Dimensions of Inequality in Japan: Distributions of Earnings, Income and Wealth between 1984 and 2014

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Motivation

- Very *general* motivation
  - ○ Occupy wall street in 2011
  - ○ Thomas Piketty (2013): "Capital in the 21st Century," originally in French
- More *specific* question
  - ○ Population aging affects inequality in Japan: Ohtake and Saito (1998)
    - • Update the data
  - ○ Extension of Lise, et al. (2014,RED)

What We Do

- Understanding the inequality in earnings, income, and wealth
  - time trend: macroeconomic view point
  - life cycle: gender, employment status, family, and marital status
- National Survey of Family Income and Expenditure (NSFIE):
  - by the Ministry of Internal Affairs and Communications
  - sample size: approximately 60,000 "households"
  - incl. one-person households and two-or-more person households
  - sample period: 1984-2014 (every five years)

Why Important?

- Understanding the current situation of inequality $\Rightarrow$ redistribution policy such as optimal tax system
- Trend of inequality over past 30 years in Japan
- Important for considering
  - population aging
  - sustainability of social security system
  - design of tax system
  - fiscal/monetary policy etc.
- Theoretical view point:
  - target for calibration of heterogeneous agent models
  - what's are "puzzles" to be explained?

Related Research

- J.-V. Ríos-Rull and his co-authors write a series of papers on economic inequality in the U.S.
  - from 1997: Días-Gímenez et al. (1997)
  - every 3-4 years?
  - using Survey of Consumer Finance
  - *Quarterly Review* by Minneapolis Fed
- The latest version:
  - Kuhn and Ríos-Rull (2016): "2013 Update on the U.S. Earnings, Income, and Wealth Distributional Fact: A View from Macroeconomics," FRB of Minneapolis, *Quarterly Review*
- Citation counts for four papers $> 1,000$

Related Research: Japan

- Ohtake (2005), Ohtake and Saito (1998)
  - over all inequality, population aging
- Moriguchi and Saez (2008), Moriguchi (2010)
  - top one percent of wage distribution using tax data
- Kambayashi, Kawaguchi and Yokoyama (2007)
  - wage distribution using BSWS
- Lise et al. (2014)
  - using NSFIE, BSWS, FIES, etc.
  - focus on consumption, income and wealth
- Unayama and Ohno (2017)
  - consumption and savings rate using NSFIE

Related Research (very incomplete)

- Top one percent:
  - Alvaredo et al. (2013), Piketty and Zuckman (2014), Piketty et al. (2014), Jones (2015), Alvaredo et al. (2017), Zuckman (2019)
- Pareto distribution:
  - Benhabib et al. (2011), Jones and Kim (2014), Gabaix (2016), Lions et al. (2016), Aoki and Nirei (2017)
- Tax data:
  - Guvenen et al. (2019)
- Theory and policy implications:
  - McKay and Reis (2016), Gorneman et al. (2016), Auclert and Rognlie (2017), Auclert (2018), Ahn et al. (2017), Inui et al. (2017), Kaplan et al. (2018)

Introduction
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Definition
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Macro
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Life Cycle
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Equivalized
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Cohort
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Conclusion
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II. Data

NSFIE

- Pros:
  - large sample size: approx. 60,000
  - detailed wealth/asset data including real assets
- Cons:
  - not panel data
  - every fine years: couldn't see just after the east Japan earthquake or the great recession
  - no info on education (not only NSFIE, though)
  - not individual (important for earnings inequality)
  - consumption/expenditure data available, but limited (Sept-Nov): see Unayama and Ohno (2018)

Definition

Definition of Variables:

- Earnings (E):
  - before-tax labor/business income of household (including employees and self-employed)
  - equivalized: using OECD equivalent scale
- Income (I):
  - before-tax annual income including
    - labor, business, capital, transfers and other income
- Wealth (W):
  - (gross) financial asset
  - net wealth: gross - debt (excl. mortgage)
  - housing and other real assets not included in the current version

Definition (cont.)

