Hochschule für
Wirtschaft und Recht Berlin
Berlin School of Economics and Law

Distribution and Growth

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1. Introduction: The Post-Keynesian (and the Classical and Marxian) vs. Neoclassical theories of distribution and growth

A1. Neoclassical theory

First principles:

1. Given production technology (function) and utility function
2. Given initial endowments
3. Maximising behaviour in competitive markets

Determine:

1. Income distribution (technology + initial endowments)
2. Growth (exogenous growth of labour force and exogenous productivity growth) at full employment.

   Capital stock growth is determined by saving and has no effect on equilibrium growth rate (‚natural growth rate‘) but only on the growth path (Solow, Swan)

A2. New neoclassical growth theory
(Romer, Lucas, …)

- Productivity growth and hence full employment growth path is endogenised (AK model, human capital, R&D, …)
- Technical progress is determined by technology and preferences
- Saving determines (broad) investment, which has a permanent effect on equilibrium growth rate (natural growth rate)

➔ Thriftiness is beneficial with respect to growth rate

Critique:

- New growth theory needs specific parameters to generate stable growth (Solow)
- What about money and effective demand?
- What about aggregate output, capital (and also human capital, …)?
  ➔ ‚Cambridge controversies in the theory of capital‘ (Lazzarini, A. 2011)

B. Classical, Marx‘s and Post-Keynesian approaches

- No a-historical first principles, theories are meant to explain ‚stylised facts‘ (Kaldor)

- Distribution and capital accumulation/growth are interdependent

- Explicit theories of distribution (‚degree of freedom‘ in price theory to be closed by socio-institutional factors)

B1. Classical and orthodox Marxian approach

- Distribution is determined by socio-institutional factors: subsistence wage and/or class struggle
- With a given technology this determines the rate of profit
- Rate of profit determines the rate of capital accumulation and growth: $g = s_{\Pi} r$
  (Classical version of Say‘s Law: S ➔ I)
- Unemployment is a persistent feature
- Capital accumulation feeds back negatively on the rate of profit in the long run
  ➔ tendency of the rate of profit to fall
  ➔ deep crisis (Marx) or stationary state (Ricardo)

B2. Post-Keynesian approach

- Capital accumulation is independent of saving, I ➔ S, no Say‘s law (➔ Robinson 1962, pp. 82-83)
- Harrod, Domar: Explore conditions for balanced growth, Harrod detects instability of ‚warranted rate of growth‘
- Kaldor, Pasinetti, Robinson: Capital accumulation (and hence growth) determines the rate of profit and thus income distribution in the long run: $r = g/s_{\Pi}$
- Kalecki, Steindl: Capital accumulation determines the growth and the degree of utilisation of productive capacities also in the long run; distribution is determined mainly by mark-up pricing in incompletely competitive markets.
- Endogenous growth models driven by effective demand, i.e. productivity growth is also demand determined

“The Keynesian models (including our own) 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, pp. 82-83)

2. Post-Keynesian distribution and growth theory I: Kaldor and Joan Robinson

Literature: Kaldor (1955/56; 1957; 1961), Robinson (1956, 1962), Pasinetti (1974), King (2010), Kurz/Salvadori (2010), Marglin (1984), Lavoie (1992, chapters 6.1-6.2).

1. Kaldor (1955/56; 1957; 1961), Kaldor/Mirrlees (1962), Pasinetti (1962)

➔Formal full employment distribution and growth models

2. Kaldor (1966; 1970; 1972; 1985; 1996), Thirlwall (1979, …)

➔Kaldor's applied economics of growth (Thirlwall 1987): sectoral and regional differences and divergences, dynamic returns to scale, cumulative causation and path dependence, export-led growth

Robinson (1956; 1962)

➔ critical of the use of equilibrium models in economics, on the one hand, but aware of the usefulness of aggregation and abstract modelling, on the other hand.

➔ Logical and historical time
"Today is a break in time between an unknown future and an irrevocable past. What happens next will be the result from the interactions of the behaviour of human beings within the economy. Movement can only be forward." (Robinson 1962, p. 26)

➔ Comparison of equilibrium positions is okay, but observed history is no movement along an equilibrium growth path

➔ „path dependence"

- "(…) in most economic reactions the path the market follows, while it is adapting itself to a change, has a long-persisting effect upon the position that it reaches" (Robinson 1956, p. 58).

A Kaldor-Robinson model

'post-Keynesian' (Kurz/Salvadori 1997),
'neo-Keynesian' (Dutt 1990; Lavoie 1992; Marglin 1984),
'Keynesian-type' (Amadeo 1986)

- closed economy without a government sector
- two classes: workers and capitalists
- workers receive wages and don't save
- excess labour supply
- capitalists own MoP and receive profits which are partly consumed partly saved
- capitalists decide about investment in capital stock
- fixed coefficient technology, no technical progress
- no depreciations
- no overhead labour
- competitive markets with flexible prices

Rate of profit:

$$(1) \qquad r = \frac{\Pi}{pK} = \frac{\Pi}{pY}\frac{Y}{Y^p}\frac{Y^p}{K} = \frac{pY - wL}{pY}\frac{Y}{Y^p}\frac{Y^p}{K} = \frac{Y - w^r L}{Y}\frac{Y}{Y^p}\frac{Y^p}{K} = (1 - w^r a)u\frac{1}{v}.$$

Capital-output ratio (v) and labour-output ratio (a) are constant

Full or normal utilisation of potential output given by the capital stock:

$$(2) \qquad u^* = u_n = 1$$

$$(3) \qquad r = (1 - w^r a)\frac{1}{v},$$

Classical saving hypothesis:

$$(4) \qquad \sigma = \frac{S}{pK} = \frac{s_\Pi \Pi}{pK} = s_\Pi r, \qquad 0 < s_\Pi \leq 1$$

Capital accumulation is determined by „animal spirits“ and rate of profit

$$(5) \qquad g = \frac{pI}{pK} = \alpha + \beta r^e, \qquad \alpha, \beta > 0$$

In each period, saving rate adjusts to accumulation rate by means of a change in the rate of profit (redistribution).

