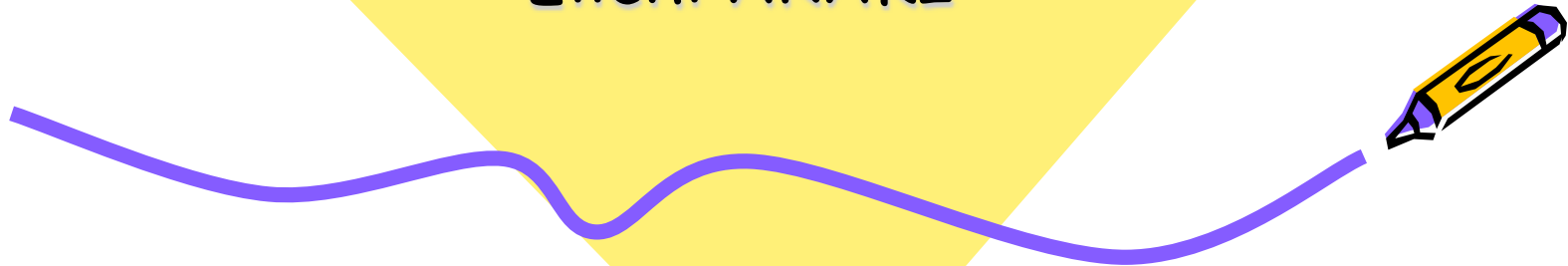


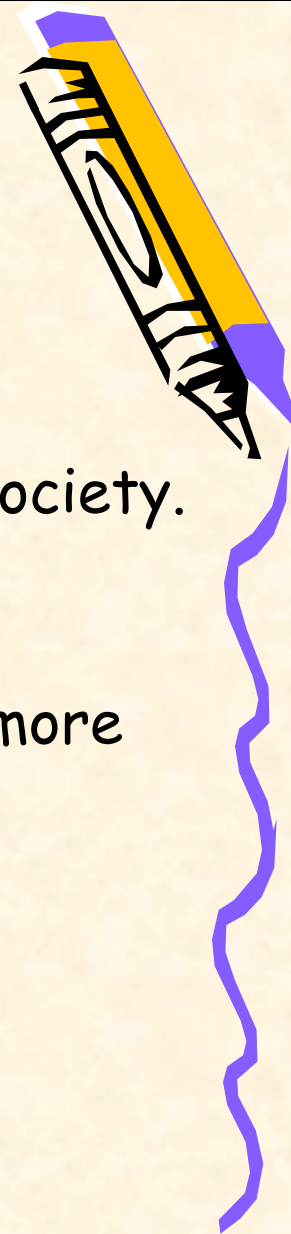


Analysis of income distribution

Eiichi ARAKI



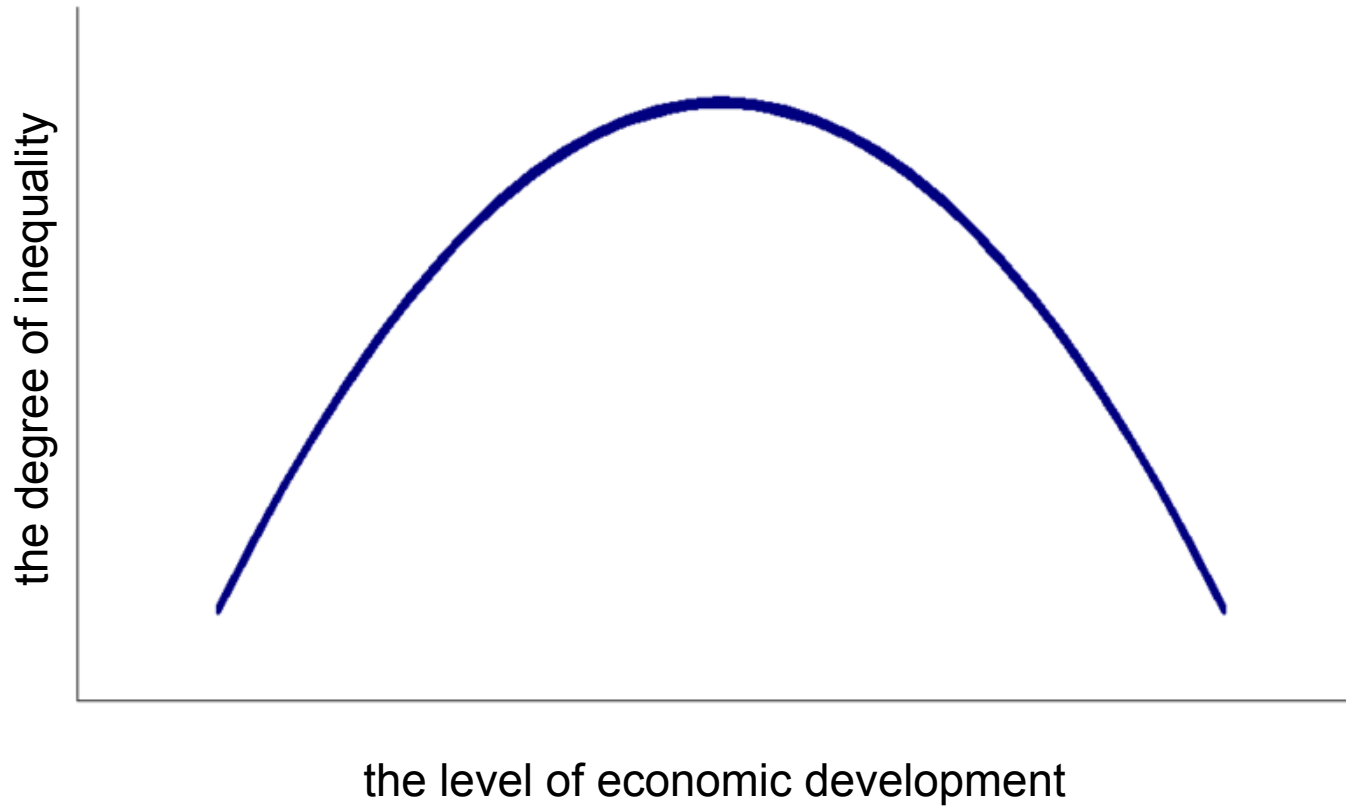
The Contents



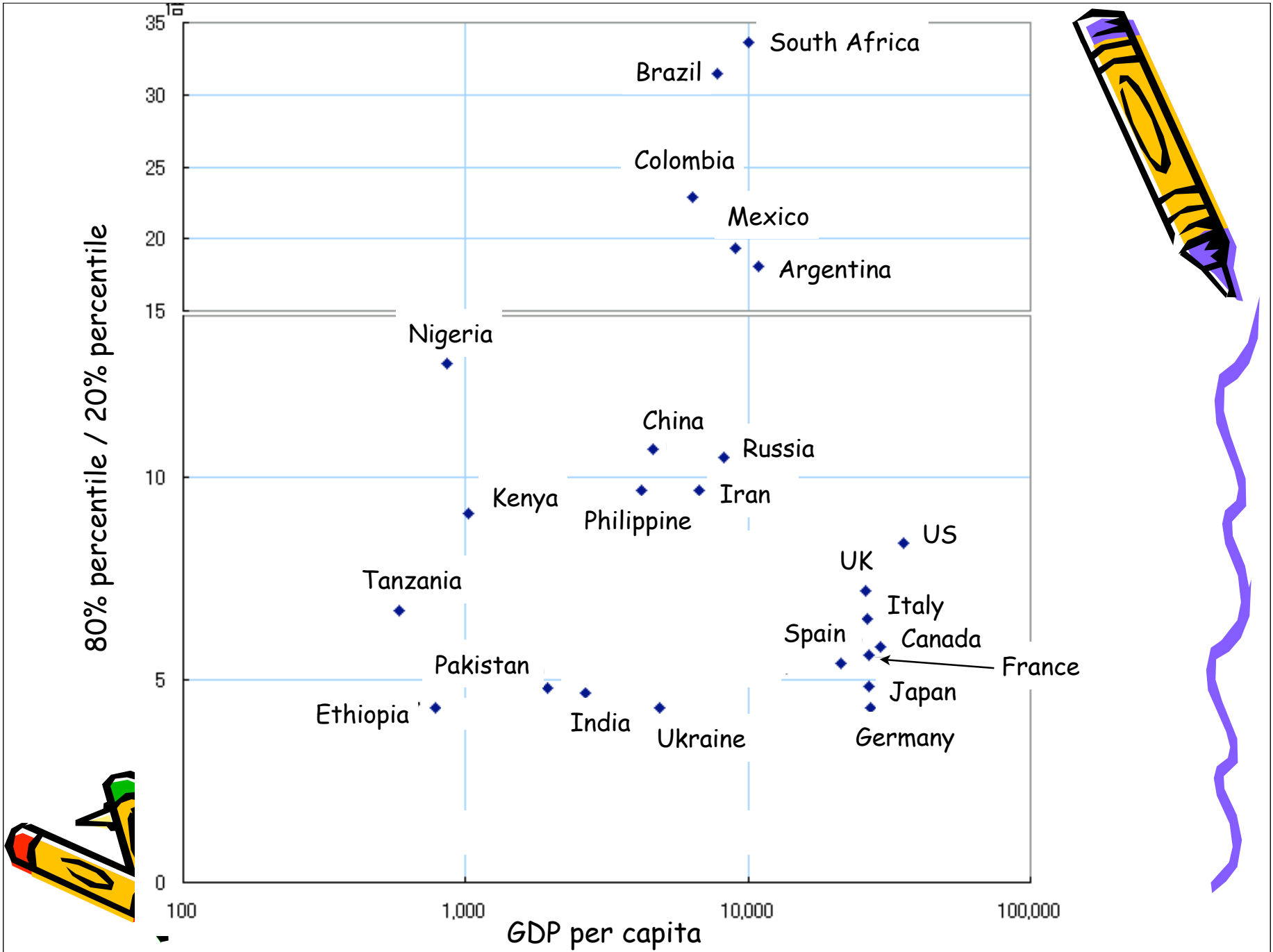
- The inverted-U hypothesis
 - In developed countries, economic growth brings a more equal society.
