Real-Time Inequality

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Introduction

A major gap in economic statistics is the lack of timely data on inequality

▶ Detailed macro data published monthly and quarterly

▶ Inequality statistics lag behind due to processing times for tax returns & limited real-time surveys

▶ Consequence: macro statistics dominate the debate, inequality data arrives "after the battle"

⇒ **Our goal:** produce distributional national accounts in real-time → **put inequality data on same footing as macro data**

This paper: a prototype of real-time inequality data for the US

There is a lot of real-time US data relevant for inequality:

▶ Jobs and earnings data from employers' monthly and quarterly surveys

▶ Unemployment, labor force, wage earnings from CPS monthly surveys

▶ Components of GDP (e.g., capital vs. labor share)

We mobilize all public data to build real-time inequality statistics

▶ To distribute all national income from national accounts across groups

▶ High frequency monthly/quarterly but "annualized" like national accounts

▶ Early estimates subsequently revised when more data available

An Historical Analogy

In the early 20th century:

▶ There were a series of business surveys and disparate indicators

▶ Each provided valuable information on the business cycle

▶ But they were not integrated into a coherent system, so it was hard to get a comprehensive view of the economy

▶ National accounts were created during the Great Depression to fix this, and became the reference tool to study business cycles

▶ **Today:** many high-frequency data relevant to inequality, but scattered

▶ **Prototype:** This paper is a first attempt to be further refined/improved

Contribution: Monthly microdata matching macro totals

- ▶ **Output:** Monthly synthetic microdata which distributes all of national income and wealth (and their components) to individuals, matching macro totals

- ▶ Can be used to compute a wide range on inequality and growth statistics

- ▶ Following a recession, this can be used to compute "distributional output gaps:" which groups of the population are below their pre-crisis income level or trend

- ▶ Incorporate all taxes and government transfers $\rightarrow$ reveal how national income is distributed and redistributed month-to-month

Estimates available on `realtimeinequality.org` within a few hours of the publication of the national accounts.

Our Website `realtimeinequality.org`
Who Benefited from Growth Last Quarter?

Real income growth per adult in the last quarter (2023-Q1)
Growth rates, gains, and income levels are annualized.

Period: ● Last Calendar Year ● Last Quarter

Sort by: Group ↓   Growth (%)   Gain ($)   Income

Group	Growth (%)	Gain ($)	Avg. Income
● Total	2.2% ↑	$1.9k	$89k
● Bottom 50%	1.5% ↑	$270	$18k
● Middle 40%	1.7% ↑	$1.6k	$92k
● Top 10%	2.7% ↑	$12k	$430k
● Top 1%	4.3% ↑	$78k	$1.9M
● Top 0.1%	4.5% ↑	$400k	$8.9M
● Top 0.01%	5% ↑	$2.1M	$42M

Methodology and Validation

Methodological Overview

1. **Starting point:** annual tax-based Distributional National Accounts microdata of income and wealth by Piketty, Saez, Zucman (2018) continuously updated and improved.

2. One-to-one statistical match with surveys (yearly CPS, SCF, ACS) to add demographics (gender, race, age).

3. Estimate high-frequency labor income distribution:
   - Employment and earning rank: using high frequency data by demographic group.
   - Individual earnings: using high frequency data on wages by industry and location.

4. Microsimulation of some transfers (during Covid).

5. Rescale capital income components to macro totals

Statistical Matching Using Optimal Transport

Statistical matching between the public use tax micro data, the annual Current Population Survey (CPS), the American Community Survey (ACS), and the Survey of Consumer Finances (SCF) to add demographics.

- ▶ **Optimal transport** to match observations "one-to-one" using common variables.

- ▶ Let d_{ij} be a distance between observation i in the first dataset and j in the second. Optimal transport minimizes $\sum d_{ij}$ across matched observations.

- ▶ Best possible matching technique if we cannot track individuals across datasets.

Estimation of Employment

First question: who should receive labor income?

▶ Estimate monthly employment rate by gender $\times$ age $\times$ marital status $\times$ race $\times$ education from the monthly CPS (using a logit model).

▶ Get total monthly employment from the BLS.

▶ For every series, compare the relative change in employment between the 12-month period covered by the microfile, and the month of interest.

▶ Adjust employment status accordingly:
  ▶ Reproduce changes in relative employment by demographic cell.
  ▶ Match total employment rate.
  ▶ All adjustments done *at the margin* (no change in employment $\Rightarrow$ no adjustment).