Definition of Variables:

- Earnings (E):
    - labor income: 勤め先からの収入 (本給・諸手当・賞与)、内職などの収入
    - business income: 農林漁業収入、農林漁業以外の事業収入
- Income (I):
    - capital income: 家賃・地代収入、利子・配当金
        - キャピタルゲインは除く
    - transfers: 公的年金・恩給、企業年金、親族などからの仕送り
    - others: その他収入 (健康保険や雇用保険給付・児童手当などを含む)、現物消費 (自家産物の消費、勤め先からの現物支給)

Definition (cont.)

Definition of Variables:

- Wealth (W):
  - 預貯金 (普通預金・定期預金、銀行・郵便局・その他の金融機関)、保険 (生命・損害・簡易、振込総額)、貸与・金銭信託 (額面)、株式・株式投資信託 (時価)、債券・公社債投資信託 (額面)、その他 (社内預金など)

- Net wealth: gross financial wealth − debt (excl. mortgage)
  - debt: 月賦・年賦の未払い残高 (カードローン、キャッシング残高)、その他の借入金残高 (教育ローンなど生活に必要な資金、事業に必要な開業資金など)
  - 住宅・土地購入のための借り入れを除く

Main Findings

1 Total inequality (measured by Gini) of E, I and W increases
   - E: 0.39 (1984) ⇒ 0.58 (2014)
   - I: 0.32 (1984) ⇒ 0.35 (2014)
   - W: 0.58 (1984) ⇒ 0.64 (2014)

2 Earnings inequality increases due to population aging
   - even after 2000s: Ohtake and Saito (1998) and Ohtake (2005)
   - earnings and income inequality of young-middle (20s-50s) increases, but income inequality of old ages rather declines after 1980s due to redistribution by public pension

Main Findings (cont.)

3 Dynamics of wealth inequality is different
- intra-generational inequality: younger generation
- expansion of zero-wealth households

4 Level of earnings/income declines after 1990s
- aggregate and by age groups
- but wealth level does not change after 1990

III. Macroeconomic Inequality

Summary Statistics

	1984	1994	2004	2014
Sample size	54,780	60,339	60,059	56,422
% of one-person HH	17.6%	20.4%	20.3%	23.2%
Average HH size	3.35	3.06	2.73	2.56
Age of HH head	45.44	49.67	53.79	57.59
% female HH head	12.6%	18.3%	17.0%	20.1%
- aged<65	9.8%	11.8%	10.5%	10.1%
HH head employed	64.1%	64.0%	56.5%	52.9%
Self-employed	27.3%	19.3%	16.8%	14.2%
Not working	8.6%	16.7%	26.7%	32.8%

‹ FIGURE

Summary of Inequality

	1984	1994	2004	2014
Earnings				
Mean	4,984	5,696	4,518	3,765
1%/median	3.46	3.92	4.59	5.82
10%/median	1.98	2.20	2.55	3.10
Gini	0.38	0.45	0.53	0.58
Income				
Mean	5,882	7,049	6,288	5,620
1%/median	3.54	3.82	3.93	4.01
10%/median	1.95	2.05	2.11	2.15
Gini	0.32	0.35	0.34	0.35

Summary of Inequality (cont.)

	1984	1994	2004	2014
Wealth				
Mean	6,873	12,075	13,916	14,118
1%/median	12.07	11.79	12.49	14.38
10%/median	3.96	4.20	4.81	5.29
Gini	0.58	0.59	0.61	0.63
Net Wealth				
Mean	6,500	11,538	13,272	13,517
1%/median	12.83	12.38	13.12	14.92
10%/median	4.15	4.40	5.01	5.49
Gini	0.62	0.62	0.66	0.68

Summary of Inequality: Correlation

	1984	1994	2004	2014
Correlation				
Earnings and income	0.880	0.863	0.833	0.832
Earnings and wealth	0.334	0.212	0.155	0.126
Income and wealth	0.482	0.340	0.327	0.307
Correlation: aged 25-59				
Earnings and income	0.885	0.888	0.851	0.878
Earnings and wealth	0.386	0.339	0.343	0.347
Income and wealth	0.486	0.381	0.397	0.403

