Comparing Income Inequality: Drowning by Numbers

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The views expressed here are solely those of the authors and they do not necessarily reflect those of the Bank of Italy

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Looking back …

Data improvements

- No longer the times of Kuznets' "Economic Growth and Income Inequality" (1955)

  I am acutely conscious of the meagerness of reliable information presented. The paper is perhaps 5 per cent empirical information and 95 per cent speculation, some of it possibly tainted by wishful thinking

- Yet, with few exceptions, information in early 1990s was still sparse in many countries, and almost absent in several others + comparability problems across countries/years

- Nowadays, the situation has tremendously improved, despite data gaps and comparability problems remain

- Now we are faced with an embarrassment of riches!

Looking back …

Great attention currently paid to inequalities

- Oxfam reports for the opening day of the Davos World Economic Forum since 2014. This year:

  The inequality explosion – survival of the richest

  In recent decades, economic inequality has soared to extreme and dangerous levels. It has become an existential threat to our societies, crippling our ability to end poverty, corroding politics and putting the future of our planet in peril

- Heightened concern for inequality originates in the Great Recession of 2008-09, but income disparities started to grow much earlier (when they did)

- Change of attitudes in international organisations …

SPEECH

русский 中文 español العربية 日本語 français

Towards a More Secure Recovery Shared by All

**2017 Annual Meetings Plenary Speech
by Christine Lagarde, IMF Managing Director**

October 13, 2017

(b) Address excessive inequality head-on

Nor should we miss this opportunity to address more decisively—and more directly—the issue which has so damaged our peoples and societies.

I am talking about excessive inequality. It hinders growth, erodes trust, and fuels political tensions.

Despite reductions in poverty and inequality *between* countries over the past generation, income and wealth inequality *within* countries has been rising. Today the top 1 percent owns about half of the world's wealth.

How can we tackle this issue more head-on?

Outline

Advances in comparing income inequality in last 30 years

1. Data progress

2. Italy as a case study

3. The "inequality explosion"

4. Conclusions

As in Atkinson and Brandolini (2001), take the viewpoint of analyst who seek ready-made summary statistics on income distribution in different countries at different dates to use in a regression or to draw inequality comparisons, and does not wish to delve into data technicalities

1. Data progress

Prelude: the first four post-war decades

- After World War II, the United Nations led the way in collecting cross-country data on income distributions
  - E.g.: UN Economic Commission for Europe, 1957: tax-based data for DK, W-GE, NL, SW, UK from original national sources

    [the measures] can either be read off from the graph or – more precisely but rather more laboriously – determined by algebraic formulae that have been determined by Gini and others. For the purposes of this study mathematical measurement was not considered necessary, and readings from curves drawn freehand have been made, with the aid of a planimeter when necessary

    Some problems in trying to replicate such freehand drawing!

Prelude: the first four post-war decades

- Many compilations ever since
    - UN agencies
    - ILO: Paukert 1973; Lecaillon et al. 1984; van Ginneken & Park 1984; Tabatabai 1996
    - World Bank: Jain 1975
    - OECD: Sawyer 1976
    - Individual scholars: Kravis 1960, Kuznets 1963, Adelman & Taft Morris 1971, Roberti 1974, Schnitzer 1975, Cromwell 1977, Fields 1989
- They vary considerably in terms of scope, country/year coverage, data documentation
- In general, well understood that differences in sources and definitions affect data comparability
    - Cromwell (1977) adjusted Ginis by additive factors

Prelude: the first four post-war decades

- **Some in-depth studies**

- Kuznets (1963) → effect of changing income concept, shifting from income to expenditure, adjusting for family size → but well aware of limitations of its statistical material

   It may not be an exaggeration to say that we deal here not with data on the distribution of income by size but with estimates or judgments by courageous and ingenious scholars relating to size distribution of income in the country of their concern

- van Ginneken & Park (1984) stands out for documentation and attention to data comparability

   – Systematic adjustment of original survey data to national accounts and population estimates

   – Improvements achieved at the cost of low coverage relative to previous efforts (33 countries)

Prelude: the first four post-war decades

- **Some mere compilations**

- Jain (1975): statistics for 81 countries in 1952-73 for 405 obs.
    - *"Stocktaking exercise" rather than "a set of 'officially accepted' estimates of the distribution of income"*

      "... the data reported in this paper are not in any sense presented as 'reliable' or even 'best estimates'"
    - Very poor description of data and no clear definition of underlying income concept
    - Kuznets' (1976) critical remark

      The author of the publication presents it as a compilation of data, without claiming responsibility for quality. But one wonders whether a compilation excluding obviously deficient estimates would not have been more useful, even allowing for the difficulties of exercising judgment.

The situation in the early 1990s

- **Despite efforts, rather limited possibility of comparing inequality levels across countries or over time**

- Example: weakness of databases used in empirical tests in emerging literature on inequality-growth relationship

  – Alesina and Rodrik (1994)

    46 countries in "high-quality" sample and 70 countries in "largest possible" sample from Jain (1975) and Fields (1989) but no other information

  – Persson and Tabellini (1994)

    49 countries from Paukert (1973), seen as "… probably among the most reliable data for international comparison of a broad sample of countries" (but little information in Paukert about data characteristics)

Post-early 1990s developments

- **Three lines of research changed landscape**

  - As previous exercises, secondary data-sets assembled by drawing summary statistics from variety of existing sources
    - (generally) better documentation, selection, cleansing
    - methods to adjust for data differences or to fill gaps

  - Secondary data-sets assembled from rich but largely under-utilised tax records → led by Piketty, Saez, Atkinson
    - Evolved into distributional national accounts

  - Use of micro-data to overcome comparability problems
    - pioneered by Luxembourg Income Study (LIS)
    - but also indirect derivations (OECD, World Bank PIP)

Advancing and refining secondary data-sets

- **Deininger & Squire (1996)**: >2,600 Ginis for 135 countries

  – "high quality" subset of 700 obs. for 115 countries, not more than 1 per country per year, based on three criteria

  – freely available at WB website, widely used in research

    E.g. Deininger & Squire (1998) and Forbes (2000) use "high-quality" data to study inequality-growth relation, with opposite results (negative and positive, respectively)

    Both raise expenditure-based Ginis by 6.6 p.p. to align them with income-based Ginis

  – Despite improvements, not exempt from problems as discussed by Székely & Hilgert (1999), Atkinson & Brandolini (2001), Pyatt (2003)

Advancing and refining secondary data-sets

- **UNU-WIDER World Income Inequality Database (WIID)**

  - Version 1.0 (2000): 5,050 Ginis for 151 countries

    Documentation and data labels Reliable/Less Reliable

    No "high quality" sample but reverse problem of not knowing how to piece together available information

  - Latest version (June 2022): 22,758 Ginis for 201 countries

    4-grade quality rating (high/average/low/unknown): "guidance for users, not … recommendation that users discard observations not judged to be high quality"

  - **WIID Companion**: 2,384 Ginis for 197 countries, standardised for per capita net income

    Principle-based selection (but no "explicit algorithm") + joint series in overlapping years + adjustment by additive factors (estimated using paired observations from LIS)

Advancing and refining secondary data-sets

- **Standardized World Income Inequality Database (SWIID)**

  – Maximise "… comparability of income inequality data while maintaining the widest possible coverage across countries and over time. The approach, in brief, is to standardize income inequality observations using as much information as possible from proximate years within the same country" (Solt, 2009)

  – Current version: Ginis for disposable and market income for 198 countries, 5,964 obs.

  – Initially, obs. from WIID, now from original sources

Advancing and refining secondary data-sets

- **Standardized World Income Inequality Database (SWIID)**

  – Complex standardisation routine, changed over time

    - Ginis from LIS microdata as benchmarks

    - Adjustment based on multiplicative factors

    - Extensive imputation of missing values

    - Smoothing (random walk prior process) "to take into account the fact that Ginis generally change only gradually from one year to the next"

  – Attractive output: long and continuous time series

Advancing and refining secondary data-sets

- **Standardized World Income Inequality Database (SWIID)**

  – Jenkins (2015): complexity and opacity of standardisation sufficient reason to avoid using SWIID (previous version) (but other serious weaknesses, e.g. data quality inversely related to country's level of development)

  – But SWIID widely used

  – E.g. Berg et al. (2018) on inequality-growth relationship → "the best–really the only–available comparable data"

    First, lower net inequality is strongly and robustly correlated with faster and more durable growth, controlling for the effect of redistribution. Second, redistribution appears generally benign in terms of its impact on growth; only when redistribution is very large is there some evidence that it may have direct negative effects on the durability of growth

The rediscovery of tax files

- **Tax-based statistics long history in inequality analysis**

  – Statistical basis for Pareto (1895, 1897) study on the shape of income distribution

  – Used by Kuznets (1953) in his monumental volume on the shares of the upper income groups in US

    - external controls for population and income totals
    - continuity of tax records allows constructing long annual time-series

  – Kuznets' approach revived by Piketty (2003) and Piketty and Saez (2003) and extended by Atkinson and Piketty (2007, 2010)

The rediscovery of tax files

- **World Top Incomes Database (WTID)**
  - 2011: income shares of richest groups of taxpayers in >30 countries over most 20th and early 21st centuries

  - All figures computed from tax records, with few exceptions
    - Kuznets' technique: external totals, Pareto interpolation

  - Strengths
    - length and density of available time-series
    - better coverage of top earners than in sample survey

  - Shortcomings
    - income definitions reflect administrative rules
    - reference unit is taxpayer, which may be unsatisfactory
    - breaks due to changes in tax legislations
    - tax avoidance practices bias the information
    - except recently, partial coverage of population

Towards Distributional National Accounts

- **World Wealth and Income Database (WID)**

  – 2015: successor to WTID, extension to wealth

- **World Inequality Database (WID)**

  – 2017: more user-friendly website, WID.world

  – Move to Distributional National Accounts (DINA)

  – OECD, Eurostat, ECB, national agencies distribute income and wealth of the household sector in national accounts

  DINA seek to distribute the entirety of national income among resident households (including all income flowing to corporations, the government, and to and from the foreign sector). In this way they account for 100% of macroeconomic growth coming from GDP statistics

Assembling micro-databases

- **Luxembourg Income Study (LIS)**

  – Project began in 1983 to create a database of microdata collected in household surveys from different countries

  – First studies: Smeeding & Boyld Torrey 1988, Rainwater & Smeeding 1988, Buhmann et al. 1988, O'Higgins et al. 1990

  – *Income distribution in OECD countries. Evidence from the Luxembourg Income Study* by Atkinson, Rainwater & Smeeding for the OECD, 1995 set a new standard (and tried to overcome criticism of earlier Sawyer study)

  – Fundamental role in driving the process of cross-national harmonisation of methods and definitions → manual of The Canberra Group (2001)

Assembling micro-databases

- **Living Standards Measurement Study (LSMS)**

  – World Bank's initiative launched in mid-1980s to improve type and quality of household data → surveys share many common features

  – Support for >100 low and middle-income countries – but LSMS website has only 152 studies for 43 countries

- **European Community Household Panel (ECHP), EU Statistics on Income and Living Conditions (EU-SILC)**

  – European Commission's initiatives

- **Household Finance and Consumption Survey (HFCS)**

  – Eurosystem's initiative, focus more on household wealth

Assembling micro-databases

- **Global Repository of Income Dynamics (GRID)**

  – Open-access database → 23 countries

    … what we think is the best data infrastructure to inform the analysis of distributional outcomes in social sciences: data must be longitudinal, administrative, granular, and harmonized (Voxeu column, 22 December 2022)

  – E.g. statistics produced by one single master code, which ensures that critical steps in data construction are carried out uniformly across countries

  – Guneven et al. (2022): during 1985-2015, GRID countries do not display any discernible common global trend towards rising income inequality, despite the often-repeated assertions to that effect

    [But they look at labour earnings among employees …]

Assembling statistics from micro-databases

- **OECD Income Distribution Database (IDD)**

  – as of October 2022, Ginis for 45 countries, with oldest data for mid-1970s, updated on a rolling basis 2/3 times a year

  – In inequality-growth literature, used by Cingano (2014)

    income inequality has a sizeable and statistically significant negative impact on growth ... redistributive policies ... have no adverse growth consequences

- **World Bank Poverty and Inequality Platform (PIP)**

  – Evolution from PovcalNet platform, which was developed by Ravallion

Summing up

What assessment of the progress since early 1990s?

- Much improved understanding that data collection and manipulations (definitions, adjustments, etc.) matter

- Much richer portfolio of databases
  - More survey/administrative sources collected since then
  - IT advances/internet facilitate data construction/sharing

- But:
  - false tension between survey and administrative data
  - long and continuous time series appealing for users, but at which cost?
  - ready-to-use compilations still insidious for inexpert users

- Need to understand underlying sources still there

2. Italy as a case study

Embarrassment of riches? A test

How has inequality varied in Italy since World War II?

