Models of Competition Between Firms: Re-Considering Kaleckian Model

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Abstract

The purpose of this paper is to consider the free-entry effect within the Kaleckian model. As a result, the Kaleckian model with free entry is unstable under the wage-led growth regime, but stable under the profit-led growth regime with Marglin and Bhaduri (1990)-type investment function. We discover an increase in the nominal wage rate decreases aggregate employment and the number of firms, but growth rate and the real the wage rate are constant. In addition, a decrease in the fixed cost increases the number of firms and the real wage rate, and decreases growth rate. Hence, these two parameters which lead to an increase in the real wage rate in the standard Kaleckian model must be clarified.

1 Introduction

The main motivation of this article is to reconsider the consistency between the wage-led growth regime and stability condition within the Kaleckian model of distribution and growth.

As is well known, one presupposition of the Kaleckian model is a constant real wage rate derived from the degree of monopoly, and the Kaleckian model has the capacity utilization as an endogenous variable (Kalecki (1954), Steindl (1952)). It brings about fruitful results: the wage-led growth regime and the stagnationism. These results are contrary to the neoclassical economy. The Kaleckian model has very definite and strong political-economy implication that if capital owners want a higher realized profit rate and higher growth rate, they must allow workers to have a higher real wage and lower the degree of monopoly.

Several authors, be they Kaleckian, have developed the Kaleckian model in many ways. Some analyses based on the Kaleckian model extend to long-run model (e.g. Dutt (1986, 1997a, 1997b), Lavoie (1992, 1995, 1996, 2003), Setterfields (2002)). Blecker (1989) and Marglin and Bhaduri (1990) show the opposite case in which a higher the degree of monopoly (profit share) stimulates aggregate demand and raises growth rate. Others add financial variables or open-economy complications (e.g. Blecker (1989), Lavoie and Godley (2001-02), Dos Santos and Zezza (2008), Hein and van Treeck (2007)). However, some recent research has focused on the effect of not the mark-up ratio but directly the real wage rate, to examine the condition of demand-led growth because the real wage rate is inversely related to the degree of monopoly.

We must distinguish the degree of monopoly from the real wage rate, although the Kaleckian model may get the degree of monopoly and the real wage rate confused because the Kalecki model assumes the degree of monopoly determines the real wage rate. An increase in the real wage rate is caused by not only a decrease in price that is derived from a decline in the degree of monopoly (good market) but also an increase in the nominal wage rate (labour market). The latter is not derived from a decrease in the degree of monopoly. As the changes of both parameters lead to the same results on aggregate employment and growth rate, they need not be definitively distinguished. But the both parameters may not be the same when we consider the degree of monopoly is not exogenous variable but derived from the fixed cost and zero-profit condition. If we consider explicitly free entry, a decrease in the fixed cost leads to new firms entering the market, and competition in the merket becomes less intensified; it causes a decrease in price, which increases the real wage rate. But an increase in nominal wage rate may also cause an increase in price which is derived from firms exiting the market because of profit squeeze. The total effect of a higher nominal wage rate on the real wage rate is ambiguous; it depends on the size of the nominal wage and the price. Therefore we must pay close attention to the difference in these parameters.

In related works, there are some analyses based on the Kaleckian model (Rowthorn (1979), Bhaduri (2008), Cassetti (2003) and Harris (1974)) develop the model in which the price is endogenous. Rowthorn (1977) and Cassetti (2003) construct models of conflict inflation. Harris

(1974) considers a positive relationship between the price and the output (employment) because of overhead labour costs. Bhaduri (2008) assumes price (income distribution) is allowed to adjust endogenously in line with usual Keynesian argument. These works have not focused on the free entry, and identify the effect of a rise in the nominal wage rate, with a decrease in the fixed cost on aggregate employment and growth rate.

The purpose of this article is to consider 'free entry' in line with Blanchard and Giavatti (2003) into Kaleckian model, and show the stability condition and the effect of the various parameters which increase real wage rate on aggregate employment and growth rate in the short run and long run. Our conclusion is that the Kaleckian model with free entry is unstable even though the goods market stability condition is satisfied. But we show the Kaleckian model is stable under the profit-led growth regime, when we consider the Marglin and Bhaduri (1990)-type investment function eliminated 'accelerator effect' within the Kaleckian model. As a result, an increase in nominal wage rate decreases aggregate employment and the number of firms, but growth rate and real wage rate is constant, and a decrease in the fixed cost increases the number of firms and the real wage rate, and decreases growth rate. Hence, these two parameters must be distinguished. Finally, we find the Kaleckian model with free entry is the consistency between the wage-led growth regime and stability condition if the fixed cost is proportional to output.

