Fritz Helmedag

Marx and Keynes:
from exploitation to employment

TECHNISCHE UNIVERSITÄT CHEMNITZ

1. Surplus value and labour demand

Proposition: The labour theory of value (Marx's approach) provides a firm basis to inquire into the determinants of employment (Keynes's concern)

Basic idea: Separation of the whole output into "necessaries" and "luxuries"

1. Surplus value and labour demand

Proposition: The labour theory of value (Marx's approach) provides a firm basis to inquire into the determinants of employment (Keynes's concern)

Basic idea: Separation of the whole output into "necessaries" and "luxuries"

1. Surplus value and labour demand

Proposition: The labour theory of value (Marx's approach) provides a firm basis to inquire into the determinants of employment (Keynes's concern)

Basic idea: Separation of the whole output into "necessaries" and "luxuries"

1. Surplus value and labour demand

Proposition: The labour theory of value (Marx's approach) provides a firm basis to inquire into the determinants of employment (Keynes's concern)

Basic idea: Separation of the whole output into "necessaries" and "luxuries"

Adam Smith (1776):

> “. . when … the labour of one family can provide food for two, the labour of half the society becomes sufficient to provide food for the whole. The other half … can be employed in providing other things …”

- Pufendorf, Cantillon, Hume
- Ricardo, Marx, Pigou, Keynes

Adam Smith (1776):

> “. . when … the labour of one family can provide food for two, the labour of half the society becomes sufficient to provide food for the whole. The other half … can be employed in providing other things …”

- Pufendorf, Cantillon, Hume
- Ricardo, Marx, Pigou, Keynes

r ≙ uniform rate of exploitation (or profit)

y ≙ nominal return of a man hour

w ≙ nominal hourly wage rate

$$r = \frac{y-w}{w} = \frac{1-\frac{w}{y}}{\frac{w}{y}} \quad (1)$$

p_B ≙ price of the wage good

w_B ≙ real wage rate

v_B ≙ labour value of the wage good

$$r = \frac{p_B - v_B w_B p_B}{v_B w_B p_B} = \frac{1-v_B w_B}{v_B w_B} \quad (2)$$

r ≙ uniform rate of exploitation (or profit)
y ≙ nominal return of a man hour
w ≙ nominal hourly wage rate

$$r = \frac{y - w}{w} = \frac{1 - \frac{w}{y}}{\frac{w}{y}} \tag{1}$$

p_B ≙ price of the wage good
w_B ≙ real wage rate
v_B ≙ labour value of the wage good

$$r = \frac{p_B - v_B w_B p_B}{v_B w_B p_B} = \frac{1 - v_B w_B}{v_B w_B} \tag{2}$$

(1) = (2):

$$h = v_B w_B = \frac{w}{y} < 1 \qquad (3)$$

h ≙ real unit labour costs, “value of labour-power”, “paid” labour, “purchasing power of the wage minute”

Profit factor:

$$1 + r = 1 + \frac{y - w}{w} = \frac{y}{w} = \frac{1}{h} = \frac{1}{v_B w_B} > 1 \qquad (4)$$

Production- or core-price level, “labour commanded”, “wage-unit”

- Marx: Inevitable demise of the bourgeois regime
- Keynes: “Doctor at the sickbed of capitalism”

Synthesis: Capitalists, workers, international trade, public sector

(1) = (2):

$$h = v_B w_B = \frac{w}{y} < 1 \qquad (3)$$

h ≙ real unit labour costs, “value of labour-power”, “paid” labour, “purchasing power of the wage minute”

Profit factor:

$$1 + r = 1 + \frac{y - w}{w} = \frac{y}{w} = \frac{1}{h} = \frac{1}{v_B w_B} > 1 \qquad (4)$$

Production- or core-price level, “labour commanded”, “wage-unit”

- Marx: Inevitable demise of the bourgeois regime
- Keynes: “Doctor at the sickbed of capitalism”

Synthesis: Capitalists, workers, international trade, public sector

(1) = (2):

$$h = v_B w_B = \frac{w}{y} < 1 \qquad (3)$$

h ≙ real unit labour costs, "value of labour-power", "paid" labour, "purchasing power of the wage minute"

Profit factor:

$$1 + r = 1 + \frac{y - w}{w} = \frac{y}{w} = \frac{1}{h} = \frac{1}{v_B w_B} > 1 \qquad (4)$$

Production- or core-price level, "labour commanded", "wage-unit"

