POWER, UNCERTAINTY AND INCOME DISTRIBUTION: TOWARDS A THEORY OF CRISIS

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1. Introduction

This paper attempts to provide a theory of crisis based on the interaction between income distribution and growth in capitalist economies in which power relations and uncertainty are important features of the economy. Although it is beyond its scope to defend the view that the theory presented provides an explanation of the current crisis, it is hoped that it is able to capture some of its major aspects.

The theory is presented using a series of models which have the common feature of using a method which is particularly suitable for taking power relations and uncertainty into account in macroeconomic analysis. This method is very different from that adopted in mainstream macroeconomic theory, especially in its new neoclassical synthesis version, which has no role for power relations whatsoever, and which sees the future in terms of probabilistic risk rather than fundamental uncertainty. Power and uncertainty are taken into account in a simple way using distributional variables which reflect power relations between the major classes in the economy, and behavior reflecting rules of thumb reflecting the actions of economic agents under conditions of uncertainty. The approach is in the tradition of Kalecki, Keynes and Marx.

The rest of the paper proceeds as follows. The next section examines a basic Kaleckian-post-Keynesian growth model in which the rate of economic growth is affected by income distribution to examine how rising inequality can explain economic stagnation. Section 3 extends the model to introduce the role of consumer debt, to show how growing consumer debt can explain an increase in growth despite increasing inequality, and explores whether such a growth process is sustainable in the long run. Section 4 examines a simple model to incorporate asset market issues to analyze how rising inequality can cause financial crises which can precipitate the onset of economic crisis. Section 5 summarizes the overall implications of the three models to underscore the need for distributional equality for stable long-run growth.

2. Growth and income distribution

We use a simple framework to present a basic model of growth and distribution. This framework makes the following assumptions. First, the economy produces a single good which can be both consumed and invested. Second, the economy is a closed one and has no economic relations with the rest of the world. Third, the government does not undertake any fiscal activity. Fourth, the good is produced with two homogeneous factors of production, labor and capital which is physically the same as the good produced. Fifth, production takes place with given fixed coefficients of production which show the maximum amounts that can be produced with each input. Sixth, the economy has two classes, workers who work for wages and capitalists who own the capital and firms and receive profits. Seventh, there are no long-term labor contracts, so that capitalists only hire as many workers as production requires, but firms must hold all the capital that they own. Eighth, capital does not depreciate. Ninth, workers consume their entire wage while capitalists save a constant fraction of their profits, and consume the rest of it. Tenth, we assume that all firms are identical which will allow us to examine firms by focusing on one (representative) firm. Most of these assumptions are made for simplicity and can be removed to incorporate additional elements into the basic model,. The assumption about two classes (which could be extended to include additional classes) is made to reflect the emphasis, following classical and Marxian approaches and empirical studies of inequality and its effects, placed on income distribution, both for its intrinsic importance and for its relation to growth.

The specifically Kalecki-Keynes aspects of our model allow aggregate demand to have a central role in the economy, that is, the level of aggregate demand determines output and employment in the economy. First, labor is always in unlimited supply, so that firms are not constrained in how much they can produce by the shortage of labor. Second, in an uncertain environment, firms fix their price as a markup on labor costs and adjust output according to the aggregate demand for goods; this requires that firms also hold excess capital, so that their production is not limited by the amount of capital they have. Third, also in the uncertain environment, firms make investment decisions, such that planned investment depends on the level of capacity utilization, which reveals to them the buoyancy of aggregate demand which in turn affects their expectations about future demand.

Our assumptions imply that nominal income is divided into wages and profits according to the equation

$$PY = WL + rPK, \tag{1}$$

where P is the price level, Y is real income, W is the money wage, L the level of employment, r the rate of profit, that is, profit as a ratio of capital stock valued at the price of the good, and K the stock of capital.

The level of employment in the economy is given by

$$L = a_0 \, Y, \tag{2}$$

where a_0 is the fixed labor-output ratio. No such condition applies to capital, since firms may hold excess capital. If there is some maximum amount of output that capital can produce, determined by a maximum capital-output ratio, a_1, the economy has to obey the restriction

$$Y \leq \frac{K}{a_1}.$$

Firms set their price using the markup-pricing equation

$$P = (1 + z)Wa_0, \tag{3}$$

where z is the fixed markup used by firms in setting the price. The level of the markup is determined, as discussed by Kalecki (1971), by the degree of industrial concentration and by the relative bargaining power between firms and workers. The money wage is assumed to be given. The fixed markup reflects power relations between workers and firms and between firms.

