

GROWTH AND INCOME DISTRIBUTION WITH MANAGERS AND FINANCIERS:  
ISSUES AND HETERODOX MODELS

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While a great deal of attention has been given to the interaction between income distribution and economic growth using heterodox macroeconomic models, most of this analysis has used two-class models of distribution with workers and capitalists which conflate concepts of personal and functional distribution. Recent discussions of increases in inequality have drawn attention to changes in income distribution due to wage inequality, rather than only to changes in the functional share of labor. This has led to the development of some models with more than three classes, introducing different kinds of labor to analyze income distributional changes. This paper examines some issues concerning different concepts of inequality and distribution, including functional, vertical and horizontal ones. It then uses a simple two-group framework to analyze the determinants and growth implications of income distributional changes involving vertical inequality to develop simple models following classical-Marxian and post-Keynesian-Kaleckian approaches.

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## **1. Introduction**

The determinants of income distribution and economic growth, and the interaction between the two, have long been a major concern of economists. The classical growth theorists, including Smith, Malthus and Ricardo, examined how income was distributed between different classes which received income from different functional categories of income, and how this distribution affected the growth process. Marx followed their lead, stressing the distribution of income between the two major classes – workers and capitalists – and its interaction with economic growth. Although the so-called marginalist and later neoclassical economists shifted the focus of attention to issues of resource allocation and efficiency, and this became identified with orthodox economics in the twentieth century, heterodox economists – including followers of Marx and Keynes – remained concerned with distribution and growth. Towards the end of the twentieth century and the beginning of the twenty-first, concerned with increases in inequality in many parts of the world, more and more economists, including many those in the mainstream are focusing their attention on inequality and its interaction with economic growth.

This paper aims to reexamine the determinants of income distribution and growth using the analytical framework of heterodox economists in light of recent discussions on the empirical and policy discussions and debates on inequality and income distribution. The main reason for this reexamination is that, following the Marxian tradition, most heterodox economists examine the determinants of distribution and its relation to growth in terms of two classes, that is, workers and capitalists, recent discussions and debates on both empirical trends and policy debates argue that a major reason for rising income inequality has to do with wage inequality and with the increase importance of finance, rather than with the power relations between workers and capitalists.

The rest of this paper proceeds as follows. The section 2 examines some conceptual, theoretical and ethical issues related to income distribution and inequality. Section 3 presents the general framework adopted in this paper for examining the issues discussed in section 2. Sections 4 and 5 analyze two models of growth and distribution based on the general framework, one in the classical-Marxian tradition and the other in the post-Keynesian-Kaleckian one. Section 6 provides some concluding comments.

## **2. Personal and functional income distribution and inequality**

It is useful to begin with a brief discussion of three sets of interrelated issues about income distribution and inequality, one primarily conceptual, one theoretical and one empirical.

At the *conceptual* level, any focus on income distribution and inequality needs to select the categories in terms of which distribution and inequality are to be examined. Economists have for some time distinguished between functional and personal income distributions. Functional income distribution refers to the distribution of income according to categories based on the functions these categories – understood as factors of production – perform in the economy; thus one refers to income from labor, capital and land. Personal or size distribution of income refers to how income (or other relevant indicators) are distributed between people, usually according to how much of it is distributed between different groups of people according where they are on the distribution; thus, one, for instance, refers to the income received by the top decile or top one per cent, or bottom 40 per cent of the population in terms of income, or inequality as measured by the Gini coefficient. For some issues, however, two different notions of personal income distribution and inequality have been distinguished, that is, vertical and horizontal. While the first refers to what has just been defined as personal income distribution, the second refers to

inequality between different types of people, where type distinguishes between divisions based on gender, ethnicity, language, region and other groups that are, in varying degrees, socially constructed by those belonging to a particular group and by others. We may refer to these three conceptual categories as functional, vertical and horizontal distributions.

As is well known, income distribution and changes in it in terms of the three categories may be very different. It is possible for the wage share to be low or falling, yet for vertical income or horizontal inequality not change at all, because people from different groups are more or less the same and receive both labor and non-labor income. It is also possible for vertical inequality to increase because of increases in wage inequality without changes in functional income distribution. If they are different, which one is worthy of our attention? It can be argued that all three are of interest not only because the answer may depend on why we are interested in income distribution, but also because for a particular purpose more than one may be relevant, although possibly in different degrees and for different reasons. We can distinguish between ethical, explanatory and instrumental reasons for being interested in income distribution. In ethical discussions vertical inequality has received the most attention – in terms of income, other consequentialist indicators like education and health outcomes, or opportunities – there are equally, if not stronger, reasons to be interested in horizontal inequality, because of the possible discriminatory explanations of it, and in functional income distribution, for reasons such as those relating to desert and the fruits of labor views of justice rather than returns to possibly inherited or ill-gotten property income. In terms of explaining levels and changes in distribution and the effects of such changes on other elements of the economy one may be interested in (such as economic growth), the focus has been more on functional distribution, since the determinants and effects of distribution depends in part on what function a factor of production has in the

economy. Neoclassical economists, for instance, who use the marginal product theory, emphasize the functional distribution, although they then translate this distribution into vertical distribution by examining the level and changes of factor endowments of people. However, vertical and horizontal distributions are of great importance for this purpose as well, because of their relevance for the analysis of power relations and power structures, which can be important determinants of distribution between people, and because of the different behavior of different people across vertical and horizontal groups that are hidden in those mainstream approaches that rely on the representative agent. Horizontal distribution is particularly important in the analysis of power, because of the organizational capabilities within horizontal groups, and vertical distribution because of differences in levels of income and other characteristics, and horizontal distribution because of social network effects are both important for behavioral differences.