- Next slides show available evidence from some databases discussed earlier

- Can we draw a coherent story?
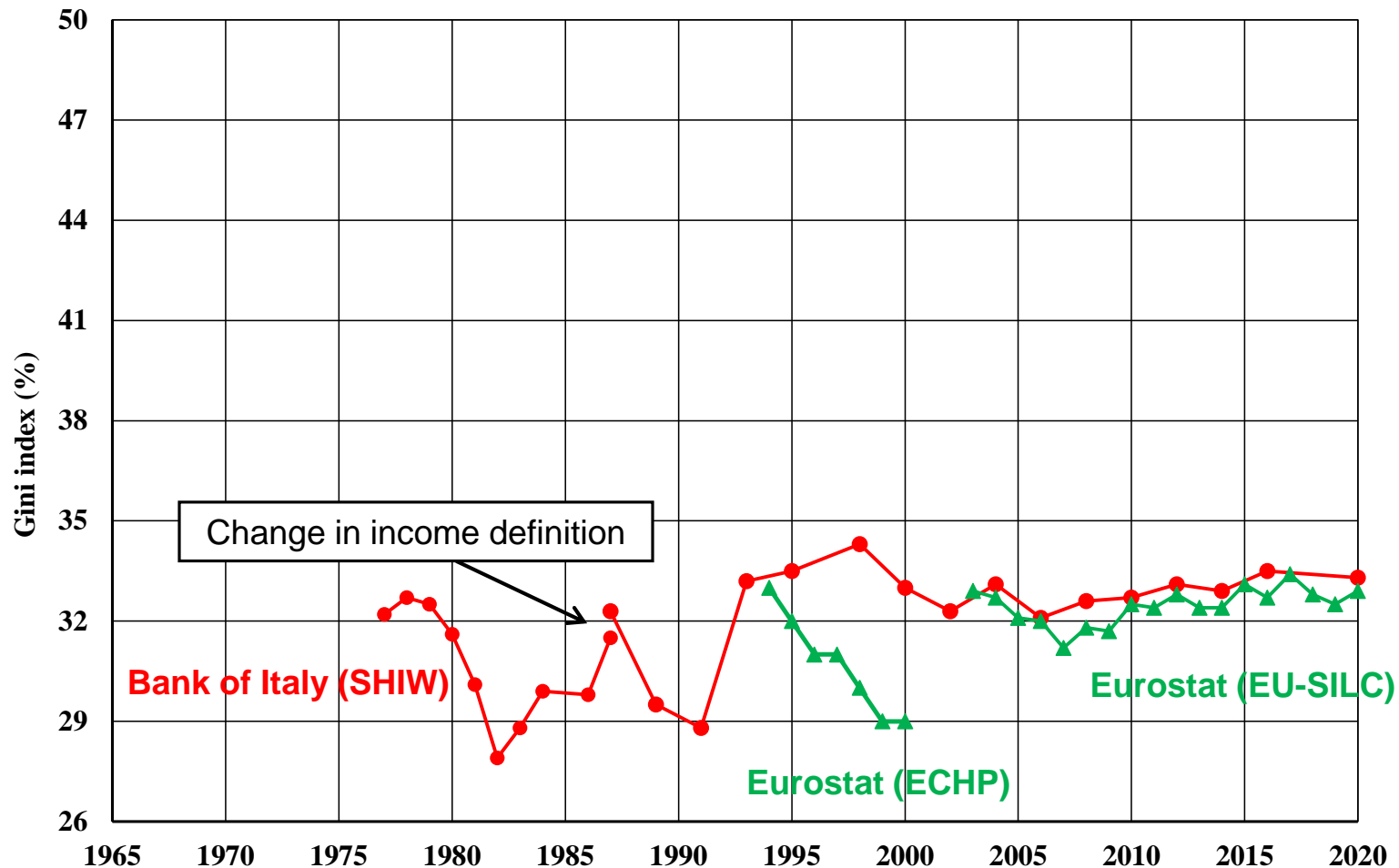
Disposable income inequality in Italy
The original sources
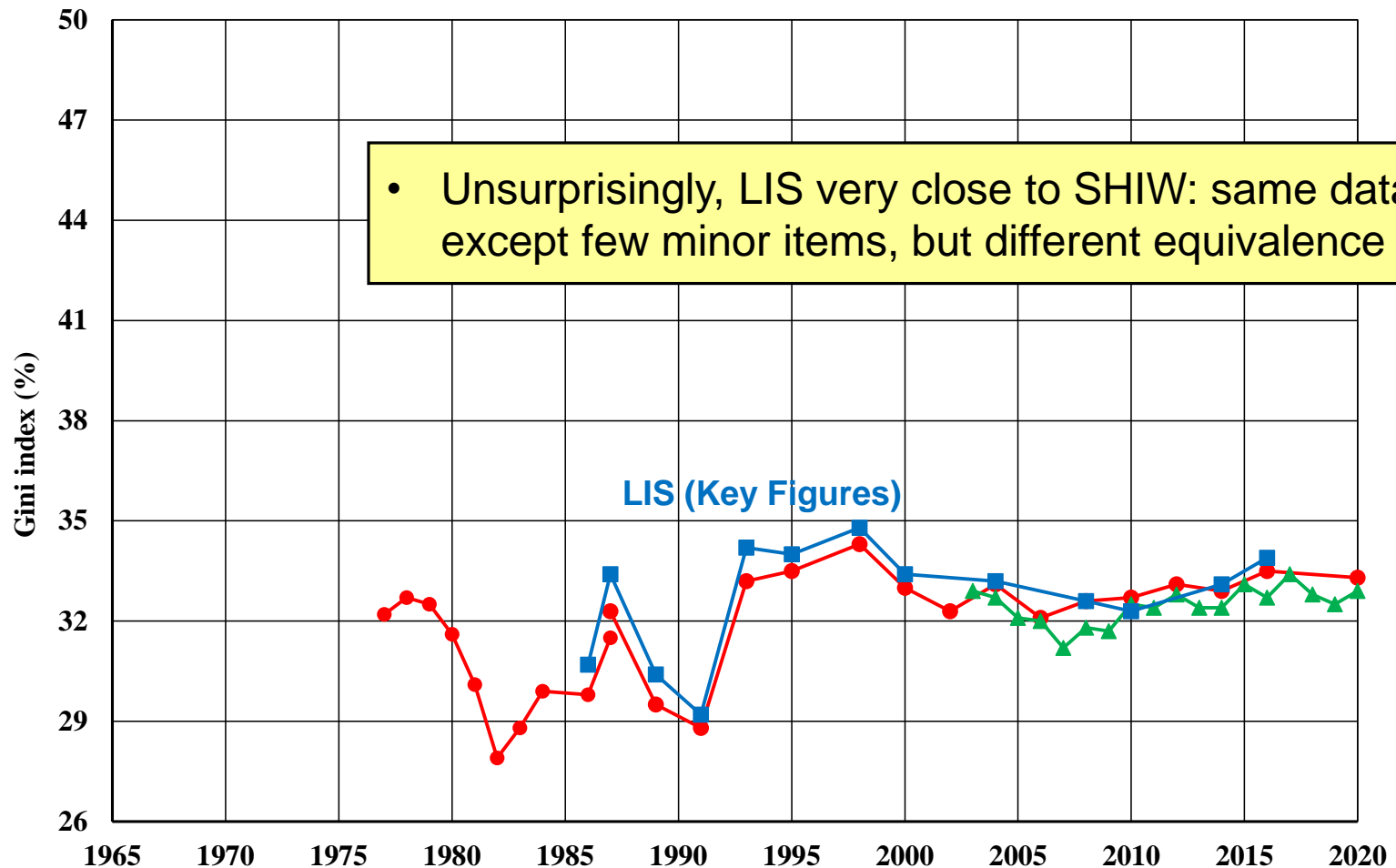

Source: websites of Bank of Italy, Eurostat.

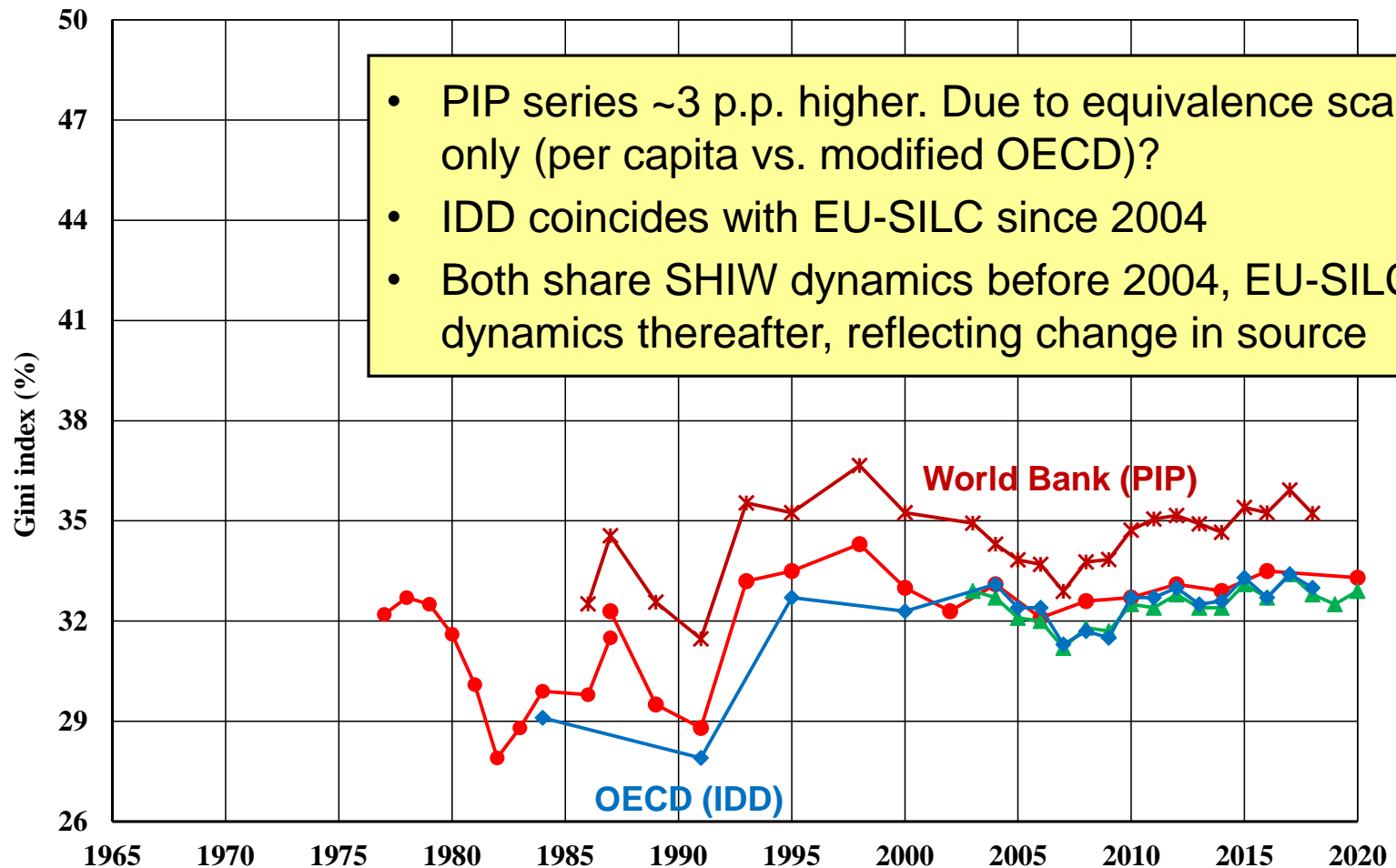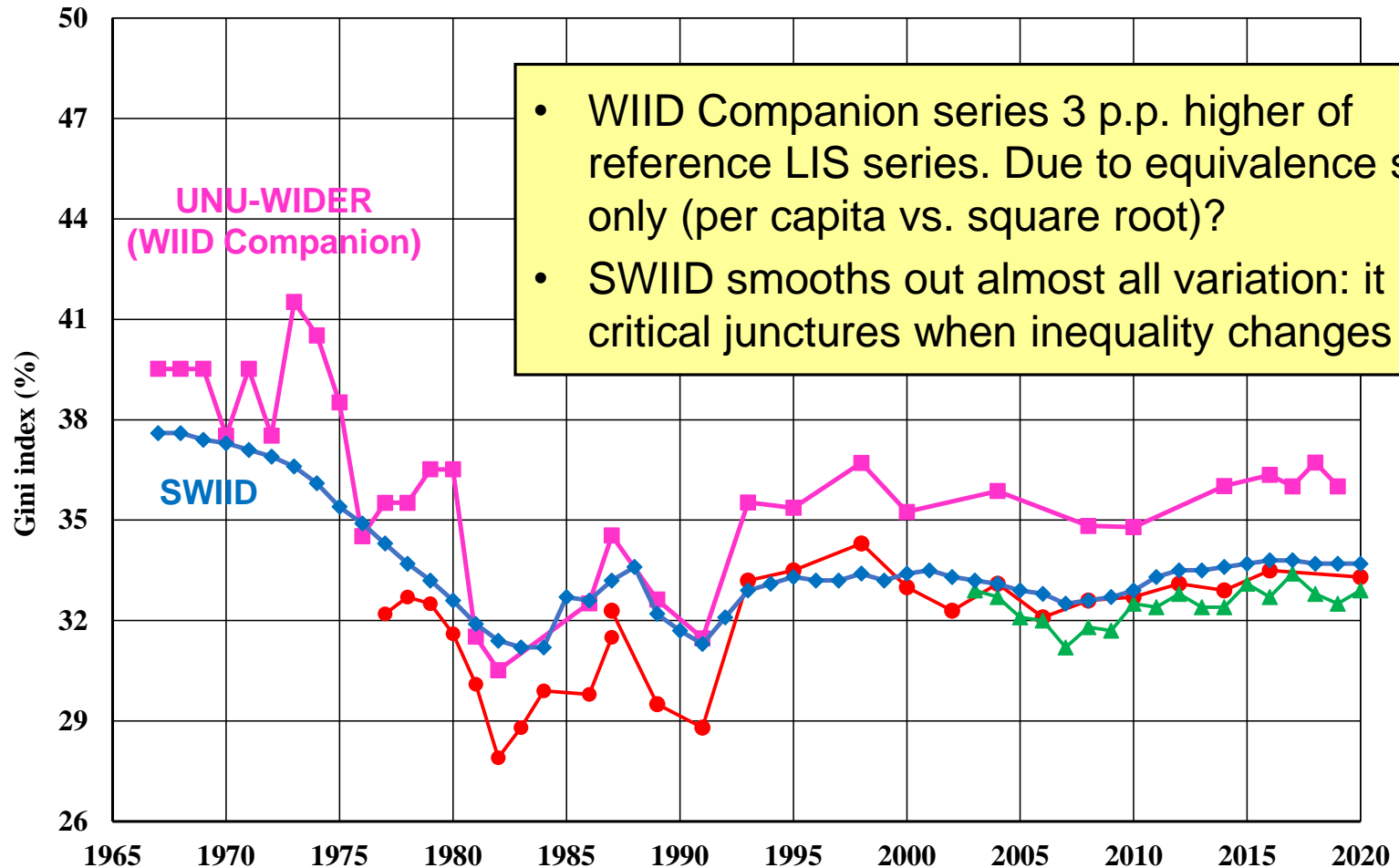# Disposable income inequality in Italy
The original sources

