

# Early-Career Job Instability and Life-Cycle Income Dynamics

Antonio Cabrales

*UCL & FEDEA*

Maia Güell

*Edinburgh, CEPR & FEDEA*

Rocio Madera

*SMU*

July 2022

*Conference on the Spanish Economy,  
Banco de España*

# Motivation

- | Labor markets: more unstable for young workers in the last decades
  - | Era of “job for life” era replaced by era of the gig economy
- | **What are the life-cycle consequences of early-career job instability?**
  - | We know: instability in early years ! lower *levels* of future earnings (von Wachter '20).
  - | Open question: Whether and how it affects the life-cycle of earnings *uncertainty*
- | Important as earnings uncertainty can affect other *macro outcomes*
  - | consumption patterns (Meghir and Pistaferri, 2011; De Nardi et al., 2019), timing of fertility (Sommer, 2016; Guner et al., 2021), housing (Paz-Pardo, 2022)
- | **This paper:** how early instability in the labor market shape the size and nature of earnings uncertainty & life-cycle profile

# Bridge two literatures

- | Lit. on earnings uncertainty & macro outcomes ! ignore initial career
  - | Meghir and Pistaferri, 2011, Karahan and Ozkan, 2013
- | Lit. on early career *scarring* ! focus on long-run averages of income levels
  - | (ENTER IN RECESSION) Kahn, 2010, Oreopoulos et al. 2012; Oyer, 2006; (FIRM SIZE) Arellano-Bover, 2019; (TEMPORARY CONTRACTS) García-Pérez et al. 2019; Hospido et al. 2018
  - | BEYOND LEVELS, variance and income risk: Cappellari and Leonardi, 2016 & Arellano et al., 2021
- | **This paper:** early career & earnings uncertainty (size+nature) & life-cycle
  - | Important: While the literature finds that earning levels stabilize after 10-15 years, it's not the case for income uncertainty

# Outline of Talk

## Measuring Early-Career Job Instability

Data

Job-Unstable vs. Job-Stable

## Estimating Life-Cycle Earnings Dynamics

## Sources of Earnings Variance over the Life-Cycle

## Conclusion

# Measuring Early-Career Job Instability

Goal: Identify workers disproportionately exposed to job instability

- | Exploit rigid *dual* structure of Spanish labor market
  - | measure instability over longer periods of times
  - | above and beyond macro shocks and trends
    - c.f. graduating in a recession, cohort

# Measuring Early-Career Job Instability

**Goal:** Identify workers disproportionately exposed to job instability

- | Exploit rigid *dual* structure of Spanish labor market
  - | measure instability over longer periods of times
  - | above and beyond macro shocks and trends
    - c.f. graduating in a recession, cohort
- | Focus on male college graduates
  - | Minimize other forms of heterogeneity.
  - | Moreover, our methods allows for ex-ante heterogeneity.

# Data: Spanish Continuous Sample of Working Histories

% rep. random sample of all workers affiliated to the SSA / year

- | Panel: selected workers are kept for subsequent years

# Data: Spanish Continuous Sample of Working Histories

% rep. random sample of all workers affiliated to the SSA / year

- | Panel: selected workers are kept for subsequent years

## Social Security records

- | 2004-2015, working histories back to the 60s (repres. since 1988)
- | Daily info on all contracts, full-time/part-time indicator
- | Top-coded



# Data: Spanish Continuous Sample of Working Histories

% rep. random sample of all workers affiliated to the SSA / year

- | Panel: selected workers are kept for subsequent years

## Social Security records

- | 2004-2015, working histories back to the 60s (repres. since 1988)
- | Daily info on all contracts, full-time/part-time indicator
- | Top-coded

## Tax records

- | Yearly info on all taxable labor income sources
- | Non top-coded

# Characterizing Early-Career Job Instability



# Characterizing Early-Career Job Instability



- | Three job states:
  - | Employed on an open-ended contract (Permanent)
  - | Employed on an fixed-term contract (Temporary)
  - | Unemployed
- | For all workers with labor market attachment during Early Career
  - | If days worked as temp during Early Career > days worked as perm ! Job-Unstable
  - | Otherwise ! Job-Stable

# Characterizing Early-Career Job Instability



- Three job states:
  - Employed on an open-ended contract (Permanent)
  - Employed on an fixed-term contract (Temporary)
  - Unemployed
- For all workers with labor market attachment during Early Career
  - If days worked as temp during Early Career > days worked as perm ! Job-Unstable
  - Otherwise ! Job-Stable