Long-run goods market equilibrium:

(6) $$r^{*} = r_t = r_t^{e} = r_{t-1}\,.$$

From equations (4) and (5):

(7) $$g\left(r^{*}\right) = \sigma\left(r^{*}\right) \qquad \Rightarrow \qquad r^{*} = \frac{\alpha}{s_{\Pi} - \beta}\,.$$

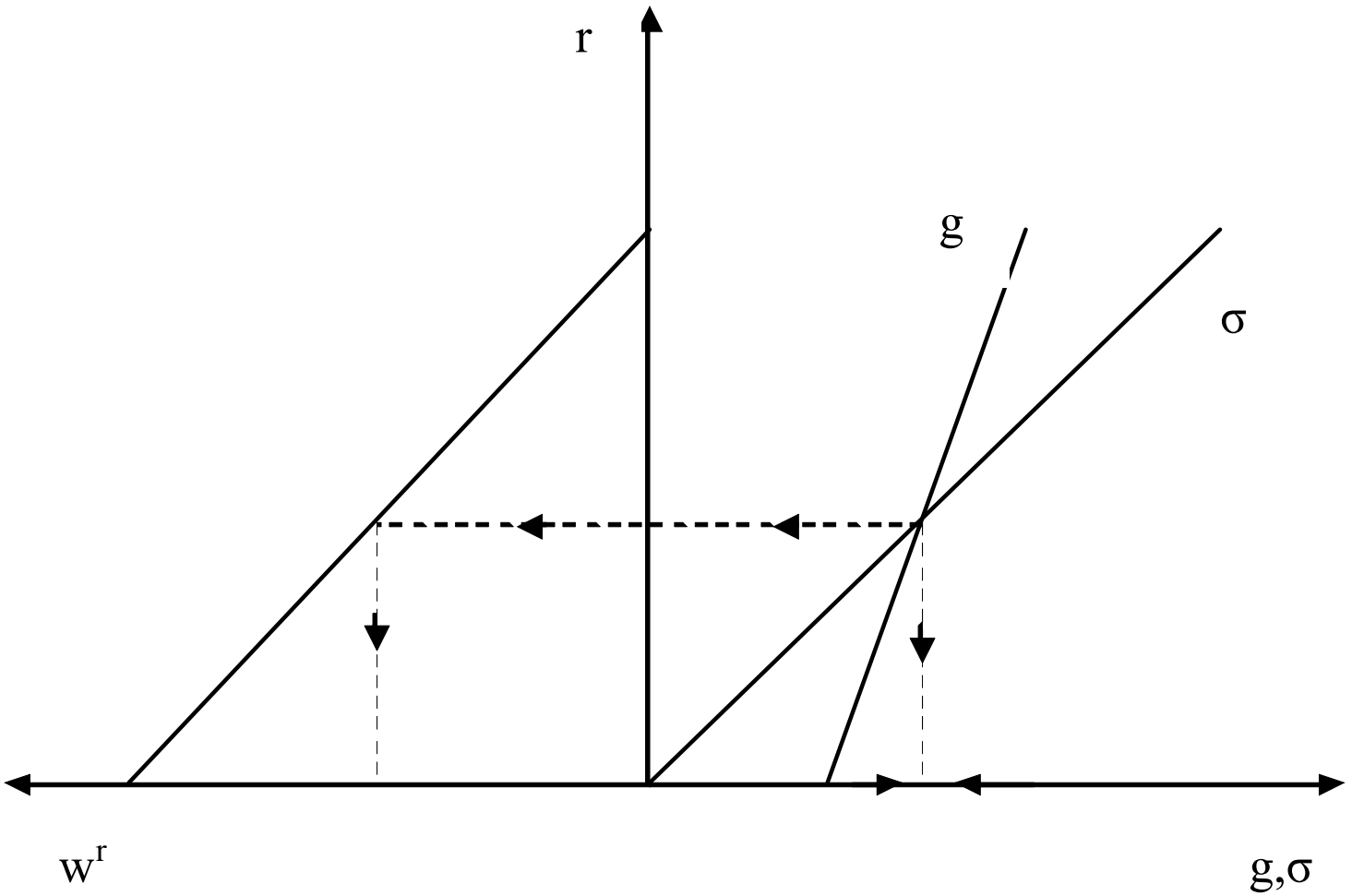
Equilibrium accumulation rate inserting (7) into (4) or (5):

(8) $$g^{*} = \sigma^{*} = \frac{s_{\Pi}\alpha}{s_{\Pi} - \beta}\,.$$

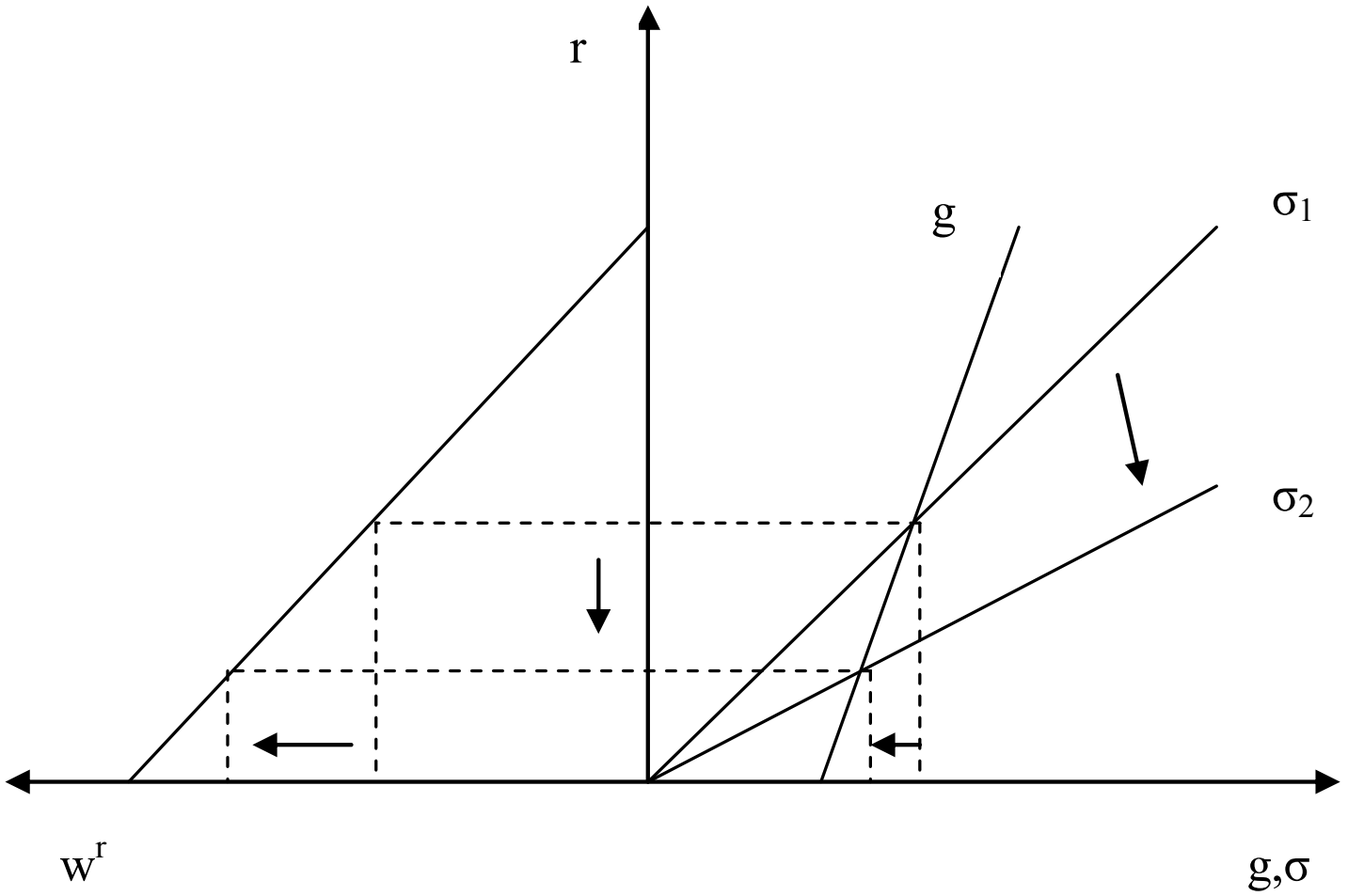
Stability condition:

(9) $$\frac{\partial \sigma}{\partial r} - \frac{\partial g}{\partial r} > 0 \qquad \Rightarrow \qquad s_{\Pi} - \beta > 0\,.$$

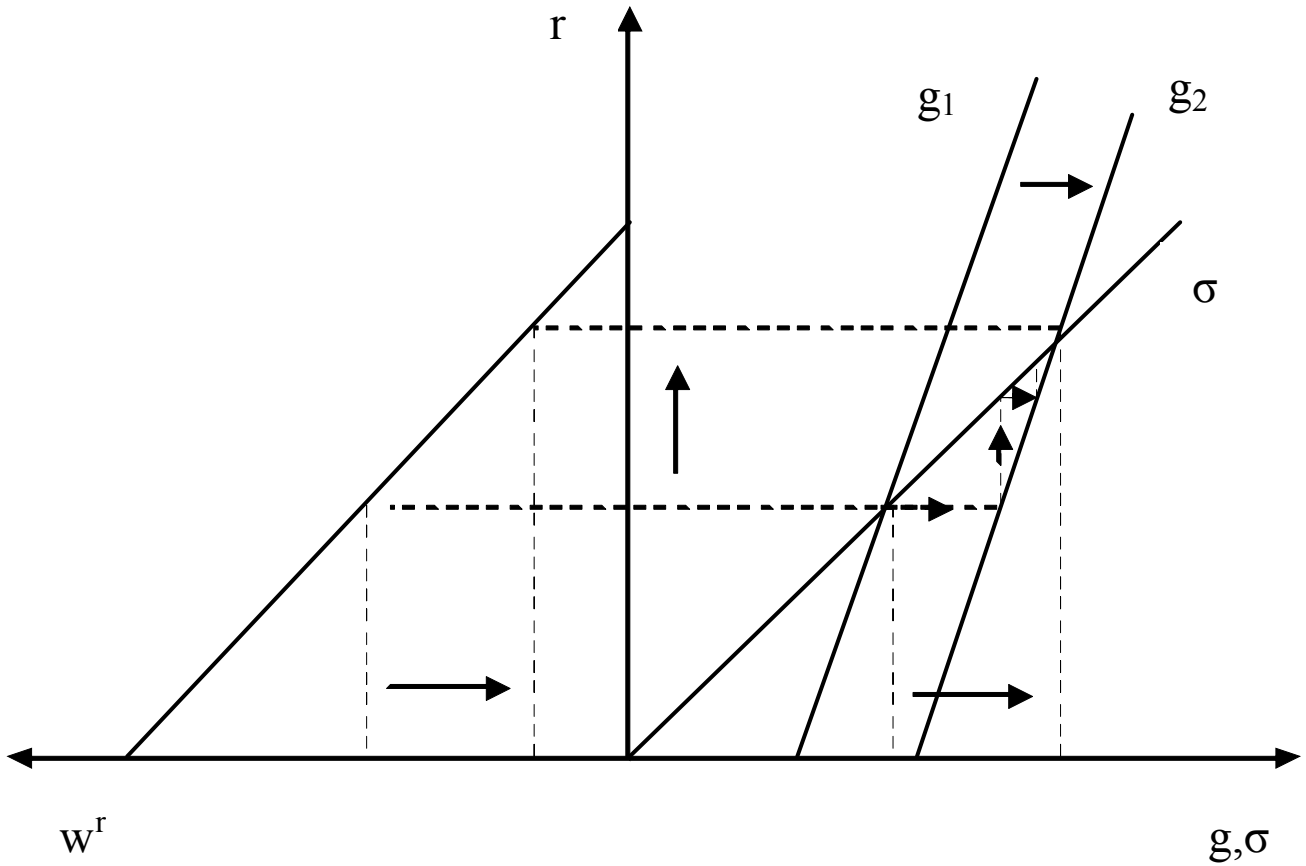
The accumulation equilibrium in the Kaldor-Robinson model