At this large scale, SHIW and EU-SILC broadly aligned
But differences in year-by-year dynamics, partly justified by survey differences
ECHP initially in line with SHIW, but quick depletion of panel; ignored in later slides

Bank of Italy (SHIW)

Eurostat (EU-SILC)

Eurostat (ECHP)
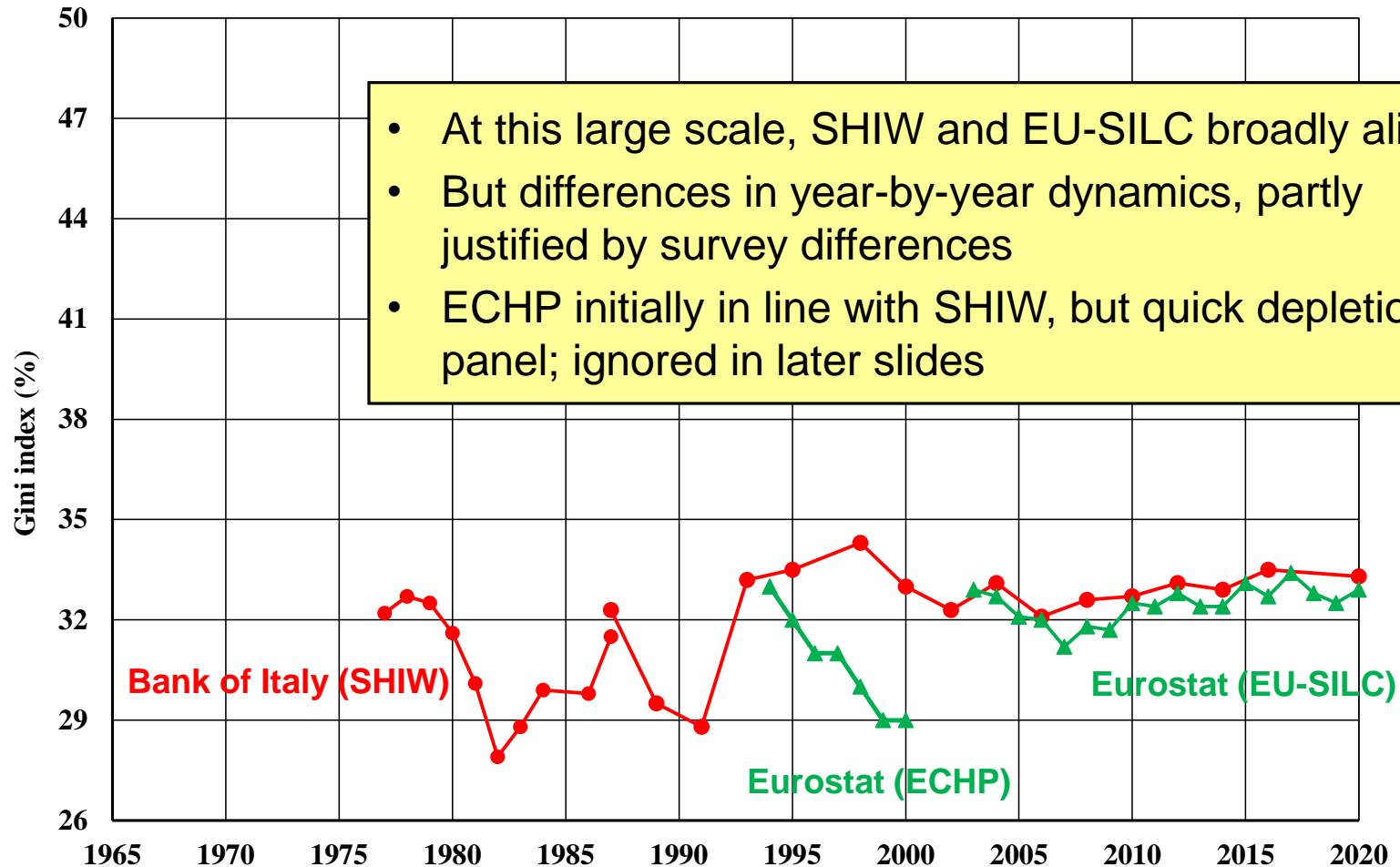
Source: websites of Bank of Italy, Eurostat.

Disposable income inequality in Italy
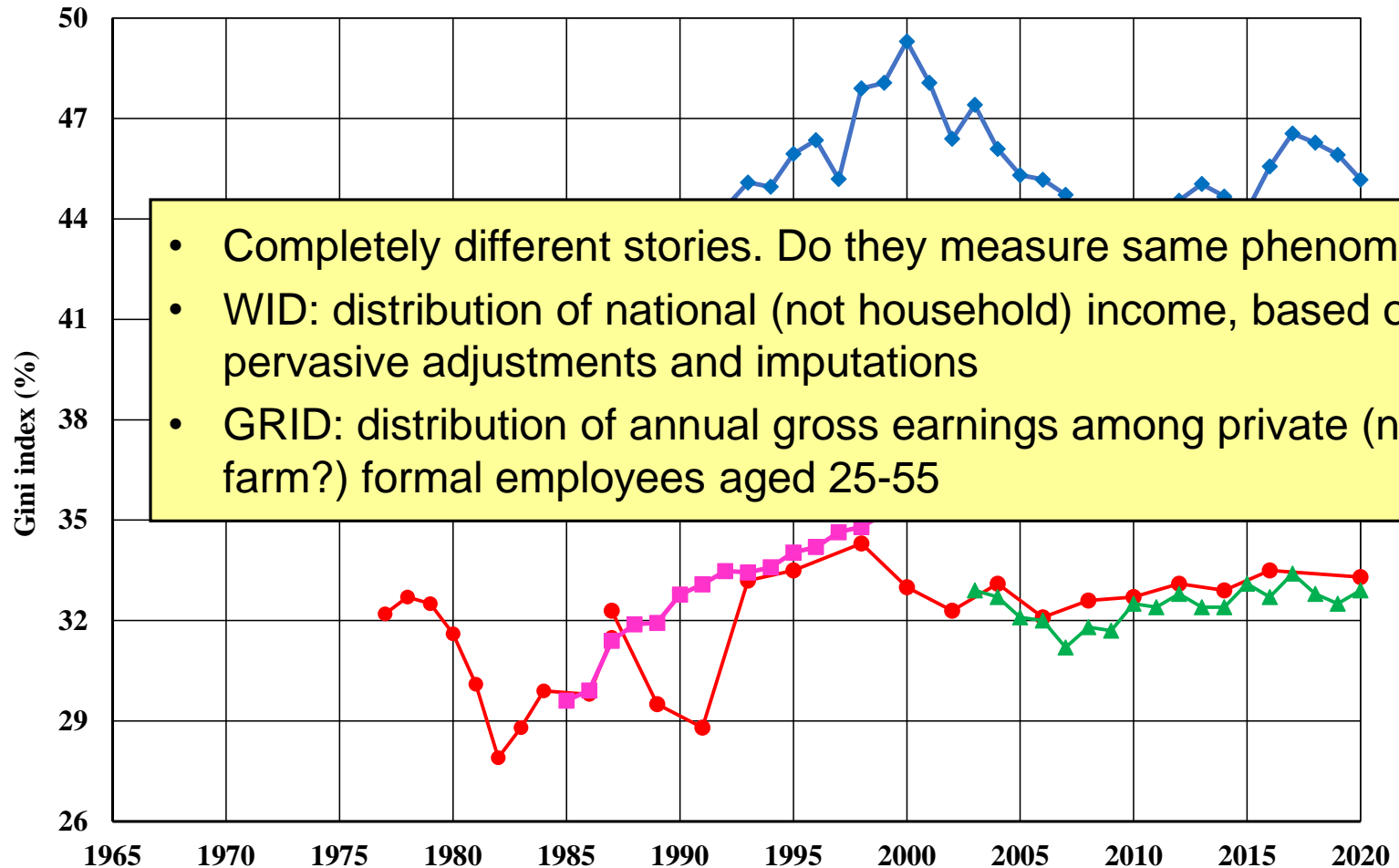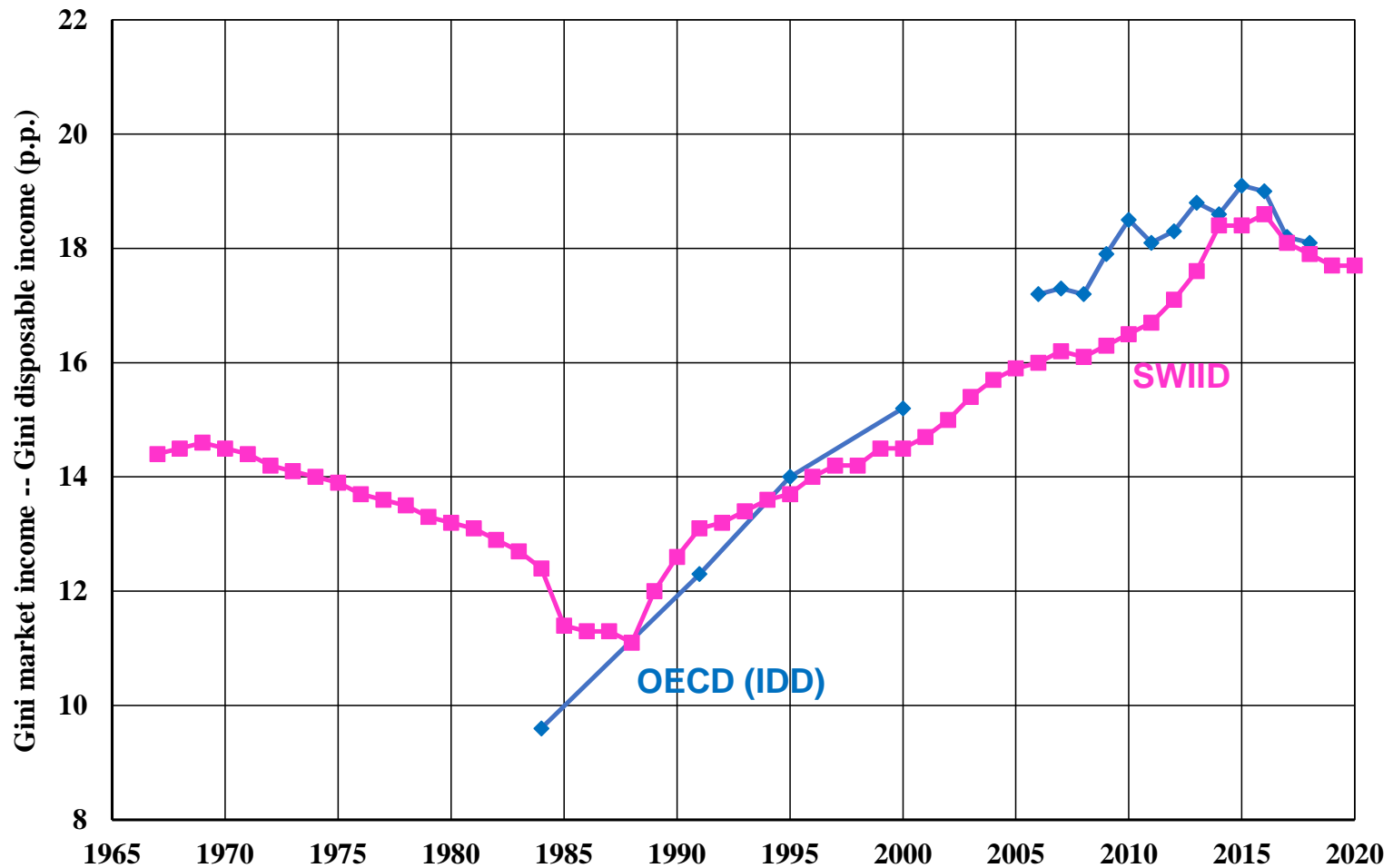# LIS

