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

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

4% 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

4% 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

4% 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

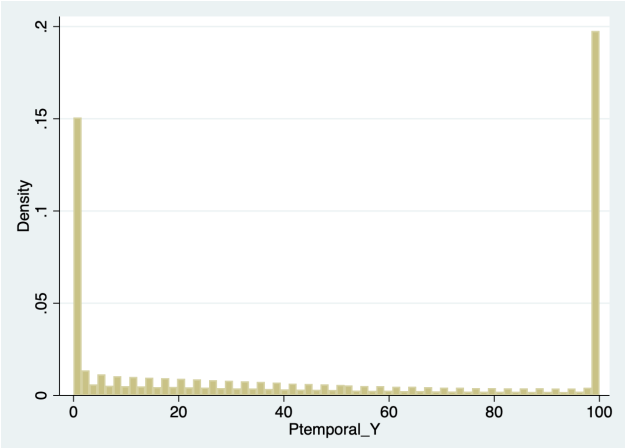
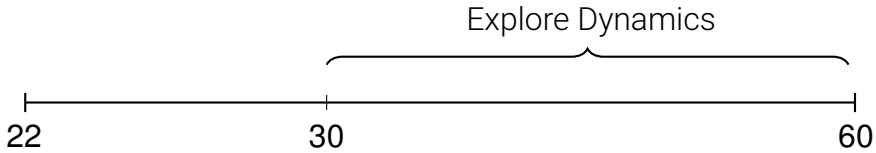


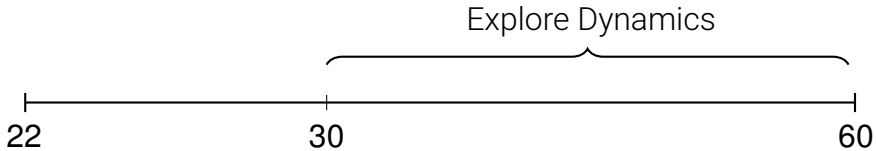
Figure: Share of Days Worked in a Temporary Contract by 30

Outline of Talk

Life-Cycle Earnings Dynamics



Life-Cycle Earnings Dynamics



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

$$\log Y_{ia} = \overbrace{g(a, X_{ia})}^{\text{observed}} + \overbrace{\alpha_i + \gamma_i a}^{\text{unobserved}} + \overbrace{u_{ia}}^{\text{transitory}} + \overbrace{z_{ia}}^{\text{persistent}}, \qquad (1)$$

ex-ante heterogeneity | ex-post uncertainty

Ex-Ante *Unobserved* Heterogeneity

α : Unobserved Heterogeneity: $\alpha_i \sim N(0, \sigma^2_\alpha)$

- Age-indpendent, captures initial conditions as of graduation
- E.g. wage differences b/c major choice, diligence,...

γ : Heterogeneity in income profiles: $\gamma_i \sim N(0, \sigma^2_\gamma)$

- 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: $z_{ia} = \rho_a z_{i,a-1} + \eta_{ia}$, with shock $\eta_{ia} \sim N(0, \sigma^2_{\eta,a})$

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

u : Transitory: $u_{ia} = \varepsilon_{ia} + \theta \varepsilon_{i,a-1}$, with shock $\varepsilon_{ia} \sim N(0, \sigma^2_{\varepsilon,a})$

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

Estimation

- ρ, σ_ε, and σ_η are functions of age:
  - σ^2_ε, σ^2_η, and ρ are cubic functions of age
  - θ, σ_α, and σ_γ are time-invariant

- Method: GMM
  - Autocovariance matrix up to 6 lags
  - Efficient weighting matrix

