Understanding Earnings Dynamics: Identifying and Estimating the Changing Role of Unobserved ability, Permanent and Transitory Shocks

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Conference on Secular Changes in Labor Market Outcomes
Federal Reserve Bank of Atlanta, October 2015

Outline

- The paper in context and quick summary
- On identification in theory and in practice
- Some final comments

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- Large increase in residual (after controlling for observables) inequality in the US since late 1970s. Two approaches

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  - Cross sectional based (SDI) analysis which invokes the price of unobserved skills (i.e. flexibility, quality of education) as drivers (Katz and Murphy, 1992 and ...)
  - Panel based analysis which invokes changing volatility of permanent (persistent) and transitory shocks (Gottshalk and Moffit, 1994 and ...)

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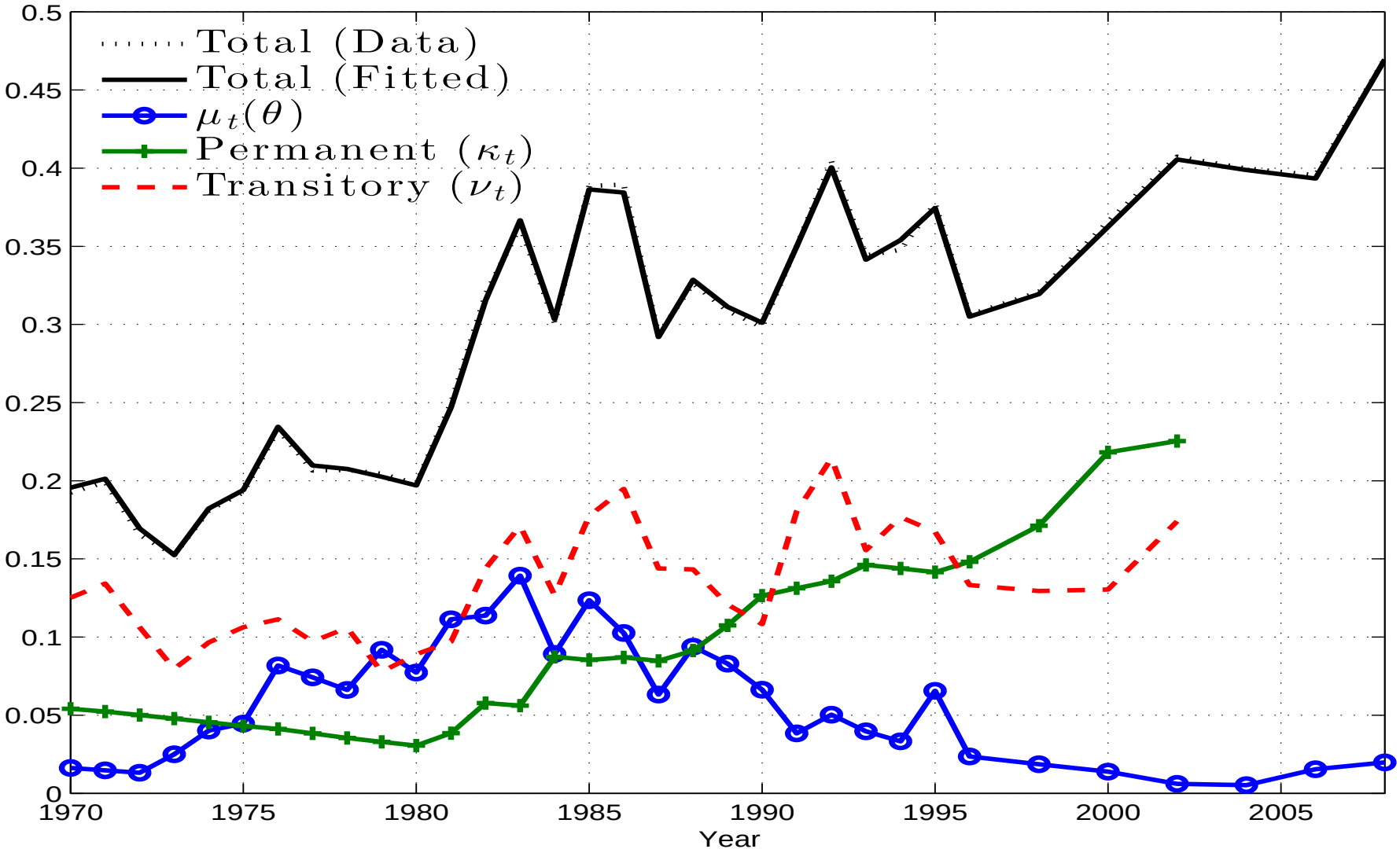
  - Cross sectional based (SDI) analysis which invokes the price of unobserved skills (i.e. flexibility, quality of education) as drivers (Katz and Murphy, 1992 and ...)
  - Panel based analysis which invokes changing volatility of permanent (persistent) and transitory shocks (Gottshalk and Moffit, 1994 and ...)
- Paper argues for panel based approach that can identify both changing volatility of shocks and changing prices of unobserved skills (methodological)
- Finds that role of changing prices of unobserved skills significant in the early 1980s but small post 1990s (substantive)

The main finding



Identification: the panel data approach in a simple case

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$$var(\eta_{it}) = var(\Delta y_{it}) - 2var(\varepsilon_{it})$$

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How to identify $p_t \theta_i$?
Taking growth rates far apart in time