Levels at Percentiles
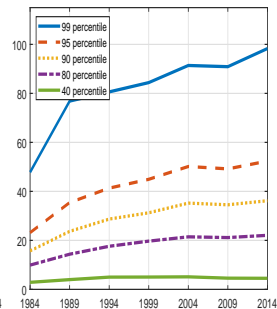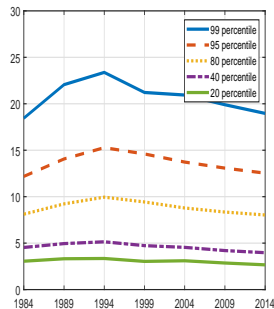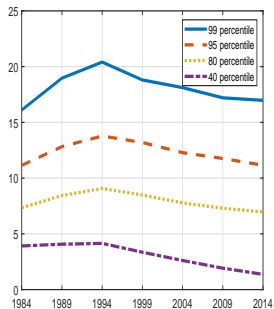
- Left: earnings, Center: income, Right: wealth

Share of Wealth held by HH
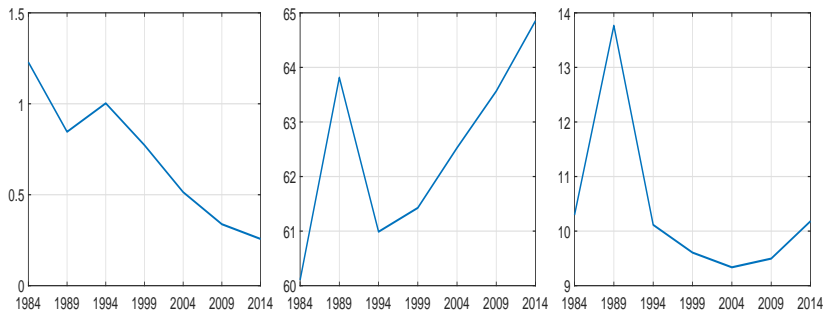
- Left: bottom 20%, Center: top 20%, Right: top 1%

IV. Aspects of Economic Inequality

Decomposition of Inequality

- Decomposition of macroeconomic inequality
  1. changes in age distribution
  2. level
  3. within-age
- Gini coefficient
  1. baseline
  2. remove age-distribution effect: constant at the level of 1984
  3. remove level effect

Decomposition of Gini: Earnings
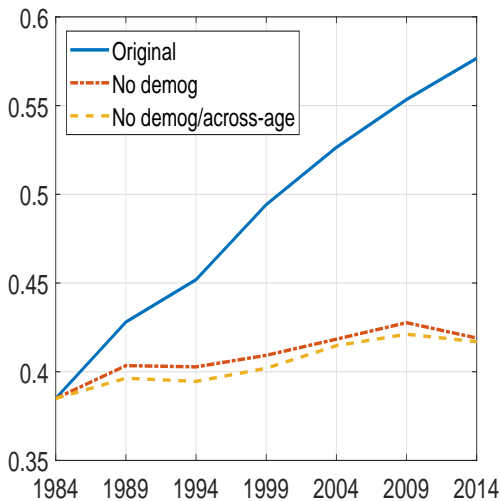
Decomposition of Gini: Income
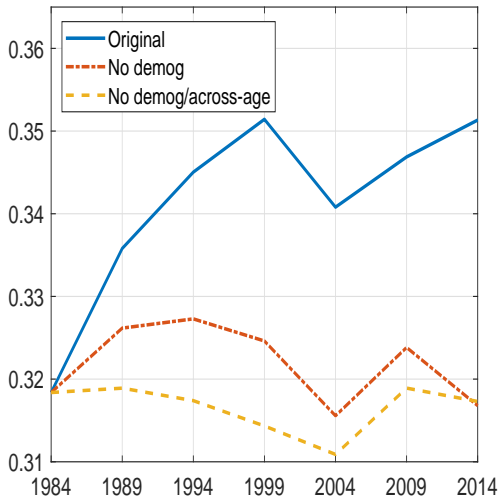
Decomposition of Gini: Wealth
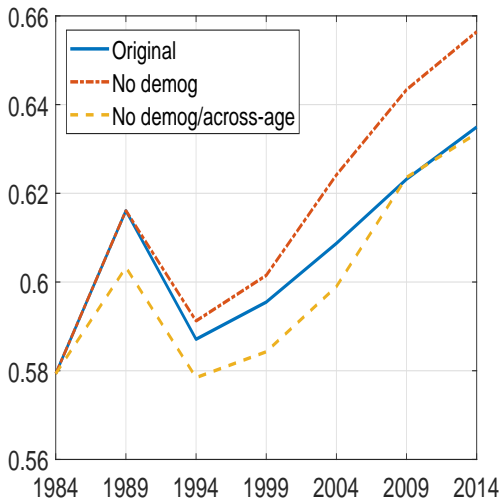
Earnings Level and Inequality by Age
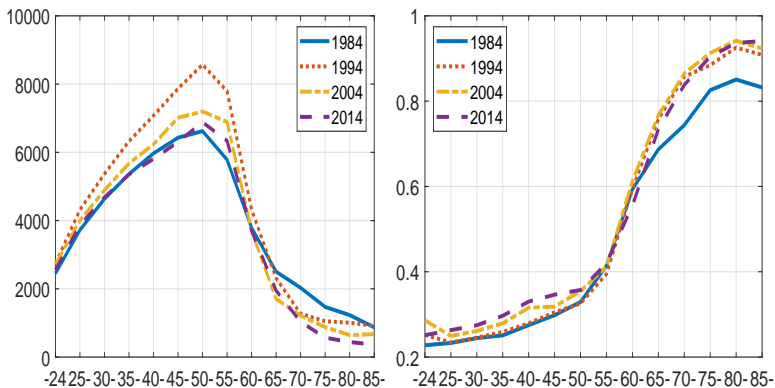
- Left: level, Right: Gini

