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The Increasing Inequality of Wealth in China, 2002–2013*

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Abstract

The inequality of wealth in China has increased rapidly in recent years. Prior to 1978 all Chinese households possessed negligible wealth. China therefore presents a fascinating case study of how inequality of household wealth increases as economic reforms take place, marketization occurs, and capital accumulates. Wealth inequality and its growth are measured and decomposed using data from two national sample surveys of the China Household Income Project (CHIP) relating to 2002 and 2013. Techniques are devised and applied to measure the sensitivity of wealth inequality to plausible assumptions about the under-representation of and the under-reporting by the wealthy. An attempt is made to explain the rising wealth inequality in terms of the relationships between income and wealth, house price inflation, differential savings, and income from wealth.

Keywords: China, wealth inequality and its decomposition, top-tail income corrections, relationships between income and wealth, house price inflation, differential savings, income from wealth

JEL Classification: C80, D31, P20

I.   Introduction

Which country in the world has the most dollar billionaires?   If you are willing to believe the *Hurun Rich List 2016* and its sources, the answer is China, with 570 (470 in the mainland), now surpassing the United States by 30 billionaires. Which city in the world has the most dollar billionaires? The answer is Beijing, with 100, now exceeding even New York. Is this a matter for national pride or for policy concern?

Our main argument is that the inequality of wealth in China has increased rapidly in recent years. Prior to the economic reforms that began in 1978, all Chinese households possessed negligible wealth. China therefore presents a fascinating case study of how inequality of wealth increases rapidly as economic reforms take place, marketization occurs, and capital accumulates. Wealth inequality and its growth deserve examination using data from two twenty-first century China Household Income Project (CHIP) surveys.

We proceed as follows. Section 2 of this chapter sets out the relevant literature on wealth inequality. Section 3 outlines the possible reasons why inequality is hypothesized to have increased. Section 4 explains the two, comparable, data sets that will be used to test the hypotheses. Owing to the economic differences between urban and rural China and the

differences in survey design and implementation, throughout we distinguish urban and rural wealth as well as the reporting of national wealth. The national wealth estimates require a weighting of the urban and rural samples.

In Section 5 we examine the level and structure of wealth in our two survey years, 2002 and 2013, and its growth during that period. Section 6 measures the distribution of wealth in the two years, by decile and by other indicators of inequality. This leads to a decomposition of wealth inequality in the two years in Section 7. Section 8 contrasts the urban and rural sectors, distinguishing between- and within-sector wealth inequality.

Section 9 attempts to explain the results, by examining the processes by which wealth inequality increased during the eleven years. Several hypotheses are tested. Section 10 provides two estimates of wealth inequality in 2013—both without and with corrections for under-reported wealth at the top of the wealth distribution. Section 11 explores the implications of the research and presents out conclusions.

II. Literature

Little has been written on the inequality of wealth in China, mainly because of the lack of data. During the pre-reform period China had virtually no private property or personal wealth.

However, the economic reforms—relating to land use, housing, finance, entrepreneurship, and so forth—allowed Chinese people to become property owners. The changes were rapid, making it difficult to keep up with the accurate collection of data.

McKinley (1993) and Brenner (2001) analyze the inequality of rural (net) wealth using the 1988 and 1995 CHIP surveys respectively. Rural households did not (and do not) own their land; they merely had (and have) use of land—holding it on long leases. Nor was there an active rental market during the initial stages of the reforms. The value of land to the household had to be calculated based on the output from their land. The policy of ensuring rough per capita equality of land holding within a local community made land "ownership" an equalizing force. Financial assets had a disequalizing effect on total wealth but the effect was small as financial assets accounted for only 3 percent of wealth in 1988 and 11 percent in 1995. When measured on a comparable basis, the Gini coefficient of wealth in rural China rose from 0.30 in 1988 to 0.35 in 1995.

Urban analysis became possible only after the privatization of urban housing, which began in the early 1990s and was largely completed in the late 1990s. The first urban study was based on the 1995 CHIP survey (Gustafsson, Li, and Zhong 2006). Only 42 percent of households reported a positive housing value: the urban wealth Gini reflected the housing inequality at this time of ongoing privatization. Official selling prices to urban resident households were very low

and simply based on the house area and not the quality or location.   But as market prices were established, values became more unequal. In 1995 the ratio of the market price to the official selling price averaged 7.7 to 1 (Zhao and Ding 2008, p. 128). Inequality of housing values was created because housing had been allocated according to official rank and political power. The windfall gains meant that housing was owned unequally.

Li and Zhao (2007) and Zhao and Ding (2008) examine rural, urban, and national wealth inequality by drawing on the 2002 CHIP survey, and Sato, Sicular, and Yue (2013) uses the 2007 CHIP survey to examine housing inequality. Xie and Jin (2015) estimate China's inequality of household wealth per capita by means of the China Family Panel Study (CFPS) survey of 2012. However, China's degree of wealth inequality and its evolution deserve additional research attention as this inequality has become more pronounced, more obvious, and more politically important.

Our analysis in much of this chapter, based on household micro data, is relatively descriptive. Thomas Piketty recently published an important book entitled *Capital in the Twenty-First Century* (2014). In it he analyzes why inequality of wealth has risen in Western countries since about 1980 and—as he predicts— it will continue to rise. Central to Piketty's argument is the fact that wealth increases more rapidly than income and that it increases more rapidly for those who are wealthier.   His data sources, such as statistics on estates and income

tax, differ from our sources. Nevertheless, in Section 9 by means of the household surveys we shall attempt to examine whether his ideas have relevance to China.

III. China's Rising Inequality of Wealth and its Possible Causes

Table 4.1 reports the basic facts about national wealth inequality as measured by the Gini coefficient. Wealth inequality is shown both on a household basis (the first three columns) and on a household per capita basis (the last three columns). The Gini coefficient of household wealth per capita is generally 3 or 5 percentage points higher than the household wealth per household. Consider the per capita results. The Gini coefficient expressed in nominal terms rose from 0.51 to 0.62 over the period.[1] Expressing 2002 wealth in 2013 consumer prices makes slight difference: the 2002 Gini falls by only about one percentage point. However, when wealth is corrected for province, urban, and rural consumer price differences (based on Brandt and Holz [2006] and adjusted to our two years), the 2002 Gini becomes 0.45 and the 2013 Gini becomes 0.57. Wealth inequality did indeed increase sharply, by some 11 or 12 Gini percentage points, over these eleven years, i.e. by about one percentage point a year.

[Table 4.1 about here]

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[1] The Gini of 0.62 in 2013 contrasts with a Gini of 0.76 in 2010 obtained by Li and Wan (2015) using the CFPS Survey 2010. This high figure is sensitive to the inclusion of some 300 implausibly or suspiciously large housing values. If they are excluded, the Gini falls by some ten percentage points.

To put China's inequality of wealth in international perspective we draw on Davies et al. (2008). The authors' report estimates for the Gini coefficient of household wealth in major economies, centering around the year 2000. The degree of wealth inequality is generally higher than that of income inequality. China's unadjusted Gini of 0.62 in 2013 is exceeded by no fewer than twenty of the twenty-six countries. The average value of the Gini for all the countries is 0.68. China's degree of wealth inequality is moderated by its remarkably high rate of home ownership in both urban and rural areas, as compared to most other countries, and by its relatively high— almost universal—rates of land "ownership" in the rural areas. The inequality of wealth in China is not exceptional. What might be exceptional, however, is its rate of increase.

A combination of several factors might be responsible for this rising inequality of wealth. China has experienced very rapid physical capital accumulation: since 2000 the proportion of GDP that is invested has generally exceeded 40 percent. Wealth has therefore risen rapidly: the question is whether the increase in wealth has accrued unequally among households.

Inequality of household income per capita has grown rapidly, with the Gini coefficient rising from 0.42 in 2002 to 0.49 in 2007. It fell to 0.43 in 2013 but this was mainly because the ratio of urban to rural incomes narrowed: within both urban and rural China inequality rose (see Chapter 2). If wealth is positively related to income, the rise in income inequality over the 2002–2013 period might have contributed to the rise in wealth inequality.

A relative rise in the price of wealth goods—property, and especially housing—enriched those who held wealth and enriched most those who held the most wealth. China has experienced a great surge in housing prices, and this is likely to have increased the inequality of housing wealth. Financial markets in China remain imperfect, thus providing opportunities to acquire wealth for those with preferential access to funds or with the ability to save a high proportion of their income. If the savings rate is positively related to income, this provides a channel that is likely to disequalize wealth holding.

The share of profits in national income was high throughout the period, at 37 percent in 2007 (Knight and Ding 2012, p. 164). Some profits accrued to the state, some profits accrued to shareholders, and some profits were saved. Some of these savings raised the value of personal holdings of company shares. If shareholding were unequally distributed among households, paid-out profits and capital gains would probably have contributed to the rising inequality of household wealth in China. If there is a higher savings rate out of income from wealth than out of other income, that too could have increased wealth inequality.

Such hypotheses to explain the observed rise in inequality of wealth are examined in Section 9.

IV. The Data

We decided to compare wealth inequality using the 2002 CHIP and the 2013 CHIP national surveys. We opted for 2002 rather than 2007 because the 2002 CHIP survey is the first comprehensive data source on wealth and because it is more interesting to take a longer-term view of trends in wealth.   However, the 2002 and 2013 data had to be as comparable as possible. Fortunately, the variables relating to wealth are very similar in the two surveys. Thus, the estimates of wealth distribution can be compared given the appropriate weightings. The weightings used were almost the same as those applied in the CHIP 2002 and the CHIP 2013 surveys to achieve national representativeness.[2]

Nevertheless, various issues still had to be resolved. Some issues were simple to deal with. For instance, because the National Bureau of Statistics (NBS) changed its definition of "migrants" in 2012, we reclassified the affected 2013 migrants to be comparable with the 2002 migrants. All provinces in each survey are covered, with one exception. Because the 2013 Xinjiang sample lacks information on wealth, both Xinjiang samples are excluded. Thus, twenty-one provinces are included in 2002 and fourteen provinces are included in 2013.

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[2] The CHIP samples were stratified by two criteria: urban/rural and Eastern/Central/Western. A set of sampling weights was created based on the population numbers in each stratum in 2002 and in 2013. Our samples are representative of the urban and rural areas of the provinces, and representative within each province.

Other issues were more difficult to resolve. Valuing wealth—and especially housing and land wealth—inevitably encounters problems. Net housing is the housing value minus housing loans. This is based on the respondents' reported values (of both owner-occupied homes and other homes) in each year, despite the weakness of the housing market in rural China.

No information was gathered in the surveys on the asset value of rural land: households merely have user rights to their land. It is possible to base the valuation of rural land (defined as cultivated land, pastures, and forests) on the reported net agricultural income. As is explained in the Appendix describing the components of wealth, the formula for the conversion from net agricultural income to the value of rural land is based on previous research findings. Land assets in urban areas are defined as zero.

