The Rise and Fall (?) of Income Inequality in China

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Inequality & “Risks”

• High, sustained inequality is thought to create risks
  – Erodes social cohesion, trust
  – Dampens investment and growth
  – Generates political and economic instability

• Concern about such risks in China
Inequality & “Risks”

- Inequality in China began to rise in the 1980s
- By the 2000s had reached a fairly high level
- In 2000s Hu-Wen leadership responded with “Harmonious society” policy agenda
  - Broad set of policies, social programs to provide social safety net and offset inequality
  - Continued, strengthened under Xi Jinping
- Official estimates indicate that inequality peaked in 2008/09, has since declined
Questions

• To assess whether and how inequality is a risk, need some facts
• In fact how high is inequality in China? How much has it really declined?
  – Is the decline real or a statistical artifact?
• What is the shape of inequality, and what underlies the decline?
• Looking forward, how might inequality evolve, and what are the potential risks?
Use Survey Data to Find Some Answers

- Today: Report new estimates of inequality based on China Household Income Project (CHIP) surveys
- Take a close look at whether estimates are robust
  - Alternative definitions/measurement of income
  - Adjust for regional differences in cost of living
  - Adjust for under-representation of top incomes
- Analyze the changing shape/patterns of inequality
- Speculate about inequality risks going forward
Preliminaries: Data & Measurement

or

*The Devil Is in the Details*
The CHIP Data

- CHIP initiated in the 1980s
- Objective: To collect household survey data for analysis of incomes and inequality
- Today: Look at findings from 2007 and 2013
• Large, national sample
  – Subset of China National Bureau of Statistics’ (NBS) annual stratified random household survey sample
• 2007 and 2013 CHIP samples
  – 20,000-30,000 urban, rural & migrant households
  – More than 60,000 individuals
  – 15 provinces across East, Center, West regions
  – Analyze using region x urban/rural/migrant population weights
• CHIP data comes from two sources
  – NBS provides data from its annual survey
  – Additional info collected using independent CHIP questionnaire

• Contains detailed info on individual and household characteristics, e.g.
  – Individuals’ ages, gender, education, employment
  – individual and household income, by source
  – household expenditures, by type
Target Variable: Income per Capita

• Household income per capita
  – Sum of household income from labor, self-employment, business, assets, capital, net transfers, minus taxes
  – Divide by number of household members

• NOT inequality of wealth (but related)
  – Wealth is a stock: the accumulated sum value of household assets, net of debt
  – Income is a flow: annual net inflow of earnings from labor, capital, transfers, etc.
Income Measurement Issues
(the details)

• Accurate measurement of inequality requires good income data

• CHIP income data comes from the NBS
  – NBS uses diary method to collect detailed info about income and expenses on real time basis
  – NBS constructs income estimates using this info

• NBS income estimates quite good, but have some significant flaws
CHIP Adjustments to NBS Income

- NBS has changed its definition of income
  - Major change in 2013, e.g.,
  - Since 2013 an (incorrect) estimate of imputed rent is included in urban income
  - Since 2013 employer contributions to employee benefits is included in income
CHIP Adjustments to NBS Income

• NBS has changed its definition of income
• SO: NBS income data before and after 2013 not fully comparable
• We use CHIP survey data to adjust 2007 and 2013 NBS income for to be consistent ("adjusted NBS income")
• NBS income definition omits some standard components of income, e.g.,
  – Implicit subsidies on rented housing (important before housing reform)
  – Prior to 2013, imputed rent on owner-occupied housing (important since housing reform)
• We use CHIP survey data to estimate imputed rent and rental subsidies, add them to adjusted NBS income ("CHIP income")
Additional Measurement Issues

1. Costs of living differ among regions and between rural and urban areas
   – Prices tend to be higher in richer locations
   – Consequently, estimates of inequality reflect price differences as well as differences in real income

• We convert incomes into comparable prices, Purchasing Power Parity (PPP) incomes
2. Under-representation of incomes of the very rich in the survey sample
   – Rich households difficult to capture in household survey samples
   – Income of rich households survey hard to measure, often understated
     • Especially asset income, business income
   – Consequently, inequality is understated
• We estimate the top tail of the distribution using info from other sources, and incorporate into the inequality estimation
Measure of Inequality*

Gini Coefficient

– Complete equality: Gini = 0
– Complete inequality: Gini = 1
– Usual range: from 0.2-0.3 (low) to 0.5-0.6 (high)

*Other measures of inequality gave similar results.
Background: Inequality to 2007

(CHIP estimates from Gustafsson, Li, Sicular 2008; Li, Sato, Sicular 2013)
Income Inequality in China, 1988-2007
(Gini coefficient; CHIP income; CHIP data)
Income Inequality: Country Comparisons

(Gini coefficients, 2011-13 except where noted)
Sources: CIA Factbook; CHIP estimates (CHIP income)
Inequality, 2007 to 2013
In fact, how high is inequality? How much has it declined?