Income Level and Inequality by Age
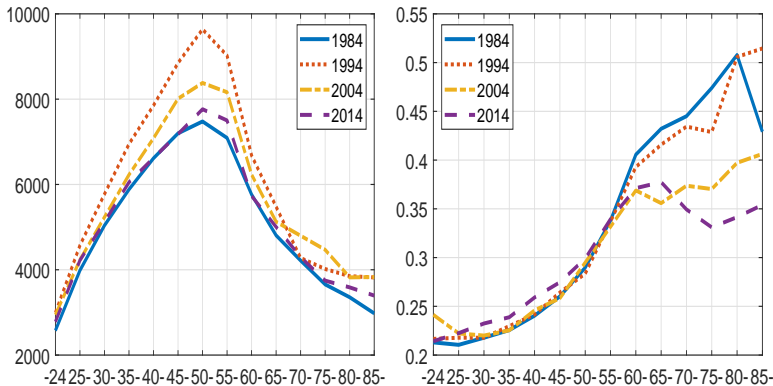
- Left: level, Right: Gini

Income Inequality excl. Public Pensions
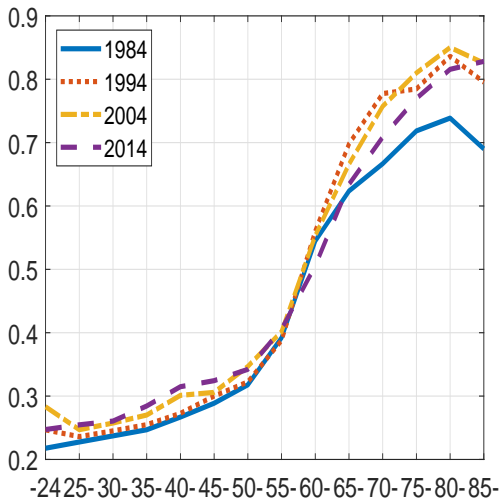
Wealth Level and Inequality by Age
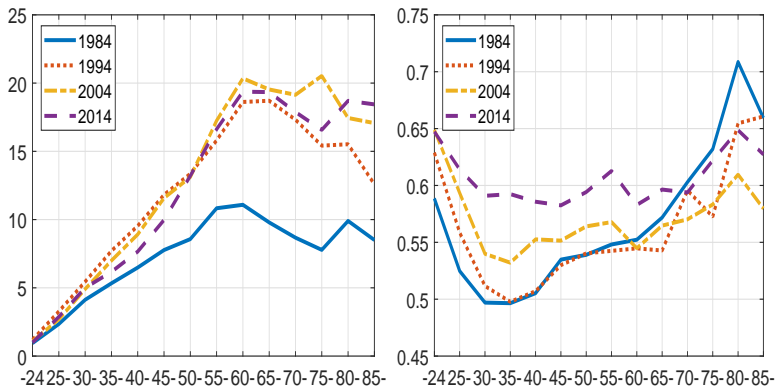
- Left: level, Right: Gini