The missing values had to be interpolated. For instance, when a housing value is missing, the imputation of the housing value is based on the price per square meter at the local (county, city, municipality, or district) level. Local averaging is also used for the missing financial assets. Where the value of net income from agricultural operations is missing, we use the county-level value. Where the consumer durables are listed but not valued, they are valued by using the local consumer durable prices, derived from the households that reported both the values and the quantities.

Comparative real wealth is obtained by reflating the 2002 nominal wealth by the NBS consumer price indexes to express the 2002 values in 2013 prices. We use the province-level consumer price indexes, distinguishing also between the urban and the rural indexes. Throughout this chapter our discussion of wealth is real wealth, i.e., measured at 2013 constant CPI-adjusted prices. The concept of most interest is not the total household wealth but the household wealth per capita. Thus, when we refer to the term "wealth," we are referring to real household wealth per capita.

It will become evident below that the growth of housing wealth has made a considerable contribution to the growth of inequality of household wealth. It is therefore important to examine the role of inflation of housing prices in this process. The task is complicated by the fact that our two data sets do not constitute a panel.

Two approaches were tried. One was to use data published by the Ministry of Housing and Construction, which show the value of sales of commercial buildings, and the corresponding sold floor space, at the district and county levels. From this information, it was possible to construct a housing inflation index. The other approach was to calculate housing prices from the CHIP surveys for each of the urban and rural areas within each included province. Districts within cities were used in the case of the metropolitan areas. Reflecting the data available, each subsample was divided into ranked subgroups based on the average house value per square meter,

and these subgroups in 2002 and 2013 were compared. If an area was not included in both years another location with very similar housing prices was substituted. The resultant house price inflation index was then applied to all households in each area. The robustness tests were passed. The results obtained by the two approaches were similar. Our estimates of inflation of housing prices are based on the second approach.

Because wealth in 2002 and 2013 is calculated in real terms using 2013 constant prices, and 2002 housing prices are already reflected in the consumer price index, it would be incorrect to make this adjustment twice. Therefore, our interest is in the relative inflation of housing prices, measured by the inflation of housing prices divided by the inflation of consumer prices.

At several points in this chapter household wealth is related to household income, both expressed in per capita terms. We follow the CHIP income definition in the 2013 survey, with the exception that imputed rents on owner-occupied housing are not included. Partly due to the NBS statistical reform in 2012, income in 2002 and income in 2013 was defined differently. We adjusted the 2002 definition of income to be consistent with the 2013 definition.

We confine our analysis to the rural and urban samples of the CHIP. Although there was a rural-urban migrant sample in both 2002 and 2013, the 2002 migrant questionnaire contained little information related to income and, especially, to wealth. Since our objective is to examine the rise in wealth inequality between the two years and to determine its causes, it is necessary to

exclude rural-urban migrants from the analysis. Insofar as the rural surveys include households containing absent migrants, their wealth is covered by the rural questionnaire.

V. The Level and Growth of Wealth, 2002 and 2013

Table 4.2 has six columns: the first three (A–C) relate to the level of wealth per capita in 2002, the next two (D and E) refer to the level of wealth in 2013, and the final column (F, derived from D and B) shows the real annual growth rate of wealth over the eleven years. National, urban, and rural wealth per capita are shown separately, and wealth is reported by type as well as total wealth.

[Table 4.2 about here]

We begin with urban wealth. Overall real net wealth per capita grew 16.8 percent per annum. The fastest growth is seen in net housing (19.4 percent), followed by consumer durables and productive fixed assets. Further insight is obtained in Table 4.3, which shows the structure of household wealth during the two years. We see that the share of urban net housing in total urban wealth rose from 62 percent in 2002 to 78 percent in 2013. This was the most striking change. The next largest share was financial assets, but this share fell from 27 percent to 14 percent.

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[Table 4.3 about here]

Total net wealth per capita in rural China grew by 14.1 percent per annum (Table 4.2). This growth rate was fastest for net housing (17.9 percent), followed by financial assets (16.6 percent). Again, net housing was the predominant form of wealth holding, rising from 41 percent to 59 percent of the total (Table 4.3). The share of land wealth fell drastically, from 29 percent to 10 percent of the total.

Similar patterns are to be found at the national level. Overall net wealth per capita increased by 16.7 percent per annum, and net housing increased fastest (20.1 percent). The share of net housing rose from 53 percent to 73 percent of the total. Clearly, housing plays a significant role in China's accumulation of wealth. It will be important to explore whether it also plays a leading role in the rising inequality of wealth.

VI.   The Distribution of Wealth, 2002 and 2013

The distribution of household wealth by wealth per capita decile is reported in Table 4.4. Consider first the urban decile shares. Remarkably, the poorest wealth decile of households held 0.44 percent of the total wealth in 2002 and 0.58 percent in 2013. By contrast, the richest decile owned 32 percent in 2002 and 42 percent in 2013, a rise of 10 percentage points.   In fact, only

the top decile experienced a substantial increase in its share over the period. A similar pattern is found in rural China. The top decile increased its share from 29 percent to 43 percent, and the shares of the lowest eight deciles fell. At the national level, the share of the richest decile rose from 37 percent to 48 percent and gain the share of the lowest nine deciles fell.

[Table 4.4 about here]

The final column of Table 4.4 reports the national wealth per capita by decile. The ratio of the highest to the lowest decile was 32 times in 2002 and no less than 91 times in 2013. The ratio of the tenth to the ninth decile rose from 2.0 to 2.9.

Figures 4.1, 4.2, and 4.3 show the Lorenz curves for wealth per capita of urban, rural, and national households. In each case, the 2013 curve is more bowed than the 2002 curve throughout its range, indicating a rise in inequality throughout the wealth distribution.

[Figure 4.1 about here]

[Figure 4.2 about here]

[Figure 4.3 about here]

Table 4.5 reduces the Lorenz curve to a single figure, that is, the Gini coefficient. In urban China, the Gini coefficient increased by 9 percentage points, from 0.47 to 0.56 over the eleven years. In rural China, the increase was even greater, by 17 percentage points, from 0.38 to 0.55. Rural wealth inequality was almost the same as urban wealth inequality in 2013, whereas the

rural Gini was lower (by 9 percentage points) in 2002. The national Gini (rising from 0.49 to 0.62) exceeded both the urban and rural Ginis because of the difference between the average urban and the average rural household wealth per capita extends the wealth range.

[Table 4.5 about here]

[Table 4.6 about here]

Table 4.6 illustrates the degree of sensitivity of the Gini coefficient to the upper and lower tails of the wealth distribution. It highlights the importance of the share of the top wealth decile, both in terms of its level and in terms of its rise. In 2002 the Gini coefficient of wealth inequality fell by 11 percentage points if the top decile is excluded from the sample, and in 2013 by no less than 15 percentage points, from 0.62 down to 0.47.

Relating the share of wealth to income deciles instead of wealth deciles, Table 4.7 reports the share held by each household income per capita decile. With only a trivial exception, there is a monotonic rise in this share with income per capita. For instance, at the national level, in 2002 the share of the lowest income per capita decile was 2.9 percent and that of the highest decile 26.6 percent, and in 2013 the share varied from 2.9 percent to 36.1 percent. The ninth decile and especially the tenth decile increased their share of total wealth in all three cases. Figure 4.4 shows clearly how inequality of wealth among income groups increased in the urban, rural and national samples.

[Table 4.7 about here]

[Figure 4.4 about here]

VII.   Decomposition of Wealth Inequality, 2002 and 2013

Table 4.8 (2002) and Table 4.9 (2013) employ the standard method for the decomposition of inequality among the different components, in this case forms of wealth holding. In each table, the first column shows the share of each item in total wealth, the second column shows the Gini coefficient for that item, and the third column shows the concentration rate, reflecting the correlation between the income of that item and the total income. The final column is derived from the product of these three variables, yielding the result of most interest: the contribution of each item to overall wealth inequality.

[Table 4.8 about here]

[Table 4.9 about here]

We examine first the urban results. Net housing makes by far the greatest contribution to wealth inequality in 2002 (66 percent). It is followed by financial assets (24 percent). Productive fixed assets are very unequally held but their contribution to total wealth inequality is small (3 percent) owing to their small share of the total. The contribution of net housing was as high as 83

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percent in 2013, increasing because all three components—its share of wealth, its concentration rate, and its Gini coefficient—rose. The contribution of financial assets fell over the period (to 11 percent) because its share of total wealth fell. Other wealth assets contributed only 6 percent to the total inequality of wealth. The extreme importance of housing in explaining the inequality of urban wealth is clear.

Housing made the largest contribution also to the rural wealth inequality. Its contribution increased from 48 percent in 2002 to 65 percent in 2013. By contrast, the contribution of land fell from 17 percent to 5 percent, essentially because the share of land in the total rural wealth fell. The contributions of other wealth assets were both minor and stable.

The urban and rural results are reflected in the national pattern. The contribution of net housing rose, at 64 percent in 2002 and 78 percent in 2013. The only other form of wealth holding of importance was financial assets, and its contribution fell from 25 percent to 13 percent, reflecting the rising contribution of net housing.

VIII. Wealth Inequality Within and Between the Urban and Rural Sectors

Table 4.10 uses the Theil index of inequality because, unlike the Gini, it can decompose inequality precisely into between-group and within-group inequality. The groups in this case are

urban and rural China. In 2002 within-group inequality of household wealth per capita accounted for 78 percent of national wealth inequality, and between-group inequality accounted for the remaining 22 percent. In 2013 the contributions were 75 percent and 25 percent respectively. The proportions of the total contributed by within-urban wealth inequality and within-rural wealth inequality fell a little, whereas the contribution by the difference between urban and rural wealth rose correspondingly. The key point, however, is that the Theil index, and both of its components, rose substantially between 2002 and 2013.

[Table 4.10 about here]

In both years the national Gini coefficient exceeded both the urban and the rural Gini coefficient because the difference between urban and rural household wealth per capita extended the wealth range. Recall that in 2002 the national, urban, and rural Gini coefficients for household wealth per capita were 0.49. 0.47, and 0.38 respectively, and in 2013 the corresponding values were 0.62, 0.56, and 0.55.

The ratio of urban to rural wealth per capita increased over the period, from 2.69 to 3.20. This widening spatial wealth disparity contributed to the rise in national wealth inequality. That is consistent with the absolute rise (from 0.10 to 0.18) and the rise in the share (from 22.5 percent to 24.9 percent) of between-group inequality in the Theil index. The findings for the wealth Gini contrast with those for the income Gini: the urban-rural disparity in income per

capita narrowed after 2007, and this was mainly responsible for the fall in China's income Gini

during the period from 2007 to 2013 (see Chapter 2).

