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Reflections on neo-Kaleckian growth regimes: a Marxian reproduction perspective

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Abstract

Purpose – The neo-Kaleckian model follows the ideas of Marx, Keynes and Kalecki, that investment is a key influencing factor in the dynamics of the capitalist mode of production. Through the discussion of different forms of investment decision function, this paper constructs the analysis framework of wage-led and profit-led economic growth regimes.

Design/methodology/approach – The model has become an important theoretical paradigm for current Western heterodox economists regarding the research on the impact of functional income distribution on economic growth, and it has a very large impact on both theoretical and empirical research. Starting from Marx's reproduction theory, this article discusses the theoretical shortcomings of the neo-Kaleckian growth regime model.

Findings – This paper mainly focuses on three aspects: (1) the ideological legacy of "Smith's Dogma"; (2) neglecting the restrictions on income distribution from the organic composition of capital and the surplus value rate; (3) technological progress and the formation of a new long economic wave.

Originality/value – The authors believe that the neo-Kaleckian model unilaterally emphasizes the demand-side factors in the economy and, unconsciously or not, ignores the role of the supply-side, which makes it encounter certain limitations in explaining long-term growth. Even if some empirical conclusions are employed to bridge functional income distribution and technological progress, there is still a lack of a theoretical basis for accurately describing long-term economic changes using this model. In order to better promote high-quality economic development and accelerate the formation of a new pattern of economic development in which the domestic large-scale cycle is the mainstay and the domestic and international double cycles promote each other, the authors need to adopt a policy combination with the supply-side as the main and the demand-side as the supplement, and to work from both sides.

Keywords Neo-Kaleckian model, Growth regime, Income distribution, Reproduction

Paper type Research paper

1. Introduction

Income distribution and economic growth have been key topics of economic discussion for a long time, and economists of different schools have discussed and analyzed those two themes at different levels and from different perspectives. In the study, combining macro labor-capital distribution with economic growth, scholars raised the idea that the distribution



proportion of total income between wage and profit will affect economic growth, which is a unique perspective and an important insight of post-Keynesian economists.

Since Kaldor and Robinson introduced income distribution between two classes into growth models, post-Keynesian economists have been putting forth new ideas in this field. In the 1980s, based on the Kaldor–Robinson model and through absorption of some thoughts of Polish economist Michal Kalecki, they created the neo-Kaleckian model and put forward the wage-led growth regime concept, thus providing an important new tool to analyze the relationship between macro labor-capital income distribution and economic growth. According to their studies, the growth regimes of major developed economies all exhibited a structural “wage-led” characteristic. To be specific, increasing the proportion of profit in total income will reduce the economic growth rate, and increasing the proportion of wage income will promote economic growth. Based on such findings, the post-Keynesian economists advocated pursuing global policy cooperation and the transnational “wage-led growth strategy” as an alternative to the globalization of neoliberalism (Lavoie and Stockhammer, 2013b).

However, disputes involving the neo-Kaleckian model have been long in existence. Even within the post-Keynesian school, some economists, including Skott (2017), did not accept the analysis conclusion of the neo-Kaleckian model. From the Marxian perspective, the neo-Kaleckian model unilaterally emphasizes the demand-side factors in the economy and ignores the role of the supply-side. As a matter of fact, the notion that macro income distribution can impact long-term economic growth has fallen within the stereotype of the “Smith’s Dogma”. Although technical progress is included in the model through the Kaldor–Verdoorn’s law, there is no way to account for true long-term growth and new long economic wave. It just explains phenomena with other phenomena. Suppose a country mainly refers to the neo-Kaleckian model and conducts aggregate demand management unilaterally based on its own “growth regime” in decision-making. In that case, misleading consequences are likely to follow.

2. Basic logic of neo-Kaleckian growth regime model

Starting from Harrod and Domar’s pioneering work, post-Keynesian economists made many effectual attempts to model Keynes’s economic thoughts, and the fruits of those attempts included the Cambridge growth model represented by Kaldor–Robinson, the neo-Kaleckian growth model represented by Rowthorn–Dutt, and post-Kaleckian growth model represented by Bhaduri–Marglin. Those models formed an alternative path diverging from the neoclassical growth model and brought into view the thought of effective demand inherited from Kalecki and Keynes. Both Keynes and Kalecki attached great importance to the issue of effective demand in the economy. Unlike the former, who emphasized psychological factors, Kalecki held that the capitalist system was structurally unstable, and functional income distribution in the economy was the key to the study and analysis of economic growth and fluctuations. This notion constitutes the core thought of the neo-Kaleckian model.

Kaldor is one of the earliest economists who have accepted Kalecki’s economic thoughts. He was the first one to encapsulate Kalecki’s theory in this famous maxim: “when workers spend what they earn, capitalists earn what they spend” (Kaldor, 1956). According to this principle, Kaldor included in the growth model the two classes with different propensities to save for the first time (Kaldor, 1957). Unlike the neoclassical theory of marginal returns, the relationship of the functional income distribution (i.e. labor-capital distribution) in Kaldor’s model is not just the result of natural operation of the macro-economy but will also influence investment decisions through saving function and thus influence the aggregate demand in the economy. Robinson, a representative scholar of the Cambridge school living within the same period as Kaldor, also established a similar model, in which she highlighted the significance of private enterprises’ investment decisions to economic accumulation. Specifically, in her model, enterprises themselves keep a portion of retained earnings, and other profits are distributed to rentiers. Rentiers consume and save out of their interest

income, but workers do not save at all (Robinson, 1962). Enterprises' investment decision depends on expected profit margin, and all enterprises adopt adaptive expectations, with the previous periodic profit margin as the currently expected profit margin; when the market reaches equilibrium, the savings and investments are equal.

