HOUSEHOLD BEHAVIOR AND THE DYNAMICS OF INEQUALITY

NEMMERS LECTURE
NORTHWESTERN UNIVERSITY

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UCL & IFS

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- *Labor economics* - **inequality in wages** and **earnings.**
- *Family or household economics* - **inequalities in family earnings, family labor supply** and **time allocations.**
- *Public economics* - **inequality in income** and **the impact of taxation**.
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- Often left to *macroeconomics* - the **distributional dynamics of consumption (**and **wealth).**

The research agenda I present here argues that these need to be brought together to get a handle on the subject of this lecture:

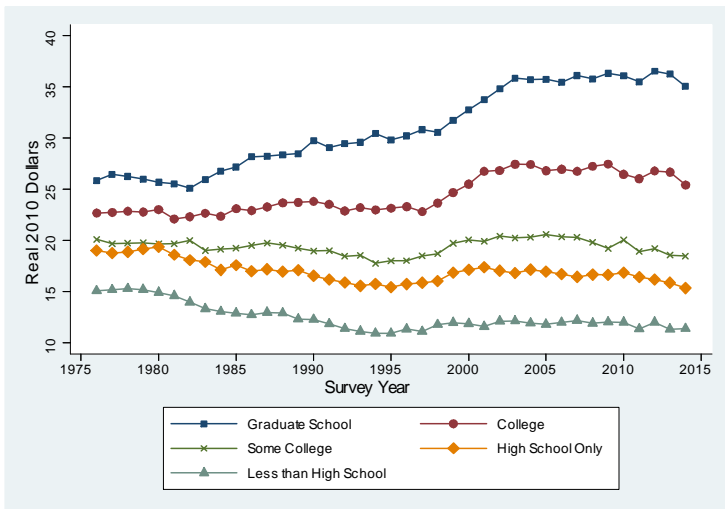..... "**Household Behavior and the Dynamics of Inequality**".....

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  - growing earnings inequality.

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- The aim of this research agenda is to explore the mechanisms families and households use to accommodate shocks, to see how successful are tax and welfare systems and to suggest how policies could be better targeted.

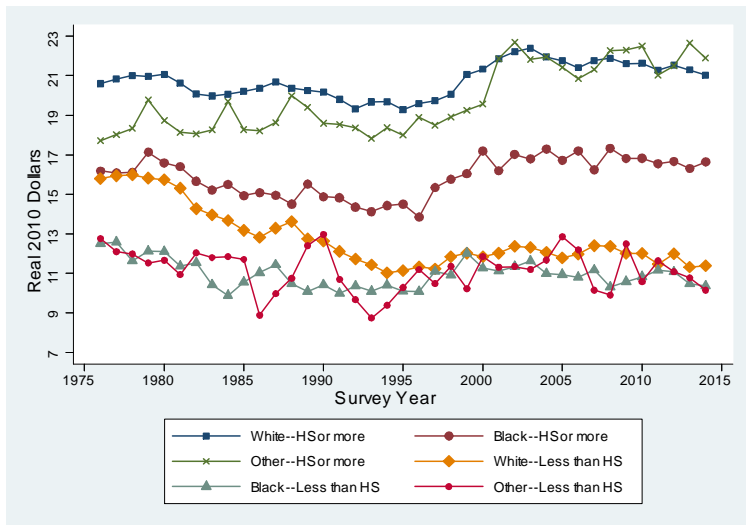- Some background descriptive motivation on different measures of inequality....
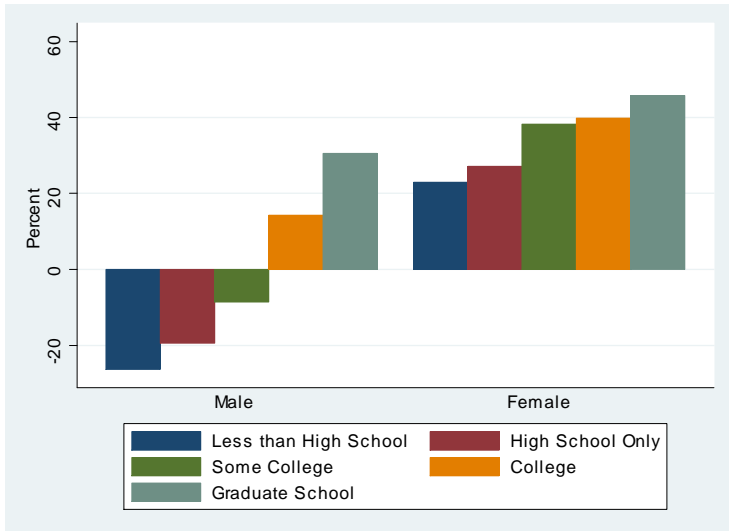
Male Median Real Wages by Education in the US

