An original "δ-χ model" for the Expansion of the Tendency of Profit Rate
by
SANAKA, Tadashi

Abstract:

An innovative formula — derived from the conventional one $p' = \frac{m}{c+v}$ by Karl Marx — can explore the sharp distinction between rise and fall of the rate of profit with a clear-cut benchmark study.

Let a set of notes with suffix "$_x$" be of the developed kinds following from each initial step respectively:

$$\text{rate of profit developed} \quad p_x' = \frac{mx}{cx+vx} \qquad (1)$$

where $c_x = c(1+\delta)$, $v_x = v(1-\chi)$, and $m_x = m + v\chi$, thus, with working day as standard ($v+m = v_x + m_x$; constant), and δ and χ are fraction of increment portion of constant capital and that of decrement of variable capital in a similar way. ($0 \leqq \delta$ and $-1 < \chi < 1$)

And, correspondingly, we have

$$\text{rate of surplus value} \quad m_x' = \frac{m+v\chi}{v(1-\chi)} = \frac{m'+\chi}{(1-\chi)} \qquad (2)$$

$$\text{organic composition of capital } \kappa_x = \frac{c(1+\delta)}{v(1-\chi)} = \frac{\kappa(1+\delta)}{(1-\chi)} \qquad (3)$$

Thus, "δ-χ model" (coined afresh) in the developed form of the rate of profit formula can be expanded as follows;

$$p_x' = \frac{mx}{cx+vx} = \frac{mx/vx}{cx/vx+1} = \frac{m'+x}{\kappa(1+\delta)+(1-\chi)} \qquad (1\text{-}2)$$

Hereby, it is self-explanatory that the numerator refers to original rate of surplus value m' plus χ (*i.e.* decrement ratio of the value of labour force to be employed). The denominator is composed of portion of the developed organic composition κ_x and the active portion of the value of labour force v_x.

"δ-χ model" can provide more effective means to explore the multipronged study of profit tendency. Let the "δ-χ model" be further unfolded;

$$p_x' = \frac{m'+x}{(\kappa+1)+(\kappa\delta-\chi)} = \frac{p'+x/(\kappa+1)}{1+(\kappa\delta-\chi)/(\kappa+1)} \qquad (1\text{-}3)$$

This type of formula can be used in such many situations in a general way as follows.

If $\kappa\delta = \chi$, for example, then the denominator of last side of equation returns itself to 1, and, therefore, the developed rate of profit p_x' will never fail to be higher than original rate, as far as $0 \leqq \chi < 1$.

$$\therefore \quad p_x' = p' + \chi/(\kappa+1) \qquad (4)$$

This specific case is one of the verification that, even if we have certain amount of

increment of constant capital, and the rise of organic component of capital accordingly, still there remains surely the room of the rise of profit rate as far as the certain χ limits permit. When the general increase of profit rate is mentioned, the *Okishio Theory* will immediately spring to mind. The theory seems probably to have something to do with the above mentioned conditions.

Another important case cannot be disregarded in reference to the study of rise and fall of the profit rate. If the "δ-χ model" is properly implemented, it could lead to a vitally important criterion of the tendency of the rate of profit. If $\chi \geqq \kappa\delta$ is the case of the last equation (cf. formula (1-3)), for example, then what will happen to the tendency? "δ-χ model" is sure to get the crucial discriminant disclosed. Put $p_x' \geqq p'$, and then you can get here the another important yardstick:

$$\chi \geqq \nabla\delta \qquad\qquad\qquad (5)$$
$$\text{where} \quad \nabla = \kappa p' / (p'+1) \quad (\, -\nabla < \chi < 1, \text{and} \, -1 < \delta \,)$$

As far as this yardstick continues to be valid, p_x' exceeds p', no matter the change of combination $C(\delta,\chi)$, and *vice versa*. Nevertheless, as the latitude of χ is rather relatively limited itself, being no match for that of δ, it is quite probable that the law of the tendency of profit rate to fall will hold up through in due course with other conditions remaining the same.

As regards so called countervailing factors, the methodological reminders should be inevitable points to note. Because, most of the countervailing effects brought about by factors touched upon in this connection can be ascribed to the countervailing reaction to be followed and/or added. From the methodological view points as aforesaid, there are some important matters to keep in mind (δ *vs* χ: relativity, $\kappa\delta = \chi$: peculiarity, and benchmark : $\chi \geqq \nabla\delta$.

The presentation will follow up with a comparative study with *Okishio Theorem* reassessed from the viewpoint of supposition of *the constant rate of real wage*.

Most factors concerning with the profit rate to be expanded in the "δ-χ model" should not only be taken as scalar, but also vector. Thus, the magnitude and the direction of them can play some vital rolls as the case may be. δ and χ, particularly, must be handled without forgetting the methodological aspects as well. The crucial subjects of controversy in concern with the tendency of rate of profit for some time shall be re-examined in this sense.

Key Words: tendency of profit rate to fall, developed form of profit rate, "δ –χ model", criterion points

Tadashi Sanaka
Professor Emeritus, Hiroshima University
Doctor of Economics, Kyoto University