The organization of the paper is as follows. Section 2 presents the basic Kaleckian model with free entry. In section 3, we consider the Marglin and Bhaduri (1990)-type investment function

within the Kaleckian model. Section 4 presents the fixed cost is proportional to output. Section 5 presents our conclusions.

2   The Basic Kaleckian model with free entry

In this section, we consider a monopolistically competitive economy in which a number of firms produce differentiated products using labor, for our Kaleckian model with free entry in the short run and the long run.

In our closed economy, there are two social classes: capitalists who are the owners of the firms and workers. The goods produced by firms are used for both consumption and investment. As is usually the case in Keynesian models, firms operate at below full capacity and adjust output immediately to meet demand. We assume the supply of labour is exogenously given, and that employment is less than the full employment level.

The 'short run' is defined as the time over which the number of firms, m is fixed, and the labour input, N is decided by a demand constraint (to satisfy the goods market equilibrium clearing condition). The 'long run' is defined such as that the number of firms, m, is also endogenous, determined by the zero-profit condition. In detail, the economy is described as follows[1].

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[1] We are not concrened here with the assumption of saving out of wages, taxes and foreign trade.

2.1 The model

There are m identical sectors in the economy. Each firm has the following production function. The output of firms, Y_i, is given by

$$Y_i = aN_i \tag{1}$$

where N_i is employment of labour, a is the productivity of labour.

Next, we consider the investment function of each firm. The investment function is based on N_i:

$$I_i = g_1 K_i + g_2 N_i, \qquad g_1 > 0, \quad g_2 > 0 \tag{2}$$

where g_2 is the sensivity of investors to the N_i, and $g_1 K_i$ is the animal spirit of capitalists. We consider $g_1 K_i > 0$. Whenever N_i increases, the firm i reacts by increasing the investment.

We propose the saving function of each firm, S, which is given by

$$S_i = s(a - w_i/p)N_i. \tag{3}$$

w_i is the nominal wage rate and p is price. Workers do not save, but firms save a fraction s of gross profit.

In line with Blanchard and Giavazzi (2003), we assume an increase in the number of firms (products) decreases the monopoly power of firms that leads to decrease in price:

$$p = p(m), \qquad \frac{\partial p(m)}{\partial m} < 0.$$

We consider $p(m)$ is constant in the short run because the number of firms is fixed, but $p(m)$ vary according to the number of firms in the long run.

Finally, we consider the free-entry condition. The net profit determines entry or exit of firms for a long time. We propose the dynamic equation of the number of firms as follows:

$$\frac{\dot{m}}{m} = g_m \left(Y - \frac{w}{p} N - D \right), \quad g_m > 0 \tag{4}$$

D is a fixed cost, that is constant. If gross profit is larger than a fixed cost, new firm entries the market, and the degree of monopoly decreases and $p(m)$ increases.

2.2 short run

The labour input of firms in the short run are determined to fulfill the goods market-clearing condition, which is ultimately given by

$$\sum_i^m S_i = \sum_i^m I_i \tag{5}$$

As all firms are symmetrical, meaning that $w_i = w$, $Y_i = Y$, $N_i = N$, $I_i = I$ and $S_i = S$, we obtain the following

$$S = I. \tag{6}$$

Substituting (2) and (3) into (6), and rearranging (6), we get

$$s(a - w/p)N = g_1 K + g_2 N. \tag{7}$$

In order for the goods market to be stable, the induced increase in investment as N rises must be less than the induced increase in saving: $s(a - w/p) > g_2$.

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Here, we show the effect of an increase in nominal wage rate, w, on the employment and growth rate in the short run.

$$\frac{\partial N}{\partial w} = \frac{sN/p}{s(a - w/p) - g_2} > 0, \qquad \frac{\partial I}{\partial w} = \frac{g_2 sN/p}{s(a - w/p) - g_2} > 0. \tag{8}$$

The increase in w depresses profit; that is, there is excess demand in the goods market. As a result, the increase in w leads to an increase in N, and that also leads to an increase in I.

In the short-run equilibrium, we find stagnationism (capacity utilization inversely related to the profit share) and the wage-led growth regime (capital accumulation rate inversely related to the profit share) in Kaleckian model. These results depend on the assumption of a positive utilization effect (g_2) in the investment function.

