

Wage Traps as Poverty and Distribution Traps in Neoclassical and Endogenous Growth Models

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Contribution of this paper

- Spell out **conditions** under which **wage traps** occur (as done in Gärtner and Gärtner (2008))
 - regarding labor demand
 - regarding labor supply
- Trace macroeconomic **consequences** (focus on **poverty traps** and related issues)
 - in neoclassical growth models
 - in endogenous growth models

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Wage traps

■ Definition

We speak of a wage trap when the labor market features **multiple equilibria**, one of which generates **labor incomes that do not exceed subsistence needs**.

■ Pertinent research in labor economics

Outward sloping labor supply; „S-shaped“, „inverted S“; „Z-shaped“.
e.g. Krueger (1962); Barzel and McDonald (1973); Dessing (2002)

■ Pertinent research in development economics

In context of child labor; emphasis on remedies
e.g. Basu and Van (1998); Basu (1999); Basu (2000); Dessing (2002); Gärtner and Gärtner (2008)

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Poverty traps

■ Definition

Multiple macroeconomic steady states featuring distinctly different, path-dependent levels of aggregate income.

■ Causes

- Production function that violates Inada conditions
- Non-parametric savings or fertility rates
- Imperfections in credit markets

■ Links to wage traps

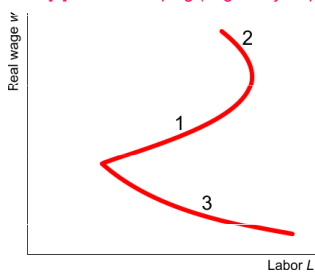
In context of child labor; emphasis on *remedies*
e.g. Basu and Van (1998); Basu (1999); Basu (2000); Dessing (2002)

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The general (Z-shaped) labor supply curve

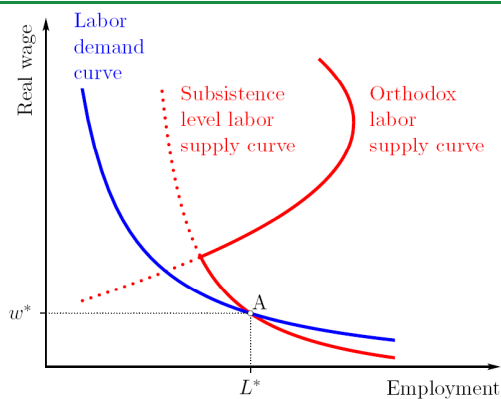
■ Three distinct segments

- [1] normal (positively sloped) at medium wage rates
- [2] backward-bending (negatively sloped) at high wage rates
- [3] outward-sloping (negatively sloped) at subsistence-level labor income



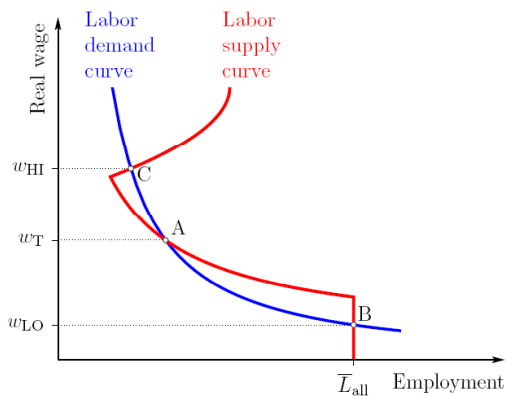
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One subsistence-level equilibrium



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Multiple near-subsistence equilibria



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Generic conditions for wage traps

$$I_S(w^*) = I_D(w^*)$$

supply = demand

$$L'_D(w^*) > L'_S(w^*)$$

instability in equilibrium (1)

$$\varepsilon_S(w) = L'_S(w) \cdot w / L_S(w)$$

wage elasticity of labor supply

$$\varepsilon_D(w) = L'_D(w) \cdot w / L_D(w)$$

wage elasticity of labor demand

$$\varepsilon_D(w^*) > \varepsilon_S(w^*)$$

instability in equilibrium (2)

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Specific functional forms

■ Labor demand

Cobb-Douglas production function

$$Y = F(L) = AL^\beta \quad (\lambda > 0, 0 < \beta < 1)$$

Wage-elasticity of labor demand when production is Cobb-Douglas

$$\varepsilon_D = -(1 - \beta)^{-1} < -1$$

■ Labor supply

Parametric subsistence level of labor income

$$wL = MIN$$

Wage-elasticity of labor supply when subsistence level is parametric

$$\varepsilon_S = -1$$

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Modifications to Cobb-Douglas scenario that foster wage traps