At the *theoretical* level we are concerned with understanding the determinants of income distribution and its interaction with economic growth using analytical schema and models. In many economic traditions, including those in the classical-Marxian and post-Keynesian ones, it is common practice to assume that there are two classes of people, workers and capitalists, who provide labor and own capital and organize production and therefore receive labor and non-labor income, respectively, with capitalists being rich and workers being relatively poor. In terms of our earlier discussion, the functional and vertical distributions are merged into one. Implicitly, some of these approaches, and certainly in Marx's discussion of class consciousness, horizontal differences in terms of identities of workers and capitalists, is also implicit in the same division.

There has, however, been a long history of incorporating different categories in different ways into schema and models focusing on economic growth and distribution. In terms of functional distribution, finer distinctions have made between different types of labor, such as

production labor, supervisory labor and unproductive labor (with different meanings attached to it), and between labor, organization and control, finance, and land and other natural resources. In terms of vertical distribution, instead of just considering the rich and the poor, one can distinguish between finer categories, such as quintiles, but a simple way to extend the rich-poor distinction is to introduce a “middle” category, although with no necessary connection to the notion of the “middle class”. Horizontal divisions, aside from the capitalist-worker distinction, have not been subject to much theoretical analysis in terms of models of growth and distribution, despite large literatures on the issue of gender and ethnicity.

Some approaches and models attempt to incorporate these complexities by adding a third class into the analysis. In David Ricardo’s growth theory, and as modeled by Pasinetti (1960), there are three classes, workers, landlords and capitalists, who provide labor, land and capital, respectively, where the first group is poor, with low wages (kept down due to population growth) and the last two are richer, but the landlord class does not save and hence does not contribute to capital accumulation. In Marx’s theory, although the basic approach to distribution focuses on the capitalist-worker distinction, with the capitalist obtaining the surplus, the division of the surplus between industrial and financial capital is also analyzed, although Marx shies away from providing general laws regarding this division. Some recent models along neo-Marxian and post-Keynesian lines have examined three classes, with workers, capitalists and rentiers, where the last two receive profit and interest income, respectively (see Dutt, 1989, 1992). Different types of labor have also been distinguished, such productive and unproductive labor, production workers and supervisory workers, and low-skilled and high-skilled labor, which have different functions in the economy and which, because they are performed by different groups of people with different levels of income, have different patterns of behavior. With the rise of managerial

capitalism, and the recognition of the distinction between owners and management (see, for instance, Marris, 1964, Galbraith, 1967) a distinction has been drawn between owners of capital and managers. Some recent models of growth and distribution have introduced a third class – in addition to workers and capital owners – that is, managers, who organize production (Dutt, 2012, Palley, 2013, Tavani and Vasudevan, 2012).

Other approaches continue to consider two groups of people, but allow them to do different things in the economy, that is, have different functions. Pasinetti (1962) provided the classic formulation of this approach, allowing workers both to provide labor and save and therefore hold capital while capitalists only hold capital, following Kaldor's (1955) formulation, which assumed different saving propensities out of wage and profit income without considering different groups of people or classes. If workers have more than one function, one can ask why capitalists cannot. After all, capitalists, according to Marx, are both owners of capital and organizers of production. Palley (2013a) develops a model in which capitalists have both these functions, combining the roles of managers and capital owners. There is also a large literature on the implications of financialization using heterodox models with two classes (see, for instance, Hein and van Treeck (2008)).

In terms of *empirical* discussions on trends in inequality and causes of these trends, the early focus in the US and some other countries that experienced increase inequality was on wage inequality, and whether the increase in equality was caused by skill-biased technological change (which increased the demand for high-skilled labor and reduced that of low-skilled labor) or by globalization (which increased the imports of goods from low-income countries that use intensively low-skilled workers, given their low wages and hence reduced the demand for low-skilled labor in the high-income countries). More recently, it has been shown, especially by

Piketty and Saez and their coauthors (see Alvaredo, Atkinson, Piketty, and Saez, 2013, for a recent overview), that much of the action in terms of distributional changes in many countries has been concentrated due to large increases in the share of the top 1 per cent and even the top .1 per cent of the population in terms of income, rather than in the share of the rest of the top 10 per cent. This concentration of income growth at the very top rather than the top more generally suggests that increases in inequality are not significantly due to increases in the wages of high-skilled workers, but rather the incomes of people at the very top of the income ladder. The obvious question arises: who are these people? It appears that they are comprised mostly of top-level managers, including CEOs of corporations, and financial executives (see Bivens and Michel, 2013, for a review of the evidence) and perhaps others who are professionally tied to them (such as lawyers, accountants and the like). The explanation for the increase in the share of this top 1 per cent is found to be more in the greater opportunity and incentives that people in this group have had in increasing their incomes, resulting from changes in laws, regulations and norms in the financial and corporate sector, and especially in changes in tax laws and financial liberalization that increase incentives of high-income groups to increase their income shares than in technological changes, that increase in the productivity of high income groups (see Stiglitz, 2012, Alvaredo, Atkinson, Piketty, and Saez, 2013, Bivens and Michel, 2013). Changes in the laws and norms have also been the result of increases in the power of the top income groups, including their influence on legislators. The higher incomes have often been described as returns to rent-seeking activity rather than productive activity. The Occupy Wall Street movement in the US was an effort to mobilize the 99 per cent to reduce the power and income share of the top 1 per cent, which also resonated in other countries.