Adjusting Monthly Employment Rates to "Annualized" Employment Rates
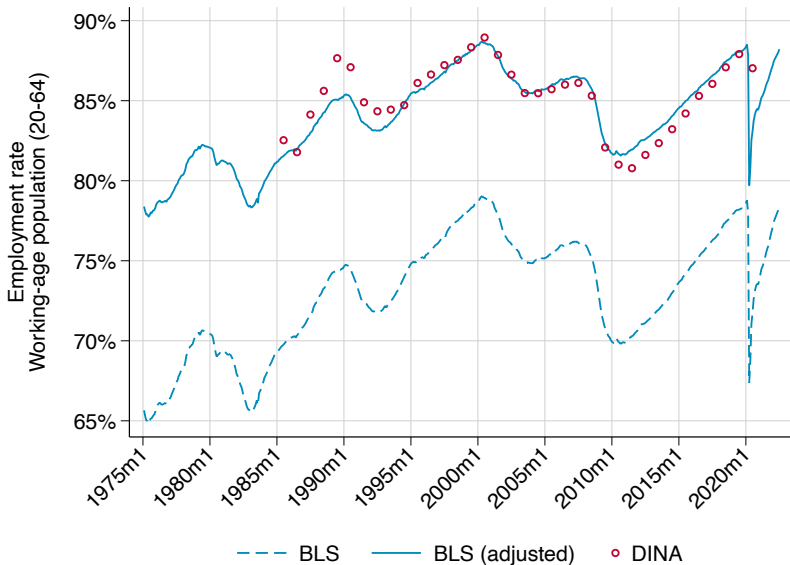
Estimation of Wages

Second question: if you receive labor income what is your wage?

► **Quarterly Census of Employment:** QCEW is an exhaustive administrative dataset (nearly all wage earners covered).
  ► Published quarterly with monthly data.
  ► Data by (6-digit NAICS industry code) $\times$ (county) $\times$ (ownership sector).
  ► $\approx$ 1,000,000 observations each month.
  ► Can be used to infer complete wage distribution including top 1% (Lee, 2020).

► **Current Employment Statistics:** For most recent months, we use the less detailed but timely monthly CES

► **Monthly Current Population Survey:** Monthly CPS is an individual survey on labor force, unemployment, weekly wage earnings, captures well the bottom 95%

Rise of Top 1% Wage Income Share (among workers) in Tax Data
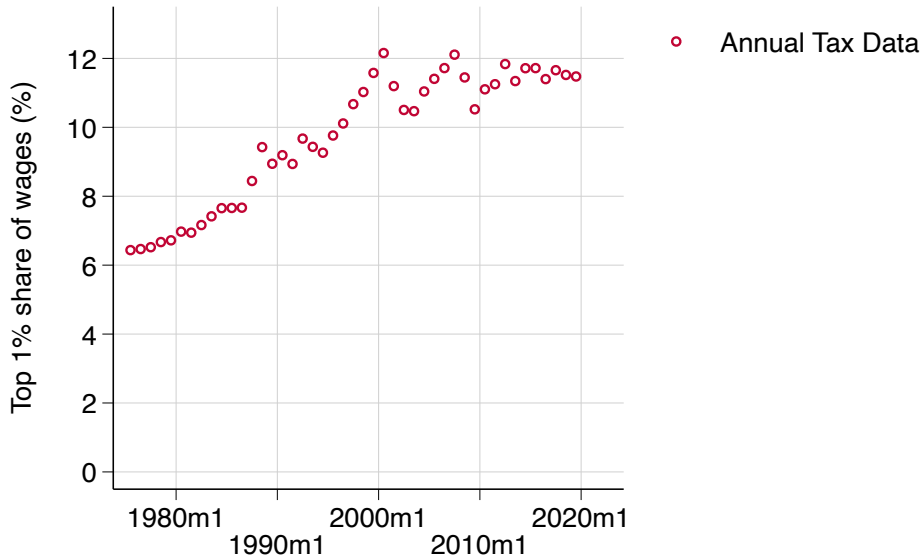
Top 1% Wage Income Share in QCEW parallels Tax Data series
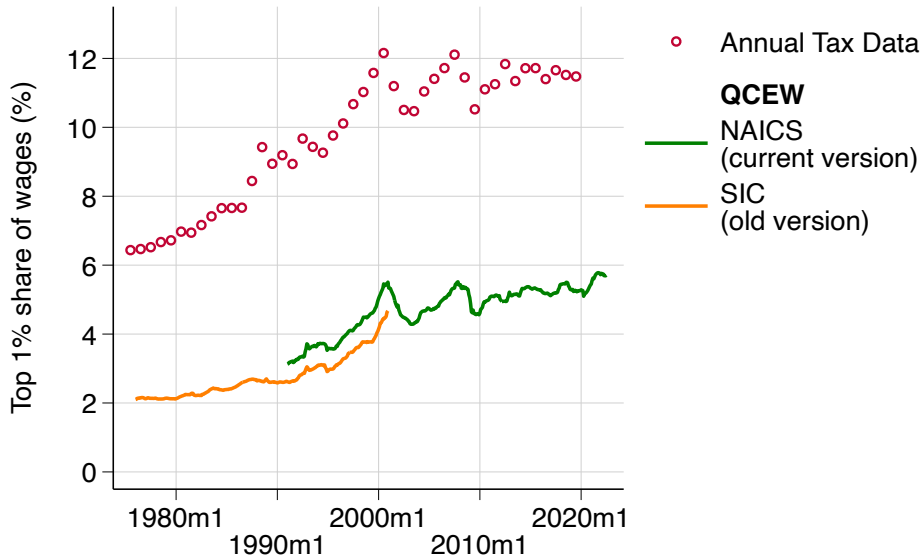
Linearly Adjusted QCEW Captures This Rise Remarkably Well

Legend:
- Annual Tax Data
- **QCEW**
- NAICS (current version)
- SIC (old version)
- Adjusted

Y-axis: Top 1% share of wages (%)

