has virtually reached full coverage so far: the gross enrollment rate in primary schools is over 100% and in junior high schools is about 99%.

The top quartile distinguishes itself from the rest three. First of all, the top quartile gains more public education resources for children under age 5. This indicates that children from better-off families are more likely to be enrolled in kindergartens. Pre-primary education has not been included in China's compulsory education yet, and thus charges higher tuition fees. Second, public transfers in education also extend to adults aged over 25 for the richest quartile, indicating that adults from these families also disproportionately participate in post-graduate education or adult education and enjoy more public benefits.

Third and most distinctively, children from the top quartile families receive much higher transfers in tertiary education due to their higher college enrollment rate. China has witnessed the fastest expansion in higher education, with annual enrollment of college tripling from 2.2 million in 2000 to 6.6 million in 2010. The higher education expansion has more favored urban youths, who are also economically better off. China's 2010 census revealed that while among population aged 20 to 29 only 20% received college or more education for the whole nation, nearly 40% of those aged 20 to 24, and nearly one third among those aged 25 to 29 in urban China were college educated. Government subsidies to higher education have a long history in China (Li et al. 2014). During China's planned economic era, college students were not only exempted from tuition fees, but also received certain amount of monthly living allowances. During the expansion of higher educational opportunities in late 1990s and after, the government gradually lowered its subsidies. From 1995 and 2004, college tuition fees increased sharply, from 800 RMB per person per

year to 5000 RMB on average (Yang 2006). Education expenditures ranked first in total household expenditures in the 10th five-year plan period. Rising tuition fees have imposed serious financial constraints on lower-income families, and some poor students were forced to give up their opportunities of entering college due to financial difficulties (Li 2007).

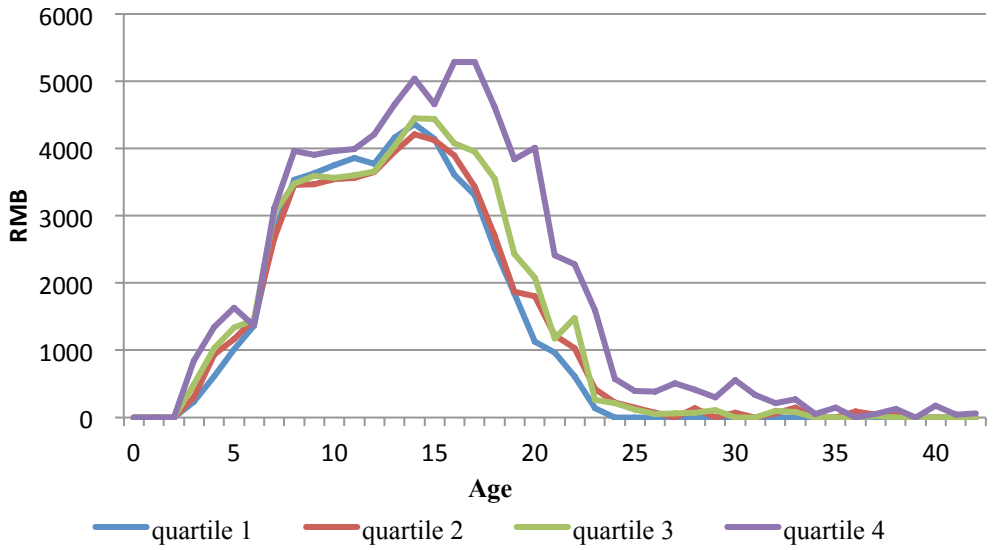

Figure 1 Per capita public education spending by income quartiles

The aggregate education transfers by age and by income groups can be estimated by multiplying the per capita spending as shown above with the share of the eligible individuals in each of the four income groups. These aggregate transfers for education are shown in Figure 2. At ages 20 and higher, young people in higher income quartiles consume more education resources in total, both due to their higher share among high-income groups and higher per capita public education consumption. However, at compulsory education stage, children from poorer families receive more public transfers than those from wealthier families, due to the larger share of school-age children in the poorer quartile as shown in Table 1.