### 3. A simple framework with the “best” and the rest

The rest of this paper will draw on the earlier discussion to develop some We assume that there are two types of people in the economy, the top income recipients – who can be called the “best” in terms of the income recipients, but who we will refer to as the top – perhaps the top one percent of income recipients – and the rest. There may be no particular reason to call these people the best, as is done in the title of the paper – hence the quotation marks – but at least it rhymes with the rest. The basic categories, therefore, are according to persons and not functions, and personal income distribution is vertical rather than horizontal although, as we shall argue later, they are not unrelated to horizontal groupings as well.

Each income group received income from two broad categories, that is, labor income and profit or capital income. Thus, we have

$$Y_i = w_i L_i + \Pi_i \quad (1)$$

where the subscript  $i$  refers to the personal income groups  $T$  and  $R$ , denoting the top and the rest,  $Y_i$  to total real income,  $w_i$  the real wage,  $L_i$  the level of employment, and  $\Pi_i$  the non-wage income of each group  $i$ .

To keep things as simple as possible we assume that the economy produces one good with two basic factors of production, labor and capital, where labor is of two types, production labor and managerial labor. We assume that the production function is of the fixed coefficients form, so that we can write it as

$$Y = \min \left[ \frac{L_p}{a}, bK \right], \quad (2)$$

where  $Y$  is total real production and income,  $L_p$  the employment of production labor (henceforth, labor),  $K$ , the amount of homogenous capital,  $a$ , the labor requirement per unit of output, and  $b$ , the maximum output-capital ratio.<sup>1</sup> Managers do not enter into this production function, but we assume that the production function implies the existence of top managers, without whom production could not be organized with this function. Increasing the number and/or quality of managers can allow changes in the production coefficients, something to which we will return later.

We assume that the rest supplies only production labor, so that we have

$$L_R = L_P, \quad (3)$$

and that the group at the top only supply top managerial and financial labor. We assume that the number of people in top management and financial positions is a constant fraction of total capital, so that<sup>2</sup>

$$L_T = \tau K \quad (4)$$

We also assume that the real wages of the two types of labor,  $w_R$  and  $w_T$ , are fixed. We will denote the ratio of the two wages by  $\sigma$ , so that we have

$$w_T = \alpha w_R. \quad (5)$$

We assume that unemployed labor always exists in the economy, and whatever labor is needed for production and other purposes can be obtained, so that labor supply is never a constraint for the economy.

We assume that both the “top” and the “rest” save a constant fraction of their income, given by  $s_T$  and  $s_R$ , and because those at the top are richer, and because the rich typically save a

higher fraction of their income,  $s_T > s_R$ . Since both groups save, both groups own wealth, which we for simplicity and to abstract from explicit consideration of asset markets, we assume to be in the form of physical capital. Since there are one two groups and all capital is owned by members of the two groups, we have

$$K = K_T + K_R, \quad (6)$$

The rest receive income from property at the exogenously given interest rate  $i_0$ , so that

$$\Pi_R = i_0 K_R. \quad (7)$$

The top receive capital income from two ways. First, they receive a return as financiers, by borrowing at the rate  $i_0$  and lending to firms at a rate given by

$$i = i_0(1 + \mu), \quad (8)$$

where  $\mu$  is their markup rate, which is exogenously given. Second, they receive dividends from the profits firms distribute after the latter retain a fixed fraction  $s_F$  of their net profits after payment of wages and interest. Thus, the capital income of the top is given by

$$\Pi_T = i_0 \mu K_R + i K_T + (1 - s_F) \Pi_F, \quad (9)$$

where  $\Pi_F$ , the net profit of firms is given by

$$\Pi_F = Y - w_R L_R - w_T L_T - i K_R. \quad (10)$$

Total saving in the economy is given by

$$S = s_R Y_R + s_T Y_T + s_F \Pi_F. \quad (11)$$

Substituting equations (1) through (5) and (7) through (10) into (11) and dividing by  $K$  we get

$$\begin{aligned} \frac{\dot{s}}{K} = & [s_R + (s_T + s_F(1 - s_T))(1 - w_R a)]u - \alpha w_R \tau s_F(1 - s_T) \\ & - [s_T - s_R + s_F(1 - s_T)(1 + \mu)]i_0 k_R \end{aligned} \quad (12)$$

where  $u = Y/K$  is a measure of capacity utilization, and  $k_R = K_R/K$  is the share of the rest in capital income.

We assume for simplicity that capital does not depreciate, so that the growth rate of capital is given by

$$\hat{K} = g \quad (13)$$

where  $g = I/K$  is investment as a ratio of capital stock and  $I$  is real investment and where the overhat denotes the rate of growth of the variable under it. The rate of change of the capital stock owned by the rest is given by

$$\dot{K}_R = s_R Y_R. \quad (14)$$

It should be noted that since equation (6) holds the capital stock owned by the top grows according to the saving by the top and the undistributed profits of firms.

Having presented the general framework and its equational structure we may make three additional remarks about it.