Male Median Real Wages by Education and Race in the US

Earnings Change by Education and Gender, US

Male Real Wages Inequality by Birth Cohort and Age in the US
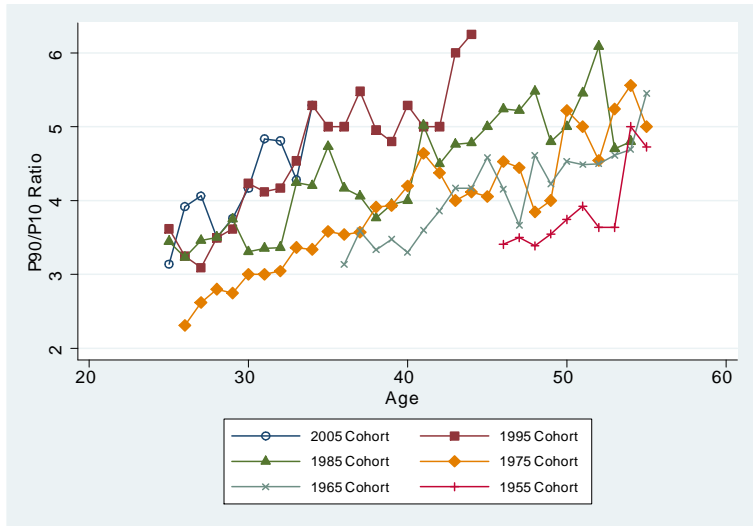
Notes: CPS FTFY workers aged 25-55; Source: Blundell, Norris-Keiller and Ziliak (2017)
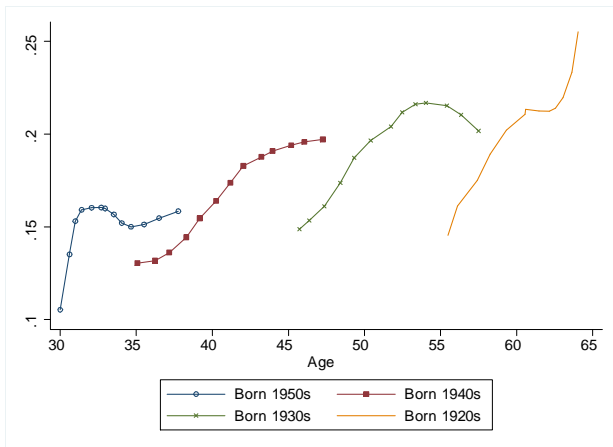
Female Real Wage Inequality (90/10) by Birth Cohort and Age in the US

Consumption Inequality by age and birth cohort (US)

Notes: var (log); Source: Blundell, Pistaferri and Preston (2008)

Consumption inequality by age and birth cohort (UK)
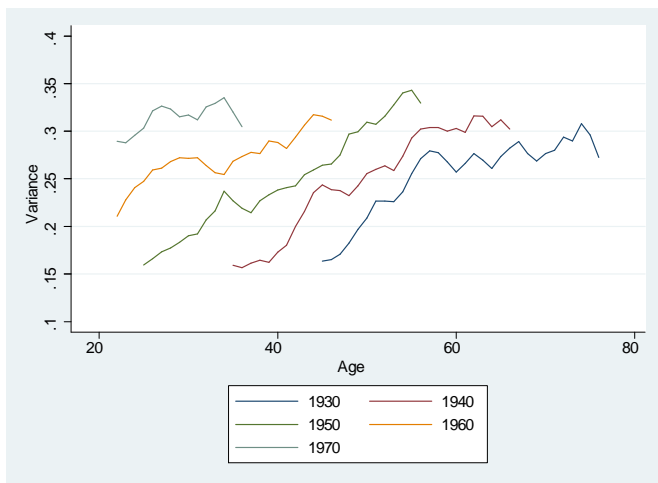
Notes: Variance (log); Source: Blundell, O'Dea and Joyce (2016).

Expenditure per Capita, Non-Medicaid Means Tested Programs, US.
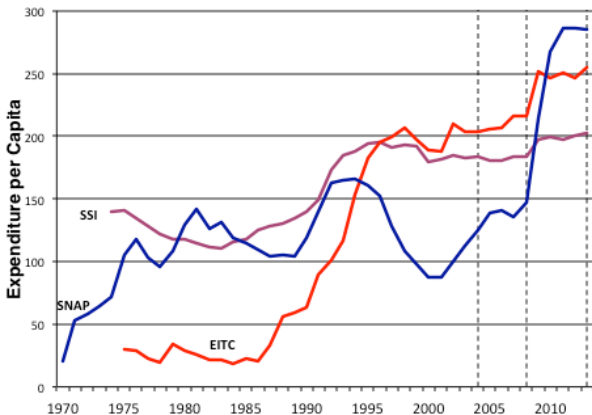
THE LINKS BETWEEN INEQUALITY MEASURES

wages: earnings: family earnings: **net income**: **consumption**: **wealth**

- The link between these various measures is mediated by multiple 'insurance' mechanisms:
  - Labor supply, etc. (wages→ earnings)
  - Family labour supply and time allocations (earnings→ family earnings)
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- To explore the distributional dynamics from wages through to consumption and wealth...

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  - Blundell, Pistaferri and Preston [BPP] 'Consumption inequality and partial insurance' (*AER*, 2008)
  - Blundell, Low and Preston [BLP] 'Decomposing changes in income risk using consumption data' (*QE*, 2013)
  - Blundell, Graber and Mogstad [BGM] 'Labor income dynamics and insurance' (*JPubE*, 2015; 2017)
  - Arellano, Blundell and Bonhomme [ABB] 'Earnings and consumption dynamics: a nonlinear framework' (*Ecta*, 2017)
  - Blundell, Pistaferri and Saporta-Eksten [BPS] 'Consumption inequality and family labor supply' (*AER*, 2016; 2017)
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- Here just an overview......