# Characterizing Early-Career Job Instability



- Three job states:
  - Employed on an open-ended contract (Permanent)
  - Employed on an fixed-term contract (Temporary)
  - Unemployed
- For all workers with labor market attachment during Early Career
  - If days worked as temp during Early Career > days worked as perm ! Job-Unstable
  - Otherwise ! Job-Stable

# Characterizing Early-Career Job Instability



- Three job states:
  - Employed on an open-ended contract (Permanent)
  - Employed on an fixed-term contract (Temporary)
  - Unemployed
- For all workers with labor market attachment during Early Career
  - If days worked as temp during Early Career > days worked as perm ! Job-Unstable
  - Otherwise ! Job-Stable

# Characterizing Early-Career Job Instability



- Three job states:
  - Employed on an open-ended contract (Permanent)
  - Employed on an fixed-term contract (Temporary)
  - Unemployed
- For all workers with labor market attachment during Early Career
  - If days worked as temp during Early Career > days worked as perm ! Job-Unstable
  - Otherwise ! Job-Stable

# 50% Threshold not binding

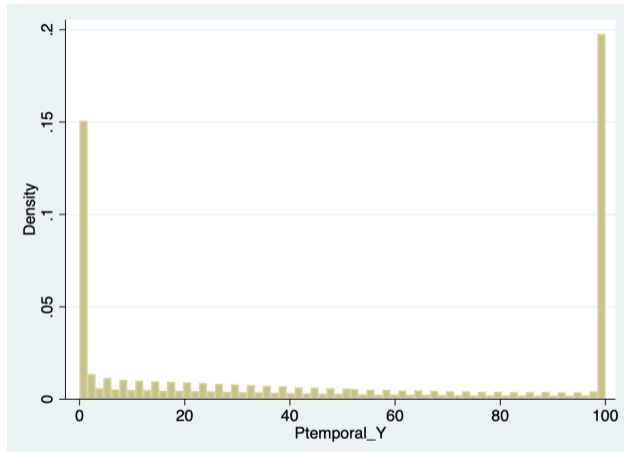


Figure: Share of Days Worked in a Temporary Contract by 30



# Outline of Talk

Measuring Early-Career Job Instability

## Estimating Life-Cycle Earnings Dynamics

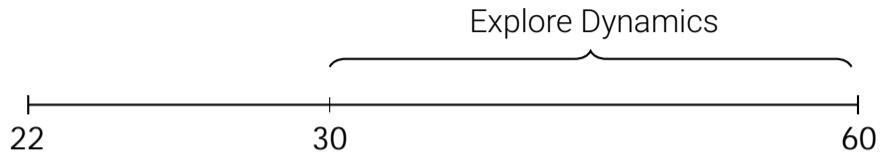
A Statistical Model to Capture Life-Cycle Dynamics

Estimation

Sources of Earnings Variance over the Life-Cycle

Conclusion

# Life-Cycle Earnings Dynamics



# Life-Cycle Earnings Dynamics



Let the log earnings of a worker  $i$  of age  $a$  be:

$$\log Y_{ia} = \underbrace{g(a, X_{ia})}_{\text{ex-ante heterogeneity}} + \underbrace{\{z_i\}}_{\text{unobserved}} + \underbrace{\{z_{ia}\}}_{\text{transitory}} + \underbrace{\{u_{ia} + z_{ia}\}}_{\text{ex-post uncertainty}}, \quad (1)$$

observed
unobserved
transitory
persistent

# Ex-Ante *Unobserved* Heterogeneity

- : Unobserved Heterogeneity:  $\epsilon_i \sim N(0, \sigma^2)$ 
  - Age-independent, captures initial conditions as of graduation
  - E.g. wage differences b/c major choice, diligence,...
- : Heterogeneity in income profiles:  $\epsilon_i \sim N(0, \sigma^2)$ 
  - Proportional to age, captures different expected income growth due to initial conditions
  - E.g. job-ladder differences b/c major choice

# Ex-Post Uncertainty (*Luck*)

**z** : Persistent:  $z_{ia} = \alpha z_{i,a-1} + \epsilon_{ia}$ , with shock  $\epsilon_{ia} \sim N(0, \sigma_{\epsilon,a}^2)$

- | Age-specific, captures shocks that have long-run consequences
- | E.g. big layoff