First, the growth and distributional dynamics of the economy can be analyzed by examining changes in  $K$ ,  $K_T$  and  $K_R$  over time, considering changes in the distributions of income and wealth. The rate of growth is measured by  $g$ , the rate of capital accumulation which

is also the rate of output growth if the rate of capacity utilization is constant. A measure of the distribution of income is the share of income going to the rest, that is,

$$\sigma_R = w_R a + i_0 u k_R. \quad (15)$$

The share going to the top is not really the remaining part of income, since a part of income consists of firm saving, but since the top are being treated as owners of the firms, we can measure their as  $1 - \sigma_R$ .

Second, we may discuss the role of different factors of production in the economy. The workers obviously provide labor for production, working with physical capital to produce the output. Top managers are in charge of the overall organization of production. There has been some debate about what such organizers, who have been referred to as the bosses, really do. Marglin (1974), making use of historical observation and theoretical reasoning, has argued that bosses are not really necessary for production or for overall efficiency, and that they make themselves seem indispensable by making workers perform specific and narrow functions within the production process, in order to divert a portion of total production to themselves as capitalist surplus. This activity does increase the rate of saving and accumulation compared to what it would be in the absence of bosses, but does not increase the efficiency of production. Landes (1986), relying on historical material argues that bosses actually do increase productivity efficiency by organizing production in, and that it is not very sensible to think of a counterfactual utopia without bosses in which workers can organize production to produce efficiently. We can sidestep this debate and think of top managers as organizing production so as to increase both labor productivity and reduce the labor share, that is, reduce  $w_R a$ , so as to increase the surplus. This may occur simply due to a reduction in  $w_R$  without a change in  $a$ , as argued by Marglin, or

also (or only) to a reduction in  $a$ , as Landes would have it, but the point is that top managers have the effect of increasing the surplus after the wages of production labor, that is,  $1 - w_R a$ , without accounting for other costs involving payments to top managers and for contractually fixed payments for finance. We can extend this argument by taking into account changes in the surplus due to increases in the quantity and quality of managerial activity. There are many ways through which this can occur, that is, by introducing new technology, new organizational methods, weakening labor organizations which are, of course related to each other, and which are sometimes referred to as business restructuring in the literature on corporate management.

Third, the dynamics of the economy can be analyzed using the rate of growth of the state variable  $k_R$ , given by

$$\hat{k}_R = \hat{K}_R - \hat{K},$$

which, using equations (1) through (3), (7), (13) and (14), implies

$$\hat{k}_R = s_R \left( w_R a u \frac{1}{k_R} + i_0 \right) - g,$$

or

$$\dot{k}_R = s_R w_R a u - (g - s_R i_0) k_R. \quad (16)$$

However, our framework has insufficient structure to examine these dynamics, since  $u$  and  $g$  are unknowns. In the next two sections we will examine two ways of fully specified models that represent two well-known heterodox traditions, that is, the classical-Marxian and post-Keynesian-Kaleckian ones, without entering into a discussion on whether they provide faithful formalizations of them.<sup>3</sup>

#### 4. A classical-Marxian model

For the classical-Marxian model we assume that full capacity utilization always prevails, so that

$$u = b \quad (17)$$

and that investment is determined by saving, so that

$$g = \frac{s}{k}. \quad (18)$$

Substituting these equations into equation (12) we obtain

$$g = [s_R + (s_T + s_F(1 - s_T))(1 - w_R a)]b - \alpha w_R \tau s_F(1 - s_T) - [s_T - s_R + s_F(1 - s_T)(1 + \mu)]i_0 k_R. \quad (19)$$

This equation shows that an increase in  $k_R$  implies a fall in  $g$ . A rise in the share of capital owned by the rest reduces total saving by redistributing income from property from the top, who have a higher saving rate, to the rest, who have a lower saving rate, and by reducing the net profits of firms who have to pay a higher interest cost because they are more heavily indebted to the rest and rely less on financing through stocks. The relation between  $g$  and  $k_R$  is shown in Figure 1 as the IS curve. We assume that the condition

$$[s_R + (s_T + s_F(1 - s_T))(1 - w_R a)]b > \alpha w_R \tau s_F(1 - s_T),$$

which states that the total saving out of income when payment of interest is not taken into account is profit, is satisfied since, without it and given our assumptions, no positive investment is possible. This condition ensures that the vertical intercept of the IS curve is positive. The distribution of income is given by

$$\sigma_R = w_R a + i_0 b k_R. \quad (15)$$

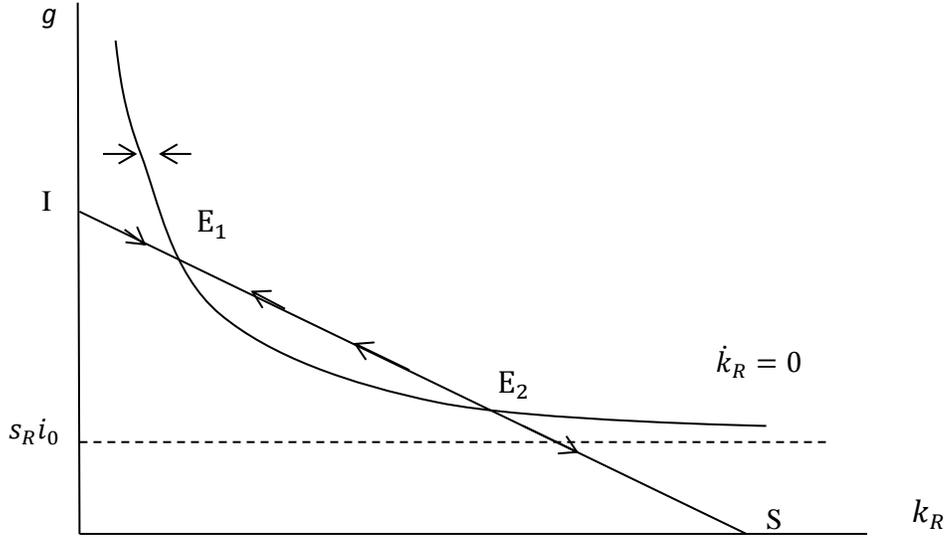


Figure 1. Classical-Marxian model

The rate of change of  $k_R$  is found by substituting equation (17) into equation (16), which yields