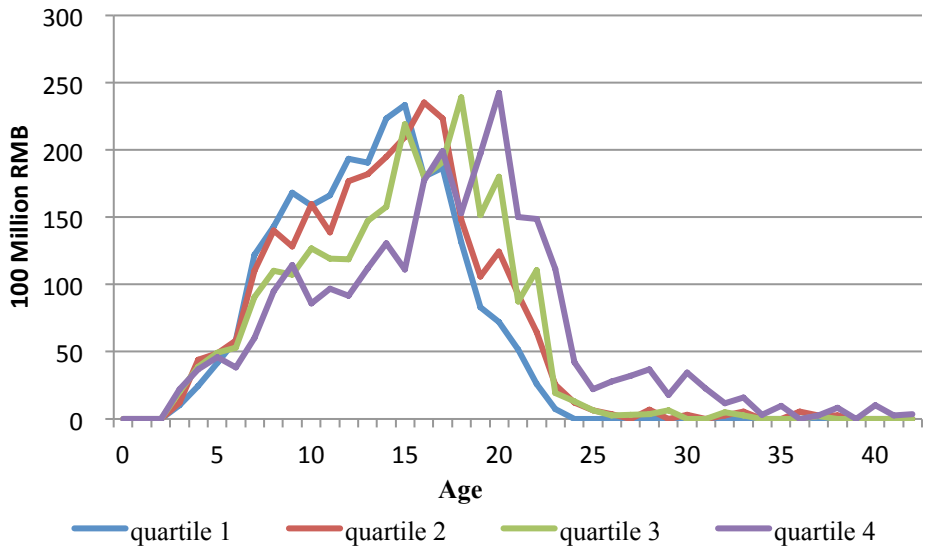

Figure 2 Aggregate public education spending by income quartiles

Total public education transfers received by four income groups, however, are relatively balanced, as differences in population composition by income quartiles wash out the disparities in per capita public transfers in education. Compared with the lowest income quartile, the ratio between the first and the next three quartiles in receiving total public education transfers is at 1.08 1.04, and 1.10. Such equalization at the aggregate level is due to the larger share of school-age children in the poorer quartiles.

Inequality in Public Health Care Transfers

This section focuses on the benefit incidence of public health care transfers by age and by income groups. Public health care institutions play a dominant role in China's health care system. In 2009, for instance, person-time patients treated by public institutions amounted to 1769 million, in contrast to only 153 million by private institutions[1]. The number of patients hospitalized in public facilities was 78 million, while the number in private organizations only stood at 6.8 million (NBS 2010). In the past decade, the Chinese government has intensively invested in public health care. Between 2000 and 2012, the share of government spending as total health care spending rose from 38.3 to 56%, accounting for 12.5% of total government spending in 2012 compared with 10.9% in 2000 (Wang 2014).

As shown in Figure 3, on the whole, the age profile of per capita public health care spending follows a J-shaped curve in each income quartile: per capita spending is high in infanthood, then decreases at teenage years and increases again in the middle age. The peak years of public health spending stay at around age 80 for all income groups.

Public health care transfers are roughly equally distributed across the income groups under age 60. Though higher income groups tend to be covered under more generous public health insurance programs, they do not seem to consume more resources, perhaps

[1] Data source: China Health Statistical Yearbook 2012

due to their better health status. However, public health spending is highly skewed in favor of the top quartile over age 60. For the three lower income groups, public health care expenditure are almost flat or rise modestly beyond age 60, similar to the case in other emerging economies such as Brazil and Chile (Turra et al. 2011). For the top income quartile, public health care spending increases quickly at advanced ages, reaching the peak of over 3,000 RMB at age 80. The peak value for the top income quartile is about three times as high as the value for the lowest quartile. In Brazil and Chile, the poor make more intensive uses of public health care services than the rich at all ages, because the rich are inclined to use private health care services. China's pattern, however, resembles those in African countries, where public health facilities are dominant and private institutions are generally poorly developed (Castro-Leal et al. 1999).