A DATA REVOLUTION IN EMPIRICAL MICROECONOMICS

I. Administrative linked data: e.g. Norwegian population register.

- Linked registry databases with unique individual identifiers.
  - Containing records for **every Norwegian from 1967 to 2006.**
  - Detailed demographic and socioeconomic information (market income, cash transfers). Recent links to real estate and assets; and to hours of work. New consumption measurements.
- Family identifiers allow to match spouses and children.
  - see Blundell, Graber and Mogstad (2015).

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II. Newly designed panel surveys: e.g. PSID since 1999.

- Collection of consumption and assets had a major revision in 1999
  - ~70% of consumption expenditures. Good match with NIPA
  - The sum of food at home, food away from home, gasoline, health, transportation, utilities, clothing etc.
- Earnings and hours for all earners; Assets measured in each wave.
  - see Blundell, Pistaferri and Saporta-Eksten (2016).

INCOME DYNAMICS AND INCOME INEQUALITY

- It turns out that the dynamics of income can usefully be described by two latent components:
  - a permanent (or *persistent*) component,
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    - persistent shocks to income are more difficult to insure,
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- There is also good economic reasoning behind this decomposition:
  - persistent shocks to income are more difficult to insure,
  - especially the young with low assets.
- How families cope with persistent shocks and the implications for inequality will be the main focus of this talk:
  - short-run fluctuations will matter too, of course,
  - especially for households with low assets (or low access to liquid assets).

A SIMPLE MODEL OF INCOME DYNAMICS

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- A key consideration is to allow the distributions of the persistent and transitory factors (η_t and ε_t) to vary with age/time for each birth cohort.

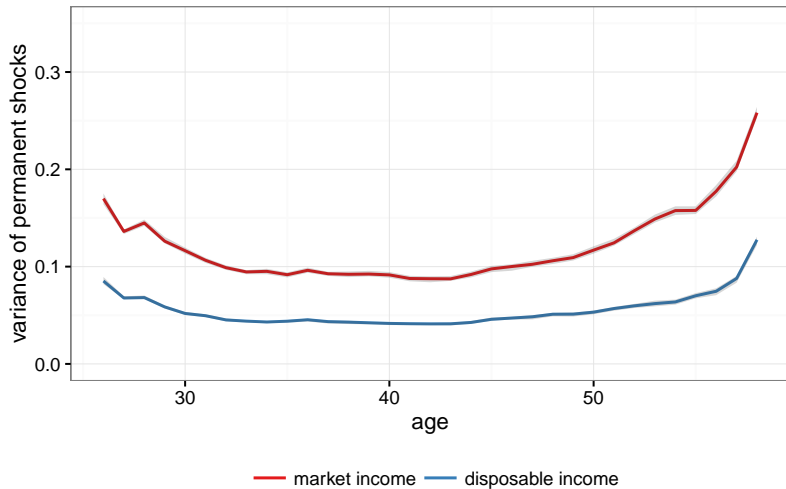- Simple but can be very revealing - detailed work on Norwegian population register panel data....