X-axis: 1980m1, 1990m1, 2000m1, 2010m1, 2020m1
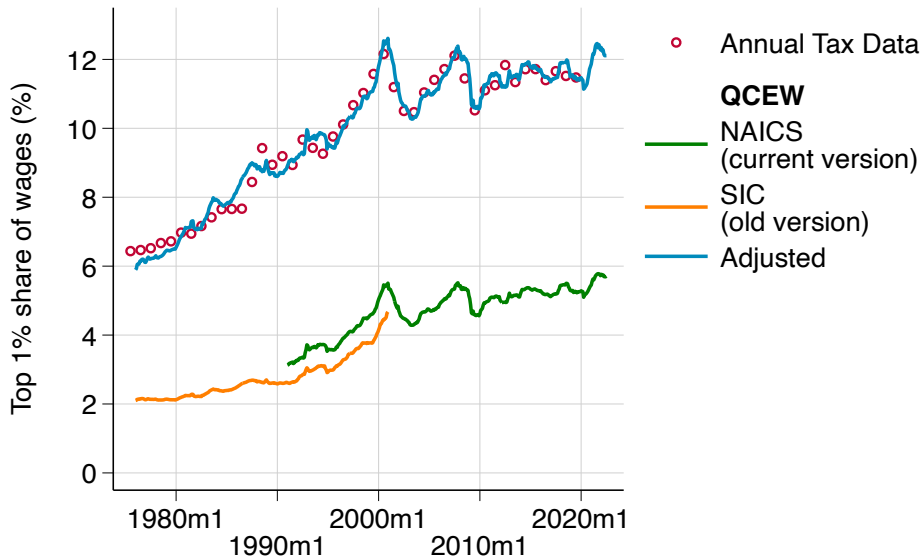
This Works Because Aggregate Profits Are Volatile, Their Concentration is Not
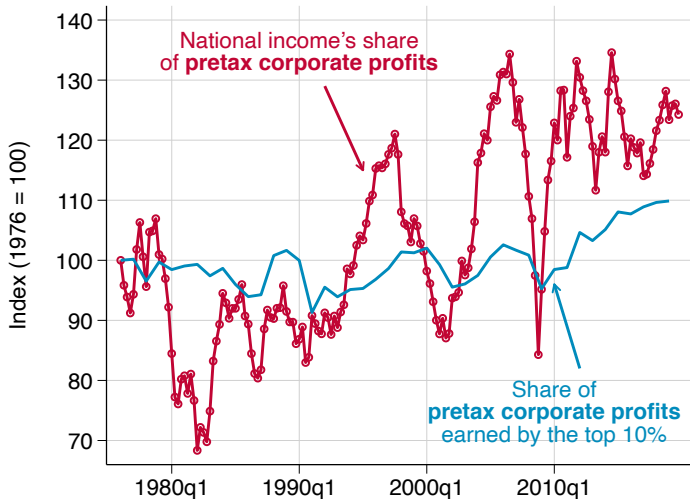
Our Methodology Successfully Predicts Annual Growth Rates

Bottom 50%

Top 1%

▸ Shares
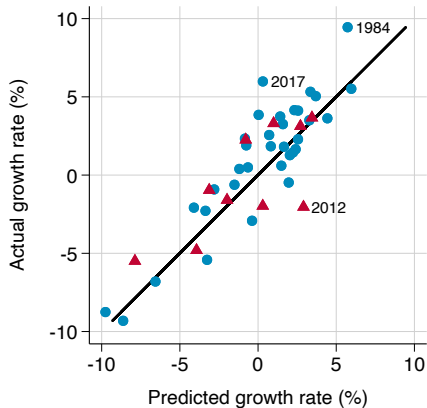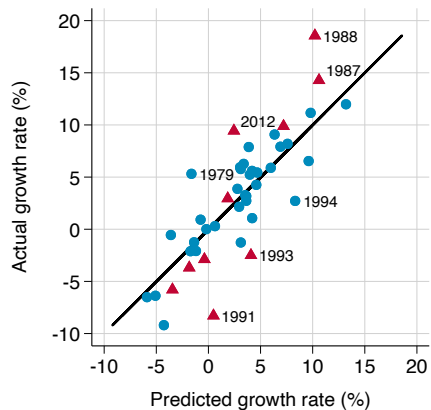
Just rescaling on macro-aggregates does not work nearly as well than our elaborate method for bottom 50%
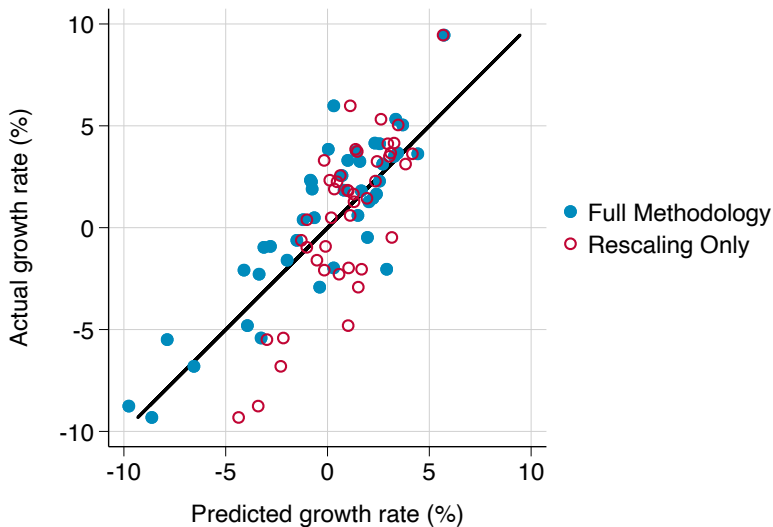
The Distribution and Redistribution of National Income During Covid

