

Understanding Wealth and Housing Inequality Among China's Older Population

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Abstract

In this paper we examine wealth inequality of China's older population aged 45 and older using data from the 2011 national baseline of the China Health and Retirement Longitudinal Study (CHARLS). As housing wealth accounts for the lion's share of household wealth in China, we provide detailed analysis of housing wealth differences in China, including an assessment of the importance of housing windfalls associated with housing reforms in the 1990s and market price increases for housing. Our calculations indicates that in 2010, the wealth Gini coefficient is 0.69, and the wealthiest 20% of the population account for three quarters of total wealth while the bottom 50% account for only 5.7% of total wealth. We show that the majority of today's wealth is the result of windfall gains, especially rapid increases in housing prices.

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I. INTRODUCTION

Much recent attention has been paid to rising wealth inequality in the US and Europe and the potentially pernicious implications of this rise for perpetuating entrenched social inequities (Piketty, 2014). In China, economic reform has led to a dramatic and well-documented increase in income inequality, but much less is known about the extent and nature of wealth inequality, even though such differences may better reflect differences in lifetime (or permanent) income and well-being. The study by Li et al (2015) in this volume suggests that the increase in wealth inequality in the 2000s may have been quite dramatic as well.

In this study, we analyze the nature of wealth inequality of China's older population aged 45 and older using data from the 2011 national baseline of the China Health and Retirement Longitudinal Study (CHARLS). Wealth differences among this population are highly consequential given the rapid speed of population aging³ and the projected decline in China's elderly support ratio, defined as the number of prime-aged adults 25–64 divided by the number older than 64, from nearly 13 in 2000 to just 2.1 by 2050. Thus, older persons in China increasingly need to rely on their own wealth to support consumption in their elderly years. Public pension programs remain immature and most elderly lack sufficient pension coverage, especially in rural areas.⁴ Analysis of the CHARLS data has found that dissaving plays a key role in ensuring that

³ It is projected that the proportion of those aged 60 and over will increase from 10% of the population in 2000 to about 30% in 2050 (United Nations, 2002).

⁴ China's rural pension program had reached 23% of rural counties by year-end 2010 just before the CHARLS survey.

expenditure by the elderly remains above the poverty line (e.g. Park *et. al.*, 2012).

This study is the first to examine wealth inequality among China's older population. A few previous studies have estimated the extent of overall wealth inequality in China (e.g., Gustafsson et al, 2006; Li and Zhao, 2007; Meng, 2007; Li, Wan and Xie, 2015). Recent studies find that housing now accounts for a dominant share of wealth and wealth inequality. China's older population is of particular interest because it is the population that benefitted most from large windfalls associated with housing reforms and huge increases in the price of housing in the 2000s. CHARLS asked very detailed questions about such windfalls, allowing us to go beyond previous research in examining how much windfalls contributed to wealth inequality, and to how windfalls were distributed across households of different socioeconomic status.

The CHARLS baseline survey is a nationally representative survey of adults aged 45 and older. We start by presenting different measures of wealth inequality, also comparing them to measures of inequality of consumption expenditure and income. Using regression analysis, we further examine how of different factors like *hukou* status, education level, marital status, and community effects explain differences in wealth. Finally, we investigate the contribution of housing windfalls to inequality in housing wealth. Under housing reforms in the late 1990s, employer-provided housing was sold to urban workers at highly subsidized prices. Then, as the housing market developed and become highly commercialized, the market price for housing skyrocketed, creating enormous wealth for owners of desirable housing units. One interesting aspect of these windfall gains was that there was significant random

variation in the size of housing windfalls realized by different individuals, because most housing units were allocated by employers before a housing market existed. To explore this issue, we examine whether inequality associated with housing windfalls reinforces or mitigates wealth differences among those with different socioeconomic backgrounds (captured by differences in educational attainment).

Throughout the analysis, we make a point of distinguishing between urban versus rural residents because of the significant differences in economic and social institutions affecting the two populations. We define urban versus rural status based on whether an individual's official family residential registration (*hukou*) is nonagricultural (urban) or agricultural (rural). There is a long history in China of preferential policies toward nonagricultural residents. Urban residents for many years enjoyed an "iron rice bowl" of guaranteed employment, housing, health insurance, pension support, and other subsidies that were unavailable to rural residents even if they migrated to cities (Chan and Zhang, 1999; Solinger, 1999). Even after three decades of reform, urban residents continue to enjoy more generous subsidies to support minimum standards of living, and better health insurance and access to housing. Family planning policies were stricter for urban residents.

The paper is divided into five sections. The next section describes the CHARLS data and the measurements used in the analysis. Section III presents the inequality measures for consumption expenditure, income and wealth, and the relationships among these three measurements. Section IV briefly describes the history of housing reform and the role of housing windfalls in explaining wealth inequality. Section V

uses regression analysis to quantify the determinants of wealth inequality. The final section concludes with a discussion of implications for how China can successfully reduce inequality in the future.

II. CHARLS DATA AND MEASUREMENTS

CHARLS is modeled after the Health and Retirement Survey (HRS) in the United States and other similar aging studies worldwide. A distinguishing feature of HRS-type surveys is that they are longitudinal and collect detailed data on both socioeconomic status and physical and mental health. The baseline of CHARLS survey was conducted between late summer 2011 and March 2012, covering 28 provinces in mainland China⁵. The baseline survey sampled individuals aged 45 and older plus their spouses.

Sampling was conducted in three stages. In the first stage 151 counties in China were stratified by rural/urban status and by per capita county GDP and then sampled with probability proportional to population (PPS). Three communities (administrative villages or urban neighborhoods) were then randomly sampled within each county unit again using PPS sampling. Sampling frames for county and village sampling were based on population data provided by China's National Bureau of Statistics. In the third stage households within each community were randomly sampled based on a full map-based enumeration of all dwellings in each neighborhood, with the goal of about 24 age-eligible households sampled from each community. One main respondent was randomly selected in each household with eligible members (those aged 45 and older)

⁵ Tibet was excluded in the sampling framework. Hainan and Ningxia were not sampled due to their small population size.

and the spouse of each main respondent was also interviewed. The response rate among eligible households was 84% (90% for rural households and 77% for urban households). The sample's demographic structure is similar to that found in the 2010⁶.

The full sample therefore includes 10,230 households and 17,224 individuals, and the number of households and corresponding individuals are presented in Table 1. For all descriptive tables, in order to maximize representativeness, we restrict attention to the sample of main respondents, excluding spouses. Regressions are unweighted and also include spouses to increase power.

