

ROBINSONIAN AND KALECKIAN GROWTH.
AN UPDATE ON POST-KEYNESIAN GROWTH THEORIES

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Working Paper No. 67

October 1999

ver 1, 12.10.99

In writing this paper I have benefited from comments by Dieter Gstach and Hansjörg Klausinger. All mistakes are mine.

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Abstract

The aim of the paper is to give an overview over basic models of Post-Keynesian growth theory. Two major families of growth models are discussed, one developed by Joan Robinson, the other by Michal Kalecki. Both share an independent investment function that depends on income distribution and a savings function that depends on income distribution. The core difference that the Robinsonian model assumes full capacity utilization in the long run, while the Kaleckian model has capacity utilization as an endogenous variable. The characteristics of these models and in particular the effects of changes in the savings propensity and the relation between distribution and growth are highlighted and contrasted. A short run Keynes-Kalecki model is as a benchmark case.

1. Introduction

The aim of this paper is to provide an overview of Post-Keynesian growth theories. The last one and a half decades have seen a renewed interest in growth theories, however of a distinctly non-Keynesian flavor. New growth theory focuses on the contribution of knowledge and innovation to economic growth while having a neo-classical macroeconomic underpinning. Demand plays no independent role and, more to the point, savings determine investment. The principles of Keynesian economics seem to have been forgotten. Contrary to this, the present paper discusses the basics of Keynesian growth models. At the very core are an independent investment function and saving propensities that differ between income classes (Kaldor savings equation). Thus the distribution of income between capital and labor plays a crucial role.

Post-Keynesian growth models, however, are not easily accessible. In particular, there is not a single post-Keynesian model, but a whole variety, with different, sometimes contradictory assumptions. For example Kaldor assumes full employment, which is denounce as "more neo-classical than neo-Keynesian" (Marglin 1984, 534). Kaleckians emphasize the role of variable capacity utilization, whereas this has not been an issue for Robinson's equilibrium analysis. (These differences are summarized in table 1.) The aim of this paper is to provide an overview and a structure for the varying models.¹

Varying assumptions in post-Keynesian growth models

		employment	
		full employment	unemployment
capacity	full capacity	Kaldor (mark I)	Robinson (in equilibrium)
	excess capacity		Kalecki

¹ Post-Keynesian growth theories, of course, are too big a subject to be comprehensively summarized in a short paper. Some post-Keynesian approaches have to left out. Among these later Kaldorian models such as those presented by Boyer and Petit 1981 and Boyer 1988 seem particular interesting.

Two major groups of Post-Keynesian growth models are distinguished: one going back to Joan Robinson and another one originating from Michal Kalecki. Both are Keynesian in that they have an independent investment function and Kaldor saving function. The difference lies in that Robinsonian models assume full capacity utilization whereas Kaleckian model does not. This difference turns out to be crucial. In Robinsonian models income distribution is an endogenous variable and higher profits go together with faster growth. Kaleckian models on the other hand, having an additional degree of freedom through variable capacity utilization, need to be complemented with an exogenous theory of income distribution and allow for regimes where higher wages lead to higher growth.

The paper is structured as follows. Section one develops the basic short run Keynes-Kalecki model with exogenous investment demand, which serves as a benchmark for the subsequent growth models. Section two makes the case for independent investment and provides some clarifications as to the notion of the long run. Section three presents the basic Robinsonian model. Section four introduces the rationales for variable capacity utilization and builds the Kaleckian model incorporating variable capacity utilization. To simplify the exposition we focus on the goods market only.

2. The principle of effective demand in the short run

At the core of Keynesian macroeconomics is the principle of effective demand, that is that investment determines savings. In contrast to classical and neo-classical economics the variable adjusting savings and investment is aggregate income and not the rate of interest.

"The Keynesian models (...) are designed to project into the long period the central thesis of the General Theory, that firms are free, within wide limits, to accumulate as they please, and that the rate of saving of the economy as a whole accommodates itself to the rate of investment that they decree." Robinson 1962, 82

Investment

To develop a theory of growth, Keynesian models then need an explicit theory of investment. This is delegated to the next section. Here, dealing with the short run, we merely posit that investment is exogenously determined, which can be justified on the grounds that investment projects take time to be realized. In other words, this period's investment expenditures are determined last period's investment decisions. Thus investment demand in the short run simply is:

$$I = \bar{I} \quad \text{SR 1}$$

Saving

Different types of income are associated with different savings propensities. This can be argued on microeconomic as well as on institutional grounds. Since workers typically have lower incomes than capitalists they will consume a higher share of their income. This would be the microeconomic argument. However, Kaldor insisted that the reason for the different saving propensities lies in the difference between workers and firms, not workers and capitalist. Firms will withhold part of the profits in order to finance investment (Kaldor 1957, Kaldor 1966).

