

INCOME INEQUALITY AND INCOME RISK: OLD MYTHS VS. NEW FACTS¹

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¹This lecture summarizes research conducted jointly with Serdar Ozkan, Fatih Karahan, Greg Kaplan, and Jae Song.

Not everything that counts can be counted...

... and not everything that can be counted counts.

Sign on Einstein's office wall at Princeton

MOTIVATION

- Nature of income inequality/risk: critical for many questions in social sciences.
- Survey-based US panel datasets have important limitations:
 - ▶ small sample size
 - ▶ large measurement (survey-response) error
 - ▶ non-random attrition
 - ▶ top-coding, etc.
- \implies **myths** about income inequality and income risk.

DATA: SSA MASTER EARNINGS FILE

- Population sample: **Universe of all individuals** with a U.S. Social Security number
- Currently covers 35 years: **1978** to **2012** (soon to be updated with 2013 data)
- Basic demographic info: sex, age, race, place of birth, etc.
- Earnings data:
 - ▶ Salary and wage earnings from W-2 form, Box 1
 - ★ **No** topcoding
 - ★ **Unique employer identifier** (EIN) for each job held in a given year.
 - ★ 4–5 digit **SIC codes** for each employer
 - ▶ Self-employment earnings from IRS tax forms (Schedule SE)

OUR SAMPLE

- 10% Representative panel of US males from 1978 to 2012
- Salary and wage workers (from W-2 forms)
 - ▶ exclude self-employed (data top coded before 1994)
 - ▶ Focus on workers aged 25–60
 - ▶ Key Advantages:
 - ★ Very large sample size (200+ million individual-year observations)
 - ★ No survey response error (W-2 forms sent from employer directly to SSA)
 - ★ No sample attrition
 - ★ No top-coding

Six Myths

SIX MYTHS

- ① **Myth #1:** Income risk has been trending up in the past 40 years.
- ② **Myths #2 and #3:** Income risk **over the business cycle is...**
mostly about countercyclical variance of shocks
- ③ **Myth #4:** Top 1% are largely immune to business cycle risk
- ④ **Myths #5 and #6:** Income **over the life cycle** can be modeled as:
(A polynomial in age... + ...a random walk process...) with Gaussian shocks

Risk and Inequality

Over Time

TRENDS IN INCOME RISK

Myth #1:

The volatility of income shocks...

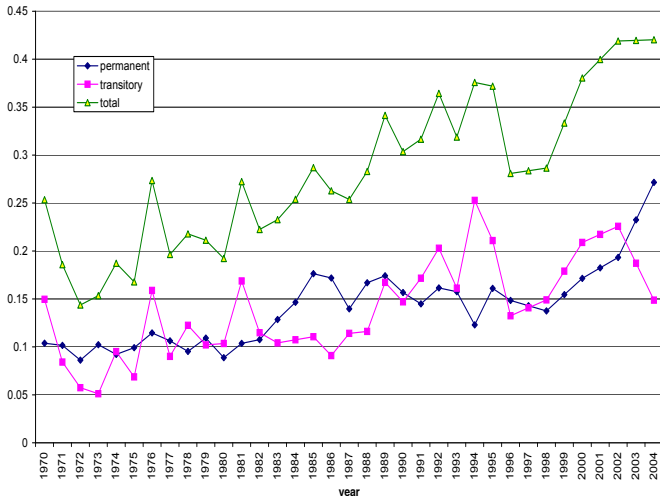
has **increased significantly** over the past 40 years.

UPWARD TREND IN INCOME RISK: BACKGROUND

- This conclusion has been reached by virtually all papers that use PSID data.
- Moffitt and Gottschalk (1995) documented it first in a now-famous paper, and it has been confirmed by a large subsequent literature.
- The fact that this finding is robust across various PSID studies suggests that it is more about the data set rather than the methodology.
- Here is how the basic result looks like (from Moffitt-Gottschalk's updated paper: Moffitt and Gottschalk (2012))

