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Significance of Post-Keynesian Economics: Kalecki-Steindl Proposition and its Extensions to Open Wage-Led Economies

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ABSTRACT. This article deals with three major points. In the outset, we review the importance of effective demand in the working of the economy, which was first advocated by Keynes. In the next place, we develop the Kalecki-Steindl proposition that asserts the significance of consumption demand for the economy in which investment does not drive economic growth. By introducing the notions of the wage-led and the profit-led regimes, we make clear the conditions for the wage-led economy. In the third place, with international trade between 2 countries and capital accumulation, we presents several propositions on the wage-led economies.

***Keywords*:** Post-Keynesian, wage-led economy, Kalecki-Steindl proposition, international trade, capital accumulation

1. Introduction

Post-Keynesian economics criticizes the contemporary mainstream economics, that centers on the neo-classicism, and is trying to construct a new alternative theory. Although economic theories critical of neo-classicism exist, in addition to Post-Keynesian, as Marxian economics and others, Post-Keynesians share the common point that their stance is based on Keynes(1936) and they try to inherit the essence of its theory. In this paper, we examine the range of Post-Keynesian economics from the angle of its significance: what kind of significance Post-Keynesian economics possesses in analyzing economic difficulties that our contemporary society is forced to confront. We carry out

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this task by discussing the theory of wage-led-economy developed by Steindl, Kalecki and others.

Needless to say, Post-Keynesian theory has many variants and the system *à la* Kalecki is only one of them. Ricardo's theory of value and distribution by Sraffa, Pasinetti, Steedman, etc., and researches of the uncertainty, investment and financing and financial instability by Davidson, Minsky, etc., also constitute the Post-Keynesian's core. In particular, the latter is important in view of the present subprime shock, and the global financial and monetary problems. However, the theory of economic growth and distribution of income, developed by Kalecki, Kaldor and J. Robinson, are extremely important in the sense that the behavior of real economy exhibits completely different features than those advocated by neo-classical economics, and that it bestows persuasive framework to analyze the economic crisis of today, as well. Nonetheless, there have been many excellent papers and books that treat the Post-Keynesian economics, so this article does not deal with the wide area of the Post-Keynesian economics, but focuses on the possibility of the wage-led growth. One should note that there is an accumulation of researches on this topic. This article will be restricted only to a part of the field.

2. Economics of Effective Demand and Expectation

What is the core of the Post-Keynesian economics, inherited from the Keynesian economics, contrasted with the mainstream in particular, neo-classicism? As well-known, Keynes placed importance on the effective demand as a factor determining the level of production or employment, and he emphasized that the effective demand was essentially dependent on an uncertain and unstable expectation factor. For example, Keynes stated as follows in the preface of Keynes(1936).

> "This book, on the other hand, has evolved into what is primarily a study of the forces which determine changes in the scale of output and employment as a whole. ... A monetary economy, we shall find, is essentially one in which *changing views about the future are capable of influencing the quantity of employment and not merely its direction*." (Slanted emphasis by the quoter)

Keynes was an economist of the effective demand. At the same time, he was the first economist that recognized the importance of expectation. The first

thing Keynes associated with expectation is, needless to say, the investment demand. Although the chapters of the fourth part of Keynes(1936) "Inducement to invest" are thought-provoking, the following two points should be taken up here from the Post-Keynesian stance.

First, Kalecki, who is deemed to understand Keynes's theory perfectly at the same period as Keynes and independently, considered the investment demand in a different way from Keynes's viewpoint. In consideration of the decision of the rate of investment, Kalecki placed importance on gross saving of firms, that is consisted of depreciation and profits before allotment, in view of the time-lag between the decision of investment and the actual investment of fixed capital, as factors to influence on the investment decision. The resulting investment function was a stock adjustment type or acceleration type investment function, where investment is dependent on the past level of economic activities and rates of changes in them. At this point, Kalecki's idea is different from Keynes' that argues the optimal investment demand from the marginal efficiency of investment and the rate of interest. They share, however, the same stance in that a long-term expectation is the most important factor that influences an investment decision, and that the long-term interest rates is not. In Kalecki's macro-economic model, developed later, adopted the investment function that mainly depends on the profitability, *i.e.* the profits share or the mark-up rate, and the level of demand, *i.e.* the output-capital ratio or the rate of operation. Thus, the rate of interest and other financial variables are relegated to dependent variables endogenously determined within the framework of the model. Furthermore, in the IS-LM diagram in the textbook, the interest rate appears to the front rather than the marginal efficiency of investment, which is nothing but the profitability factor and the expectation factor. Disregard of the time lag in the investment decision and excessive emphasis on an interest rate are the limits of IS-LM analysis.

Second, Keynes' emphasis on expectation is not restricted to the investment demand. It is often pointed out that the demand for money and bonds depends on expectation, and above-mentioned Keynes's preface also describes directly the feature of money-based economy. Here, however, let us touch on the relation between consumption demand and expectation. In Chapter 8 of Keynes(1936), objective factors to determine consumption demand, and in Chapter 9, subjective factors are taken up. Therein, many factors other than income are discussed. For example, as objective factors, (1) a change in the

wage-unit, (2) a change in the difference between income and net income (depreciation), (3) windfall changes in capital-values, (4) time discount rates, (5) changes in fiscal policy (the taxation system, and the interest rate influenced by them), (6) changes in expectations of the relation between the present and future level of income, are mentioned, and, as for subjective factors, eight motives are pointed out; let us pick up some of them, for example, (1) "To provide for an anticipated future relation between the income and the needs ... ," (2) "To enjoy a gradually increasing expenditure, since it gratifies a common instinct ..., even though the capacity for enjoyment may be diminishing," (3) "To satisfy pure miserliness, ..." In this way, these includes almost all the ideas of theoretical hypotheses on which later consumption functions are built. Keynes himself excluded changes in factors other than income out of main determinants, because they are regarded as relatively slow, and, placing emphasis on that the marginal propensity to consume decreases as income increases, his concern shifted to the determination of investment demand. Although he pointed out that diminishing marginal propensity to consume is a special difficulty that an affluent society faces, Keynes did not analyze the consumption function as a difficulty which rich countries confront, in view of the above mentioned factors. However, 70 years after Keynes, it will be necessary to reexamine the relation between consumption and expectation now, when the role of investment demand as a component of total demand, decreases owing to the transition from high to low growth, resource constraints and environmental problems.