COVID: All Groups Recover their Pre-tax Income Within 20 Months
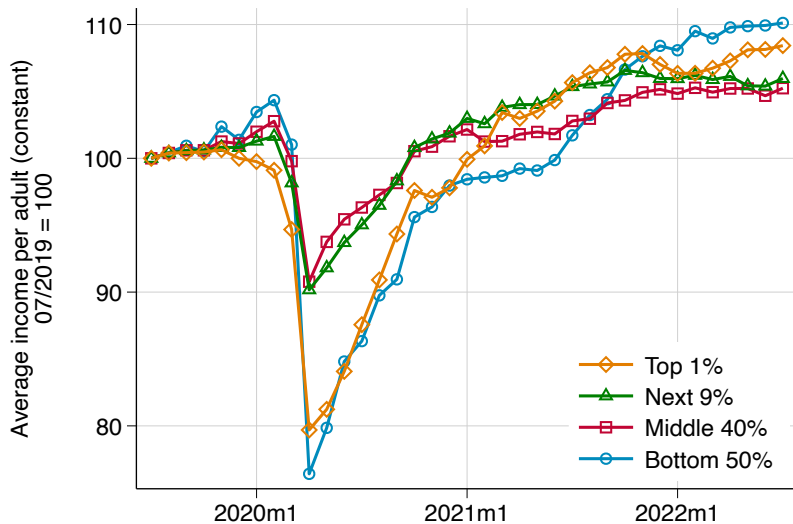
Role of Government Transfers: COVID-specific programs

Microdata makes is easy to model new government programs

- ▶ Paycheck Protection Program (PPP): loans to keep businesses afloat (70% went to owners, 30% to workers according to Autor et al. 2022)

- ▶ Extra Unemployment benefits:
  - ▶ Extended duration
  - ▶ Extra $600 per week from March 2020 to July 2020
  - ▶ Extra $300 per week from January to September 2021

- ▶ More generous Child Tax Credit and Earned Income Tax Credit in 2021 only

- ▶ Stimulus checks of $1200 in April 2020, $600 in January 2021, $1400 in March 2021 for bottom 90%

Bottom 50% Incomes (aged 20-64): The Role of Government Transfers
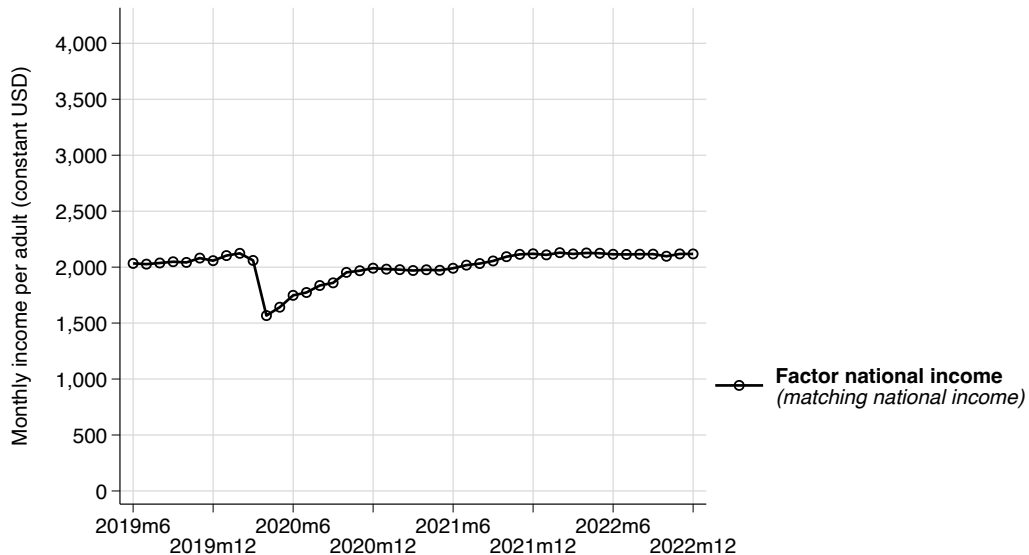
Factor national income
(matching national income)