Consumption demand is given by wages and the share of profits not saved, so that, in real terms, consumption demand is

$$C = \left(\frac{W}{P}\right)L + (1-s)rK, \tag{4}$$

where s is the fraction of profits that is saved. Investment demand, at a point in time is predetermined, given by the equation

$$\frac{I}{K} = g \tag{5}$$

where g is given at a point in time, as a result of past plans. Over time g changes according to the equation

$$\dot{g} = \Lambda(g_d - g) \tag{6}$$

where $\Lambda>0$ is represents that speed at which g adjusts to g_d, the desired investment-capital ratio. This ratio, in turn is given by

$$g_d = \gamma_0 + \gamma_1 u, \tag{7}$$

where $u = Y/K$ is a measure of capacity utilization and γ_i are positive investment parameters to give us a simple linear investment function. In the planned or desired investment function the rate of capacity utilization captures the buoyancy of the market and expectations about the future.

In the short run we assume that the stock of capital, *K*, and the investment-capital ratio, *g*, are given, and the goods market clears due to variations in output and hence the rate of capacity utilization. The short-run equilibrium condition is given by

$$C + I = Y. \tag{8}$$

This condition can also be written as *I=S*, or as

$$\frac{I}{K} = \frac{S}{K}, \tag{8'}$$

where *S* is real saving, that is, *S=Y-C.*

Using equations (1) and (4) and this definition of saving, we obtain a positive relation between the saving-capital ratio and the profit rate, given by

$$\frac{S}{K} = sr. \tag{9}$$

Substituting from equations (2) and (3) into equation (1) we obtain

$$r = \left[\frac{z}{(1+z)}\right]u, \tag{10}$$

which shows that the rate of profit increases with both the markup (because of an increase in the profit share) given the rate of capacity utilization, and the rate of capacity utilization (given the profit share) because of the increase in sales and profits. Equations (9) and (10) imply

$$\frac{S}{K} = s\pi u, \tag{11}$$

where $\pi = z/(1+z)$ is the profit share.

Substituting equations (5) and (11) into equation (8') we can write the short-run equilibrium condition as

$$g = s\pi u,$$

which solves for the unique and stable short-run equilibrium value of the rate of capacity utilization, given by

$$u = \frac{g}{s\pi}. \tag{12}$$

In Figure 1, given g, the equilibrium value of *u* is obtained from the *g*=*sπu* line. The short-run equilibrium value of *u* rises with *g* through the standard multiplier effect, falls with *s*, reflecting the paradox of thrift, and falls with π. The shift in power away from workers and towards larger firms, shifts income distribution away from wages, reduces the overall consumption demand in the economy, and reduces aggregate demand and capacity utilization.

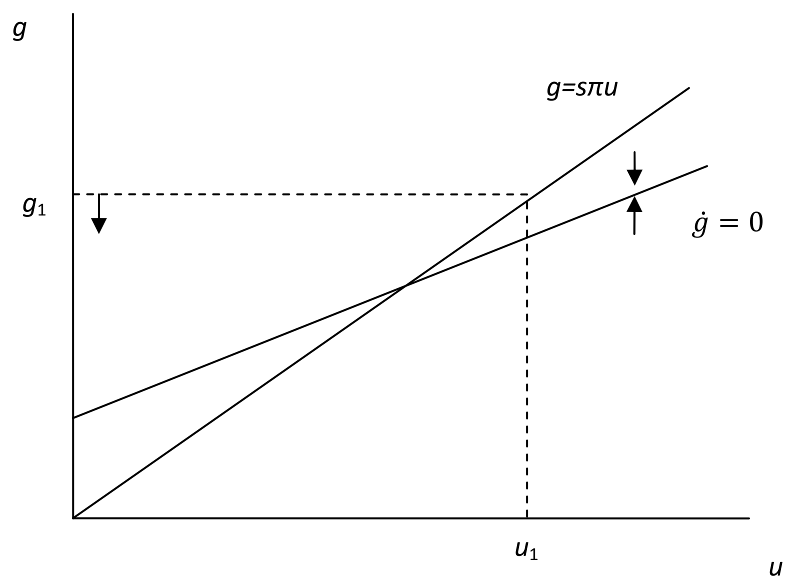


Figure 1. Simple model of growth and distribution

In the long run, the stock of capital changes over time, according to the dynamic equation

$$\dot{K} = gK \tag{13}$$

and g changes according to equation (6). The dynamic equation for the long run is obtained by substituting equations (7) and (12) into (6), which gives

$$\dot{g} = \Lambda \left[\gamma_0 + \gamma_1 \frac{g}{s\pi} - g \right]. \tag{14}$$