Three principal factors affect the use of public health services among the elderly: health insurance coverage, income, and access. First, in China, elderly's health insurance coverage is linked to residence type and also to employment prior to retirement. There are two major types of public health insurances in urban areas: urban employees are covered by the Urban Employees Basic Medical Insurance (UR-BMI) established in 1998, and unemployed urban residents are under the Urban Residents Basic Medical Insurance (UR-BMI) piloted since 2007. In rural areas, nearly 80 percent of peasants did not have any health insurance until 2003 (Ministry of Health, 2004), when the Chinese government launched the New Cooperative Medical Scheme (NCMS) in rural China. Within a decade, the scheme expanded dramatically and covered about 96 percent of the rural population by 2010[2]. Benefit packages, however, differ vastly for these three health insurance programs. For example, the average inpatient reimbursement rate for UE-BMI was 65% in 2008 and for UR-BMI was 45% in 2007, while the figure for NCMS was only 41% in 2009 (Barber and Yao 2011). In addition, the deductibles and reimbursements are more favorable for retirees than for employed workers under UE-BMI, which encourages the elderly insured to consume more public health care resources. The elderly from the top quartile are usually those who worked in urban formal sectors prior to their retirement and are more likely to be covered by generous health insurances, thus are more inclined to receive public health care.

Second, health care is a normal good, which implies that the use of public health services increases with income. For instance, in rural areas, enrollment in the New Rural Cooperative Medical Insurance is found to increase significantly the inpatient service utilization among high income groups, while having no impact among low income groups, because low reimbursement rate and high out-of-pocket medical expenditures refrains poor people from going to the hospitals.

Third, poorer households, which often live in the countryside or areas far away from quality public health institutions, face long journeys and high opportunity cost to obtain health care (Castro-Leal et al. 1999). For instance, number of beds in health institutions per thousand persons in urban areas was 5.54, in contrast to less than half, 2.41, in rural areas in 2009 (National Bureau of Statisticis, 2010). The access constraints would be especially serious for older people.

[2] Data source: China Statistical Yearbook 2011

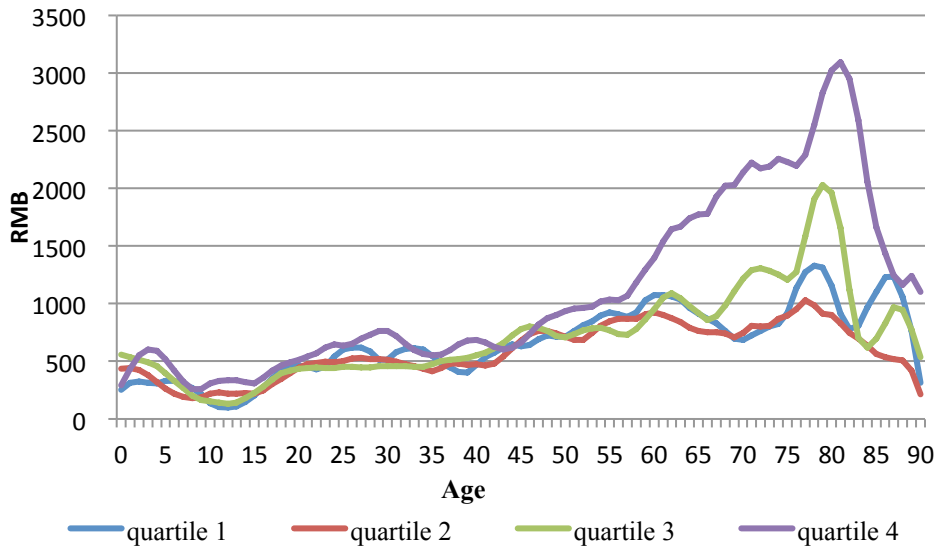

Figure 3 Per capita public health care consumption by income quartiles

The incidence of aggregate health care spending by age and by income groups is shown in Figure 4. Public health care consumption for people aged 20s from the top quartile is much higher than those from other income groups, mainly because there is a concentration of young people among the richest group. In addition, public health spending for old people from the top income quartile ranks first, followed by those from the bottom quartile. This pattern is partially attributed to a high fraction of old people among the richest and poorest groups. This pattern is different from what was found in Brazil and Chile, where the elderly are more concentrated in the top income groups due to their high life cycle savings and wide coverage of pension system (Turra et al., 2011).

Even in aggregate terms, total public transfer in health care is heavily biased towards the richest quartile. In comparison to the lowest income quartile, those at higher quartiles receive 0.92, 1.05, and 1.59 times total public health care transfers respectively.