The Kaleckian model thus has very definite and strong political-economy implications. If capitalist want a higher realized profit rate and higher growth rate, they must allow workers to have a higher real wage and a higher share of the national income.

2.3 Long run

In the short run, the number of firms is fixed. However, in the long run, we allow m and $p(m)$ to change over time.

As all firms are symmetrical, we obtain the following zero-profit condition:

$$(a - w/p(m))N = D. \tag{9}$$

It yields two equation (7) and (9) for the two unknowns of N and m in the long run.

Next we examine the stability condition for the long-run equilibrium related to the dynamic equation of the number of firms, which are given by equations (4).

Proposition 1: The Kaleckian model with free entry is unstable.

Proof: The associated stability condition of (4) is $\partial \dot{m}/\partial m < 0$[2]:

$$\frac{wp'(m)}{p(m)^2}N - (a - w/p)\frac{swg_1K}{(s(a - w/p) - g_2)^2}\frac{p'(m)}{(p(m))^2} < 0. \qquad (10)$$

We organize the above stability condition as follows:

$$\frac{-g_2 wp'(m)N}{s(a - w/p) - g_2} < 0. \qquad (11)$$

To satisfy the stability conditon, we need $g_2 < 0$ under stability condition of goods market in the short run and $p'(m) < 0$. As we assume $g_2 > 0$, the Kaleckian model with free entry is unstable.

Q.E.D.

When $Y - \frac{w}{p}N > D$, the price decreases by the increase in the number of firms, m. It leads to increase in the real wage rate through a lower $p(m)$; that leads to excess demand in the goods market, and to an increase in N. As a result, $Y - \frac{w}{p}N$ is larger; total effect on gross profit is positive because the effect of an increase in the real wage rate is smaller than the effect of an increase in N. Therefore, the model is not stable.

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[2] $\frac{\partial N}{\partial m}$ in the short run is

$$\frac{-swg_1K}{(s(a - w/p) - g_2)^2}\frac{p'(m)}{(p(m))^2} > 0$$

Thus, even if the stability condition of goods market in the short run is satisfied, the Kaleckian model with free entry is unstable. This result depends on the investment function and a constant fixed cost. Next section, we consider the Marglin and Bhaduri (1990)-type investment function within the Kaleckian model, and show the Kaleckian model with free entry is stable under the profit-led growth regime.

3   Marglin and Bhaduri (1990)-type investment function

This section, we present the model with Marglin and Bhaduri (1990)-type investment function, and show the stability condition and the effect of various parameters which increase the real wage rate on aggregate employment, Nm, and growth rate.

Before we examine the model with Marglin and Bhaduri (1990)-type investment function, it is useful to discuss the standard Kaleckian investment function employed by Rowthorn (1981), Taylor (1983) Dutt (1984) and Agliardi (1988), which incorporates the rate of profit and the rate of utilization of capacity on investment, is positive. This investment function can be written in linear form as:

$$\frac{I}{K} = g_1 + g_r \left(\frac{Y - \frac{wN}{p(m)}}{K} \right) + g_2 \frac{N}{K}, \qquad g_r > 0. \tag{12}$$

The investment function set by firms depends on the rate of capacity utilization and on the realized rate of profit.

The goods market equilibrium condition is $I = S$ in the symmetric equilibrium in the short

run;

$$s\left(a - \frac{w}{p(m)}\right)\frac{N}{K} = g_1 + g_r\left(a - \frac{w}{p(m)}\right)\frac{N}{K} + g_2\frac{N}{K}.$$

The stability condition of short run is as below:

$$\Delta_r = (s - g_r)\left(a - \frac{w}{p(m)}\right) - g_2 > 0. \tag{13}$$

The effect of an increase in nominal wage rate on employment in each firm and growth rate are positive[3]. It is the stagnationism and the wage-led growth regime.

The dynamic equation of the number of firms is (4), so that stability condition of the number of firms is $\partial\dot{m}/\partial m < 0$. A necessary stability condition is shown in the following condition:

$$-\frac{w}{p(m)^2}p'(m)\frac{g_1 g_2 K}{\Delta_r^2} < 0. \tag{14}$$

As it also needs $g_2 < 0$ to satisfy the above stability condition, the model is unstable even though the short-run stability condition is satisfied.