MYTH #1: UPWARD TREND IN INCOME RISK

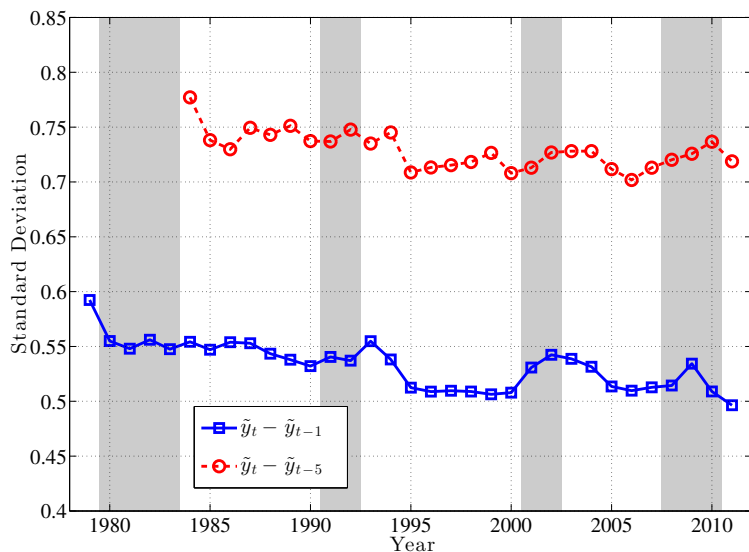
Figure 10: Permanent, Transitory, and Total Variances for those 30-39 with Education Greater than 12



FACT #1: NO UPWARD TREND IN VOLATILITY

- When researchers turned to administrative datasets, such as the one described above, the opposite conclusion emerges robustly
- See, e.g., Congressional Budget Office (2007); Sabelhaus and Song (2010); Guvenen et al. (2014b)
- In fact, looking by age, gender, and industry groups, we see the same pattern of flat or declining volatility in all groups (with the exception of agriculture, which is very small).
- Here is the basic figure from Guvenen et al. (2014b):

FACT #1: NO UPWARD TREND IN VOLATILITY



Source: Guvenen, Ozkan, Song (JPE, 2014)

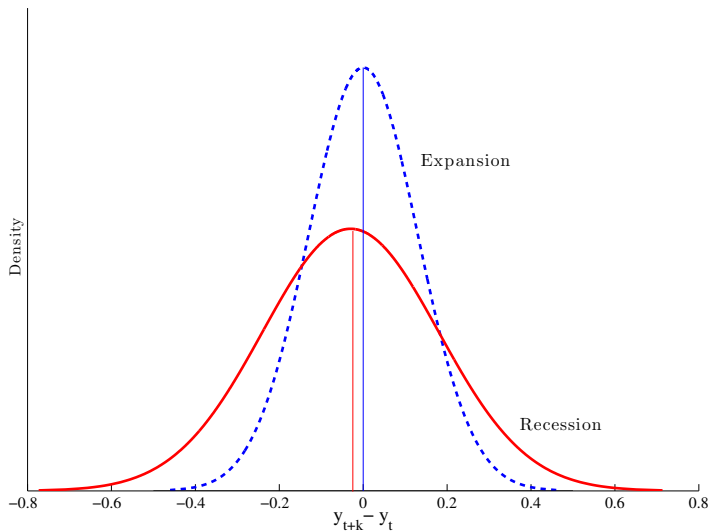
Risk and Inequality Over the Business Cycle

BUSINESS CYCLE VARIATION IN SHOCKS

Myth #2:

The **variance** of idiosyncratic income shocks
rises substantially during recessions.

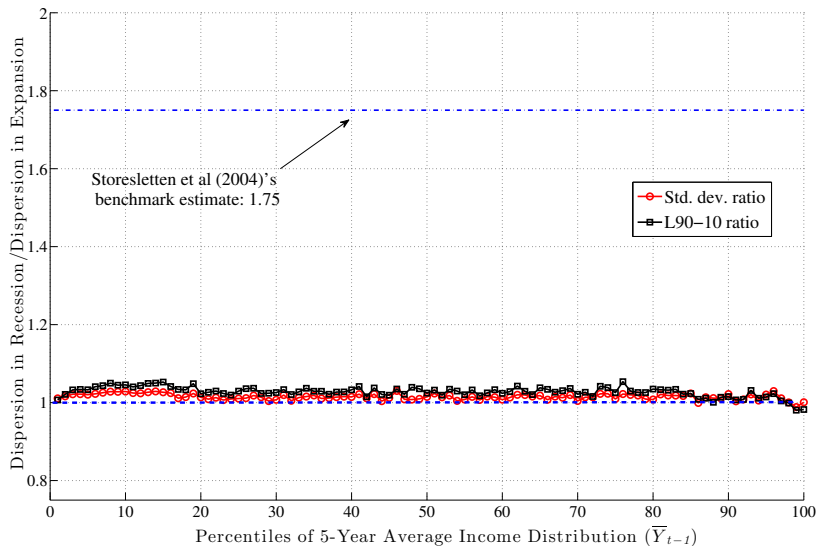
MYTH #2: COUNTERCYCLICAL SHOCK VARIANCES