Since effective demand and the expectation as a factor determining it are the gist of Keynes theory, it is clear that neo-classicism is located in the opposite pole: effective demand *versus* supply-side, and unstable and uncertain expectation *versus* rational expectation. Thus, neo-classicism models deviate from reality. When Post-Keynesian develops Keynesian economics centering on effective demand and expectation, analysis of wage-led type economy has an important significance. This will be discussed in this article.

3. Post-Keynesians and Neo-classicals

Steindl(1952) explained a cause of the interwar economic stagnation from the angle of the oligopolization of the economy. If an oligopolistic firm can control a market, its markup rate will rise and the rise of the profit share will arise. It pushes total demand downward and brings about long-term economic stagnation. However, ironically, the world economy greets unprecedented high growth after that. Steindl(1979) made some points on why his prediction went

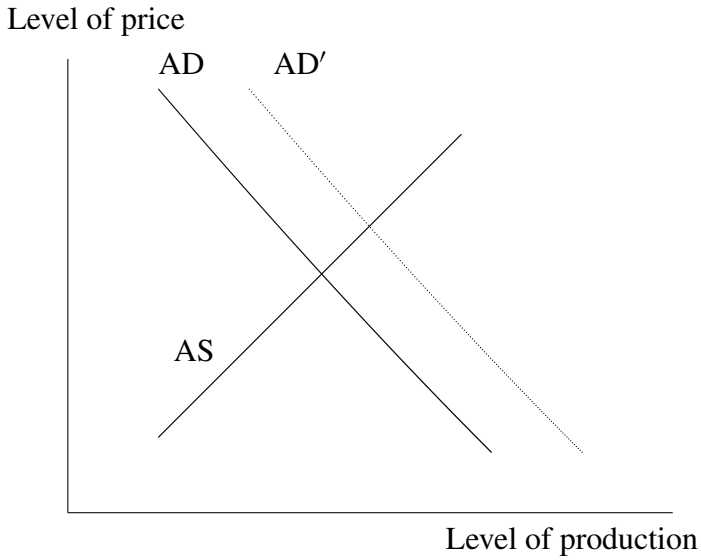

FIGURE 1. Keynes policy

wrong. That is, he thought that he made light of four factors: positive governmental fiscal expenditure, world-wide military expenditures, competition of technology between the Western and the Eastern blocks, and a close cooperation of the Western countries led by USA.[1] More than 30 years after that, the present economy has fallen in the low-growth state which Steindl probably did not expect. Whether Steindl's proposition explaining low-growth of the interwar period is revived as a hypothesis explaining the present long-term low-growth state or not, this is an important point of argument.

It is common for the prescription of Keynes, which makes the economy escape low-growth, that either fiscal policy or financial policy stimulates total demand. According to textbook AD-AS analysis, Keynesian fiscal and financial policies are such that shifts AD curve rightward. This intends to restore the level of production, by pulling up prices (Fig. 1).

On the other hand, the market-driven type neoclassical policy is such that shifts the aggregate supply curve AS, contrary to the Keynes case, to the right-hand side (Fig. 2). Demand is stimulated as prices decrease, and the equilibrium point E_o moves to E_1, that is, the levels of production and employment

[1]The high growth period came to a turning point in 70s. Its background pointed out by Steindl(1979) is the vigilance on the firm and government side, against full employment and persistent high growth rate. This is the point emphasized by Kalecki(1943).

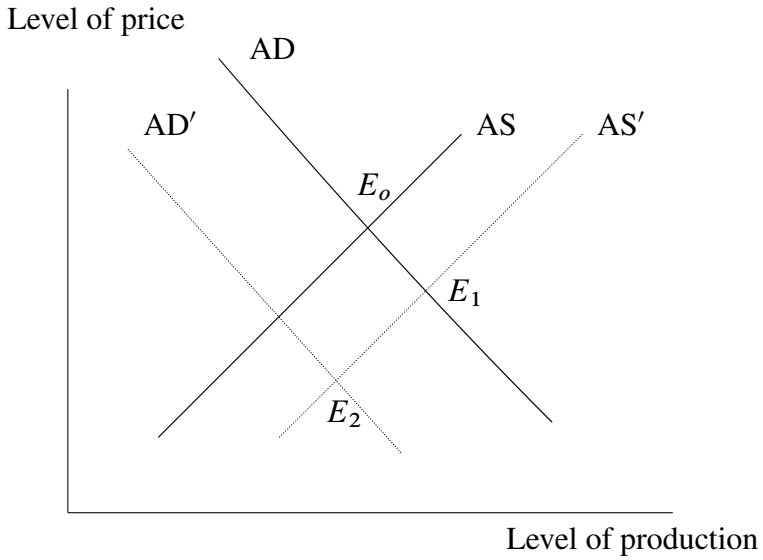

FIGURE 2. Neo-classical policy

increase. Keynes thought that the aggregate supply function is given technically and he did not regard the shift as a policy variable. However, as Okishio(1957) clarified, the aggregate supply function expresses a floor price that enables firms to perform a certain amount of supply, and it depends not only on technique factors, but also on the rate of wages and required profits.