[Insert Table 1 about here]

Understanding wealth, expenditure, and income inequality among the older population in China requires detailed information on these measures. CHARLS made great efforts to collect all of the necessary information to measure these economic indicators precisely. Main respondents and their spouses were asked about their individual financial assets and all sources of income and public transfers that they received as individuals. A financial respondent—the person most familiar with the household's finances—answered questions about household assets, including housing, individual assets and income of other household members, income from household activities such as agriculture, household expenditures, and household-level transfers, including private transfers from non-household members. Also, important for this study is the fact that both the respondent and spouse were asked detailed questions

⁶ The population structure by age group of those aged 45 and older in China's 2010 population census (2011-2012 CHARLS baseline survey) is as follows: 23.8 (19.91) percent aged 45-49, 17.7 (14.16) percent aged 50-54, 18.3 (18.95) percent aged 55-59, 13.2 (16.27) percent aged 60-64, 9.28 (10.95) percent aged 65-69, 7.44 (8.6) percent aged 70-74, 5.38 (6.11) percent aged 75-79, 4.74 (5.01) percent aged 80+ (all numbers based on authors' calculations). Thus, relative to the 2010 census CHARLS slightly under-samples those aged 45-54 and oversamples those aged above 60; however, these differences are relatively small.

about all purchases of housing from work units in the past, and the purchase time and price (plus estimated market price at time of purchase if not purchased at a market) of all houses currently owned by household members.⁷

Our wealth measure, net wealth per capita, is composed of housing, livestock, land, financial assets, production capital, and durable goods. Net housing wealth is the difference between the self-reported current value of all houses owned by household members minus the remaining balance on all mortgage loans. The net present value of land is calculated based on the expected discounted stream of rental income from different types of land that the household has been allocated or purchased (cultivated land, forest, ranch, pond, etc.). Net financial assets is the sum of cash balances, deposits, government bonds, stocks, mutual funds, loans from others, public housing fund, housing fund of the working unit (“*jizikuan*”), unpaid salary, rotating savings and credit associations, outstanding borrowing excluding mortgage loans, and credit card balance.^{8 9}

Total household income is the sum of respondents and spouse (RS) income and household income. RS income includes individual-based wage income and fringe benefits from work, public transfer income targeting individuals, individual

⁷ Of the current residence, 4.88% of them were purchased from work units (Table 10). An unfortunate omission is the lack of information on houses that have previously been sold if they were not purchased from work units. However, most urban households have not sold houses (only 293 households sold houses in the whole sample). We also lack data on construction cost of self-build houses so cannot estimate wealth gains from rising housing prices for most rural households.

⁸ In this paper we have made no attempt to estimate pension wealth.

⁹ We have two data caveats. First, restricting sample to older Chinese may reduce inequality if younger cohorts systematically have lower wealth, but may increase within-cohort inequality if wealth differences within cohorts increase with age. Secondly, survey data are likely to underestimate wealth at the top (due to non-response) and underestimate financial assets (due to under-reporting) (Davies et. al, 2009).

self-employment income, pension income, asset income (including housing rental income and cash flows from stock funds and other types of investment), and private transfer income received by the respondent and spouse. Household income is the sum of household net agricultural income, self-employed income from businesses engaging multiple household members, public transfer income targeting households, other asset income, and income from other household members. Household income per capita is the sum of the income of all household members divided by the total number of household members¹⁰.

Household consumption expenditure is the sum of 18 items measured based on recall questions covering the past week, month, or year depending on the expected frequency of different types of expenditures.¹¹ The largest items are food (50.4 percent) and medical expenditures (14.8 percent). The survey asks about food expenditure during the past week, including expenditures on dining out, food bought from the market and the value of home-produced food.¹² Household expenditure per capita is obtained by dividing annual household consumption expenditure by the total number of household members.¹³

¹⁰ Although we can clearly distinguish each source of individual income for main respondents and their spouses, who were asked about each separately, for other household members, we can only distinguish two types of individual income: earnings from work and all unearned income (including pensions, public transfers, asset income, and other sources of income). Given our strong prior that public transfers are likely to account for the bulk of such income (because other members tend to be too young to have pension income and asset income is relatively rare), we have chosen to categorize all unearned individual income of other household members as public transfer income when calculating household income from different sources.

¹¹ The expenditure items are food, medical expenditure, communication, utilities, fuel, servant, transportation, daily items, entertainment, clothing, traveling, heating, fitness, beauty, repairs, training, property management, and donations.

¹² Food expenditures spent on guest meals are excluded from food expenditures to better reflect household food expenditure in a normal week.

¹³ The household food expenditure per capita is calculated by dividing total household food expenditure over the number of individuals ate regularly in the household in the past week.

III. WEALTH, EXPENDITURE, INCOME INEQUALITY

Table 2 presents the Gini coefficients for the wealth per capita of China's older population, also calculated separately for urban and rural residents, and for those below and above 60. For comparison, we also present the Gini coefficients for expenditure per capita and income per capita. For the total population, the Gini coefficient for wealth is 0.69, which is higher than the Gini coefficients for income (0.61) and expenditure (0.46). The wealth Gini coefficient for China's older population is similar to estimates made for the entire population (see Li et al, 2015, this issue), and is lower than recent estimates for the US.¹⁴

The Gini coefficients show that wealth inequality is more severe among urban residents (0.65) than among rural residents (0.62). This contrasts with income inequality, which is more severe for rural residents (0.62) than for urban residents (0.53). The results also show that inequality is higher for all three measures for elderly above 60 than for those aged 45 to 59.

Table 2 presents the mean, the median, 90th percentile, and 10th percentile of household expenditure, income, and net wealth per capita for those aged 45 and older in 2011. The average per capita expenditure, income and wealth per capita are 8,286, 11,600, and 83,201 Yuan, respectively. Mean net wealth per capita has reached a high level of \$18,545 if the PPP exchange rate is used. However, the medians are much lower than the means. Median per capita expenditure, income and wealth per capita are

¹⁴ It is unclear whether we should expect inequality among the older population to be larger or smaller than for the entire population. If younger people have less income than older people, one might expect across-cohort inequality to be greater for the whole population. However, if older groups have greater within-cohort inequality, then restricting the sample to older persons could increase inequality.

5,775, 6,350, and 31,870 Yuan, respectively, indicating skewed distributions for these well-being measures.

[Insert Table 2 about here]

Next, we report three percentile ratios to measure inequality in the distributions of expenditure, income and net wealth--P50/10, P90/50, and P90/10 (Table 3). For example, the P50/10 ratio for wealth is calculated as the wealth per capita at the 50th percentile divided by the wealth per capita at the 10th percentile. Thus, P50/10 describes inequality in the lower half of the distribution, P90/50 describes inequality in the upper half of the distribution, and P90/10 portrays inequality in the entire distribution. Based on these ratios, wealth and income disparities are greater than expenditure inequality, where the P90/P10 is 75.1 for wealth, 75.4 for income, and just 8.8 for expenditure. The results also reveal greater disparity in the bottom of the income and wealth distributions. The percentile gap is even greater for the income distribution (P50/10 equals 18.1) than that for the wealth distribution (P50/10 equals 13).