Based on the work of Kaldor and Robinson, the classical "Cambridge growth model" gradually took shape. However, due to its inherent defects below, the model still failed to meet the requirements of post-Keynesian scholars: (1) The price in the model is still fluctuating flexibly, and enterprise still is the price taker; (2) capacity utilization appears as an exogenous variable and is posited at a fixed level or fully utilized level.

Scholars sought theoretical support from Kalecki's economic thoughts to surmount the restrictions of the "Cambridge growth model" (Rowthorn, 1981; Dutt, 1984). According to Kalecki's notion, price is determined by oligarchs with monopoly power based on a mark-up on their own production cost. The manufacturer enjoys the pricing power and is not simply a price taker. On such presumption, the manufacturer replaces the supply-demand relationship as the price maker of commodities. Conversely, change in the market supply-demand relationship cannot directly influence the price. However, it can influence the capacity utilization of enterprises under existing capital stock. In this case, capacity utilization is no longer a constant but an endogenous variable smaller than one.

Based on the above presumption, Rowthorn (1981) and Dutt (1984) each developed a similar benchmark model independently. Compared with the Kaldor–Robinson model, because the enterprise enjoys the pricing power, the actual wage obtained by workers in the Rowthorn–Dutt model is reversely determined by the cost mark-up rate, and the share of profit in the total income is also determined by the mark-up rate instead of freely fluctuating monetary wages. Considering the saving behavior of different groups, it also affects the determination of the saving function.

According to Kalecki's summarization (1990), the major issues addressed by Keynes in his book *"The General Theory of Employment, Interest, and Money"* are (1) determination of short-run equilibrium under a certain production pattern at a given investment level; and (2) determination of investment level. And Kalecki's job was to reproduce Keynes's conclusion in a different manner. Based on this principle, enterprises' investment decisions or accumulation formulas are always the focus of neo-Kaleckian economists' discussion. On this issue, the Rowthorn–Dutt model inherits Keynes's statement on "animal spirits", and its investment decision function contains autonomous investments that are subject to "animal spirits" and other social-historical factors. However, the key independent variable contained in the investment decision function of the Kaldor–Robinson model is the projected profit margin. In the Rowthorn–Dutt model, the projected profit margin is substituted by the current profit margin with the actual capacity utilization added as an additional explanatory variable [1].

The entire neo-Kaleckian growth model comprises a set of equations including profit margin, saving rate, equilibrium condition and stability condition:

$$r = \frac{\Pi}{K} = \frac{\Pi}{Y} \frac{Y}{Y^n} \frac{Y^n}{K} = h \frac{u}{v} \quad (1)$$

$$h = \frac{1}{1 + m} \quad (2)$$

$$\sigma = s_\pi r = s_r h \frac{u}{v} \quad (3)$$

$$g = \alpha + \beta u \quad (4)$$

$$g^* = \sigma^* \quad (5)$$

$$\frac{\partial \sigma}{\partial h} - \frac{\partial g}{\partial h} > 0 \Rightarrow s_\pi h \frac{u}{v} - \beta > 0 \quad (6)$$

In the above set of equations, Equation (1) breaks up profit margin into capital share (h), capacity utilization (u) and capital-output ratio (v). Equation (2) defines profit share as the function of mark-up rate (m), and the mark-up rate is regarded as being related to the bargaining power of an enterprise in the product market and labor market. Equations (3) and (4) determine the levels of saving and investment in the economy, respectively, and a definite solution will be obtained through the equilibrium condition (5). The equilibrium solution of the equations must meet the stability condition given in Equation (6). That is, the saving level should be more sensitive to changes in capital share than the investment level.

By solving this standard neo-Kaleckian growth model, we will obtain the equilibrium value of capacity utilization and economic growth rate, and all partial derivatives relating to profit share obtained through those equilibrium values are smaller than zero. Thus, what Rowthorn calls “cost paradox” appears. In other words, with an increased profit share (a declined wage share), the capacity utilization and growth rate of the economy will fall.

$$\frac{\partial u^*}{\partial h} = \frac{-\alpha s_\pi \frac{1}{v}}{\left(s_\pi h \frac{u}{v} - \beta\right)^2} < 0 \quad (7)$$

$$\frac{\partial g^*}{\partial h} = \frac{-\alpha \beta s_\pi \frac{1}{v}}{\left(s_\pi h \frac{u}{v} - \beta\right)^2} < 0 \quad (8)$$

Economists summarize the foregoing conclusion deduced from the neo-Kaleckian model as the “wage-led” growth regime. The existence of this growth regime means that we can promote the improvement of capacity utilization and economic growth rate simply by increasing the wage share (or reducing the profit share) in distribution. However, Bhaduri and Marglin, in their milestone research, made important corrections to the investment decision function in the Rowthorn–Dutt model, thus creating a variant of the neo-Kaleckian model and giving prominence to the debate on the “wage-led” and “profit-led” growth regimes (Bhaduri and Marglin, 1990).