It was, ironically, after neoclassical economics became, through the criticism of Keynes, the mainstream that the shift of total supply was recognized as a policy variable. The shift of the aggregate production function includes possibilities such as: (1) the rise in the labour productivity by introducing new technology and increasing labour intensity, (2) the cut-down of nominal wage rates, and (3) reducing profits margin. The market-driven policy based on neoclassical economics after 1980s is mostly around (1) and (2). Although it must have had apparent validity as an alternative to the Keynesian policy called AD shift, the treason from the effective demand side took place, as a matter of fact. The rightward shift of AS shifted AD to the left-hand side simultaneously. The equilibrium point moved to E_2, and not to E_1. This process is explained by the expectation factors, such as the objective and the subjective factors which determine consumption demand, as discussed in the previous section.

It was due to the total demand factor that the market-mechanism based policy brought about stagnation; when investment demand declines, consumption demand becomes important again. Thus, it becomes important to examine the

relation between consumption demand and expectation and income distribution in addition to income. The limit of the market-driven neoclassical policy is not overcome by returning to the Keynes demand policy alone. At this point, we see the significance of Post-Keynesian economics and Kalecki-Steindl proposition that analyze the contents of demand, and make clear the relationship among distribution, total demand and growth.

4. Fundamental Wage-Led Model

The fundamental wage-led models of Post-Keynesian theory of distribution and growth share the following assumptions.

(1) Effective demand plays an important role for the level of production and the growth rate not only in the short run, but also in the long run.

(2) The mode of income distribution influences total demand.

(3) The markup pricing, that is, oligopolistic behavior to add markup to the average cost, is realistic.

(4) Investment demand depends mainly on the rate of return and the rate of operation.

These are the fact recognized by Steindl, Kalecki, etc. from observation. Accepting these as common hypotheses, researches made after them, such as Wood (1975), Marglin (1984), Bhaduri (1986), Dutt (1990), Lavoie (1992), and Setterfield (2002) tried to explain stagnation and the business-cycles of the 20th century capitalist economy.

According to the papers in Setterfield (2002), especially Blecker (2002), the basic model to explain the Kalecki-Steindl stagnation proposition that states declination of total demand caused by rises of the profit share, or, in other words, by decreases in the wage share is as follows:

$$\text{(4.1)} \qquad \text{Pricing} \quad P = \pi \tau W,$$

$$\text{(4.2)} \qquad \text{Profit share} \quad h = 1 - \frac{1}{\pi},$$

$$\text{(4.3)} \qquad \text{Wage share} \quad \omega = \frac{1}{\pi},$$

$$\text{(4.4)} \qquad \text{Profit rate} \quad r = h\sigma,$$

$$\text{(4.5)} \qquad \text{Saving function} \quad g^s = s_r r,$$

$$\text{(4.6)} \qquad \text{Investment function} \quad g^i = f(r, \sigma),$$

$$\text{(4.7)} \qquad \text{I-S balance} \quad g^s = g^i.$$

As for the price setup, for the sake of brevity, fixed cost and input costs other than labour are disregarded, and the unit price P will be given as a product of unit labour-expenses τW and the fixed markup $\pi > 1$, where τ stands for labour per unit, and W a nominal wage rate per unit. Given a markup rate π, the profit share h and wage share ω will also be determined. The profit rate r is, by definition, the product of the profit share h and the output-capital ratio σ, which will be called the *output coefficient* hereafter. If the saving from wage income is disregarded, the saving function of the whole economy is the product of the profit rate r and the saving ratio from profits as in (4.5). Although the investment function depends profitability and the rate of operation, (4.6) is expressed as a function of the profit rate r, that represents the former, and the output coefficient σ, that substitutes the latter.

It is easily seen that the Kalecki-Steindl stagnation proposition holds under a short-term stability condition with this model. That is, *if the wage share ω goes up, the output coefficient σ will certainly be augmented* ;

$$\frac{\partial \sigma}{\partial \omega} = \frac{(s_r - f_r)\sigma}{(s_r - f_r)h - f_\sigma} > 0, \tag{4.8}$$

where the partial derivatives of f are assumed positive, $f_r,\ f_\sigma > 0$. In fact, the denominator is positive from the Keynes stability condition, and it entails the positivity of the numerator.

The rise of wages has two effects on goods demand. First, it stimulates consumption demand through increase of labour income. Second, it reduces the profit share and control investment demand. Total demand either increases or decreases, this depends on which effect is larger. The former effect becomes dominant in this model, because the stability condition that the rise of an output coefficient cancels excess demand guarantees simultaneously that the total saving is stimulated to increase more than the reduction of investment by increase of the wage share.

The investment function of this model, however, lacks generality. That is, the output coefficient σ is related to investment demand doubly: not only through the profit rate r, but also independently of the profit rate. Now, let us consider an investment function that is equipped with two independent variable, the output coefficient σ and the profit share h:

$$\text{investment function} \quad g^i = g(h, \sigma). \tag{4.9}$$

This contains (4.6) as a special case, but it is more general. If we examine the influence of the wage share on the output coefficient after replacing the

investment function, the sign of $\frac{\partial \sigma}{\partial \omega}$ is indefinite, even if the Keynes stability condition is satisfied. Namely,

$$s_r\sigma - g_h > 0 \quad \Rightarrow \quad \frac{\partial \sigma}{\partial \omega} > 0, \tag{4.10}$$

$$s_r\sigma - g_h < 0 \quad \Rightarrow \quad \frac{\partial \sigma}{\partial \omega} < 0. \tag{4.11}$$

Whether these relations hold or not depends on how the saving function and the investment function react to changes in the wage share ω: the more the former reacts, the more wage increases stimulate production, and, conversely, the more the latter reacts, the more production is pushed down by increases in wages. The Kalecki-Steindl proposition that a decrease in the wage share can bring about production stagnation is the case in which $\frac{\partial \sigma}{\partial \omega} > 0$ is true, so that the case of (4.10) is usually called the *stagnation regime*. On the other hand, the latter case of (4.11) is called the *exhilaration regime*. However, this terminology is often confusing. What is worse still, the stagnation regime and the exhilaration regime are combined with the growth rate, and the terminology such as wage-led growth and profit-led growth is used, which makes the situation more confusing. Therefore, in what follows, the regime in which rises of the wage share have positive influence on production and the rates of profit and growth are called the wage-led type. When necessary to make clear what is influenced, they will be expressed as the wage-led production, wage-led profit and wage-led growth.