- The N-curve hypothesis ?
 - However, G8 countries look becoming more and more unequal recently.
- Evidence in Japan
 - Histogram (Income distribution)
 - Gini coefficient
 - Poverty ratio



Inverted-U hypothesis

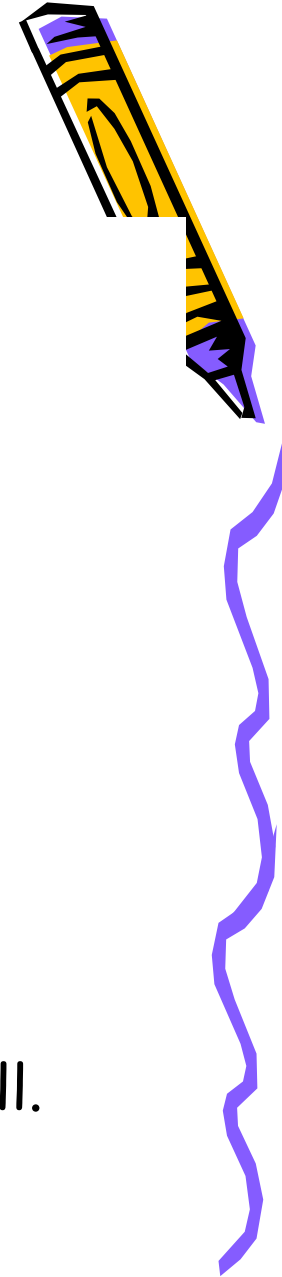


a.k.a. Kuznets curve (S. Kuznets, 1955)