Long-run equilibrium is attained when $\dot{g} = 0$ and is stable and economically meaningful if $\gamma_0 > 0$ and $s\pi > \gamma_1$, the latter being the familiar stability condition stating that the response of saving to variations in output and capacity utilization exceeds that of investment. The stable case is shown in Figure 1, where the $\dot{g} = 0$ line is given by the equation $g = \gamma_0 + \gamma_1 u$, which ensures that g=g_d, so that $\dot{g} = 0$ is satisfied. The stable long-run equilibrium is obtained at the intersection of the two lines in the figure. At points above the $\dot{g} = 0$ line, g>g_d, so that g falls, as shown at the initial short-run equilibrium at g_1 in the figure.

The determinants of inequality in this model are those forces which change π, which is the share of profits in income. Although the model can be extended to examine the endogenous dynamics of π,[1] for the purposes of this paper and for simplicity, we examine shifts in inequality parametrically. A weakening in the bargaining power of workers implies a rise in z and hence in π, and can be due to a weakening in the power of labor unions, or changes in technology which increase the importance of supervisory workers (who are paid out of markup income and whose income can be considered a part of profits). The rise in π has the effect of rotating the g=$s\pi u$ curve in Figure 1. The long-run equilibrium value of the levels of capacity utilization and the rate of investment are therefore reduced. As the distribution of income changes away from wages, consumption demand falls, and this reduces capacity utilization in the long run and, with it, the rate of accumulation. A result similar to this is obtained if the distribution of income changes due to a balanced-budget change in fiscal policy which reduces the tax rate on profit income and increases it on wage income.

It should be noted that this result depends on the fact that in long-run equilibrium we have unemployed workers and that capacity utilization is endogenous and is therefore not equal to some exogenously-given desired rate of capacity utilization. While these features of the model may appeal to some, they are possibly to trouble those who prefer to see a constant rate of unemployment and actual capacity utilization equal to some desired rate in long-run equilibrium. For those who are in the latter category, however, the model can be extended to allow for endogenous technological change (which makes labor productivity growth, and hence the effect supply of labor, depend on labor market conditions) and for endogenous changes in desired capacity utilization, to produce long-run equilibrium with a constant rate of unemployment and actual capacity utilization equal to its desired level, and yet reproduce the result that an exogenous increase in inequality (see Dutt, 1997, Lavoie, 1997, Dutt, 2006).

The relation between the increase in inequality and the reduction in growth is not a logical necessity in Keynes-Kalecki models of this kind. For instance, Bhaduri and Marglin (1990) have shown that if we make desired investment depend positively on the profit share and the rate of capacity utilization, then the effect on the rate of accumulation of the rise in the profit share may be negative or positive. This can be seen by replacing the desired investment function by

$$g_d = \gamma_0 + \gamma_1 u + \gamma_2 \pi, \tag{15}$$

Following Bhaduri and Marglin (1990), the increase in π will shift the $g=s\pi u$ line as well as the $\dot{g} = 0$ line upwards, and because the rise in the profit rate has a positive effect on accumulation, the long-run effect on investment may be positive (what has been called the case of profit-led growth), or negative (what has been called the case of wage-led growth).

It may seem that economies such as the US one, in which there has been a consistent increase in inequality over a period of time, but in which growth has been buoyant before the current recession, is profit led in the sense just discussed. But this is not necessarily the case. The increase in inequality has not been accompanied by an increase in the rate of investment, as the case of profit-led growth implies. What has occurred, instead, as is widely recognized, is a consumption-led increase in demand. This can be explained in two ways in terms of our model.

The first way is to allow for a third class in the economy, which receives income from markup income and in this sense can be thought of as overhead labor. This class receives income which is, however, a deduction from profit, and is thus not a part of the profit share which has a positive effect on investment. Thus, if the increase in the markup, which raises the gross profit share (which refers to markup income), is accompanied by higher payments to overhead labor, the net profit share (which subtracts payments to overhead labor), investment spending may not be stimulated significantly. However, to the extent that overhead labor saves, but not as much as from out of net profit income, a reduction in the saving rate out of overhead labor (due to what has been called conspicuous consumption or luxury fever) can keep growth buoyant. The second way is to allow for borrowing by workers, an avenue which is pursued in the next section.