[Insert Table 3 about here]

Table 4a and Table 4b make similar percentile comparisons for the urban and rural subsamples. The results presented in Table 4a reveal that across all measures urban standards of living are much higher than rural standards of living, reflecting China's substantial urban-rural gap. For example, the 10th percentile of rural residents has per capita expenditure, income and net wealth of 1,580, 220, and 2,373 Yuan, respectively. Meanwhile, the corresponding numbers for the 10th percentile of urban residents is 3,290, 1,300, and 2,740. The 90th percentile measurements in rural areas are

11,650, 18,160 and 97,300 Yuan, respectively, but the numbers in urban areas are 22,550, 36,850, and 366,735 Yuan.

[Insert Tables 4a and 4b about here]

Table 4b shows that inequalities at the bottom are more severe than at the top for both rural and urban residents, and that this is true regardless of which measurement is considered. In all cases, the P50/10 ratio is larger than the P90/50 measure. Secondly, while expenditure inequality appears similar for rural and urban residents, income and wealth inequality display different patterns for the two groups. In rural areas, income inequality is more severe than wealth inequality, with the P90/10 for income being 82.5 and that for wealth 41. In urban areas, however, wealth inequality is more severe than income inequality. Net wealth per capita at the 90th percentile of urban residents is 133.8 times that of the 10th percentile while per capita income at the 90th percentile is 28.3 times that of the 10th percentile.

We next explore how inequality evolves across cohorts. When the sample respondents are divided into 5-year age cohorts (45-49, 50-54, 55-60, 60-65, 65-69, 70-74, and 75+), we observe declining trends with age in the median values of all three measures, with wealth per capita declining from 38,740 Yuan for those age 45 to 49 to 23,782 Yuan for those 75 and older, expenditure per capita declining from 7,277 Yuan to 4,807 Yuan, and income per capita declining from 8,927 to 4,760 Yuan. On the other hand, the P90/10 presented in Figures 1a, 1b and 1c show a somewhat different trends. For expenditure, the P90/10 increases from 7.4 for the 45-49 group to 9.7 for the 75+ group. This increase is mainly driven by the low level of spending of

the oldest old, as per capita expenditure of the 10th percentile is 1,830 Yuan for those aged 45 to 49 but only 1,418 Yuan for those aged 75 and above. For income, the P90/10 dispersion is declining across age cohorts (except a spike for the 50-54 group), reflecting the fact that after retirement the incomes of the elderly are more equalized. However, wealth dispersion (Figure 1c) declines for those less than 60, but increases steadily from 58 for those aged 60 to 64, to 135 for those aged 75 and above.

[Insert Figures 1a, 1b and 1c about here, the Expenditure P90/10, the income P90/10, and Wealth P90/10]

To better understand wealth inequality, we further describe the components of wealth¹⁵, for the full sample as well as for the urban and rural sub-samples. For the population as a whole, housing is the main form of wealth with an average share of 80.8%, followed by land (6.9%), financial assets (6.1%), durables (3.6%), and other assets. Even though real estate often is described as a middle class asset in the literature (e.g., Piketty, 2006), in CHARLS only 8.6% of individuals report that they live in households with no housing equity, including 12.8% for urban residents and 6.3% for rural residents. However, the value of the housing wealth is much lower in rural areas, with the median housing value being less than one third of the median urban housing value. Not surprisingly, the wealth structures of the urban and rural samples are different. For urban residents, housing equity (84.6%) and financial assets (9.6%) altogether account for 94.2% of wealth per capita; for rural residents, the main forms of wealth are housing (73.6%), land (16.9%), and durables (4.8%), together

¹⁵ Mean shares described in this paragraph are calculated as the mean of each category divided by the mean of the total, not the mean of household-specific shares.

accounting for more than 95% of wealth. The mean share of financial assets among rural residents is nearly zero (-0.6%), perhaps reflecting the fact that many rural residents borrow money from friends or relatives.

[Insert Table 5 about here]

Next, we calculate the correlation among expenditure, income and net wealth to better understand how the three dimensions of economic well-being are related to each other. The correlation of net wealth with income is 0.33, and with expenditure is 0.30 (Table 6), significantly positive but far from one. The linkages between wealth and income and between wealth and expenditure are substantially lower in rural areas (0.187 and 0.09) than in urban areas (0.399 and 0.430). When net wealth is further divided into housing wealth and non-housing wealth, we find that the correlations of income and expenditure with housing wealth are stronger than with the non-housing wealth.

[Insert Tables 6 about here, the correlation table of income, expenditure and wealth]

Even though the overall correlation of net wealth with income and expenditure is moderate, it is informative to look more closely at the extremes of the joint distribution to see the extent to which China has a wealthy superclass and a very poor underclass. Here, we examine the relationship between wealth and expenditure per capita. Expenditure is considered as a preferred measure of living standards, because it best captures consumption which directly enters individuals' utility functions, and because it generally better reflects permanent income than income which is subject to

greater year-to-year fluctuations, especially for rural households (Park et.al, 2012). When individuals are divided into quintiles based on expenditure, Table 7 indicates that those maintaining higher living standards have a higher proportion of wealth in housing. For example, the median share of housing wealth over total wealth for respondents in the highest expenditure per capita group is 95.1%, almost 20 percentage points higher than for those in the lowest living standard group. Those in the highest expenditure quintile also have greater debt, a higher probability of having mortgage loans, and a lower probability of having negative wealth.

Figure 2 depicts how closely net wealth is related to living standard when we break down both expenditure and wealth into quintiles, with the poorest group labeled with 1 and the richest groups labeled with 5, and examine frequencies for each of the 25 combinations of wealth and expenditure quintiles. The most striking finding is that many of those in the wealthiest group also are the largest spenders, with this group accounting for 9.63% of observations. There is relatively less concentration in the group that is least wealthy and has the lowest expenditure (5.97%). Thus, in China those who are very wealthy (chiefly on the basis of housing) also clearly enjoy the highest living standards as measured by expenditures.