Change of distribution influences not only the output coefficient σ but the profit rate and the growth rate. The diagram below displays it.

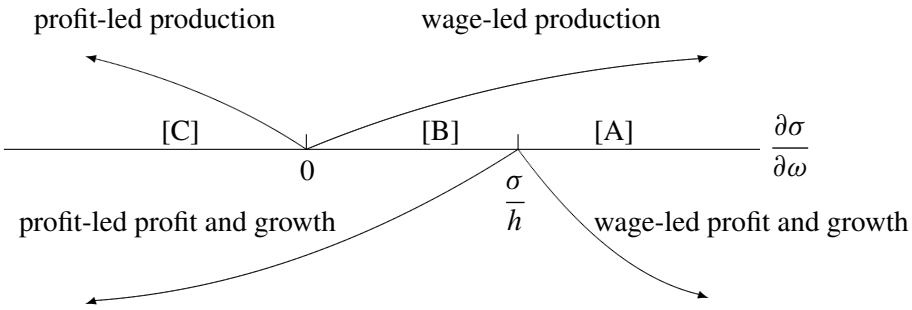

FIGURE 3. Wage-led Economy vs. Profit-led Economy

In the above diagram, in [A], the rise of the wage share influences positively the level of production and the growth rate (in this case, the profit rate). Conversely, in [C], the rise of the profit share has a positive effect on production, employment, and growth. If the economy is in [C], workers will be forced to abide wage cut, when

policies to stimulate production and increase employment are carried out. In [A], on the contrary, it is necessary to pull up the wage share in order to stimulate business. In the middle regime [B], although the rise of the wage share is effective for production and employment, the reduction in the wage share is effective for the rates of profit and growth. As long as firms make decisions, they aim at cutting down the wage share to maximize profit, and hence conflict relationships arise between capitalists and workers.

What is the social desirability of the wage-led economy? The wage-led economy [A] is an economy with the property that changes of raising wages, desirable for workers, raises at the macro level the rates of profit and growth for firms simultaneously.[2] For example, suppose that the production coefficient will be raised. In the profit-led economy, it is necessary to raise the profit share and to reduce the wage share in order to do so. In the wage-led economy, however, the reduction in the profits share and raising of the wage share are needed. Comparing the two types of economies from the angle of cost in terms of the growth rate, the economic growth rate $g = s_r h\sigma$, required to create the same increase in the employment coefficient, for the profit-led economy is greater than that for the wage-led economy.

As shown in the following figure, when the growth rate goes down from g_0 to g_1, the profit share h should be decreased, irrespective of the wage-led or the profit-led economy. The decrease in h at point B is smaller than that at A, and the output rate goes up at point A, although goes down at point B. To put it in other words, the wage-led economy can realize, in contrast to the profit-led type, the same decrease in the growth rate by increasing the wage share and the output coefficient.

This fact is derived by that the profit-led economy means the total demand policy depending on investment demand. When environmental restrictions etc. increase its importance from now on, it is necessary to realize an economy which maintains employment without raising the growth rate. In this sense, we can say that realizing the wage led economy is of significance for our community.

Whether an economy is either the wage-led type or the profit-led type depends, as described so far, on the feature of the investment function and the saving function. Although it is determined mainly by behaviours of agents in the private economic sector, the next issue is if the government can make policies to guide the economy to the wage-led economy. This will be discussed in the next section.

5. Savings of Workers' Household and the Progressive Tax System

The shape of the saving function is related to formation of wage-led economy. It was assumed in the above fundamental model that savings come only from profit income.

[2]At the level of each firm, the story may differ. The macro effect and micro effect do not look the same in the micro level. It is necessary for policy makers that they persuade both capitalists and workers from the macro angle, and set an appropriate guidelines.

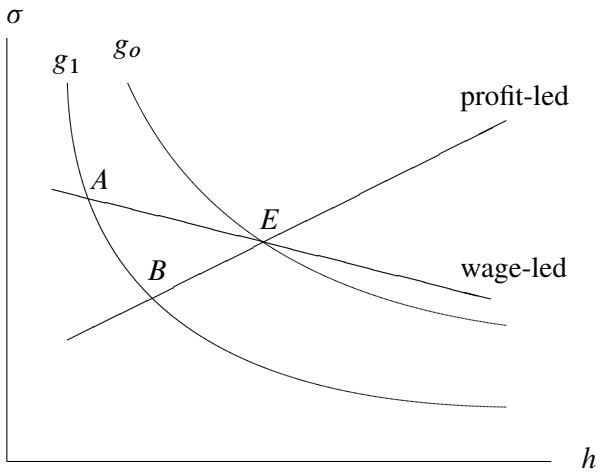

FIGURE 4.

Does the possibility of the wage-led economy become stronger, if savings of workers' household are taken into account?

