Discussion of Michael Christian:


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Christian’s Main Findings

1. US human capital stock is “gigantic”

   - $3/4$ quadrillion dollars in 2006
   - $\approx 55 \times GDP$
   - $\approx 16 \times \text{Fixed assets } + \text{ durables}$
Christian’s Main Findings

1. US human capital stock is “gigantic”
   
   - 3/4 quadrillion dollars in 2006
   - $\approx 55 \times GDP$
   - $\approx 16 \times \text{Fixed assets + durables}$

   Big even if nonmarket time excluded (15 $\times$ GDP)
Christian’s Main Findings

1. US human capital stock is “gigantic”
   - 3/4 quadrillion dollars in 2006
   - $\approx 55 \times \text{GDP}$
   - $\approx 16 \times \text{Fixed assets + durables}$

2. Gross investment estimates sensitive to enrollment patterns
Uses Jorgenson-Fraumeni Methodology

\[ H_{y,s,a,e} = \begin{cases} 
E_{y,s,a,e} + \frac{(1+g)}{(1+\rho)}\pi_{y,s,a+1}H_{y,s,a+1,e} & a > 34 \\
E_{y,s,a,e} + \frac{(1+g)}{(1+\rho)}\pi_{y,s,a+1}\tilde{H}_{y,s,a+1,e} & a \leq 34 
\end{cases} \]

\[ \tilde{H}_{y,s,a,e} = \omega_{y,s,a,e}H_{y,s,a+1,e+1} + (1 - \omega_{y,s,a,e})H_{y,s,a+1,e} \]

where \( y, s, a, e \) = year, sex, age, education

\( H \) = human capital stock

\( E \) = average yearly earnings of group

\( \pi \) = survival probability

\( g \) = growth rate of labor earnings

\( \rho \) = discount rate
Human Capital >> Fixed Assets

- Total Human Capital/GDP
- Nonmarket Human Capital/GDP
- Market Human Capital/GDP
- (Fixed Assets+Durables)/GDP
Two Measures: Very Different Results

Jorgenson-Fraumeni (1989)

Jorgenson-Fraumeni (1992)

Christian (2010)

Kendrick (1976)
Why are J-F-C Estimates so Large?

- Education output treated as investment not consumption
- Nonmarket time earns same after tax wage as market time
- Costs of maintaining capital during lifetime not subtracted
- Costs of raising children not subtracted
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- Education output treated as investment not consumption
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- Costs of raising children not subtracted
- More importantly, why does it matter?
Main Comments

- Would like to see
  - Less emphasis on the size of the stocks
  - More emphasis on their economic importance

- With the goal of better connecting theory and measurement
Consumers of the Estimates

- Who are they?
- Who should they be?
Consumers of the Estimates

- Who are they? Satellite accountants

- Who should they be?
Consumers of the Estimates

- Who are they? Satellite accountants

- Who should they be?
  - Labor economists studying education policy
  - Development economists studying income differences
  - Financial economists studying asset pricing
  - Macroeconomists studying business cycles
Economic Importance of Estimates

• Issues in labor
  - What are implications for returns to education?
  - How are the implied returns different from Mincer’s?

• Issues in development
  - What are implications for education policies of poor?
  - And for true income & wealth differences?
ECONOMIC IMPORTANCE OF ESTIMATES

• Issues in finance
  ◦ What are implications for asset prices?
  ◦ Do they help resolve any outstanding puzzles?

• Issues in macro
  ◦ What are implications for business cycles?
  ◦ Do they shed light on the large labor wedge?
Recommendations for Future

• Focus on specific economic questions

• Specify economic environment fully
  ◦ What are the production technologies?
  ◦ Who are the owners of productive factors?
  ◦ What is consumption, investment?
  ◦ What transactions occur?

• Construct model accounts using current BEA methodology