[Insert Figure 2 about here, the quintiles of expenditure and wealth]

Another frequently used way to describe the degree of wealth inequality is to calculate the percentage of total wealth owned by the top x% of the population for different x. We do the same for expenditure and income. Results are presented in Figure 3 and Table 8. We can observe from Figure 3 that wealth inequality is the most

severe among the three measures, with the top 20% accounting for three quarters of the overall wealth, compared to two thirds of total income, and about half of total expenditure. The lower half of the population, however, accounts for only 5.7% of total wealth and 6.3% of total income, not too dissimilar to the shares in the US and Europe (Piketty, 2014). Table 8 further shows that the top 10% own 57.54% of total wealth and earn 46.95% of total income. Piketty (2014) warns that in most of the European countries, like France, Germany, Great Britain and Italy, the top 10% account for about 60% of total national wealth which he views as dangerously high. It thus may be concerning that the concentration of wealth among the richest Chinese aged 45 and above has reached a similar magnitude. The distribution of wealth within the top 10% is also uneven, with the top 1% accounting for 20.82% of total wealth, the top 2-5% accounting for 21.85%, and those in the 6-10% range accounting for 14.74%. For the top 10%, the share of housing wealth is 58.05%, similar to their share of total wealth, but their share of non-housing wealth is even higher at 80% of total non-housing wealth.

[Insert Figure 3 about here, the share of total expenditure/income/wealth]

[Insert Table 8 about here, shares in total expenditure, income and wealth by top individuals]

IV. HOUSING REFORM AND HOUSING WINDFALLS

As displayed in Table 5, housing is the dominant component of household wealth in China. In this section we describe housing reforms and housing market

development in China, and present the first estimates of housing windfall gains using nationally representative survey data. It turns out that these windfalls comprise a significant share of household wealth. What is interesting is to consider is how these windfalls were distributed and how they contribute to wealth inequality today.

Before 1978 housing in urban China was all allocated by the state. The state owned all assets, with housing typically controlled by work units who allocated individual housing units to its workers. Efforts to commercialize and reform the housing system began as early as 1979 (Fong, 1988; Kirkby, 1990; Lim and Lee, 1990; Lau, 1993; Wang and Murie, 2000), but for many years on a limited scale. Important housing reform documents were promulgated in 1991 (“On Comprehensive Reform of the Urban Housing System”) and 1996 (“The Decision on Deepening the Urban Housing Reform”), which led to full-scale implementation by 1998. The different reforms varied in their details, but generally involved the sales of housing units to employees, often at low, subsidized prices, with restrictions placed on resale for some period of time.¹⁶ The 1998 reform established the transition to a new system in which new workers were no longer entitled to housing allocation by work units but instead were paid an employer-financed housing subsidy and expected to purchase or rent housing in the market. Public housing would be constructed and made available to low-income households. The speed of implementation and many specific details of

¹⁶ The earliest reforms allowed the sale of new housing to urban residents at construction cost. These owners had the right to use their property and pass it on through inheritance, but did not have the right to sell their houses to the market. Experiments with comprehensive housing reform began in 1986, when a housing subsidy for all public sector employees was introduced and sales of public sector housing were promoted in some areas. The 1991 document endorsed the large scale sale of public housing at very low prices, particularly to current occupiers, but was suspended in 1993 due to concern about the low prices of sales. See also Park and Porter (2003).

housing reform policies varied by locality.

Figure 3 shows the timing of housing purchases from work units and the market over time. The impact of housing reform policies is readily apparent. The number of housing purchases from working units peaked during the period of 1995 – 1999 when housing reform was in full swing. Such purchases declined afterwards. In contrast, the number of houses purchased in the private market gradually increased, rising significantly and surpassing purchases from work units during the 2000-2004 period. During this period, the market price for housing rose rapidly.

Today, China has a very high rate of home ownership, similar to other former socialist countries who implemented similar housing reforms (Table 9). 88.08% of urban residents and 92.23% of rural residents live in households that own at least one house.

Housing windfalls, which we calculate as the difference between the current value of housing and the original purchase price, contributes significantly to wealth generation of urban households. Table 10 tabulates the sources of respondents' current residence. In 2011 purchases from working units and purchases from the market accounted for almost equal shares (21.23% vs. 21.27%) for urban households. In contrast, for rural households, most housing is self-build, with purchases from the market accounting for only 4.52% and purchases from work units almost nonexistent (0.20%).

The degree to which households benefited from housing windfall can be seen vividly from the magnitude of windfalls presented in Tables 11a and 11b. We divide

housing windfalls into two components--market windfall and subsidy. The market windfall is the difference between the current market value (or sales price for sold houses from work units) and the (self-reported) estimated market value at the time of purchase. The subsidy is equal to the difference between the estimated market price at the time of purchase and the price actually paid at the time of purchase. Thus, subsidies as defined here can reflect below-market prices charged by work units during housing reform, by friends or relatives, or by local governments that sell housing at low prices to assist the poor or as compensation to those whose houses are demolished in accordance with local government development plans.

Table 11a reports the share of housing wealth accounted for by windfalls (market windfalls and subsidies) for the sample of urban respondents with complete (consistent) information that enables the calculation of both market windfalls and subsidies.¹⁷ Table 11b reports results when all available data is used. For example, for households that report a purchase price but not the market price at the time of purchase, we are able to calculate a total windfall amount, but not the amount of market windfall or subsidy. To show the important role of housing reform, we also separately summarize the windfalls for houses purchased from work units in both tables.

For the consistent sample, the mean housing wealth is 291,000 Yuan. Of the respondents with complete data, 70.17% have benefited from a positive housing windfall, including 60.42% who report receiving market windfalls and 42.17% who receive subsidies. Windfalls account for 71.66% of current housing wealth, including

¹⁷ A number of respondents did not accurately recall the date and amount of past housing purchases, or reported numbers that are implausible even using the most conservative criteria, leading to missing values.

46.71% from market windfalls and 25.35% from subsidies. For respondents who purchased housing from work units, mean housing value is significantly greater (391,000 Yuan) than for all urban households and the frequency of windfalls, especially from subsidies, is much greater (86.05% receive subsidies). For these individuals, windfalls from market windfalls and subsidies are nearly equally important.

For the full (unbalanced) sample, the results are broadly similar (Table 11b). However, the mean housing value for all households is greater (410,000 Yuan), perhaps reflecting a few households with very valuable housing. The share of housing value accounted for by windfalls is also somewhat reduced (51.68%). The results for those who purchased housing for work units is very similar to the results reported in Table 11a.