3. Consumer debt, growth and distribution

In this section we continue to assume that there are two classes, but allow workers to finance a part of their consumption by borrowing,[2] so that

$$C_W = (1-\pi)Y - iD + dD/dt, \qquad (16)$$

and that capitalists receive the interest income, and save a constant fraction of their total income, s, so that

$$C_P = (1\text{-}s)\ [\pi Y + iD], \tag{17}$$

where D is the stock of debt in real terms. It is assumed that profit recipients do not curtail their consumption when they lend. For simplicity, we assume that banks simply intermediate between lenders and borrowers, and we do not take explicit account of any other kind of debt in the economy, to focus on consumer debt incurred by workers. Total consumption is given by

$$C = C_W + C_P, \tag{18}$$

The stock of debt, D, is given at a point in time, and that over time it adjusts according to[2]

$$\mathrm{d}D/\mathrm{d}t = \Omega\ (D_d - D), \tag{19}$$

where Ω is a positive constant, and where the desired level of debt is given by

$$D_d = \theta\ [(1\text{-}\pi)Y - iD]. \tag{20}$$

The desired level of debt can be interpreted as a determined by borrowers, although it could also be interpreted as being determined by lenders or by both, taking into account the income of borrowers net of interest payments in deciding how much to debt to hold. Thus an increase in the level of θ will be interpreted as being due to the greater willingness of borrowers to increase their debt in order to increase in conspicuous consumption. The idea of desired debt-income ratio of borrowers is consistent with evidence which suggests that borrowers borrow less when they are more in debt (see Tobin, 1957), but increases in the urge to consume induce them to increase the ratio. It can also be interpreted - at least in part - as reflecting changes in lending practices due perhaps to institutional changes – such as deregulation of the financial system allowing home equity lending, adjustable-rate consumer loans, and securitization (repackaging of debts and selling as new securities), and technological changes in credit reporting in the US in the 1980s – which led to rapid growth in financial intermediation. But consumers must be willing to borrow more for consumer debt to actually increase.

The model is otherwise exactly same as the one discussed in section 2. One feature of it worth pointing out that our analysis does not endogenize changes in asset markets due to changes in borrowing and debt, because it keeps the interest rate (and implicitly, other financial variables) constant, an issue to which we return later.

In the short run we assume that the level of output adjusts to clear the goods market, given the levels of debt, capital stock and investment. In short-run equilibrium the goods market clears, so that equation (8) must be satisfied. Substituting from equations (6), and (16) through (20) into equation (8) and dividing through by K we get

$$u = (1-\pi)u - i\delta + \Omega\{\theta[(1-\pi)u-i\delta]-\delta\} + (1-s)(\pi u+i\delta) + g,$$

where $\delta = D/K$ is the consumer debt to capital stock ratio. Solving for u from this equation we get its short-run equilibrium value, which is

$$u = \{g - [si+\Omega(1+i\theta)]\delta\}/\Gamma, \tag{21}$$

where $\Gamma = s\pi-\Omega\theta(1-\pi)$. The expression Γ represents the impact on saving of an increase in capacity utilization: the first term shows the additional saving by profit recipients, and the second term shows the additional consumption (or dissaving) financed out of borrowing by workers. Assuming that output (and capacity utilization) adjusts in response to the excess demand for goods, the stability of short-run equilibrium requires that $\Gamma>0$, that is, that saving increases with total income, or that the increase in saving by profit recipients more than offsets the increase in consumption due to borrowing by workers. We assume that this condition is satisfied, and moreover, that we always have $g > [si+\Omega(1+i\theta)]\delta$ to ensure a positive output level.

It should be noted that an increase in g increases the equilibrium level of u. A rise in g increases demand and output with the multiplier $1/\Gamma$. An increase in the debt-capital ratio, δ, however reduces u. This contractionary effect occurs because: first, it redistributes income from workers-borrowers to capitalists-lenders who save a higher fraction of their income; second, it reduces the desired level of debt by increasing interest payments; and third, the higher level of debt reduces the propensity to increase debt given the desired level of debt. The last two effects operate by reducing the level of borrowing-financed consumption by debtors. These effects have to be taken into account when we move from the short run to the long run, when g and δ can change.