■ Modifications to labor supply

$$\text{MIN}(L) = \lambda \cdot L^\gamma \quad (\lambda, \gamma, L > 0)$$

$$\varepsilon_S^{-1} = -1 + \gamma > -1$$

Wage trap occurs whenever $\gamma > \beta$

Modifications to Cobb-Douglas scenario that foster wage traps

■ Modifications to demand side

$$F(L) = A(E \times L)^\beta \quad \text{Cobb-Douglas with labor efficiency}$$

$$E = w^\alpha \quad \text{Labor efficiency depends on wage rate}$$

$$L = (\beta A w^{\alpha\beta-1})^{\frac{1}{1-\beta}} \quad \text{Labor demand}$$

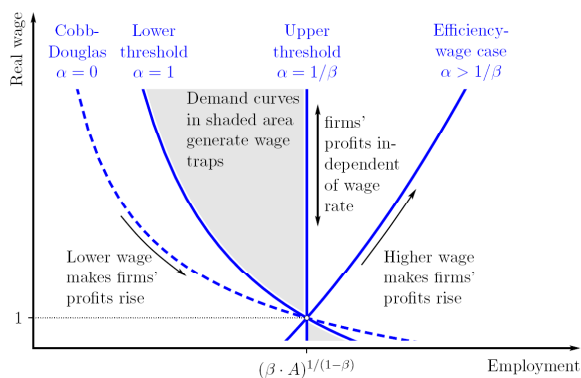
$$\varepsilon_D = -\frac{1 - \alpha\beta}{1 - \beta} \quad \text{Wage elasticity of labor demand}$$

$\alpha = 0$ standard case; no wage trap

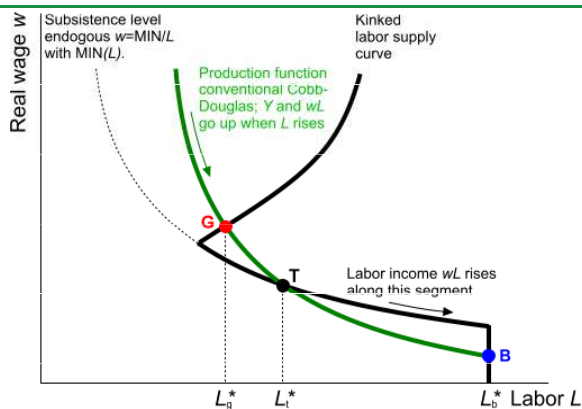
$\alpha > 1$ wage trap possible

$\alpha = 1/\beta$ wage trap disappears; efficiency wage scenario kicks in

Efficiency wages and wage traps



Wage traps: case 2



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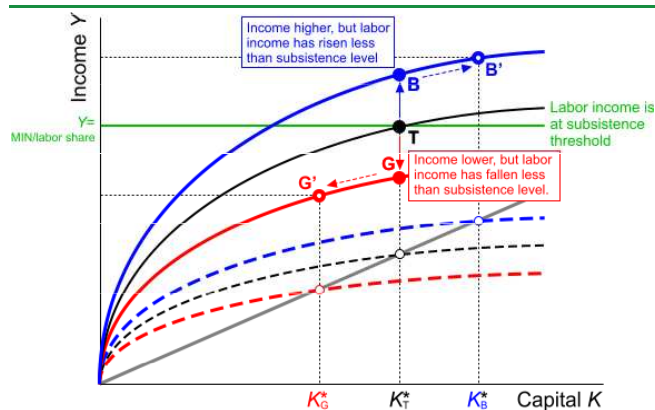
Wage traps in Solow model: assumptions

- Active population comprises *workers* and *owners of capital stock*
 - **workers** do not save
 - **capital owners** save constant fraction of their income
- Closed economy; no government
 - savings are a constant fraction of income
 - investment equals private saving

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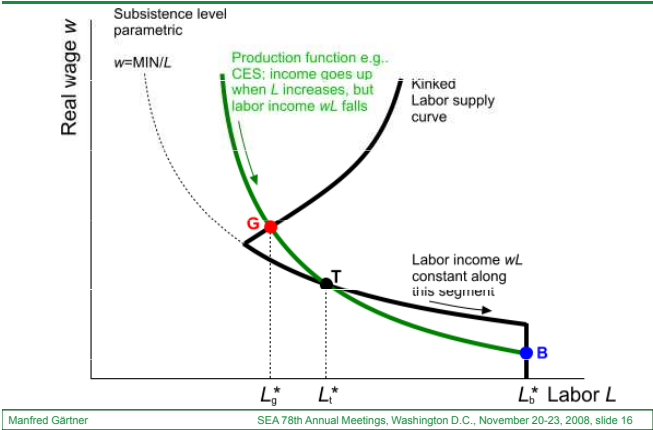
Wage traps in Solow model: case 2