V. DETERMINANTS OF INCOME, EXPENDITURE AND WEALTH INEQUALITY

Results presented in the previous section established the fact that housing windfalls account for a large share of wealth in urban China. To get a better sense of how this component of wealth is distributed across households, as well as how other components of wealth (and income and expenditures), in this section we analyze the determinants of income, expenditure and wealth differences. In particular, we examine the extent to which differences in these various economic outcomes are explained by the educational attainment of respondents. In China, education level is a good summary measure of socioeconomic status. It is significantly associated with wages (Zhang et al,

2004) and occupational status, and is relatively fixed by early adulthood. Thus, we expect wealth, income, and expenditure to be strongly positively associated with educational attainment. To the extent that some components of wealth are less associated with educational attainment than others, the distributions of those assets are likely to be less correlated with socioeconomic status, or more randomly distributed across households in the population. Because many urban houses were first allocated by work units, and the distribution of work-unit housing may not have been strongly correlated with future market values of those housing, we hypothesize that housing windfalls and thus housing values may be less associated with educational attainment than other forms of wealth. If this is the case, differences in housing value may contribute to increasing wealth inequality, but not necessarily in a pattern that reinforces existing dimensions of social stratification.

Tables 12a to 12e present the regression results for the determinants of income, expenditure, total wealth, housing wealth, and non-housing wealth (all measured in log per capita terms). The regressions also control for marital status, age, and *hukou* type. Results are reported for the full sample, the urban and rural subsamples, and for each of these with and without community fixed effects. Each table thus has six columns of regression results. In all regressions, education levels of respondents are categorized into the illiterate, low-education (primary and below), middle-education (completed junior high or senior high school), and high education (college or above), with the illiterate group serving as the reference group. To further quantify the role of education in determining these measures, Table 13 summarizes the regression results by

calculating the ratios of income, expenditure, or wealth per capita of each education group compared to the illiterate group¹⁸.

We first examine the impact of education on income and expenditure, to establish benchmarks for comparison with the results for wealth (Tables 12a and 12b). There are several findings of note. First, education is strongly positively associated with both income and expenditures. Second, the returns to education are higher for income than expenditure. The income and expenditure of the high education group on average is 3.37 and 2.24 times that of the illiterate group (Table 13). Third, the returns to the highest level of education (high school) are much greater than for other levels of education. Fourth, the income returns to education are greater for urban residents than for rural residents, while the consumption returns to education are much closer for the two groups. Fifth, the returns to education for urban residents, whether for income or expenditure, are much greater when NOT controlling for community fixed effects. The income (expenditure) of the high education group is 3.48 (2.64) times that of the illiterate group without community fixed effects and 2.32 (1.83) times that of the illiterate group when controlling for community differences (Table 13). Controlling for community differences matters much less for the returns to education for rural residents, suggesting that more educated urban workers tend to be concentrated in communities with higher wages than more educated rural laborers.

Next, we turn to the results for wealth, housing wealth, and non-housing wealth. Comparing the returns to education for wealth with that for income, we find that the

¹⁸ The ratios are calculated as the exponential term of the estimated coefficients.

wealth returns to low and middle education levels are similar (actually slightly lower) to the income returns, but the wealth return to the highest educational level is much greater than for income (Table 12c). Wealth of the high education group on average is 4.61 times that of the illiterate group (Table 13). Thus, wealth is more concentrated than income in the high education group. Second, we find that controlling for community fixed effects reduces the wealth returns to education significantly more than the income returns to education, suggesting that educated workers are even more concentrated in high wealth communities than in high income communities. Given the large disparities in housing prices in the largest Chinese cities (which also have more educated workers) compared to other cities, the importance of community differences perhaps is not surprising.

Finally, we compare the returns to education for housing wealth and non-housing wealth (Tables 12d and 12e). Consistent with the more random distribution of housing windfalls, we find that differences in housing wealth are much more weakly correlated with educational attainment than total wealth. Housing wealth of the high education group is 3.17 times that of the illiterate group, compared to 4.61 times for all wealth (Table 13). Thus, while education differences in wealth are greater than for income, education differences in housing wealth are less than that for income. We also find that controlling for community fixed effects more sharply reduces wealth differences by education level for housing wealth than for non-housing wealth. Interestingly, controlling for community fixed effects also significantly reduces housing wealth differences by educational level for the rural sample, but has no effect

on non-housing wealth differences of rural households.

Taken together, these findings are consistent with housing wealth differences being less associated with prior socioeconomic status than other forms of wealth. In fact, Meng (2007) found that wealth inequality actually declined from 1995 to 2002, the period spanning the most widespread implementation of housing reform. We attribute this to the large, somewhat random variation in housing windfall gains experienced by urban households due to housing reform and rapid housing price appreciation. This is not to say that the rich and powerful did not benefit more on average from housing windfalls. For instance, Meng (2007) documents how Party members enjoyed greater increases in housing wealth from housing reform. Rather, the main point is that the distribution of such windfalls was not as strongly correlated with socioeconomic status as other forms of wealth. Differing results of regressions that do and do not control for community fixed effects also suggest that large differences in housing price growth across cities and communities has had a major influence on the distribution of wealth in China.

VI. CONCLUSION

This study is the first to study wealth inequality of China's older population (aged 45 and older). It is based on analysis of the national baseline wave of the China Health and Retirement Longitudinal Study (CHARLS). We calculate a wealth Gini coefficient of 0.69. Those at the 90th percentile have 75.1 times more wealth than those at the 10th percentile, and the wealthiest 20% of the population account for three

quarters of total wealth while the bottom 50% account for only 5.7% of total wealth.

Housing now accounts for the lion's share of household wealth in China, making it by far the most important source of inequality in wealth. A main contribution of this study is a detailed analysis housing wealth differences in China, including an assessment of the importance of housing windfalls associated with housing reforms in the 1990s and market price increases for housing. We show that the majority of today's wealth is the result of windfall gains, especially rapid increases in housing prices. Using regression analysis, we show that housing wealth is less correlated with socioeconomic status than total wealth or income, likely reflecting a nontrivial random component to the distribution of housing windfalls across the population. We also find large differences in housing windfalls across different cities and communities.

Because housing reform and the unparalleled increase in housing prices during the 2000s may be one-time events benefitting a specific cohort of China's urban population, it will be of great interest and importance to continue monitoring the evolution of housing and wealth inequality in China, especially between older and younger populations. Relatedly, it will be important to understand how wealth is passed on from one generation to the next to perpetuate class differences. The importance of wealth inequality for an array of political, social, and economic outcomes justifies close scrutiny of wealth dynamics in China.