Households with Zero Wealth
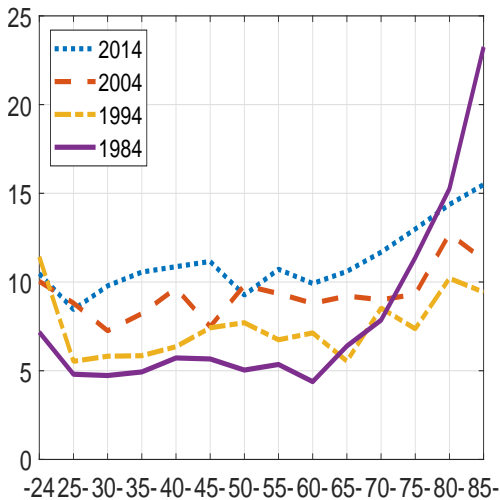
HH with Wealth above 50M Yen
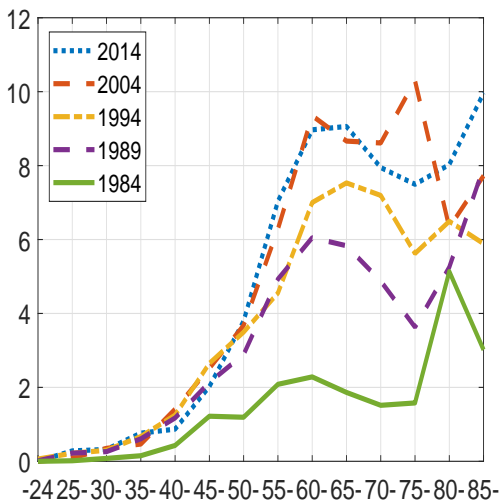
Portfolio by Wealth Levels (2014)

	Q1	Q3	Q5
Avg. wealth (JPY1,000)	181	7,012	45,785
Decomposition (%)			
Deposit	83.0	67.2	63.0
Insurance	14.7	26.3	20.0
Stock and bonds	0.9	4.2	15.1
Others	1.4	2.4	1.8

Portfolio by Wealth Levels (2014) (cont.)

	Top 5-1%	Top 1%	All
Avg. wealth (JPY1,000)	68,297	143,540	14,118
Decomposition (%)			
Deposit	60.7	54.0	68.3
Insurance	17.8	15.9	23.0
Stock and bonds	20.0	29.3	6.7
Others	1.5	0.9	2.0

Portfolio by Age Group (2014)

	25–29	45–49	65–69
Avg. wealth (JPY1,000)	2,874	9,971	19,339
Decomposition (%)			
Deposit	83.7	60.2	70.0
Insurance	11.2	30.5	20.3
Stock and bonds	2.4	5.2	9.2
Others	2.7	4.1	0.5

V. Equivalized

Equivalized Inequality

- Equivalize using OECD scale
  - Adult: $1.0 + 0.7$ ...
  - Kids: 0.5
- Male and female

Equivalized Earnings
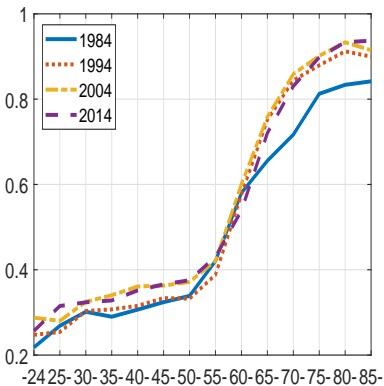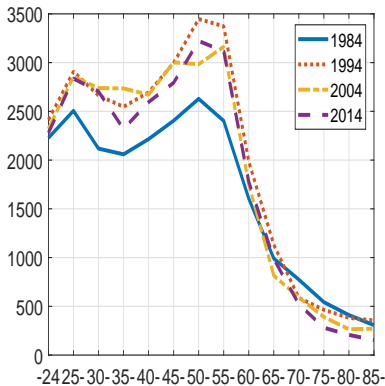
- Left: level, Right: Gini