$$\dot{k}_R = s_R w_R a b - (g - s_R i_0) k_R. \quad (20)$$

The condition that  $\dot{k}_R = 0$ , so that  $k_R$  become stationary, is satisfied when

$$g = s_R i_0 + \frac{s_R w_R a b}{k_R}. \quad (21)$$

This equation is shown by the line marked  $\dot{k}_R = 0$ , with the line having the vertical axis as its vertical asymptote and  $g = s_R i_0$  as its horizontal asymptote. Since our assumptions imply  $g > s_R i_0$ , equation (20) shows that points to the right of the line imply that  $\dot{k}_R < 0$  and those to the left imply that  $\dot{k}_R > 0$ , explaining the direction of the horizontal arrows. Since equation (19)

is always satisfied, the economy must always be on the IS curve in the figure, and the movement of the economy along that curve is shown by the arrows. The economy will be at a long run equilibrium when  $\dot{k}_R = 0$ , that is, when it is at the intersection of the  $\dot{k}_R = 0$  curve and the IS curve. We see that there will be two equilibria, at  $E_1$  and  $E_2$ , the former being stable and the latter unstable. If the economy does not start at a level of  $k_R$  higher than the level given by  $E_2$ , the economy will converge to the long-run equilibrium at  $E_1$ .

Starting from an initial long-run equilibrium at  $E_1$  we now examine the implications of parametric changes which have typically been argued to lead to increases in the share of income going to the top, that is, increases in the share going to top managers and to financiers.

Regarding finance, we can examine the effects of an increase in  $\mu$ , the markup determining interest, and a reduction in  $s_F$ , which increases dividend payments to shareholders. The increase in  $\mu$  and the fall in  $s_F$  both shift the IS curve downwards: higher interest costs and lower firm saving reduces total saving and therefore investment for any level of  $k_R$ , while leaving the  $\dot{k}_R = 0$  unchanged. The short-run effect, at a given  $k_R$  is to reduce saving and investment. In the long run the reduction the rate of capital accumulation without a reduction in the rate of growth of the capital owned by the rest increases  $k_R$  which further reduces the rate of accumulation by increasing interest payments. Thus, increasing financialization in these senses (see Hein and van Treeck, 2008) reduces the rate of growth of the economy in the short run and further in the long run.

Regarding top management, we can examine the implications of increases in  $\alpha w_R$  and  $\tau$ . In addition to the direct effect of these changes, our discussion on what top managers do implies that an increase in these two parameters, reflecting increases in the quantity and remunerations of

top management, and hence their effort or “quality”, has the effect of increasing  $1 - w_R a$  through corporate restructuring. Equation (19) shows that although these changes directly reduce  $g$  by increasing total payments to top management, for small values of  $\tau$ , given the small size of this group, the indirect effect of the increase in  $1 - w_R a$  is to increase  $g$  for any given level of  $k_R$ . Equation (21) shows that the fall in  $w_R a$  shifts the  $\dot{k}_R = 0$  downwards. Thus, in the short run, given  $k_R$ ,  $g$  increases and, in the long run,  $k_R$  falls and  $g$  increases further, because the shift in the distribution of wealth towards the top increases overall saving and accumulation even further. Income distribution becomes more vertically concentrated both due to the reduction in  $w_R a$  and to the reduction in  $k_R$  (although an increase in  $\tau$  does not necessary imply a rise in the share of the top 1 per cent because it may increase the number of top managers, but if the increase does not extend the number of top managers beyond the top 1 per cent, the share of the top 1 per cent does increase). We will assume that when  $w_R$  falls  $\alpha$  increases sufficiently to increase  $w_T$  or at least not reduce it.

The overall effect on growth and income distribution depends on the relative changes in the parameters reflecting greater financialization and the activities of top managers in the non-financial sector. If the income of the rest comes primarily from wage income rather than capital income, the overall effect is an increase in inequality, but the effect on growth may be positive or negative. It seems that, at least in terms of the classical-Marxian model, that captains of industry have a positive role in generating economic growth while financiers have a negative role.

## **5. A post-Keynesian-Kaleckian model**

The classical-Marxian model of the previous section assumed that saving and investment are equalized at the full capacity utilization since saving is always equal to investment. The post-

Keynesian-Kaleckian (PKK) model departs from this assumption by introducing an independent investment function according to which firms make investment plans and allowing saving and investment to equalize, due to changes in output and capacity utilization, in response to excess supply or demand in the goods market. In equilibrium saving and investment are equalized, so that equation (18) holds.