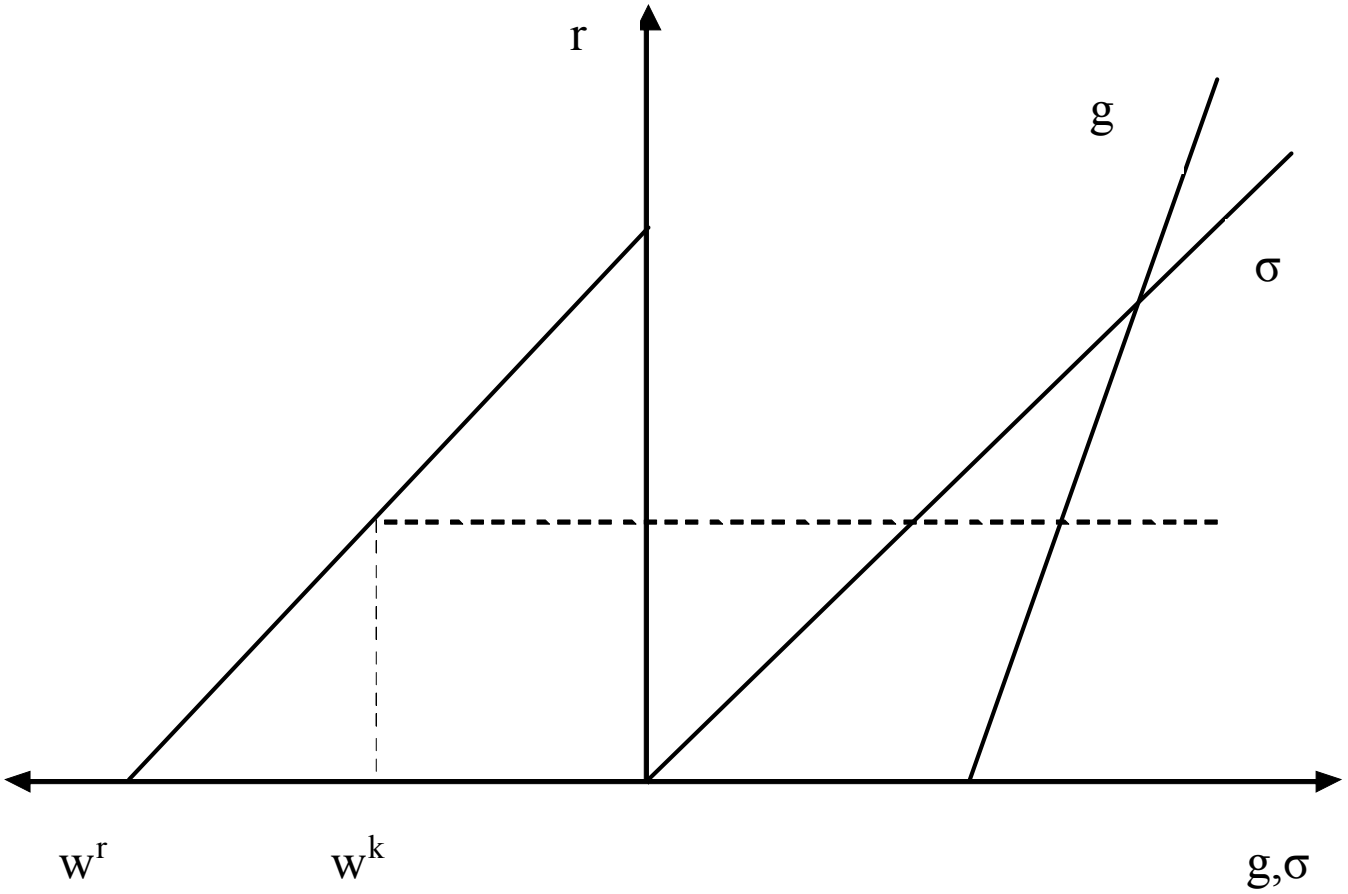
The paradox of saving in the Kaldor-Robinson model



An increase of the propensity to accumulate in the Kaldor-Robinson model



The inflation barrier in the Kaldor-Robinson model



w^k: convential real wage rate, minimum real wage rate from the perspective of the workers

Inflation barrier requires lower investment or higher propensity to save

"When it is the real wage (whether at a miserable or a comfortable level) which limits the rate of growth, greater thriftiness makes more investment possible in a perfectly straightforward and unambiguous sense." (Robinson 1962, p. 63)

➔ rentiers' demand for distributed problems is the problem

Assessing the Kaldor-Robinson model of distribution and growth

1. Against neoclassical economics it has been demonstrated that the rate of profit is independent of technology and is only determined by behaviour of capitalists (Pasinetti)
2. Adjustments have to assume prices to be more flexible than money wages in the long-run
3. Real wage rate is only a residual variable. Distribution conflict does not matter, apart from inflation barrier.
4. Long-run normal (full) utilisation of the capital stock implies strictly inverse relationship between real wage rate and the rate of profit. No adjustment via capacity utilisation.
5. Simple accumulation function which does not explicitly capture the effects on the rate of profit (unit labour costs + capacity utilisation)

3. Post-Keynesian distribution and growth theory II: Kalecki, Steindl and Kaleckian models

Literature: Kalecki (1954; 1971), Steindl ([1952] 1976), Amadeo (1986), Bhaduri/Marglin (1990), Blecker (2002), Dutt (1984; 1987; 2011), Kurz (1994), Rowthorn (1981)

Lavoie (1992, chapters 6.3-6.4)

Kalecki (1954; 1971)

- Theory of effective demand based on Marx‘s Schemes of Reproduction

- Theory of pricing and distribution:
  - demand determined prices in primary sector
  - cost determined prices in industrial + service sector
  ➔ constant marginal and average variable costs
  ➔ mark-up pricing in oligopolistic markets
  ➔ underutilisation of productive capacities
  ➔ changes in demand trigger changes in output and not in prices

"In fact, ***the long-run trend is but a slowly changing component of a chain of short-period situations; it has no independent entity***, ..." (Kalecki 1971, p. 165, my emphasis)

"Even on the *average* ***the degree of utilisation throughout the business cycle will be substantially below the maximum reached during the boom …The reserve of capital equipment and the reserve army of unemployed are typical features of capitalist economy at least throughout a considerable part of the cycle***." (Kalecki 1971, p. 137, my emphasis)

Steindl ([1952] 1972)

- Tendency towards oligopoly, price rigidity, excess capacity
- Maldistribution of funds: incomplete re-investment in oligopolies, lack of funds in competitive industries
- Weakening of aggregate demand, which is self-reinforcing ➔ stagnation in mature capitalism due to protection of ‚too high profit margins‘

The basic Kaleckian/Steindlian model

- long-run unemployment ➔ no scarcity of labour
- income distribution determined by mark-up pricing
- capacity utilisation is usually below full utilisation in the long run ➔ endogenous variable also in the long run

- Steindl ([1952]1976), Sylos-Labini (1969): firms hold excess capacity to supply fluctuating demand and to prevent competitors from market entry
- Lavoie (1992): excess capacity does not contradict minimisation of costs ➔ firms might use some plants at an optimal degree of utilisation and others are not used at all
- Nikiforos (2013): minimisation of unit costs via number of shifts ➔ demand affects target rate of utilisation

Harrodian/Marxian critique (Dumenil/Levy, Shaikh, Skott): Why should deviation of utilisation from normal or target rate be considered a long-run equilibrium?

➔ You can be Keynesian/Kaleckian in the short run but have to be Classical/Marxian in the long run!