Table 1 presents a comparison among the three representative post-Keynesian growth models, including the Kaldor–Robinson model, Rowthorn–Dutt model and Bhaduri–Marglin model. Obviously, the main difference among those three models lies in the investment function. It is worth noting that the setting of the investment function in the Bhaduri–Marglin model is directly derived from the Kaldor–Robinson model, except that the former replaces the projected profit margin with actual profit margin, divides the profit margin into three parameters, assumes that the capital-output ratio (v) as a constant. That is, it introduces such

	Kaldor–Robinson	Rowthorn–Dutt	Bhaduri–Marglin
Investment function	$g = \alpha + \beta r^e$	$g = \alpha + \beta u + \chi r$	$g = \alpha + \beta u + \tau h$
Saving function	$\sigma = s_\pi r$	$\sigma = s_\pi h \frac{u}{v}$	$\sigma = s_\pi h \frac{u}{v}$
Profit margin	$r_t^e = r_{t-1}$	$r = h \frac{u}{v}$	$r = h \frac{u}{v}$
Capacity utilization	$u^* = u_n = 1$	$u^* = \frac{\alpha}{\frac{h}{s_\pi}(s_\pi - \chi) - \beta}$	$u^* = \frac{\alpha + \tau h}{s_\pi \frac{h}{v} - \beta}$
Growth regime	None	Wage-led	Wage- and profit-led

Table 1.
Comparison of post-
Keynesian growth
models

factors as capacity utilization and capital share in terms of form. The introduction logic of capacity utilization in the Bhaduri–Marglin model differs from that of capacity utilization in the neo-Kaleckian models including the Rowthorn–Dutt model. The latter is an explanatory variable added deliberately while the former appears as a decomposed component of the actual profit margin.

In the Rowthorn–Dutt model, the partial derivatives of the three variables, including capacity utilization, economic growth rate and profit margin concerning profit share, are all smaller than zero. That is to say, the result of the Rowthorn–Dutt model is indisputably the “wage-led” growth regime. Based on this model, reducing the wage share (or increasing the profit share) will undoubtedly hinder economic growth, so the most desirable policies are undoubtedly increasing the wage share, guaranteeing the workers’ rights and interests, and reinforcing the strength of labor unions. In the Bhaduri–Marglin model, change in profit share will impact the workers’ consumption, savings and enterprise investment at the same time. The economy will exhibit a “wage-led” growth regime only when the effect of such change on consumption is greater than on investment. If the direct impact of profit share on enterprise investment demand is greater than that on the workers’ consumption and investment, the economy will exhibit the “profit-led” characteristics. In other words, increasing the profit share (or reducing the wage share) will help promote economic growth.

The emergence of the Bhaduri–Marglin model enriches the connotation of the growth regime and expands the discussion scope of the neo-Kaleckian model. The neo-Kaleckian growth regime model before the birth of the Bhaduri–Marglin model is actually an empirical summary of the postwar golden age of developed capitalist countries, the epitome of the “wage-led” regime and a written proposal of the corresponding policy mix. After the birth of the Bhaduri–Marglin model, the impact of functional income distribution on economic growth becomes ambiguous again. Many empirical studies have been done on the definition of the growth regime of some economies and the growth regime evolution of an economy at different stages. However, Lavoie discovered a very interesting rule in those empirical studies. He pointed out that based on all the empirical studies related to growth regimes, Maxian scholars tended to emphasize the existence of the “profit squeeze” effect and weaken the role of effective demand, thus reaching the conclusion of “profit-orientation”. In contrast, pure post-Keynesian scholars generally emphasize the role of effective demand more and tend to believe that the economy is “wage-led” (Lavoie, 2017).

Some Chinese scholars often regard the Bhaduri–Marglin model as a direct inheritance and development of the Rowthorn–Dutt model and consider these two models and other derivative models as the neo-Kaleckian models collectively (Li and Xia, 2019; Shi and Liu, 2017). There are also a few scholars who notice the controversies that the Bhaduri–Marglin model encounters within the neo-Kaleckian school (Liu and Lu, 2016). As the most typical manifestation of such a controversy, Caldentey and Vernengo maintained that the corrections of the Rowthorn–Dutt model by the Bhaduri–Marglin model impaired the position of Keynes’s theory of effective demand in the growth model and requested the post-Keynesian theory to make a clean break with the Bhaduri–Marglin model (Caldentey and Vernengo, 2013). Based on theoretical requirements, some scholars are more willing to refer to the Rowthorn–Dutt model and its directly derivative models as the “neo-Kaleckian models” and call the Bhaduri–Marglin model and its derived models as the “post-Kaleckian models” so as to differentiate them (Hein, 2017; Palley, 2017).

3. Reflections from Marx’s reproduction theory

It is clear that even the neo-Kaleckian scholars may disagree on the setting of the model due to their different academic backgrounds. As a result, the two branches not fully compatible with each other, namely the neo-Kaleckian model and the post-Kaleckian model, are formed, and

the former sometimes calls itself the “post-Keynesian/Kaleckian school”. Theoretically speaking, the formation of two branches and Lavoie’s observation that “Marxist scholars tend to believe that the economy is ‘profit-led’” are actually inevitable. That is because Bhaduri and Marglin’s post-Kaleckian model is essentially a revision of the neo-Kaleckian model based on an analysis of the “profit squeeze” phenomenon in the context of Marx’s theory. In contrast, Rowthorn and Dutt’s “neo-Kaleckian model” tends to underscore the insufficiency of effective consumption.

According to Marx’s reproduction theory, increased gross output is the direct result of expanded reproduction, and the increase in income must be directly caused by the increased output. Therefore, without expanded reproduction, there will not be real income growth. Any change in the proportion of wage and profit in the output will not give rise to any change in output unless such change produces a certain effect on the next-period expanded reproduction. Keynes’s theory of effective demand on which the neo-Kaleckian model is based unilaterally emphasizes the demand-side factor, neglects the actual role of constant capital and variable capital investments in promoting economic growth, and ignores the real impetus of long-term economic growth. Harvey once pointed out that “Marx indicates, in effect, that he wishes to distinguish between those contingent forces that can push wage rates hither and thither and the socially necessary forces that attach to the accumulation of capital in general and which dictate the value of labour power” (Harvey, 2006, p. 52). In Marx’s opinion, the so-called socially necessary forces undoubtedly refer to the distribution of the means of production.