IX.   Explaining the Results

A. The Wealth-Income Ratio

How does wealth relate to income? Do households with higher income per capita have

proportionately higher wealth per capita? If that is the case, what are the mechanisms that

produce this result? Table 4.11 shows the wealth/income ratio by income decile (both expressed

in per capita terms) in 2002 and 2013. This information is more easily absorbed by examining

Figure 4.5. Causation cannot be attributed to the relationship: causation might run from income

to wealth or from wealth to income, or in both directions. Nevertheless, the results are

informative.

[Table 4.11 about here]

[Figure 4.5 about here]

We see from the figure that in 2002 the wealth/income ratio was very similar for the urban,

rural, and national samples. The ratio was highest for the poorest income decile but beyond the

second decile the ratio was constant, declining only slightly. In China as a whole the average

ratio was 4.9. The high ratio for the poorest two income deciles might be due to the egalitarian

system of land holding and the possibility that income fluctuations raised the ratio of wealth (for instance, land and housing) relative to the income of households with temporary income poverty (for example, instances of negative net income). The analysis by income decile reveals a relationship that might otherwise be obscured.

The wealth/income ratio was generally higher in 2013, notably for the poorest and the richest households. In particular, the urban ratio increased beyond the median income level, and the same U-shape is seen in the national sample. A tendency for the wealth/income ratio to rise with income (beyond a low-income level) is observable in 2013 but not in 2002. The country's wealth/income ratio in 2013 was 7.4, having increased rapidly—by no less than 2.5—over the eleven years. China's ratio then exceeded the private wealth/income ratio in the developed economies, which generally varied between 5 and 6 (Piketty 2014, p. 50).

The same exercise is conducted for the housing wealth/income ratio in Table 4.12. Again, the patterns are best absorbed in Figure 4.6. In 2002 the ratio is highest for the poorest income decile, it is similar for all three cases, and it is constant beyond the second decile. For the 2013 sample, the middle deciles are pivotal. Beyond them, the rural ratio is constant but the urban ratio, and thus also the national ratio, tend to rise. Thus, there is a tendency for the housing wealth/income ratio to rise with income decile in the upper half of the urban and national income

distribution.[3] Over the period from 2002 to 2013 the housing wealth of households outpaced their incomes in China as a whole.

[Table 4.12 about here]

[Figure 4.6 about here]

[Table 4.13 about here]

Table 4.13 reports the growth of real wealth per capita by income per capita decile, as does Figure 4.7. In the rural sample, the lowest decile shows the highest growth rate, but in the urban and national samples it is the highest decile that grows the fastest. In the national and urban samples, the growth rate rises after the third or fourth decile, and in the rural sample the growth rate rises after the sixth decile. There is a tendency for China's income-rich to become relatively wealth-richer.

[Figure 4.7 about here]

B. The Role of House Price Inflation

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[3] The curious fall in the ratio in the 2013 rural sample is likely to have an institutional explanation, e.g., the difficulty of owning more than one house in the village or the difficulty of reporting a market-based rather than a cost-based value.

Table 4.14 divides the increase in housing wealth into that part which is due to relative house price inflation and that part which is due to a real increase in housing. However, our measure of relative house price inflation necessarily includes the value of house improvements per square meter: it is not a pure price effect. Thus, the real increase (the increase in housing quantity) represents an increase in the average number of square meters reported. Insofar as part of the increase in house values is due to housing improvements, these improvements represent a form of wealth holding that yields high returns to the investment.

[Table 4.14 about here]

In China as a whole, after eliminating the effect of relative house price inflation (74.3 percent of the increase), 25.7 percent is due to the increase in the volume of housing wealth. We see that the proportions in both urban and rural China are similar to the national case. Much of China's rapid growth in housing wealth can be attributed to a relative increase in house values.

The effect of relative house price inflation seems important enough to examine its effect on the growth of household wealth as a whole. Thus, Table 4.15 divides the change in household wealth over the eleven years into that part which is due to house price inflation (relative to consumer price inflation) and other factors. In urban China, 62.4 percent of the rise in household wealth is due to (relative) inflation of house prices and 37.6 percent is due to other factors. In rural China, we see that 46.5 percent of the rise resulted from relative house price inflation and

53.5 percent resulted from other factors. At the national level, 56.9 percent of the increase in household wealth reflects the relative house price index and 43.1 percent reflects other influences. We see the significant importance of relative house price inflation for the growth of household wealth in China.

Figure 4.8 shows the housing price (per square meter) in 2002 on the horizontal axis, with regions (county, city, or district of municipality) of the country, ordered from the lowest priced region in 2002 on the left to the highest priced on the right; the prices (in 10,000 yuan) range from 0 to 0.6. The regions to the far right are the four municipalities of Beijing, Shanghai, Tianjin, and Chongqing. The vertical axis (also measured in 10,000 yuan, but ranging from 0 to 4.0) shows the housing price of each region in 2013. The best fit to the points is curvilinear, curving upwards. Areas with initially higher house prices benefited from proportionately faster house price inflation.

[Table 4.15 about here]

[Table 4.16 about here]

[Figure 4.8 about here]

Table 4.16 shows the impact of house price inflation on the Gini coefficient. Columns A and B report the Gini as previously estimated. Column C reports the Gini for 2013 if wealth is deflated by the relative rise in house prices between 2002 and 2013. Column D shows the rise in

the undeflated Gini over the eleven years (B-C). Columns E and F measure the contributions to the rise in the Gini that are due to the rise in house prices (B-C) and to other factors (C-A). Relative house price inflation accounted for 55 percent of the rise in urban China, 17 percent in rural China, and 45 percent at the national level. Again, the excess of house price inflation over consumer price inflation is very important to our story.

An underlying question that deserves further research is the following: Why has house price inflation been so rapid? One possible explanation is the rapid increase in demand for housing and housing land in relation to its supply. Another possibility is that the housing market has grown stronger over time. Part of the house price inflation during this period might have represented some market undervaluation in 2002 and subsequent movement toward equilibrium market values.

C. Differential Savings

Another channel by which wealth inequality can increase is through differential savings: the rich might save a higher proportion of their income than the poor. Savings is defined as disposable income per capita minus consumption per capita, with imputed rent excluded from both income and consumption. Expenditures on consumer durables are not part of measured consumption; instead they are treated as an addition to wealth.

[Table 4.17 about here]

[Table 4.18 about here]

Table 4.17 and Figure 4.9 show the savings rate (i.e., saving as a percentage of income) by income per capita decile, and Table 4.18 and Figure 4.10 do the same for wealth per capita. Table 4.17 displays a monotonic rise in the savings rate in all six columns as we move up the income deciles. At the national level, in 2002 the savings rate rose from −15.8 percent in the lowest decile to 31.7 percent in the highest decile, and in 2013 it rose from −51.8 percent to 57.2 percent. Some negative savings is to be expected in the lowest decile if there is transient poverty.

Similarly, there is a general upward trend in the savings rate as we move up the wealth per capita deciles. For instance, at the national level in 2002 the savings rate rises from 0.7 percent in the lowest wealth decile to 20.8 percent in the highest wealth decile; the corresponding figures in 2013 are 17.3 percent and 48.7 percent respectively. In both years the difference in the savings rate between the lowest and the highest wealth deciles exceeds 20 percentage points.

In general, even though wealthy households might on average be closer to their target wealth levels, the wealthier tend to accumulate more quickly. Thus, households with higher income and those with higher wealth save a higher proportion of their income. These disparities in savings rates contribute to the rising inequality of wealth among households.

[Figure 4.9 about here]

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D. The Ratio of Wealth Income to Non-Wealth Income

Piketty (2014) examines the ratio of wealth to income (β) over time: β = K/Y. Income from wealth (Y_k) is a proportion (α) of national income: α = Y_k/Y. This can be expressed as α = rβ where r is the rate of return on wealth. The proportion α increases, by definition, if the return on wealth exceeds the growth rate of income (i.e., if r > g). Piketty argues that as α, the share of Y_k, rises, the inequality of wealth increases. As wealth accumulates, the income derived from wealth also rises. If the savings rate for income from wealth is higher than that for income from non-wealth, this generates proportionately faster growth of wealth for those with more of their income derived from wealth. Thus, ceteris paribus, if the savings rate of households is greater, their ratio of wealth income to total income is higher. Piketty (2014) regards this mechanism as an important explanation for the rise in wealth inequality in the advanced economies.

Nevertheless, this effect is unlikely to be important in the Chinese case. We define income from wealth as interest, dividends, and rent received.[4] In 2002, the proportion of income from wealth was very low, at 4.6 percent for the urban sample, 3.0 percent for the rural sample, and

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[4] We exclude imputed rent because it dominates the series, especially in the lower income deciles, and imputed wealth income is unlikely to affect savings to the same extent as wealth income received.

for the two combined it was 3.6 percent; in 2013, the corresponding figures were 9.5 percent, 4.0

percent, and 6.3 percent respectively (Table 4.19). Thus, it is to be expected that in 2002 the

proportion of income from wealth would have a negligible effect on savings, and even in 2013 it

had only a small effect.

[Table 4.19 about here]

[Table 4.20 about here]

[Figure 4.11 about here]

Is the proportion of income from wealth as a percentage of total income related to income

level? Table 4.20 and Figure 4.11 report this proportion by household income per capita decile.

Beyond the first decile, the proportion increases little as we move up the deciles in 2002 but it

tends to increase more in 2013. For instance, for the 2013 national sample the share rose from

3.8 percent in the lowest three income deciles to 8.7 percent in the highest three deciles.

However, even in 2013 the effect was modest.

To further examine Piketty's argument, we estimated the OLS equations with the savings

rate as the dependent variable and the share of income from wealth as an explanatory variable. In

2013 at least, there is a higher propensity to save out of income from wealth than out of other

income. However, this significant positive coefficient on income from wealth may be a

non-causal association resulting from the positive relation between the share of income from

wealth and income on the one hand and between income and the savings rate on the other. Indeed, the addition of income per capita in the estimated equation removed the significant positive effect of the share of income from wealth.

Table 4.20 and Figure 4.11 show that China's proportion of income from wealth, although rising with income, is not sufficiently large to have a substantial effect on income inequality. However, income from wealth is defined as income from interest, profits, and rents, and it does not take account of income in the form of capital gains derived from the increase in real house prices. The rate of house price inflation relative to consumer price inflation averaged 14.9 percent per annum. Recall that housing wealth constitutes the major part of total household wealth, being 53 percent of wealth in 2002 and 73 percent in 2013 (Table 4.3).