- Marx: Inevitable demise of the bourgeois regime
- Keynes: "Doctor at the sickbed of capitalism"

Synthesis: Capitalists, workers, international trade, public sector

(1) = (2):

$$h = v_B w_B = \frac{w}{y} < 1 \qquad (3)$$

$h \triangleq$ real unit labour costs, “value of labour-power”, “paid” labour, “purchasing power of the wage minute”

Profit factor:

$$1 + r = 1 + \frac{y - w}{w} = \frac{y}{w} = \frac{1}{h} = \frac{1}{v_B w_B} > 1 \qquad (4)$$

Production- or core-price level, “labour commanded”, “wage-unit”

- Marx: Inevitable demise of the bourgeois regime
- Keynes: “Doctor at the sickbed of capitalism”

Synthesis: Capitalists, workers, international trade, public sector

2. Unit labour costs and sectoral profits

Parameters:

$$0<t_W,s_W,m_W<1 \quad \text{and} \quad 0<c_W=1-s_W-m_W<1$$
$$0<t_P,s_P,m_P<1 \quad \text{and} \quad 0<c_P=1-s_P-m_P<1 \qquad (5)$$

Gross profits (P_B) in the basic industry:

$$P_B=rW_B=c_W(1-t_W)(W_B+W_X)-W_B \qquad (6)$$

$W_B \triangleq$ wage bill in the basic industry
$W_X \triangleq$ wage bill in the secondary sector

Autonomous demand:

$$A=I+X+D \qquad (7)$$

Outline:

1. Surplus value and labour demand
2. Unit labour costs and sectoral profits
3. Employment and technological progress
4. Reaping rewards for the work

2. Unit labour costs and sectoral profits

Parameters:

$$0 < t_W, s_W, m_W < 1 \quad \text{and} \quad 0 < c_W = 1 - s_W - m_W < 1$$
$$0 < t_P, s_P, m_P < 1 \quad \text{and} \quad 0 < c_P = 1 - s_P - m_P < 1 \qquad (5)$$

Gross profits (P_B) in the basic industry:

$$P_B = rW_B = c_W(1-t_W)(W_B + W_X) - W_B \qquad (6)$$

$W_B \triangleq$ wage bill in the basic industry

$W_X \triangleq$ wage bill in the secondary sector

Autonomous demand:

$$A = I + X + D \qquad (7)$$

Outline:

1. Surplus value and labour demand
2. Unit labour costs and sectoral profits
3. Employment and technological progress
4. Reaping rewards for the work

2. Unit labour costs and sectoral profits

Parameters:

$$\begin{array}{lll} 0 < t_W, s_W, m_W < 1 & \text{and} & 0 < c_W = 1 - s_W - m_W < 1 \\ 0 < t_P, s_P, m_P < 1 & \text{and} & 0 < c_P = 1 - s_P - m_P < 1 \end{array} \qquad (5)$$

Gross profits (P_B) in the basic industry:

$$P_B = rW_B = c_W(1 - t_W)(W_B + W_X) - W_B \qquad (6)$$

$W_B \triangleq$ wage bill in the basic industry

$W_X \triangleq$ wage bill in the secondary sector

Autonomous demand:

$$A = I + X + D \qquad (7)$$

2. Unit labour costs and sectoral profits

Parameters:

$$\begin{array}{lll} 0<t_W,s_W,m_W<1 & \text{and} & 0<c_W=1-s_W-m_W<1 \\ 0<t_P,s_P,m_P<1 & \text{and} & 0<c_P=1-s_P-m_P<1 \end{array} \quad (5)$$

Gross profits (P_B) in the basic industry:

$$P_B=rW_B=c_W(1-t_W)(W_B+W_X)-W_B \quad (6)$$

$W_B \triangleq$ wage bill in the basic industry

$W_X \triangleq$ wage bill in the secondary sector

Autonomous demand:

$$A=I+X+D \quad (7)$$

Gross profit in the luxury department (P_X):

$$P_X = rW_X = A + c_P(1-t_P)r(W_B + W_X) + (t_W + rt_P)(W_B + W_X) - W_X \tag{8}$$

Sectoral wage bills from (6) and (8):

$$\begin{aligned} W_B &= \frac{c_W(1-t_W)A}{(1+r)\left[r(1-c_P)(1-t_P) + (1-c_W)(1-t_W)\right]} = \\ &= \frac{hc_W(1-t_W)hA}{(1-h)(1-c_P)(1-t_P) + h(1-c_W)(1-t_W)} \end{aligned} \tag{9}$$