In the long run we assume that *D*, *K* and g can change over time. We examine the dynamics of the economy by focusing on the dynamics of g, which are given by equation (6), and of δ. From the definition of δ we see that

$$\hat{\delta} = \widehat{D} - \widehat{K}.$$

which implies, using equations (5), (19) and (20),

$$\hat{\delta} = \Omega\theta(1-\pi)\frac{u}{\delta} - \Omega(1+i\theta) - g$$

(22)

Substitution from equation (21) then implies

$$\dot{\delta} = \Omega\theta(1-\pi)\frac{g-[si+\Omega(1+i\theta)\delta]}{\Gamma} - \Omega(1+i\theta)\delta - g\delta. \quad (23)$$

Substitution of equation (7) and (21) into (6) implies

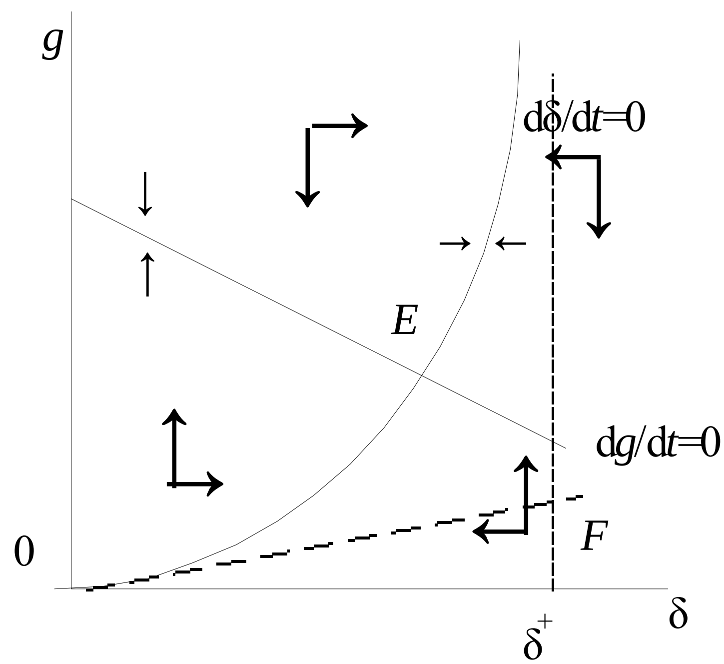
$$\dot{g} = \Lambda\left[\gamma_0 + \gamma_1\frac{g-[si+\Omega(1+i\theta)\delta]}{\Gamma} - g\right].$$

(24)

Equations (23) and (24) comprise a dynamic system in the variables δ and g. Long-run equilibrium is attained when $\dot{\delta} = 0$ and $\dot{g} = 0$. It is straightforward to check that this equilibrium is stable and that the dynamics of the system can be shown using Figure 2.

The effect of an increase in θ in the short run is to increase capacity utilization provided that $(1-\pi)u-i\delta>0$, or that the net income of workers is positive, which we always assume to be the case. Thus, higher consumption financed by more borrowing is expansionary.

To analyze the long-run effects we note that a rise in θ shifts both $dg/dt=0$ and $d\delta/dt=0$ curves. The increase, by increasing u, increases the desired rate of accumulation g_d, thereby pushing the $dg/dt = 0$ isocline in the phase diagram upwards. As long as workers have a positive income net of interest payments (which was required for the positive short-run effect of increased borrowing on capacity utilization), $d\delta/dt$ will rise for given values of δ and g when θ rises: increased borrowing leads to faster debt accumulation. The $d\delta/dt=0$ isocline will therefore move downwards and to the right. The long-run equilibrium effect on δ is therefore positive, and



on g, ambiguous. It is shown in the Appendix that the sign of the effect on g depends on whether g exceeds, or is less than, si. This ambiguity regarding the effect on the growth rate arises because, despite the increase in demand caused by borrowing, a higher debt burden in the long run shifts income from borrowers to debtors who have a lower propensity to consume, and thereby reduces the rate of capacity utilization, and hence, accumulation. The higher is *si* the higher is the reduction in aggregate demand due to increased borrowing. The higher is *g* the higher is the increase in aggregate demand due to the increase in borrowing and the debt (with the debt-capital ratio being constant in long-run equilibrium).