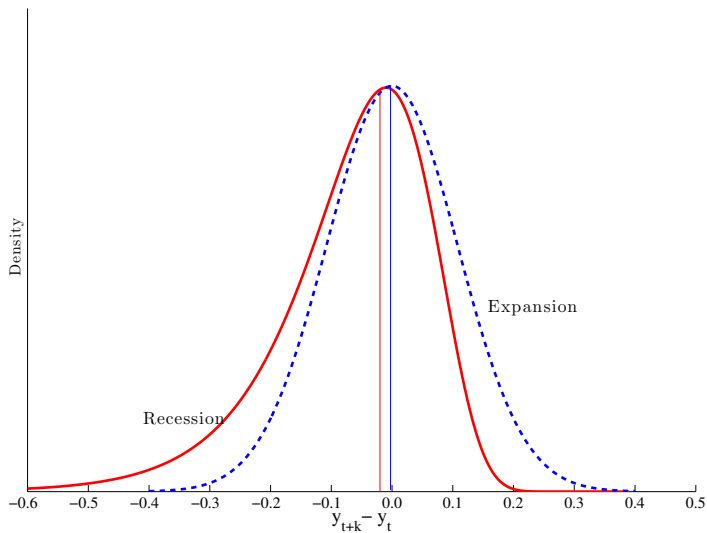
COUNTERCYCLICAL VARIANCE

- Constantinides and Duffie (1996): **countercyclical variance** can generate interesting and plausible asset pricing behavior.
- Existing **indirect parametric** estimates find **a tripling** of the variance of persistent innovations during recessions (e.g., Storesletten et al (2004)).
- Our **direct and non-parametric** estimates show no change in variance over the cycle. See the next figure.
- The following figures on Myths 2 to 4 are from Guvenen et al. (2014b).