In accordance with Marx’s reproduction theory, the neo-Kaleckian model has three defects that deserve introspection: (1) ideological legacy of the “Smith’s Dogma”; (2) ignoring the restrictions of the organic composition of capital and surplus value rate on investment decision and income distribution; (3) the difficulty in explaining technical progress and formation of new long economic waves.

3.1 Ideological legacy of “Smith’s Dogma”

Classical economics has a classical concept that Marx called “Smith’s Dogma” regarding national income distribution and value production. Marx pointed out that Adam Smith confounded the annual product value with the annual value product, omitting the role of constant capital in the formation of the product value. He simply broke up commodity value into three types of income, including wage, profit and land rent and then stated that the three types of income, namely wage, profit and land rent, are the fundamental factor that determines the exchange value of commodities. This leads to the phenomenon that “The result is that Smith’s confusion persists to this day, and his dogma forms an article of orthodox belief in political economy” (Marx, 1992, p. 467). Marx’s criticism of “Smith’s Dogma” actually contains two different levels. The first level is the lack of constant capital, i.e. regarding the new value created by labor as gross product value and neglecting the value transfer of the means of production and raw materials. The second level is the inversion of value creation and value distribution. The determination of value should exist prior to income, and the three types of income are not different expressions of the same phenomenon. Instead, their relationships are determined by different laws.

In the context of neoclassical economics, Smith’s Dogma is formalized as the marginal factor-value theory, that is, the prices of factors reflect their marginal productivity, and the share of factors in national income represents their output elasticity under existing technical conditions. Zhang (2004) pointed out that such correction to neoclassical economics was a response to Keynes’s theory, that is, introducing constant capital into the production process in the form of capital factor. The theory of factor productivity circumvents Marx’s first-level criticism of “Smith’s Dogma”, thus rendering the value of constant capital acknowledged on the surface, but the relationship between value production and value distribution is still

inverse. There is no essential difference between the factor productivity theory and Say's "Trinity Formula" in this respect. The difference in the roles played by different factors in the production process is covered up by the same method of income determination. Capital gains the profit, the laborer gains the wage and the residual value is used to show the role of the technical level. By this time, at the macro level, shares of wage and profit are naturally determined by factor price and contain no special economic significance. Both wage and profit are only a segment of aggregate demand, and any change of their proportions will not directly affect the level of aggregate demand.

The post-Keynesian growth model, which originates from Keynes's and Kalecki's theories of effective demand, attempts to let functional income distribution make "sense" economically at the very beginning. In Kaldor–Robinson's Cambridge growth model, although the market prices of products are fully elastic, the relationship between capital accumulation and income distribution is emphasized. With enterprise investment decisions at a dominant position, investment and capital accumulation directly impact profit margin and influence actual wage by affecting the employment rate. By introducing manufacturers' mark-up pricing, the neo-Kaleckian model further draws a line with neoclassical economics in this regard. After the manufacturers obtain the pricing power, the market price is no longer monetarily expressed by the marginal productivity of factors but determined by the mark-up rate and their own production cost. Likewise, shares of profit and wage in the macro economy are no longer the natural outcome of elasticity of factors output; instead, they are also subject to the actual mark-up rate.

This practice of the neo-Kaleckian model seemingly avoids Smith's Dogma's confusing value product with product value at the micro-level. However, the relationship between value creation and value distribution is still reversed. At the macro level, because the role of wage and profit as part of aggregate demand in expanded production is emphasized, the casual sequence from value distribution to value creation is manifested. In Marx's theory, the amount of value used to compensate for constant capital and variable capital is determined before the production process. The former is the consumption of the means of production and raw materials, while the latter is the value of the means of production required for the reproduction of labor. They are both independent of human will. The balance of gross product value after deduction of these two parts is the surplus value left for capital owners. However, in the neo-Kaleckian model, a mark-up rate to the satisfaction of the capitalists should be established first. Through calculation with the mark-up rate, the wage level that the workers should deserve is obtained backward. That is to say, the wage level available to the workers is not determined by labor value but the return level expected by the capitalists and the struggle between labor and capital in the labor market. The logic order of value distribution and value creation is reversed, and the conditions that determine value components are ignored. And value segments, including profit and wage, are determined by the same factor. Actually, it regards the labor-capital distribution as the "result of a pure power relation in the market place" and is "an inadmissible abstraction" for Marx because only in production "that the fundamental relation between capital and labour becomes very clear" (Harvey, 2006, p. 43).

Furthermore, like neoclassical economics, the value of constant capital is only superficially recognized in the neo-Kaleckian model. Although the neo-Kaleckian model includes all the constant capital in the calculation of mark-up on cost at the micro-level, the starting point of its macro model is still the national income identity, and what always appears at both ends of the identity is not annual product value but annual value product. With the symbols of Marxist economics, if the profit margin is broken down, the adopted total amount Y is still the $V + m$ part of the product without considering the update and compensation of existing constant capital. C , which truly represents constant capital, is ignored and is substituted by m in the newly added value. From this perspective, capital

share and profit share themselves imply that the compensation for constant capital is neglected. Judging from Marx's theoretical logic or actual total amount, compensation for constant capital is the most important part of economic "aggregate demand". In some variants of the neo-Kaleckian model, the researchers divide the economy into two sectors relative to the production of capital goods and consumer goods and introduce constant capital is introduced through the production of intermediate goods (Dutt, 1988, 2017). However, as mentioned earlier, such practice still cannot respond to Marx's second-level criticism of "Smith's Dogma", i.e. casual sequence of value distribution and value creation. In the two-sector neo-Kaleckian model, the mark-up rate of each sector still occupies a prioritized position in the logic chain, and the distribution results are still the "product of pure power relations on market".