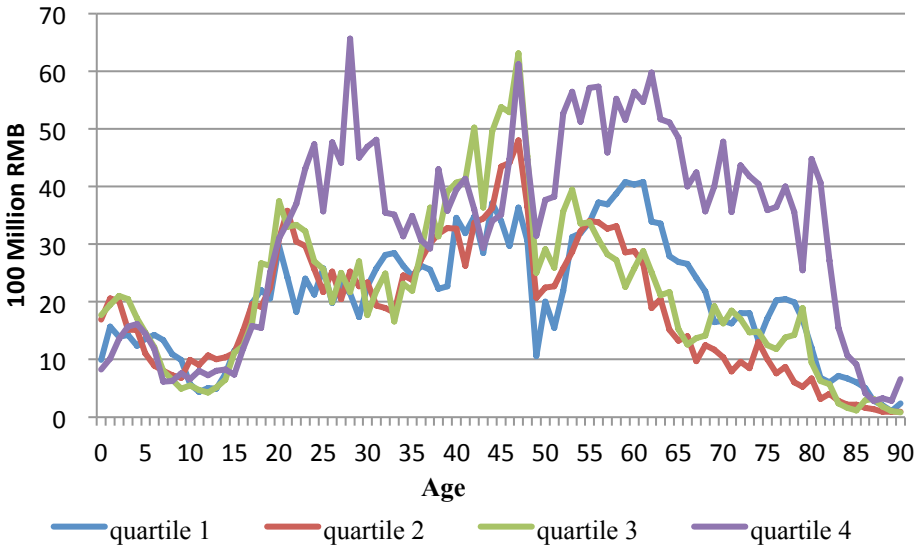

Figure 4 Aggregate public health care consumption by income quartiles

Inequality in Public Pension Transfer

In this section we investigate how the age patterns of public pension transfers differ by income groups. China's public pension has shifted from the pay-as-you-go system to a combination of pay-as-you-go system and funded system, aimed at providing economic support for the elderly people.

As shown in Figure 5, the incidence of per capita public pension is strongly regressive, with older people at the top of the income distribution enjoying much higher pension benefits. The concentration of public transfers in the top quartile is particularly striking in pension benefits as compared with in public education and health care. For instance, those aged 75 from the top quartile receive a pension of 11,793 RMB per year on average, in comparison to those from the second quartile who receive 4,000 RMB, and those from the bottom quartile, who receive only less than 250 RMB. The ratio between the top and the bottom income group was nearly 50 to 1. One can argue that the richest group also paid higher contributions during their working life, and is thus entitled to higher values of pension, but it is also more than clear that the imbalanced distribution results from a highly fragmented public old age support system currently in place in China.

Such a fragmented arrangement dates back to China's socialist years, with a social and economic system that separated the urban and rural populations and urban populations working in different types of organizations. The most prestigious group are government employees (including military personnel), who do not need to pay into the system but receive up to 100% of pre-retirement income (Pozen 2013). By comparison, the rural people lag far behind in social security benefits, though the Chinese government has made great strides in expanding pension coverage for rural population recently. The new rural pension scheme was piloted in 2009, covering roughly 72.8 million individuals, or 10.2% of the rural population. Under this insurance scheme, the individual contribution amount is currently set at up to 1,000 RMB annually and monthly payout is only at 55 RMB (roughly 9 USD). The top income quartile families are predominately from urban areas and therefore enjoy higher pension benefits.