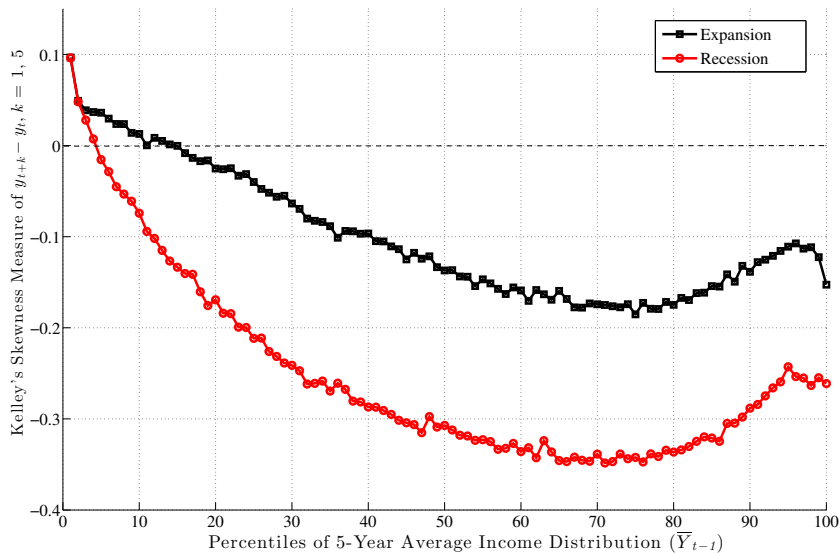
FACT #2: NO CHANGE IN VARIANCE



FACT #2: COUNTERCYCLICAL LEFT-SKEWNESS



FACT #2: COUNTERCYCLICAL SKEWNESS

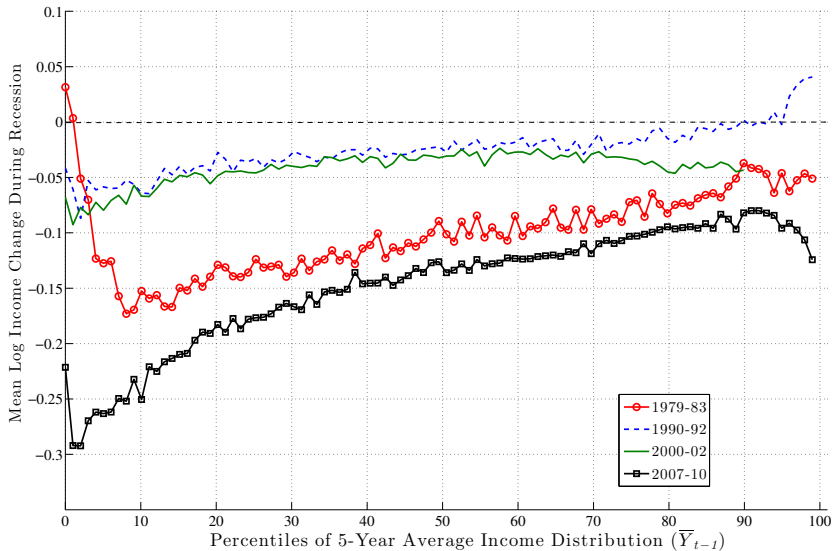


IS BUSINESS CYCLE RISK PREDICTABLE?

Myth #3:

Business cycle risk is mostly ex-post risk

FACT #3: BUSINESS CYCLE RISK IS PREDICTABLE

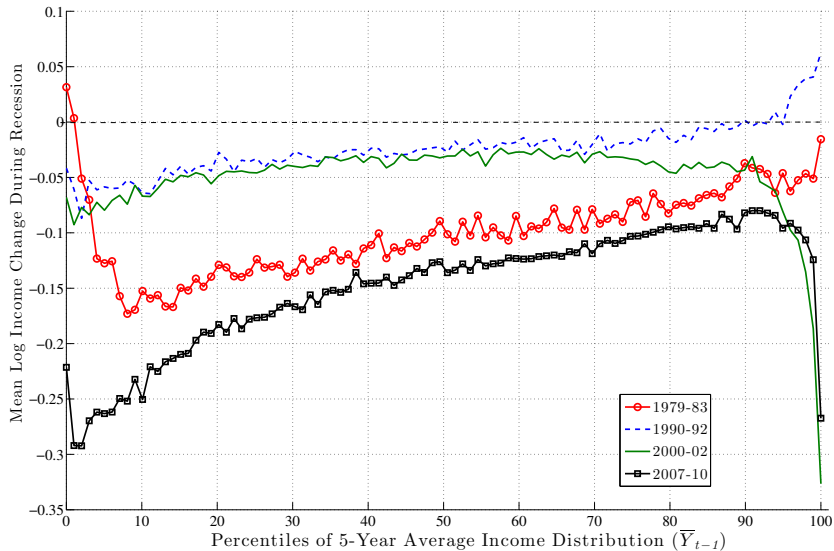


BUSINESS CYCLE RISK FOR TOP 1%

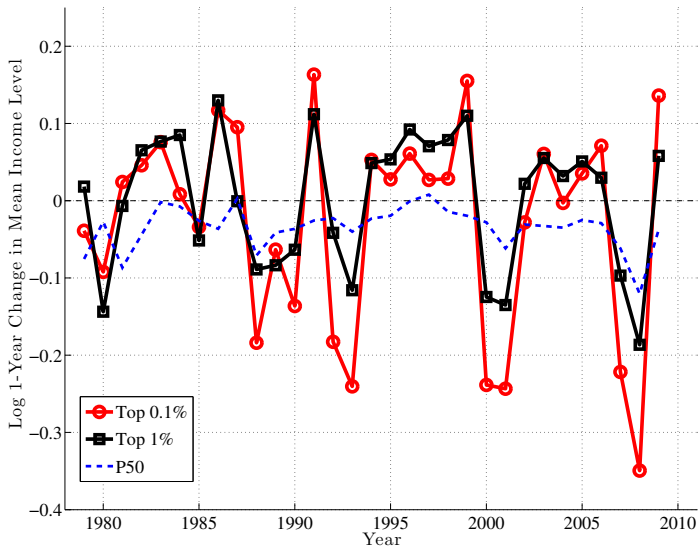
Myth #4:

The top 1% are largely immune
to the pain of business cycles.