Estimates: Life-Cycle

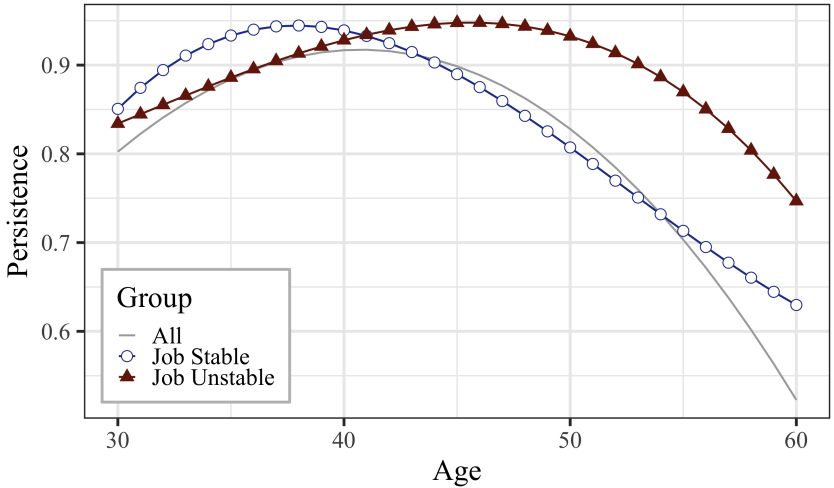
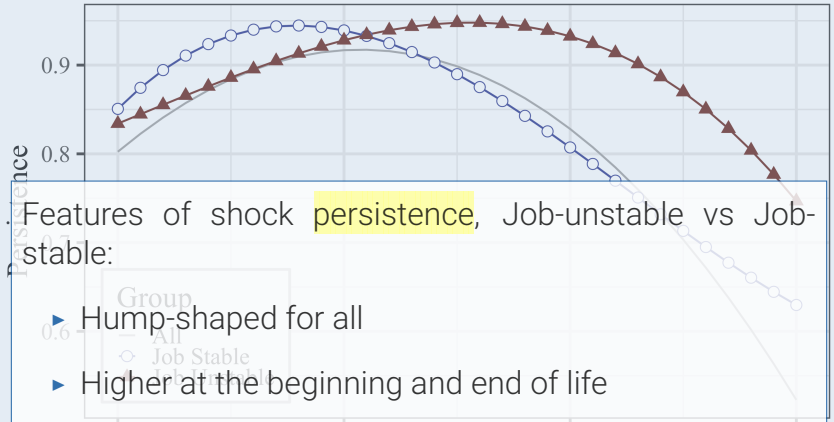


Figure: Persistence

Estimates: Life-Cycle



Features of shock persistence, Job-unstable vs Job-stable:

- Hump-shaped for all
- Higher at the beginning and end of life
- Peaks later in life
  ↪ age of 46 vs 37

Figure: Persistence

Estimates: Life-Cycle

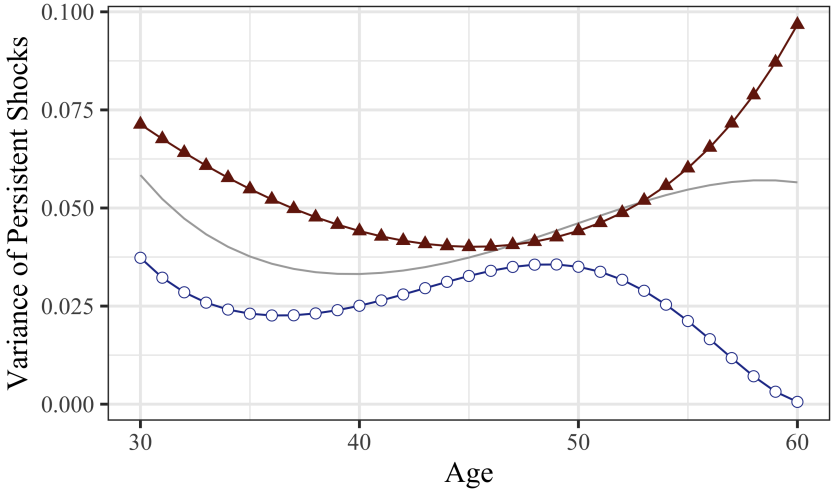
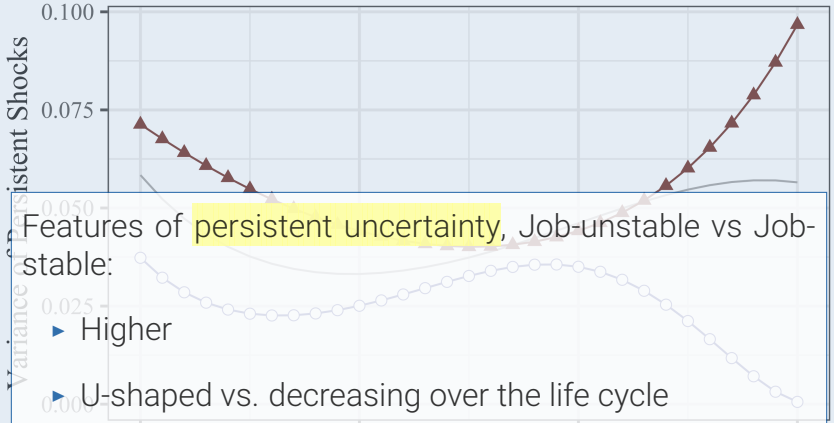


Figure: Variance of Persistent Shocks

Estimates: Life-Cycle



Features of persistent uncertainty, Job-unstable vs Job-stable:

- Higher
- U-shaped vs. decreasing over the life cycle
  - Big difference at the end of the life-cycle
    ↪ From age 50 on