Table 1. Number of Households and Individuals in CHARLS National Baseline

		Households	Individuals
Overall		10230	17224
	Aged 45-59	5580	9771
	Aged 60+	4650	7453
	Urban	2612	4227
	Rural	7618	12997
Expenditure, income and wealth		9334	15899
	not missing		
	Urban	2301	3804
	Rural	7033	12095

Table 2. Gini Coefficients

	Total	Rural	Urban	45-59	60+
Expenditure p.c.	0.46	0.42	0.42	0.44	0.48
Income p.c.	0.61	0.62	0.53	0.58	0.60
Net wealth p.c.	0.69	0.62	0.65	0.65	0.71

Table 3. Expenditure, Income and Wealth Inequality at a Glance

	Mean	10%	50%	90%	p50/p10	p90/p50	p90/p10
Expenditure p.c.	8286	1885	5775	16603	3.06	2.87	8.81
Income p.c.	11660	350	6350	26400	18.14	4.16	75.43
Net wealth p.c.	83201	2449	31870	183956	13.01	5.77	75.11

Table 4a. Urban-Rural Divergence: Absolute Levels

Percentiles	Rural			Urban		
	10%	50%	90%	10%	50%	90%
Expenditure p.c.	1580	4528	11650	3290	9204	22550
Income p.c.	220	3910	18160	1300	13908	36850
Net Wealth p.c.	2373	22510	97300	2740	70189	366735

Table 4b. Urban-Rural Divergence: Ratios

	Rural			Urban		
	p50/10	p90/50	p90/10	p50/10	p90/50	p90/10
Expenditure p.c.	2.90	2.60	7.40	2.80	2.50	6.90
Income p.c.	17.80	4.60	82.50	10.70	2.60	28.30
Net wealth p.c.	9.50	4.30	41.00	25.60	5.20	133.80

Table 5. The Composition of Wealth

Per capita assets	Total		Urban		Rural	
	mean	percent	mean	percent	mean	percent
Housing equity	67273	80.86	137593	84.88	32349	73.50
Non-housing wealth	15929	19.14	24519	15.12	11662	26.50
Livestock	715	0.86	64	0.04	1038	2.36
Land	5986	7.20	2828	1.74	7555	17.17
Durables	2929	3.52	4716	2.91	2041	4.64
Fixed capital	1404	1.69	1712	1.06	1251	2.84
Financial assets	4895	5.88	15199	9.38	-223	-0.51
Total	83202	100.00	162112	100.00	44011	100.00
People with no housing equity		9.00		13.90		6.70

Table 6. Correlations among Per Capita Expenditure, Income, and Wealth

	Total	Rural	Urban
Net wealth			
Income and expenditure	0.24	0.29	0.15
Income and wealth	0.33	0.19	0.40
Expenditure and wealth	0.30	0.09	0.43
Housing assets			
Income and housing assets	0.43	0.16	0.46
Expenditure and housing assets	0.39	0.18	0.41
Non-housing assets			
Income and non-housing assets	0.09	0.16	0.03
Expenditure and non-housing assets	0.10	0.05	0.25

Table 7. Wealth Composition by Expenditure Quintiles

5 quintiles of expenditure p.c.	Overall	1	2	3	4	5
Median wealth share of housing (%)	86.50	75.50	79.30	87.50	88.90	95.10
Mean per capita debt (Yuan)	5205	2588	3021	4728	6106	9930
Has mortgage debt (%)	2.99	1.61	1.75	2.36	2.70	6.49
Negative net wealth (%)	4.60	4.25	4.51	4.54	6.35	3.50

Table 8. Shares of Total Expenditure, Income and Wealth of Richest Individuals

Wealth per capita	1%	5%	10%	last 50%
% total net wealth	20.82	42.68	57.42	5.73
% total income	16.25	33.70	46.95	6.31
% housing wealth	20.10	42.96	58.05	5.22
% nonhousing wealth	35.61	64.66	80.36	-15.94

Table 9. Home Ownership Rates

House number	Non-ag hukou	Agricultural hukou	All
None	11.92	7.87	8.76
One	79.85	85.96	84.60
Two	6.37	5.04	5.33
Three	0.61	0.36	0.41
Four	0.09	0.05	0.06
Six	0	0.01	0.01
Missing	1.17	0.72	0.82
Total	100	100	100
N	2,308	8,061	10,372

Table 10. Sources of Current Residence

	Non-ag hukou	Agricultural hukou	All
Purchased from market	21.27	4.52	8.24
Purchased from working unit	21.23	0.20	4.88
Purchased from family	1.47	0.69	0.87
Inherited or received as gift	2.86	3.57	3.42
Self-built	24.26	72.26	61.58
Received as compensation for demolition	6.07	0.66	1.86
Owned (other sources)	3.08	0.96	1.43
Don't own current house	15.73	11.95	12.78
Missing	4.03	5.20	4.94
Total	100	100	100
N	2,308	8,061	10,372

Table 11a. Housing Windfalls (Consistent Sample)

Housing value components	Unit	All	% of current market value	Purchased from working unit	% of current market value
Current market value	1000 yuan	291		391	
Total windfall	1000 yuan	209	71.66	335	85.61
Total windfall if >0	1000 yuan	305		365	
Total windfall >0	%	70.17		93.02	
Market windfall	1000 yuan	136	46.71	176	45.03
Market windfall if >0	1000 yuan	281		330	
Market windfall >0	%	60.42		74.16	
Subsidy	1000 yuan	74	25.35	159	40.58
Subsidy if >0	1000 yuan	177		184	
Subsidy >0	%	42.17		86.05	
N		1200		387	

Table 11b. Housing Windfalls (Full Sample)

Housing value components	Unit	All	% of current market value	N	Purchased from working unit	% of current market value	N
Current market value	1000 yuan	410		1639	358		582
Total windfall	1000 yuan	212	51.68	1359	317	88.46	504
Total windfall if >0	1000 yuan	307		962	355		460
Total windfall>0	%	70.79		1359	91.27		504
Market windfall	1000 yuan	132	32.10	1301	170	47.46	405
Market windfall if >0	1000 yuan	281		775	325		299
Market windfall>0	%	59.57		1301	73.83		405
Subsidy	1000 yuan	73	17.73	1223	159	44.31	390
Subsidy if >0	1000 yuan	177		509	184		336
Subsidy>0	%	41.62		1223	86.15		390

Table 12a. Determinants of Income Per Capita (ln)

	Total		Urban		Rural	
Married	0.138***	0.104***	0	0	0.178***	0.122***
> age 60	-0.194***	-0.202***	0	0	-0.314***	-0.288***
Low educ.	0.282***	0.214***	0.264***	0.247***	0.278***	0.198***
Med. educ.	0.618***	0.485***	0.706***	0.539***	0.557***	0.466***
High educ.	1.215***	0.845***	1.246***	0.841***	1.562***	1.460***
Rural	-1.010***					
Constant	8.917***	9.199***	8.868***	9.054***	7.940***	6.633***
Community fixed effects	N	Y	N	Y	N	Y
Obs.	15547	15547	3767	3767	11780	11780
R-squared	0.209	0	0	0	0.052	0.282

Table 12b. Determinants of Expenditure Per Capita (ln)