For convenience, we will later assume that the saving propensity out of wage income is zero, which was the original proposition of Kalecki and can be substantiated empirically. However the crucial assumption is that the saving propensity out of profits is higher than that out of wages.²

Hence the saving function will typically have the form:

$$S = s_W(Y - R) + s_R R \quad \text{Kaldor savings function,}$$

where Y is income, R profits, S savings and s_W and s_R the saving rates of wage and profit income respectively.

And in the simplified form, where saving occurs out of profits only:

$$S = s_R R \quad \text{SR 2}$$

² Pasinetti (1963) proposed an extension of the saving function, where workers receive part of the profit income, according to their share in the capital stock, as represented by their savings. This modification complicates the analysis, but does not modify the results, at least of the Robinsonian model, in any crucial way (Marglin 1984), hence it is ignored here.

Wages and the labor market

The labor market in Keynesian models is unlike other markets: the labor market equilibrium is not an equilibrium in the usual sense of market-clearing. The number of workers employed depends on the level of economic activity, i.e. the equilibrium on the goods market; and wages are understood as conventional wages, either in nominal (Keynes) or in relative terms (Kalecki), rather the outcome of market clearing. Keynes assumed given money wages. Workers and capitalist cannot bargain over real wages, but only over nominal wages (Keynes 1973, p. 13). These are thought to be determined by the respective income positions of different groups of workers. Hence the idea of a real wage equilibrating the labor market is rejected. Moreover, any industry's workers will attempt to resist a cut in nominal wages because they are afraid that their income position relative to other industries may deteriorate. (This is appreciated by Keynes, not classified as a market imperfection). Thus the asymmetry between inflation and deflation and Keynes recommendation to pursue inflationary policy if real wages are "too high".

For Kalecki the profit share, and inversely the wage share, is given by the degree of monopoly, which in turn is determined by the degree of competition, the extent of non-price competition and the organizational strength of labor. Hence the real or relative income distribution is determined by structural factors, that are fixed in the short run. As for Keynes, a change in money wages has little real effect for Kalecki, since firms will lower their prices accordingly and thereby reestablish the conventional income distribution. In either case, changes in money wages translate into changes in the price level rather than changes of the real wage.

It is worth emphasizing that a conventional wage is not eo ipso in contradiction with the wage being equal to the marginal product of labor. Marginal productivity wages are just another way of stating the profit maximization condition, if standard production functions are assumed (which many post-Keynesians are unwilling to do). In any case, the neo-classical chain of causation is reversed: In a Keynesian

model it would be the conventional wage in combination with demand factors determining the marginal productivity of labor instead of the other way.³

The simple short run model

Putting savings (or inversely consumption) and investment together, we get equilibrium income:

$$Y = I + wN + C_R$$

$$Y = I + (1-\pi)Y + (1-s_R)\pi Y$$

where Y , I , w , and N , following conventional notation denote income, investment, wages and employment respectively and $p = \frac{R}{Y}$, the exogenously given profit share, and C_R the consumption by capitalists. At the equilibrium level of income we get the Kaleckian multiplier

$$Y^* = \frac{1}{s_R p} \bar{I}$$

SR 3

Key findings

The two results that will provide the yardstick to evaluate Keynesian growth models are, firstly, the inverse relationship between the savings propensity and output, and, secondly, the inverse relationship between the profit share and output. Both, the savings propensity and the profit share appear in the denominator of the equilibrium value of income. Savings, in this model are a leakage, the smaller the leakage, the higher output will be. A similar argument applies to the profit share. Since profits are associated with a higher savings propensity they exhibit higher leakages than wage income (which is assumed to be fully consumed).

The question of how, if at all, the Keynesian argument of effective demand can be maintained in the "long run" is contested. Before diving into the discussion of long run Keynesian models we will briefly review the investment function.

³ Sticking closer to Keynes, and not the simplified presented here, we should say that the conventional nominal wage, together with factors of effective demand that determine the price level, determine the real wage, and thus the marginal product of labor.