Variance of permanent shocks to income
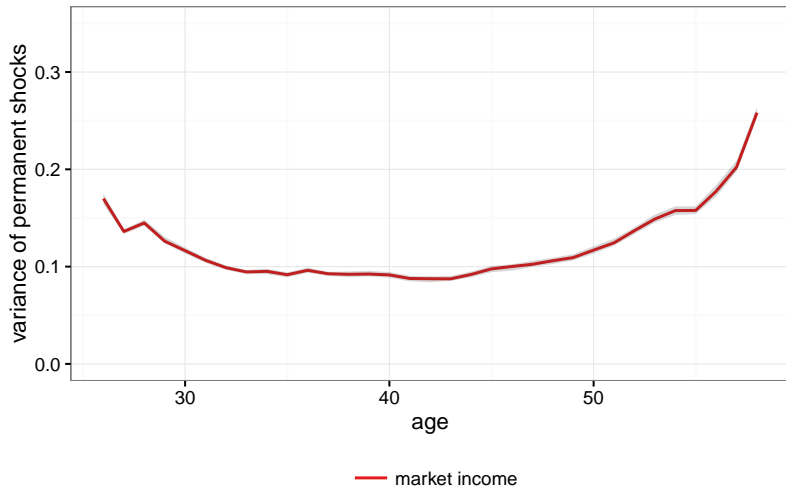
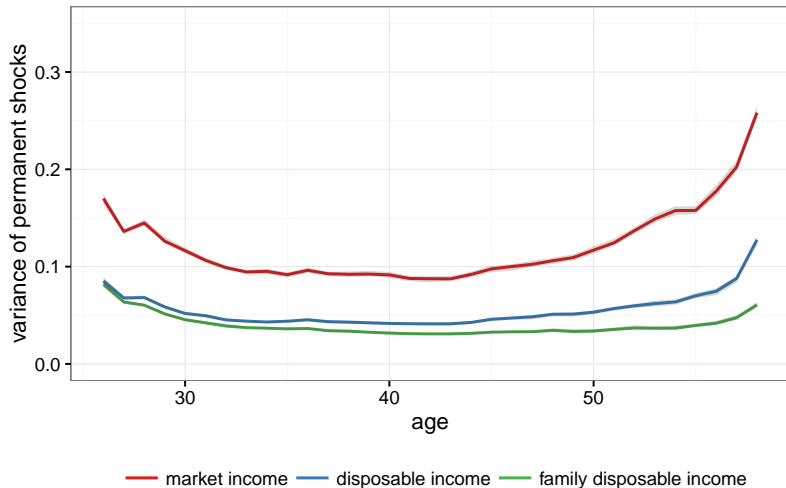Source: Blundell, Graber and Mogstad (2015).
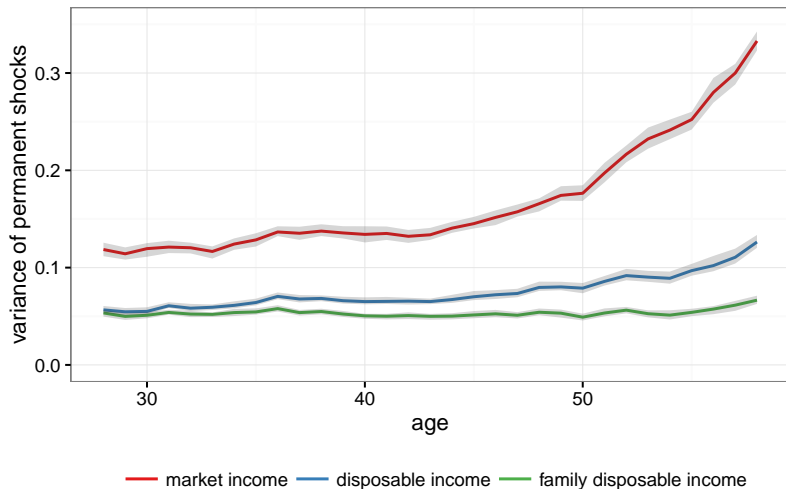
Variance of permanent shocks to income

Source: Blundell, Graber and Mogstad (2015).

Variance of permanent shocks to income

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Variance of permanent shocks to income (low skilled)

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CONSUMPTION DYNAMICS AND INEQUALITY

To account for the impact of income shocks on consumption we introduce *transmission parameters* writing consumption growth as:

$$\Delta \ln C_{it} \cong \gamma_{it} + \Delta Z'_{it} \varphi + \phi_t v_{it} + \psi_t \varepsilon_{it} + \xi_{it}$$

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- For a simple benchmark intertemporal consumption model for consumer of age t, BLP (2013) show

$$\phi_t = (1 - \pi_{it}) \text{ and } \psi_t = (1 - \pi_{it})\gamma_{Lt}$$

where

$$\pi_{it} \approx \frac{\text{Assets}_{it}}{\text{Assets}_{it} + \text{Human Wealth}_{it}}$$

and γ_{Lt} is the annuity value of a temporary shock to income for an individual aged t retiring at age L.

Consumption inequality in Norway by age, low skilled.

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Social insurance takes most of the strain in insuring consumption fluctuations. Little role for self-insurance or other channels.
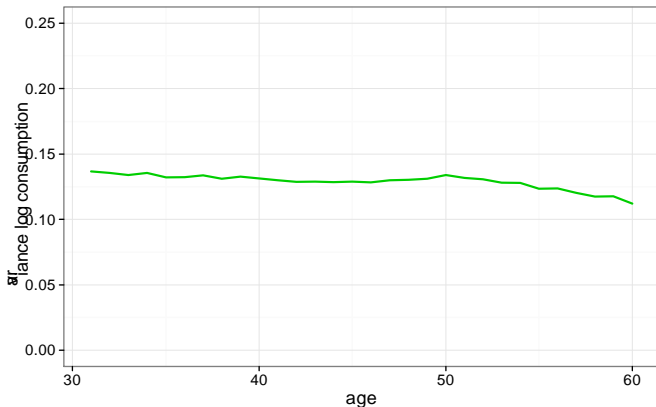
Notes: Variance log consumption. Consumption measured using income sources, taxes paid, bank balances, real estate and asset transactions.
Source: Blundell, Graber and Mogstad (2017).

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Using the US PSID data, BPP estimates of *partial insurance*, $\widehat{\phi}_t$:

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0.7928 (.18) for those born in the 1940s.

- The estimate falls by more than 30% if we exclude taxes, EITC and food stamps for the no college group.
- For a low wealth sample $\widehat{\phi}_t$ is .8489 and there are significant impacts of transitory fluctuations in income too.

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1. The income process: usual shocks and nonlinear persistence.

2. Other mechanisms: in particular family labor supply and time use with children.

   - see also the work separating employment shocks by *Hamish Low, Costas Meghir and Luigi Pistaferri (AER)*.

   - advance information could be a key issue too *(ABB)*.