Let s_w stand for the saving rate of workers' household, and modify the above model. Then, the following relation is obtained:

$$\frac{\partial \sigma}{\partial \omega} = \frac{(s_r - s_w)\sigma - g_h}{[s_r h + s_w(1-h)] - g_\sigma}. \tag{5.1}$$

The saving rate of workers' household improves the short-term stability (denominator > 0). As for the sign of the numerator, the numerator will become negative if the saving rate of workers' household increases sufficiently, although the savings rate of capitalists' household naturally exceeds it ($s_r > s_w$). Especially in the economy in which investment behaviours react to the profits share sensitively, this is more likely the case. The economy with high household saving rates, such as Japan and Southeast Asian countries, tend to be profit-led economies. The structure of the tax system is also concerned with the saving function. Let t_r and t_w stand for the tax rates of profit income and wage income, respectively. Then, the above model is modified as:

$$g^s = [1 - (1-s_r)(1-t_r)h - (1-s_w)(1-t_w)(1-h)]\sigma, \tag{5.2}$$

$$g^i = g[(1-t_r)h,\ \sigma], \tag{5.3}$$

$$g^s = g^i + X, \quad X = \frac{G-T}{K}\text{: constant.} \tag{5.4}$$

Under the same assumptions, the effect of the wage share on the level of production is given by:

$$\frac{\partial \sigma}{\partial \omega} = \frac{[(1-s_w)(1-t_w) - (1-s_r)(1-t_r)]\sigma - g_1(1-t_r)}{[1-(1-s_r)(1-t_r)h - (1-s_w)(1-t_w)(1-h)] - g_\sigma}. \tag{5.5}$$

The rise of tax rates improves the possibility of stability (denominator > 0). The sign of the numerator is important. The greater the tax rate of workers becomes, the more likely it is negative, *i.e.*the profit-led type, and, conversely, the greater the tax rate of capitalist becomes, the more likely it tends to be positive, *i.e.*the wage-led type. Therefore, to strengthen the progressiveness of taxation increases the possibility of the wage-led economy.

A feature of the major countries, including Japan, in recent years about the saving function is declines in the savings ratio due to low birthrate and longevity and the reduction of the highest tax rate. From the above analysis, the decline in the savings ratio will improve the possibility of the wage-led economy, whilst weakening the progressiveness of the tax system by reducing the highest tax rate will conversely strengthen the possibility of the profits-led economy. If they feel an uneasiness in employment and social security, the savings ratio of the workers' household will increase for the self-defense. By leading government expenditure to the direction which reduces the future uneasiness for the workers' household, it becomes possible to lower the savings ratio and increase the possibility of the wage-led economy. It is also effective to improve the progressiveness of a tax.

6. International Competition and the Wage-Led Type

Bhaduri and Marglin (1990) and Blecker (1989) developed the research which indicates that the intensified international competition restrains the possibility of the wage-led economy. They point out that it becomes difficult to lay increase of the wage share in own country on a price, namely, the so-called profit squeeze arises, if international price competition becomes severe; as a result, though an increase in wages is connected with increase of consumption demand, it may bring about aggravation of the trade balance simultaneously and total demand may not grow. Therefore, the possibility that the wage-led type will be realized becomes small under the global economy.

Meanwhile, one should note that not only the wage-led type but also the profit-led type encounters with difficulty under the global economy. In fact, if the profit-led economy tries to raise the profits share, with keeping the nominal wage rate constant, the home market price will rise and international price competition will become disadvantageous. Even if the profits-led economy, in which the rise of the profit share raises investment demand with positive influence on production or employment, is materialized at home, the possibility of the profit-led type becomes weaker by severe foreign competition. The above view by Blecker *et. al.* that international competition weakens

the possibility of the wage-led type is applied also to the profits-led type. Since this is the point overlooked, some details will be developed in the following.

The supply-demand equilibrium of one country with foreign trade is as follows: Let S stand for savings, and B the trade balance, and one has

$$S = I + B. \tag{6.1}$$

The saving function g^s and the investment function g^i in terms of homeland capital are defined in the same manner as before. Under the usual assumptions, export E depends on foreign income Y^* and the trade term θ, import M on homeland income Y and θ. Let P, P^* and e stand for, respectively, homeland price, foreign price and the exchange rate, and the term of trade is expressed as:

$$\theta = \frac{eP^*}{P}. \tag{6.2}$$

From the above, the trade balance is expressed as follows:

$$B = X(\theta, Y^*) - \theta M(\theta, Y). \tag{6.3}$$

Assume that export and import are homogeneous functions of degree 1 with respect to the level of foreign production and that of homeland production, respectively. The trade balance per homeland capital stock $b = \dfrac{B}{K}$ is given by the following:

$$b = \chi(\theta)\sigma^*\lambda - \theta m(\theta)\sigma, \tag{6.4}$$

where, $\lambda = \dfrac{K^*}{K}$ denotes the capital ratio of homeland and foreign countries, and σ^* is the output coefficient, supposed to be constant, of foreign capital. From these, supply-demand equilibrium in the goods market is described by the following:

$$s_r h\sigma = g(h, \sigma) + \chi(\theta)\sigma^*\lambda - \theta m(\theta)\sigma. \tag{6.5}$$

Assume, as Blecker(1989) did, firms offsets aggravation of the trade term, which is caused by the increase in wages of homeland, with reducing markup rates, *i.e.* by means of profit squeeze. Then,

$$\pi = \bar{\pi}\theta^{\alpha}, \quad 0 \leq \alpha \leq 1. \tag{6.6}$$

However, firms may try to offset the aggravation in international competition with wages cut. That is,

$$\omega = \bar{\omega}\theta^{\beta}, \quad 0 \leq \beta \leq 1. \tag{6.7}$$

In the above, $\bar{\pi}$ and $\bar{\omega}$ stand for, respectively, the markup rate and the wage share, which firms and workers demand. α and β denote sensitivity coefficients representing how much firms and workers push down the demands of their share.