Gross profit in the luxury department (P_X):

$$P_X = rW_X = A + c_P(1-t_P)r(W_B + W_X) + (t_W + rt_P)(W_B + W_X) - W_X \quad (8)$$

Sectoral wage bills from (6) and (8):

$$W_B = \frac{c_W(1-t_W)A}{(1+r)\left[r(1-c_P)(1-t_P) + (1-c_W)(1-t_W)\right]} = \frac{hc_W(1-t_W)hA}{(1-h)(1-c_P)(1-t_P) + h(1-c_W)(1-t_W)} \quad (9)$$

$$W_X = \frac{\left(r+1-c_W(1-t_W)\right)A}{(1+r)\left[r(1-c_P)(1-t_P)+(1-c_W)(1-t_W)\right]} = \frac{\left[1-hc_W(1-t_W)\right]hA}{(1-h)(1-c_P)(1-t_P)+h(1-c_W)(1-t_W)} \qquad (10)$$

$$W_B + W_X = \frac{A}{r(1-c_P)(1-t_P)+(1-c_W)(1-t_W)} = \frac{hA}{(1-h)(1-c_P)(1-t_P)+h(1-c_W)(1-t_W)} \qquad (11)$$

Total wages decline with the rate of profit (and increase with unit labour costs).

$$W_X = \frac{\left(r + 1 - c_W(1-t_W)\right)A}{(1+r)\left[r(1-c_P)(1-t_P) + (1-c_W)(1-t_W)\right]} = \frac{\left[1 - hc_W(1-t_W)\right]hA}{(1-h)(1-c_P)(1-t_P) + h(1-c_W)(1-t_W)} \qquad (10)$$

$$W_B + W_X = \frac{A}{r(1-c_P)(1-t_P) + (1-c_W)(1-t_W)} = \frac{hA}{(1-h)(1-c_P)(1-t_P) + h(1-c_W)(1-t_W)} \qquad (11)$$

Total wages decline with the rate of profit (and increase with unit labour costs).

Proportion between sectoral wage bills:

$$\frac{W_B}{W_X} = \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} \qquad (12)$$

The profit of the basic sector depends on the wage bill in the luxury industry:

$$P_B = \frac{1-h}{h} W_B = \frac{1-h}{h} \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} W_X = \frac{(1-h)c_W(1-t_W)}{1-hc_W(1-t_W)} W_X \qquad (13)$$

Maximal profit in the wage-good industry at h^*:

$$0 < h^* = \frac{(1-c_P)(1-t_P) - \sqrt{(1-c_P)(1-t_P)(1-c_W)(1-t_W)}}{(1-c_P)(1-t_P)-(1-c_W)(1-t_W)} < 1 \qquad (14)$$

Intersection of the profit functions at $\hat{h}$:

$$\frac{1}{2} \leq \hat{h} = \frac{1}{2-c_W(1-t_W)} < 1 \quad \text{for} \quad 1 \geq c_W(1-t_W) > \frac{1}{2} \qquad (15)$$

Proportion between sectoral wage bills:

$$\frac{W_B}{W_X} = \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} \qquad (12)$$

The profit of the basic sector depends on the wage bill in the luxury industry:

$$P_B = \frac{1-h}{h} W_B = \frac{1-h}{h} \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} W_X = \frac{(1-h)c_W(1-t_W)}{1-hc_W(1-t_W)} W_X \qquad (13)$$

Maximal profit in the wage-good industry at h^*:

$$0 < h^* = \frac{(1-c_P)(1-t_P) - \sqrt{(1-c_P)(1-t_P)(1-c_W)(1-t_W)}}{(1-c_P)(1-t_P)-(1-c_W)(1-t_W)} < 1 \qquad (14)$$

Intersection of the profit functions at $\hat{h}$:

$$\frac{1}{2} \leq \hat{h} = \frac{1}{2-c_W(1-t_W)} < 1 \quad \text{for} \quad 1 \geq c_W(1-t_W) > \frac{1}{2} \qquad (15)$$

Proportion between sectoral wage bills:

$$\frac{W_B}{W_X} = \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} \qquad (12)$$

The profit of the basic sector depends on the wage bill in the luxury industry:

$$P_B = \frac{1-h}{h} W_B = \frac{1-h}{h} \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} W_X = \frac{(1-h)c_W(1-t_W)}{1-hc_W(1-t_W)} W_X \qquad (13)$$