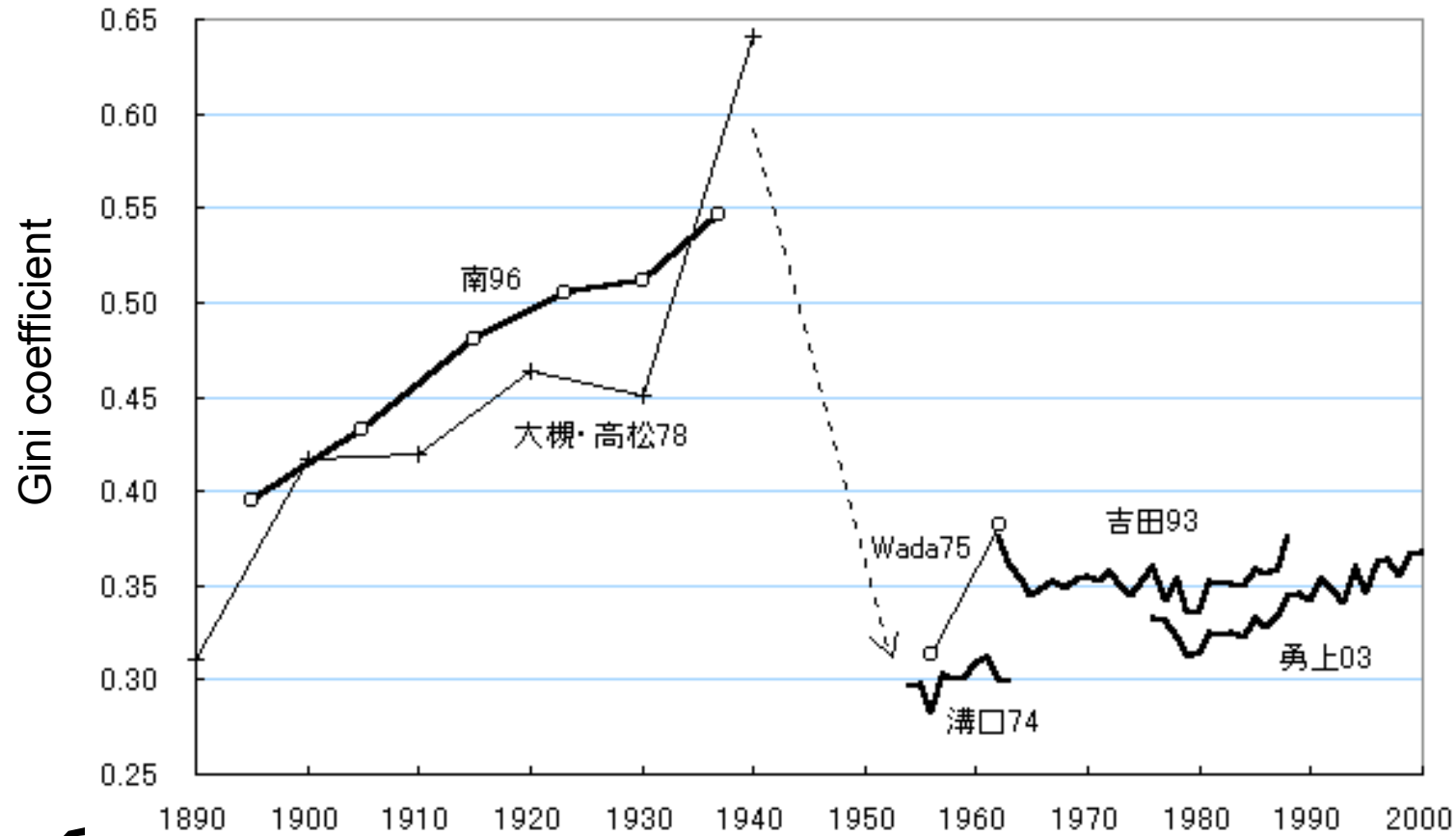


Inverted-U hypothesis (2)

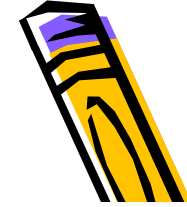
- Economic inequality :
 - increases in early stages of development,
 - a critical average income is attained,
 - begins to decrease.
- Why ?
 - In earlier stages, **physical capital** is the main engine of economic growth.
 - In later stages, **human capital** becomes more important. And as a country becomes rich :
 - **Mass education** opens up opportunity for all.
 - Government put forth some redistributive **social policies**.



Inverted U-curve in Japan



Inverted-U in Japan (2)



- 1945: Japan was simply a **ruin** (just after WW2)
- 50s-60s: achieved **miraculous economic growth**
- 1964: joined **OECD** (Tokyo olympics, bullet train)
- 1968: the **2nd. largest economy**
- 70s-80s:
 - was said to be "**the most equal society**"
 - most Japanese thought they were middle-class.

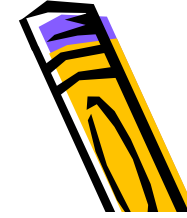
• But now:

- the word "**Gap-widening**" is in fashion.

The mass media enthusiastically broadcast this word and everybody talks about it.



Rumours

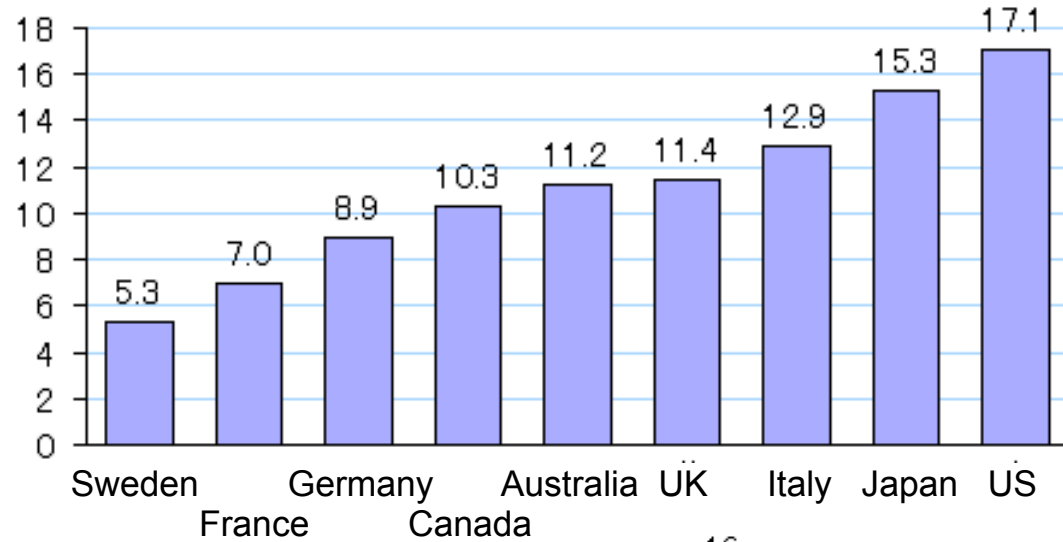


- “Economist” reports about the “L-shaped poverty line” in Japan on 16/Oct/2008.
(http://www.economist.com/finance/displaystory.cfm?story_id=12437739)
- According to a TV programme broadcast on 9/Sep/06 made by a left-wing newspaper (Asahi shimbun) :
 - OECD's relative poverty ratio shows that Japan is the second “poorest” country following the 1st., USA.
 - A few hundred people died of hunger in 2005 in Japan. The number of suicides has seen a drastic increase. Many parents can not afford children's school fees, and so on.