These results are changed when we consider it to be a more general investment function that Marglin and Bhaduri (1990) assume. As Marglin and Bhaduri(1990) argue, the investment function (12) amounts to the imposition of a 'accelerator effect', that is the depressing effects of reduced utilization necessarily dominates the stimulating effects of a rise in the profit share. Marglin and Bhaduri (1990) assume more general investment function eliminated 'accelerator

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[3]

$$\frac{\partial N}{\partial w} = \frac{1}{\Delta_r K p(m)}(s - g_r) > 0$$

effect':

$$I = I\left(\pi = \frac{Y - \frac{w}{p(m)}N}{Y}, N\right), \qquad I_\pi > 0, \ I_N > 0. \tag{15}$$

This investment function can be written in linear form as:

$$\frac{I}{K} = g_1 + \frac{g_\pi}{K}\left(\frac{Y - \frac{wN}{p(m)}}{Y}\right) + g_2\frac{N}{K}, \qquad g_\pi > 0. \tag{16}$$

The goods market equilibrium condition in the short run is

$$s\left(a - \frac{w}{p(m)}\right)\frac{N}{K} = g_1 + \frac{g_\pi}{K}\left(1 - \frac{w}{ap(m)}\right) + g_2\frac{N}{K}$$

which, since it is linear, yields an explicit solution for the equilibrium level of the labour-capital

ratio:

$$\frac{N}{K} = \frac{g_1 + \frac{g_\pi}{K}\left(1 - \frac{w}{ap(m)}\right)}{s(a - \frac{w}{p(m)}) - g_2}. \tag{17}$$

The stability condition of short run is as below:

$$\Delta_b = s\left(a - \frac{w}{p(m)}\right) - g_2 > 0. \tag{18}$$

Here, we show the effect of an increase in nominal wage rate, w, on the employment and growth

rate in the short run under $\Delta_b > 0$.

$$\frac{\partial\frac{N}{K}}{\partial w} = \frac{1}{p(m)}\frac{s\frac{N}{K} - \frac{g_\pi}{aK}}{\Delta_b},$$

$$\frac{\partial\frac{I}{K}}{\partial w} = \frac{s}{p(m)\Delta_b}\left(g_2\frac{N}{K} - \frac{g_\pi}{aK}\left(a - \frac{w}{p(m)}\right)\right).$$

Thus, there are ambiguous in sign. If $s\frac{N}{K} - \frac{g_\pi}{aK}$ is positive (negative), this model is stagnationism (exhilarationism). If $g_2\frac{N}{K} - \frac{g_\pi}{aK}\left(a - \frac{w}{p(m)}\right)$ is positive (negative), this model is wage-led growth regime (profit-led growth regime).

Next, we consider the long-run equilibrium. The associated stability condition, $\partial\dot{m}/\partial m < 0$, is[4]

$$\left(a - \frac{w}{p(m)}\right)\frac{-1}{\Delta_b}\frac{wp'(m)}{p(m)^2}\left(s\frac{N}{K} - \frac{g_\pi}{aK}\right) + \frac{wN}{Kp(m)^2}p'(m) < 0. \tag{19}$$

We rewrite the above stability condition as follows:

$$-\frac{wp'(m)}{p(m)^2}\frac{1}{s(a - \frac{w}{p(m)}) - g_2}\left(g_2\frac{N}{K} - \frac{g_\pi}{aK}\left(a - \frac{w}{p(m)}\right)\right) < 0. \tag{20}$$

We need

$$\left(g_2\frac{N}{K} - \frac{g_\pi}{aK}\left(a - \frac{w}{p(m)}\right)\right) < 0 \tag{21}$$

to satisfy the stability condition. This condition is the same as $\frac{\partial\frac{I}{K}}{\partial w} < 0$ in the short run. It means "profit-led growth regime" (capital accumulation rate positively related to the profit share).

Proposition 2: The Kaleckian model with free entry is stable under Marglin and Bhaduri-type investment function and profit-led growth regime.

When $Y - \frac{w}{p}N > D$, the price decreases by the increase in the number of firms, m. It leads to increase in the real wage rate through a lower $p(m)$; that is excess supply in the goods

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[4] $\frac{\partial\frac{N}{K}}{\partial m}$ in the short run is

$$\frac{\partial\frac{N}{K}}{\partial m} = \frac{-wp'(m)}{p(m)^2}\frac{s\frac{N}{K} - \frac{g_\pi}{aK}}{\Delta_b}.$$

market, and it leads to a decrease in N. As a result, $Y - \frac{w}{p}N$ is smaller; total effect on gross

profit is negative in "profit-led growth regime" because the effect of an increase in the real wage

rate is larger than the effect of an decrease in N. Therefore, the Kaleckian model with free

entry is stable when we employ the Bhaduri and Marglin-type investment function eliminated

'accelerator effect'. This result depends on "profit-led growth regime".