The NBS data indicate the average household real income per capita increased by 10 percent per annum between 2002 and 2013. It is therefore plausible that when real house price inflation is included, the annual return on wealth exceeded the growth of income (r > g). Moreover, it may be the case that the capital gains from housing wealth increase with income per capita. This is apparent from Table 4.21 and Figure 4.12, which show, by income per capita decile, the percentage increase in real house price inflation (derived for each household by the method explained above) over the eleven-year period in urban areas, rural areas, and China as a whole. In the urban sample, the relationship is U-shaped but the percentage increase rises with

income beyond the fourth income decile. Owing to changing weights, the rise is more pronounced at the national level. For instance, this rise is from 134 percent in income per capita decile 1 to 202 percent in income per capita decile 10.

[Table 4.21 about here]

[Figure 4.12 about here]

If we accept Hicks's (1946, p. 178) concept of income, real capital gains during a period are included as income. Thus, a rise in real housing wealth is a part of income. We have shown that as conventionally measured this rise increases proportionately with income. Once the role of real house price inflation is considered, it is possible that $r > g$. If that is the case, then Piketty's mechanism would be relevant in China.

X.   Corrections for Under-representation and Under-reporting in 2013

China has enough dollar billionaires to influence measures of income and wealth distribution if they are included in the national household surveys on which the estimates of inequality are based. However, it is most unlikely that they are included and, if any are indeed included, their wealth would be accurately recorded. It is worth exploring scientific ways of correcting for survey inaccuracies near the top of the income distribution.

Atkinson, Piketty, and Saez (2011), using income tax data for the major economies, attempt to measure the income share of the top 5, or 1, or 0.1 percent. They identify these precise top shares by imputing them using the Pareto distribution. They use the actual distribution below 5 (or 1, or 0.1) percent but apply the Pareto distribution for the top incomes. Their justification is that "a number of top income studies conclude that the Pareto approximation works remarkably well."

The Pareto law for top incomes is given by the cumulative density function F(y):

$$1 - F(y) = (k/y)^\alpha \quad (k > 0, \, \alpha > 0)$$

where α is the Pareto parameter. The corresponding density function f(y) is:

$$F(y) = \alpha k^\alpha / y^{(1+\alpha)}$$

The key property of the Pareto distributions is that the ratio of average income y*(y) of individuals with income above y, to y, does not depend on the income threshold y.

$$y^* = \alpha y / (\alpha - 1)$$

i.e.,
$$y^*(y)/y = \beta = \alpha/(\alpha-1)$$

Thus, if we know β, we can calculate α. A higher value of β implies a fatter upper tail.

Atkinson, Piketty, and Saez (2011) assume that records are accurate (i.e., there is no non-responses and no under-reporting), but our concern is to conduct simulations that assume under-representation and under-reporting.

Consider first correcting for under-representation. Given that the top households tend to avoid a survey of this sort, reweighting can be used to correct for this non-response bias. Assume that the non-response rate among the top wealth households is 50 percent. We can then expand the top 5 percent of households to become the top 7.5/102.5 = 7.32 percent, and then get a new frequency distribution of household wealth. This involves randomly repeating every second high-wealth household. It is then possible to calculate the Gini with the assumed non-response uncorrected and corrected, and to measure the sensitivity of the Gini to this assumption.

Table 4.22 reports the results of this exercise. The rows indicate the top percentile to be expanded. The first row shows no expansion, then expansion of the top 0.5 percent, 1.0 percent, and 5.0 percent of the wealth distribution. The columns show the mean values of the simulated sample and its Gini coefficient if the top sub-sample is first doubled and then tripled. Consider the effect of doubling the number of wealthy households. The Gini coefficient of the actual sample is 0.62. It rises to 0.65 when the top 5 percent of households is doubled in number. If a tripling is assumed instead, the Gini rises to 0.67 in the case of the top 1 percent of households but it falls to 0.66 in the case of the top 5 percent. As a kernel density function suggests, beyond about 1 percent of the households a tripling of the top households begins to dilute inequality.

[Table 4.22 about here]

Now consider correcting for under-reporting of wealth by respondents. Semi-parametric analysis can be used: actual data below the top x percent and simulated data for the top x percent, with values taken from the corresponding Pareto function. The observed and the simulated frequencies should be the same at the changeover point. We now have the means to correct for possible under-reporting of household wealth. The actual value of β is derived from the survey. A higher value—a fatter tail— can be assumed on the assumption that there is under-reporting.

Table 4.23 shows four rows. In the first row by assumption there is no under-representation of the wealthy, i.e., no expansion of the richest sub-sample takes place. In the other three rows, it is assumed that the number of those in the top 0.5 percent, 1.0 percent, and 5.0 percent respectively of the sample are tripled. The value of β in the actual sample is 1.51. Column 1 shows the results if the value of β takes almost its actual value (assumed β=1.5); column 2 assumes a fatter tail (β=2.0) owing to the assumed under-reporting of wealth; and column 3 shows a still fatter tail.

[Table 4.23 about here]

As might be expected, simply replacing the actual data with simulated data has a negligible effect on the Gini coefficient. This is evident in the Gini value (0. 613) of the (first row, first column) cell in the table. Looking across the first row, the Gini coefficient increases from 0.62 (actual distribution) to 0.64 when β=2.0 and to 0.66 when β=0.25. This row shows the

degree of sensitivity of the Gini to possible under-reporting. When the assumption of under-reporting is combined with the assumption of under-representation, the effect is magnified. Consider a tripling of the top 1 percent of wealthy households (row 3). The Gini rises from 0.67 with the actual value of β to 0.69 with β=2.0 and to 0.71 with β=2.5. On that last assumption, the Gini coefficient is 9 percentage points above its reported value. Expanding the top 5 percent is again found to dilute inequality.

The table cannot produce the "true, corrected" Gini coefficient of wealth. However, it does show considerable sensitivity of the Gini to plausible assumptions of the degree of under-representation of wealthy households and under-reporting by wealthy households.

A different method of correcting for underrepresentation at the top of China's wealth distribution is employed by Xie and Jin (2015). They use the *Hurun Rich List 2012*, which reported the wealth of the one thousand richest households in China. The Pareto distribution was then applied to estimate the wealth of the top 0.1 percent and, with the appropriate weights, this was combined with the wealth data from the CFPS national survey of 2012 for the remaining 99.9 percent of households (Xie and Jin 2015, p. 209). The unadjusted Gini coefficient of wealth among households was estimated to be 0.64 and the Gini adjusted for underrepresentation at the top was 0.73—a difference of 9 percentage points (Xie and Jin 2015, table 2). Their estimates correspond well to our unadjusted Gini in 2013 (0.62) and our adjusted estimate when based on

the assumptions that the top 1 percent is tripled and that $\beta = 2.5$ (0.71)—also a difference of 9 percentage points.

XI. Conclusion

Between 2002 and 2013 (real) household net wealth per capita in China increased by 17 percent per annum, and net housing wealth increased by no less than 20 percent per annum. Our comparison of China's inequality of household wealth per capita in the two years shows that this inequality rose rapidly in the twenty-first century. For instance, the share of the top wealth decile increased from 37 percent to 48 percent of the total wealth. A decomposition of the sources of wealth inequality show the immense importance of net housing in the share of wealth and in the contribution to wealth inequality, and in its rise over time: the share rose from 53 to 73 percent and the contribution rose from 64 to 79 percent.

This chapter may be one of the first attempts not only to describe China's rapidly rising inequality of wealth but also to explain the phenomenon. Setting aside the poorest income groups, we found a tendency for the wealth/income ratio to rise with income in 2013, and for the wealth/income ratio to rise sharply over the eleven-year period under examination. The rise in relative house values played a key role in widening the distribution of wealth. The tendency for

savings to rise with income and to rise with wealth provides a mechanism whereby wealth inequality will grow, with those having more income and more proportional wealth savings y and thus accumulating wealth more rapidly. Although Piketty (2014) emphasizes higher savings out of wealth income in his explanation of rising wealth inequality in the advanced economies, China's income from wealth as a share of the total income is still small and so its effects on savings can only be minor. However, if we regard real capital gains as part of income, Piketty's mechanism has credence in China.

Although China's inequality of income, as evidenced by the 2007 and 2013 CHIP surveys, now seems to be on the decline, we have suggested reasons to expect that the inequality of wealth will continue to rise. This rising inequality is a phenomenon of growing socioeconomic importance, and it deserves more extensive study in the future.

Possible policy implications also deserve attention. These might include reform of the banking and financial systems: reform can have the effect of reducing inequality in terms of opportunities to secure access to funds, and thus at least to reduce unfair wealth inequality. It is worth exploring the feasibility of introducing serious wealth and inheritance taxes. Corruption among the powerful is likely to have increased wealth inequality. The current anticorruption campaign, as described by Manion (2016), which was introduced in 2013, is likely to temper the rise in wealth inequality which otherwise would stem from corruption.

Appendix.   The Measurement of Wealth per Capita in CHIP 2002 and CHIP 2013

In all cases we divide each component of wealth by the number of household members to obtain household wealth per capita. For 2002 we follow very closely the definitions set out in the data appendix to Zhao and Ding (2008, pp. 140–144). The definitions used in 2013 are set out below.

A. Net Housing Value

Net housing value is calculated as the housing value minus housing loans. As a few households (3.5 percent of all households) have more than one house, we sum the net value for each household—the reported market value of both owner-occupied and any other owned housing. For those who report housing area but not housing value, we multiply by the average value per square meter in the county. Those who have no ownership rights but report housing area are recorded as having a housing value of zero.

B. Net Financial Assets

The questionnaire asks separately about the total value of financial assets and about the separate components. Where the sum of the components is not equal to the reported total value, we use the sum of the components. Financial assets include spot cash, demand deposits, time deposits,

endowment insurance, government bonds, other bonds, stocks, funds, futures, money lent (but not including business loans), and other financial assets.

C. Non-housing Debt

Comparing reported gross non-housing debt with the sum value of its components, we use the value of the debt components when the two are not equal. Missing values are treated as zero.

D. Fixed Productive Assets

We take the estimated net present value of agricultural and non-agricultural fixed productive assets as reported in the questionnaire to record the fixed productive assets.

E. Consumer Durables

We take the estimated market value of households' "movable properties" from the questionnaire as the value of consumer durables, which comprises private (non-business) cars and various other consumer durables.

F. Rural Land Value

The variable household net agricultural income, recorded in the NBS survey, is used to calculate the rural land value in 2013. However, because we lack direct information on the net household agricultural income in 2002, we follow Zhao and Ding (2008) in assuming that one acre of irrigated land equals two acres of dry land, and we calculate the net household agricultural income as the gross agricultural income minus production costs. Furthermore, following earlier research we assume that 25 percent of the net agricultural income comes from land and the return rate of land is 8 percent (McKinley 1993; Zhao and Ding 2008). Therefore, we derive the land value from the net household agricultural income times 25/8.

G. Other Assets

The questionnaire items "other precious metals and jewellery (including gold ornaments)" and "other assets" are not included in the financial assets or the fixed productive assets or the consumer durables. Accordingly, we define these items as our "other assets" variable.

