

# Labor Supply in the Past, Present, and Future

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## The paper in a nutshell

- Start from **Boppart, Krusell (2016)**
  - Show that *aggregate labor supply* declines with development
  - Characterize preferences that deliver BGP with hours decline
- This paper: focus on **heterogeneity**
  - Recent trends in labor supply differ by groups
  - Write quantitative model consistent with these trends
- Project forward and give a quantitative version of “*Economic Possibilities for our Grandchildren*”
  - How much we will work in 100 years?
  - Who will work in 100 years?
  - At this point only trends in aggregate productivity, but more to come

## General comments

- Very nice paper
  - Model of BGP with intensive and extensive margins of labor supply
  - Central role for Inc Effect > Subs Effect
    - Can produce endogenous retirement with flat productivity and flat cost of working
    - Implications across several dimensions of heterogeneity
  - Quantitative exercise disciplined with panel micro data to talk about long run trends
- Purposely simple framework: first step
- In what follows I would like to discuss
  - ① Core mechanism of income vs. substitution effect
  - ② Complete markets assumption
  - ③ Too stylized labor supply side
  - ④ Too stylized labor demand side

# 1. Income and substitution effects

*What are they?*

- Standard Intratemporal Condition (IC):

$$u_c w = u_l \Rightarrow c_{it}^{-\sigma} w_t = \psi_i h_{it}^{1/\theta}$$

- Substitution effect: as wages go up the return to work increases
  - Income effect: as wages go up the value of income declines
  - With  $\sigma = 1$  both effects cancel out
- 
- Traditional view
    - Hours are constant in the long run  $\Rightarrow$  BGP requires  $\sigma = 1$
    - This restricts the cross-section: permanent differences of wages across workers do not generate differences in hours
- 
- This paper view
    - Hours decline in the long run  $\Rightarrow$  BGP requires  $\sigma > 1$
    - This restricts the cross-section: better paid workers work less hours

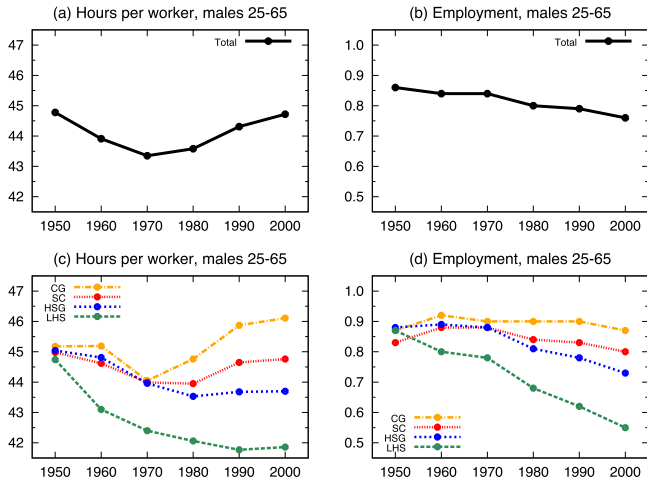
# 1. Income and substitution effects

## Problems

- Do more productive workers work less hours?
  - a) Yes, if we look at residual wage inequality
    - Heathcote, Storesletten, Violante (AER 2014)
      - But residual wage inequality partly driven by transitory shocks, which are absent here
  - b) Nope, if we compare education groups
    - Michelacci, Pijoan-Mas (JET 2016)
      - How does the model deal with this?
      - Insurance across types (more on this later)
- Have workers with higher wage growth reduced their hours more?
  - Nope, if we look at workers by education
    - Michelacci, Pijoan-Mas (JET 2016)
      - How does the model deal with this?

# 1. Income and substitution effects

*Michelacci, Pijoan-Mas (JET 2016)*



Note. Employment rates and hours per worker are for male workers of age 25–65 from the US Census. CG refers to college graduates, SC to high school graduates with some college education, HSD to high school graduates, and LHS to workers with less than high school degree.

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## Measurement

Very stylized model  $\Rightarrow$  hard to bring to the data

### ① Estimation of $\sigma$ and $\theta$ : taken off the shelves

Heathcote, Storesletten, Violante (AER 2014)

- Good, because HSV-14 use same preferences and same IC to obtain the parameters
- Bad, because HSV-14 also contains uninsurable shocks

### ② Why not use IC with PSID data to obtain $\sigma$ and $\theta$ ?

- Obtain the strength of income effect from the panel and use it to make predictions in the long run
- IC already used to obtain fixed effect in leisure

### ③ How to think about the mapping of model wealth to data?

- Wealth has strong life cycle component in the data
- In the model of CM wealth is more than just current asset holdings



## 2. Complete markets assumption

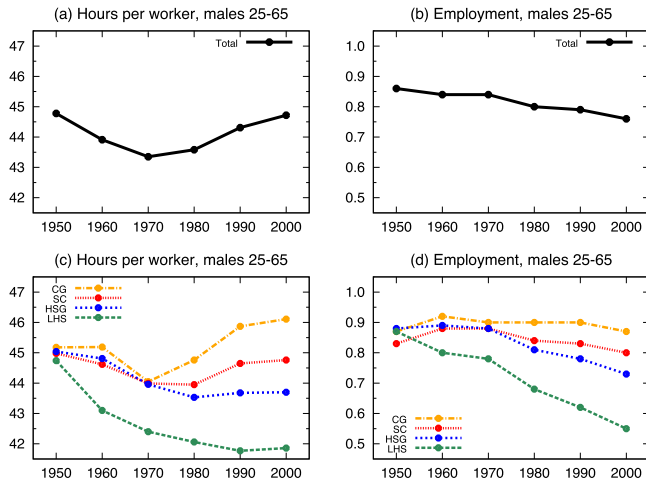
- Complete markets assumption. Allows to:
  - solve for planner problem
  - overlook (hopefully) second order financial issues related to risk
- But this has (unintended?) consequences
  - Within a dynasty, different generations have different productivity
  - CM implies consumption insurance across types
  - ⇒ This kills income effect of different wages in the cross-section
    - Individuals of high productivity work harder than individuals of low productivity (and consume the same)
- Problems
  - In the model: it's bad to be skilled (work more, consume the same)
  - In the data consumption of college workers much larger (80%) than consumption of high school dropouts

### 3. Labor supply

- In the model, productivity moves hours in the intensive and extensive margins in the same direction
- Yet
  - ① *Recent US experience shows diverging trends for men*  
*McGrattan, Rogerson (MPLS QR 2004), Michelacci, Pijoan-Mas (JET 2016)*
    - Hour per worker increased between 1970 and 2000
    - Employment rate declined between 1970 and 2000
  - ② In the long run: decline intensive margin, stability extensive margin
- Need a more sophisticated theory of extensive margin?
  - Perhaps 1970-2000 is “short run” blip
  - Perhaps long run trends can be explained by demographic composition

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## 4. Labor demand

- Labor demand in the model very simple:
  - One equilibrium wage  $\Rightarrow$  different workers are perfect substitutes
  - Project future labor demand through increase in aggregate productivity
- However, there is evidence of
  - Imperfect substitution between different types of workers
  - **Differential demand trends** for different types of workers
- For instance,
  - Skill-biased technical change  
Katz, Murphy (QJE 1992); Krusell, Ohanian, Rios-Rull, Violante (ECTA 2000)
  - Task-biased technical change and polarization of labor market  
Autor, Levy, Murnane (QJE 2003); Autor, Dorn (AER 2013)
- Main worry about the future is automation and its effect on the labor demand of different skills
- ▷ How can the model fit this into its projections?