3. A Keynesian Theory of Investment

Unlike Neo-Classical economics, Keynesian economics regards accumulation, or investment, as the variable that drives the growth process. In Neo-Classical growth theory, investment effectively ceases to exist in the long run, adjusting passively relative prices and output growth and coincides with the supply of savings.

Contrary to this, in Keynesian economics investment is understood to be determined independently from savings. This presupposes that investment is not normally constrained by the availability of savings,⁴ but the possibility of mobilizing credit. Usually this analysis of the real sector is complemented by assuming a flexible financial system and an endogenous money supply. Thus the structure of the financial system becomes important. Unlike in neoclassical theory internal and external finance are treated asymmetrically. Especially for small firms it is often difficult to obtain credit. For the purpose of this paper, however, we will ignore financial issues.

Though the "independent investment function" is at the core of Keynesian economics, there is no agreement on the precise form of the investment function. In the most general formulation investment is determined by the present value of the expected future income stream—where "expected" is the critical word. Since the future is fundamentally uncertain and open, there is no objective way of forming expectations, rather it is animal spirits, conventions and psychology that determine profit expectations and thus investment spending. Hence the crucial question in Keynesian theory of investment becomes: What determines expectations about future revenues? And, how can thus a realistic investment function be modeled?

Uncertainty (Shackle, Vickers)

To some Keynesians the formation of expectations is a genuinely creative act, hence investment cannot be predicted. "... intended (designed, ex ante) investment is a

⁴ This is, of course, only true as long as output has not reached its maximum possible level, which in the Keynesian view is the normal state of things.

laws to itself, dependent (if at all) on too elusive and involved a skein of subtle influences, too eagerly clutching at the straws of suggestion whirled along by "the news", to be ever captured in any intelligible, let alone determinable equation. It is not really the shapes of the curves, but their broad bodily shifts and deformation, that contain the meaning of the argument." (Shackle quoted in Vickers 1992, 446). Thus one current of Keynesians holds that investment demand is simply unpredictable, continually subject to sudden shifts. This does not allow for a meaningful long run theory, but leads to a privilege for short run analysis. Since we are interested in the former, we do not follow this line of thought. Uncertainty is a condition of human behavior and not the end of the story on investment.

From uncertainty to conventions and institutions (Crotty)

Crotty (1990, 1992) argues that Keynes combined his argument of fundamental uncertainty with a theory of conventional behavior. Since people are forced to act in an uncertain world they will adopt and submit to conventions of behavior, rules of thumb and the like, not the least because they could not stand admitting that they "simply don't know" what the consequences of their actions will be. This conventional behavior will lead to periods of continuity, order, and stability—for certain periods, but may violently break down at other times. Hence Keynesian economics has to be "institutionally specific and historically contingent" (Crotty 1992, 495)

Long run equilibrium and historical time

In the analysis of steady state conditions uncertainty ceases to play a central role. Since steady states reproduce themselves, there is nothing to be uncertain about. Asserting uncertainty will then not do the job of guaranteeing an independent investment function—if we subscribe to the standard view of what the long run is. For Keynesians this has been a reason to criticize the notion of the long run rather than to give up the independent investment function. In particular Joan Robinson has argued that the standard notion of the long run operates in a framework of logical time that is inadequate for a realistic growth theory because it does away with the unpredictability of the future that economic agents are confronted with at any point in time.

For the purpose of this paper it might be helpful to use the term "medium run" rather than the long run, to draw attention to the differences from the conventional usage of the notion long run, which refers to a theoretical point where everything has settled down. In a way, we will use the minimalist characteristic of the long run: an endogenous capital stock. What we have in mind is a period a few decades, certainly of the movements between, not within business cycles.

Important influences on expected profits (and hence investment):

Even if the investment function has to be institutionally specific, Keynesian economics has identified some key factors that will enter investment function, though with historically varying weights (Basle, Mazier and Vidal 1993). Four factors appear most frequently in the literature. First, profits as a proxy of future profits. Second, demand growth ("accelerator"). In either case different measures exist. Third, the availability of finance, which either brings us back to profits as the source of inside finance or to the structure of the financial system (bank based financing versus capital market based financing). Fourth the rates of return of financial investment, which is the alternative to the acquisition of additional physical capital. Other factors that are sometimes included are competitive pressure and technological progress. For the purpose of this paper, which is comparing Robinsonian and Kaleckian growth models we will focus on the first two factors, profits and demand. Of these factors we will focus on the first two, since these are determined endogenously in the model, whereas the other two operate as institutional shift variables.