• Present estimates based on CHIP survey data
  – NBS income
  – Adjusted NBS income
  – CHIP income
## Nationwide Inequality in China
(Gini coefficients, household income per capita)

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Note: All estimates calculated using the CHIP data, with weights.
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Notes: Adjusted NBS income is modified so that 2007 and 2013 income definitions are more consistent.
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<td>CHIP income</td>
<td>0.49</td>
<td>0.43</td>
<td>-10.9%</td>
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Notes: Adjusted NBS income is modified so that 2007 and 2013 income definitions are more consistent. CHIP income equals adjusted NBS income plus imputed rents on owner-occupied housing and implicit subsidies on rental housing.
Inequality: Country Comparisons

(Gini coefficients, 2011-13 except where noted)
Sources: CIA Factbook; CHIP data (CHIP income)
Discussion

• Different income definitions give somewhat different levels of inequality, but...
• All estimates show inequality DECLINED
• Decline is larger with adjustments to income definition
  – Largest decline for CHIP income
  – Reflects changes in the distribution of imputed rents on owner occupied housing
What underlies the decline?

1. Faster growth in incomes of lower-income groups
Income Increases 2007 to 2013, by Decile (%)

Note: CHIP income, weighted. Calculated in constant prices.
What underlies the decline?

1. Faster growth in incomes of lower-income groups
2. Inequality of most types of income declined
Change in Inequality of Income Sources, 2007 to 2013
(Gini concentration coefficients)

<table>
<thead>
<tr>
<th>income source</th>
<th>2007</th>
<th>2013</th>
<th>change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>wage earnings</td>
<td>0.554</td>
<td>0.477</td>
<td>-13.9%</td>
</tr>
<tr>
<td>non-agricultural business</td>
<td>0.506</td>
<td>0.471</td>
<td>-6.9%</td>
</tr>
<tr>
<td>agriculture</td>
<td>-0.211</td>
<td>-0.169</td>
<td>19.9%</td>
</tr>
<tr>
<td>pension income</td>
<td>0.649</td>
<td>0.568</td>
<td>-12.5%</td>
</tr>
<tr>
<td>asset income</td>
<td>0.592</td>
<td>0.572</td>
<td>-3.4%</td>
</tr>
<tr>
<td>imputed rents on owner-occupied housing</td>
<td>0.516</td>
<td>0.448</td>
<td>-13.2%</td>
</tr>
</tbody>
</table>

Note: The Gini concentration coefficient measures how equally a source of income is distributed relative to the distribution of total income. Higher values mean that more of this source of income goes to higher income individuals.
What underlies the decline?

1. Faster growth in incomes of lower-income groups
2. Inequality of most types of income declined
3. The urban-rural income gap declined
# The Urban-Rural Income Gap

<table>
<thead>
<tr>
<th>Year</th>
<th>Urban-rural income ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>2.7</td>
</tr>
<tr>
<td>1995</td>
<td>3.1</td>
</tr>
<tr>
<td>2002</td>
<td>3.3</td>
</tr>
<tr>
<td>2007</td>
<td>4.0</td>
</tr>
<tr>
<td>2013</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Note: CHIP income; ratio of formal urban to rural income per capita. Migrants living in urban areas are not included in these calculations.
The Urban-Rural Income Ratio: Alternate Estimates

<table>
<thead>
<tr>
<th>Year</th>
<th>CHIP income, formal urban to rural</th>
<th>CHIP income, all urban to rural</th>
<th>NBS income, all urban to rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>4.0</td>
<td>3.8</td>
<td>3.5</td>
</tr>
<tr>
<td>2013</td>
<td>2.6</td>
<td>2.4</td>
<td>2.7</td>
</tr>
<tr>
<td>% change</td>
<td>-36.5%</td>
<td>-37.7%</td>
<td>-22.9%</td>
</tr>
</tbody>
</table>

Note: “All urban” includes both formal urban residents and rural-urban migrants living in urban areas. Calculated using CHIP data, with weights.
Urban-Rural Gap: Discussion

- Reversal of a long-term trend
- A major factor behind the decline in national inequality
  - In 2007 contributed 45-50% of overall inequality
  - In 2013 contributed 25-30%
- China’s gap is no longer an outlier
  - Bangladesh, India, Indonesia < 2.0
  - Thailand, Philippines 2.2-2.3
  - South Africa, Zimbabwe > 3.0
What explains the narrowing of the urban-rural gap?