Hein/Lavoie/van Treeck (2011, 2012):

1. Mechanisms to tame 'Harrodian instability' in the Harrodian/Marxian models are not convincing
   - Kaldorian price mechanism,
   - firms' retention ratio (Shaikh),
   - firms get scared when approaching full employment (Skott),
   - monetary policies step in (Dumenil/Levy)

2. Kaleckian have provided arguments for u to be endogenous in the long run, too:
   - Dutt (2010): normal/optimal rate of utilisation cannot be precisely determined in a world of uncertainty but is rather a range
   - Dallery/van Treeck (2010): firms have multiple goals and accept variations in capacity utililsation and hence deviations from target or normal rate
   - Lavoie (1995): Firms adapt their assessment of the 'normal' rate of utilisation, empirical support by Schoder (2012)
   - Hein (2006): Monetary policy intervention feeds back on stable rate of employment and thus on 'normal' rate of utilisation through interest-cost channel

One-sector-model, closed economy without state, no technical progress, no overhead labor, no depreciations, no intermediate products

$$(1) \qquad r = \frac{\Pi}{pK} = \frac{\Pi}{pY}\frac{Y}{Y^v}\frac{Y^v}{K} = \frac{Y - w^r L}{Y}\frac{Y}{Y^v}\frac{Y^v}{K} = (1 - w^r a)u\frac{1}{v} = hu\frac{1}{v}$$

r: rate of profit, u: rate of capacity utilisation, a: labour output ratio, v: capital potential-output ratio,

Mark-up pricing on unit labour costs determines profit share

$$(14) \quad p = (1+m)\frac{W}{Y} = (1+m)wa, \qquad m > 0$$

$$(15) \quad h = \frac{\Pi}{pY} = \frac{pY - W}{pY} = 1 - \frac{W}{(1+m)W} = 1 - \frac{1}{1+m}$$

Saving function:

$$(16) \quad \sigma = \frac{S}{pK} = \frac{s_\Pi \Pi}{pK} = s_\Pi r = s_\Pi hu\frac{1}{v}, \qquad 0 < s_\Pi \leq 1$$

Determinants of investment?

> "It is interesting to notice that the theory of effective demand, already clearly formulated in the first papers, remains unchanged in all the relevant writings, as do my views on the distribution of national income. However, there is a continuous search for new solutions in the theory of investment decisions, where even the last paper represents – for better or for worse – a novel approach." (Kalecki 1971, p. viii)

Kalecki's ([1933] 1969) early work on the trade cycle:

- profits have a positive effect, capital stock has a negative effect

➔ profit rate has a positive effect on investment decisions

Kalecki (1954):

- Positive effect of internal financial resources ('principle of increasing risk') and sales expectations, negative effect of capital stock in existence, positive effect of innovations, which are required to generate long-run growth

More details: Steindl (1981), Sawyer (1985), Lopez G/Assous (2010)

The Rowthorn-Dutt-model: stagnationism

Rowthorn (1981), Dutt (1984, 1987), Taylor (1983)

(1) $r = hu\frac{1}{v}$

(15) $h = 1 - \frac{1}{1+m}$

(16) $\sigma = s_{\Pi} hu\frac{1}{v}$

(17) $g = \frac{I}{K} = \alpha + \beta u, \qquad \alpha, \beta > 0$

➔ capital accumulation is determined by animal spirits and capacity utilisation (model results do not change if we add the **rate of profit** to the investment function!)

Goods market equlibrium:

(18) $g = \sigma$

Stability condition:

(19) $\frac{\partial \sigma}{\partial u} - \frac{\partial g}{\partial u} > 0 \Rightarrow s_{\Pi} \frac{h}{v} - \beta > 0.$

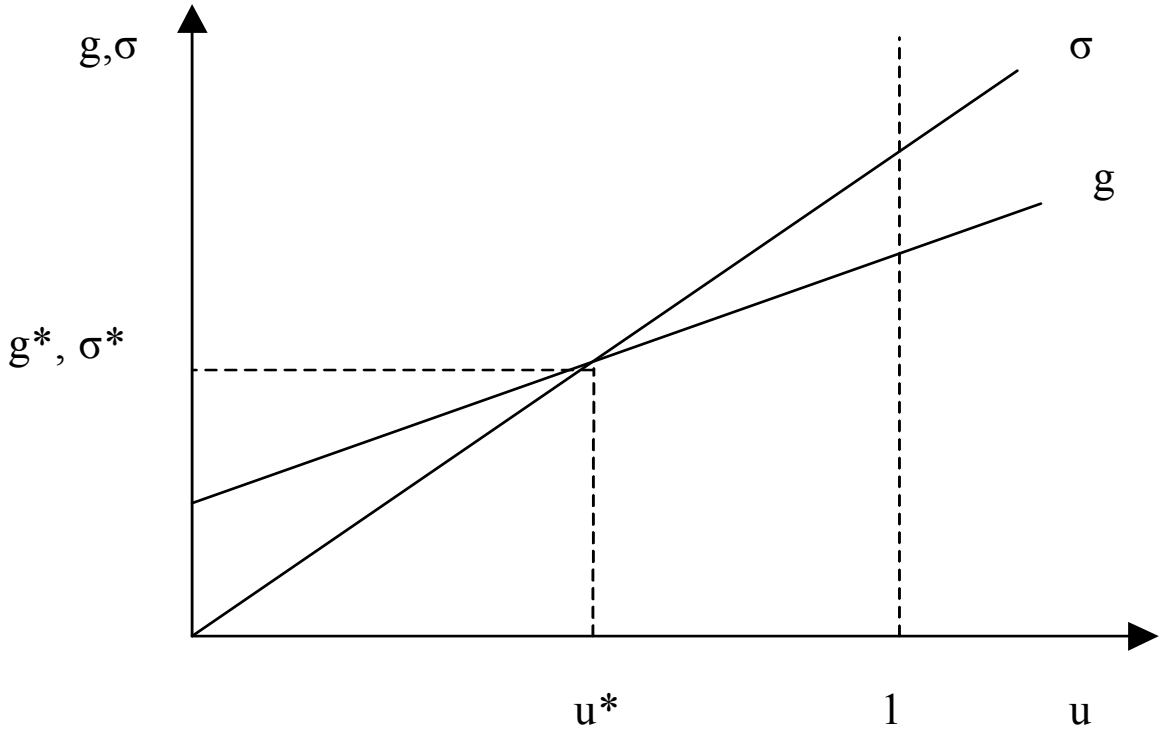
Equilibrium solution:

(20) $u^* = \frac{\alpha}{s_{\Pi} \frac{h}{v} - \beta}$

(21) $g^* = \sigma^* = \frac{s_{\Pi} \frac{h}{v} \alpha}{s_{\Pi} \frac{h}{v} - \beta}$