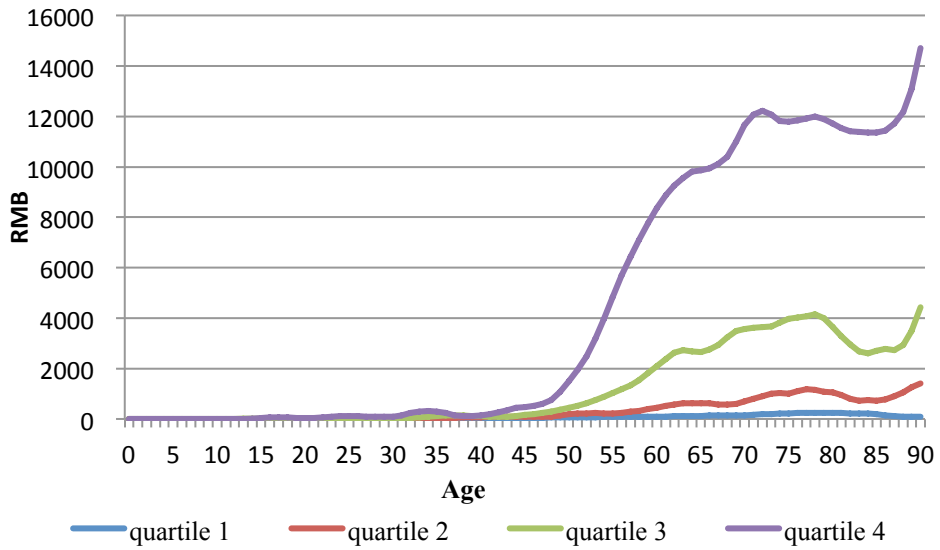

Figure 5 Per capita public pension spending by income quartiles

As shown in Figure 6, age profiles of aggregate pension spending show an inverse-U shape for each income group, with the peak at around age 60, with higher income quartiles receive much higher benefits at peak ages. For example, the elderly at age 60 from the top quartile receive 33.8 billion pension benefits in total, while the same cohort from the bottom quartile receive merely 3 billion.

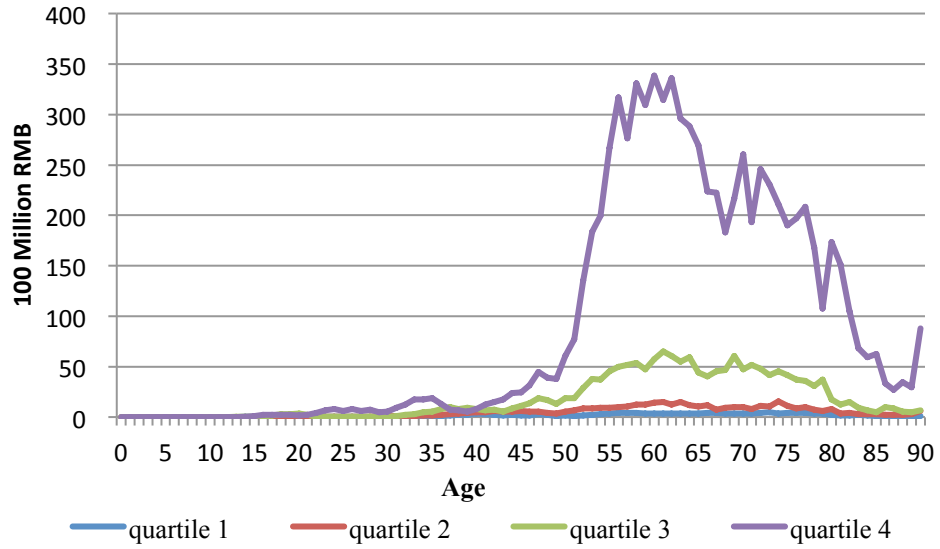

Figure 6 Aggregate public pension spending by income quartiles

The total amount of pension benefits delivered to the top quartile is 55 times as delivered to the bottom quartile, indicating that pension benefits do not favor the poor but rather increasingly rewards the rich. Gao et al. (2013) compared the distribution of pension benefits in China and Vietnam, and found that pension system in China was much more regressive than that in Vietnam.

Inequality in Total Public Transfers

In the sections above, we have examined inequalities in receiving public education, health care, and pension transfers separately by age and by income groups. In this section, we combine the three types of public transfers, and estimate the inter-generational and intra-generational imbalances in total public transfers.

Figure 7 only presents the inter-generational imbalances in per capita total public transfers. As in most societies, public transfers in China show a clear age pattern favoring population in the dependent ages. Individuals in the young and old ages receive the lion's share of public transfers. Older dependent population also receive much more public transfers than the young dependents. Per capita public spending averaged 5,619 RMB for the elderly 65 and over, compared with that of only 2,841 RMB for children below the age of 19. Public transfers per capita favor the elderly over the young by a factor of 1.98 to 1. Such a bias toward the elderly not only resembles that observed in other developing countries such as in Chile and Brazil (Turra et al. 2011, Rosero-Bixby 2011), but also in developed countries such as U.S. (Isaacs 2009).