H. Total Net Wealth

The total value of net wealth is the sum of the wealth components listed and defined above: net housing wealth, net financial assets, non-housing debt, fixed productive assets, consumer durables, rural land value, and other assets.

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Table 4.1. *Gini coefficient of wealth and income inequality*

	Household level			Household per capita level		
	Actual	CPI adjusted	PPP+CPI adjusted	Actual	CPI adjusted	PPP+CPI adjusted
2002 wealth	0.453	0.441	0.402	0.506	0.494	0.445
2013 wealth	0.583	0.583	0.541	0.617	0.617	0.574
2002 income	0.384	0.371	0.329	0.437	0.424	0.370
2013 income	0.417	0.417	0.388	0.433	0.433	0.400

Source: In this and all subsequent tables and figures the estimates for 2002 are derived from the 2002 CHIP survey and the estimates for 2013 are derived from the 2013 CHIP survey.

Table 4.2. *Level and growth of wealth per capita*

Category	Actual 2002 (A)	CPI adjusted 2002 （B）	PPP+CPI adjusted 2002 （C）	Actual 2013 （D）	PPP adjusted 2013 （E）	Annual real growth rate, 2002–2013 F=(D-B)
Urban						
Overall net wealth	36764	49517	36042	273841	195607	16.8
Financial assets	9921	13357	9731	38996	28697	10.2
Net housing	22639	30483	22146	214021	151423	19.4
Productive fixed assets	712	973	761	4041	3181	13.8
Consumer durables	3088	4160	3006	15071	11085	12.4
Other assets	648	878	652	2334	1708	9.3
Non-housing debt	-244	-334	-254	-622	-487	5.8
Rural						
Overall net wealth	13666	19576	20521	83489	80127	14.1
Land	3862	5590	5903	8263	8297	3.6
Financial assets	2076	2972	3122	16112	15906	16.6
Net housing	5680	8074	8406	49336	46430	17.9
Productive fixed assets	1192	1722	1812	4931	4772	10.0
Consumer durables	1072	1529	1602	5690	5550	12.7
Non-housing debt	-216	-311	-324	-843	-828	9.5
National						
Overall net wealth	21565	29815	25829	162829	128261	16.7
Land	2541	3678	3884	4819	4839	2.5
Financial assets	4759	6523	5382	25650	21238	13.3
Net housing	11480	15738	13105	117978	90192	20.1
Productive fixed assets	1027	1466	1452	4560	4109	10.9
Consumer durables	1761	2429	2083	9600	7857	13.3

Other assets	222	300	223	973	712	11.3
Non-housing debt	-225	-319	-300	-751	-686	8.1

Notes: In this and all subsequent tables and figures wealth is defined as household wealth per capita. A comparison with the NBS macroeconomic data on total household financial savings (47 trillion yuan) in 2013 suggests that the survey estimate of household per capita financial savings when multiplied by the population (3.5 trillion yuan) is an understatement.

Table 4.3. *Structure of household wealth by type of wealth asset (%)*

Category	Urban		Rural		National	
	2002	2013	2002	2013	2002	2013
Overall net wealth	100	100	100	100	100.0	100.0
Land	-	-	28.6	9.9	12.3	3.0
Financial assets	27.0	14.2	15.2	19.3	21.9	15.8
Net housing	61.6	78.2	41.2	59.1	52.8	72.5
Productive fixed assets	2.0	1.5	8.8	5.9	4.9	2.8
Consumer durables	8.4	5.5	7.8	6.8	8.1	5.9
Other assets	1.8	0.9	-	-	1.0	0.6
Non-housing debt	-0.7	-0.2	-1.6	-1.0	-1.1	-0.5

Notes: In this and all subsequent tables and figures we show only the CPI deflated wealth, i.e., both the 2002 and the 2013 wealth are reported in constant 2013 prices.

Table 4.4. *Household wealth share by wealth decile (%)*

Wealth decile from lowest to highest	Urban		Rural		National		National wealth per capita (yuan)	
	2002	2013	2002	2013	2002	2013	2002	2013
1	0.4	0.6	2.2	0.7	1.2	0.4	3742	7688
2	2.0	1.9	3.8	2.1	2.6	1.4	8223	22575
3	3.6	2.8	5.0	3.1	3.6	2.2	11584	33397
4	5.0	3.8	6.1	4.1	4.6	3.0	15003	45232
5	6.5	4.9	7.2	5.2	5.7	4.0	18858	59417
6	8.3	6.4	8.6	6.6	7.0	5.4	23577	77474
7	10.5	8.4	10.1	8.3	8.9	7.4	30210	104428
8	13.6	11.6	12.3	11.0	11.8	10.7	40365	148946
9	18.5	17.9	15.8	16.4	17.5	17.2	59001	238683
10	31.5	41.8	29.0	42.7	37.1	48.4	119630	701955

Table 4.5. *Wealth Gini coefficients, 2002 and 2013*

Sample	2002	2013	Change 2002–2013	
			Percentage points	Percentage
Urban	0.472	0.557	0.09	18.03
Rural	0.384	0.548	0.16	42.54
National	0.494	0.617	0.12	25.06

Table 4.6. *The sensitivity of wealth level and wealth inequality to the tails of the wealth distribution*

Category	Wealth level (yuan)		Wealth inequality (Gini)	
	2002	2013	2002	2013
Entire sample	29815	162829	0.494	0.617
Excluding highest 1%	27971	144433	0.470	0.581
Excluding highest 5%	23905	113573	0.419	0.518
Excluding highest 10%	20848	93429	0.380	0.473
Excluding lowest 1%	30147	164693	0.487	0.611
Excluding lowest 5%	31289	171358	0.472	0.598
Excluding lowest 10%	32733	180135	0.456	0.582

Table 4.7. *Household wealth share by income per capita decile (%)*

Income per capita decile from lowest to highest	Urban		Rural		National	
	2002	2013	2002	2013	2002	2013
1	4.2	3.0	4.2	5.2	2.9	2.9
2	5.4	3.7	5.3	4.7	4.1	2.8
3	6.0	4.8	6.4	5.3	4.9	3.3
4	7.2	5.6	7.3	5.8	6.0	4.4
5	8.7	6.6	8.0	7.3	7.1	5.2
6	9.5	8.2	9.0	7.8	8.4	6.8
7	10.5	9.9	10.3	9.8	10.5	9.0
8	12.0	12.2	11.8	11.8	13.4	12.1
9	14.7	16.6	14.8	16.4	16.3	17.5
10	21.9	29.5	23.0	25.9	26.6	36.1

Table 4.8. *Household wealth inequality and its decomposition, 2002*

	Category	Wealth structure	Gini index	Concentration rate	Contribution to overall wealth inequality
Urban	Financial assets	0.269	0.596	0.707	0.237
	Net housing	0.617	0.561	0.911	0.661
	Productive fixed assets	0.021	0.982	0.626	0.027
	Consumer durables	0.084	0.555	0.566	0.056
	Other assets	0.017	0.913	0.411	0.014
	Non-housing debt	-0.008	-0.975	0.365	0.006
Rural	Land	0.281	0.455	0.522	0.172
	Financial assets	0.155	0.641	0.755	0.193
	Net housing	0.416	0.533	0.843	0.481
	Productive fixed assets	0.087	0.675	0.594	0.089
	Consumer durables	0.078	0.466	0.642	0.060
	Non-housing debt	-0.016	-0.918	0.140	0.005
National	Land	0.101	0.691	0.004	0.001
	Financial assets	0.228	0.688	0.796	0.250
	Net housing	0.545	0.636	0.914	0.636
	Productive fixed assets	0.044	0.847	0.424	0.032
	Consumer durables	0.082	0.569	0.672	0.063
	Other assets	0.011	0.963	0.625	0.014
	Non-housing debt	-0.011	-0.951	0.254	0.005

Table 4.9. *Household wealth inequality and its decomposition, 2013*

	Category	Wealth structure	Gini index	Concentration rate	Contribution to overall wealth inequality
Urban	Financial assets	0.145	0.606	0.681	0.108
	Net housing	0.778	0.608	0.967	0.828
	Productive fixed assets	0.016	0.979	0.608	0.017
	Consumer durables	0.055	0.704	0.580	0.041
	Other assets	0.008	0.765	0.451	0.005
	Non-housing debt	-0.003	-1.482	0.201	0.001
Rural	Land	0.114	0.552	0.412	0.050
	Financial assets	0.189	0.618	0.730	0.164
	Net housing	0.580	0.635	0.907	0.646
	Productive fixed assets	0.061	0.909	0.699	0.075
	Consumer durables	0.067	0.728	0.648	0.061
	Non-housing debt	-0.011	-1.085	0.215	0.005
National	Land	0.039	0.714	-0.012	-0.001
	Financial assets	0.160	0.647	0.763	0.130
	Net housing	0.711	0.702	0.960	0.785
	Productive fixed assets	0.031	0.942	0.608	0.029
	Consumer durables	0.059	0.746	0.685	0.049
	Other assets	0.006	0.915	0.695	0.006
	Non-housing debt	-0.005	-1.212	0.203	0.002

Table 4.10. *National wealth inequality decomposition: Urban and rural*

Year	Index	National inequality	Within-group inequality	Between-group inequality
2002	Theil index	0.429	0.332	0.096
	Proportion (%)	100	77.5	22.5
2013	Theil index	0.728	0.547	0.182
	Proportion (%)	100	75.1	24.9

Table 4.11. *Wealth/income ratio by income per capita decile*

Income per capita decile from lowest to highest	Urban		Rural		National	
	2002	2013	2002	2013	2002	2013
1	6.4	9.5	7.1	11.5	6.6	11.2
2	5.1	7.3	5.7	9.0	5.6	8.1
3	4.7	7.4	5.5	7.5	5.1	6.8
4	4.7	7.1	5.3	6.6	5.0	6.9
5	4.8	7.3	5.0	6.7	4.7	6.4
6	4.5	7.7	4.8	5.9	4.5	6.4
7	4.5	8.1	4.7	6.2	4.6	6.6
8	4.4	8.4	4.4	5.8	4.5	6.7
9	4.2	9.0	4.3	5.9	4.3	7.0
10	4.2	9.6	4.0	4.5	4.1	7.9

Table 4.12. *Housing wealth/income ratio by income per capita decile*

Income per capita decile from lowest to highest	Urban		Rural		National	
	2002	2013	2002	2013	2002	2013
1	4.4	6.9	3.1	7.7	2.8	7.3
2	3.3	5.6	2.3	5.3	2.4	4.8
3	3.0	5.8	2.2	4.4	2.2	4.0
4	3.0	5.5	2.1	3.6	2.2	4.0
5	3.0	5.7	2.0	3.9	2.2	4.0
6	2.9	6.0	1.8	3.3	2.3	4.3
7	2.8	6.3	1.8	3.5	2.5	4.8
8	2.7	6.8	1.7	3.5	2.6	5.0
9	2.5	7.2	1.8	3.8	2.5	5.3
10	2.4	7.6	1.8	2.7	2.4	6.1