**u** : Transitory:  $u_{ia} = \eta_{ia} + \nu_{i,a-1}$ , with shock  $\eta_{ia} \sim N(0, \sigma_{\eta,a}^2)$

- | Age-specific, captures shocks that are perceived as short lived
- | E.g. temporary wage cut or freeze

# Estimation

- |  $\beta$ ,  $\gamma$ , and  $\delta$  are functions of age:
  - $\beta$ ,  $\gamma$ , and  $\delta$  are cubic functions of age
  - $\alpha$ ,  $\eta$ , and  $\zeta$  are time-invariant
  
- | Method: GMM
  - Autocovariance matrix up to 6 lags
  - Efficient weighting matrix

# Estimates: Life-Cycle

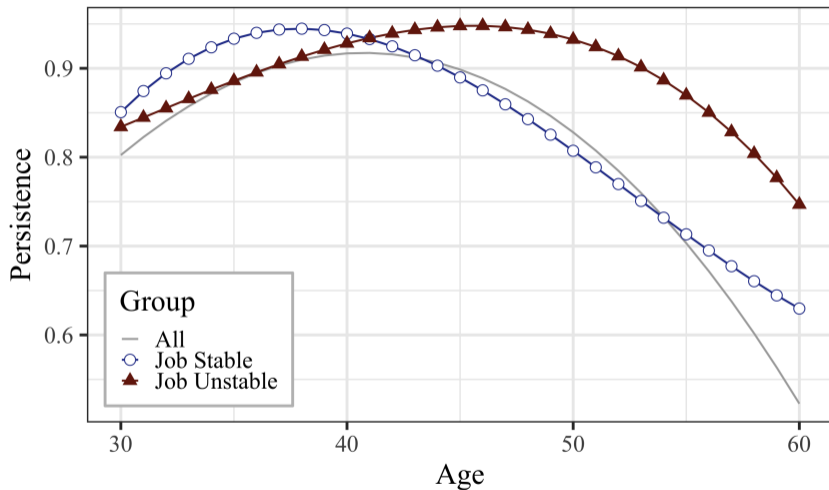


Figure: Persistence

# Estimates: Life-Cycle

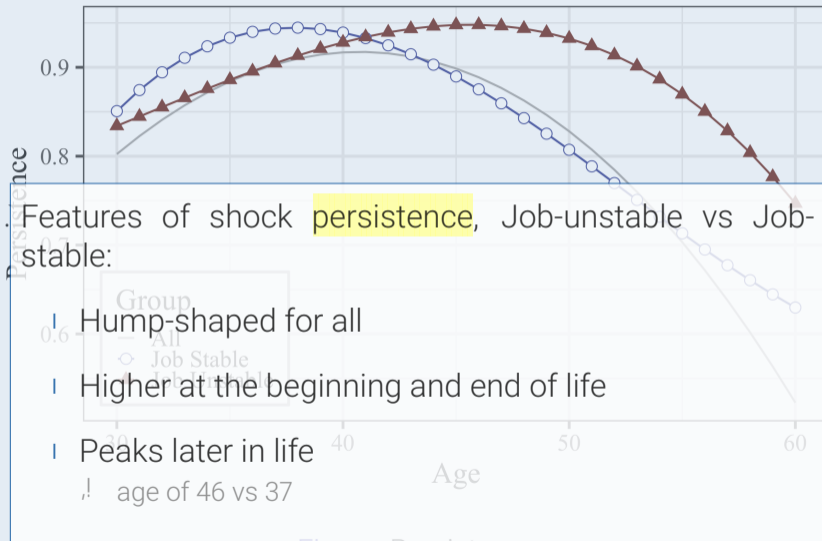


Figure: Persistence



# Estimates: Life-Cycle

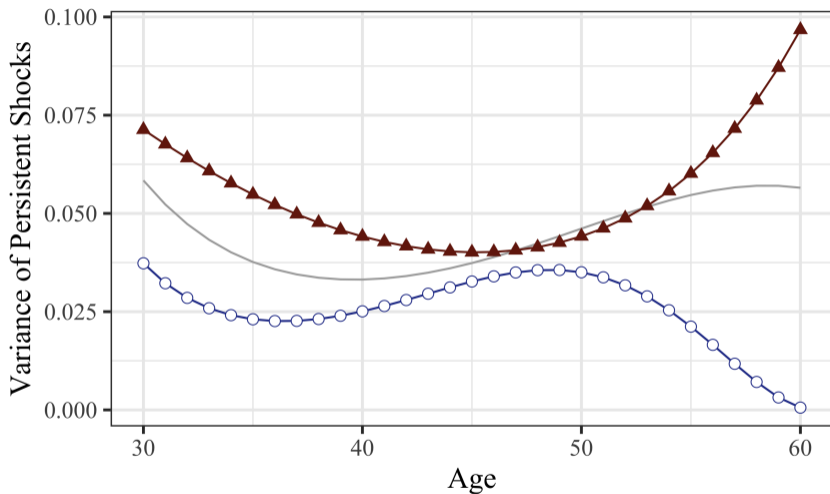


Figure: Variance of Persistent Shocks

# Estimates: Life-Cycle

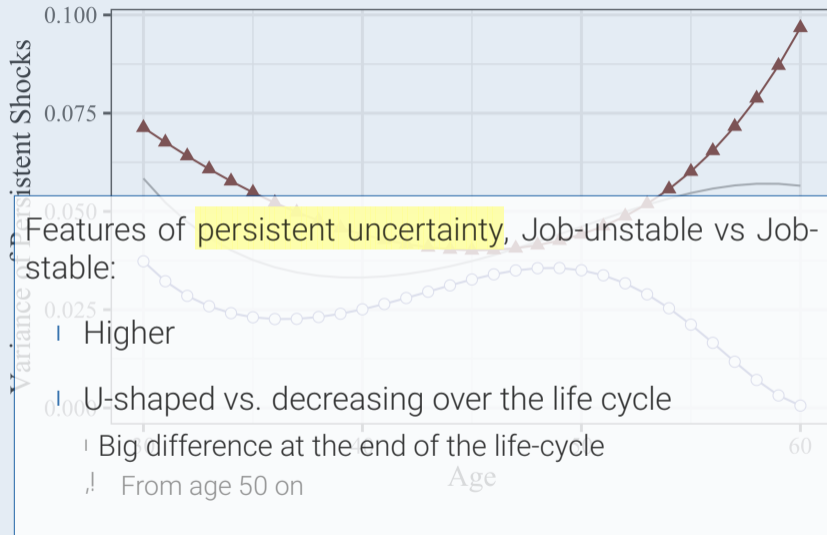