We assume that in the short run  $g$  is given, depending on past decisions. In the long run  $g$  changes according to the equation

$$\dot{g} = \Lambda[g^d - g]. \quad (22)$$

The equation states that when the desired investment of firms deviates from actual investment, actual investment changes over time towards the desired level. The speed of adjustment is denoted by the constant  $\Lambda$ . The desired level of investment is assumed to be determined by the rate of capacity utilization (as argued by Steindl, 1952) and by the internal savings of firms (as argued by Kalecki, 1971) as a ratio of capital stock. We therefore assume

$$g^d = G\left(\frac{S_F}{K}, u\right), \quad (23)$$

where

$$S_F = s_F \Pi_F, \quad (24)$$

and the partial derivatives of the function  $G$ , that is  $G_1$  and  $G_2$  are both positive. Also, as in the model of the previous section,  $k_R$  is fixed in the short run, but adjusts over time according to equation (16).

In the short run, given  $g$  and  $k_R$ ,  $u$  adjusts to satisfy equation (18). This implies that in short run equilibrium

$$u = \frac{g + \alpha w_R \tau s_F(1-s_T) + [s_T - s_R + s_F(1-s_T)(1+\mu)]i_0 k_R}{s_R + (s_T + s_F(1-s_T))(1-w_R a)}. \quad (25)$$

This short-run equilibrium level of  $u$  increases with both  $g$  and  $k_R$ , since the partial derivatives of  $u$  with respect to them, shown with subscripts, are seen to be

$$u_g = \frac{1}{\Delta}, \quad (26)$$

and

$$u_{k_R} = \frac{[s_T - s_R + s_F(1-s_T)(1+\mu)]i_0}{\Delta}, \quad (27)$$

where  $1/\Delta$  is the short-run investment multiplier and  $\Delta = s_R + (s_T + s_F(1-s_T))(1-w_R a)$ . An increase in  $g$  increases the level of aggregate demand and therefore the level of output and capacity utilization through the multiplier effect. An increase in  $k_R$  shifts income from the top and the firms, which have a higher propensity to save to the rest, who have a lower propensity to save, therefore increasing consumption and aggregate demand, thereby increase output through the multiplier effect.

In the long run, the dynamics of  $g$  and  $k_R$  are given by substituting equations (2) through (5), (7), (8)(10), (23), and (24) into equation (22), which implies

$$\dot{g} = \Lambda[G(s_F[(1-w_R a)u - \alpha w_R \tau - i_0(1+\mu)k_R], u) - g], \quad (28)$$

and equation (16), where  $u$  is given by equation (25). Figure 2 shows the dynamics of  $g$  and  $k_R$  for this model.

The  $\dot{g} = 0$  curve shows combinations of  $g$  and  $k_R$  at which  $g$  is stationary. Equation (28) implies that a change in  $g$  changes  $\dot{g}$  according to

$$\frac{\partial \dot{g}}{\partial g} = \Lambda [(G_1 s_F (1 - w_R a) + G_2) u_g - 1].$$

We assume that  $G_1$  and  $G_2$ , while positive, are small enough to make this expression negative.

This implies that, starting from a stationary level of  $g$ , an increase in  $g$  will make  $\dot{g}$  negative.

Equation (28) also implies that a change in  $k_R$  changes  $\dot{g}$  according to

$$\frac{\partial \dot{g}}{\partial k_R} = \Lambda G_1 (s_F (1 - w_R a) u_{k_R} - i_0 (1 + \mu)).$$

Using equation (27) we see that the sign of this expression is given by the sign of

$$-\{[s_T (1 - s_F + \mu) (1 - w_R a)] + s_R (1 + \mu + s_F (1 - w_R a)) + s_F (1 - s_F) (1 - s_T) (1 + \mu)\},$$

which is clearly negative. This implies that we need to reduce  $k_R$  to increase  $\dot{g}$  to satisfy  $\dot{g} = 0$  again. It follows, therefore, that the  $\dot{g} = 0$  will have a negative slope, as shown in Figure 2.

Moreover, since  $\dot{g}$  falls when  $g$  rises, the vertical arrows shown changes in  $g$  are as drawn in the figure 2.

The  $\dot{k}_R = 0$  curve shows combinations of  $g$  and  $k_R$  at which  $k_R$  is stationary. It is obtained from equations (16) and (25) obtained by setting the left hand side of equation (16) to zero. The equation of the curve is given by

$$g = s_R i_0 + \frac{s_R w_R a u}{k_R}, \quad (29)$$

where  $u$  is given by equation (25). The curve for this equation, marked  $\dot{k}_R = 0$  in Figure 2 and shown only for the positive quadrant, is a rectangular hyperbola. Equation (16) implies that a change in  $k_R$  changes  $\dot{k}_R$  according to

$$\frac{\partial \dot{k}_R}{\partial k_R} = s_R w_R a u_{k_R} - (g - s_R i_0).$$

Although equation (27) tells us that  $u_{k_R} > 0$ , in the positive quadrant it can be shown that this expression is negative. Thus, the horizontal arrows showing changes in  $k_R$  are as drawn in the figure.