1. UNUSUAL INCOME SHOCKS AND NONLINEAR PERSISTENCE

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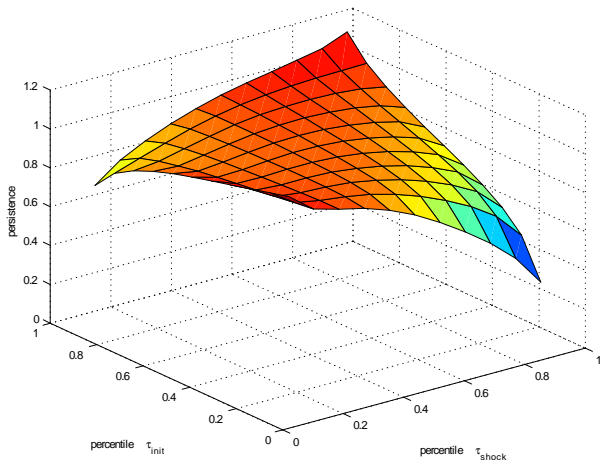
- **Evidence of such nonlinearity?**

Nonlinear Persistence in the PSID
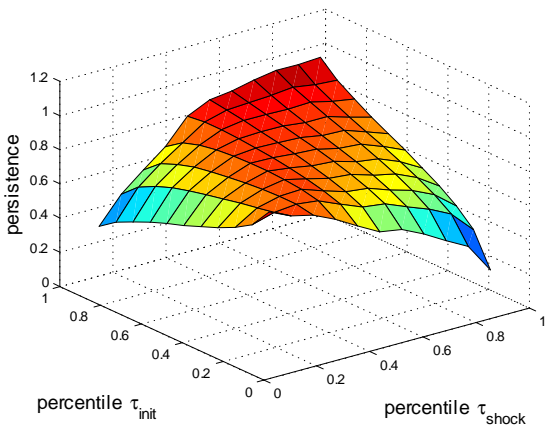
Notes: Pre-tax household labor earnings, Age 30-60 1999-2009 (US). Estimates of the average derivative of the conditional quantile function.
Source: Arellano, Blundell and Bonhomme (2017).

Nonlinear Persistence in the Norwegian Register Data

Notes: Norwegian Population Register, Family Earned Income. Estimates of the average derivative of the conditional quantile function.
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- And delivering a new measure of nonlinear persistence.

- Use this new nonlinear framework to explore the complete distributional dynamics of income,

- and then the implications for consumption and savings decisions....

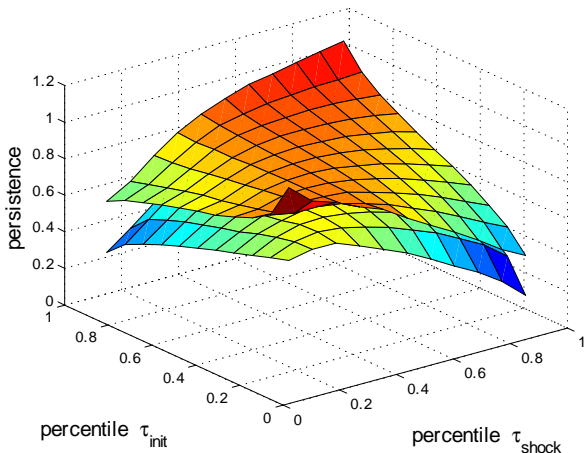# Nonlinear Persistence in Permanent Income
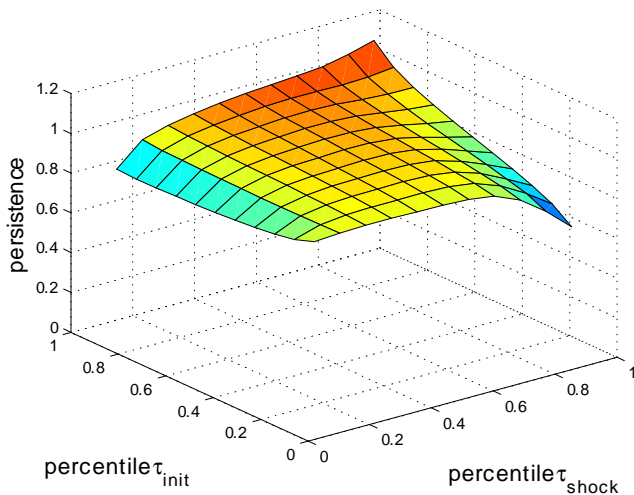
Implied Model Simulation of Persistence in Income
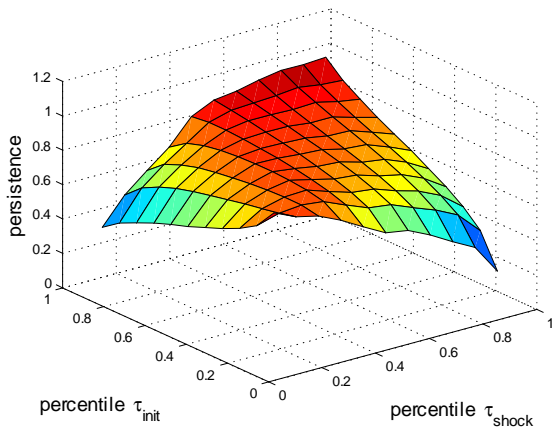
Notes: Pre-tax household labor earnings, Age 30-60 1999-2009 (US). Estimates of the average derivative of the conditional quantile function see source paper.
Source: Arellano, Blundell and Bonhomme (2017).