Bottom 50% Incomes (aged 20-64): The Role of Government Transfers
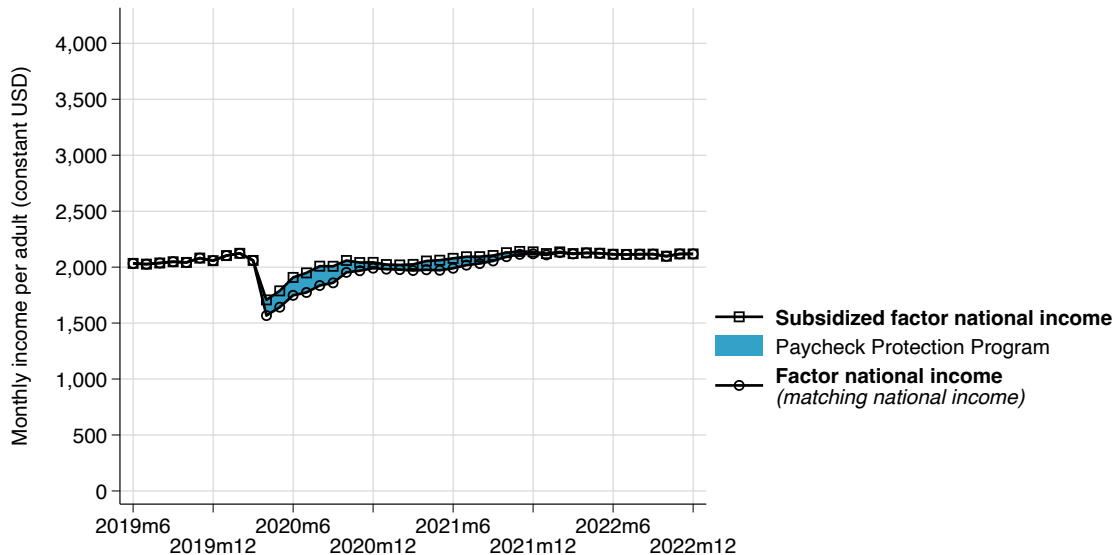
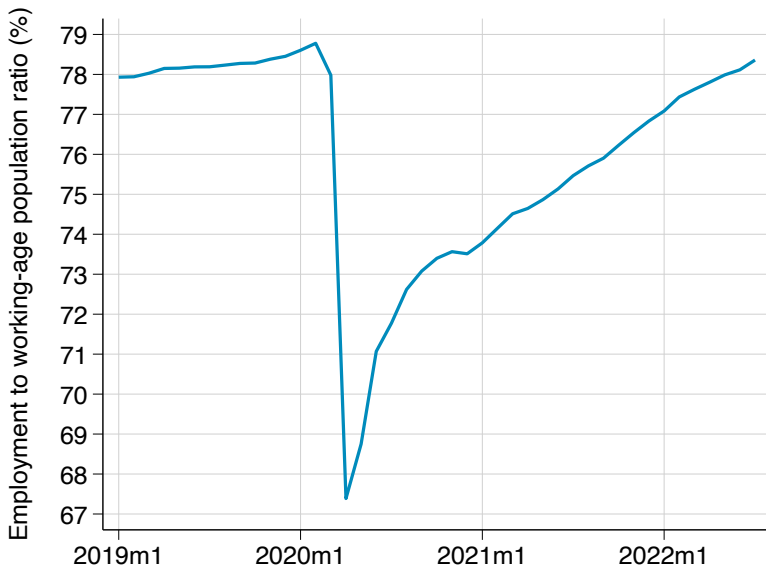# Bottom 50% Incomes (aged 20-64): The Role of Government Transfers
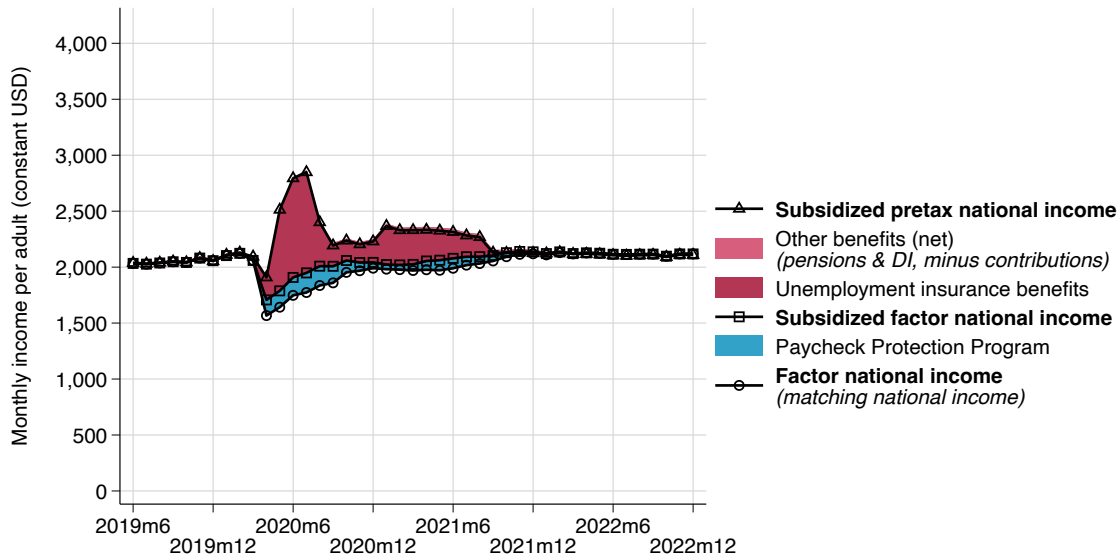
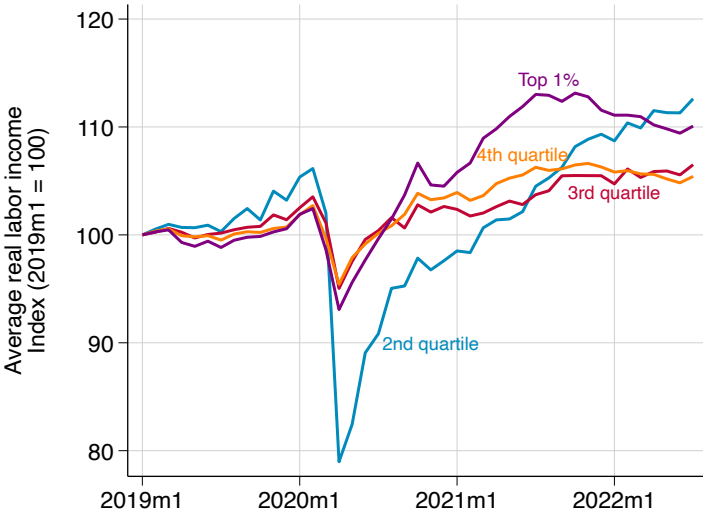# Bottom 50% Incomes (aged 20-64): The Role of Government Transfers
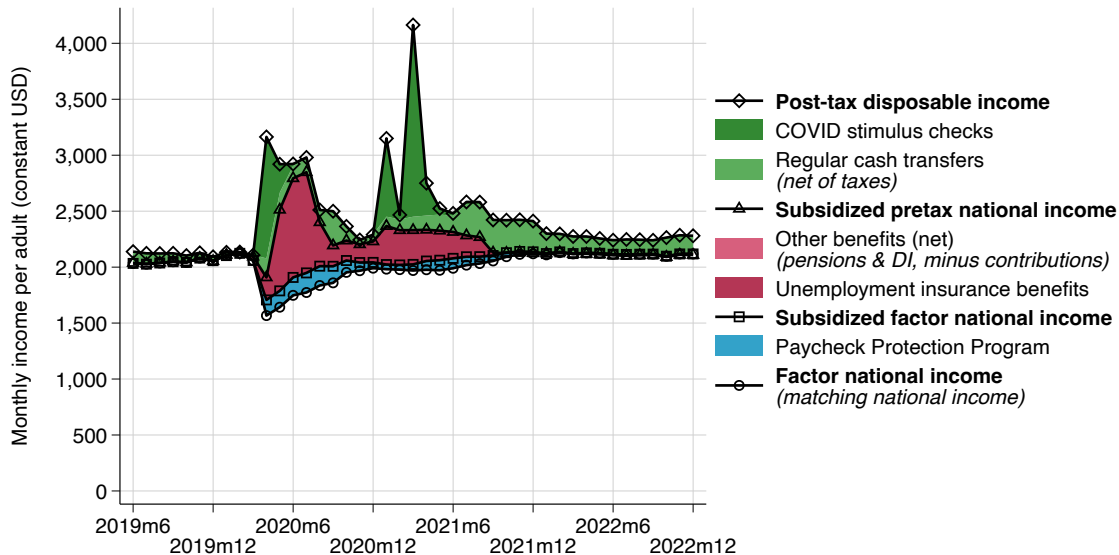
The Post-Covid Recovery: Is Real Labor Income Growing? For Whom?