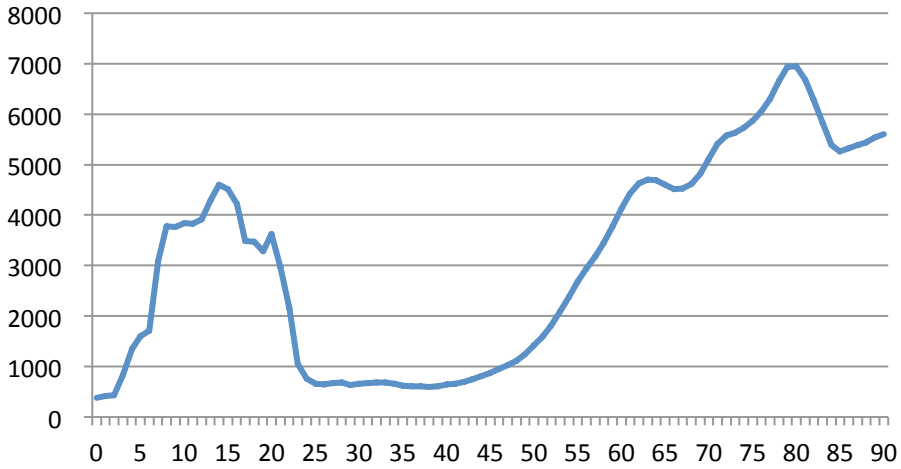

Figure 7 Per capita total public transfers

The generational imbalances in per capita public transfers also differ by income groups. Figure 8 further displays differences in pubic spending across age and across income groups. Per capita public spending is roughly equally distributed across income groups at the young and middle ages due to equally distributed education and health care spending. However, it is highly regressive over age 50, as higher income groups receive much higher pension benefits and make more intensive use of public health services. For the bottom quartile, public spending is more in favor of children: spending per child amounts to 2,689 RMB, more than twice the spending per elder person, 1107 RMB. For the top quartile, by contrast, public spending per elder person is almost three times higher than public spending per child.

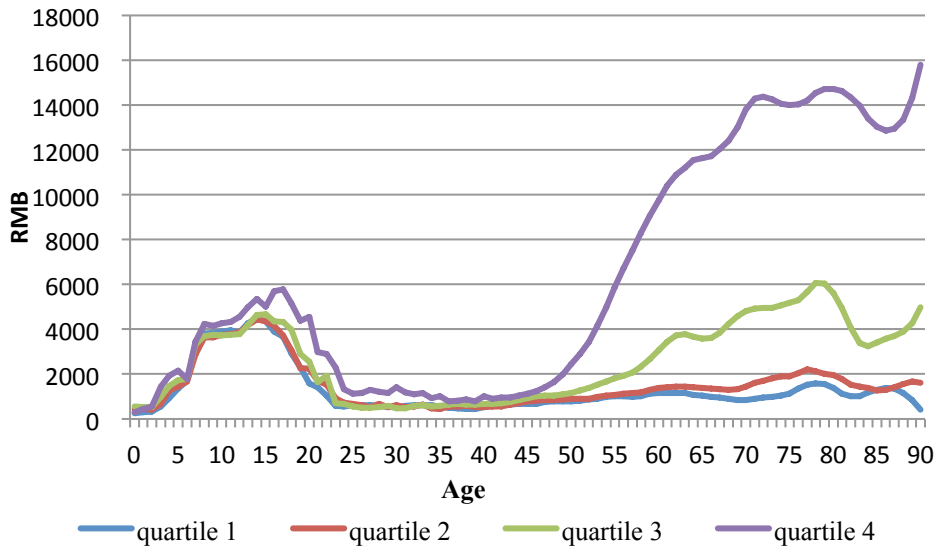

Figure 8 Per capita total public transfers by income quartiles

Conclusion

Public transfers in China at the end of the first decade of the twenty-first century are already heavily biased toward the older generation. Total public spending per person 65 and older is twice as high the spending per child aged below 19. Though public education spending is almost equivalent to public pension spending in NTA account in 2009, the elderly also consume much more public health resources than teenagers, so that total public transfers are significantly in favor of the elderly. Generational imbalances in benefit incidence are closely related to population aging, which is unfolding with an unprecedented pace in China. The expansion in the elderly population combined with the high levels of spending on the elderly could exert a heavy pressure on China's government fiscal budget in the coming years.