Earnings: Male and Female
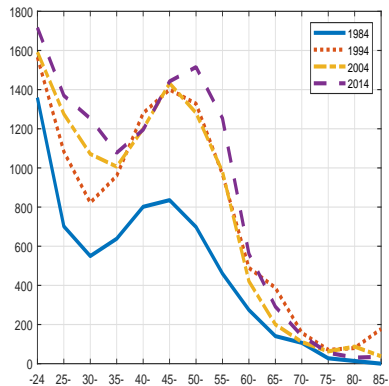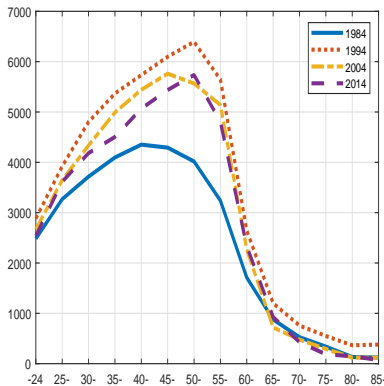
- Left: male, Right: female

Equivalized Income
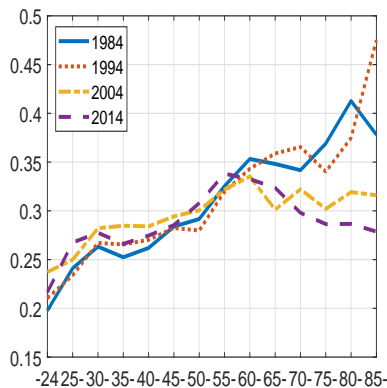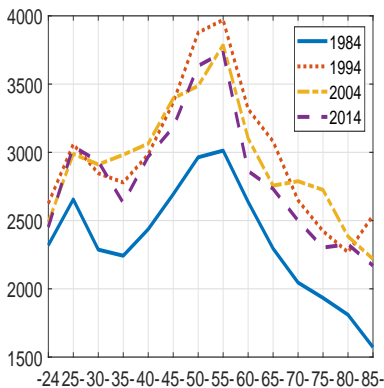
- Left: level, Right: Gini

Equivalized Wealth
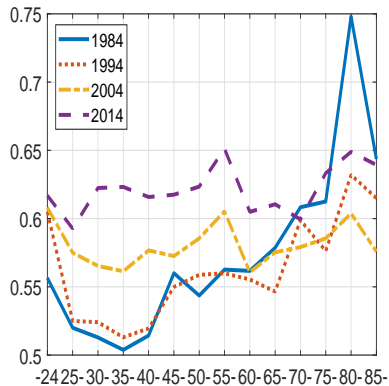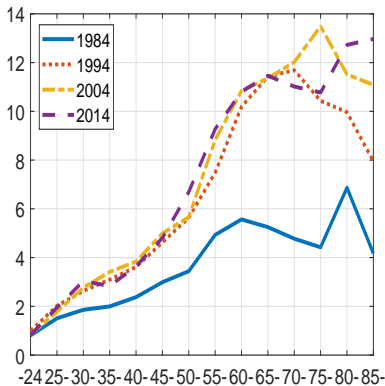
- Left: level, Right: Gini