The neo-Kaleckian model attempts to emphasize the priority of enterprise investment, thus giving the functional income distribution an economic meaning different from that of the neoclassical theory with a declaration that it has drawn a line with classical economics and neoclassical economics. However, this goal is not achieved. Because the neo-Kaleckian macro model proceeds from the gross national income representing annual value product, it naturally excludes the compensation for the update and consumption of constant capital and neglects the most important component of economic "aggregate demand". With the reversed relationship of value creation and value distribution, the model abstracts the relationship in the field of production as a power struggle of labor market and product market rather than explore the labor-capital relation based on what Marx called – "forces with social necessity", still showing the logical legacy of "Smith's Dogma".

3.2 Restrictions of organic composition and surplus value rate on investment decision and income distribution

This problem is essentially continuous with the issue of "Smith's Dogma". In nature, they both fail to truly notice the field of production and focus their research on the relatively secondary distribution field. In the neo-Kaleckian model, the key variable influencing investment decision and income distribution is the mark-up rate decided by the manufacturer, which is believed to depend on the manufacturer's bargaining power in the product market and labor market (Hein, 2014).

When a new investment is put into production, just like existing capital, it must be divided into two parts, namely constant capital and variable capital. The ratio of the two parts $\frac{C}{V}$, must correspond to the technical level adopted for current production instead of being arbitrarily determined by the capital owner. Supposing that the technology used for production is not changed with a quantitative increase of capital, the organic composition of additional capital should be identical to that of existing capital. Considering the capacity utilization, the enterprise maintains a portion of surplus fixed capital, and the additional capital may appear in the form of variable capital. When a new round of production process is completed, and aggregate social product appears with an increased quantity, the newly-increased value also needs to be distributed. Except for C' , the compensation for consumption of constant capital, the ratio of the remaining parts, $\frac{V}{M}$, will be jointly determined by technical relations and production relations.

The functional income distribution discussed in the Kaleckian growth model is a reflection of the surplus-value rate. The so-called growth regime under the "prosperity mode" actually means a weakened labor force and increased surplus value rate. Increasing the profit share in such a model can stimulate private investment by influencing capital owners' prospecting future benefits. However, the emphasis on subjective expectation inherited from Keynes and Kalecki leaves out the objective requirements on technical relations in the investment process.

In the book *The General Theory of Employment, Interest and Money*, Keynes argues that gross savings are necessarily equal to the gross investment, for “no one can save without acquiring an asset, whether it be cash or a debt or capital-goods” (Keynes, 2018, p. 73). This judgment fails to notice that different forms of assets hold different positions in production, and Marx pointed out that capitalists can “retain at least part of his constant capital in the money form for a longer time” (Marx, 1992, p. 521). Due to the latter circumstance, the conversion of monetary capital to productive capital is no longer transient and smooth but delayed and frictional, thus making it difficult for the capitalist economy to expand reproduction.

The idea that functional income distribution, i.e. distribution of new value between two classes, will directly affect the scale of production activity in the next period without considering the conversion of monetary capital into productive capital or the distribution of productive capital into constant capital and variable capital is hugely fractured in logic. It simplifies the two necessary steps as in “investment – production” in the reproduction process with the sheer emphasis on the capital in the monetary form at the beginning and closing by reducing $G \rightarrow \left\{ \begin{smallmatrix} Lp \\ A \end{smallmatrix} \rightarrow W \rightarrow G' \right.$ to $G \rightarrow G'$, and insists that this growth comes within the capital itself. As a result, it only reaches the surface of income distribution without getting to the nature of accumulation and growth, namely the power of expanded reproduction.

Putting aside the “profit-led vs. wage-led” dichotomy, if the role of profit share is reviewed from the perspective of reproduction, the missing logic links missing in the neo-Kaleckian model will be found. First, increased wage share will cause a profit squeeze and reduce the growth of gross output. This does not mean increasing profit share is bound to cause a higher growth rate, wherein the link of transforming monetary capital to productive capital is involved. Second, the new investment can only lead to the increase in gross output through production, which inevitably involves its technical relations, that is, the technical composition of constant capital and variable capital. Third, the increase in gross output cannot turn into an increase in the income of various groups until the realization of products is fulfilled. Only by exchanging with currency, the value of products can be realized and thus income be increased.

3.3 Technical progress and formation of new economic long wave

The neo-Kaleckian growth regime model has a considerable explanatory power for short-term economic fluctuations, but it cannot be limited to the short-term analysis and instead, it should be viewed from a long-term perspective. On the one hand, the issue of economic growth issue only makes sense over a long time. On the other hand, some scholars think that in the neo-Kaleckian model, “the long-term equilibrium growth rates of both GDP and productivity are endogenous in the growth of effective demand and income distribution, and thus the government’s fiscal, monetary, and income distribution policies have a short-term effect on aggregate demand, output, and employment as well as a long-term effect on economic growth” (Hein, 2014, p. 480).

From the long-term perspective, the post-Keynesian theory fails to pay enough attention to the supply-side, rendering itself criticized by different schools. As the scholar who attached great importance to the supply-side factor, Kalecki continued the research paradigm proposed by Marx in Volume II of *Capital* and specially highlighted the importance of technical progress and capital accumulation to long-term economic growth in the *Selected Essays on the Economic Growth of the Socialist and the Mixed Economy* (Duan and Zhao, 2019). However, while reviewing the development of the post-Keynesian economic growth theory, Hein (2014) pointed out that during the development of the neo-Kaleckian model, due to its theoretical emphasis, this model neglected the supply-side factor noticed by Kalecki

regarding the growth of the socialist economy, and mainly paid attention to the demand-side content. From this perspective, some scholars criticized the defects of the neo-Kaleckian model. For example, neo-Ricardian economists remarked that the neo-Kaleckian model lacked the foundation of long-term analysis. The model's key technical parameters are exogenous, making the model only focus on the short and intermediate-term economic fluctuation. If the model is placed in the long-term framework, it will not be different from the fixed-parameter exogenous growth model in neoclassical economics (Shi and Liu, 2017).