We can define that the homeland economy is the wage-led type when $\frac{\partial\sigma}{\partial\bar{\omega}} > 0$, and the profit-led type when $\frac{\partial\sigma}{\partial\bar{\pi}} > 0$, in this model. Substituting (6.6) and (6.7) into (4.2) and (4.3), and taking derivatives from (6.5), we have the following:

$$(6.8)\quad (s_r h - g_\sigma + \theta m)d\sigma = \frac{1}{\alpha+\beta}[(s_r\sigma - g_h)\alpha\omega - m\sigma(\varepsilon_X + \varepsilon_M - 1)\theta]\frac{d\bar{\omega}}{\bar{\omega}} - \frac{1}{\alpha+\beta}[(s_r\sigma - g_h)\beta\omega + m\sigma(\varepsilon_X + \varepsilon_M - 1)\theta]\frac{d\bar{\pi}}{\bar{\pi}},$$

where ε_X and ε_M are the elasticities of export and import, respectively. Assume that the Marshall-Lerner condition $\varepsilon_X + \varepsilon_M - 1 > 0$ and the Keynes stability condition $s_r h - g_\sigma + \theta m > 0$ are satisfied. Then, by assuming $\beta = 0$ and $d\bar{\pi} = 0$, we have the results *à la* Blecker. Even if the homeland economy is wage-led, *i.e.* $s_r\sigma - g_h > 0$, the homeland production σ can be depressed due to the worsening trade balance, thus the foreign trade can constrain the validity of wage-led economy.

(1) *The homeland possibility of the wage-led type is weakened by competition pressures caused by foreign trade.*

From (6.8) we know the following as well.

(2) *Controlling markup rate to foreign competition* (*increases in* α) *improves the possibility of the wage-led economy.*

These are what Blecker(1989) obtained.

Assume that the homeland economy is profit-led, *i.e.* $s_r\sigma - g_h < 0$, where the increase in $\bar{\pi}$ raises the homeland production σ when competitive pressures from foreign trade is ignored. However, it is easily seen from (6.8) that the foreign pressures also constrain the validity of the profit-led type.

(3) *The homeland possibility of the profit-led type is weakened by competitive pressures caused by foreign trade.*

(4) *The possibility that rises of the target share* $\bar{\omega}$ *or* $\bar{\pi}$ *give negative effects on production becomes greater in proportion to the scale of trade; the smaller* α (*resp.* β) *is, the greater the effect will be, with respect to* $\bar{\omega}$ (*resp.* $\bar{\pi}$).

It is not correct that international competition weakens only the possibility of the wage-led type. Although Blecker's result is not an error, the negative effect should not be restricted to the wage-led type case. Whether the wage-led or the profit-led type, consumption demand in the former case and investment demand in the latter case have positive influences on production and employment of the homeland economy, but aggravation of trade balance weakens the position.

7. Wage-Led Economy in the Open Two-Country Case

This section considers the effects of international competition in the open two-country case. The problem is whether the homeland wage-led effects are multiplied or jeopardized according to the type of foreign country being wage-led or profit-led. In order

to analyze this, we consider the mutually dependent two-country economy. Homeland economy is assumed the same as before.

7.1. Formula for the foreign country. Using the asterisk for a foreign country, pricing equation and profit share are described as follows:

$$P^* = \pi^* \tau^* W^*, \tag{7.1}$$

$$h^* = 1 - \frac{1}{\pi^*}. \tag{7.2}$$

The markup ratio in the foreign country is also sensitive to the competitiveness of her own product.

$$\pi^* = \bar{\pi}^* \theta^{-\alpha^*}, \quad 0 \leq \alpha^* \leq 1. \tag{7.3}$$

From these equations coupled with homeland similar equations, we know that the term of trade is rewritten as

$$\theta = \left(\frac{\bar{\pi}^* \omega^*}{\bar{\pi} \omega} \right)^{\frac{1}{\alpha + \alpha^*}}. \tag{7.4}$$

The term of trade depends on the relative ratio of wage shares in two countries, $\frac{\omega^*}{\omega}$, which is assumed as a given parameter. The basic model is summarized as follows:

$$s_r h \sigma = g(h, \sigma) + b, \tag{7.5}$$

$$s_r^* h^* \sigma^* = g^*(h^*, \sigma^*) - \frac{1}{\theta \lambda} b, \tag{7.6}$$

$$b = \theta^{\varepsilon_X} \sigma^* \lambda - \theta^{1-\varepsilon_M} \sigma. \tag{7.7}$$

where $\lambda = \frac{K^*}{K}$. From (7.4) and the definitions of the profit share, we know

$$\theta = \theta(\omega^\dagger), \quad \frac{d\theta}{d\omega^\dagger} < 0, \tag{7.8}$$

$$h = h(\omega^\dagger), \quad \frac{dh}{d\omega^\dagger} < 0, \tag{7.9}$$

$$h^* = h^*(\omega^\dagger), \quad \frac{dh^*}{d\omega^\dagger} > 0, \tag{7.10}$$

with $\omega^\dagger = \frac{\omega}{\omega^*}$. In this model, the equilibrium productions of domestic and foreign countries (σ, σ^*) are determined by (7.5) and (7.6) depending on the wage share ratio $\omega^\dagger$. It is appropriate to define that the homeland is of the wage-led type when $\frac{\partial \sigma}{\partial \omega^\dagger} > 0$, and of the profit-led type when $\frac{\partial \sigma}{\partial \omega^\dagger} < 0$. Similarly, the foreign country is defined as wage-led when $\frac{\partial \sigma^*}{\partial \omega^\dagger} < 0$, and profit-led when $\frac{\partial \sigma^*}{\partial \omega^\dagger} > 0$.