Our results also reveal several important cleavages of inequalities in public transfers across income groups in China. Education and health care are basic services essential to combat poverty and are often subsidized with public funds to help achieve that purpose, while our evidences show that public spending in education and health care is not very effective in reaching the poor. Public education spending is equally distributed by income groups at the primary and secondary level, while favors the rich at the tertiary level as they have much higher chances to be accepted into colleges. Public health care program equally benefits people from different income groups at young and middle ages. However, there is a strong tilt toward the higher income groups at senior ages due to higher utilization rates and more generous reimbursements. Public pension, serving as an important form of public cash transfers, is expected to provide livelihood support for the elderly people. Our results show that public pension is highly regressive in China, with lower income groups entitled to much less pension benefits. For instance, the top quartile received almost 80% of the public pension funding in 2009, in contrast to only 1.5% for the bottom quartile. The regressive nature of public pension spending mainly arises from the fragmented pension

system in China. Inequalities in public transfers across income groups are further complicated by the interactions of generational imbalances. For instance, per capita public spending is higher on children than on the elderly among lower income groups. Yet, public spending is also highly regressive at senior ages than among young ages.

These results offer important insights into the problems facing Chinese government that is struggling to deliver essential and equitable social services to its citizens. China faces both a prospect of rapid population aging and a history of an elementary and fragmented social safety net. Generational imbalances in benefit incidence are closely related to the population aging, which is unfolding with an unprecedented pace. As reported in China's 2010 census, population aged 60 and above reached over 178 million, accounting for 13.26% of the total population, up by 2.93 percentage points as compared with the 2000 census. The UN's projection under the medium fertility variant scenario shows that the total population aged 60 and above in China will increase to 340 million by 2030, accounting for 24% of the total population, and to 440 million by 2050, accounting for 34% of the total population. The expansion in the elderly population combined with the high levels of spending on the elderly would exert a heavy pressure on government fiscal budget in the coming years.

In aggregate terms, total public transfers (education, health care and pension combined) in China for 2009 amounted to 2.93 trillion RMB, making up 8.6 percent of the GDP. The projected aggregate public transfers in 2030, based on the age-specific per capita values in 2009 adjusted by population age structure in 2030, would rise sharply to 3.82 trillion RMB, up by 30 percent from 2009. This projection only demonstrates the power of population aging over China's fiscal burden. More realistically, with expanded social securities and improved human capital investment, per capita public spending in 2030 would largely outpace the current value, further exacerbating the aggregate fiscal burden.

Cost of financing a functional and equitable social safety net in China has already sky rocked in recent years. In China, public transfers including education, health care and pension already accounted for 8.6 percent of GDP in 2009, compared with almost 9 percent of GDP in the U.S in 2008 on Social Security, Medicare and Medicaid combined (without taking into account of public education). In addition to increasing government investments, the currently fragmented health insurance system and pension system need to move towards a unified system, so as to reduce inequalities in benefit incidence across the socioeconomic groups. China's government in the past decade has already made efforts to extend the social safety net, especially to the poor and under-privileged. These efforts included extension of public health insurance and pension to the rural population and to the unemployed urban population. However, the regional and socio-economic disparities are still evident. At present, the elderly living in rural areas or in low income class rely heavily on transfers from their children to cover living expenses and medical expenditures. With the declining fertility and frequent migration, the large and strong family network gets weakened or even collapses. If the disadvantaged elderly are not well targeted by government programs, the level of inequality would be heightened. Building an equitable and sustainable social safety net in rapidly transforming China, in other words, still has a long way to go.

References cited

Barber, Sarah L. and Lan Yao (2011). "Development and status of health insurance systems in China." *The International Journal of Health Planning and Management*, 26 (4): 339-356.

Cai, Yong, Feng Wang, Ding Li, Xiwei Wu and Ke Shen (2014). "China's age of abundance: when might it run out?" *The Journal of the Economics of Ageing*, 4: 90-97.