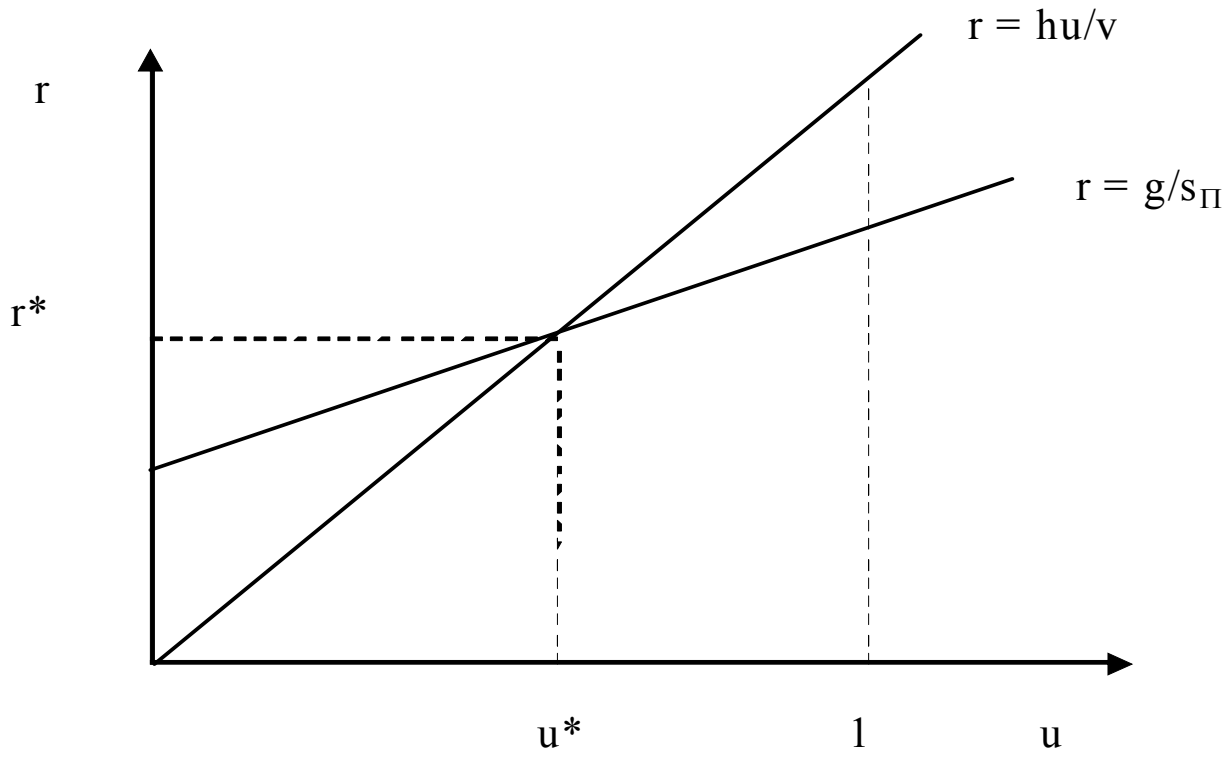
(22) $r^* = \frac{\frac{h}{v} \alpha}{s_{\Pi} \frac{h}{v} - \beta}$

Rate of capital accumulation and rate of capacity utilisation



from equations (16) and (17)

Rate of profit and rate of capacity utilisation



from equation (1) ➔ profits cost curve (Lavoie 1992)

and equations (16) and (18) ➔ effective demand curve (Lavoie 1992)

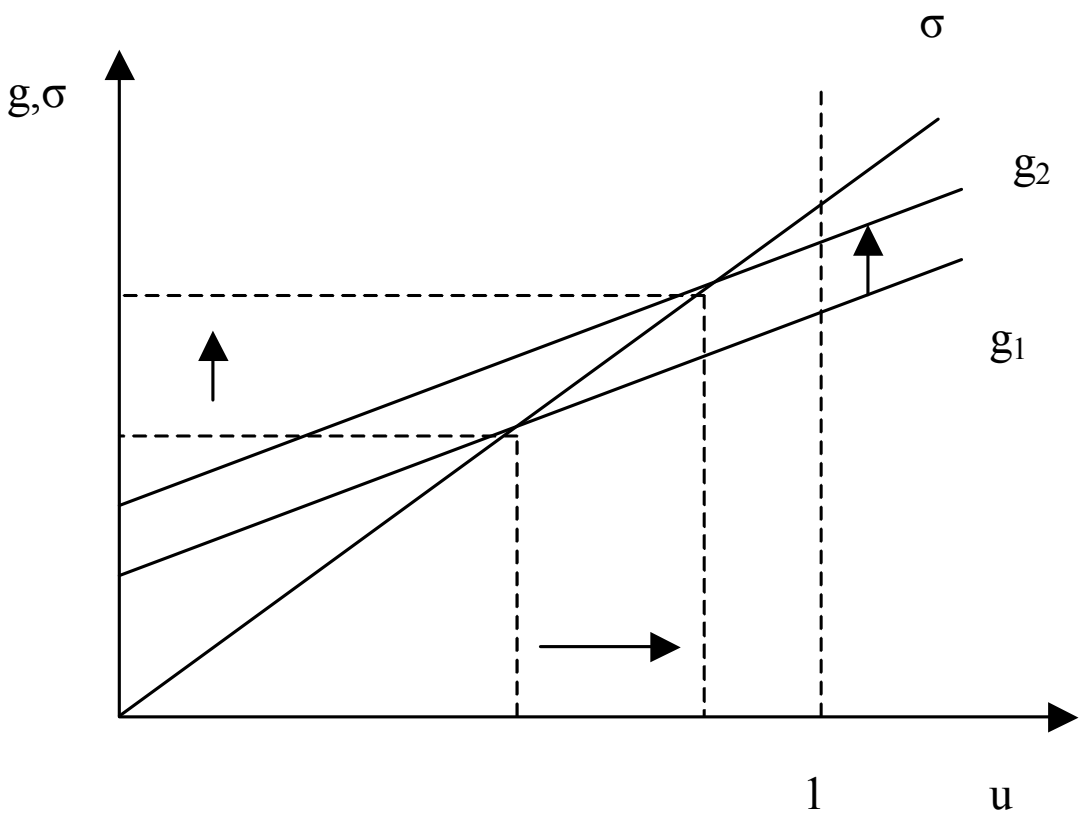
Increasing animal spirits

$$(23)\quad \frac{\partial u^*}{\partial \alpha} = \frac{1}{s_{\Pi}\frac{h}{v} - \beta} > 0$$