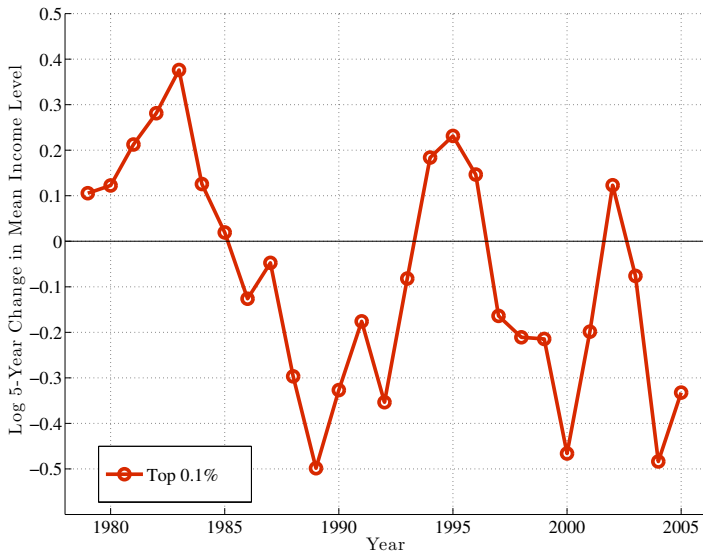
FACT #4: THE “SUFFERING” OF THE TOP 1%



FACT #4: 1-YEAR INCOME GROWTH, TOP 1%



FACT #4: 5-YEAR INCOME GROWTH, TOP 0.1%



Risk and Inequality Over the Life Cycle

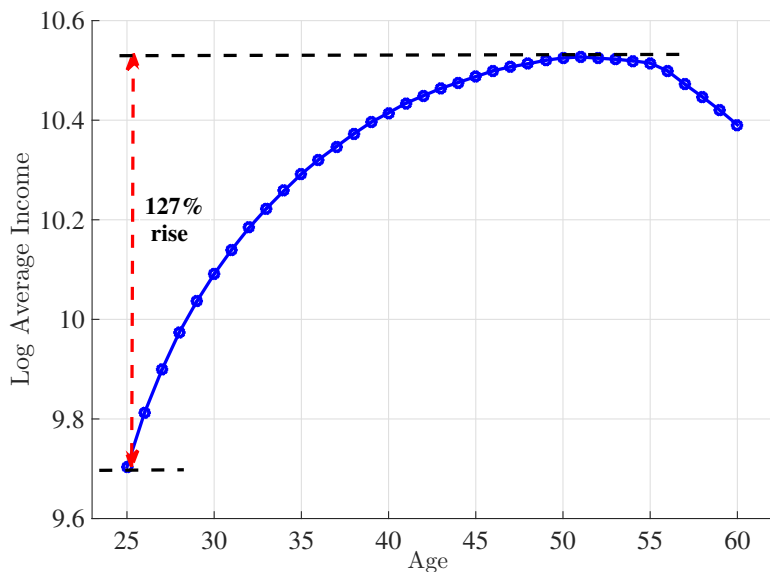
LIFECYCLE PROFILE OF INCOME

Myth #5:

A reasonable specification of income over the life cycle consists of:

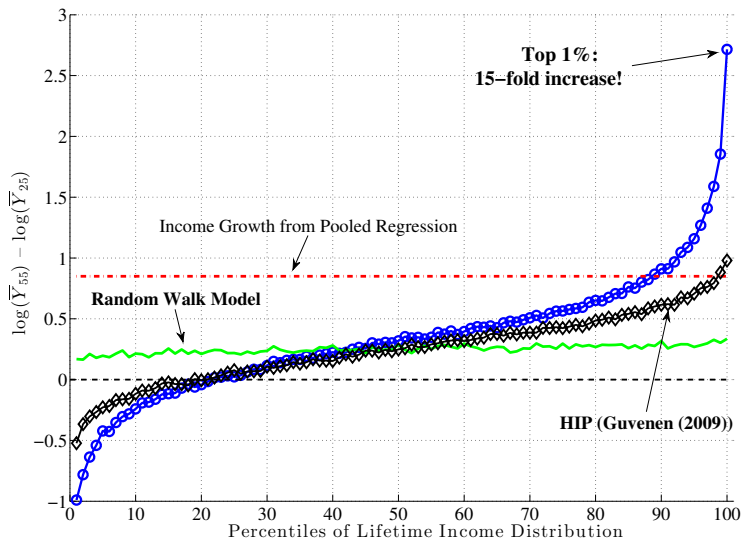
- 1 A common polynomial in age... +
- 2 ...a random walk process...
- 3 with Gaussian shocks

MYTH #5: LIFECYCLE PROFILE OF INCOME



Source for the rest of this section: Guvenen et al. (2014a)

FACT #5: LIFECYCLE PROFILES OF INCOME



DISTRIBUTION OF INCOME SHOCKS

Myth #6:

It is OK to model income growth...

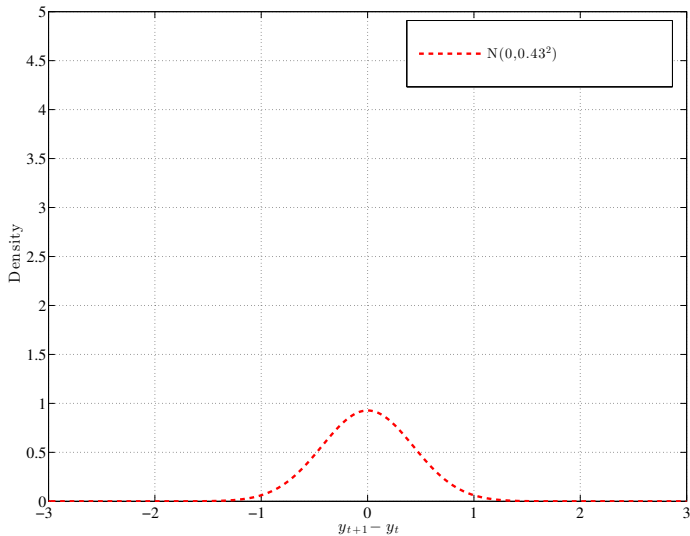
...as a lognormal distribution

⇒ it is OK to assume...