Table 4.13. *Wealth level and annual percentage increase by income per capita decile*

Income per capita decile from lowest to highest	Urban			Rural			National		
	2002	2013	Increase per annum 2002–2013 (%)	2002	2013	Increase per annum 2002–2013 (%)	2002	2013	Increase per annum 2002–2013 (%)
1	21064	77822	12.6	8365	40334	15.4	9195	43208	15.1
2	26940	98446	12.5	10673	36102	11.7	13176	40231	10.7
3	30411	128693	14.0	12846	40218	10.9	15781	47325	10.5
4	36222	147125	13.6	14725	43739	10.4	19487	62470	11.2
5	43703	177166	13.6	16236	53904	11.5	22985	75292	11.4
6	46781	219433	15.1	18303	57839	11.0	27328	95799	12.1
7	54147	266466	15.6	21183	74994	12.2	34705	127277	12.5
8	60823	329424	16.6	23936	86381	12.4	43783	169678	13.1
9	72324	449767	18.1	30106	118358	13.3	54507	239901	14.4
10	109256	792049	19.7	46450	173419	12.7	87791	501407	17.2

Table 4.14. *Growth of net sousing per capita: Simulation with deflated house prices*

Sample	Level of household wealth			Change in housing wealth 2002–2013	Contribution to change in housing wealth (%)	
	2002	2013	2013(housing price deflated)		Housing price	Housing quantity
	(A)	(B)	(C)	(B-A)	(B-C)/(B-A)	(C-A)/(B-A)
Urban	30483	214021	73322	183538	76.7	23.3
Rural	8074	49336	19618	41261	72.0	28.0
National	15738	117978	42002	102240	74.3	25.7

Table 4.15. *Growth of household net wealth per capita, 2002–2013: Simulation with deflated house prices*

Sample	Level of household wealth			Change in wealth	Contribution to change in wealth (%)	
	2002 (A)	2013 (B)	2013 (house price deflated) (C)	2002–2013 (B–A)	House price (B–C)/(B–A)	Other (C–A)/(B–A)
Urban	49517	273840	133786	224323	62.4	37.6
Rural	19575	83488	53747	63913	46.5	53.5
National	29815	162829	87108	133014	56.9	43.1

Table 4.16. *Impact of relative house price inflation on wealth inequality*

Sample	Gini coefficient of household wealth			Change in Gini 2002–2013 D=(B–A)	Contribution to change in Gini (%)	
	2002 (A)	2013 (B)	2013(house price deflated) (C)		House price inflation (B-C)/(B-A)	Other (C–A)/(B–A)
Urban	0.472	0.557	0.510	0.085	55.1	44.9
Rural	0.384	0.548	0.520	0.164	17.2	82.8
National	0.494	0.617	0.561	0.124	45.3	54.7

Table 4.17. *Savings rate by income per capita decile (%)*

Income decile from lowest to highest	Urban		Rural		National	
	2002	2013	2002	2013	2002	2013
1	–2.6	7.0	–29.8	–65.9	–15.8	–51.8
2	9.1	32.8	7.0	–12.2	11.5	1.1
3	13.8	38.9	12.9	6.5	18.9	17.4
4	16.1	41.3	17.9	16.1	25.8	25.5
5	19.9	42.4	21.9	22.1	26.6	31.3
6	22.7	46.6	28.9	29.3	26.0	38.2
7	23.4	48.2	33.8	31.7	24.3	43.6
8	23.9	50.2	33.0	39.9	26.1	44.8
9	27.3	53.5	34.9	46.8	27.2	49.3
10	34.2	60.1	38.8	52.6	31.7	57.2

Table 4.18. *Savings rate by wealth per capita decile (%)*

Wealth decile from lowest to highest	Urban		Rural		National	
	2002	2013	2002	2013	2002	2013
1	20.9	37.6	6.9	31.2	11.5	31.6
2	23.4	40.4	10.9	29.2	13.1	31.4
3	23.4	43.9	13.1	30.8	14.5	32.5
4	25.2	43.3	13	30.8	16.4	34.3
5	24.4	45.2	16	33.1	18.5	37.8
6	25.3	43.9	16.7	34.5	20.9	38.3
7	25.8	44.3	18.4	37.1	22.5	41.6
8	27.5	44.6	20	36.1	24.3	43.4
9	26.8	49.4	22.1	40	26	44.6
10	28.6	53	24.7	45.7	28.1	50.0

Table 4.19. *Income from wealth as share of household income*

	Urban		Rural		National	
	2002	2013	2002	2013	2002	2013
Percentage (%)	4.64	9.54	3.04	4.04	3.59	6.34

Note: We use CPI-deflated wealth and income, both household per capita. Income from wealth is here defined as interest, dividends, and actual rent.

Table 4.20. *Share of income from wealth in total income by income per capita decile*

Income decile from lowest to highest	Urban		Rural		National	
	2002	2013	2002	2013	2002	2013
1	4.4	9.6	3.4	5.6	3.2	5.5
2	4.7	8.1	2.7	2.6	2.5	3.1
3	4.2	8.5	2.4	2.6	2.7	2.9
4	4.7	8.8	2.3	2.1	2.8	3.5
5	4.3	8.5	2.7	2.8	3.3	4.7
6	4.5	9.9	2.6	2.6	3.8	6.2
7	4.5	10.3	2.5	3.6	4.3	7.2
8	4.2	10.1	3.3	4.8	4.5	8.1
9	5.1	10.6	4.0	5.9	4.5	8.6
10	5.9	11.0	4.8	5.5	5.5	9.5

Table 4.21. *Real housing growth rate by income per capita decile in 2002 (%)*

Income decile from lowest to highest	Urban	Rural	National
1	183.0	132.0	133.6
2	178.4	132.7	136.6
3	177.2	133.7	135.5
4	171.0	131.8	145.8
5	177.3	132.0	149.1
6	177.4	136.8	161.9
7	185.7	134.1	163.9
8	192.3	133.9	172.2
9	201.0	139.5	186.3
10	207.6	139.6	202.4

Table 4.22. *Simulated correction for non-response by the wealthy in 2013*

	Top sub-sample doubled		Top sub-sample tripled	
	Mean	Gini	Mean	Gini
No expansion	162829	0.617	162829	0.617
Expand top 0.5%	176310	0.639	189621	0.657
Expand top 1%	183888	0.647	204423	0.668
Expand top 5%	212058	0.650	255719	0.657

Table 4.23. *Simulated correction for non-response plus under-reporting by the wealthy in 2013*