Figure: Variance of Persistent Shocks

# Estimates: Life-Cycle

Figure: Variance of Transitory Shocks

# Estimates: Life-Cycle

Features of **transitory uncertainty**, Job-unstable vs Job-stable:

- | Higher
- | Flat vs decreasing over life
  - ! Big difference at the end of the life-cycle

Figure: Variance of Transitory Shocks

# Outline of Talk

Measuring Early-Career Job Instability

Estimating Life-Cycle Earnings Dynamics

Sources of Earnings Variance over the Life-Cycle

Conclusion

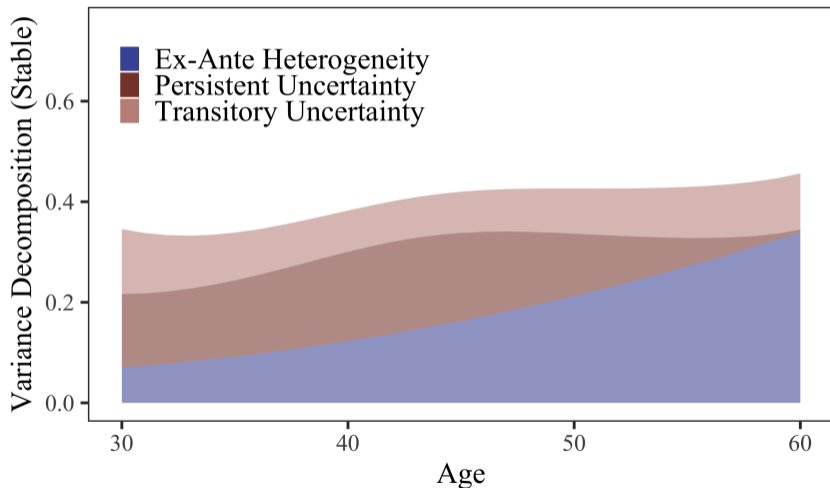
# Decomposing Sources of Earnings Variance

How much of total earnings variance of the life cycle is accounted for by

- | Ex-ante heterogeneity
  - Cumulative effect of initial heterogeneity
- | Ex-post uncertainty (luck)
  - transitory
  - persistent: Combination of behavior of persistence ( ) and variance of persistent shocks (  $\sigma^2$  )