If we assume that this condition is satisfied, the model can be abbreviated to two equations

in the long-run equilibrium:

$$s \left(a - \frac{w}{p(m)} \right) \frac{N}{K} = g_1 + \frac{g_\pi}{K} \left(1 - \frac{w}{p(m)a} \right) + g_2 \frac{N}{K}$$

$$\left(a - \frac{w}{p(m)} \right) \frac{N}{K} = \frac{D}{K}$$

by defining the endogenous variable N and m.

Here, we show the effect of a rise in the nominal wage rate, w, and a decrease in the fixed

cost, D, on aggregate employment and growth rate in the long run.

Proposition 3: An increase in w causes a decrease in m and an increase in $p(m)$; the

real wage rate, the growth rate and employment in each firm return to initial levels. Aggregate

employment decreases.

$$\frac{\partial N}{\partial w} = 0, \quad \frac{\partial m}{\partial w} = \frac{w}{p(m)} p'(m) < 0, \quad \frac{\partial (Nm)}{\partial w} < 0, \quad \frac{\partial I}{\partial w} = 0$$

In the short run, the effect of an increase in w on employment in each firm and investment

depends on some parameters. In the long run, an increase in w depresses gross profit, and firms

exit from the market; that is a decrease in m and an increase in $p(m)$. Therefore the effect of an

increase in nominal wage rate in the short run gradually disappears with an increase in $p(m)$. As

a result, the real wage rate, the growth rate and employment in each firm return to the initial

level. Employment in each firm is constant, the number of firms decrease so that aggregate

employment, Nm, in the long run is lower: the size of the increase in the nominal wage rate

only causes a decrease in the number of firms although the effect on growth rate and aggregate

employment in the short run is positive. If workers want larger aggregate employment, they

must accept a lower nominal wage.

Proposition 4:   A decrease in D causes an increase in m, a decrease in $p(m)$, an increase

in the real wage rate, and a decrease in I. The total effects of a lower D on Nm is ambiguous.

$$
\frac{\partial \frac{N}{K}}{\partial D} = \frac{wp'(m)}{p(m)^2} \frac{s\frac{N}{K} - \frac{g_\pi}{aK}}{\frac{wp'(m)}{p(m)^2}\left(-g_2\frac{N}{K} + (a - \frac{w}{p(m)})\frac{g_\pi}{aK}\right)},
$$
$$
\frac{\partial m}{\partial D} = \frac{s(a - \frac{w}{p(m)}) - g_2}{\frac{wp'(m)}{p(m)^2}\left(-g_2\frac{N}{K} + (a - \frac{w}{p(m)})\frac{g_\pi}{aK}\right)} < 0, \qquad \frac{\partial I}{\partial D} = s > 0
$$

$$
\frac{\partial Nm}{\partial D} = \frac{\frac{wp'(m)}{p(m)^2}m(sN - \frac{g_\pi}{a}) + N(s(a - \frac{w}{p(m)}) - g_2)}{\frac{wp'(m)}{p(m)^2}\left(-g_2\frac{N}{K} + (a - \frac{w}{p(m)})\frac{g_\pi}{aK}\right)}.
$$

The effect of a lower D on employment in each firm depends on the short-run effect. If

$s\frac{N}{K} - \frac{g_\pi}{aK}$ is positive (negative), the effect is also positive (negative) in the long run.

But, the effects of a lower D on aggregate employment is ambigous. In the case where

(in absolute value terms) $|p'(m)|$ is small and the paradox of cost is not realized in the short

run, a decrease in the fixed cost leads to an increase in the aggregate employment; that is

exhilarationism. On the contrary, in the case where (in absolute value terms) $|p'(m)|$ is large or

the paradox of cost is realized in the short run, a decrease in the fixed cost leads to a decrease

in the aggregate employment; that is stagnationism.

As shown above, on the assumption that the degree of monopoly is decided by zero-profit

condition, we conclude that it does not identify the effect of a rise in the nominal wage rate, w,

with a decrease in the fixed cost, D, on aggregate employment and growth rate in the long run;

although an increase in the nominal wage rate has no effect on the real wage rate and growth

rate, a decrease in fixed cost leads to an increase in the real wage rate and a decrease in growth

rate.