Source: websites of Bank of Italy, Eurostat, LIS.
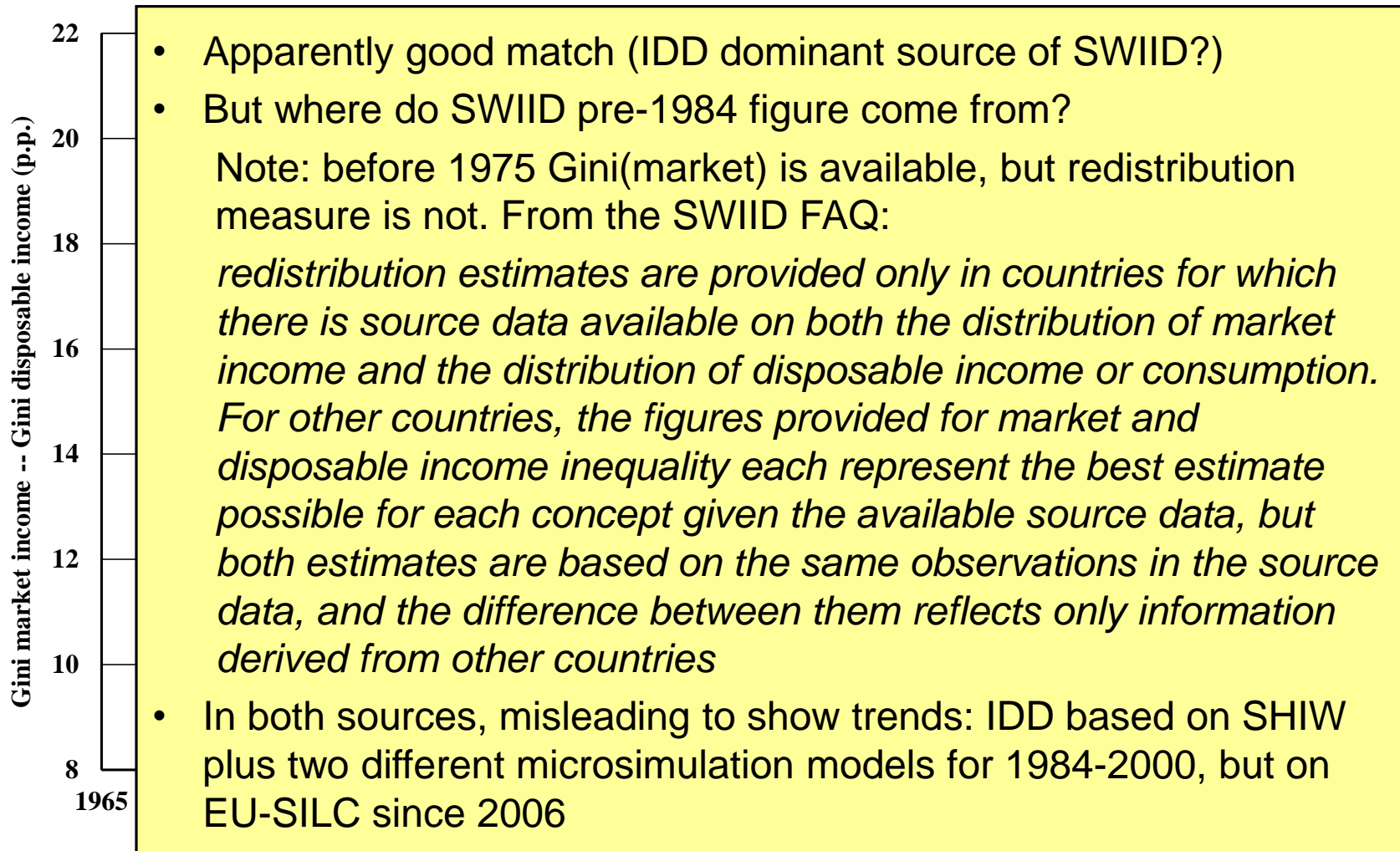
Disposable income inequality in Italy OECD and World Bank

PIP series ~3 p.p. higher. Due to equivalence scale only (per capita vs. modified OECD)?

IDD coincides with EU-SILC since 2004

Both share SHIW dynamics before 2004, EU-SILC dynamics thereafter, reflecting change in source

World Bank (PIP)

OECD (IDD)

Gini index (%)

Source: websites of Bank of Italy, Eurostat, OECD, World Bank.

Disposable income inequality in Italy
WIID Companion and SWIID

- WIID Companion series 3 p.p. higher of reference LIS series. Due to equivalence scale only (per capita vs. square root)?
- SWIID smooths out almost all variation: it hides critical junctures when inequality changes

UNU-WIDER
(WIID Companion)

SWIID

Gini index (%)

Source: websites of Bank of Italy, Eurostat, UNU-WIDER, SWIID.

Disposable income inequality in Italy
WID and GRID

Gini index (%)

WID
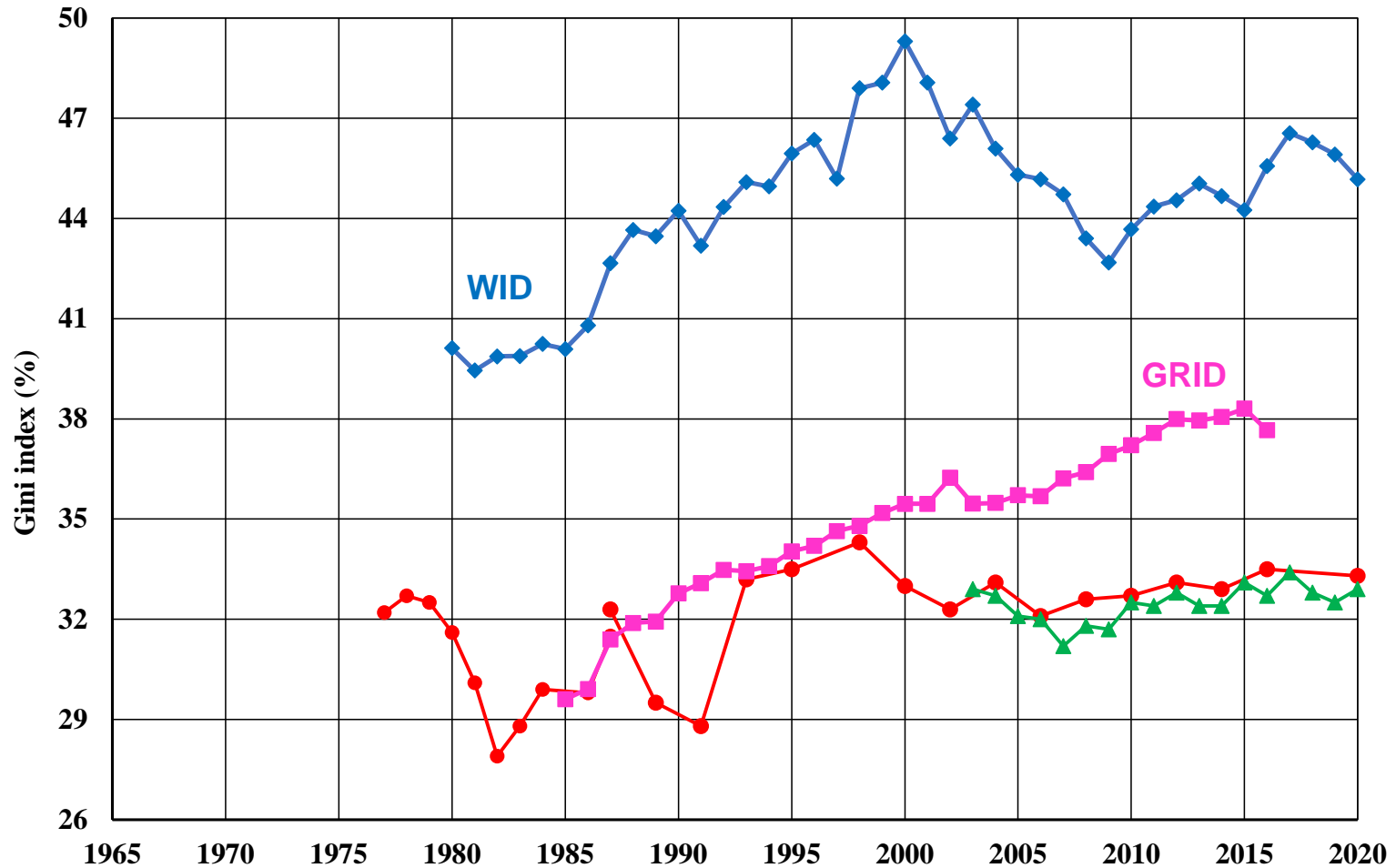
GRID

Source: websites of Bank of Italy, Eurostat, WID, GRID.

Disposable income inequality in Italy WID and GRID

Gini index (%)

- Completely different stories. Do they measure same phenomena?
- WID: distribution of national (not household) income, based on pervasive adjustments and imputations
- GRID: distribution of annual gross earnings among private (non-farm?) formal employees aged 25-55

Source: websites of Bank of Italy, Eurostat, WID, GRID.

Absolute income redistribution in Italy OECD and SWIID

Source: websites of OECD and SWIID.

Absolute income redistribution in Italy OECD and SWIID

Gini market income -- Gini disposable income (p.p.)

22 —

20 —

18 —

16 —

14 —

12 —

10 —

8 —

1965

- Apparently good match (IDD dominant source of SWIID?)
- But where do SWIID pre-1984 figure come from?

  Note: before 1975 Gini(market) is available, but redistribution measure is not. From the SWIID FAQ:

  redistribution estimates are provided only in countries for which there is source data available on both the distribution of market income and the distribution of disposable income or consumption. For other countries, the figures provided for market and disposable income inequality each represent the best estimate possible for each concept given the available source data, but both estimates are based on the same observations in the source data, and the difference between them reflects only information derived from other countries

- In both sources, misleading to show trends: IDD based on SHIW plus two different microsimulation models for 1984-2000, but on EU-SILC since 2006

Source: websites of OECD and SWIID.