Figure: Variance of Persistent Shocks

Estimates: Life-Cycle

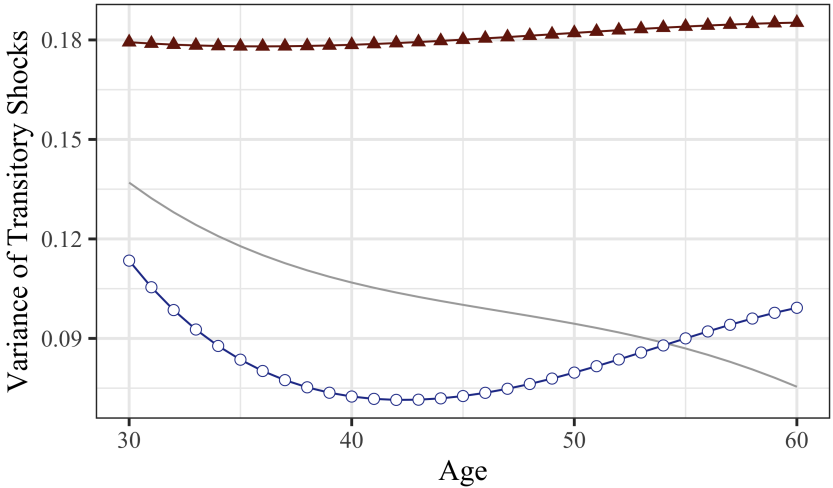
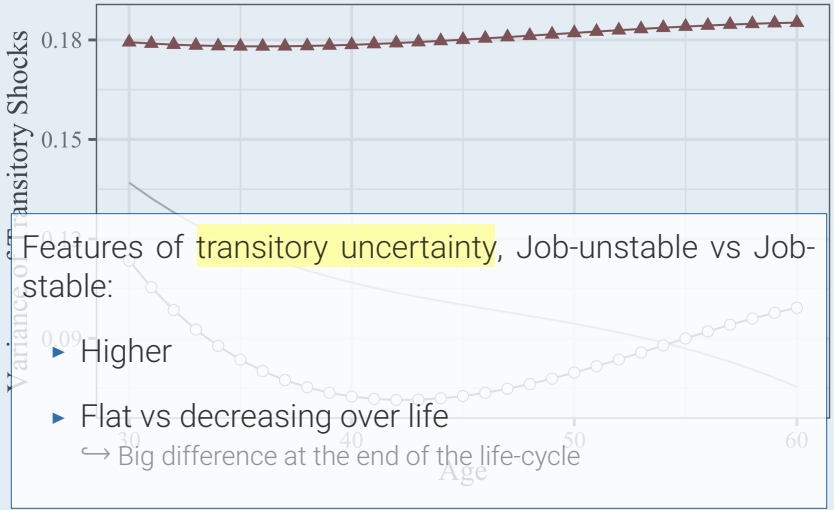


Figure: Variance of Transitory Shocks

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

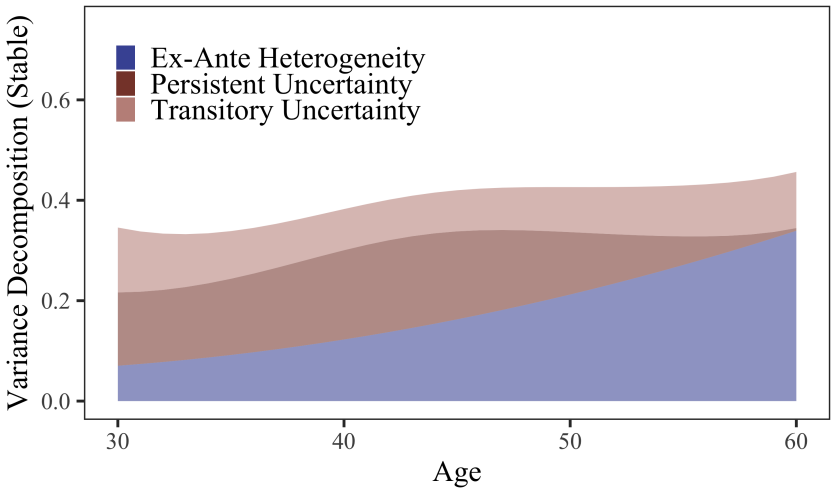
Decomposing Sources of Earnings Variance

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 (ρ) and variance of persistent shocks (σ^2_η)