Maximal profit in the wage-good industry at h^*:

$$0 < h^* = \frac{(1-c_P)(1-t_P) - \sqrt{(1-c_P)(1-t_P)(1-c_W)(1-t_W)}}{(1-c_P)(1-t_P) - (1-c_W)(1-t_W)} < 1 \qquad (14)$$

Intersection of the profit functions at $\hat{h}$:

$$\frac{1}{2} \leq \hat{h} = \frac{1}{2-c_W(1-t_W)} < 1 \quad \text{for} \quad 1 \geq c_W(1-t_W) > \frac{1}{2} \qquad (15)$$

Proportion between sectoral wage bills:

$$\frac{W_B}{W_X} = \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} \tag{12}$$

The profit of the basic sector depends on the wage bill in the luxury industry:

$$P_B = \frac{1-h}{h}W_B = \frac{1-h}{h}\frac{hc_W(1-t_W)}{1-hc_W(1-t_W)}W_X = \frac{(1-h)c_W(1-t_W)}{1-hc_W(1-t_W)}W_X \tag{13}$$

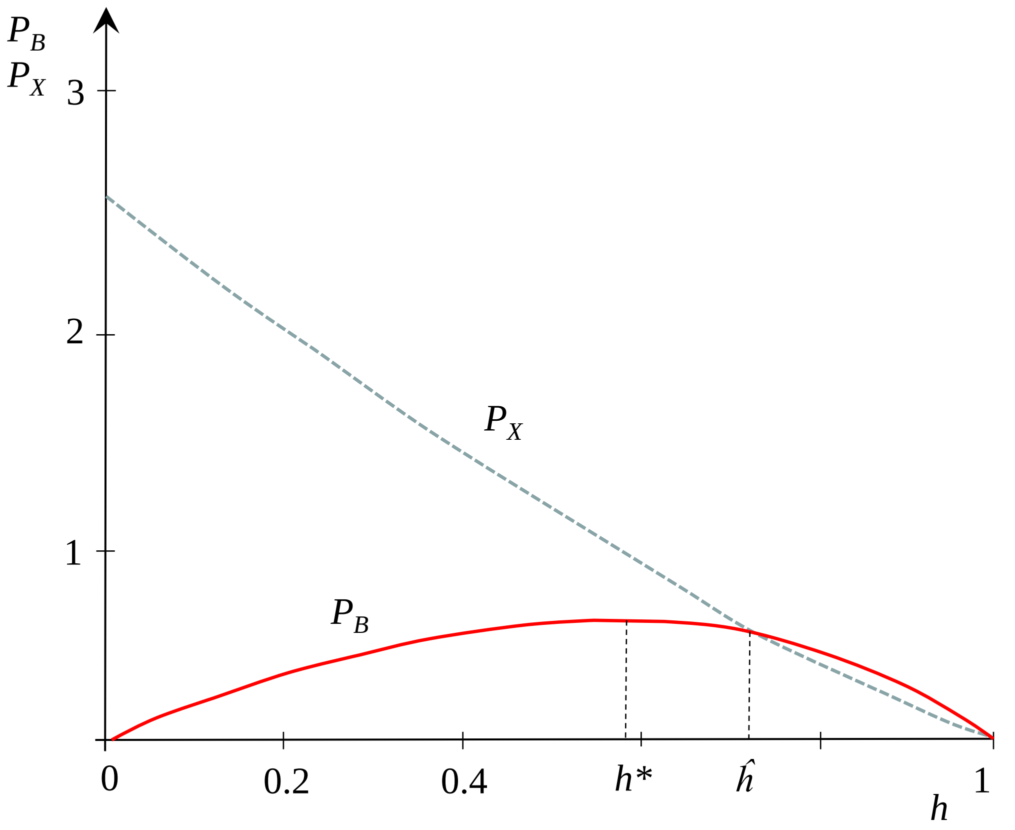
Maximal profit in the wage-good industry at *h**:

$$0 < h^* = \frac{(1-c_P)(1-t_P)-\sqrt{(1-c_P)(1-t_P)(1-c_W)(1-t_W)}}{(1-c_P)(1-t_P)-(1-c_W)(1-t_W)} < 1 \tag{14}$$