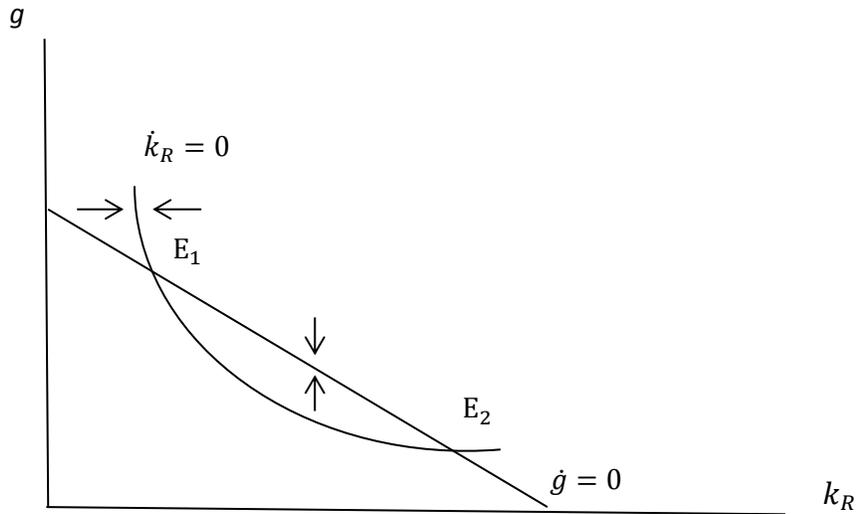


Figure 2. Post-Keynesian-Kaleckian model

A long-run equilibrium, with stationary levels of  $g$  and  $k_R$ , occurs at the intersection of the  $\dot{g} = 0$  and  $\dot{k}_R = 0$  curves. Figure 2 shows that there may be two long-run equilibria, of which the one at  $E_1$  is stable and the one at  $E_2$  is a saddle-point. The long-run dynamics of this model seem to be very much like that of the classical-Marxian model.

However, the effects of changes in the parameters that we analyzed in the previous section are rather different for this model. We will examine the effects of changes in the relevant parameters starting from a long-run equilibrium at  $E_1$ . An increase in financialization, as reflected by an increase in  $\mu$  and a reduction in  $s_F$ , in the short run, with given levels of  $g$  and  $k_R$  (so that the economy stays at  $E_1$ ) equation (25) shows that there is a rise in capacity utilization: a redistribution from firms to the top (in their capacity as financiers) due to an increase in the interest markup or due to smaller retained earnings increases consumption demand for the top and therefore increases output and capacity utilization. However, if higher interest costs are passed on by firms to an increase in markup and therefore reduces the share of the wages of the rest (see, for instance, Dutt, 1992), the change in the share of the wages of the rest reduces aggregate demand, output and capacity utilization by reducing consumption demand by shifting the distribution of income from those with a higher propensity to save. The increase in financialization will also shift the  $\dot{g} = 0$  and  $\dot{k}_R = 0$  curves. If there is no effect on the wage share of the rest so that  $w_R a$  remains unchanged, equation (28) that the increase in  $u$  will tend to increase  $\dot{g}$  but the direct effect is to reduce saving by firms, and therefore reduce  $\dot{g}$ . The overall effect of an increase in  $\mu$  through  $G_1$  can be shown to be negative while that through  $G_2$  is obviously positive. Depending on the relative strengths of these two effects on desired investment the effect of  $\mu$  on  $\dot{g}$  can be negative or positive. If we add on the effect of a reduction in  $w_R a$  the overall effect is much more likely to be negative. The effect of a reduction in  $s_F$  is also ambiguous, although the negative effect is more likely, especially with the effect on the wage share of the rest. Equation (29) shows that the effect of changes in the financial parameters on the  $\dot{k}_R = 0$  will be only through the effect on  $u$ , implying that without the effect on the production markup the effect will be to increase  $u$  and to shift the curve upwards while with

markup effect the shift can be downwards. The overall effect on the long-run equilibrium position will in general be ambiguous, depending on: (1) the expansionary effect of the parameters on consumption spending of the top; (2) the contractionary effect of higher interest costs through the firm saving channel; and (3) the induced distributional shifts due to a higher production markup and the distribution of capital stock.

In terms of changes in the income of top managers, that is, increases in  $\tau$  and  $\alpha$ , and resulting reductions in  $w_R a$ , the rise in these incomes will have a positive effect on consumption by redistributing income from firm profits to top incomes. However, there will be a negative effect on consumption by redistributing income away from the rest. The effect of this redistribution on capacity utilization is shown by a rise in  $\pi = 1 - w_R a$ ; equation (25) shows that this is given by

$$u_\pi = -(s_T + s_F(1 - s_T)) \frac{u}{\Delta^2}. \quad (30)$$

The overall effect in the short run level of capacity utilization is likely to be negative if the positive consumption effects of the increase in consumption of the top are small. Equation (29) shows that if  $u$  falls the  $\dot{k}_R = 0$  shifts downwards, since the rate of capital accumulation of the rest goes down, which reduces  $\dot{k}_R$  for a given  $g$ . If a rise in these parameters increases  $\pi$ , there will also be a fall in  $w_R a$ , which will push the  $\dot{k}_R = 0$  line down further. Equation (28) shows that the effect of a rise in  $\alpha$  and  $\tau$  and consequently of a fall in  $u$  on the  $\dot{g} = 0$  curve depends on the change in  $u$  and the change in  $\pi$ . The effect of the change in  $u$  is positive, since capacity utilization increases desired investment both directly through the term  $G_2$  and indirectly through its effect on firm saving, that is, through  $G_1$ . From equation (28) we see that the effect of a rise in  $\pi$  is

$$\frac{\partial \dot{g}}{\partial \pi} = \Lambda [G_1 s_F (u + \pi u_\pi) + G_2 u_\pi]. \quad (31)$$