4   Blanchard and Giavatti (2003)-type fixed cost

This section shows that creates possibilities for stable equilibirum in the long run. In line with

Blanchard and Giavatti (2003), we assume the fixed cost, D, is propotional to output:

$$D = cY, \quad c > 0 \tag{22}$$

where c is constant. The dynamic equation of the number of firms is as follows;

$$\dot{m} = \left(aN - \frac{w}{p(m)}N - caN \right) \tag{23}$$

The model can be abbreviated to two equations in the long-run equilibrium:

$$\left(a - \frac{w}{p(m)} \right) = ca$$

$$s \left(a - \frac{w}{p(m)} \right) N = g_1 K + g_2 N$$

by defining the endogenous variable N and m.

Proposition 5: If the fixed cost is proportional to output, the Kaleckian model with free entry is stable.

To satisfy this dynamic equation, we needs

$$\frac{\partial \dot{m}}{\partial m} = \left(a - \frac{w}{p(m)} - ca \right) N_w + \frac{p'(m)}{(p(m))^2} wN < 0 \tag{24}$$

We organize the above stability condition noting the neighborhood of the equilibrium as follows:

$$\frac{p'(m)}{(p(m))^2} wN < 0 \tag{25}$$

The stability condition related to the dynamic equation is satisfied.

QED

If gross profit is larger than the fixed cost, new firms enter the market. It leads to a decrease in a price and an increase in the real wage rate; there is excess demand in the goods market and it leads to an increase in N and output. As the fixed cost is proportional to output and the real wage rate increases, net profit share becomes lower. This process continues until gross profit is equal to the fixed cost, and thus this model is stable.

Next, we show the effect of a rise in the nominal wage rate and a decrease in the fixed cost on various parameters. An increase in the nominal wage rate is absorbed by an increase in price, and the number of firms and the aggregate employment decrease although the employment in each firm is constant.

$$\frac{\partial p(m)}{\partial w} > 0, \quad \frac{\partial m}{\partial w} < 0, \quad \frac{\partial \frac{w}{p(m)}}{\partial w} = 0, \quad \frac{\partial N}{\partial w} = 0, \quad \frac{\partial (Nm)}{\partial w} < 0, \quad \frac{\partial \frac{I}{K}}{\partial w} = 0$$

These conclusions are the same as in the previous section. We consider the effect on a decrease in entry barrier, c. A decrease in c leads to an increase in m and a decrease in $p(m)$, that leads to increase in the real wage rate; it leads to increased employment in each firm, and a rise growth rate and aggregate employment.

$$\frac{\partial (Nm)}{\partial c} = -\frac{g_1 K sam}{(sca - g_2)^2} + \frac{wN}{a(1-c)^2 p'(m)} < 0$$

In a case of the hypothesis that the fixed cost is proportional to output, we find wage-led growth regime and stagnationism are consistent, even though we consider the free entry within the Kaleckian model. We find the positive relationship between the real wage rate, aggregate employment and growth rate. A decrease in c leads to increase the real wage rate. Therefore, we should take policy for promoting competition (a decrease in c) to increase growth rate.

However, we must also pay close attention to the distinction between an increase in the nominal wage rate and a decrease in the entry barrier. In a standard Kaleckian model, workers can only get a higher wage if they can induce firms to accept lower mark-up. It is difficult to derive

the standard Kaleckian model's results from nominal wage rate as control variable. However, in the case of nominal wage, this model is exhilarationism (capacity utilization positively related to the profit share, profit-led) so that it needs a decrease in w to increase aggregate employment.

5   Concluding Remarks

This paper explicitly analyses the effects of the nominal wage rate and the fixed cost on the aggregate employment and growth rate within the long-run Post-Keynesian Kaleckian model with free entry.

Our results offer an important conclusion. The basic Kaleckian model overlooks the effect of free entry. The Kaleckian model with free entry is unstable under wage-led growth regime, but stable under profit-led growth regime with Marglin and Bhaduri (1990)-type investment function. We find an increase in nominal wage rate decreases aggregate employment and the number of firms, but growth rate and the real wage rate are constant, and a decrease in the fixed cost increases the number of firms and the real wage rate, and decreases growth rate. This conclusion shows that we must pay close attention to the difrrence between these two parameters which lead to an increase in the real wage rate in the Kaleckian model. From the viewpoint of economic policy, the Kaleckian model can not be a theoretical foundation of increasing the nominal wage for a better society.

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