On the issue of endogenized technological progress, the typical response of the neo-Kaleckian school is to point out the two channels through which the wage share influences long-term technological progress. The first one is the Webb effect that the increase in actual wage directly promotes that in labor productivity; the second one is that under the wage-led growth regime, the role of wage increase in driving total income will promote the increase of labor productivity and thus guarantee long-term growth through the Kaldor-Verdoorn's law. The former is the direct effect of wage on productivity, while the latter is an indirect effect.

Boyer argued that the economic growth regime could be divided into the "wage-led growth regime" and "profit-led growth regime" in terms of labor productivity. Under the former regime, increasing actual wage or wage share can directly promote the increase of labor productivity, and the opposite effect will appear under the latter regime (Boyer, 1988). Vergeer and Kleinknecht's research on the Organization for Economic Cooperation and Development (OECD) countries shows that from 1961 to 2004, every 1% increase in the actual wage in these countries was accompanied by a 0.39% increase in labor productivity (Vergeer and Kleinknecht, 2010). According to Lavoie and Stockhammer, it should be admitted that all economies have a wage-led productivity regime (Lavoie and Stockhammer, 2013a, b). Their interpretation of this regime is that the wage increase will impose cost pressure on enterprises, which prompts them to increase research and development investments, choose labor-saving technical advances and thus improve labor productivity. Some Chinese scholars argue that the positive effect of the increased share of labor income on productivity is realized in such forms as increased human capital and efficiency wages. This can also be reckoned in the Webb effect summarized by the neo-Kaleckian school (Chao and Lian, 2019).

A higher level of education of laborers or greater working enthusiasm helps increase enterprises' labor productivity in the short term. However, as long as the production technology adopted by enterprises is not significantly changed, the machinery equipment, which is of core importance, is not upgraded on a large scale, and to a great extent, there will be no physical change to the technical composition of capital, that is, there will not be any long-lasting technical progress. The idea that private enterprises will increase research and development investment due to labor cost pressure and thus make some capital-biased technological progress in the long term also cannot hold logically. The profit squeeze effect caused by the increased wage share at the macro level will reduce enterprises' retained earnings, thus possibly making them unable to afford research and development activities, which will hinder the improvement of labor productivity.

The neo-Kaleckian scholars believe that in a wage-led economy, the increase in the wage share or actual wage will not only directly increase labor productivity but also facilitate the increase of labor productivity indirectly through the Kaldor-Verdoorn effect of economic growth.

The Kaldor-Verdoorn effect originated from the statement of Verdoorn, a Dutch economist, and afterward received wide attention among English-speaking countries through the introduction of Kaldor. Rowthorn summarized this law as a phenomenon of "increasing returns to scale" (McCombie *et al.*, 2002). Many post-Keynesian economists conducted empirical tests according to this rule of thumb and drew positive conclusions (Naastepad, 2006; Hein and Tarassow, 2010; Storm and Naastepad, 2013). However, this effect could only show the statistical relevancy between those two variables and failed to indicate

their actual causal relationship. [Marquetti \(2004\)](#) found that the economic growth rate was the “Granger causality” of productivity growth rate. However, he failed to propose a theory that could clearly explain its economic connotation. According to Basu’s research, the regression coefficient between economic growth rate and productivity growth rate is subject to multiple factors, including the elasticity of labor supply, the elasticity of factor substitution, profit share and total increasing returns to scale. In reality, this coefficient is a positive number smaller than one in only a few special cases that happen to be “achieved” ([Basu and Budhiraja, 2020](#)). Therefore, Kaldor–Verdoorn’s law cannot effectively support the argument of the neo-Kaleckian school that pure demand-side management can facilitate technological progress and thus create a positive effect on long-term economic growth.

4. Fundamental ways to achieve growth

The neo-Kaleckian model centers on functional income distribution between capital and labor, and its fundamental objective is to provide a theoretic basis for seeking policies in favor of economic growth. Based on the conclusions of the Rowthorn–Dutt model and the neo-Kaleckian model that arose afterward, the main developed capitalist countries in the world are under the wage-led growth regime. Therefore, expanding the power of labor unions, increasing the minimum wage and adopting the policies that cause final income to tilt toward laborers can significantly boost effective demand and further promote economic growth. The neo-Kaleckian model requires governments to adjust the distribution of disposable income with their own fiscal and monetary policy tools as their core goal and seek international cooperation ([Lavoie and Stockhammer, 2013b](#); [Hein and Truger, 2012](#)).

The post-Kaleckian model used by Bhaduri–Marglin and their followers introduces Marx’s notion with the emphasis on profit squeeze, but it still abstracts the power of social necessity as the outcome of occasional factors in the market and fails to reflect the scientific connotation of Marxism truly. According to Marxian reproduction theory, the decisive factor in an economy is the distribution of the means of production and organic composition of capital determined by technical conditions. “The rate of accumulation is the independent, not the dependent variable; the rate of wages is the dependent, not the independent variable” ([Marx, 1990](#), p. 770). Theoretically speaking, the attempt to affect capital accumulation by adjusting income distribution is actually an act of reversing cause and effect and running counter to the original purpose. In practice, demand management with fiscal stimuli as the major approach may incur a serious burden on national finance so it cannot last for long. The real recipe to guarantee long-term healthy economic development should be found in the aspects of promoting accumulation and increasing the efficiency of accumulation.