• Rapid growth in rural incomes
  – 12.9% per year (constant prices)
  – Compared to urban: 5.1%

• Strong growth in most sources of rural income
  – e.g., pensions, asset income, net transfers...
• But: Agricultural income grew slowly
  – 1.9% per year (constant prices)
  – Agriculture accounted for only 19% of rural household income in 2013
• And: Inequality within rural areas increased
  – Rural Gini rose from .375 to .405
  – (Note: urban Gini also rose, from .339 to .356)
What underlies the decline?

1. Faster growth in incomes of lower-income groups
2. Inequality of most types of income declined
3. The urban-rural income gap declined
4. Regional income gaps narrowed
RATIO OF INCOME IN EAST CHINA TO CENTER, WEST

2007 2013

East/Center 1.83 1.52

Center/West 1.20 1.05

Note: CHIP income, calculated using CHIP data, with weights.
Discussion

- Gap between East and Center narrowed
- West basically caught up with Center
- Contribution of regional income gaps to overall inequality*
  - 2007: 15%
  - 2013: 8%

*CHIP income, decomposition of Theil/MLD inequality indexes by population subgroup.
Is the Decline Robust to Spatial Price (PPP) Adjustments?
Inequality with and without Adjustment for Spatial Cost of Living Differences (PPP)
(Gini coefficients, household income per capita)

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<th>2013</th>
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<tr>
<td>NBS income</td>
<td>0.470</td>
<td>0.448</td>
<td>-4.7%</td>
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<tr>
<td>PPP NBS income</td>
<td>0.417</td>
<td>0.414</td>
<td>-1.0%</td>
</tr>
<tr>
<td>CHIP income</td>
<td>0.486</td>
<td>0.433</td>
<td>-10.9%</td>
</tr>
<tr>
<td>PPP CHIP income</td>
<td>0.431</td>
<td>0.400</td>
<td>-7.2%</td>
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Note: PPP estimates adjust incomes for urban/rural and provincial differences in costs of living using price indices based on Brandt and Holz (2006) updated to the present using NBS price index data. Calculated using CHIP data, with weights.
Discussion

- **Level** of inequality is markedly lower with PPP adjustments.
- **Decline** in inequality from 2007 to 2013 is smaller with PPP adjustments:
  - For NBS income, decline is only 1%.
  - For CHIP income, decline is 7%.
- **Conclusion:** Some of the apparent decline in inequality reflects changes in prices.
Is the Decline Robust to Incorporating Top Incomes?
How to Correct for Under-Representation of Top Incomes?

• We use a standard methodology
  – Assume the income distribution of the top income group is a certain shape (Pareto distribution)
  – Using published info on wealth of the extremely rich, estimate the income distribution for the top income group
  – Using survey data, estimate the income distribution for the rest of the population
  – Combine the two distributions, calculate Gini
Data and Assumptions

• Published info on China’s rich
  – Forbes and Hurun lists report wealth
  – We convert wealth to income per capita
    • use one-year fixed deposit interest rate; assume household size = 2

• Data for the rest of the distribution: CHIP

• Calculate a range of estimates
  – For each of Forbes, Hurun and combined lists
  – For alternative income cut offs between top and everyone else
Estimates of China’s Gini Coefficient Incorporating Top Incomes

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<th>Incorporating Top Incomes</th>
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<td>.492</td>
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Note: NBS income, calculated using data from Forbes, Hurun and CHIP.
Low estimate: Forbes list, cut-off is highest income in CHIP
Medium estimate: Hurun list, cut-off is 60,000 yuan
High estimate: Combined list, cut-off is 120,000 yuan
Discussion: Level of Inequality

• 2007
  – Gini increases modestly for all three estimates (less than 10%)
  – Incorporating top incomes doesn’t make a huge difference

• 2013
  – Gini increases noticeably (10 to 40%)
  – Alternate estimates differ widely
  – Incorporating top incomes makes a difference
## Estimates of China’s Gini Coefficient Incorporating Top Incomes