	Total		Urban		Rural	
Married	-0.0124	-0.0276*	0	0	-0.0306	-0.0284
> age 60	-0.154***	-0.137***	0	0	-0.234***	-0.199***
Low educ.	0.148***	0.126***	0.140***	0.122***	0.152***	0.123***
Med. educ.	0.344***	0.310***	0.450***	0.334***	0.279***	0.300***
High educ.	0.893***	0.581***	0.970***	0.602***	0.717***	0.648***
Rural	-0.578***					
Constant	8.893***	8.546***	8.756***	8.932***	8.380***	8.550***
Community fixed effects	N	Y	N	Y	N	Y
Obs.	16954	16954	4094	4094	12860	12860
R-squared	0.204	0	0	0	0.048	0.232

Table 12c. Determinants of Wealth Per Capita (ln)

	Total		Urban		Rural	
Married	0.118***	0.103***	0.234***	0.181***	0.0463	0.0561*
> age 60	-0.310***	-0.283***	0	0	-0.446***	-0.383***
Low educ.	0.208***	0.157***	0.323***	0.282***	0.180***	0.120***
Med. educ.	0.490***	0.321***	0.682***	0.382***	0.419***	0.328***
High educ.	1.529***	0.793***	1.715***	0.892***	1.031***	0.679***
Rural	-0.835***					
Constant	10.66***	11.50***	10.30***	11.07***	9.979***	9.156***
Community fixed effects	N	Y	N	Y	N	Y
Obs.	15417	15417	3703	3703	11714	11714
R-squared	0.162	0	0	0	0.059	0.283

Table 12d. Determinants of Net Housing Wealth Per Capita (ln)

	Total		Urban		Rural	
Married	-0.138***	-0.115***	-0.146**	-0.135***	-0.145***	-0.114***
> age 60	-0.229***	-0.218***	0	0	-0.327***	-0.307***
Low educ.	0.206***	0.110***	0.269***	0.120**	0.188***	0.0963***
Med. educ.	0.405***	0.219***	0.504***	0.173***	0.368***	0.249***
High educ.	1.155***	0.510***	1.253***	0.506***	0.963***	0.537***
Rural	-1.445***					
Constant	11.06***	11.79***	10.90***	11.68***	9.677***	9.791***
Community fixed effects	N	Y	N	Y	N	Y
Obs.	15077	15077	3438	3438	11639	11639
R-squared	0.257	1	0	0	0.028	0.391

Table 12e. Determinants of Non-housing Wealth Per Capita (ln)

	Total		Urban		Rural	
Married	0.309***	0.258***	0.233***	0.253***	0.341***	0.257***
> age 60	-0.399***	-0.356***	-0.247***	-0.316***	-0.473***	-0.372***
Low educ.	0.167***	0.191***	0.199*	0.356***	0.164***	0.154***
Med. educ.	0.557***	0.474***	0.778***	0.666***	0.442***	0.414***
High educ.	1.786***	1.180***	2.000***	1.375***	1.034***	0.912***
Rural	-0.0123					
Constant	8.364***	5.920***	8.221***	5.714***	8.390***	8.017***
Community fixed effects	N	Y	N	Y	N	Y
Obs.	13715	13715	3298	3298	10417	10417
R-squared	0.09	0	0	0	0.069	0.335

Table 13. Education Gradient (Base Group: The Illiterate)

	Total		Urban		Rural	
	Income					
Low education	1.33	1.24	1.30	1.28	1.32	1.22
Middle education	1.86	1.62	2.03	1.71	1.75	1.59
High education	3.37	2.33	3.48	2.32	4.77	4.31
	Expenditure					
Low education	1.16	1.13	1.15	1.13	1.16	1.13
Middle education	1.41	1.36	1.57	1.40	1.32	1.35
High education	2.44	1.79	2.64	1.83	2.05	1.91
	Wealth					
Low education	1.23	1.17	1.38	1.33	1.20	1.13
Middle education	1.63	1.38	1.98	1.47	1.52	1.39
High education	4.61	2.21	5.56	2.44	2.80	1.97
	Housing wealth					
Low education	1.23	1.12	1.31	1.13	1.21	1.10
Middle education	1.50	1.24	1.66	1.19	1.44	1.28
High education	3.17	1.67	3.50	1.66	2.62	1.71
Community	N	Y	N	Y	N	Y