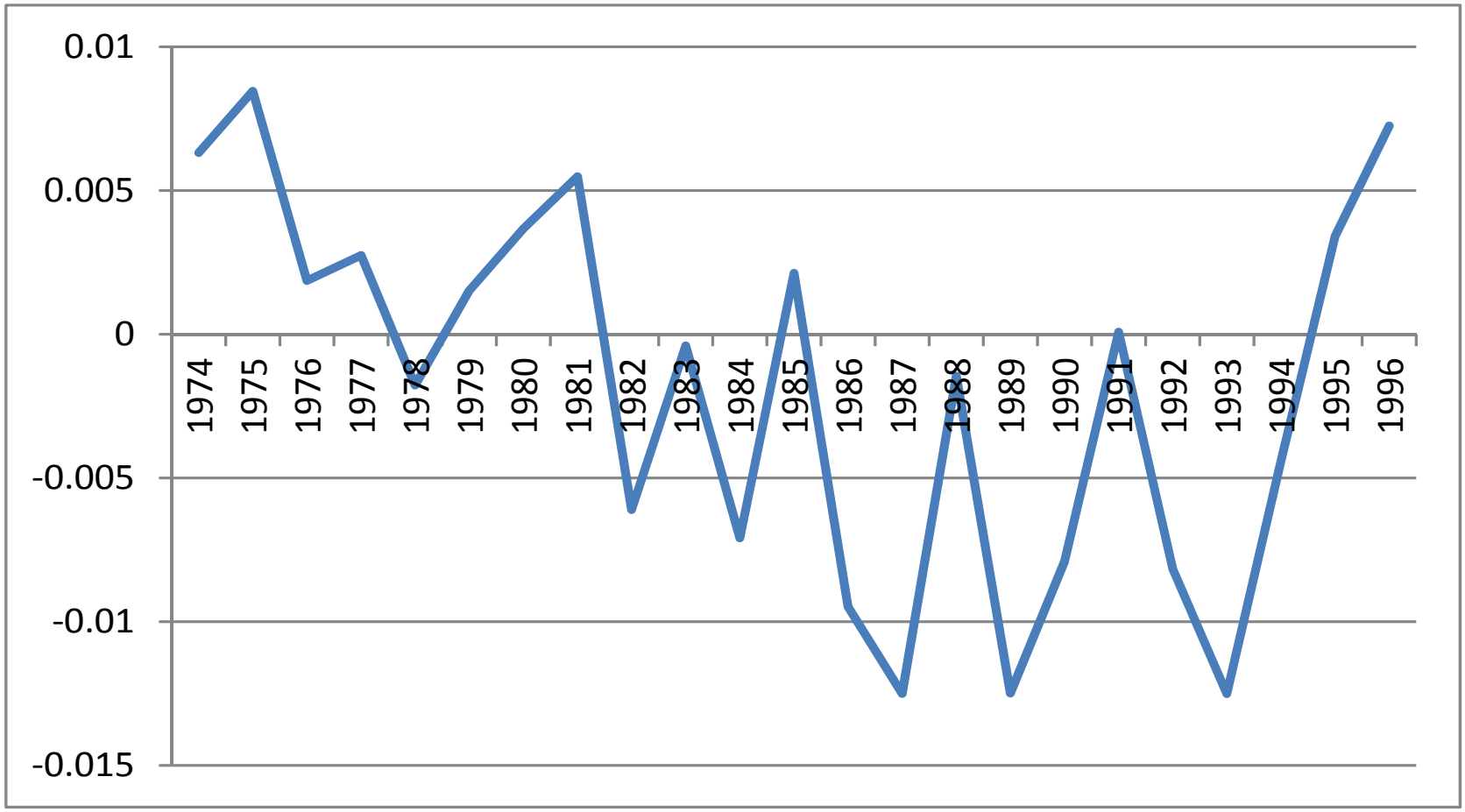
$$\begin{aligned} & cov(\Delta y_{it+2}, \Delta y_{it}) \\ = \; & E(\theta_i \Delta p_{t+2} + \eta_{it+2} + \varepsilon_{it+2} - \varepsilon_{it+1})(\theta_i \Delta p_t + \eta_{it} + \varepsilon_{it} - \varepsilon_{it-1}) \\ = \; & E\theta_i^2 \Delta p_{t+2} \Delta p_t \end{aligned}$$

- General idea: shocks (temporary or permanent) do not generate co-variation in growth rates far apart, while unobserved skills (which are fixed characteristics associated with common prices) do, hence observed covariation in far apart growth rates can be attributed to changing prices of observed skills

Identification in practice

- Covariance of growth rates of different individuals at two years far in time should be informative about role of unobserved skills
- How has this covariance evolved in PSID?
- Data set from Heathcote, Perri, Violante (2001) (PSID, annual data 1967-1996), compute log male earnings residuals and then $Cov(\Delta y_{i,t}, \Delta y_{i,t+4})$

Covariance of earnings growth at t and t+4



Reinterpreting the main result

- Increase in inequality in early 1980s associated to changes in growth rates correlated in time, as individuals experience growth in earnings, expect growth to persist
- Inequality in early 2000 mostly explained by standard permanent shocks plus transitory shocks

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- Paper could connect more to panel estimation litt. Litt. focused on simple two shocks model as finds autocovariance of earnings die off quickly. Using same data the paper suggest this is not the case?
- Small literature suggesting the simple permanent and transitory shock mis-pecified as it yields very different estimates if moments in level v/s growth rates are used. I suspect that specification used in this paper might help to solve this puzzle.