4.1 The fiscal stimulus policy can hardly sustain

In Keynes’s theory, the investment in aggregate demand, especially the investment in the public sector, plays a key role in economic growth. When talking about how to promote economic recovery from recession, Keynes concluded ([2018](#), pp. 285–289) that the arrangement for current investment should not be in the charge of the private sector. The reason is that when marginal efficiency and expected return of capital are still low, that is, the private capital investment is stimulated with a rate close to zero, the goal cannot be achieved, and low private investments can even restrict the recovery of propensity to consume. Keynes also proposed that the real cure was to increase the propensity to consume through income redistribution or other methods and thus make sure that the amount of current investment required to maintain a certain level of employment was relatively small ([Keynes, 2018](#), pp. 285–289). This notion was proposed on the condition that the propensity to consume and investment multiplier exist. The higher the propensity to consume is, the higher

the investment multiplier is. Therefore, the investment multiplier can be increased by increasing the whole economy's propensity to consume, and thus a considerable growth may be driven by the relatively small investment. The most immediate conclusion from the two theories of inefficient private investment and the investment multiplier is that stimulating economic growth requires greater public investment and an expansion of the share of consumption in final demand. For more than half a century, the thought has profoundly affected the theoretic circle and policy practices.

Since the beginning of 2020, the COVID-19 pandemic has become a global public health crisis and also hits the world economy. Regarding the weak world economy, the Nobel Laureate Paul Krugman proposed taking 2% of a country's annual total GDP as deficit-supported public expenditure to stimulate the economy and continuing this practice on a long-term basis. He believed that this initiative could help an economy avoid the liquidity trap and bridge the gap between actual output and potential output when private capital rejects investment. The largest dispute over this idea is its sustainability. Krugman also held that it was acceptable if the ratio of government deficit to GDP reached 150%, and the economy would not collapse even if the ratio reached 200% (Krugman, 2020). Coincidentally, the neo-Kaleckian economists also remarked that "autonomous government deficit constraints" should not be considered in using government expenditures and taxes, but they tended to emphasize the role of government expenditure in adjusting income distribution instead of substituting private investment (Hein, 2017). According to the traditional monetary theory, if the ratio of government debt to gross domestic product exceeds a certain level, the government will be insolvent, and a sovereign debt crisis will occur. However, since 2019, as modern monetary theory becomes a buzzword, the discussion about whether government deficit constraint really exists has become increasingly heated. According to modern monetary theories, the governments of sovereign nations do not restrict their budgets like families. Therefore, governments can issue unlimited currencies for adjusting domestic resource allocation (Jia and He, 2020).

In the long run, continuous fiscal stimuli are not the correct remedy but procrastination to solve the current problem. In this regard, Krugman (2020) also said, "If secular stagnation looks like less of a problem at some future date, we can rethink permanent stimulus then". Even if the pressure caused by the permanent stimulus for the deficit is still acceptable, it is not the best choice. Because such a stimulus is still focused on the distribution of final products, the public expenditure that "incurs no public burden" can be deemed part of the country's massive redistribution policy. However, just as Marxian reproduction theory reveals, this policy still centers on income distribution and fails to get to the core factors influencing accumulation and growth. A truly effective long-term policy must involve adjusting the technical relations in production, establishing an industrial structure more suitable for future development requirements, constructing a more required industrial structure for future development, guiding the economy to get out of stagnation and depression and achieving long-term economic growth and consumption improvement.

4.2 Create a new development pattern through two-way efforts

According to the "Proposals for formulating the 14th Five-Year Plan (2021–2025) for National Economic and Social Development and the Long-Range Objectives Through the Year 2035" officially approved at the fifth plenary session of the 19th CPC Central Committee (2020), China should focus on promoting high-quality development and deepening the supply-side structural reform with reform and innovation as the fundamental driving forces to meet the people's growing needs for a better life as the fundamental purpose. China should also coordinate development and security, accelerate the construction of a modern economic system and accelerate the construction of a new development pattern where domestic and

foreign markets (i.e. domestic and international circulations) can boost each other with the domestic market (domestic circulation) as the mainstay ([The Central People's Government of the People's Republic of China, 2020](#)). To facilitate the long-range goal of establishing the new development pattern, we proceed from the supply-demand relationship and explore relevant policy suggestions based on Marxian reproduction theory along with our reflections on the neo-Kaleckian growth model.

Judging from the relationship between supply and demand, currently and in the following stage, the major contradiction faced by China's economic operation is still at the supply-side, and the demand-side contradiction is secondary. Therefore, we must adhere to deepening the supply-side structural reform, enhance the ability of the supply system to meet domestic demands and lead and create new demands through innovation-driven and high-quality supply. Meanwhile, attention should be paid to demand-side management while the supply-side structural reform is upheld. It is also necessary to continue upholding the strategic focus of expanding domestic demand and combine the implementation of the strategy of expanding domestic demand with the deepening of the supply-side structural reform, thus developing a higher level of dynamic balance marked by demand driving supply and supply creating demand, and establishing a new development pattern with two-way efforts.

Development is the basis and key to solving all problems in China. The establishment of a new development pattern requires ensuring smooth domestic circulation and promoting the construction of the "dual circulations", that is, domestic and international circulations. And the construction of the dual circulation depends on the appeal of domestic circulation to global resource factors. Therefore, domestic circulation is the base and foothold of the dual circulation and the basic precondition for establishing a new development pattern. According to the analysis in this paper, the main focus of smoothing domestic circulation is not the demand side but the supply side. This requires us to uphold innovation-driven development, promote the advancement of the industrial infrastructure and modernization of the industrial chain, improve the quality and efficiency and core competitiveness of the economy, thus optimizing supply structure and improving supply quality.