Absolute income redistribution in Italy in 2019 OECD, SWIID vs. micro-simulation models
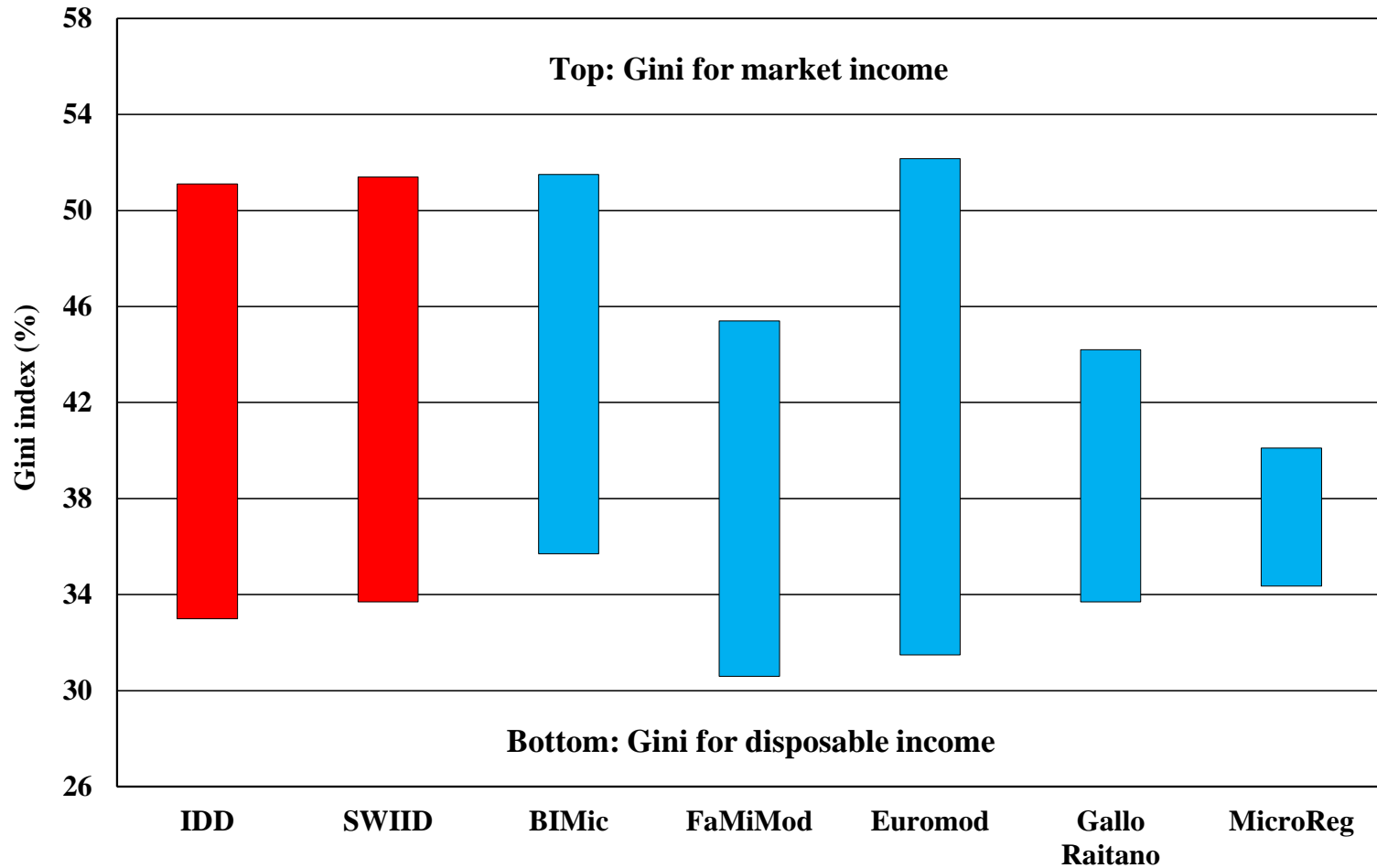
Source: websites of OECD and SWIID, personal communications for micro-simulation models.
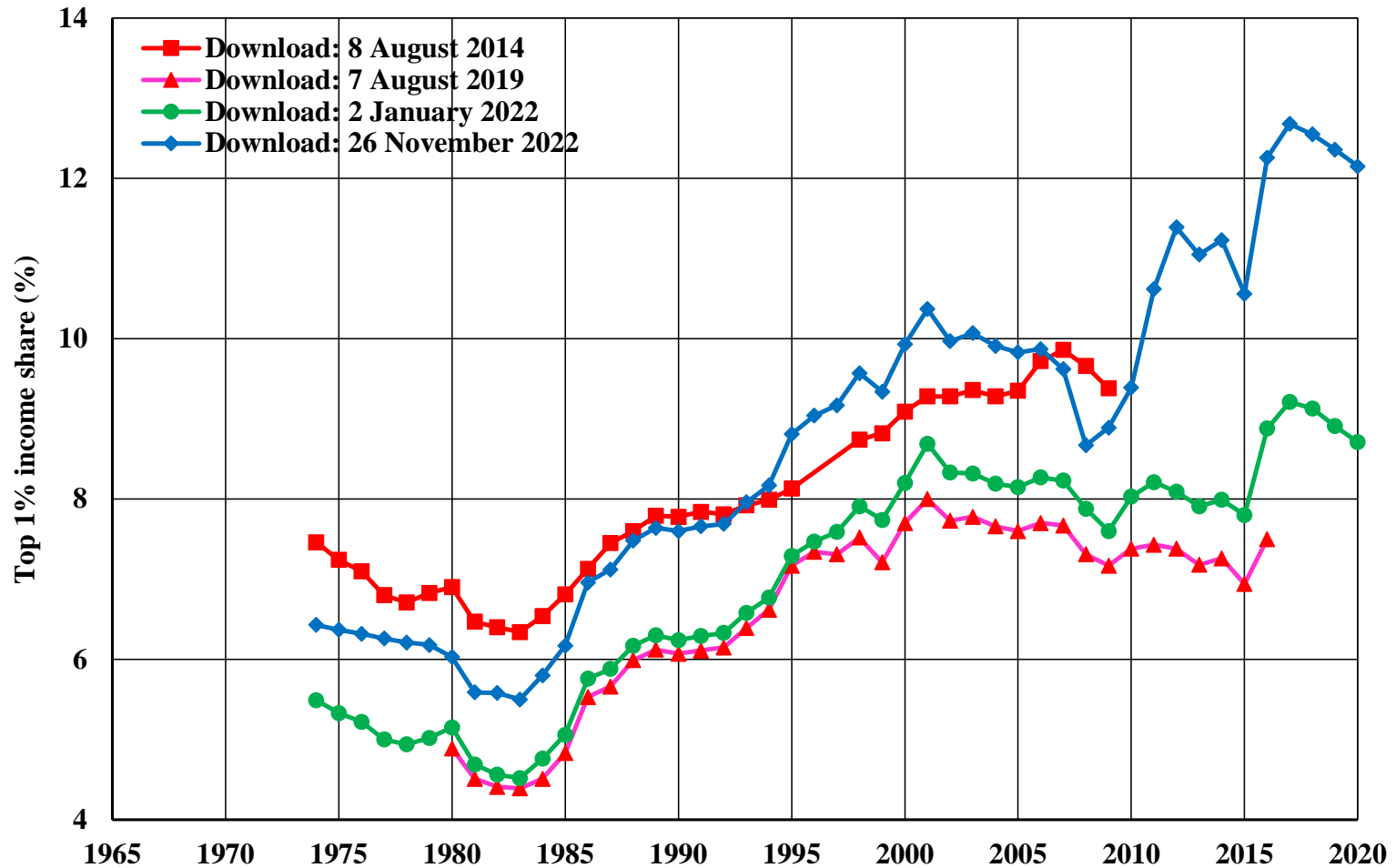
Pre-tax income inequality in Italy
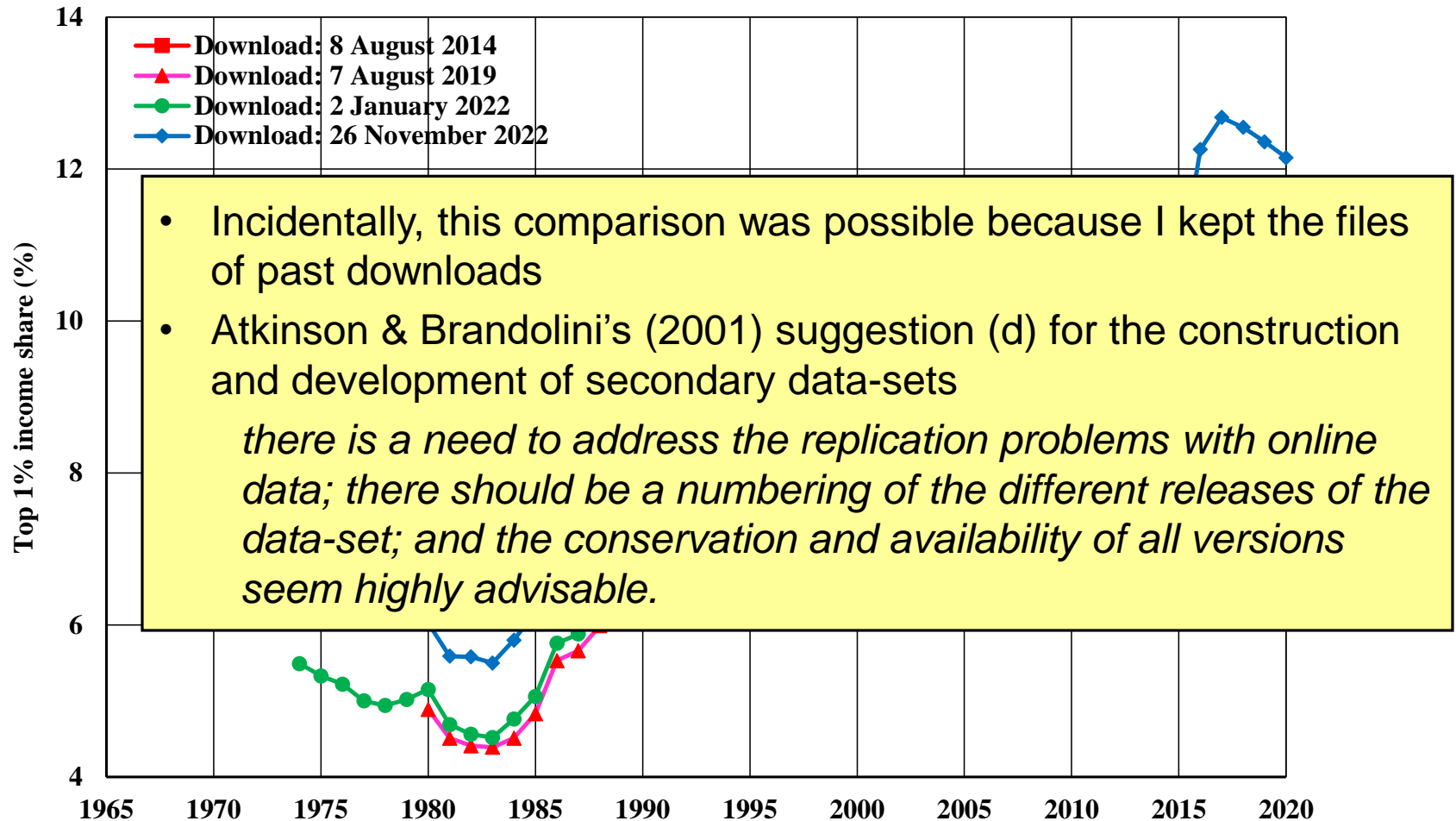# Different releases of WTID/WID
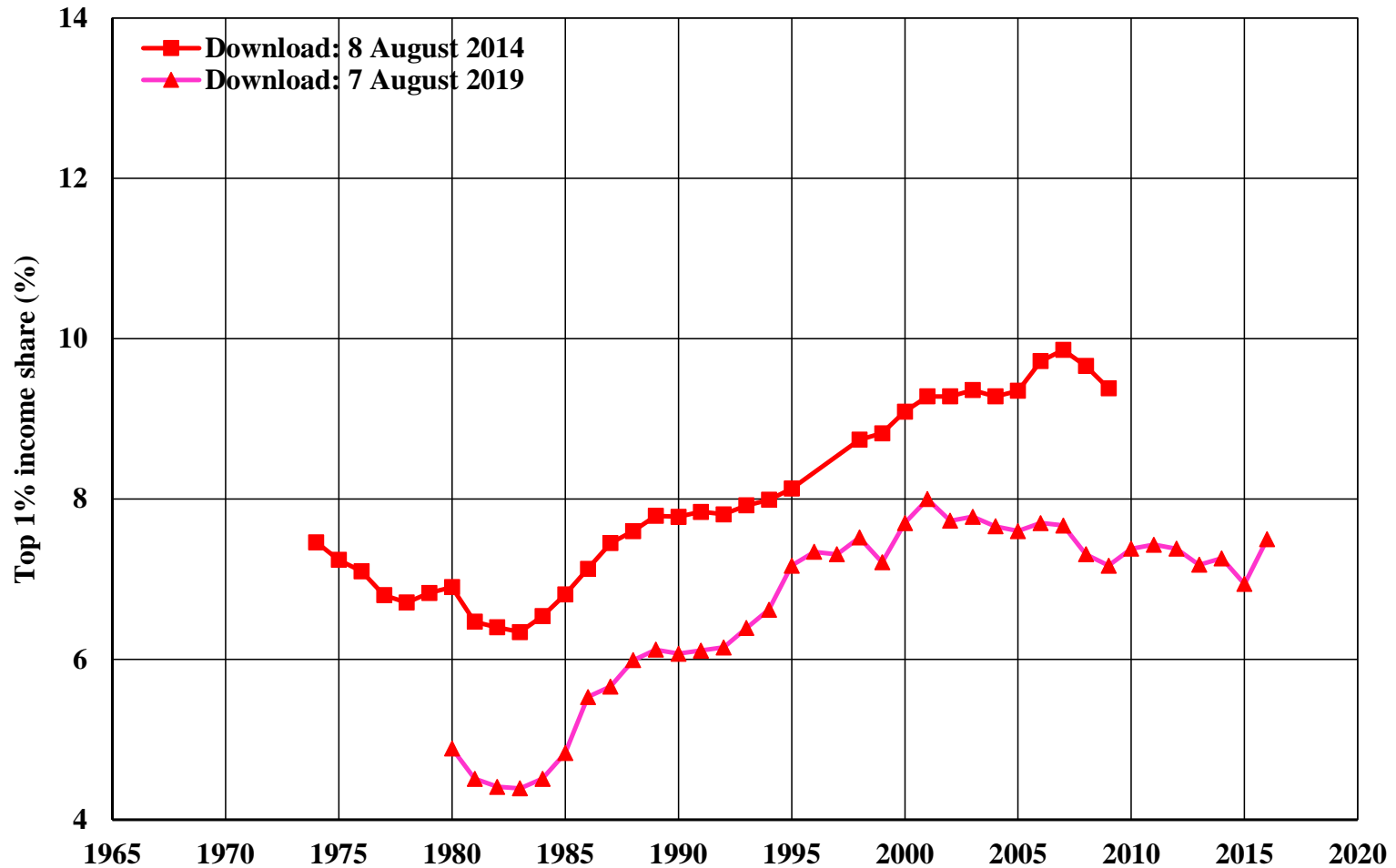
Source: websites of WTID/WID at different dates.