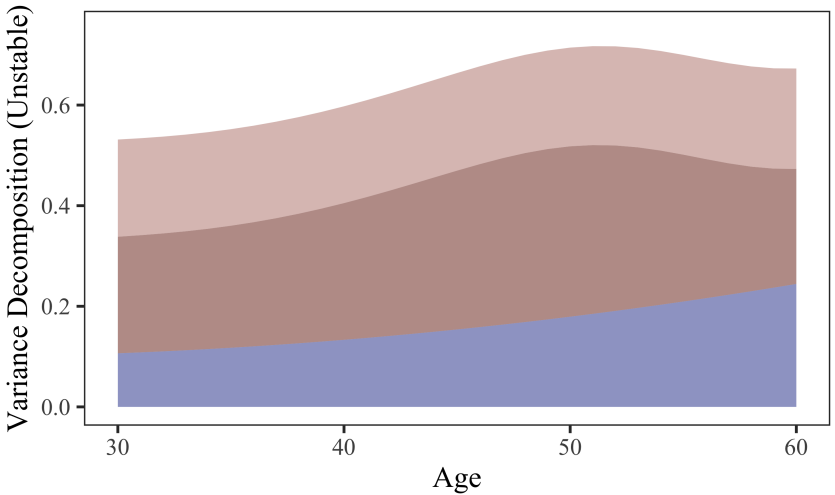
Decomposing Sources of Earnings Heterogeneity

Job-Stable



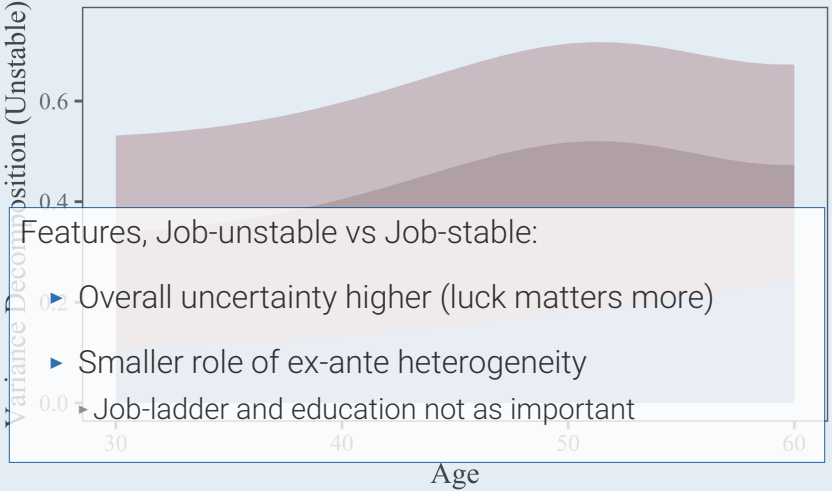
Decomposing Sources of Earnings Heterogeneity

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

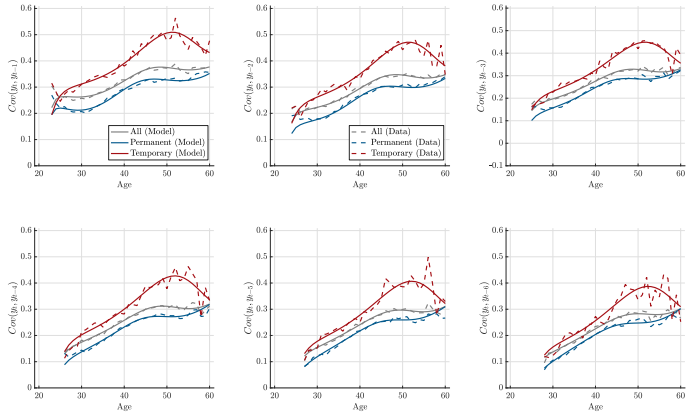
Conclusion

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

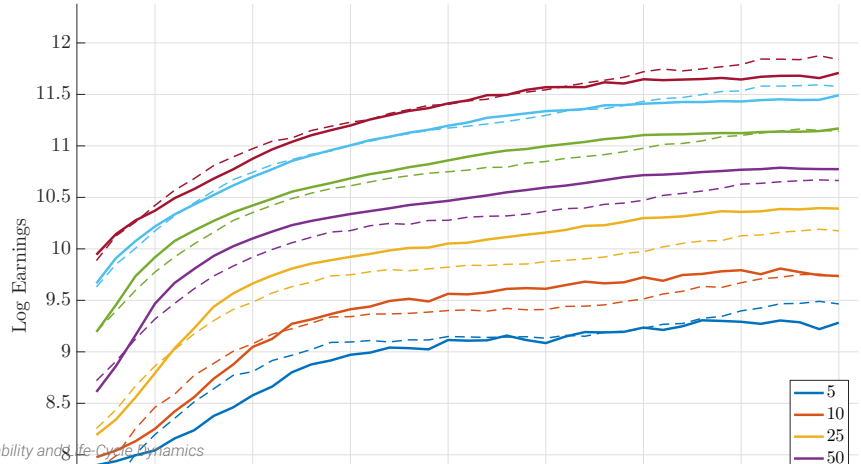
Autocovariance Fit



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