In order to optimize supply structure, improve supply quality and thereby smooth domestic circulation, the following two aspects may be considered. On the one hand, the government should adhere to innovation-driven development, reinforce national strategic scientific forces, strengthen base research, attach importance to original innovation, promote enterprises' status as innovation subjects, focus on developing core technology and enhance the advantages and make up for the shortcomings of the industrial chain and supply chain. On the other hand, the government shall optimize our investment structure, maintain reasonable investment growth, give play to the role of investment in optimizing the supply structure, accelerate the improvement of weak links of infrastructure construction, promote enterprises' equipment update and technological transformation, expand investment in strategic emerging industries, promote the construction of major projects of new infrastructure, new urbanization, transportation and water engineering, and bring into play the leveraging role of government investment.

Based on smoothing domestic circulation through scientific and technological innovation, promoting optimization and upgrading of supply structure through investment, and leading and creating new demands through innovation-led and high-quality supply, China also needs to adhere to the strategic focus of expanding domestic demand and accelerate the development of a complete system of domestic demands. China's government shall reinforce the basic role of consumption in promoting economic development, follow the trend of consumption upgrading, boost traditional consumption, foster new types of consumption, appropriately increase public consumption, promote the development of environmentally-friendly, healthy and safe consumption, and encourage the development of new consumption models and business modes. Making efforts in both directions with the supply-side as the

mainstay and the demand-side as the supplementation will help promote high-quality economic development and accelerate the establishment of a new economic development pattern in which the domestic economic cycle plays a leading role while the international economic cycle remains its extension and supplement.

5. Conclusion

The neo-Kaleckian model inherits Keynes's and Kalecki's thoughts on effective demand, selectively inherits Kalecki's cost mark-up pricing, heterogenous saving rate and independent investment function, and thus exploits new soil for further research on the relationship between income distribution and economic growth on the basis of the Cambridge growth model. However, the neo-Kaleckian model emphasizes Kalecki's thoughts on functional income distribution and effective demand one-sidedly and ignores Kalecki's ideas on socialist economic growth and the supply-side role. As a consequence, the neo-Kaleckian model lacks supply-side factors and shows defects in explaining long-term economic growth. Although some studies link income distribution with technological progress through a number of empirical conclusions, this model still lacks the theoretical basis for accurately depicting long-term economic change.

In this paper, the development course of the neo-Kaleckian growth model has been reviewed. Starting from the Cambridge growth model initiated by Kaldor and Robinson, this theoretical approach sets itself apart from the neoclassical growth model in the following two aspects. Firstly, it emphasizes the impact of effective demand and income distribution on economic growth; secondly, it attaches great importance to investment decision function in the economy and puts investment at a prioritized position in the economy. To surmount the defects of the Cambridge growth model, the Rowthorn–Dutt model borrowed the mark-up pricing idea from Kalecki's analysis of the capitalist economy and substituted the projected profit margin in the Cambridge growth model with capacity utilization, thus obtaining the neo-Kaleckian growth model. Afterward, Bhaduri and Marglin transformed the neo-Kaleckian model based on Marx's profit squeeze thought, turning the theory from a pure, effective demand model to a growth regime model with a more ambiguous conclusion. Both neo-Kaleckian model developed by Rowthorn and Dutt and the post-Kaleckian model developed by Bhaduri and Marglin maintain that the adjustment of the functional income distribution will directly affect the production level of an economy under a given growth regime. In other words, for an economy under a wage-led (or profit-led) growth regime, an increase in the profit share of national income will promote (or impede) the expansion of gross economic output.

However, judging from Marxian reproduction theory, the Kaleckian growth regime model has the following three defects. (1) Ideological legacy of "Smith's Dogma". Although the neo-Kaleckian model attempts to draw a line with neoclassical economics, it still reverses the logical order of value creation and value distribution and fails to break away from the set pattern of "Smith's Dogma" by reflecting the value of updating and compensating for constant capital. (2) Restrictions of the organic composition of capital and surplus value rate. Neither the ratio of constant capital to variable capital nor the ratio of variable capital to surplus-value is a value that can be changed arbitrarily, and they are both subject to the socially necessary forces, such as the organic composition of capital and surplus-value rate. Therefore, enterprises' investment decisions and actual proportion of income distribution cannot be changed arbitrarily. (3) Determination of technical progress and new long economic wave. The neo-Kaleckian model argues that an increase in the wage share will promote productivity improvement through the direct Webb effect and indirect Kaldor–Verdoorn effect. However, neither of those two causal relationships is reliable.

According to Marxian reproduction theory, for any economy that wants to extricate itself from economic stagnation and embrace long-term growth, it is necessary to shift from a long

wave of depression to a long wave of prosperity. This requires adhering to deepening the supply-side structural reform, enhancing the ability of the supply system to meet domestic demands, and leading and creating new demands through innovation-led, high-quality supply. If the supply-side factor is neglected and the aggregate demand management represented by fiscal expenditure, tax and redistribution policies are recklessly implemented, high-quality development and formation of a new development pattern may be hindered. On the one hand, deficit finance has its upper limit and cannot be sustained for long. On the other hand, demand management plays a limited role in transforming the long-term production structure and cannot directly promote the conversion of economic drivers. Judging from the supply-demand relationship, the principal contradiction faced by China's economic operation is still at the supply-side, and the demand-side contradiction is secondary for now, which will remain for a long time. We must focus on the supply-side structural reform and meanwhile pay attention to demand-side management. We shall combine the implementation of the strategy of expanding domestic demand with the deepening of the supply-side structural reform, develop a higher-level dynamic balance represented by demand driving supply and supply creating demand, and establish a new development pattern through two-way efforts.

Note

1. According to Amadeo's demonstration, the effect of adding the current profit margin to the investment function is equivalent to the changing of the coefficient of the actual capacity utilization. Therefore, the standard neo-Kaleckian model generally simplifies the investment function as $g = \alpha + \beta u$ instead of the form presented in Table 1. However, this does not change the conclusion of the model (Amadeo, 1986).

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