Pre-tax income inequality in Italy
Different releases of WTID/WID

Source: websites of WTID/WID at different dates.

Pre-tax income inequality in Italy
Different releases of WTID/WID

Source: websites of WTID/WID at different dates.

Pre-tax income inequality in Italy
Different releases of WTID/WID

Legend:
- Download: 8 August 2014
- Download: 7 August 2019
- Download: 2 January 2022
- Download: 26 November 2022

- Incidentally, this comparison was possible because I kept the files of past downloads
- Atkinson & Brandolini's (2001) suggestion (d) for the construction and development of secondary data-sets

  there is a need to address the replication problems with online data; there should be a numbering of the different releases of the data-set; and the conservation and availability of all versions seem highly advisable.
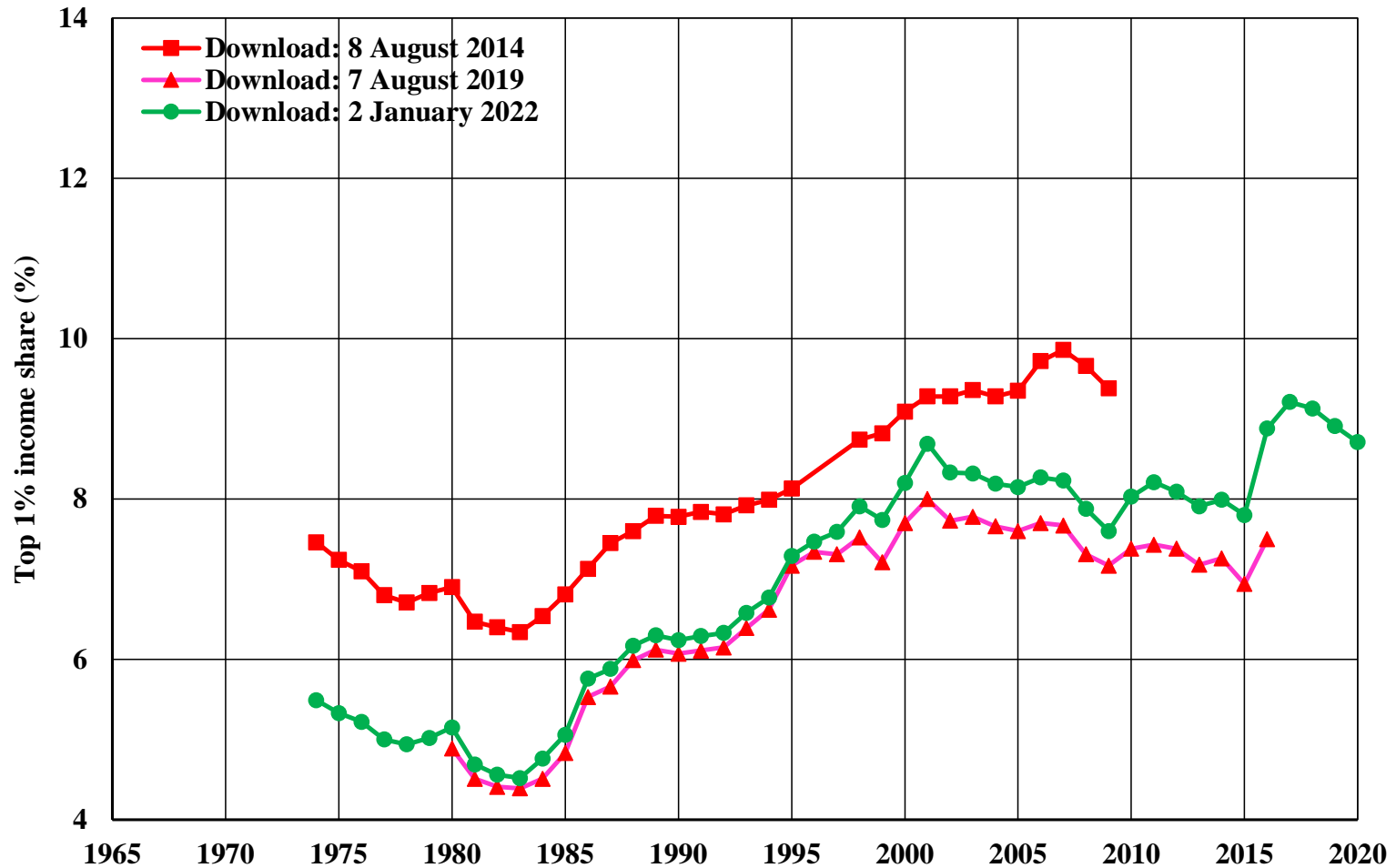
Source: websites of WTID/WID at different dates.

Embarrassment of riches? A test

One methodological consideration after this quick review

- (With many apologies) let me cite again Atkinson & Brandolini (2001), in particular the last recommendations to users

  We are not convinced that at present it is possible to use secondary data-sets safely without some knowledge of the underlying sources, and we caution strongly against mechanical use of such data-sets

Embarrassment of riches? A test

How has inequality varied in Italy since World War II?

- Next slides show available evidence from some databases discussed earlier

- Can we draw a coherent story?

  The answer is no. There may be good reasons for the differences. But if I had to tell how inequality has changed in Italy over the last half a century, I would be in trouble. Unless I choose one source and decide it is "the best–really the only–available"

3. The "inequality explosion"

Gini index and top 1% share: income
United Kingdom & United States
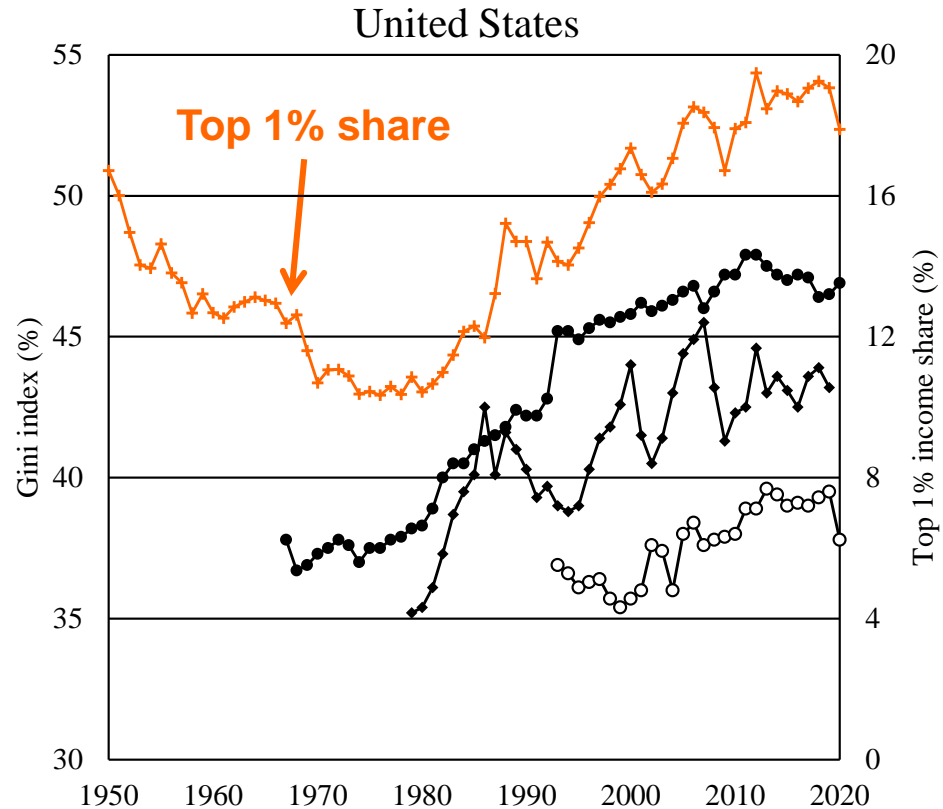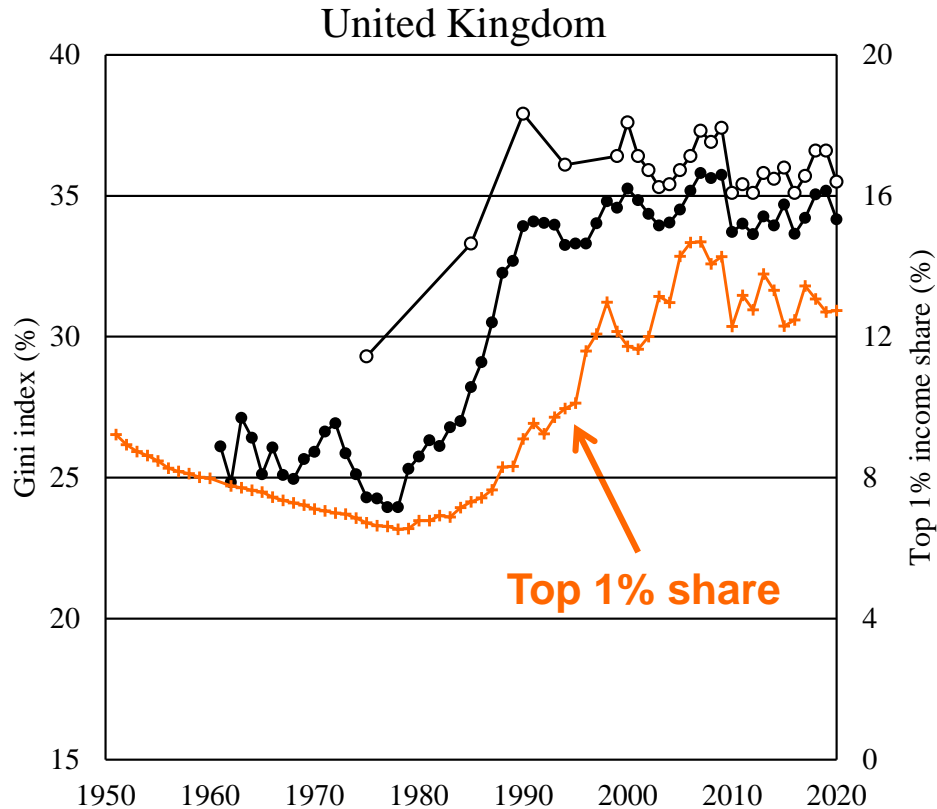
Source: national sources and OECD for Gini indices, WID for top 1% share; discontinuities not shown.