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<td>2013</td>
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<tr>
<td>Change, 2007 to 2013</td>
<td>-4.7%</td>
<td>1.0%</td>
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Note: NBS income, calculated using data from Forbes, Hurun and CHIP.
Low estimate: Forbes list, cut-off is highest income in CHIP
Medium estimate: Hurun list, cut-off is 60,000 yuan
High estimate: Combined list, cut-off is 120,000 yuan
Discussion

• Incorporating top incomes erases the decline in inequality from 2007 to 2013
  – Low estimate: Inequality remains unchanged
  – Medium and high estimates, inequality increases 18% to 40%

• Strong assumptions, so results only indicative

• Main lesson: Can no longer ignore understatement of top incomes in survey data
Answers to Those Questions...
In fact how high is inequality?

- Some of the details matter
  - Adjustments to income definition: Impact fairly modest
  - PPP adjustments: Reduces inequality by 10%
  - Incorporating top incomes
    - 2007: impact fairly modest, less than +10%
    - 2013: increases inequality by +18% to +40%

➤ OVERALL: Standard estimates okay for 2007, understated for 2013
Is the decline real?

➢ The decline is real for part of the population
  – Inequality declined for the population represented by the survey sample (bulk of the population)
  – But: Some of the decline was due to changes in prices

➢ If the sample captured the top income population, the decline would likely disappear
What underlies the decline?
(for the bulk of the population)

- Faster income growth in bottom half of the income distribution
- Reduced inequality of most types of income
- Rapid growth of rural incomes and narrowing urban-rural gap
- Regional catch up
- Further research needed on causes, e.g., impact of policies, urbanization, etc.

– Stay tuned for new CHIP book
How might inequality evolve, and what are the potential risks?

Promising trends

- Income growth of lower-middle groups indicates expansion of middle-income population
- Narrowing urban-rural and regional gaps
- Secular changes in income structure are moderating inequality for most of the population
  - Declining inequality of most types of income
  - Household incomes are becoming more diversified
  - Growing pension and transfer income for lower-middle groups suggest social policies are playing a role
How might inequality evolve, and what are the potential risks?

- **Concerns**
  - Will promising trends continue?
  - Growing importance of top income group
    - And: Data understate the potential for asset and property ("capital") income to drive up inequality
  - Rising inequality within rural and urban sectors
    - With ongoing urbanization, within-urban inequality will become more important
    - Inequality among people in close proximity is more divisive
THE END
Some additional findings: Household perceptions of economic security
• CHIP 2013 questionnaire included questions asking households’ *perceptions* about:
  – Standard of living
  – Economic security
• Here are the questions and answers...
Which statement do you think best describes the living standard of your household?

<table>
<thead>
<tr>
<th>Category</th>
<th>Comfortable</th>
<th>Can afford extras</th>
<th>Comfortable</th>
<th>Cannot afford many extras</th>
<th>Not comfortable</th>
<th>Cannot afford some basics</th>
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<tr>
<td>Urban (excl. migrants)</td>
<td>75%</td>
<td>10%</td>
<td>11%</td>
<td>4%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Rural</td>
<td>72%</td>
<td>9%</td>
<td>14%</td>
<td>4%</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>Migrants</td>
<td>72%</td>
<td>6%</td>
<td>16%</td>
<td>6%</td>
<td>9%</td>
<td>4%</td>
</tr>
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- **Very comfortable, can afford extras**
- **Basically comfortable, cannot afford many extras**
- **Not comfortable, cannot afford some basics**
Which statement do you think best describes the economic situation of your household?

- cannot deal with even basic economic shocks
- cannot deal with many economic shocks
- can deal with most economic shocks
- can deal with all kinds of economic shocks
- don't know

**Urban (excl. migrants):**
- 6% cannot deal with even basic economic shocks
- 5% cannot deal with many economic shocks
- 5% can deal with most economic shocks
- 6% can deal with all kinds of economic shocks
- 13% don't know

**Rural:**
- 7% cannot deal with even basic economic shocks
- 9% cannot deal with many economic shocks
- 5% can deal with most economic shocks
- 5% can deal with all kinds of economic shocks
- 11% don't know

**Migrants:**
- 7% cannot deal with even basic economic shocks
- 4% cannot deal with many economic shocks
- 7% can deal with most economic shocks
- 5% can deal with all kinds of economic shocks
- 10% don't know
Discussion

• Most households consider themselves
  – Basically comfortable
  – Not very economically secure

• Economic security is another potential source of “risk”