4. Post-Keynesian growth I: Robinson and Kaldor (mark I)

The growth model considered here goes back to Robinson (1956, 1962) and Kaldor (1957, 1960). Being a Keynesian model, the assumptions of an independent investment function and of a Kaldor savings function are maintained. Implicitly it is assumed that the economy is operating at full capacity, the importance of this will become clear later. Investment depends on profits. The main difference in the

formulations by Kaldor and Robinson is that the former assumes full employment. The investment spending then ceases to determine the level of output, but determines the distribution of income (most explicitly in Kaldor 1960). The profit share has to adjust such that the necessary savings are provided. Contrary to this, Robinson insists on the simultaneous determination of accumulation and profits, with full employment as a mere coincidence. What unites both models is the mechanism of adjustment: changes of prices relative to wages. Money wages are given and prices adjust such that the level of profits generates the savings necessary to finance investment. This model has also been labeled inflationist model of growth (Lavoie 1992).

The model

We continue to assume that saving comes exclusively out of profits, for convenience (s) denotes the saving propensity out of profits ($s=s_R$). As for investment one part of it consists of autonomous investment and the other is a positive function of current profits. Since we are dealing with steady state analysis, current profits are a perfect expectation for future profits. For simplicity, we use a linearized form of the investment function.⁵ Since we are dealing with a dynamic model, savings and investment are normalized by the capital stock. Let $r = \frac{R}{K}$ denote the rate of profit, then our two functions that define the goods market are:

investment	$g^I = \frac{I}{K} = a + br$	RG 1
savings	$g^S = \frac{S}{K} = sr$	RG 2
equilibrium condition	$g^I = g^S$	RG 3

⁵ Marglin 1984 presents a formal analysis of the Kaldor-Robinson variante of Keynesian growth theory. A word on substitutability. Since Harrod and Domar, Keynesian growth models have become associated with fixed proportions in production. This is misleading, since the general mechanism of the Keynesian model is not affected by the substitutability. E.g. Marglin concludes: "in short, continuous substitution resolves the 'knife edge' problem of Evsey Domar (...) by imparting a positive slope to the saving function. But continuous substitution does nothing for Harrod's problem of opposition between warranted and natural growth rates (...). Opposition between warranted and natural rates of growth arises from the existence of an investment demand function." Marglin 1984, 190

Since we have three equations and three unknowns (g^I , g^S and r) the system can be solved. The corresponding equilibrium values are (we use $g^*=g^I=g^S$):

$$r^* = \frac{a}{s-b} \quad \text{RG 4}$$

$$g^* = a + \frac{ab}{s-b} \quad \text{RG 5}$$

$s-b > 0$ is necessary to guarantee for a positive profit rate. This is also the standard stability condition in Keynesian growth models, already noted in Robinson 1956. It asserts that savings are more sensitive to income than investment, if not the system will explode. In what follows we will assume that this condition holds.

The derivatives with respect to the saving propensity of capital income and autonomous accumulation are:

$$\frac{\partial r}{\partial s} = \frac{-a}{(s-b)^2} < 0 \quad \text{RG 6}$$

$$\frac{\partial r}{\partial a} = \frac{-1}{(s-b)} > 0 \quad \text{RG 7}$$

$$\frac{\partial g}{\partial s} = \frac{-ab}{(s-b)^2} < 0 \quad \text{RG 8}$$

$$\frac{\partial g}{\partial a} = \frac{s}{(s-b)} > 0 \quad \text{RG 9}$$

Findings

This long run model preserves one of the Keynesian insights of the short run and inverts the other: a higher saving propensity lowers the rate of growth, but higher growth goes together with lower wages. Observe that equilibrium growth, here

proxied by the rate of growth of the capital stock, has savings in the denominator. Thus the negative relation between saving propensity and growth (RG 8). The other key finding of the short run, however, is not maintained. Higher growth rates are associated with higher profitability. Unlike the short run, there is no exogenous income distribution. Hence the causality does not run from income distribution to accumulation but the other way. If capitalists invest more, i.e. if autonomous investment increases, they will receive higher profits (see RG 7).