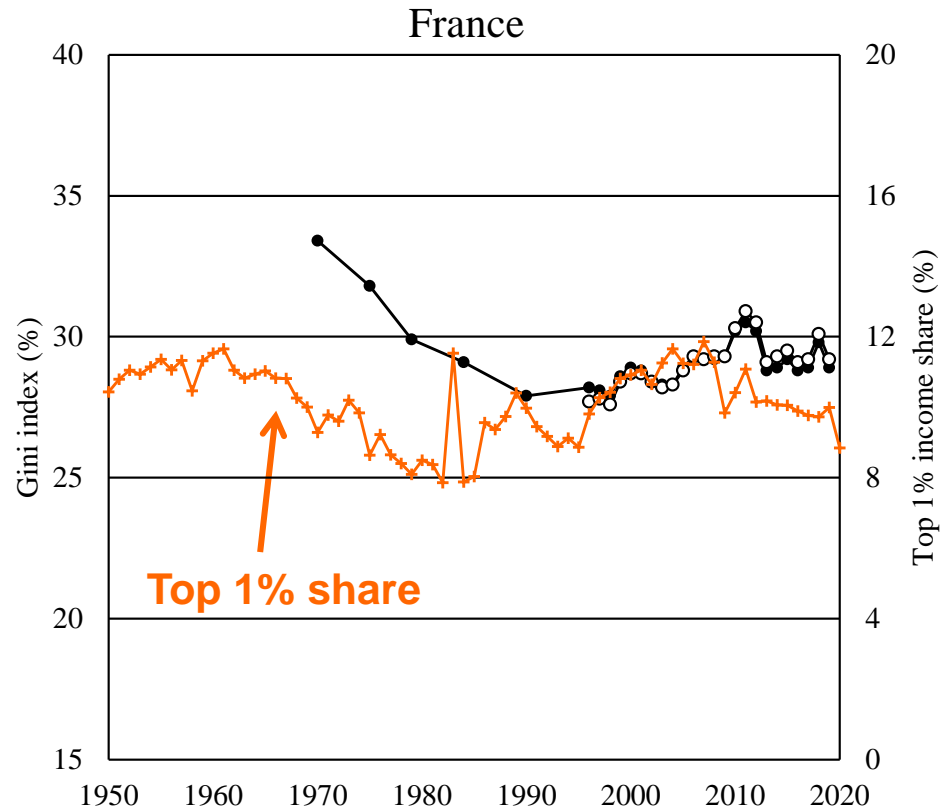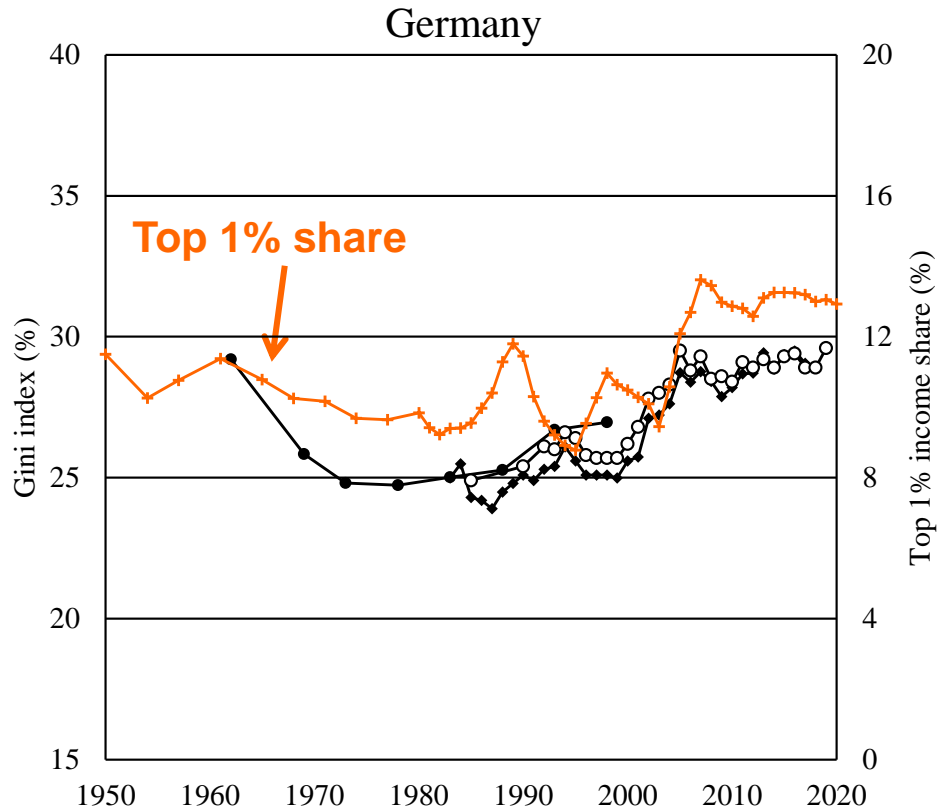# Gini index and top 1% share: income Sweden & Finland
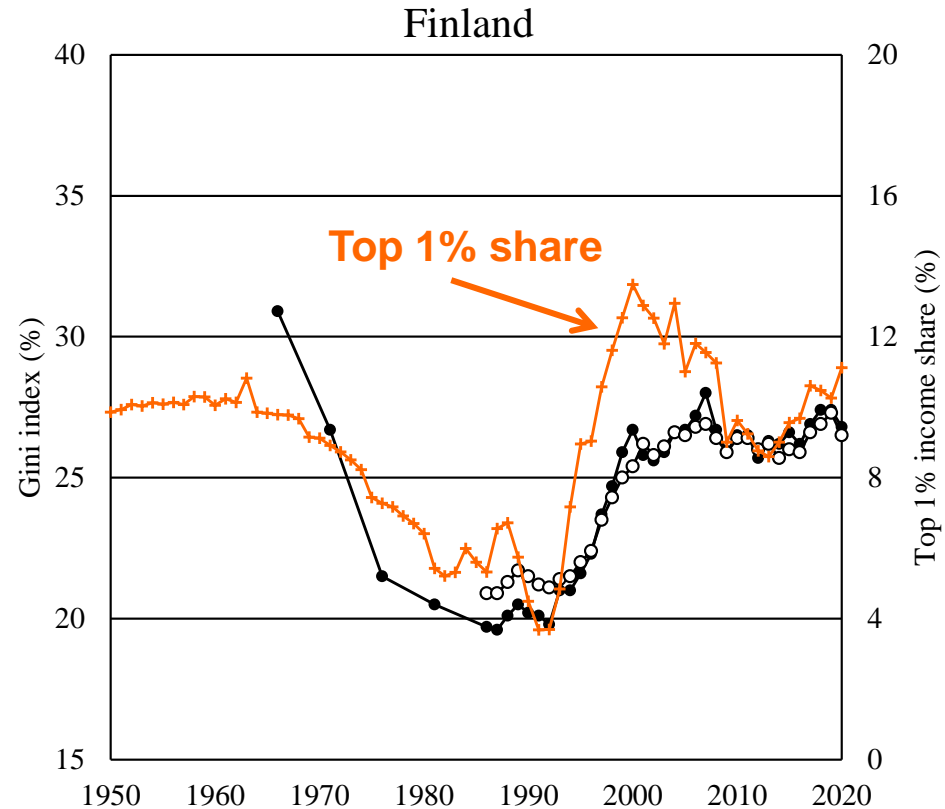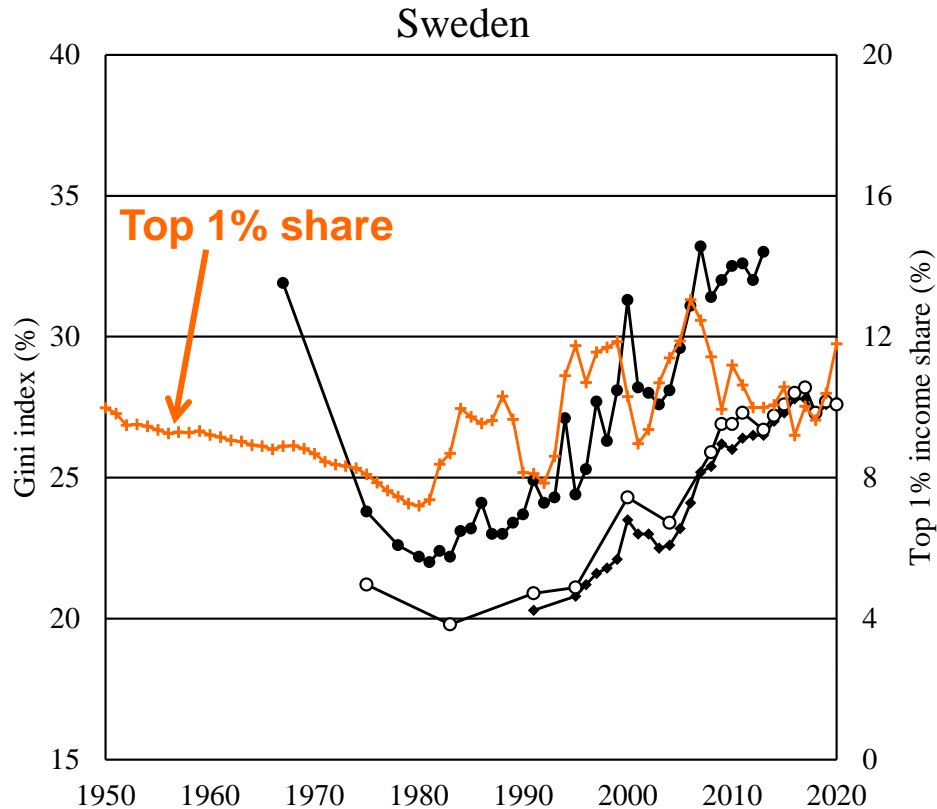
Source: national sources and OECD for Gini indices, WID for top 1% share; discontinuities not shown.