Substituting from equation (30) we see that this expression can be written as

$$\frac{\partial \dot{g}}{\partial \pi} = \Lambda \left[ G_1 s_F \left( u - \pi (s_T + s_F (1 - s_T)) \frac{u}{\Delta^2} \right) - G_2 (s_T + s_F (1 - s_T)) \frac{u}{\Delta^2} \right].$$

This expression can be written as

$$\frac{\partial \dot{g}}{\partial \pi} = \frac{\Lambda u}{\Delta} \left[ G_1 s_F \left( \Delta - \pi (s_T + s_F (1 - s_T)) \frac{1}{\Delta} \right) - \frac{G_2}{\Delta} (s_T + s_F (1 - s_T)) \right].$$

If we assume that  $s_R$  is very small, we have  $\Delta = (s_T + s_F (1 - s_T)) \pi$  this expression becomes

$$\frac{\partial \dot{g}}{\partial \pi} = \frac{\Lambda u}{\Delta} \left[ G_1 s_F (\pi (s_T + s_F (1 - s_T)) - 1) - \frac{G_2}{\pi} \right].$$

which is unambiguously negative. Thus the effect of a change in the share of top managers with a resulting rise in  $\pi$  is to reduce  $\dot{g}$  and push the  $\dot{g} = 0$  curve downwards if  $s_R$  is small. It may be noted that result does not depend on the capacity utilization term involving  $G_2$ , and will hold even if  $G_2=0$ . The overall effect of a downward shift in the downward shift of the two curves, in the event of a small downward shift of the  $\dot{k}_R = 0$  curve, which is likely with a small  $s_R$  and a low long-run equilibrium level of  $k_R$  and a steep  $\dot{k}_R = 0$  is a fall in  $g$  and a fall in  $k_R$ , reducing both growth and income equality.

## 6. Conclusion

This paper has discussed some conceptual issues regarding income distribution and inequality and developed a simple model with two vertical groups, the top and the rest to examine the implications of the kinds of changes that have been argued to increase the share of the income at the top. It has shown that financialization and the increasing importance and income of top

managers (or CEOs and their close subordinates) can explain both lower rates of growth, and rising wealth and income inequality especially with deficient aggregate demand.

The model we have developed is a simple one with many important omissions. First, we have examined two separate models. The analysis can be extended to deal with a combined model in which we can allow for post-Keynesian-Kaleckian features at lower levels of aggregate demand when accumulation is demand-constrained and classical-Marxian features at higher levels of aggregate demand, when accumulation is saving constrained to endogenously determine under what conditions aggregate demand deficiency is more likely. Second, we have abstracted from consumer debt. We can extend the model to introduce borrowing and debt holding by some lower-income borrowers which, along the lines discussed in Dutt (2006) can imply further adverse distributional consequences on growth. Third, we have abstracted from fiscal policy considerations. Introducing fiscal policy changes, for instance, reductions in the taxes on the top income recipients and increases for the rest can not only be used to provide additional incentives for the people at the top increasing their efforts to garner a higher share of income (as discussed by Alvaredo et. al., 2013) and also explain how, by shifting income distribution and reducing consumer spending, growth is reduced due to a reduction in aggregate demand. Finally, we have examined a closed economy. Introducing open economy and globalization can provide us with additional reasons for increases in the share of capital income which is mobile across borders and which reduces the bargaining power of workers, although the effects on growth become more complicated and require the analysis of more than one country.

The model also raises important issues for the relative power of different groups in society which are left for future work. It has been argued that, with the rise in importance of high-skill labor and the growth of footloose and short-term labor the power of labor has declined, and with

the increasing role of workers as asset holders (especially through pension capital) they are no longer interested in increasing the share of labor. Moreover, it has been argued that ethnic and gender divisions may also have had a role in the power of the labor. It has also been argued that the rich are also divided in terms of their roles of financiers, industrial capitalists and managers. However, these divisions may have been exaggerated to the extent that many of the same people may be both managers, financial and industrial capitalists, and hence have shared interests and group cohesion. Our analysis in terms of two vertical groups that do not strictly follow functional divisions can be used to understand whether class interests based on functional categories can be replaced by group interests based on vertical inequality and whether this inequality can come to resemble aspects of horizontal inequality in terms of shared identities and solidity between different groups based on shared interests and shared views of what is a good society and thereby tilt the balance of power in the political arena between the top and the rest.

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## NOTES

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<sup>1</sup> We do not distinguish between non-supervisory workers and supervisory workers, or between low-skilled and high-skilled workers, aggregating them all into production workers. We can assume that a change in the composition of labor between these groups affects  $a$  and the wage of labor as well. We abstract from changes in the composition of labor between the groups for simplicity.

<sup>2</sup> We may assume, for simplicity, that the bulk of the “labor” performed by the top consists of top managerial work, the amount of it being proportional to capital stock, and that “labor” in the financial sector does not depend on the size of the financial sector and is negligible in quantity so that it can be treated as zero, or that the “labor” performed by the top is both managerial and financial in nature and both increase with capital stock.

<sup>3</sup> This follows the approach of Marglin (1984) and Dutt (1990) in starting with a general framework for examining growth and distribution and then using alternative closures to obtain alternative models. The classical-Marxian model of section 4 is similar to the neo-Marxian model of Marglin (1990) and Dutt (1990) and the post-Keynesian-Kaleckian model is similar to the Kalecki-Steindl model of Dutt (1990).