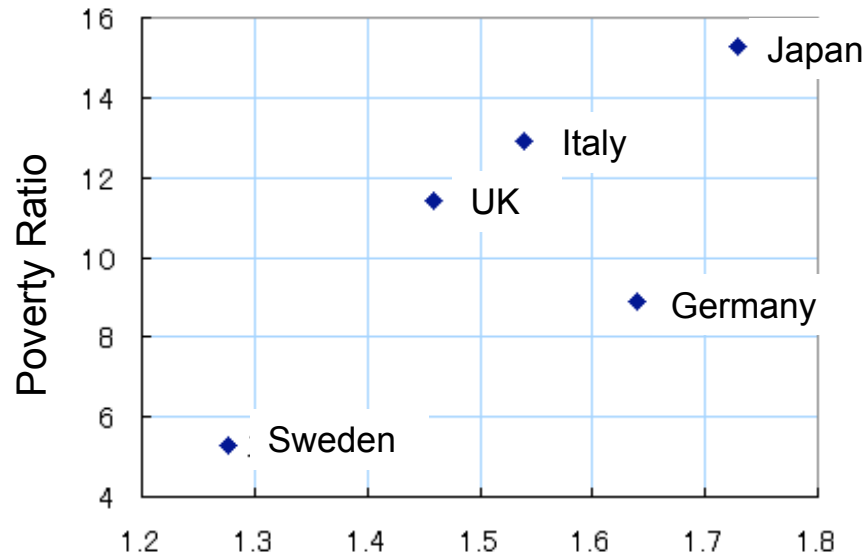


Poverty Ratio

(the share of the people whose income is less than a half of the median)



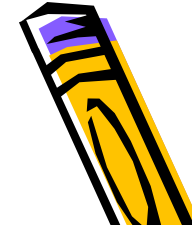
OECD statistics



Wages for 50-59 year olds / Wages for the under 30s



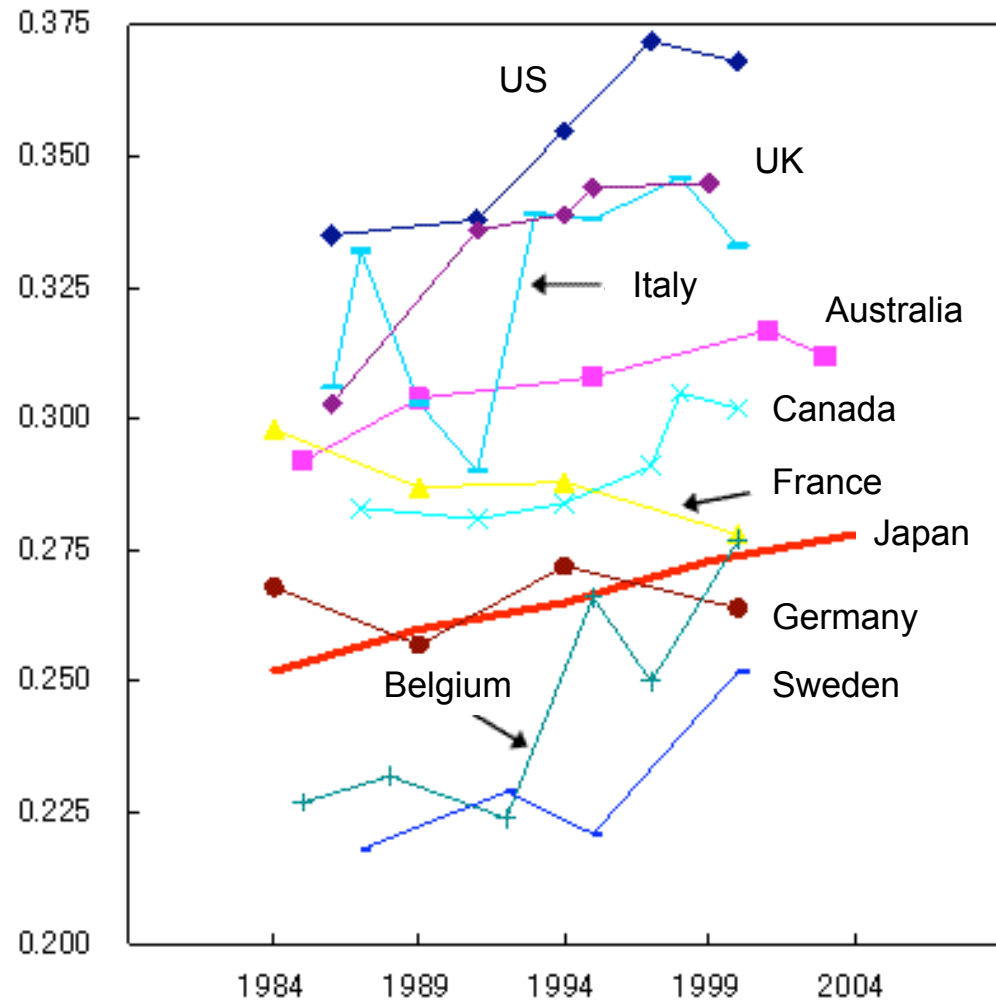
N-curve in G8 countries ?



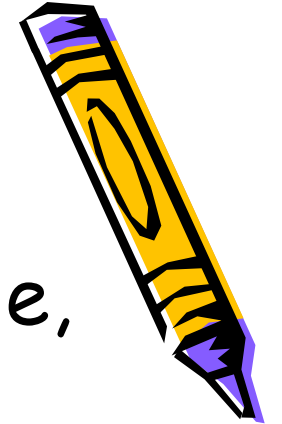
Recently,
G8 countries seem
becoming more and more
unequal.
Some economists proposed
N-curve hypothesis.