Gini index and top 1% share: income
Canada & Netherlands
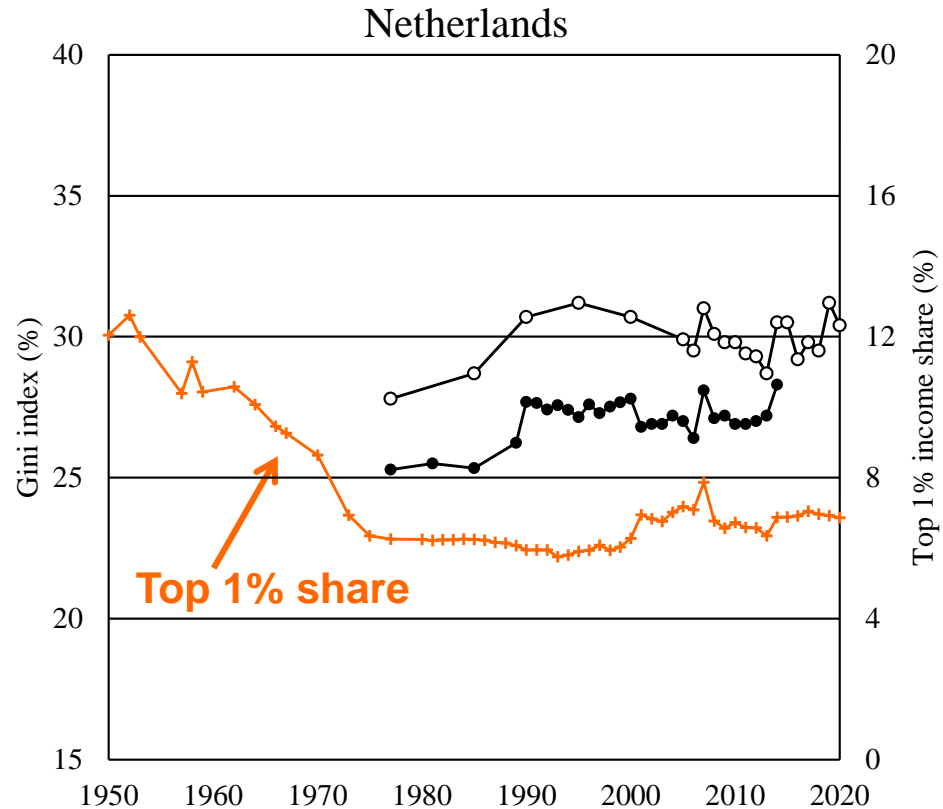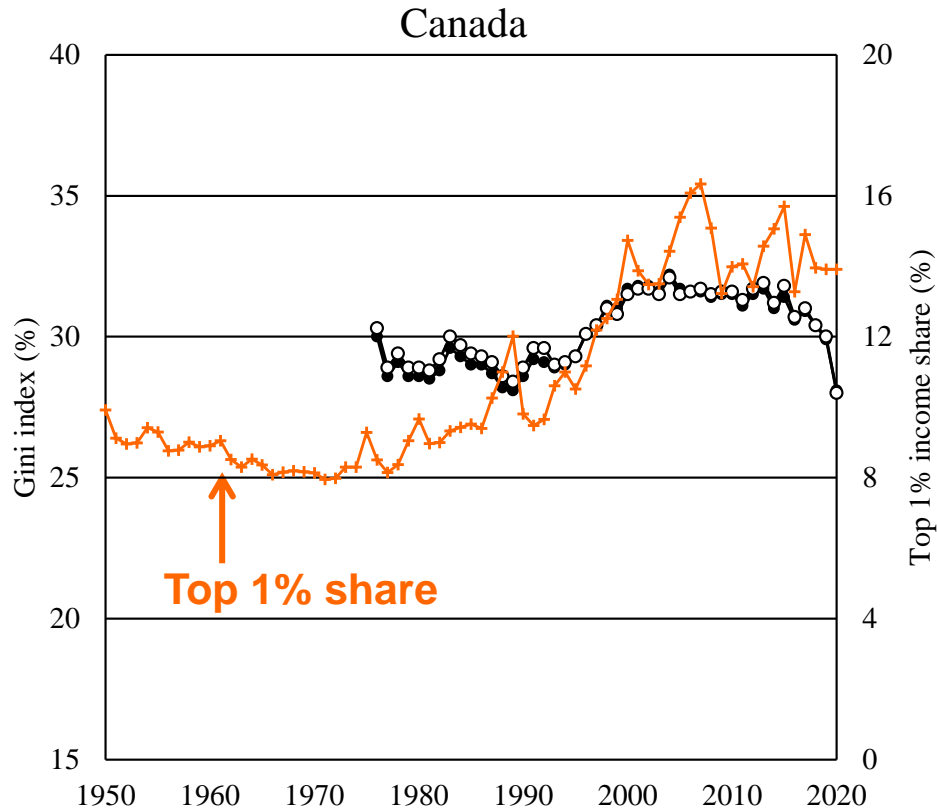
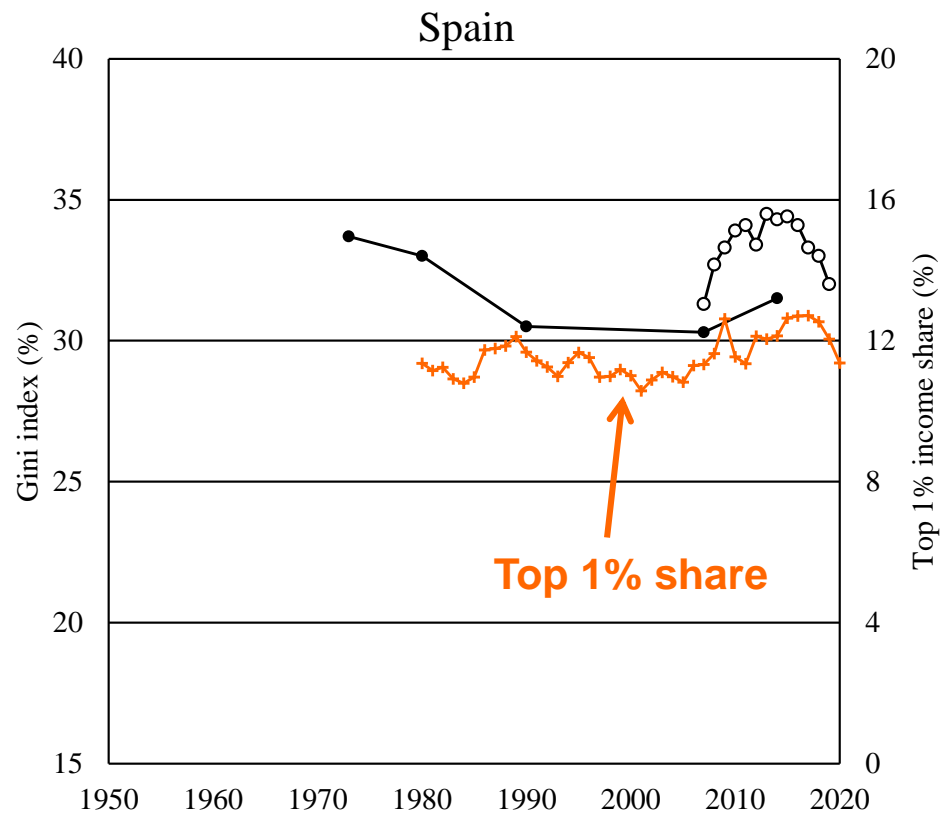Source: national sources and OECD for Gini indices, WID for top 1% share; discontinuities not shown.
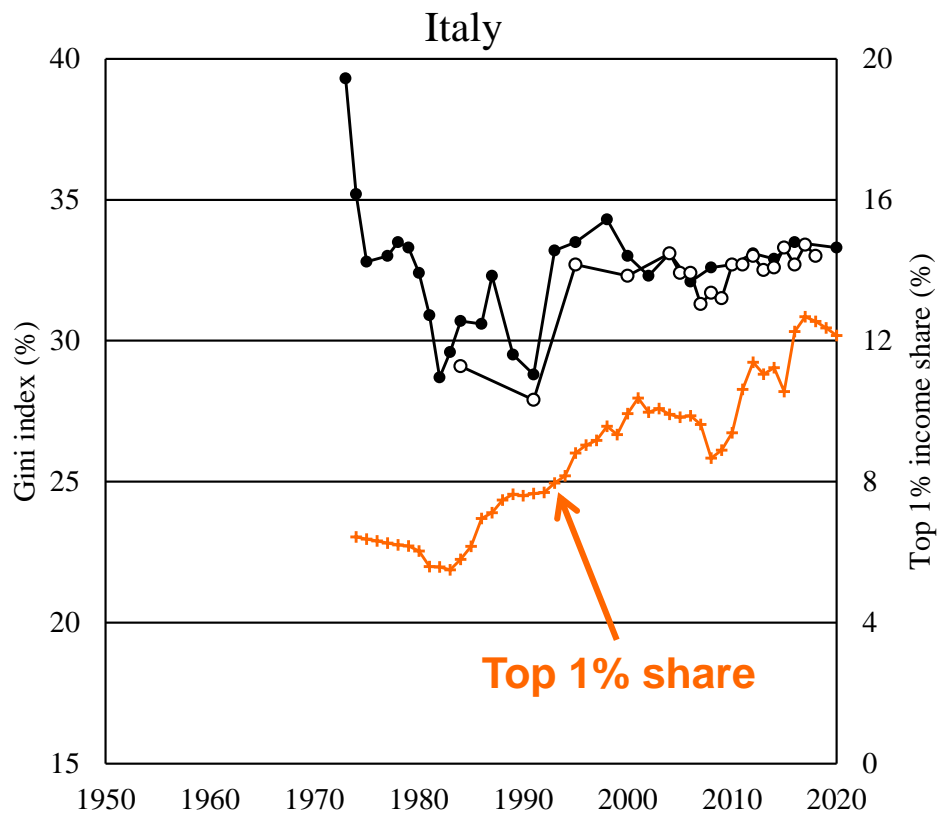
Gini index and top 1% share: income
Germany & France

Source: national sources and OECD for Gini indices, WID for top 1% share; discontinuities not shown.
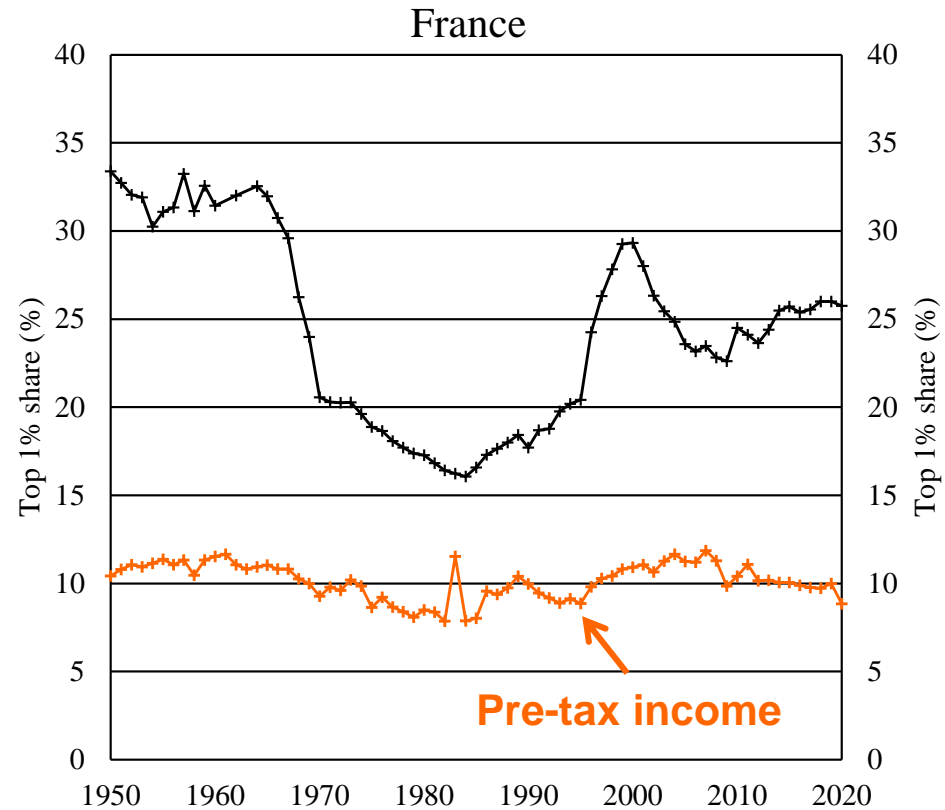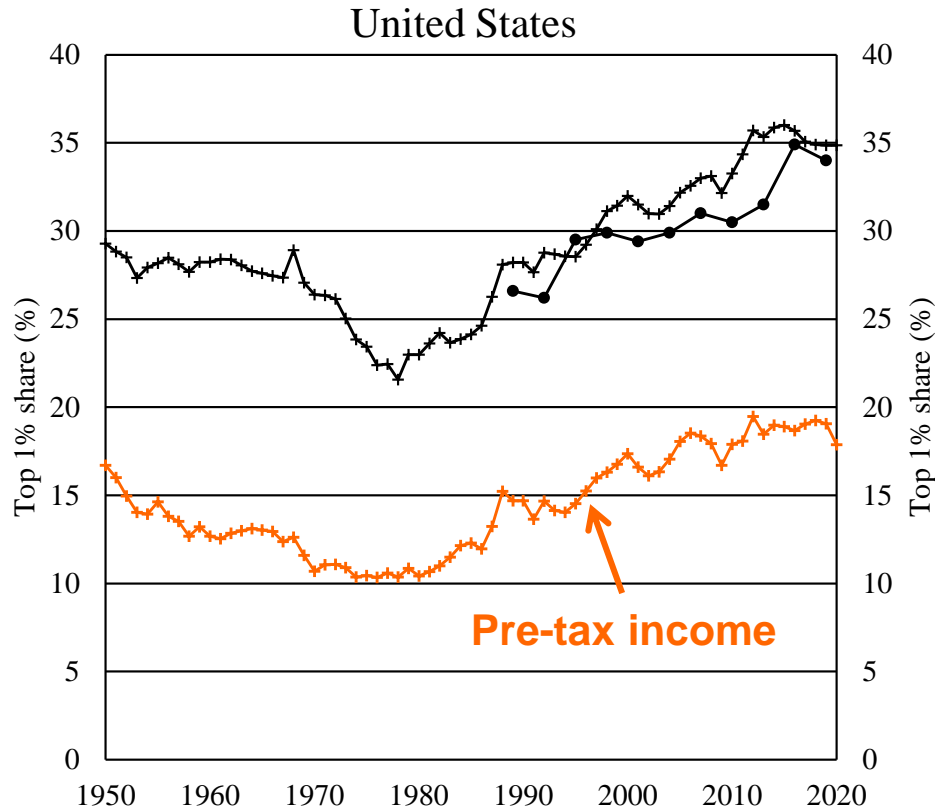
Gini index and top 1% share: income
Italy & Spain

Italy

Spain

Top 1% share

Top 1% share

Source: national sources and OECD for Gini indices, WID for top 1% share; discontinuities not shown.

Top 1% share: income vs. <u>wealth</u>
United States & France

Source: WID and Congressional Budget Office for the United States.

Long-run inequality changes

1. **Patterns depend on many choices**
    - Inequality index
        - Gini index vs. top income shares (but also poverty ratios, polarisation and middle class measures)
    - Income definition
        - Market, pre-tax, post-tax
        - Household vs. national (incl. undistributed profits, in-kind public spending)
    - Focal variable
        - Income vs. wealth
    - Time horizon
        - Lifetime vs. current income

Long-run <u>income</u> inequality changes

2. **Some U-shaped pattern** in many countries, but timing, magnitude and persistence differ

   - While common forces may have affected all advanced economies, countries' circumstances and policy choices led to distinct national patterns
   - Tax-benefit systems are primary examples of these policy choices (but not the only one: e.g. regulation)

   Atkinson (1997)

   it is misleading to talk of "trends" when describing the postwar evolution of the income distribution ... It may be better for a number of countries to think in terms of "episodes" where inequality fell or increased.

Long-run <u>income</u> inequality changes

3. **Reversal of post-war downward trends** due to:

   - more flexible labour markets
   - taxation reforms favouring high taxpayers
   - rolling back of welfare states

   Kenworthy and Smeeding (2014)

   most of the rise in income inequality in the United States is due to an increase in inequality of market incomes, especially at the top of the distribution, as changes in redistribution have played a small role

   Interesting dichotomy between literature in US and Europe, where welfare state changes feature prominently

Conclusions

Only a final remark

- **Despite progress, never forget Kuznets' old warning**

  I am acutely conscious of the meagerness of reliable information presented. The paper is perhaps 5 per cent empirical information and 95 per cent speculation, some of it possibly tainted by wishful thinking

  And especially try not to be captured by your wishful thinking

Thanks for your attention!