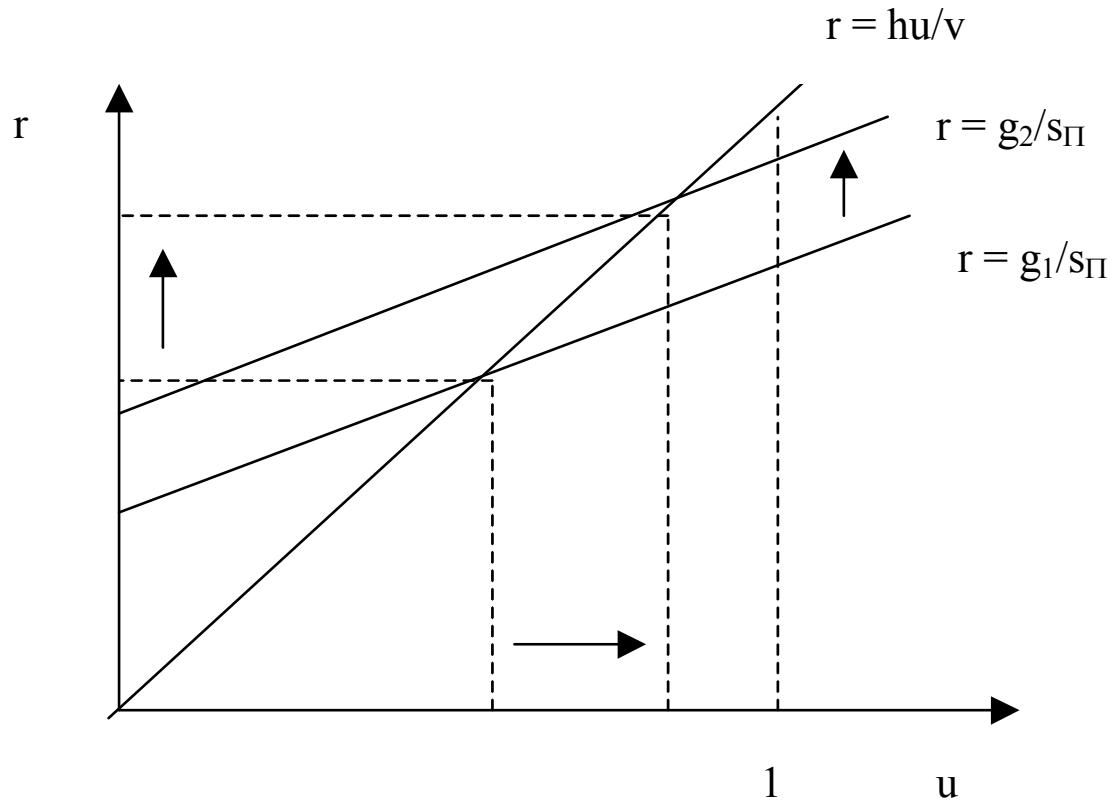
$$(24)\quad \frac{\partial g^*}{\partial \alpha} = \frac{s_{\Pi}\frac{h}{v}}{s_{\Pi}\frac{h}{v} - \beta} > 0$$

$$(25)\quad \frac{\partial r^*}{\partial \alpha} = \frac{\frac{h}{v}}{s_{\Pi}\frac{h}{v} - \beta} > 0$$

Rate of capital accumulation and rate of capacity utilisation: increasing animal spirits



Rate of profit and rate of capacity utilisation: increasing animal spirits



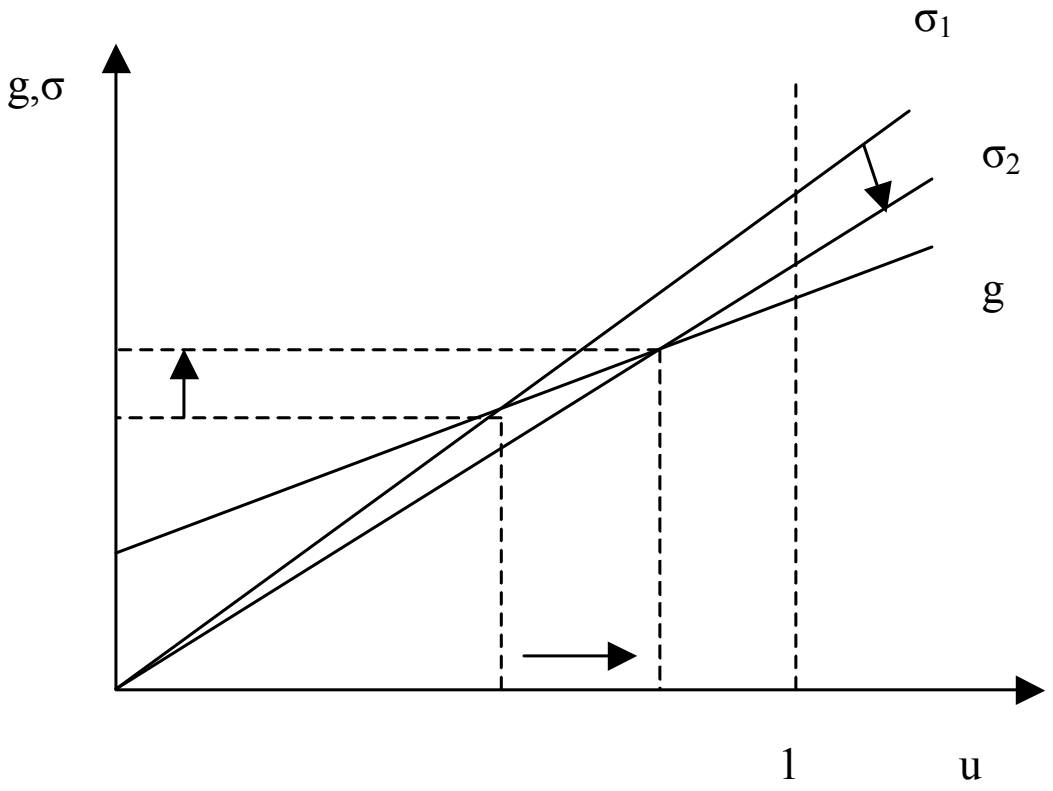
The paradox of saving

$$(26)\quad \frac{\partial u^*}{\partial s_П} = \frac{-\alpha \frac{h}{v}}{(s_П \frac{h}{v} - \beta)^2} < 0$$

$$(27)\quad \frac{\partial g^*}{\partial s_П} = \frac{-\alpha\beta \frac{h}{v}}{(s_П \frac{h}{v} - \beta)^2} < 0$$