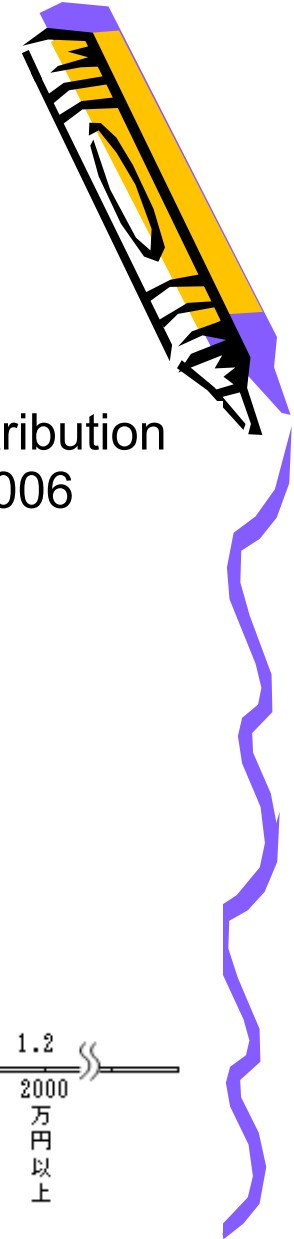
Gini coefficient in developed countries



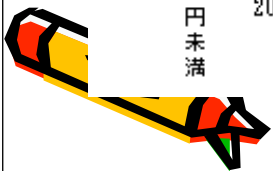
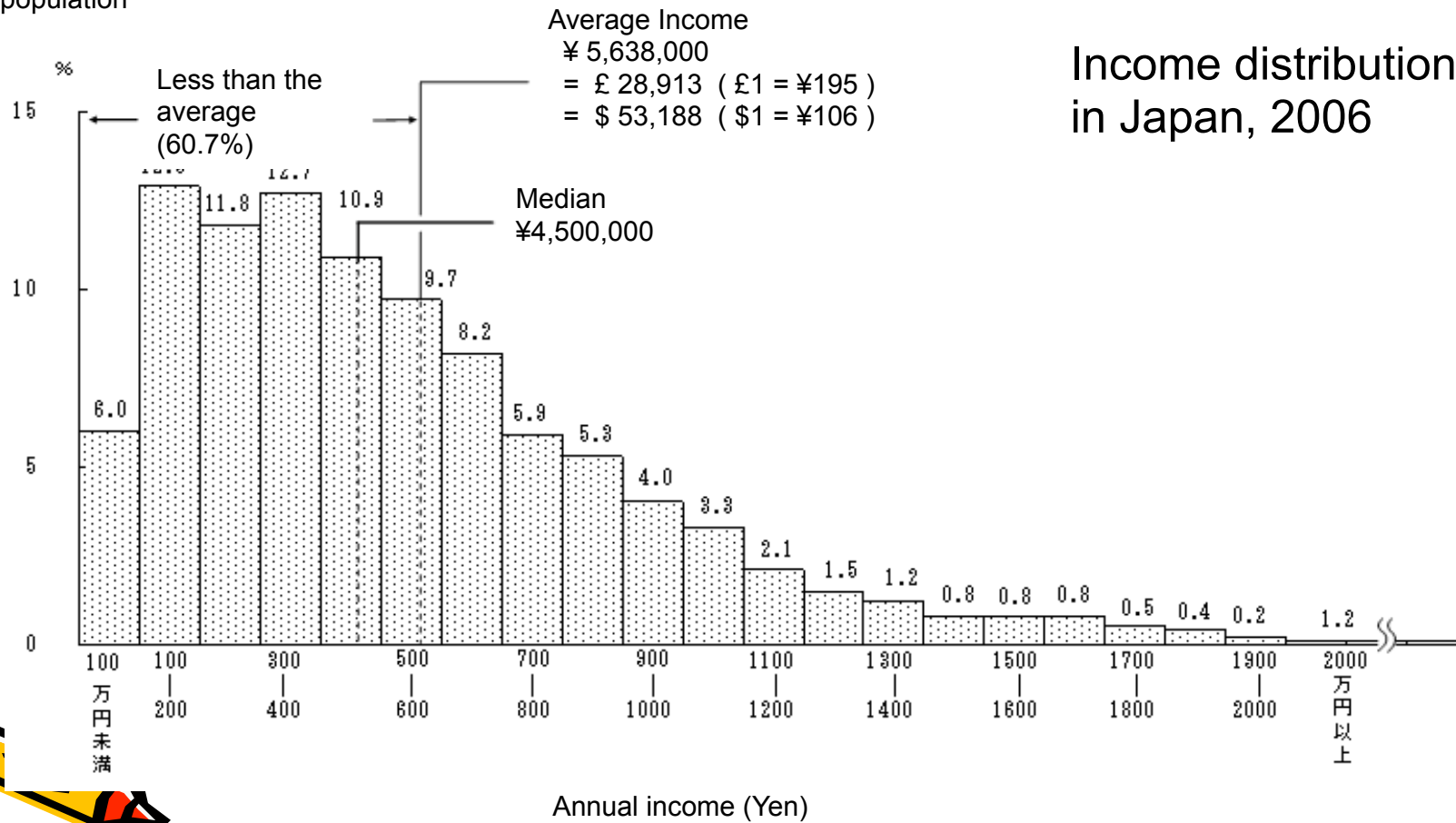
- Which hypothesis is more plausible, the inverted U or N-curve ?
- In other words, is Japan still an equal society or becoming unequal ?
- Let's confirm it.



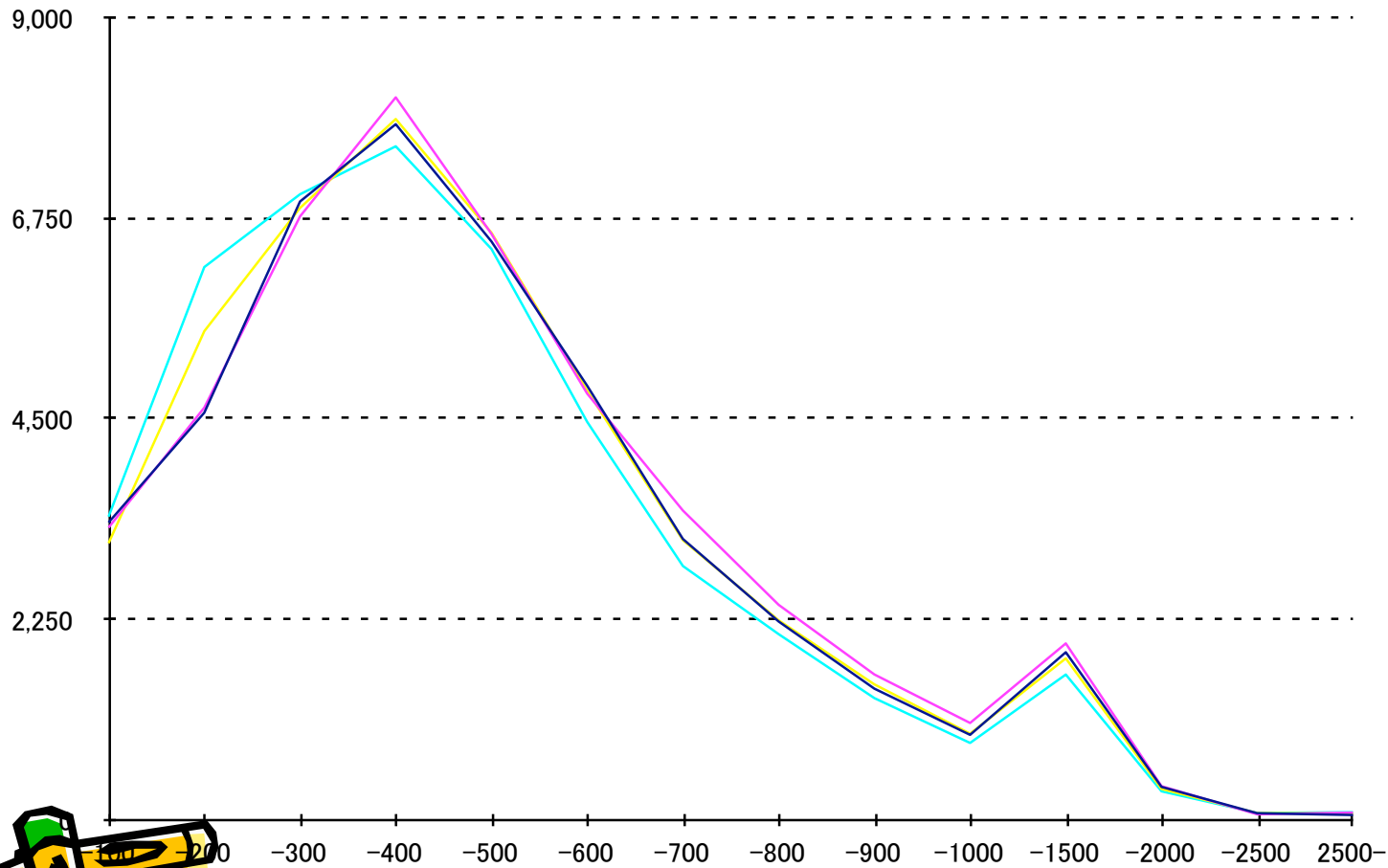
Japan's case: Evidence (1)