Our model therefore implies that an increase in consumer borrowing and leads to an increase in consumer debt in the long run, it may have the effect of reducing the rate of growth of the economy in the long run. This occurs due to the adverse income distributional consequence of a rise in consumer debt which redistributes income from workers/debtors to profit recipients/creditors who have a higher propensity to save. To the extent that this effect is negative and large, it can possibly outweigh the growth-enhancing effects of the increase in θ

4. Financial instability, growth and distribution

The model just described implies that borrowing-financed expansion may have adverse long-run consequences, but that it need not necessarily have such a consequence. However, it is possible that financial conditions may change in such a way that the growth process may be interrupted due to financial factors and to expectational changes.

We introduce financial factors with a variable, φ, which captures the notion of financial fragility as measured by a variable such as the debt-to-asset ratio of firms and households. We model decision-making under uncertainty by introducing another variable, α, which captures what can be called animal spirits or confidence.[3]

Our investment function is given by

$$I/K = g^I (u, \alpha, \varphi). \tag{25}$$

To economize on the number of state variables we assume that, rather than investment being predetermined and responding to deviations between the actual and desired rates of investment, it is determined by the desired rate of investment. We assume that $g^I_u > 0$, where the subscript denotes the partial derivative with respect to the variable u. We assume that $g^I_\alpha > 0$, since greater confidence and more buoyant animal spirits on the part of both firms and financiers implies higher levels of investment. Finally, $g^I_\varphi < 0$, since a more leveraged position will imply that firms and financiers will cut back on investment and lending, although at low levels of φ, this effect is likely to be negligible.

Saving is assumed to depend positively on the output and capacity utilization and on the profit share, π, since profit recipients save a higher fraction of their income than wage earners. However, it is also possible, and increasingly more the case, that confidence and financial fragility have an effect on consumption and saving as well. As consumer debt becomes more important, the effect of financial fragility on consumption is likely to become stronger, at least when φ is high, and consumption becomes more strongly related to confidence, for instance, about future employment and income prospects of consumers. Thus we assume that the saving function is given by

$$S/K = g^S (u, \alpha, \varphi, \pi). \tag{26}$$

where $g^S_u > 0$, $g^S_\alpha < 0$, $g^S_\varphi > 0$ and $g^S_\pi > 0$ Saving falls with confidence and rises with financial fragility since consumption rises with confidence and falls with fragility. As households become less confident about the future, they start saving more, and they also cut down on consumption when their debt position worsens.

For the short run we assume that α and δ are given, and that u adjusts to clear the goods market. The short-run equilibrium value of u, which satisfies the condition (8') can be written as

$$u = u(\alpha, \varphi, \pi) \quad (27)$$

where our assumptions imply $u_\alpha > 0$, $u_\varphi < 0$ and $u_\pi < 0$. These derivatives will be larger in absolute value if saving and investment responds to α and δ than if only investment responded to them. At low levels of φ, u_φ is likely to be small in absolute value, since investment and consumption will not be deterred much by increases in financial fragility when financial fragility is low. It will become larger in absolute value at higher levels of φ.

In the long run we assume that

$$d\alpha/dt = X(u, \alpha, \varphi) \quad (28)$$

and

$$d\varphi/dt = F(u, \alpha, \varphi, \pi). \quad (29)$$

The partial derivatives are assumed to have the following signs. For the animal spirits function we assume that $X_u > 0$, $X_\alpha > 0$, and $X_\varphi < 0$. Animal spirits are excited when the economy, measured by its rate of capacity utilization, does better. Animal spirits are further excited when animal spirits are high, due to what Akerlof and Shiller (2009) call the confidence multiplier. Finally, confidence declines when the economy becomes more financially fragile. This can occur because the level of confidence of firms, financiers and households declines when their debt level rises, but also because higher debt may imply a fall in asset prices which shakes confidence. For the financial fragility function we assume that $F_u > 0$, $F_\alpha > 0$, $F_\varphi < 0$, and $F_\pi > 0$. although for low levels of φ, $F_\varphi \geq 0$ is possible. Increases in economic activity will imply that households and firms be willing and able to borrow more (by being deemed more creditworthy). Increases in confidence will also increase borrowing and hence debt. Increases in indebtedness can increase indebtedness further by increasing debt service obligations including interest payments; this may be exacerbated by increasing interest rates which increase interest payments.