FIGURE 1A THE EXPENDITURE P90/10 ACROSS COHORTS

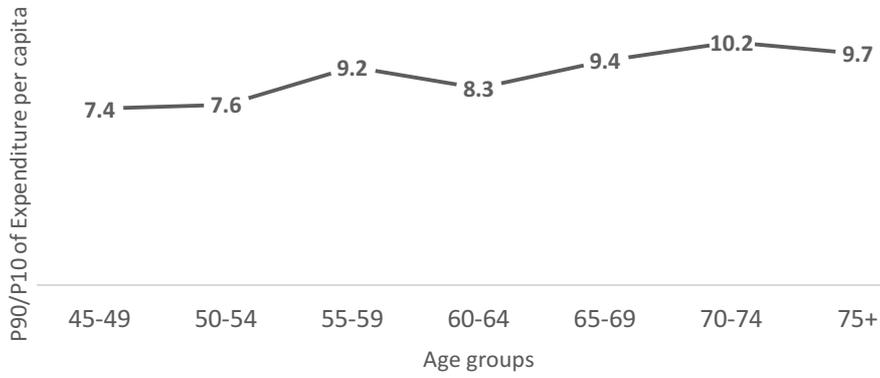


FIGURE 1B THE INCOME P90/10 ACROSS COHORTS

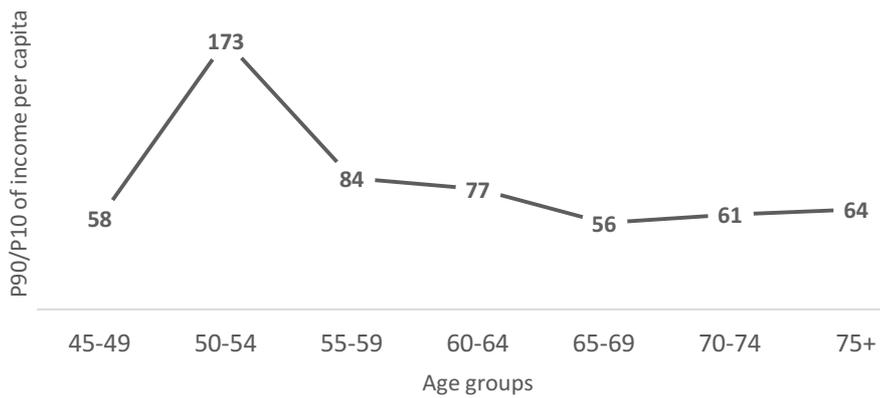


FIGURE 1C WEALTH P90/10 ACROSS COHORTS

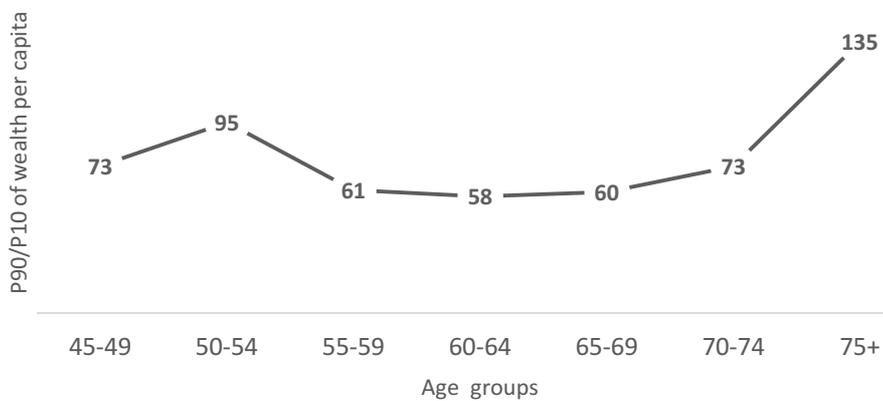


Figure 2 Net wealth and expenditure in quintiles: the ratios

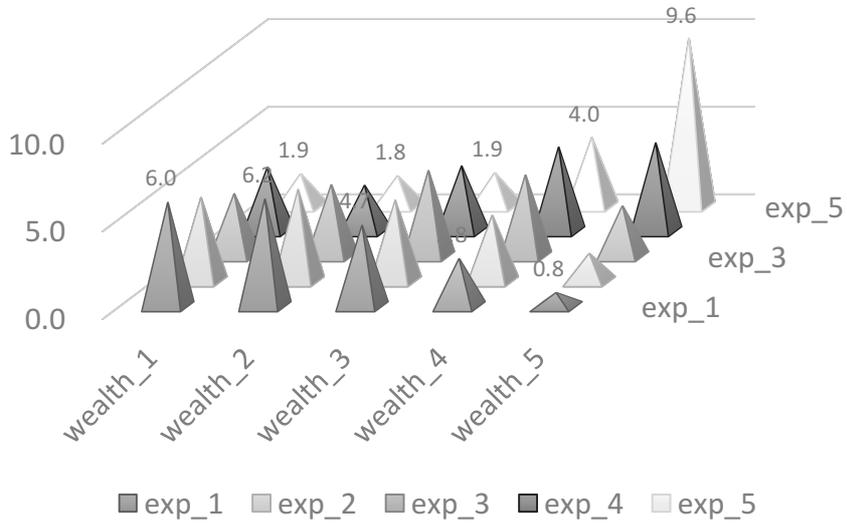


Figure 3 Share of total wealth/income/expenditure (%)

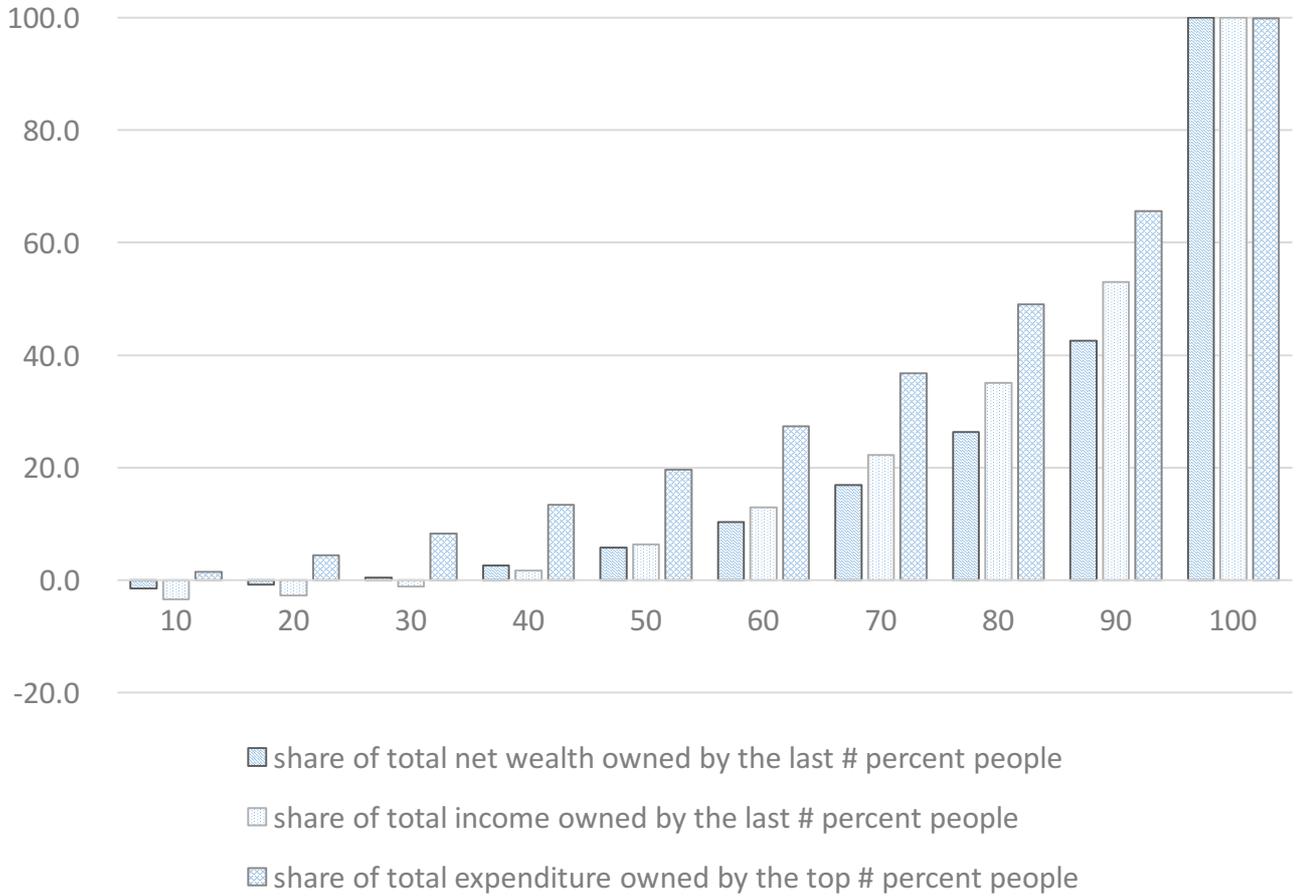


Figure 4: Timing of House Purchase and Compensation



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