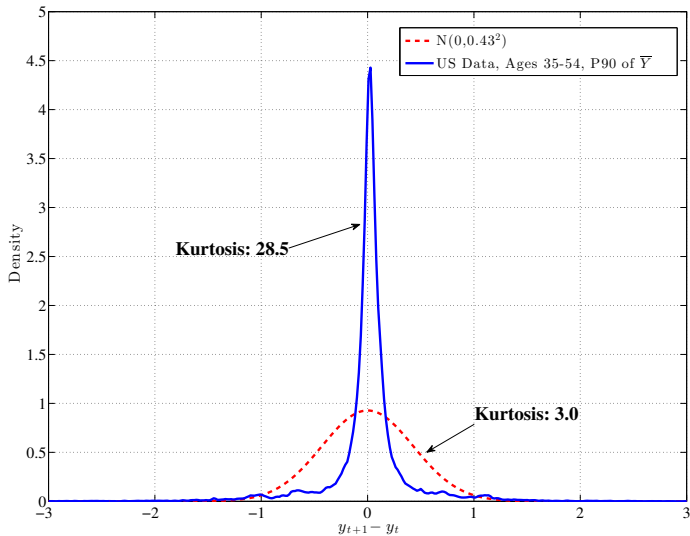
...zero skewness and no excess kurtosis

Kurtosis

MYTH #6: LOGNORMAL HISTOGRAM OF $y_{t+1} - y_t$



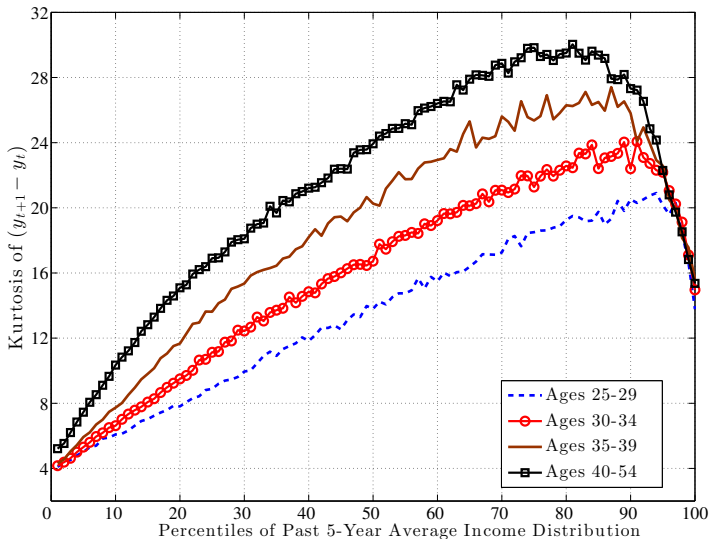
FACT #6: EXCESS KURTOSIS



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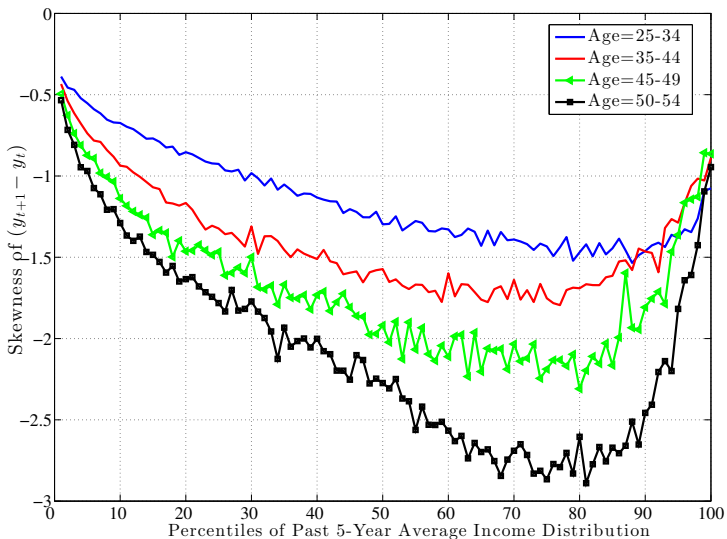
$x \downarrow$	Prob($ y_{t+1} - y_t < x$)	
	Data	$N(0, 0.43^2)$
0.05	0.39	0.08
0.10	0.57	0.16
0.20	0.70	0.30
0.50	0.80	0.59
1.00	0.93	0.94

FACT #6: EXCESS KURTOSIS

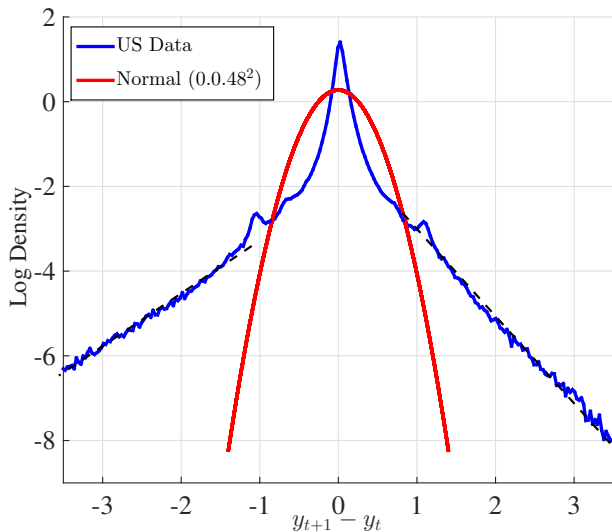


Skewness

FACT #6: SKEWNESS OF $y_{t+1} - y_t$



DOUBLE PARETO TAILS OF EARNINGS GROWTH



CONCLUSIONS

- For too long, we have played the “blind men and the elephant.”
- But there is hope: some fantastic datasets are becoming more accessible.
- Challenges: Data on consumption.. still very limited.
- We hope these new (or revised) facts will feed back into theory and policy work.

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