Confidence Intervals for Estimated Nonlinear Persistence

Notes: 95% CI for estimated average derivative of the conditional quantile function
see source paper; parametric bootstrap.
Source: Arellano, Blundell and Bonhomme (2017).

IMPLICATIONS FOR THE CONSUMPTION DISTRIBUTION

- Allow the permanent and transitory income components to interact with assets, age and individual heterogeneity:

$$c_{it} = g_t(A_{it-1}, \eta_{it}, \varepsilon_{it}, \nu_{it}, \xi_i)$$

- assets A_{it-1},
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- Track the impact of a permanent income shift on consumption for different levels of assets and for different ages......
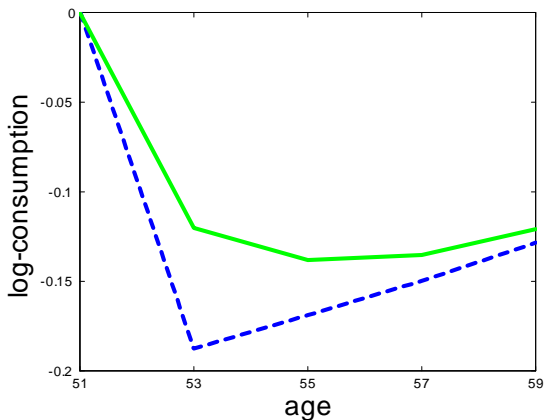
Partial Insurance by Age and Assets
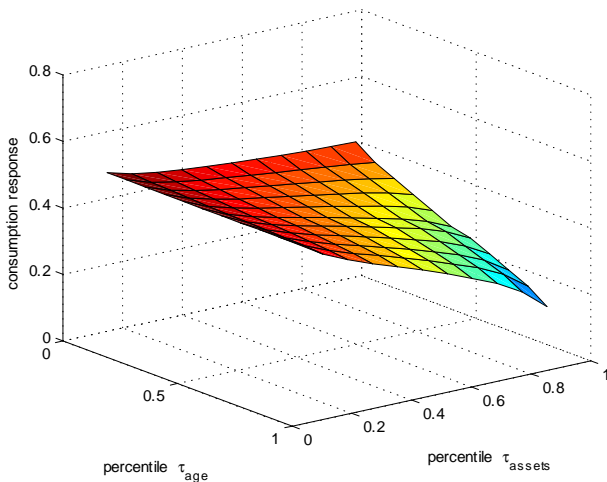
Notes: Families with head aged 30-60, 1999-2009 (US). Estimates of the average partial insurance of persistent shocks.
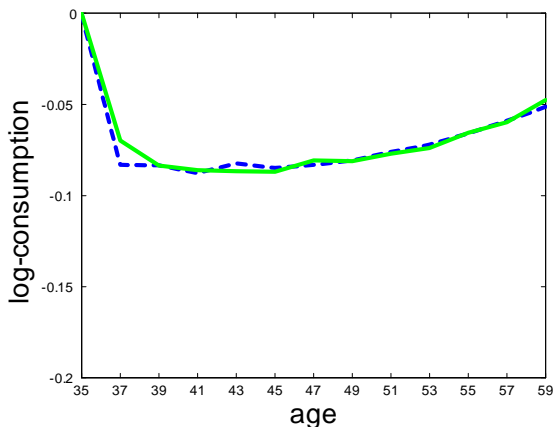Source: Arellano, Blundell and Bonhomme (2017).

Consumption responses for older worker
(high income [90th], bad shock [10th])

Notes: Impulse response of persistent shock; 90th percentile of permanent income, 10th percentile shock; 25th percentile (blue) and 75th percentile (green) of assets. Families with head aged 50-60, 1999-2009 (US).
Source: Arellano, Blundell and Bonhomme (2017).

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Families with head aged 35-60, 1999-2009 (US).
Source: Arellano, Blundell and Bonhomme (2017).

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2. WHAT ABOUT A ROLE FOR FAMILY LABOR SUPPLY?

Families have the possibility of adjusting on many margins.

- **To make progress we distinguish four separate mechanisms:**

1. Labor supply of other family members,
2. Non-linear taxes and welfare,
3. Self-insurance (i.e., savings) through the *direct* use of net assets,
4. Other informal mechanisms and networks....

2. What about a role for family labor supply?

Families have the possibility of adjusting on many margins.

- **To make progress we distinguish four separate mechanisms:**

1. Labor supply of other family members,
2. Non-linear taxes and welfare,
3. Self-insurance (i.e., savings) through the *direct* use of net assets,
4. Other informal mechanisms and networks....

- We then examine each step in the distributional dynamics from wages to consumption.