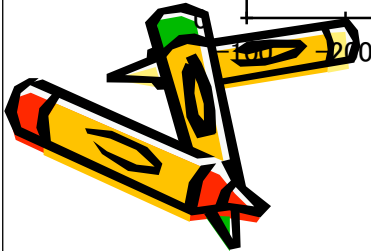
percentage of the population



Evidence (1) - continued



Income Distribution in Japan



Evidence (2)

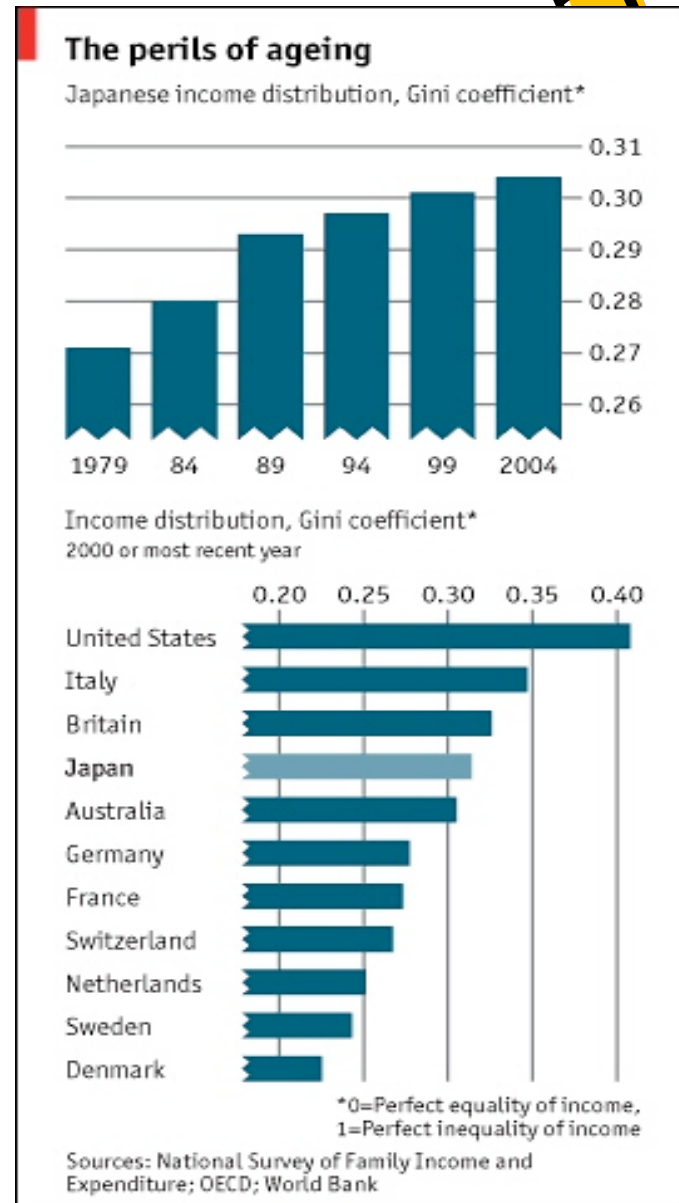
Gini coefficient:

takes a value from 0 to 1

A larger value implies
a larger degree of inequality

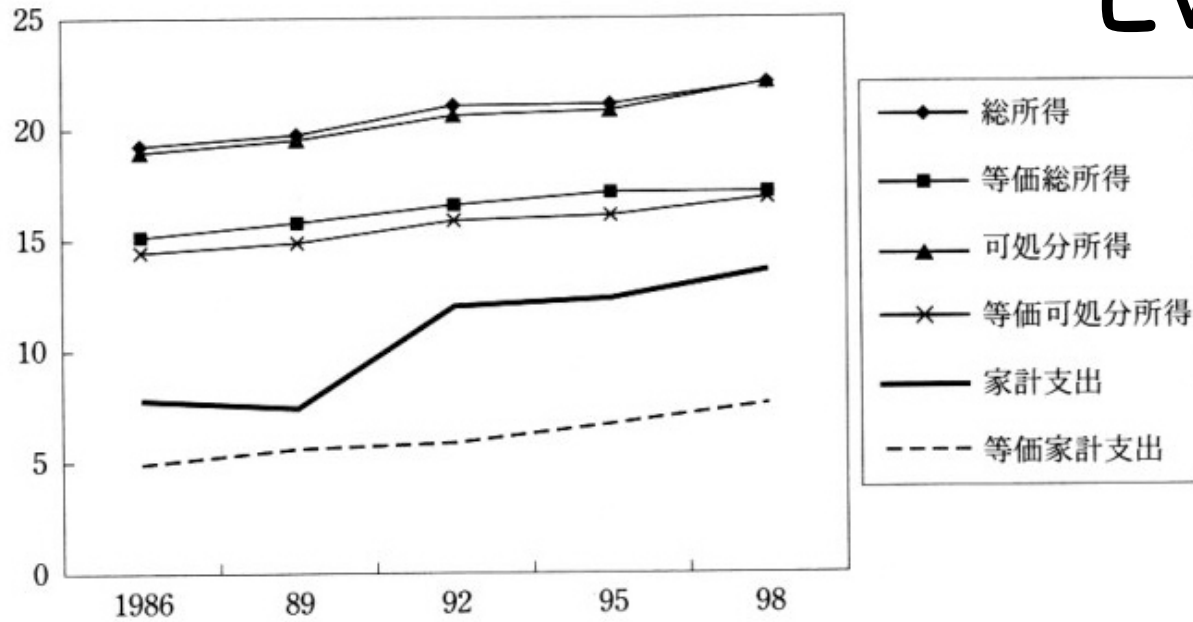


Gini Coefficient

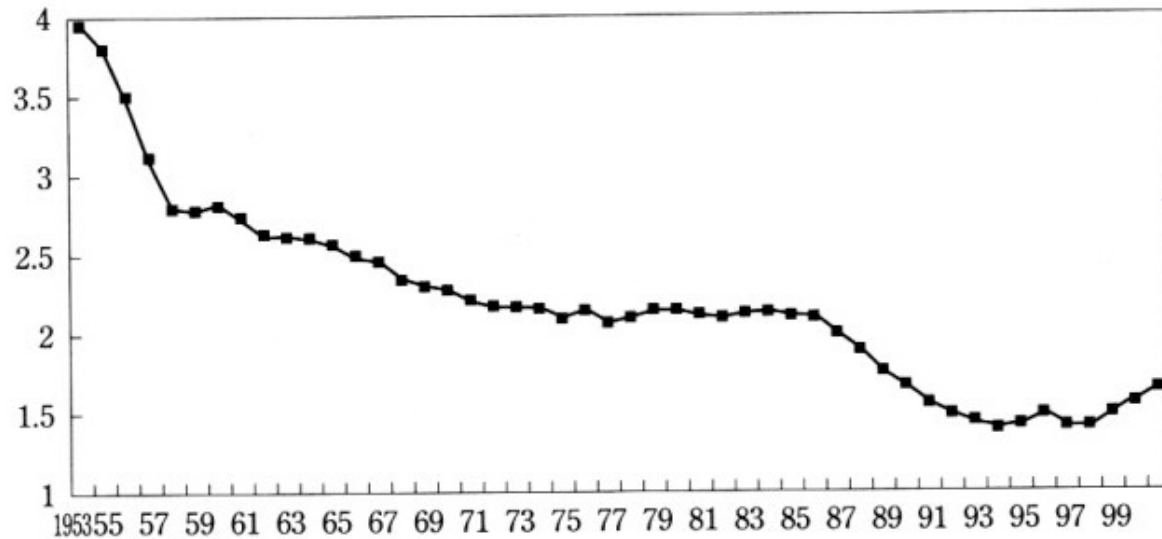


The Economist, Jun 15th, 2006

Evidence (3)



Poverty Ratio
← recalculated by
a Japanese researcher



Share of households on relief, the livelihood-protection



So far, evidence shows...



1. Japan's **Income Distribution** has been gradually shifting leftwards at lower income levels. But the change is very small.
2. Japan's **Gini coefficient** has been increasing, which means the gap is widening.
3. **The poverty-ratio** was almost same in the 1980s, which means the sudden widening of the gap has not occurred.
4. **The rate of household on relief** has rather been decreasing constantly, which means the number of the extremely poor has been decreasing.

1,3 and 4 contradict N-curve, while 2 supports it.

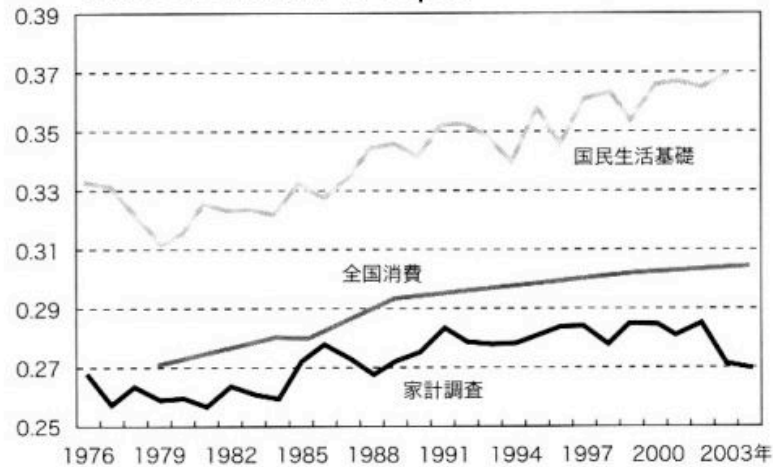
So, let's inspect 2 in detail:

Why has the **Gini coefficient** risen recently in Japan ?

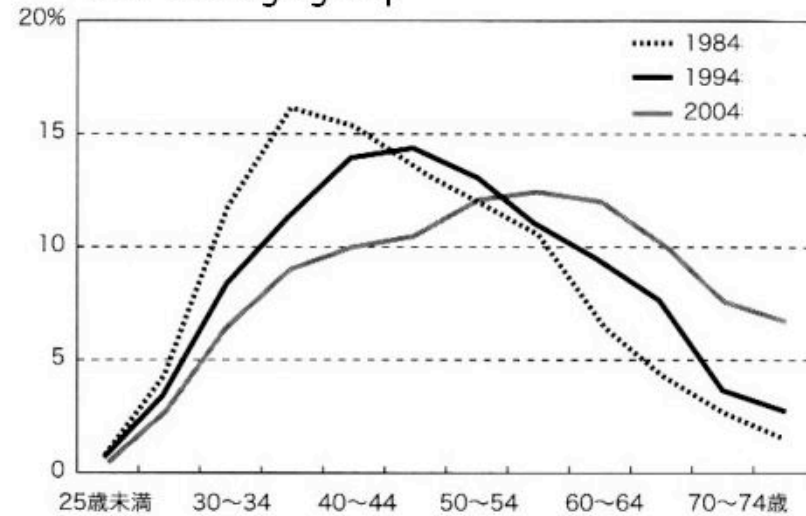
Why has the Gini coefficient risen ?