7.2. Two-country model with capital accumulation. If the wage shares, ω and ω^*, and the capital ratio λ are given, then the levels of production, σ and σ^*, of both countries are determined from (7.5) and (7.6).

First, consider the case with a constant output coefficient of the foreign country, say $\sigma^* = 1$, and, from (7.5), we have

$$\frac{d\sigma}{d\omega^\dagger} = \frac{(g_h - s_r\sigma)h' + b_\theta\theta'}{s_r h - g_\sigma - b_\sigma}, \tag{7.11}$$

where h' and θ' are, respectively, derivatives of h and θ with respect to $\omega^\dagger$;

$$\theta' = -\frac{1}{\alpha + \alpha^*}(\omega^\dagger \bar{\pi}^\dagger)^{-(1+\frac{1}{\alpha+\alpha^*})} < 0, \tag{7.12}$$

$$h' = \frac{\alpha}{\pi\theta}\theta' < 0, \tag{7.13}$$

where $\bar{\pi}^\dagger = \dfrac{\bar{\pi}}{\bar{\pi}^*}$.

Since the denominator of (7.11) is positive in view of the stability condition of the goods market (Keynes's stability condition), the condition for the wage-led economy is expressed by

$$(g_h - s_r\sigma)h' + b_\theta\theta' > 0. \tag{7.14}$$

Meanwhile, in (7.14),

$$b_\theta = m(\theta)\sigma(\varepsilon_X + \varepsilon_M - 1) > 0, \tag{7.15}$$

so that the greater $m\sigma$ is, the less likely (7.14) becomes to be true.

Thus, considering the weight of international trade, *for the wage-led economy, it is necessary that* $s_r\sigma > g_h$.

The above points were made clear by Blecker(1989) and Bhaduri-Marglin(1990).

Now, consider capital accumulation and dynamics with respect to λ, which is described by

$$\hat{\lambda} = g^* - g(h(\omega^\dagger), \sigma(\omega^\dagger, \lambda)). \tag{7.16}$$

Since σ is an increasing function of λ, the motion of λ fulfills the stability condition, and the homeland growth rate converges to the growth rate of the foreign country g^* in equilibrium. Then, an increase in the wage share of the homeland decreases the rate of profit distribution; nevertheless, in the long-term period in which the growth rate converges to the world growth rate, the homeland level of production σ increases, irrespective of the wage-led or the profit-led type.

7.3. Two-country model with mutually dependent production. Secondly, we consider the case in which the homeland economic activities affect the foreign country.

From (7.5) and (7.6), we obtain

$$\begin{pmatrix} J_{11} & J_{12} \\ J_{21} & J_{22} \end{pmatrix} \begin{pmatrix} d\sigma \\ d\sigma^* \end{pmatrix} = \begin{pmatrix} C_1 \\ C_2 \end{pmatrix} d\omega^{\dagger}, \tag{7.17}$$

where, $J_{11} = g_\sigma - sh + b_\sigma$, $J_{12} = b_{\sigma^*} > 0$, $J_{21} = -\dfrac{b_\sigma}{\theta\lambda} > 0$, $J_{22} = g^*_{\sigma^*} - s^*_r h^* \dfrac{b_{\sigma^*}}{\theta\lambda}$, $C_1 = (s_r\sigma - g_h)h' - b_\theta\theta'$, $C_2 = (s^*_r\sigma^* - g^*_{h^*})h^{*\prime} + \dfrac{\theta'}{\theta\lambda}b_\theta$. In order for this 2-country model to be stable with respect to σ and σ^*, it is necessary that the following two hold:

$$J_{ii} < 0, \quad (i = 1, 2) \tag{7.18}$$

$$J_{11}J_{22} - J_{12}J_{21} > 0. \tag{7.19}$$

We assume that *these two conditions are satisfied.*

In case that *either* $d\sigma$ *or* $d\sigma^*$ *is very small*, the condition for the homeland (resp. foreign country) being wage-led is $C_1 < 0$ (resp. $C_2 > 0$), and conversely $C_1 > 0$ (resp. $C_2 < 0$) for being the profit-led type. Therefore, the conditions for the wage-led type for 2 countries are respectively expressed by

$$g_h < s_r\sigma - b_\theta \frac{\theta'}{h'}, \tag{7.20}$$

$$g^*_{h^*} < s^*_r\sigma^* + b_\theta \frac{\theta'}{\theta\lambda h^{*\prime}}. \tag{7.21}$$

These conditions are likely to be satisfied with relatively small variations in investment with respect to the rate of distribution of profit and greater rates of savings.

We can consider 4 combinations of the regimes of the homeland and the foreign country, depending on either the wage-led or the profit-led. That is, (wage-led, wage-led), (wage-led, profit-led), (profit-led, wage-led) and (profit-led, profit-led).

By investigating the influence of an increase in $\omega^{\dagger}$ on the levels of production of 2 countries, σ and σ^*, we obtain the following three results.

Nakatani(2008b) analyzed such economies and obtained the following results:

TABLE 1. $\frac{d\sigma}{d\omega^{\dagger}}$ and $\frac{d\sigma^*}{d\omega^{\dagger}}$

		Foreign country	
		Wage-led	Profit-led
Home country	Wage-led	indeterminate	increase
	Profit-led	decrease	indeterminate

(1) *If the homeland is of the wage-led type and the foreign country is of the profit-led type, then rises of the wage share of the homeland brings about increases in production of both.*

(2) *If the homeland is of the profit-led type and the foreign country is of the wage-led type, then rises in the wage share of the homeland brings about decreases in production of both.*

(3) *If both the homeland and the foreign country are of the wage-led type or the profit-led type, then the influence of the rise of the wage share of the homeland on the levels of production of both countries is indefinite.*

What are the implications of the above analysis? Constructing the wage-led economy and pulling up the wage share of the homeland contributes to both the homeland and the partner country in two-country economy. If the partner country is of the profit-led type, it not only promotes production and employment of the homeland, but also affects the partner country. If the partner is of the same wage-led type, the direction of changes is not determined, but it gives still advantageous effects on the homeland in the sense that $\frac{\sigma}{\sigma^*}$ goes up. Therefore, even if we takes foreign relations into consideration, we can say that shifting to the wage-led economy is advantageous.