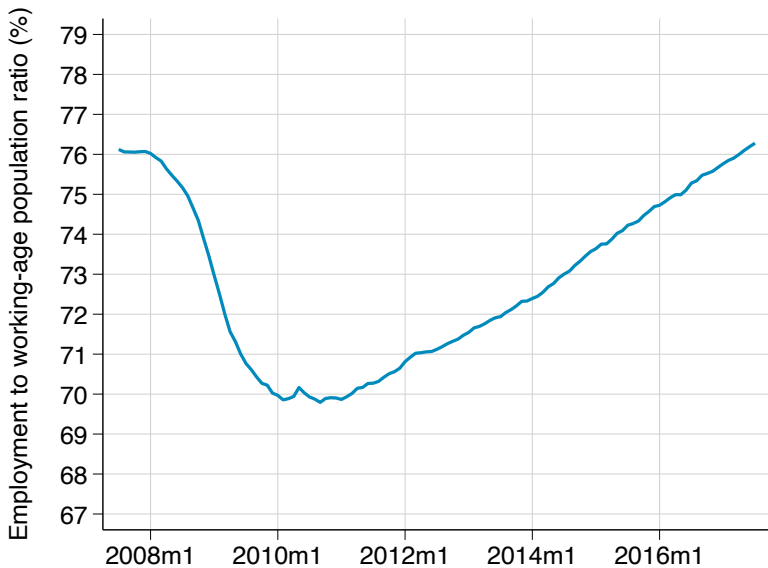# Employment Rate (age 20-64) Back to Pre-COVID Levels by mid-2022