The importance of the full capacity utilization assumption

This is not a surprise. Since full capacity utilization was assumed (implicitly), the economy is at its production possibility frontier, which at the same time is the profit-wage frontier. Thus there is a clear trade off between wages and profits. Further, since saving only occurs out of profits, the latter have to rise to allow for higher accumulation. The savings equation holds the key: rewriting it as a profit function ($r = g/s$), it becomes evident that (1) for a given saving propensity, higher growth and higher profits go hand in hand, and (2) for a given level of growth, the lower the propensity to save, the higher the profit rate has to be.

In other words: being on the production possibility frontier, real wages have to be reduced in order to redirect resources from the production of consumption goods to capital goods. Changes in the profit rate are the mechanism by which savings adjust to investment. The way this redistribution from wages to savings takes place (though not modeled explicitly here) is through inflation. Economically, if the demand for investment goods rises, their price will rise too, which initiates an inflationary process through which wages, fixed in money terms, get eroded.

A variation without consequences: the accelerator

To illustrate that the crucial assumption is the one of full capacity utilization, and not the lack of an accelerator term in the investment function, we will modify the investment function by incorporating a demand variable.

investment

$$g' = \frac{I}{K} = a + br + cg$$

RG 2'

where c is the accelerator and g the equilibrium growth rate.

The equilibrium values then are:

$$r^* = \frac{a}{s(1-c)-b} \quad \text{RG 4'}$$

$$g^* = a + \frac{ab}{s(1-c)-b} \quad \text{RG 5'}$$

Thus, again, higher accumulation is possible only with a higher profit rate. The point of this exercise was to clarify that it is not the accelerator itself that allows higher wages to be conducive to growth, but that this mechanism works only in conjunction with flexible capacity utilization.

Criticism

Within the post-Keynesian debate two main criticisms have been articulated: First, that the assumption of exogenous money wages is not meaningful beyond a short run analysis. The longer the time horizon of the analysis, the bigger the ability to bargain over real wages. However, the model presented above has no room for an exogenous determination of the distribution of income. There are only three equations and already three unknowns. Thus income distribution is determined on the goods market, with no room for the labor market or institutional factors to influence it. Second, higher growth is possible only at a higher profit rate, which is the exact opposite of the short run model. This latter criticism led to renewed interest in Kaleckian growth model in the 1980s.

5. Post-Keynesian growth II: Kalecki, Steindl, Dutt, Marglin & Bhaduri

The model presented here has a long line of ancestors: It goes back to Kalecki (1971) and Steindl (1952), and was reformulated recently by Rowthorn (1982) and Dutt (1984). The version presented here is based on Marglin and Bhaduri (1990),

for reasons explained below. The key difference to the Robinson type model is variable capacity utilization. This may sound unfamiliar in a growth model, and will therefore be discussed in some more detail in the next section. The effects of this assumption are important. Income distribution is then not determined by investment, but is set autonomously. A reduction in the profit share can foster growth because the consumption propensities of workers will cause an increase in output and capacity utilization. If the capacity effect on investment is stronger than the profit effect then accumulation will speed up.

Variable capacity utilization

There can be no doubt that capacity utilization varies over the business cycle. Changes in output are not so much caused by changes in the equipment and workers hired, but by changes in their productivities (both capital and labor productivity move procyclically) as determined by demand. However growth models usually employ a full capacity assumption on the grounds that excess capacity would be costly to maintain and thus competed away.

It was Steindl (1952), building on Kalecki's work, who argued forcefully that this need not be true in an economy dominated by monopolistic competition. The existence of excess capacity will be the rule rather than the exception in such an economy.⁶ Oligopolists certainly have the power to maintain idle capacity, since they are price setters. Facing a reduction in demand they can keep up prices while reducing only quantities. But why should they maintain these idle capacities?

By now, various justifications have been given (an overview is provided by Lavoie 1992, 124ff). The most fundamental reason is uncertainty. Firms will hold excess capacity to maintain flexibility in the face of unexpected events, much the same way households hold cash (Steindl 1952). Second, oligopolists may keep excess capacity as deterrent to entry by new or outside firms (Sylos-Labini 1971). Third there may be a variety of technical reasons. Indivisibilities in the production process (Kurz 1987) may make it impossible to tailor machines to match production exactly. Or, if

⁶ Similar ideas about the pervasiveness of excess capacity or slack can be found in Hirschman (1970) and Leibenstein (1966). However neither of them develops this into a theory of variable capacity utilization in a macroeconomic model.

overworking machines makes them deteriorate quickly it may be rational to keep excess capacity. Finally, excess capacity may be a result of the irreversibility of many investment projects (Crotty 1992). Since they cannot be undone easily, idle capacity may be existing simply because it is too expensive to remove it, and can be put back to use if demand suddenly increases.