VI. Cohort

Earnings Profiles by Cohort
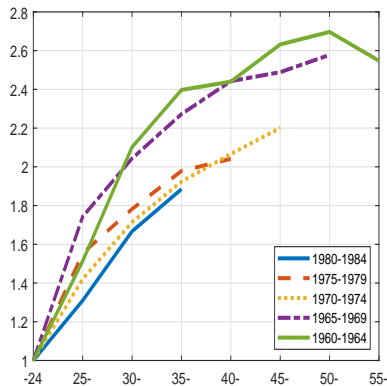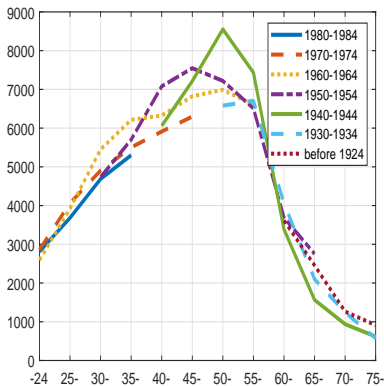
Income/Wealth Profiles by Cohort
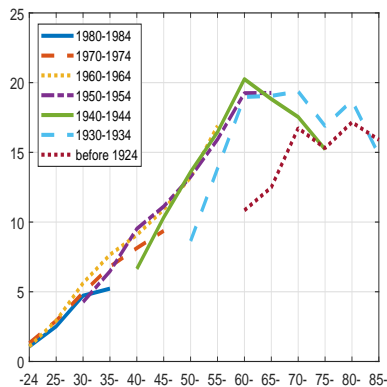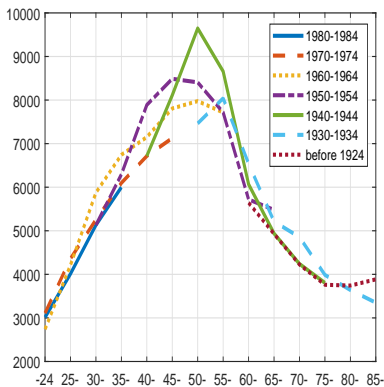
VII. Conclusion

(Near) Future Research

- Policy implication: redistribution policies
  - Piketty, Saez and Stantcheva (2014), Saez (2016), McKay, Nakamura and Steinson (2016), Auclert (2018)
- More research on poor (zero wealth) households
- Real asset: in progress!

Thank You!

Appendix Figures

Distribution of HH Head Age
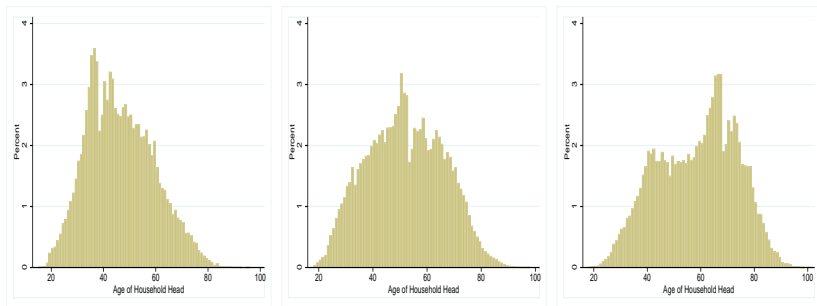
- Left: 1984, Center: 1999, Right: 2014