Castro-Leal, Florencia, Julia Dayton, Lionel Demery and Kalpana Mehra (1999). "Public Social Spending in Africa: Do the Poor Benefit?" *World Bank Research Observer*, 14 (1): 49-72.

Folbre, Nancy and Douglas Wolf (2012). "The intergenerational welfare state." *Population and Development Review*, S38: 36-51.

Gao, Qin, Sui Yang, and Shi Li (2013). "The Chinese welfare state in transition: 1988-2007." *Journal of Social Policy*, 42 (4): 743-764.

Gu, Baochang, Wang Feng, Zhigang Guo, and Erli Zhang (2007). "China's Local and National Fertility Policies at the End of the Twentieth Century", *Population and Development Review*, 33 (1): 129-147.

Isaacs, Julia B. (2009). *How much do we spend on children and the elderly*. Washington, D.C.: Brookings Institution.

Kotlikoff, Laurence J. and Scott Burns (2012). *The Clash of Generations: Saving Ourselves, Our Kids, and Our Economy*. Cambridge MA: MIT Press.

Lee, Ronald (2012). "Intergenerational transfers, the biological life cycle, and human society." *Population and Development Review*, S38: 23-35.

Lee, Ronald and Andrew Mason (2011). "Theoretical Aspects of National Transfer Accounts", in R. Lee and A. Mason (Eds.) *Population Aging and the Generational Economy: A Global Perspective*, Cheltenham, UK and Northampton, MA, Edward Elgar.

Li, Shi, John Whalley, and Chunbing Xing (2014). "China's Higher Education Expansion and Unemployment of College Graduates". *China Economic Review*, 30: 567-582.

Meerman, Jacob (1979). *Public Expenditures in Malaysia: Who Benefits and Why?* New York: Oxford University Press.

Ministry of Health of China (2004). *Report on China's Health Care Development*. Beijing.

National Bureau of Statistics of China (2010). *China Statistical Yearbook 2010*. Beijing: China Statistics Press.

National Bureau of Statistics of China (2011). *China Statistical Yearbook 2011*. Beijing: China Statistics Press.

Pozen, Robert C. (2013). Tackling the Chinese Pension System. Paulson Policy Memorandum. Chicago: The Paulson Institute.

Preston, Samuel H. (1984). "Children and the elderly: Divergent paths for America's dependents". *Demography*, 21 (4): 435-457.

Selowsky, Marcelo (1979). *Who Benefits from Government Expenditure?* New York: Oxford University Press.

Rosero-Bixby, Luis (2011). "Generational transfers and population aging in Latin America." *Population and Development Review*, S37: 143-157.

Turra, Cassio M., Mauricio Holz, and Daniel Cotlear (2011). "Who Benefits from Public Transfers? Incidence across Income Groups and across Generations in Brazil and

Chile", in Daniel Cotlear (ed.) *Population Aging: Is Latin America Ready?* Washington, D.C.: the World Bank.
United Nations Population Division (2013). National Transfer Accounts Manual: Measuring and Analysing the Generational Economy. New York.
van de Walle, Dominique, and Kimberly Nead, eds. (1995). *Public Spending and the Poor: Theory and Evidence*. Baltimore: Johns Hopkins University Pres.
Wang, Feng (2011). "The future of a demographic overachiever: Long-term implications of the demographic transition in China." *Population and Development Review*, S37: 173-190.
Wang, Feng (2014). *Institutional and Fiscal Challenges to the Old-Age Support System in Asia-Pacific Region*. Expert Report for the United Nations Development Program.
Willis, Robert J. (1988). "Life cycle, institutions and population growth: A theory of the equilibrium interest rate in an overlapping-generations model." In R. Lee, W.B. Arthur and G. Rodgers (eds.), *Economics of Changing Age Distributions in Developed Countries*. Oxford: Oxford University Press, pp. 106-138.
Xie, Yu and Jingwei Hu (2014). "An introduction to the China Family Panel Studies (CFPS)." *Chinese Sociological Review*, 47 (1): 3-29.
Yang, D. (2006). *Transition and Development of China's Education*. Beijing: Social Science Academic Press (in Chinese).