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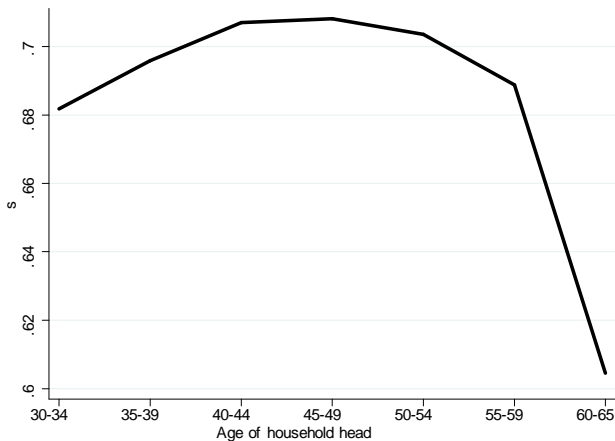 - might love to spend time together but have to eat!
- A persistent shock to his wages will depend on preferences over time use and consumption, but also on the net assets the family can draw on and how important his earnings are in the human capital of the family ....
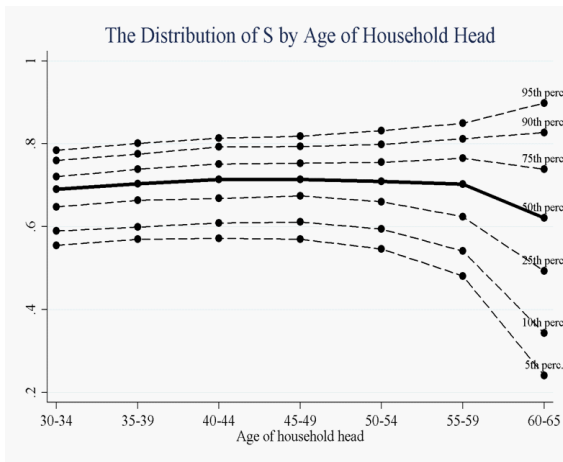
The share of his human wealth by age

$$s_{i,t} \approx \frac{\text{Human Wealth}_{male,i,t}}{\text{Human Wealth}_{i,t}}$$

Notes: PSID couples. Source: Blundell, Pistaferri and Saporta-Eksten (2016)
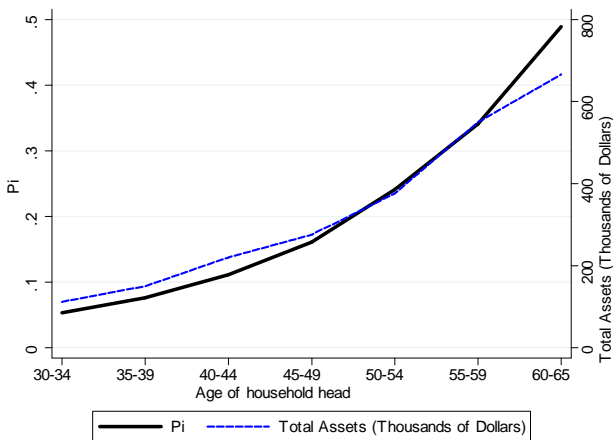
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The Distribution of S by Age of Household Head

Source: Blundell, Pistaferri and Saporta-Eksten (2016)

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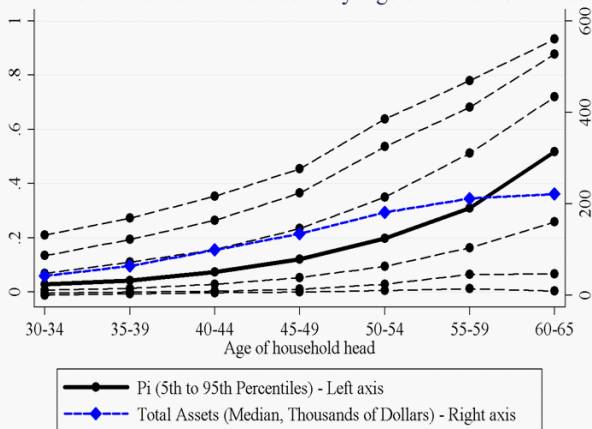

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The Distribution of Pi and Assets by Age of Household Head

Legend:
- Pi (5th to 95th Percentiles) - Left axis
- Total Assets (Median, Thousands of Dollars) - Right axis

x-axis: Age of household head

Household consumption responses to an adverse persistent shock to husband's real wages
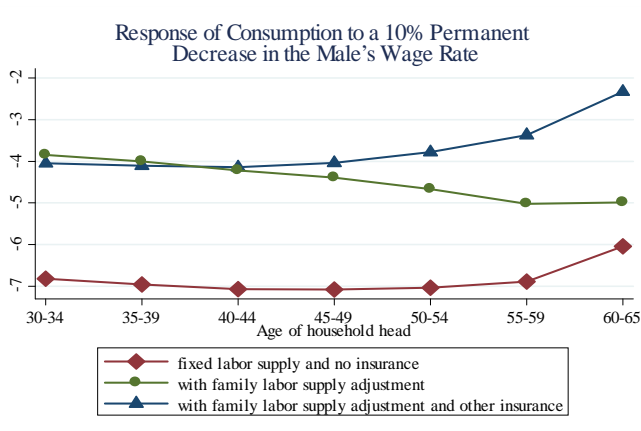
Notes: Average response. Source: Blundell, Pistaferri and Saporta-Eksten (2016)