Intersection of the profit functions at $\hat{h}$:

$$\frac{1}{2} \leq \hat{h} = \frac{1}{2-c_W(1-t_W)} < 1 \quad \text{for} \quad 1 \geq c_W(1-t_W) > \frac{1}{2} \tag{15}$$

Figure 1: Sectoral profits



$A = 1$; $c_W = 0.75$; $t_W = 0.1$; $c_P = 0.5$; $t_P = 0.2$

3. Employment and technological progress

Gross national income (Y):

$$Y = (1+r)(W_B + W_X) = \frac{(1+r)A}{r(1-c_P)(1-t_P)+(1-c_W)(1-t_W)} = \frac{A}{(1-h)(1-c_P)(1-t_P)+h(1-c_W)(1-t_W)} \qquad (16)$$

$$\frac{\partial Y}{\partial h} \lesseqgtr 0 \quad \text{for} \quad (1-c_P)(1-t_P) \lesseqgtr (1-c_W)(1-t_W) \qquad (17)$$

Volume of work (N) by definition:

$$N = \frac{Y}{y} \qquad (18)$$

3. Employment and technological progress

Gross national income (Y):

$$Y = (1+r)(W_B + W_X) = \frac{(1+r)A}{r(1-c_P)(1-t_P)+(1-c_W)(1-t_W)} = \frac{A}{(1-h)(1-c_P)(1-t_P)+h(1-c_W)(1-t_W)} \quad (16)$$

$$\frac{\partial Y}{\partial h} \lesseqgtr 0 \quad \text{for} \quad (1-c_P)(1-t_P) \lesseqgtr (1-c_W)(1-t_W) \quad (17)$$

Volume of work (N) by definition:

$$N = \frac{Y}{y} \quad (18)$$

3. Employment and technological progress

Gross national income (*Y*):

$$Y = (1+r)(W_B + W_X) = \frac{(1+r)A}{r(1-c_P)(1-t_P)+(1-c_W)(1-t_W)} = \frac{A}{(1-h)(1-c_P)(1-t_P)+h(1-c_W)(1-t_W)} \qquad (16)$$

$$\frac{\partial Y}{\partial h} \lesseqgtr 0 \quad \text{for} \quad (1-c_P)(1-t_P) \lesseqgtr (1-c_W)(1-t_W) \qquad (17)$$

Volume of work (*N*) by definition:

$$N = \frac{Y}{y} \qquad (18)$$

"Scissors" tautology:

$$\frac{dN}{N} = \frac{dY}{Y} - \frac{dy}{y} \tag{19}$$

Volume of work, analytically:

$$N = N_B + N_X \overset{(12)}{=} \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} N_X + N_X = \frac{N_X}{1-hc_W(1-t_W)} \tag{20}$$

With $N_X = v_X X$ and h from equation (3):

$$N = \frac{v_X X}{1-v_B w_B c_W(1-t_W)} \tag{21}$$

"Motion equation":

$$\frac{dN}{N} = \frac{dX}{X} + \frac{dv_X}{v_X} + \frac{v_B w_B c_W(1-t_W)}{1-v_B w_B c_W(1-t_W)} \left(\frac{dv_B}{v_B} + \frac{dw_B}{w_B} \right) \tag{22}$$

"Scissors" tautology:

$$\frac{dN}{N} = \frac{dY}{Y} - \frac{dy}{y} \quad (19)$$

Volume of work, analytically:

$$N = N_B + N_X \stackrel{(12)}{=} \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} N_X + N_X = \frac{N_X}{1-hc_W(1-t_W)} \quad (20)$$

With $N_X = v_X X$ and h from equation (3):

$$N = \frac{v_X X}{1-v_B w_B c_W (1-t_W)} \quad (21)$$

"Motion equation":

$$\frac{dN}{N} = \frac{dX}{X} + \frac{dv_X}{v_X} + \frac{v_B w_B c_W(1-t_W)}{1-v_B w_B c_W(1-t_W)} \left(\frac{dv_B}{v_B} + \frac{dw_B}{w_B} \right) \quad (22)$$

"Scissors" tautology:

$$\frac{dN}{N} = \frac{dY}{Y} - \frac{dy}{y} \qquad (19)$$

Volume of work, analytically:

$$N = N_B + N_X \overset{(12)}{=} \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} N_X + N_X = \frac{N_X}{1-hc_W(1-t_W)} \qquad (20)$$