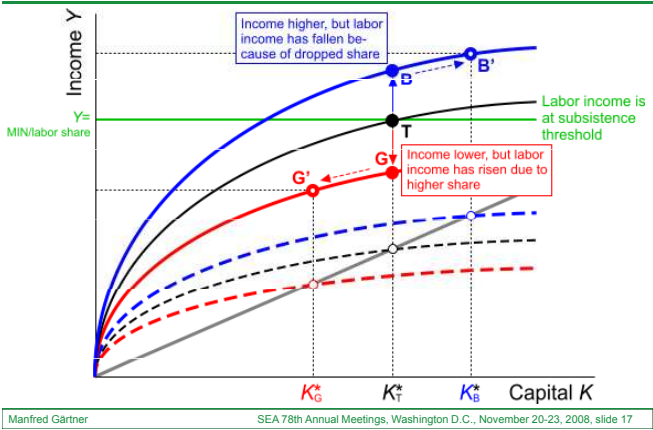
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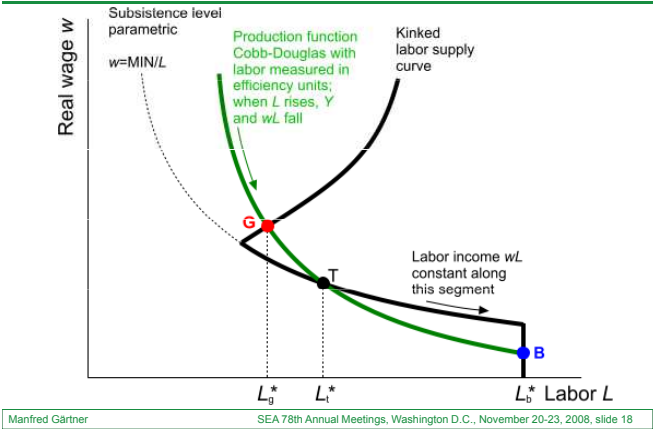
Wage traps: case 1A



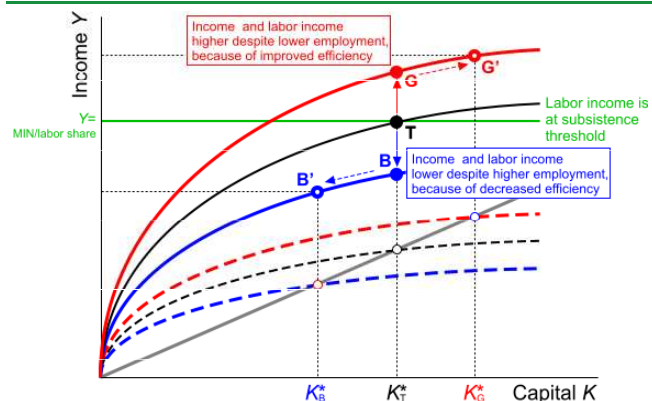
Wage traps in Solow model: case 1A



Wage traps: case 1B



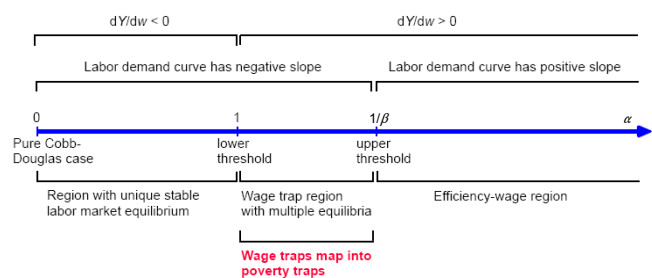
Wage traps in Solow model: case 1B



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Efficiency wages and wage traps



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Main results

■ **Wage traps cannot occur** in scenarios that combine **parametric subsistence** levels with conventional **Cobb-Douglas production**.

■ There is no such thing as *the* wage trap. **Wage traps may occur** under three stylized scenarios:

1. **When labor income falls as we move down the labor demand curve.**
 - A. This may happen when **income goes up while the share of labor income falls**.
 - B. It may also happen at constant labor income shares, as in Cobb-Douglas, **when labor efficiency drops when wage rate falls**.
2. **When subsistence needs are not parametric, but rise with employment.**

■ Wage traps may translate into **poverty traps** in neoclassical growth models and affect growth paths in models of endogenous growth if they are of type 1A or type 2.

■ Wage traps may also translate into **distribution traps** in neoclassical growth models and affect growth paths in models of endogenous growth if they are of type 1B.

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