The model

The Kaleckian growth model introduces variable capacity utilization. Thus we have one more variable to explain and the model is closed by setting income distribution exogenously.

investment	$g^I = \frac{I}{K} = a + b\pi + cz$	KG 1
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savings	$g^S = \frac{S}{K} = s\pi z$	KG 2
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equilibrium condition	$g^I = g^S$	KG 3
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where

z capital productivity (Y/K) interpreted as capacity utilization

π profit share R/Y

Assuming constant technology we can interpret capital productivity as a measure of capacity utilization. The saving function is basically unaltered ($S=s_R R$), but is expressed now as a function of the profit share and capacity utilization.

The investment function now consists of an autonomous part, and reacts positively to profits and to capacity utilization. The profit share is used as a measure of profitability to highlight the distributional influence on investment (more on this below).

Since we are not interested here in any specific formulation of the theory of distribution we will assume in the following that the profit share is exogenously given. It could of course be endogenized, e. g. as a function of capacity utilization as in Marglin and Bhaduri (1990).

income distribution	$\pi = \pi^*$	KG 4
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The equilibrium values and some comparative statics are:

$$z^* = \frac{a + b\mathbf{p}}{s\mathbf{p} - c} \quad \text{KG 5}$$

$$g^* = a + b\mathbf{p} + c \frac{a + b\mathbf{p}}{s\mathbf{p} - c} \quad \text{KG 6}$$

$$\frac{\partial z}{\partial \mathbf{p}} = \frac{-bc - sa}{(s\mathbf{p} - c)^2} < 0 \quad \text{KG 7}$$

$$\frac{\partial g}{\partial \mathbf{p}} = b + c \frac{\partial z}{\partial \mathbf{p}} \quad \text{KG 8}$$

Note that KG 8 cannot be signed.

Findings

We get the following interesting result: An increase in the profit share will decrease capacity utilization, but its effect on capacity growth, i.e. the growth of capital stock is ambiguous. There will be a positive capacity effect and a negative profit (share) effect on investment, what the net effect will be cannot be answered a priori. Thus, two regimes are possible depending on the relative strength of capacity and profit effects in the investment function. If the capacity effect outweighs the profit effect, growth is wage lead. If the profit effect is stronger than the capacity effect, growth is profit lead.

A digression

The question whether the profit rate or the profit share is used in the investment function, may sound like a technical detail, but it is not. If the investment function is written as

investment

$$g^I = \frac{I}{K} = a + br + cz \quad \text{KG 2'}$$

this is tantamount to assuming that the capacity effect always outweighs the profit effect. This was pointed out by Marglin and Bhaduri (1990). The early reformulations of the Kaleckian growth model by Rowthorn (1982) and Dutt (1984) both used the profit rate rather than the profit share

$$g^I = a + b\mathbf{p}z + cz = a + (b\mathbf{p} + c)z$$

Solving this the system now, (and leaving the profit share exogenous) we get

$$g^* = a + \frac{a(b\mathbf{p} + c)}{s\mathbf{p} - b\mathbf{p} - c} \quad \text{KG 6'}$$

as the equilibrium growth and

$$\frac{\partial g}{\partial \mathbf{p}} = \frac{-acs}{(s\mathbf{p} - b\mathbf{p} - c)^2} < 0 \quad \text{KG 8'}$$

as the derivative of growth with respect to the profit share, which is negative.

The intuition behind this result is as follows: If higher capacity utilization rates at a given profit rate induce higher investment, this implies that capitalists are not bothered by lower profit shares! Since we assumed that profit rates are constant and that capacity utilization increased, profit shares must have fallen. Hence a redistribution from profits to wages will affect investment through the capacity effect (caused by the higher consumption propensity of wage incomes), but through the profit effect only if the profit rate falls.

Summary

Since capacity utilization is introduced as a new variable, the Kaleckian model has one more degree of freedom, which is filled by a profit share equation, here taken to be fixed exogenously. The current model has three equations in three unknowns.

Hence wages can raise now, increase capacity utilization and even the profit rate. An increase in wages (in the wage share to be exact), can push the economy towards the profit-wage frontier: Distribution is not a zero sum game any more. However wage increases will only have this effect, if the capacity effect on investment (accelerator) is stronger than the profit effect.

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