Education, Growth and Distribution: A Heterodox Macrodynanic Perspective

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July 2008
Berlin Summer School
Outline

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1. Introduction

- How does education affect the dynamics of the capitalist economy – growth and distribution
- Orthodox neoclassical view – labor productivity growth and human capital accumulation: good for growth, often good for distribution, choice to get educated. Many models.
- Heterodox perspectives: unemployment, not so much matter of choice but access, ideological functions. Hardly any models.
- Purpose of paper: develop simple heterodox models
  - two classes of workers with different skills
  - neo-Marxian and Post-Keynesian models
2. Education, growth and distribution: alternative perspectives

- Neoclassical growth models:
  - Solow, Uzawa, Lucas
  - Postpones steady state, leads to ‘endogenous’ growth
  - Many models with workers having the same skill level, income distribution neglected
  - Some models with differential skills – often otherwise the same; distribution between them examined – matter of choice, but models examine inequality – differences in preferences, technology, cumulate through endogenous transfers

- Neoclassical trade theoretic models:
  - High- and low-skilled workers
  - US inequality
  - North-South trade and uneven development

- Heterodox models
  - Unemployment, worker-capitalist – other classes
  - Many models, but hardly any with education and skill formation, natural thing to do
  - Much informal discussion
3. Education, labor skills and heterodox models

• Education, standard and narrow perspective: improve labor skills – low-skilled to high-skilled

• Difference between low- and high-skilled workers
  – Labor augmenting, no other difference
  – Two different factors in production
  – Qualitatively different roles in economy – production versus services, production versus R&D
  – Routine, repeatable activities versus innovation and discovery
3. Education, labor skills and heterodox models, cont.

- Heterodox models – general approach, closed economy, no formal government activity, assets not formally incorporated, one good
- Two kinds of workers, high and low skilled, and capital
- Skill premium:
  \[ \phi = \frac{W_H}{W_L} > 1 \]
- Input-output relations:
  \[ Y = \min [kK, AL] \]
- Demand for high-skilled labor:
  \[ H^d = b(\phi) \frac{K}{A}, \text{ where } b' < 0 \]
- Given \( H, K, A \) is short run. Market clear through variations in \( \phi \)
3. Education, labor skills and heterodox models, cont.

\[ \Phi = b^{-1}(AH/K) = \sigma(AH/K) \]
3. Education, labor skills and heterodox models, cont.

- Technological change
  \[ \dot{A} = \mathcal{A} = \mathcal{A}_0 + \mathcal{A}_1 (AH/K) \]

- Dynamics of $H$
  \[ \frac{dH}{dt} = g(H) \quad g'>0 \]
  \[ g(H) = 0 \text{ for all } H < \min \quad H > 1 \]

- General model framework: workers don’t save
  \[ rK = Y - w_L L - w_H H \]
  \[ C = (1-s)rK + w_L L - w_H H \]
  \[ S = srK \]
4. Neo-Marxian model

• Additional assumptions
  \[ Y = kK \]
  \[ \psi = w_L/A \]
  \[ I = srK \]

• Short run, \( K, H \) and \( A \) fixed

• Long run,
  \[ \frac{dK}{dt} = I \]

\( A \) and \( H \) change as described earlier

\[ h = \tau_0 + \tau_1 h + \Theta g(\sigma(h)) - s[(1 - \lambda)k - \sigma(h)h\lambda] \]
Neo-Marxian model, cont.

- Stable or unstable
- Effects of rise in
- Stable case, given assumptions, growth rate increases; distribution – from high-skilled workers to capitalists, share of low skilled workers constant

- Stable or unstable
- Effects of rise in $\lambda$
- Stable case, given assumptions, growth rate increases; distribution – from high-skilled workers to capitalists, share of low skilled workers constant
- Unstable case: growth with human capital formation, or decline. Increase in $\lambda$ can change decline into upward spiral
- Extension to examine changes in $\lambda$. Low skilled workers can be hurt by $\lambda$ increase
5. Post-Keynesian model

• Additional assumptions

\[ P = (1+z) \frac{W_L}{A}, \text{ implies } w_L = A/(1+z) \]
and \( \zeta = 1/(1+z) \)

\[ Y = C + I. \]

\[ \frac{I}{K} = \gamma_0 + \gamma_r r + \gamma_u u + \gamma \]

• Short run, \( A, H, K \) given

\[ r = (1-\zeta) u - \zeta h \left( \gamma + \gamma \right) \]

\[ u = \frac{\gamma_0 + \lambda h \sigma(h)(s - \gamma_r) + \gamma_r (\tau_0 + \tau_1 h)}{(s - \gamma_r)(1 - \lambda) - \gamma_u} \]
5. Post-Keynesian model, cont.
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- Stable and unstable
- Stable case: greater openness of education can reduce growth by reducing income of skilled workers; need not happen if there is a strong boost to investment through technological change
- Can explain cases of high access and low growth – too much skill creation with low growth; low access and high consumption-led growth
- Extension to include dynamics of $\lambda$
6. Conclusion

• Summary

• Models can be modified:
  – Saving by high-skilled workers
  – Skill premium rigidity
  – Different investment functions – wage and profit led

• Broader role for education