However, beyond a point, further increases in δ will reduce the net income of borrowers, thereby reducing their willingness and ability to borrow, especially because financiers find themselves overextended and do not wish to lend more. Greater financial fragility implies more lender's and borrower's risk, so that credit constraints bind more strongly and borrowers are loath to further increase their indebtedness. Moreover, increases in fragility may imply a fall in asset prices which can result in a further reduction in lending. Increase in inequality, captured by increases in π, increase financial fragility through a number of channels. First, it changes the composition of asset holding towards more risky assets, from say bank deposits to stocks. Second, it leads to more borrowing by households, both because of stronger keeping-up-with-the-Jones effects as the less rich try to keep up with the more rich when the income gap between them increases, because of the greater need to meet necessary payments or what has been called necessitous borrowing, and because of changing government financial policy to reduce social problems caused by rising inequality.

Substituting equation (27) into equations (28) and (39) we obtain the dynamic equations

$$d\alpha/dt = x(\alpha, \varphi, \pi) \qquad (28')$$

and

$$d\varphi/dt = f(\alpha, \varphi, \pi). \qquad (29')$$

where our assumptions imply that $x_\alpha > 0$, and $x_\varphi < 0$, and $f_\alpha > 0$, and $f_\varphi < 0$, although $f_\varphi > 0$, is possible at low levels of φ. The dynamics of the system can be examined using the phase diagrams shown in Figure 3. The slope of the $d\alpha/dt = 0$ isocline is $-(x_\varphi/x_\alpha)$, and that of $d\varphi/dt = 0$ is $-(f_\varphi/f_\alpha)$; the vertical and horizontal arrows, showing movements in α and φ are determined by the signs of x_α and f_φ.

Long-run equilibrium is given at the intersection of the two isoclines. The stability of long-run equilibrium depends on the signs of the trace, given by $x_\alpha + f_\varphi$, and the determinant, given by $x_\alpha f_\varphi - x_\varphi f_\alpha$, of the Jacobian of the dynamic system given by equations (28') and (29'). If the trace is negative and the determinant is positive at the long-run equilibrium, it will be stable. The confidence multiplier and the positive effect of α on short-run capacity utilization, which imply that $x_\alpha > 0$, contribute to instability in the system. A negative f_φ which is large in absolute value can contribute towards making the trace negative, but it also makes it more likely that the determinant condition is violated.

Two possible configurations of the curves is shown in Figure 3. In (a) there are two long-run equilbria, the lower one of which is unstable and the upper one is saddle-point unstable. If the economy starts below the dashed separatrix it can experience increases in α and φ as in the dynamic path shown by the curved arrow, but once it passes the $d\alpha/dt=0$ isocline animal spirits will start to falter and then financial fragility may be able to correct itself, although not by enough to reverse the decline in capacity utilization and growth (both of which depend positively on α and inversely on φ. In (b) there is one equilibrium which implies cycles which may be stable or unstable, depending on the sizes of x_α and f_φ.

Though in a crudely reduced form, the simple model has enough structure to allow us to examine some reasons for increases in financial fragility and cyclical instability. Three examples of such an analysis may be briefly presented. One, financial innovation can be represented by a reduction in the absolute value of f_φ, which, as shown in the figure, makes cyclical instability more likely. It can also imply a fall in the absolute value of x_φ, which also destabilizes the system. Two, an increase in the importance of confidence and debt in consumption spending decisions implies, by increasing u_α.and increasing the absolute value of u_φ, that it increases x_α

and f_α.and makes the absolute values of x_φ and f_φ more strongly negative, which has an ambiguous effect on stability, but is likely to increase the amplitude of the system by making the booms and recessions stronger. A combination of these two tendencies, however, is likely to destabilize the system. Three, the effects of an increase in π is to reduce *u* in the short run, which may dampen animal spirits, but its effect on financial fragility is likely to be strong, making a financial collapse more likely.