The Tight Labor Market Benefits Low-Wage Workers
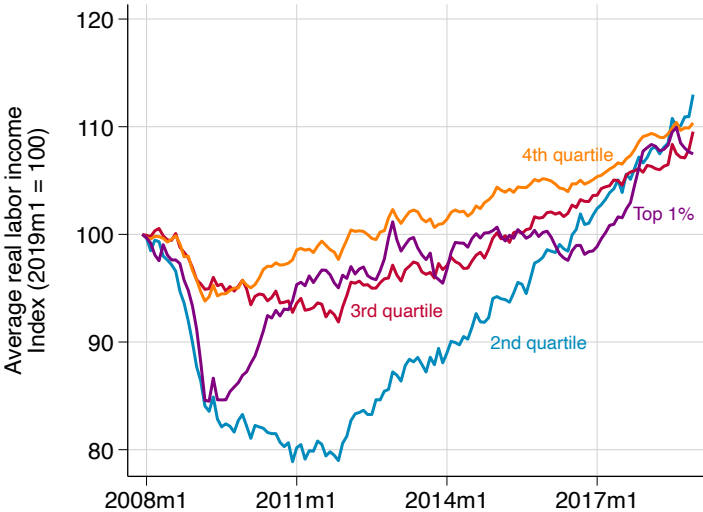

Real Labor Income Per Working-Age (20–64) Adult

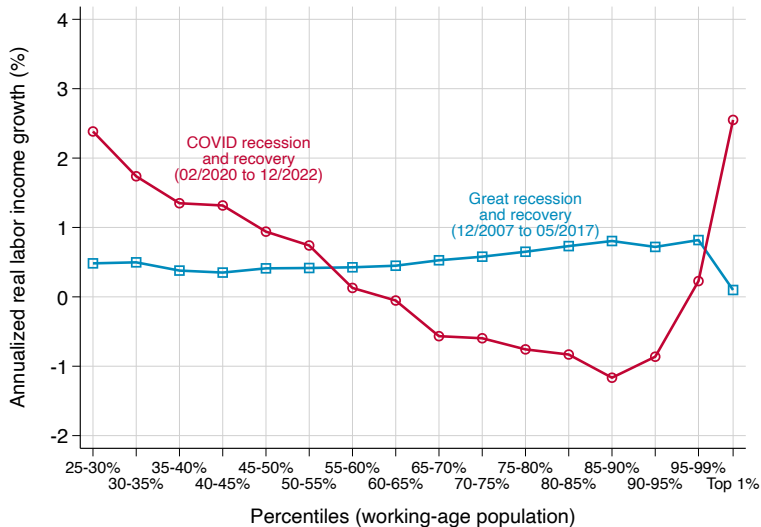# After the Great Recession, Employment Took 8 Years to Recover

Real Labor Income Per Working-Age (20–64) Adult

Annual Real Growth In Labor Income by Percentile

Annualized real labor income growth (%)

COVID recession
and recovery
(02/2020 to 12/2022)

Great recession
and recovery
(12/2007 to 05/2017)

Percentiles (working-age population)

Crisis and Recovery by Race and Gender

A Comprehensive Estimate of Black/White Economic Disparities
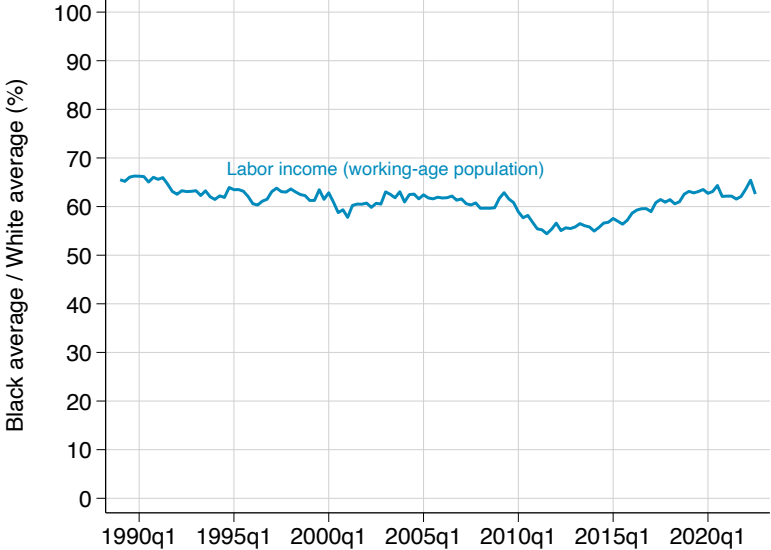
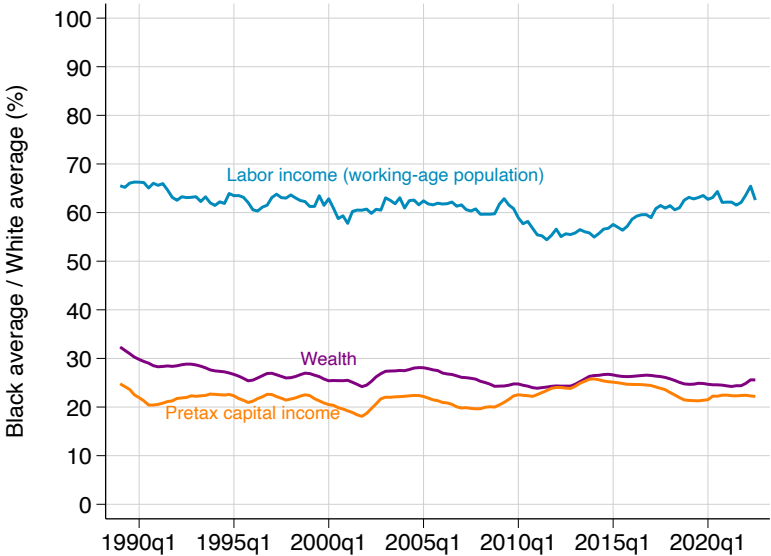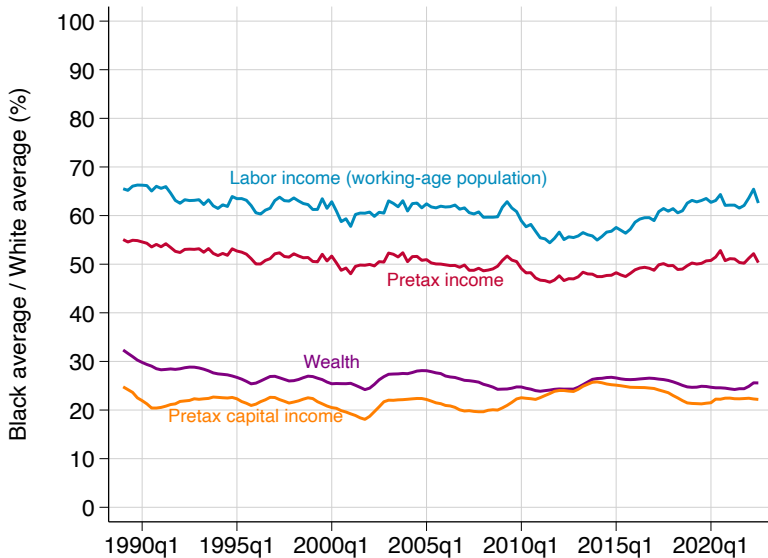Labor income (working-age population)