# Decomposing Sources of Earnings Heterogeneity

Job-Stable



# Decomposing Sources of Earnings Heterogeneity

Job-Unstable



# Decomposing Sources of Earnings Heterogeneity

## Job-Unstable

Features, Job-unstable vs Job-stable:

- | Overall uncertainty higher (luck matters more)
- | Smaller role of ex-ante heterogeneity
  - | Job-ladder and education not as important

# Outline of Talk

Measuring Early-Career Job Instability

Estimating Life-Cycle Earnings Dynamics

Sources of Earnings Variance over the Life-Cycle

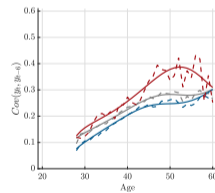
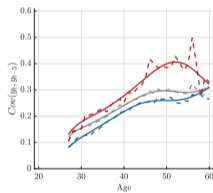
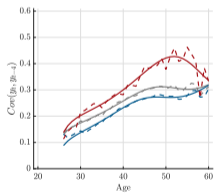
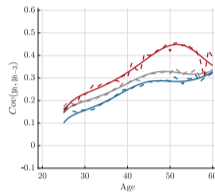
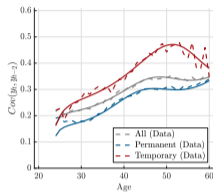
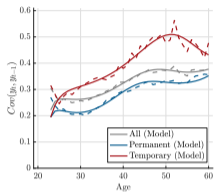
Conclusion

# Conclusions

- | Workers exposed to job instability during early-career years face higher uncertainty throughout the life-cycle
  - | They experience higher volatility in their income shocks
  - | Shocks are increasingly persistent until later in life, compared to job-stable
- | Decomposing the sources of increasing uncertainty shows that
  - | Variance of earnings shocks does not fade out with age, as opposed to job-stable
  - | Risk play less of a role for the job-stable than job-unstable. Persistent component of uncertainty plays a bigger role for the job-unstable, especially later on in the life-cycle.

# APPENDIX

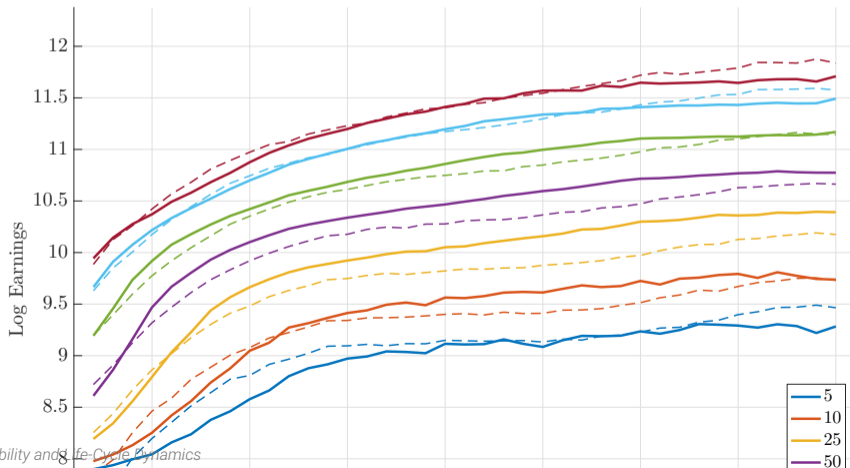
# Autocovariance Fit



# Simulation Fit

\*Estimated earnings within a model of job transitions, from CGMV 2018.

Figure: Quantiles of Log earnings: Data (solid) vs. Simulation (dashed)



# Sample Selection

Table: Number of observations kept at each step

Sel. Criteria	Remaining Obs
Begin with	10.88M
Age missing	10.87M
Contract missing	10.87M
Education missing	10.14M
Age 22-60	6.42M
Drop duplicate spells	5.41M
Total	5.41M
Men	2.95M
Women	2.46M

# Sample Selection

Table: Number of observations kept at each step

Sel. Criteria	Remaining Obs	
Begin with	10.88M	
Age missing	10.87M	
Contract missing	10.87M	
Education missing	10.14M	
Age 22-60	6.42M	
Drop duplicate spells	5.41M	
Total	5.41M	
		College
Men	2.95M	418K
Women	2.46M	571K