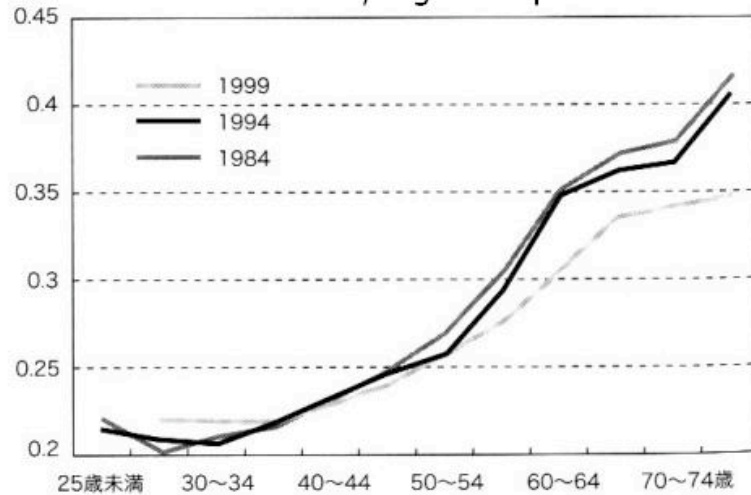
Gini Coefficient in Japan



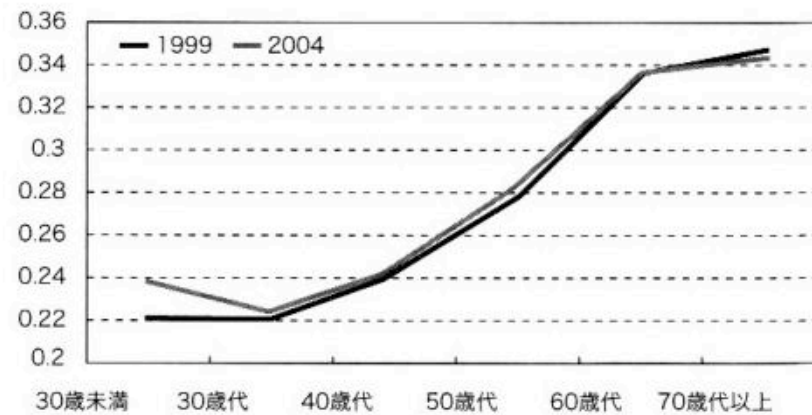
Share of age group



Gini Coefficient by Age Groups



Gini Coefficient by Age Groups



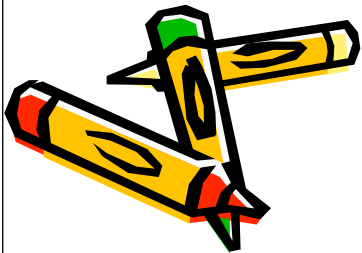
Why has the Gini coefficient risen ?

- G.c. is higher in the older age group.
- G.c. within each age group unchanged.
- Recently the population in the oldest age group has been increasing.

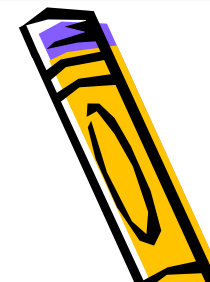
- Therefore, the recent rise of G.c. has been caused by the increase in the number of old people.
- This is an inevitable thing in an ageing society.
- It does not necessarily mean Japan is getting unequal because the retired old people usually have a fair amount of savings although their income is zero.



- So far, we've got no trustful evidence which shows that the Japanese society is becoming more and more unequal.
- But then, why do people talk about "Gap-widening" so nervously ?



Why do people talk about “the gap-widening society” so nervously?

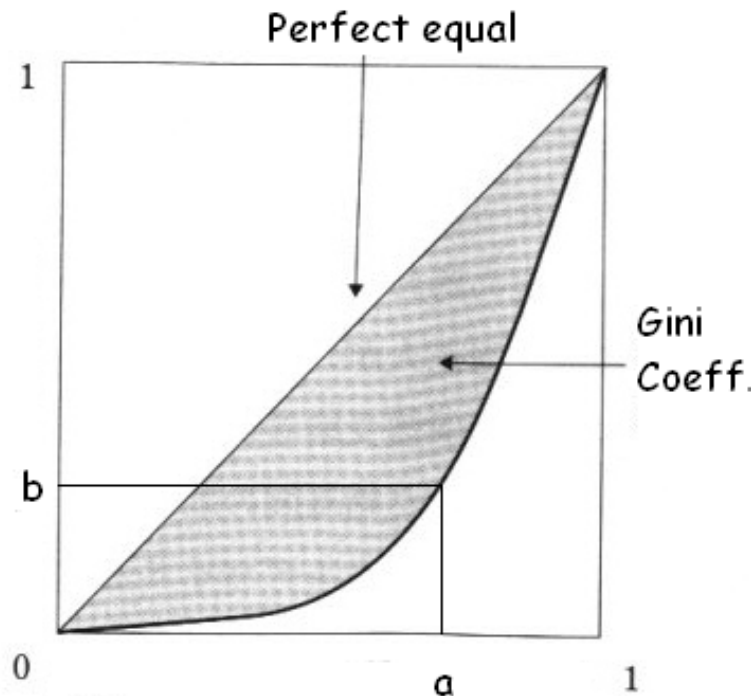


People are nervous of the gap-widening in the future.

- Actually, the gap in consumption expenditure shows a sign of widening.
- Actually, Gini coefficient rose in the youngest group. Among young people, the unemployment rate rose and the number of part-time workers increased.
- The Japanese government has recently taken some conservative policies. For instance, in the progressive income tax and the inheritance tax, the tax rates for richer people have been alleviated.
- The seniority-order wage system and life-time employment custom are collapsing. Instead, many companies are introducing a result-related wage system.



(Exercise) Gini coefficient



On the horizontal axis, people are located in ascending order from the poorest to the richest.

And the solid curve, moving from the poorest to the richest, plots the proportion of people against the corresponding proportion of total income obtained by those people. For instance, 100 a % people from the poorest hold 100 b % of total amount of income in the society.

This curve is called **Lorenz curve**.

And the **Gini coefficient** is (the shaded area) $\times 2$.

As you can easily see, it takes a value in the range 0-1.

In the perfect equal society, it will be 0.

In the perfect unequal society, it will be 1.



Numerical examples

Load the following file into Excel.

<http://rio.andrew.ac.jp/R/gini.xls>