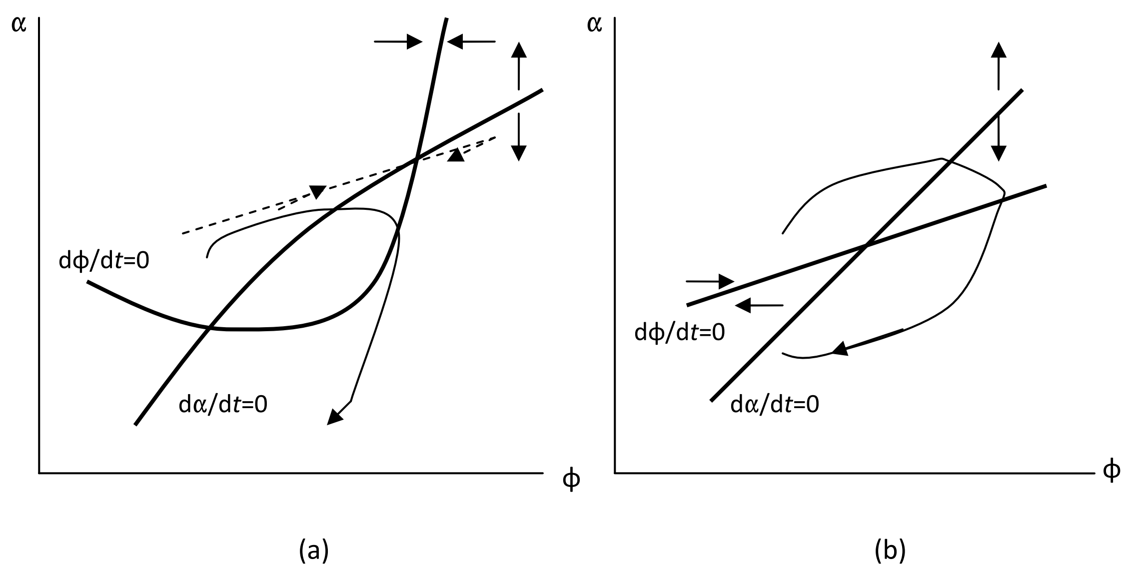


Figure 3. Model with finance and uncertainty

We have discussed these financial issues using a simple reduced-form model of growth and finance. If this type of analysis is found useful, it can be enriched in a number of ways. First, it can be extended to deal with specific types of assets, such as bonds, stocks and real estate. Second, in so doing, one can introduce additional short run variables into the model, such as the stock price and the interest rate, which changes quickly in the short run (see Taylor, 2004, for examples of both types of models). Third, it may be instructive to analyze explicitly the relation between flows and stocks concerning not only physical capital (as done in the model), but also financial assets and liabilities, by using what are called stock-flow-consistent models. However, these models become extremely complicated very quickly since they require the explicit analysis of a large number of stock variables, and therefore necessitate the use of simulation techniques (see Godley and Lavoie, 2007).

5. Conclusion

This paper has discussed a series of dynamic macroeconomic models which take seriously power relations and uncertainty to show how rising inequality can help us to understand the genesis of the current crisis.

The first model has shown how a rise in inequality can result in a tendency towards an effective demand problems and lower rate of growth. The first and second models have analyzed how this tendency towards stagnation is not a foregone conclusion when inequality increases, and may be checked by increases in consumption demand, financed in part by increasing consumer debt. However, it is possible that this tendency may not be sustainable in the long run if increasing indebtedness brings about a further redistribution of income from the poor to the rich, and this is more likely to happen if investment remains relatively weak. The third model shows that the macroeconomic system does not need to wait for a long time to have experience such a denouement, since increases in inequality can also result in financial fragility and the dampening of animal spirits relatively soon. While such adverse financial outcomes are possible even without income distributional problems – due to financial liberalization, for instance – rising inequality is likely to make the problem more acute.

The obvious implication of this analysis is that there needs to be a reversal in the tendency towards greater inequality that has been experienced in many countries, if economies are to be set on paths of long-term sustainable growth.

In conclusion, it needs to be stressed that the models discussed in this paper have abstracted from many features of actual economies. Two glaring omissions are government fiscal policy and open economy issues. It is possible for effective demand to be boosted by expansionary fiscal policy. While there is much to be gained from such a policy, especially if it boosts long-term growth by investing in infrastructure and facilitating technological change, there is the potential for destabilization due to increases in government debt, especially in open economies. It is possible that open economy considerations may imply that improvements in income distribution may reduce international competitiveness by increasing wage income, this again is not a foregone conclusion, given that distributional improvements can also generate positive growth and induced increases in productivity which can improve competitiveness. Such issues, however, are beyond the scope of the present paper.

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NOTES

[1] See, for instance, Dutt (2011) and Assous and Dutt (2011).

[2] The following discussion draws on Dutt (2005).

2. We do not model bankruptcy explicitly. Bankruptcies can be taken to imply that a part of the debt is cancelled, which implies that the interest rate actually incorporates within it a given bankruptcy rate (as a fixed ratio of the total debt). A fuller analysis will have to analyze the effects of changes in the bankruptcy rates on lending conditions.

[3] The following discussion draws on Dutt (2010).