The top sub-sample is tripled	β=1.5		β=2.0		β=2.5	
	Mean	Gini	Mean	Gini	Mean	Gini
No expansion	160679	0.613	172353	0.637	184028	0.659
Expand top 0.5%	190583	0.659	201664	0.677	212745	0.693
Expand top 1%	205039	0.669	222775	0.694	240511	0.715
Expand top 5%	256270	0.657	272737	0.677	289204	0.694
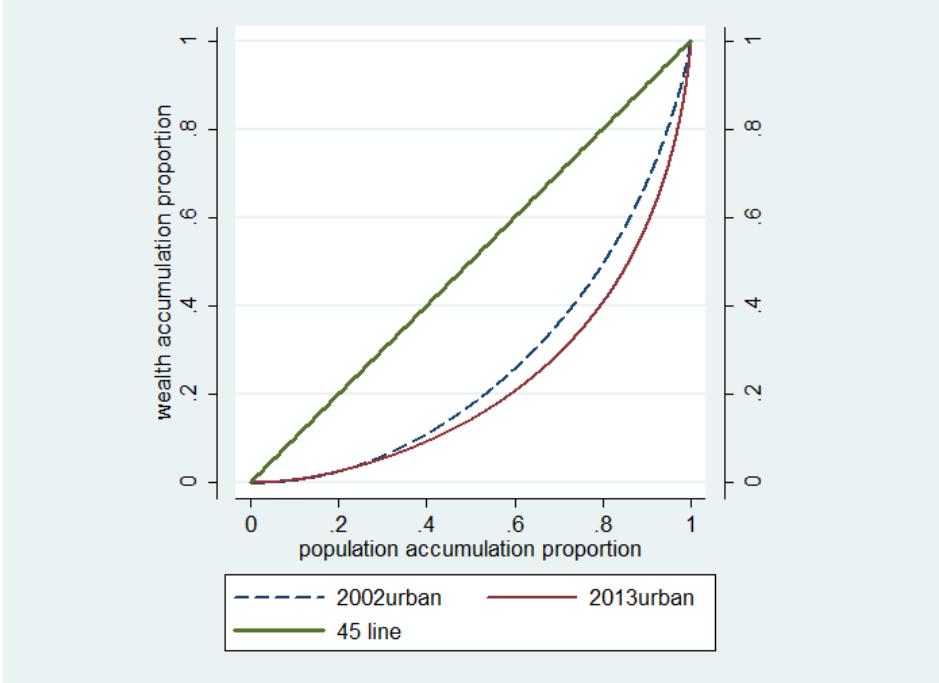
Figure 4.1. *Wealth Lorenz curves for urban households*
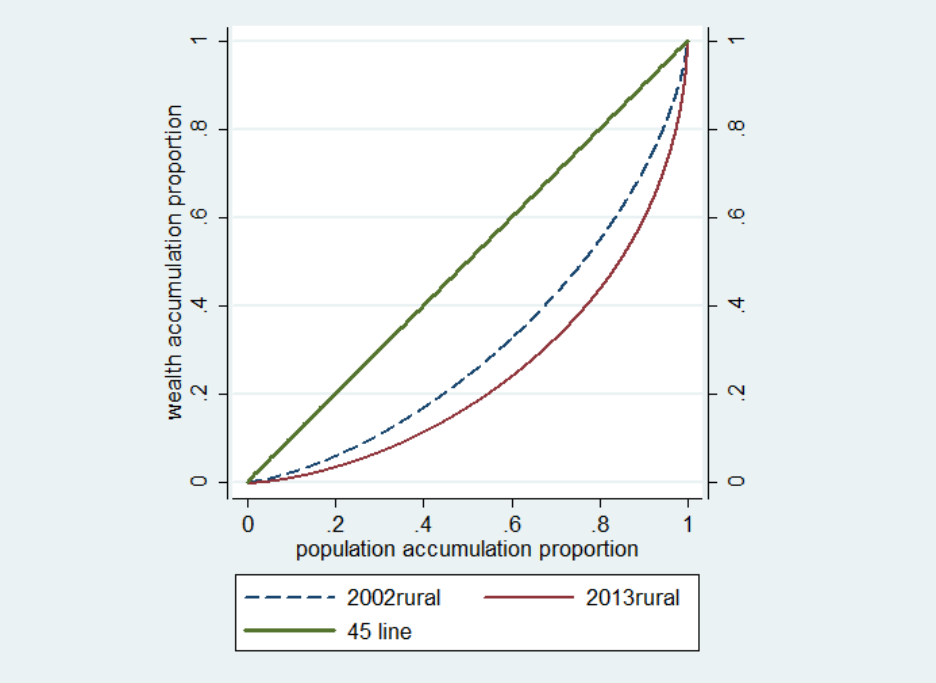
Figure 4.2. *Wealth Lorenz curves for rural households*
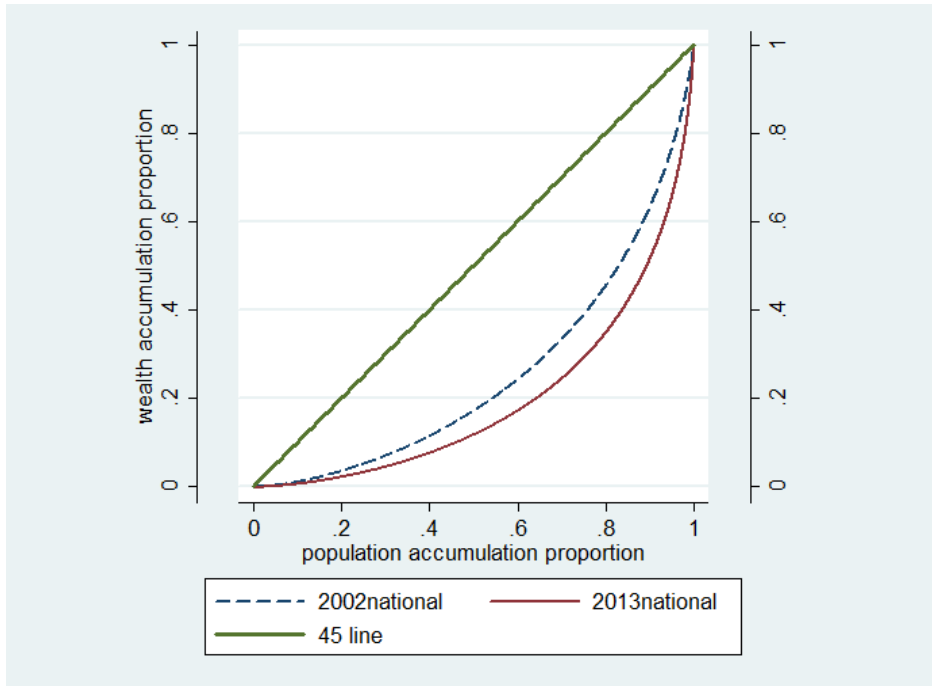
Figure 4.3. *Wealth Lorenz curves for national households*
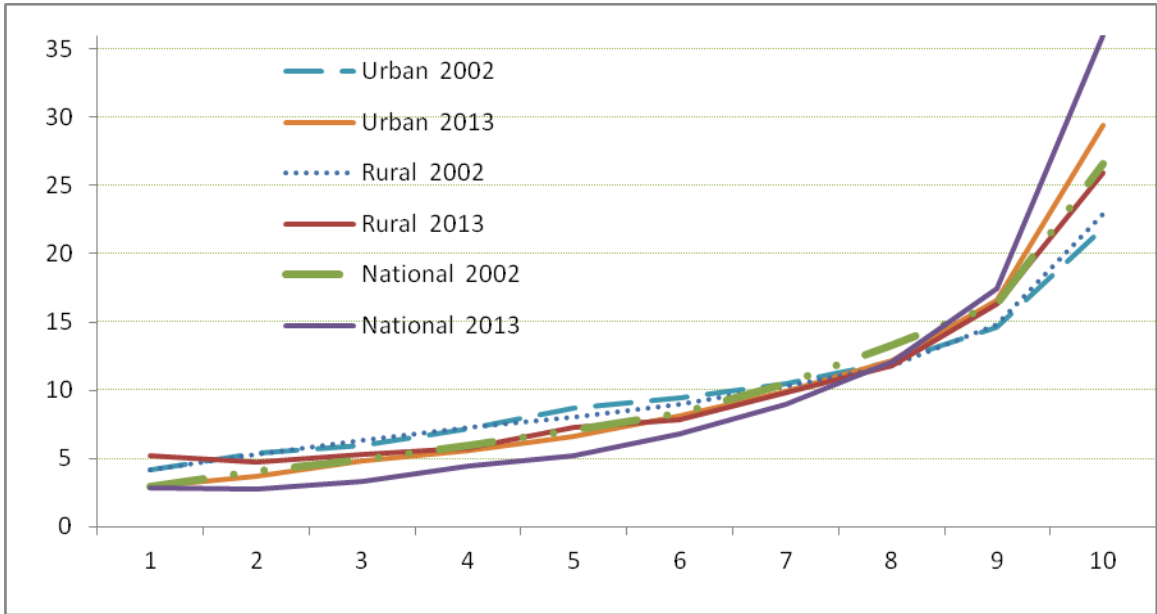
Figure 4.4. *Household wealth share by income per capita decile*
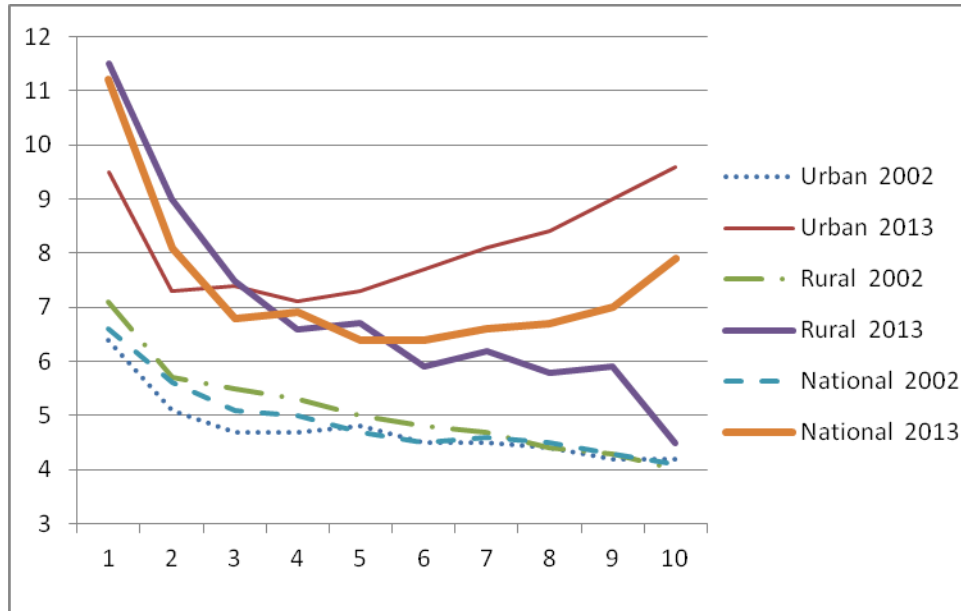
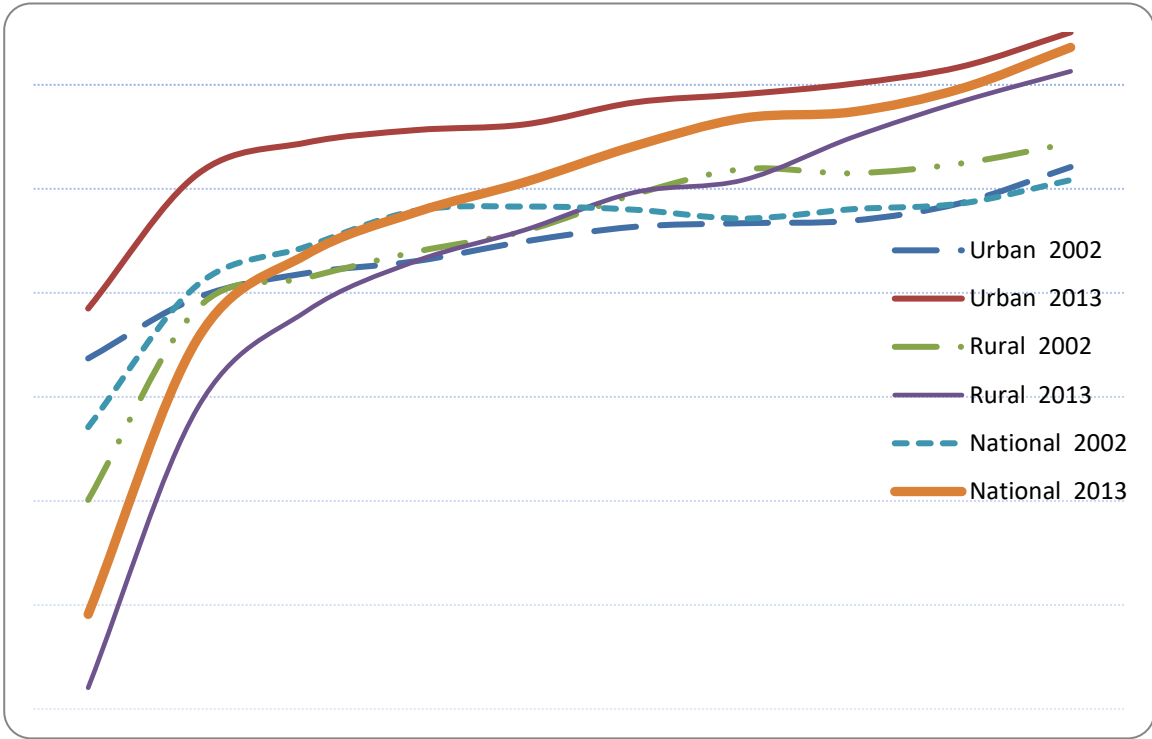**Figure 4.5.** *Wealth/income ratio by income per capita decile*
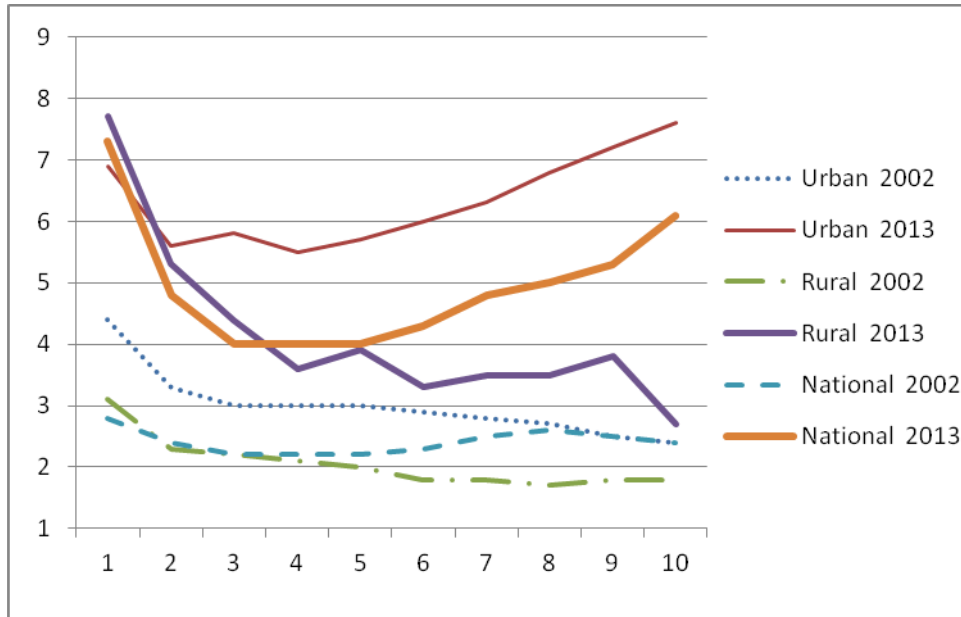
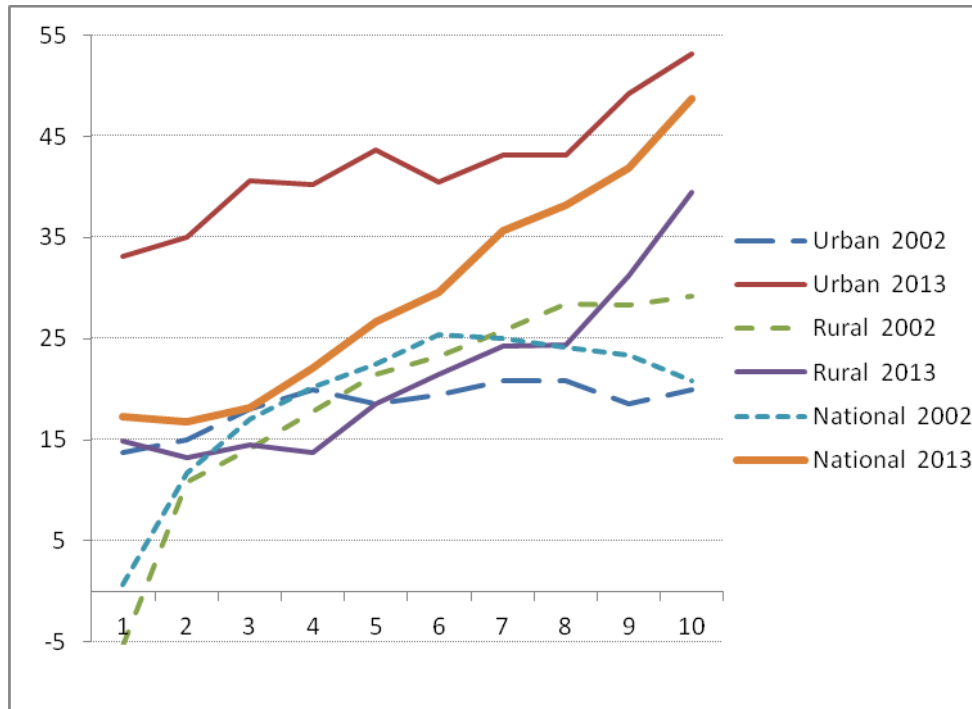**Figure 4.6.** *Housing wealth/income ratio per income per capita decile*
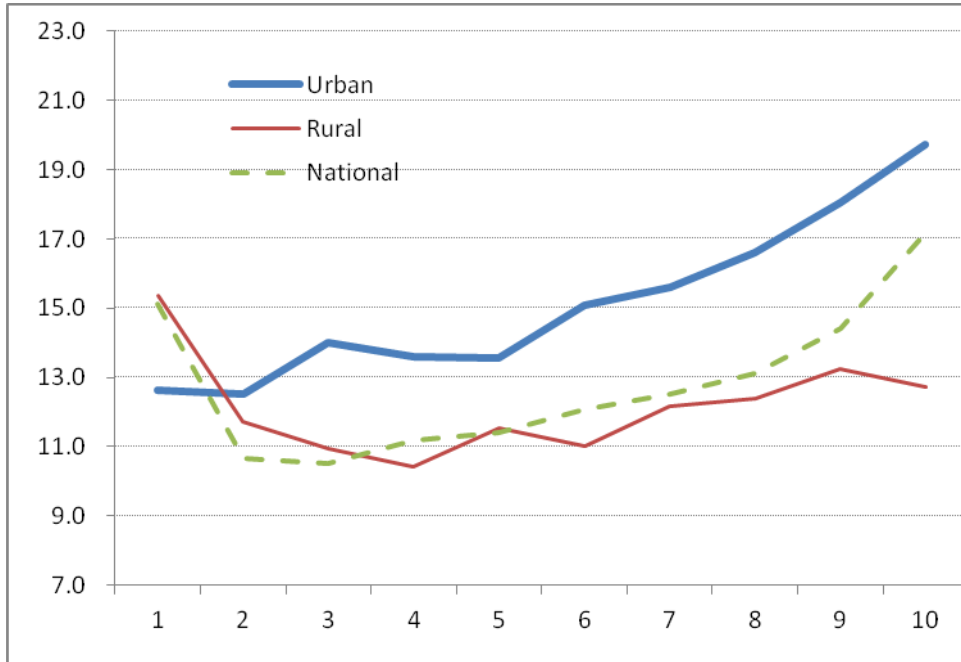
Figure 4.7. *Annual percentage increase in wealth by income per capita decile*
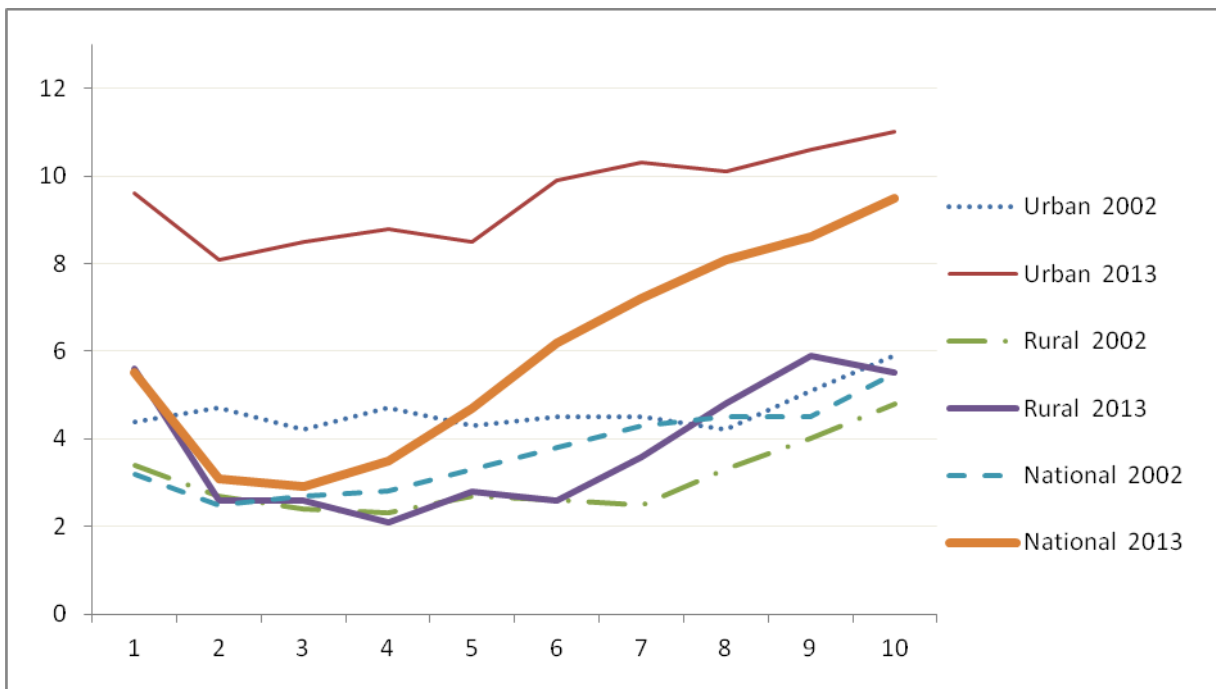
Figure 4.8. *Housing prices by common area in 2002 and 2013*