Household consumption responses to an adverse persistent shock to husband's real wages

Consumption Response to a -10% Permanent Shock to Head's Wages (κ_3)
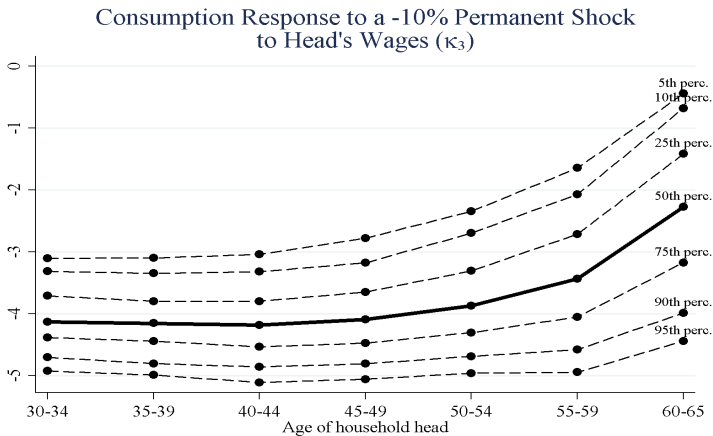
Notes: Distribution of responses.
Source: Blundell, Pistaferri and Saporta-Eksten (2016)

IMPLICATIONS....

- Found that family labor supply is a key mechanism for 'insuring' unexpected shocks,
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- Overall, once family labor supply, assets and taxes/benefits are accounted for, there is little evidence for additional insurance.

- But where do these hours adjustments come from?

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- A neat and simple household production model works a treat!

  - it is mother's time with children that takes a hit...

Mother's labor supply response to a persistent adverse shock (10%) to husband's earnings

Hours and employment (Wife)

Legend: Extensive margin, Intensive margin
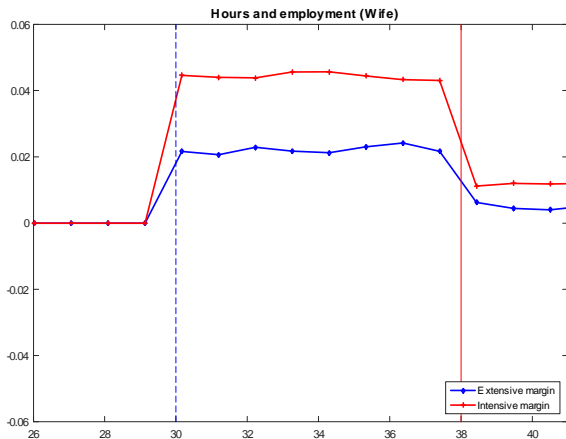
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Mother's time with children response to a persistent adverse shock to husband's earnings

Time with children (Wife)
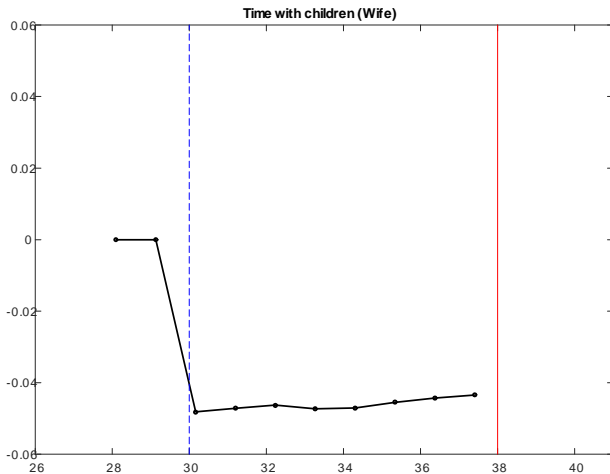
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....**Note, Nonlinear Persistence remains a key feature for male wages**
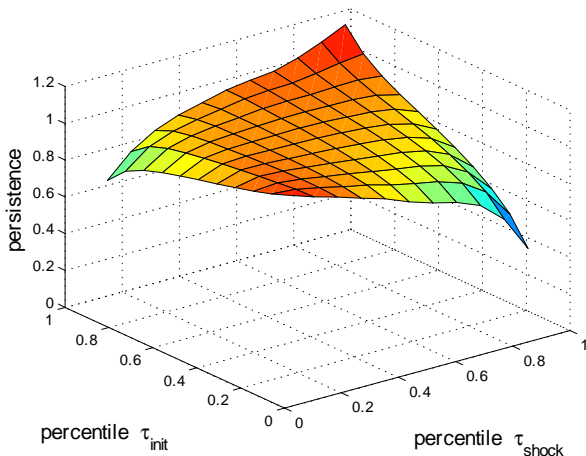
Notes: Log male wages, Age 30-60 1999-2009 (US). Estimates of the average derivative of the conditional quantile function. Source: Arellano, Blundell and Bonhomme (2017b).

GATHERING UP THE RESULTS...

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- Drawing from linked administrative population register data and carefully collected panel data surveys.

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That's it for now!

Household Behavior and the Dynamics of Inequality

Nemmers Lecture
Northwestern University

Richard Blundell

UCL & IFS

May 2017