Weight of Commercial Sector and Reproduction Scheme

Hiroshi ONISHI

Keio University, JAPAN

Japanese Tradition of Mathematical Marxism

Nobuo Okishio

Michio Morishima

Reproduction Scheme with Commercial Sector

$$W_1=c_1+v_1+m_1$$
$$W_2=c_2+v_2+m_2$$
$$W_c=c_c+v_c+m_c$$

In this case,

- total supply = demand of the <u>means of production</u>

$$c_1+v_1+m_1=c_1+c_2+c_c$$
$$\Rightarrow \quad v_1+m_1=c_2+c_c$$

- total supply = demand of the <u>means of consumption</u>

$$c_2+v_2+m_2=v_1+m_1+v_2+m_2+v_c+m_c$$
$$\Rightarrow \quad c_2=v_1+m_1+v_c+m_c$$

<u>commercial sector is not productive</u>

- substituting the above 2nd equation for the 1st equation leads

$$\cancel{v_1+m_1}=c_2+c_c=\cancel{v_1+m_1}+v_c+m_c+c_c$$

$$\Rightarrow$$

$$0= c_c+v_c+m_c= W_c$$

<u>It means commercial sector is not productive at all.</u>

In the case of Extended Reproduction Scheme

$$W_1 = c_1 + v_1 + m_1(c) + m_1(v) + m_1(k)$$
$$W_2 = c_2 + v_2 + m_2(c) + m_2(v) + m_2(k)$$
$$W_c = c_c + v_c + m_c(c) + m_c(v) + m_c(k)$$

In this case, also

$$W_c = c_c + v_c + m_c(c) + m_c(v) + m_c(k) = 0$$

period of production and period of circulation

invest

Get money

means of production

G → W< ・・・(production)・・・ W' → G'

labor force

|←circulation→|← period of production →|←circulation→|

simplify

|← period of production →|← period of circulation →|

Role of the Commercial Capital

Δp Δc

|← period of production →|← period of circulation →|

Δp $\Delta c'$

|← period of production →|←circulation→|←production･･･

Additional surplus value = $\dfrac{\Delta c-\Delta c'}{\Delta p}m$

- additional surplus value > cost and transferred surplus of commercial sector

$$\frac{\Delta c - \Delta c'}{\Delta p} m > c_c + v_c + m_c$$

$$\frac{\Delta c - \Delta c'}{\Delta p}(c_p + v_p) \times \boldsymbol{annual\ rate\ of\ profit} > (c_c + v_c)\{1 + \boldsymbol{annual\ rate\ of\ profit}\}.$$

$$\frac{\Delta c - \Delta c'}{\Delta p}(c_p + v_p)\mathbf{r}\left(\frac{\mathbf{1}}{\boldsymbol{\Delta p + \Delta c}}\right) > (c_c + v_c)\left\{1 + \boldsymbol{r}\left(\frac{\mathbf{1}}{\boldsymbol{\Delta p + \Delta c}}\right)\right\}$$

Where **r** is the profit rate of one turnover.

Ratio of (Cc+Vc)/(Cp+Vp)

- Just a transform from the above inequality leads

$$\frac{\Delta c - \Delta c'}{\Delta p} \cdot \frac{r}{(\Delta p + \Delta c) + r} > \frac{c_c + v_c}{c_p + v_p}$$

On the equilibrium

$$\frac{\Delta c - \Delta c'}{\Delta p} \cdot \frac{r}{(\Delta p + \Delta c) + r} = \frac{c_c + v_c}{c_p + v_p}$$

Ratio of $Wc/(W_1+W_2)$

If we set $z=\frac{\Delta c-\Delta c'}{\Delta p}$,

and profit rate is equalized between both sectors,

$$Wc=z\frac{r}{(\Delta p+\Delta c)+r}(W_1+W_2)=z\frac{r}{(\Delta p+\Delta c)+r}(c_1+c_2+v_1+v_2+m_1+m_2)$$

But, how can we determine average profit rate r ?

For this question, we need to solve the transformation problem.

Iterative Method of Transformation from Value to Price of Production

$W_1 = c_1 + v_1 + m_1$

$W_2 = c_2 + v_2 + m_2$

$$W_1^* = \left(c_1 \frac{W_1^*}{W_1} + v_1 \frac{W_2^*}{W_2}\right)(1 + r^*)$$

$$W_2^* = \left(c_2 \frac{W_1^*}{W_1} + v_2 \frac{W_2^*}{W_2}\right)(1 + r^*)$$

transform 3 equation system in the same way

$(W_1^* + W_2^* = W_1 + W_2)$

- $W_1 = c_1 + v_1 + m_1$

$W_2 = c_2 + v_2 + m_2$

$W_c = z\frac{r}{(\Delta p + \Delta c) + r}(c_1 + c_2 + v_1 + v_2 + m_1 + m_2)$

$$W_1^* = \left(c_1 \frac{W_1^*}{W_1} + v_1 \frac{W_2^*}{W_2}\right)\left(1 + \frac{r^*}{\Delta p + \Delta c}\right)$$

$$W_2^* = \left(c_2 \frac{W_1^*}{W_1} + v_2 \frac{W_2^*}{W_2}\right)\left(1 + \frac{r^*}{\Delta p + \Delta c}\right)$$

$$W_c^* = z(c_1 \frac{W_1^*}{W_1} + c_2 \frac{W_1^*}{W_1} + v_1 \frac{W_2^*}{W_2} + v_2 \frac{W_2^*}{W_2}) \frac{r^*}{\Delta p + \Delta c}$$

Implications of the that equation system

①The first two equations and $W_1^* + W_2^* = W_1 + W_2$ can determine three variables: W_1^*, W_2^* and r* independently from the commercial sector.

②Sale and Profit in the commercial sector W_c^* are $z\frac{r^*}{(\Delta p+\Delta c)+r^*}$ times larger than in the industrial sectors.

③$z\frac{r^*}{(\Delta p+\Delta c)+r^*}$ is determined by the technologies Δp, Δc and Δc' and by r* which is determined by the industrial sectors.

Final Form of 3 sector reproduction scheme

- $W_1^* = c_1\frac{W_1^*}{W_1} + v_1\frac{W_2^*}{W_2} + \left(c_1\frac{W_1^*}{W_1} + v_1\frac{W_2^*}{W_2}\right)\frac{r^*}{\Delta p+\Delta c}$
- $W_2^* = c_2\frac{W_1^*}{W_1} + v_2\frac{W_2^*}{W_2} + \left(c_2\frac{W_1^*}{W_1} + v_2\frac{W_2^*}{W_2}\right)\frac{r^*}{\Delta p+\Delta c}$
- $W_c^* = c_c\frac{W_1^*}{W_1} + v_c\frac{W_2^*}{W_2} + \left\{z\left(c_1\frac{W_1^*}{W_1} + c_2\frac{W_1^*}{W_1} + v_1\frac{W_2^*}{W_2} + v_2\frac{W_2^*}{W_2}\right)\frac{r^*}{\Delta p+\Delta c} - \left(c_c\frac{W_1^*}{W_1} + v_c\frac{W_2^*}{W_2}\right)\right\}$

C part V part M part