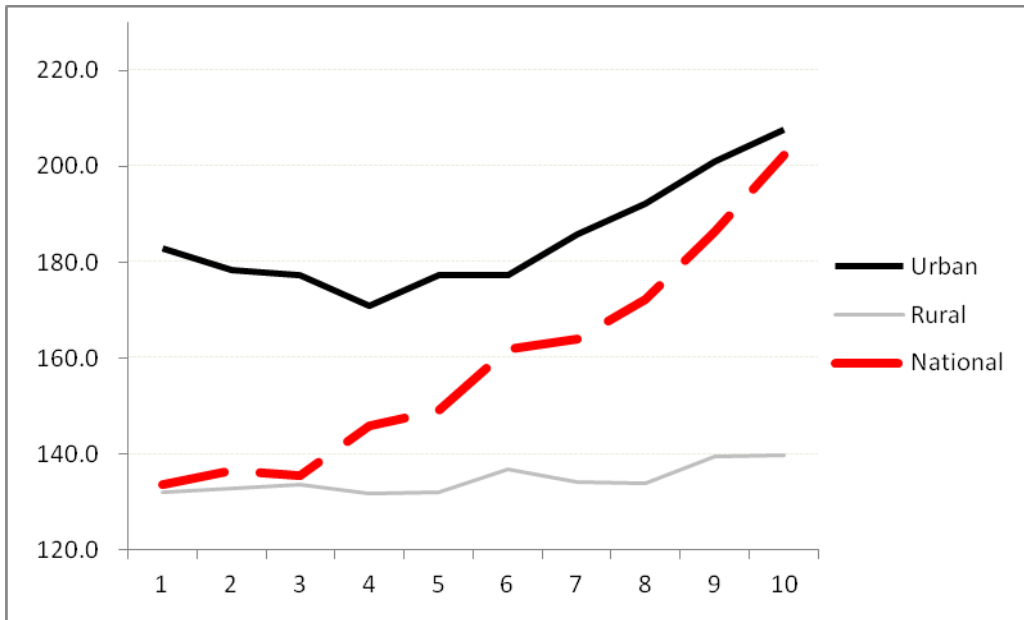**Figure 4.9.** *Savings rate by income per capita decile (%)*

Figure 4.10. *Savings rate by wealth per capita decile (%)*

Figure 4.11. *Share of income from wealth in total income by income per capita decile*

Figure 4.12. *Growth rate of real housing prices by income per capita decile (%)*