With $N_X = v_X X$ and h from equation (3):

$$N = \frac{v_X X}{1-v_B w_B c_W(1-t_W)} \qquad (21)$$

"Motion equation":

$$\frac{dN}{N} = \frac{dX}{X} + \frac{dv_X}{v_X} + \frac{v_B w_B c_W(1-t_W)}{1-v_B w_B c_W(1-t_W)}\left(\frac{dv_B}{v_B} + \frac{dw_B}{w_B}\right) \qquad (22)$$

"Scissors" tautology:

$$\frac{dN}{N} = \frac{dY}{Y} - \frac{dy}{y} \tag{19}$$

Volume of work, analytically:

$$N = N_B + N_X \overset{(12)}{=} \frac{hc_W(1-t_W)}{1-hc_W(1-t_W)} N_X + N_X = \frac{N_X}{1-hc_W(1-t_W)} \tag{20}$$

With $N_X = v_X X$ and h from equation (3):

$$N = \frac{v_X X}{1-v_B w_B c_W (1-t_W)} \tag{21}$$

"Motion equation":

$$\frac{dN}{N} = \frac{dX}{X} + \frac{dv_X}{v_X} + \frac{v_B w_B c_W (1-t_W)}{1-v_B w_B c_W (1-t_W)} \left(\frac{dv_B}{v_B} + \frac{dw_B}{w_B} \right) \tag{22}$$

4. Reaping rewards for the work

- "Necessaries" and "luxuries" are not defined in kind but by the financial origin of expenses
- The uniform rate of profit depends on unit labour costs determined in the wage good sector
- Focal points of real unit labour costs refer either to the profit maximum in the basic industry or to the intersection of the sectoral profit curves
- The effects of technological progress in the basic and luxury industry differ

4. Reaping rewards for the work

- "Necessaries" and "luxuries" are not defined in kind but by the financial origin of expenses
- The uniform rate of profit depends on unit labour costs determined in the wage good sector
- Focal points of real unit labour costs refer either to the profit maximum in the basic industry or to the intersection of the sectoral profit curves
- The effects of technological progress in the basic and luxury industry differ

4. Reaping rewards for the work

- “Necessaries” and “luxuries” are not defined in kind but by the financial origin of expenses
- The uniform rate of profit depends on unit labour costs determined in the wage good sector
- Focal points of real unit labour costs refer either to the profit maximum in the basic industry or to the intersection of the sectoral profit curves
- The effects of technological progress in the basic and luxury industry differ

4. Reaping rewards for the work

- "Necessaries" and "luxuries" are not defined in kind but by the financial origin of expenses
- The uniform rate of profit depends on unit labour costs determined in the wage good sector
- Focal points of real unit labour costs refer either to the profit maximum in the basic industry or to the intersection of the sectoral profit curves
- The effects of technological progress in the basic and luxury industry differ

4. Reaping rewards for the work

- "Necessaries" and "luxuries" are not defined in kind but by the financial origin of expenses
- The uniform rate of profit depends on unit labour costs determined in the wage good sector
- Focal points of real unit labour costs refer either to the profit maximum in the basic industry or to the intersection of the sectoral profit curves
- The effects of technological progress in the basic and luxury industry differ

Appendix

$$P_X = rW_X = \frac{r\left(r+1-c_W(1-t_W)\right)A}{(1+r)\left[r(1-c_P)(1-t_P)+(1-c_W)(1-t_W)\right]} = \frac{(r^2+ra)A}{r\alpha_P+\alpha_W+r^2\alpha_P+r\alpha_W} \qquad \text{(A1)}$$

$$0 < a \equiv 1-c_W(1-t_W) < 1$$

$$0 < \alpha_P \equiv (1-c_P)(1-t_P) < 1$$

$$0 < \alpha_W \equiv (1-c_W)(1-t_W) < 1$$

$$\frac{\partial P_X}{\partial r} = \frac{A(Z_1 + Z_2)}{(\cdot)^2} \qquad \text{(A2)}$$

$$Z_1 = 2r^2\alpha_P + 2r\alpha_W + 2r^3\alpha_P + 2r^2\alpha_W + ar\alpha_P + a\alpha_W + ar^2\alpha_P + ar\alpha_W$$

$$Z_2 = -(r^2\alpha_P + 2r^3\alpha_P + r^2\alpha_W + ar\alpha_P + 2ar^2\alpha_P + ar\alpha_W)$$

$$Z_1 + Z_2 = r^2\alpha_P(1-a) + \alpha_W\left(r(r+2) + a\right) > 0 \qquad \text{(A3)}$$