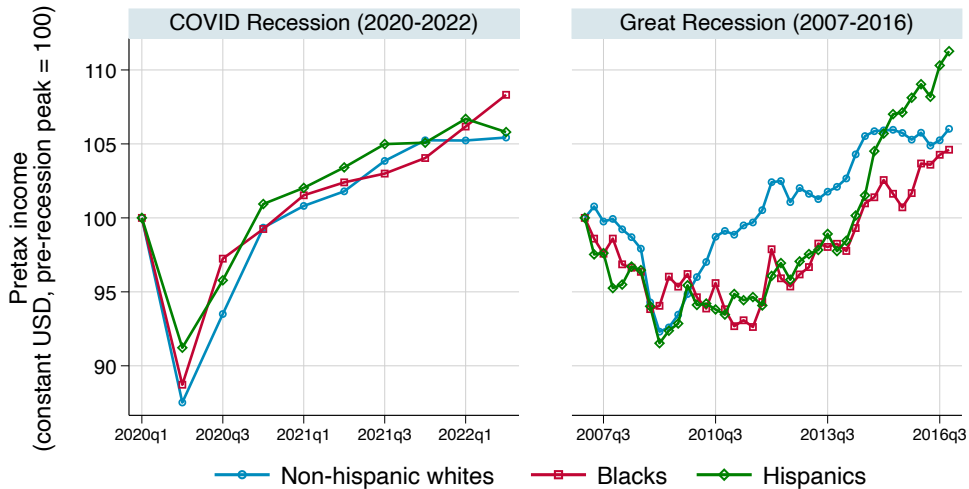# A Comprehensive Estimate of Black/White Economic Disparities
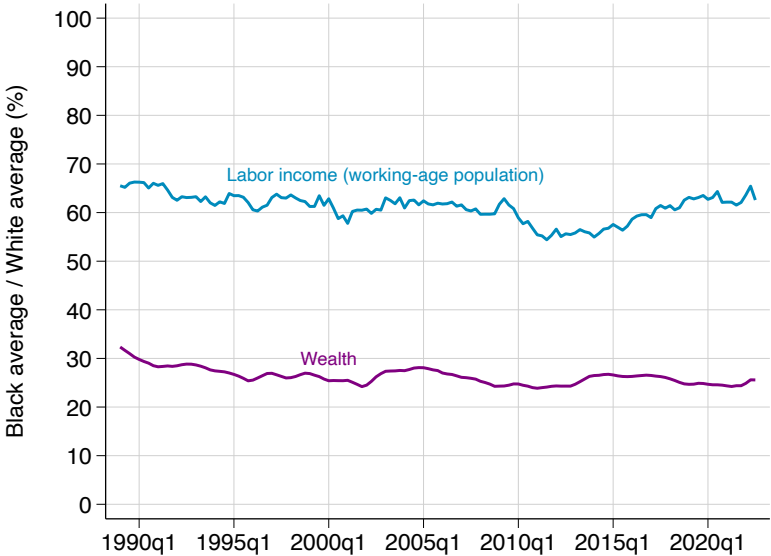
A Comprehensive Estimate of Black/White Economic Disparities

A Comprehensive Estimate of Black/White Economic Disparities

Recessions and Recovery by Race and Ethnicity

A Covid "Shecession"? Recessions and Recovery by Gender

Conclusion

- ▶ It's possible to track inequality in near real-time.
- ▶ Estimates based solely on public data.
- ▶ Prototype to be improved and run by government agencies down the road.
- ▶ Stark contrast between the recoveries from the last two recessions.

- ▶ `realtimeinequality.org`
- ▶ Updated daily for wealth, quarterly for income.