Family Size and Self-employed
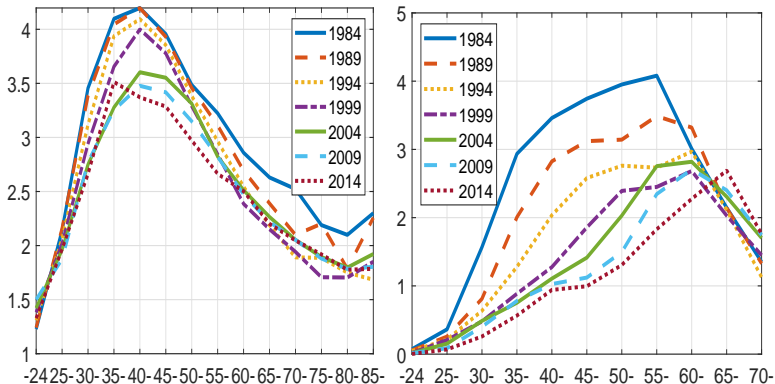
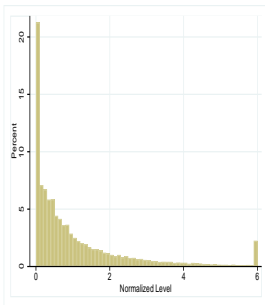- Left: family size, Right: % of self-employed
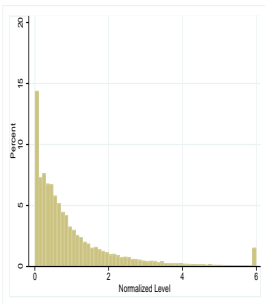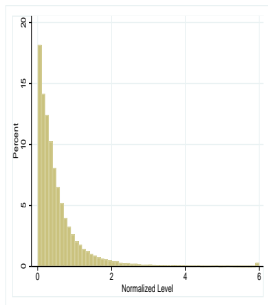
Distribution of Earnings
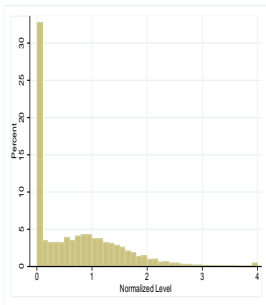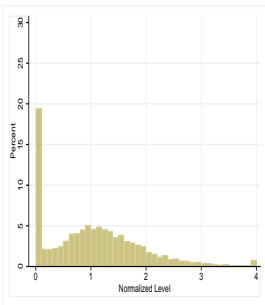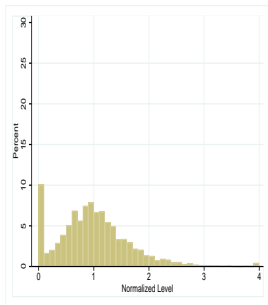
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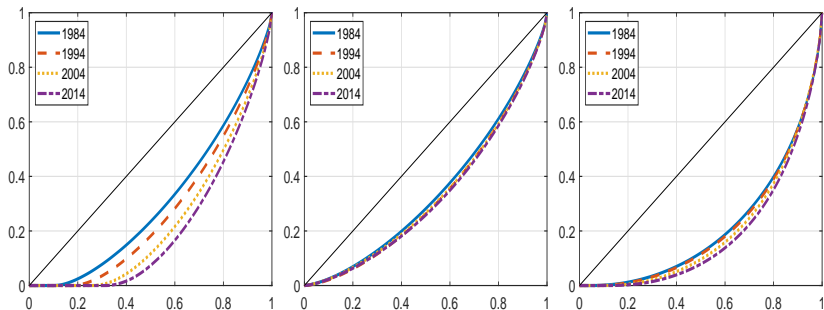
Distribution of Income
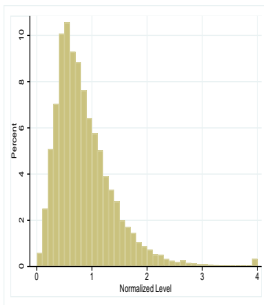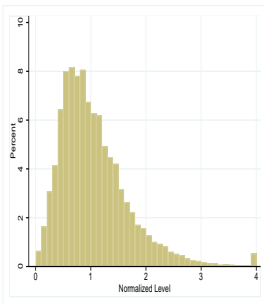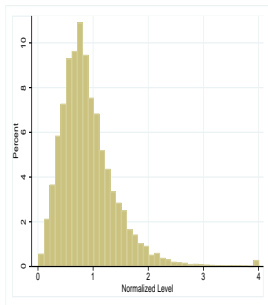
- Left: 1984, Center: 1999, Right: 2014

Distribution of Wealth

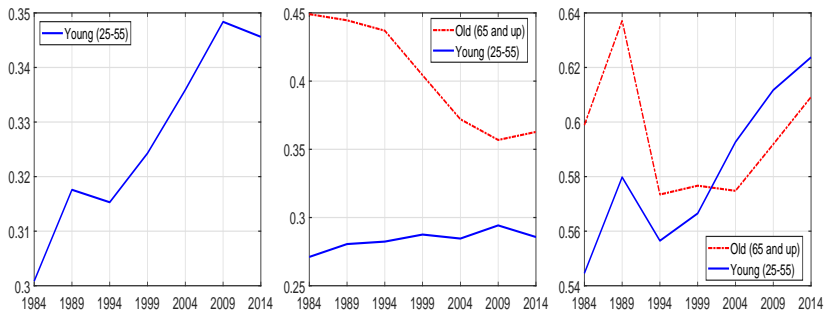- Left: 1984, Center: 1999, Right: 2014

Lorenz Curves

◂ RETURN

Gini Coefficient by Age Groups

- Left: earnings, Center: income, Right: wealth

◄ RETURN