8. External Persistence and Internal Persistence

As for the persistence of one economy, employment of the homeland as well as external balances needs to be maintained, above all. In capitalistic system, full employment is an exception and cannot avoid unemployment. While this was Keynes's issue, it was also fully known by Kalecki that an economic system called a capitalistic system makes intimidation to workers called unemployment indispensable. However, in order to continue at the long period of time of a capitalistic system, although full employment is impossible, an unemployment rate must be kept within narrower bounds, neither expanding nor reducing. Neoclassical assumption of full employment is reasonably understood only when we read it as a constant rate of unemployment.

Let us look at the long-term persistence of the one-country economy with respect to three points, (1) equilibrium of the goods market, (2) external equilibrium, and (3) equilibrium of the labour market. Equilibrium of the goods market is assumed from the beginning of the argument by the above model. When the second external equilibrium is considered as the trade balance, it leads as follows:

$$bK = \chi(\theta)Y^* - \theta m(\theta)Y = 0. \tag{8.1}$$

In terms of elasticity, one obtains the following:

$$\varepsilon_X \hat{\theta} + \hat{Y}^* = (1 - \varepsilon_M)\hat{\theta} + \hat{Y}. \tag{8.2}$$

Take (8.2), and consider the effect that foreign competition controls the markup of the homeland.

$$\pi = \bar{\pi}\theta^{\alpha}. \tag{8.3}$$

In addition, from the definition of the real wage rate R, *i.e.*,

$$R = \frac{1}{\pi\tau}. \tag{8.4}$$

Take (8.4) into consideration, and let γ stand for the rate of increases in labour productivity. Then, (8.2) is rewritten as

$$\hat{Y} = \frac{\varepsilon_X + \varepsilon_M - 1}{\alpha}(\gamma - \hat{R}) + \hat{Y}^*. \tag{8.5}$$

Namely, the domestic growth rate $\hat{Y}$ which maintains external equilibrium depends, if Marshall-Lerner Condition is assumed, the gap between rates of increases of labour productivity and the real wage rate, and the growth rate of the foreign country.

As for restrictions of the labour market, if the unemployment rate u is kept constant in the long run, then it follows

$$(1-u)N_s = N = \tau Y. \tag{8.6}$$

From (8.6), it is necessary that the homeland economy should grow at the natural rate of growth $\hat{Y} = \gamma + n = g_n$. On the other hand, the foreign country should grow at the growth rate $Y^* = g_n^*$ satisfying the labour market constraint.

From the above, the rate of increase of the real wage rate with which external equilibrium and labour equilibrium are compatible is as follows.[3]

$$\hat{R} = \gamma + \frac{g_n^* - g_n}{\varepsilon_X + \varepsilon_M - 1}\alpha. \tag{8.7}$$

If the profits margin becomes sensitive to foreign competition, *i.e.* α goes up, then its long run influence on the real wage rate depends on the natural rates of growth of both homeland and the foreign country. If the rate of natural growth of the foreign country is higher than that of homeland, then, the more sensitive to foreign relations the profit margin is, the higher the real wage rate should be increased in the long run. On the contrary, when the natural rate of growth of the homeland is higher, the increasing rate of the real wage rate should be controlled in the long run.

Thus, it depends also on the economic conditions of the partner country to realize the wage-led economy in the homeland.

[3]If the production cost includes imported goods, modification is necessary.

9. Concluding Remarks

So far, we have seen whether Post-Keynesian economics is effective as a theoretical framework to replace neo-classicism in analyzing problems of today from the angle of the wage-led type economy. The following lists the emphasized points of this article.

1) In order to realize a persistent economy under the constraints of low growth and environmental restrictions, it is effective to make transition to the wage-led regime, and the current economic crisis requires the shift of the aggregate supply function, and not the return to a mere Keynesian policy to stimulate effective demand.

2) The shift of the neo-classicism aggregate supply policy induced the negative effect on demand, which is a reverse effect. A transition to the wage-led economy is a structural reform contrary to neoclassical policies.[4] Post-Keynesian economics theory, focusing on income distribution, consumption demand, and expectation, is an important supporting theory for the transition.

3) Although the realization of the wage-led economy depends on the features of the saving function and the investment function, policies to reduce the savings ratio of workers' household and to maintain and strengthen the progressive tax system promote the wage-led economy.

4) An advantage of the wage-led economy is to maintain production and employment with a lower rate of growth. Severe international competition weakens the merit of the wage-led economy, but to raise the wage share in the wage-led economy of the homeland gives advantages to the homeland, irrespective of features of the foreign country.

5) In order to fulfill equilibria of the trade balance and the labour market, the real wage rate of the homeland should be increased at a greater rate, if the natural rate of growth of the foreign country is greater than that of the homeland.

Many problems are left behind without considerations. For example, micro analysis of firm's investment behaviour, studies of policy framework to orientate firms in the long run from the angle of the society as a whole, dynamics of capital accumulation of the wage-led economy, and positive analysis of many countries, like Stockhammer and Onaran(2004). Many topics lie in front of us.

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[4] See Nakatani-Skott(2007).

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