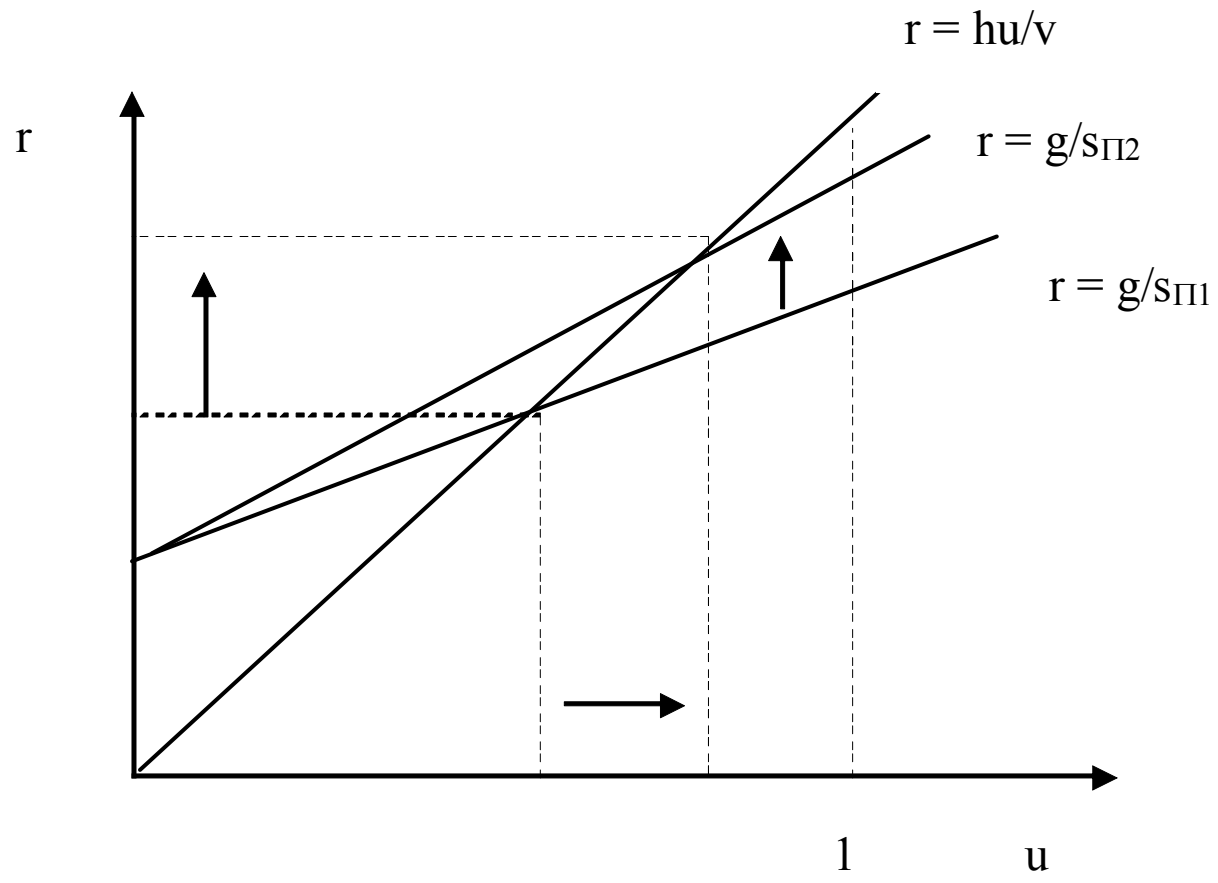
$$(28)\quad \frac{\partial r^*}{\partial s_П} = \frac{-\alpha \frac{h^2}{v^2}}{(s_П \frac{h}{v} - \beta)^2} < 0$$

Rate of capital accumulation and rate of capacity utilisation: decreasing propensity to save out of profits



Rate of profit and rate of capacity utilisation:

decreasing propensity to save out of profits



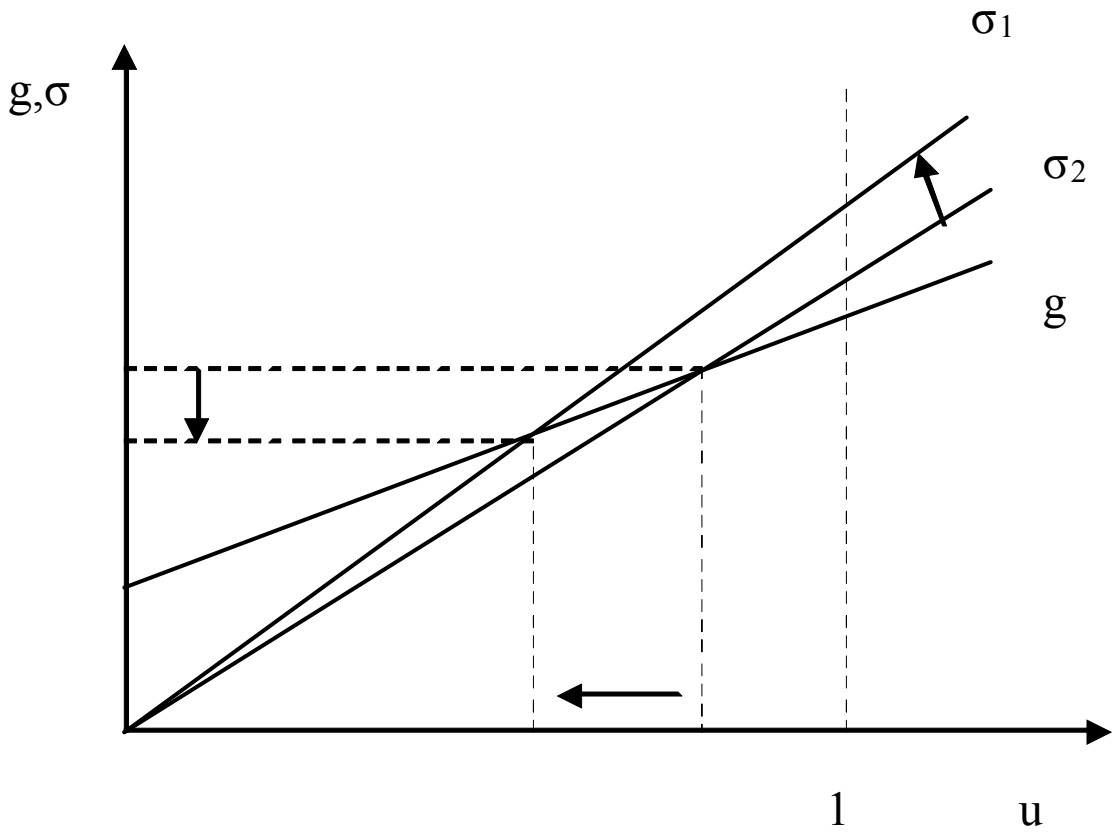
The paradox of costs

$$(29)\quad \frac{\partial u^*}{\partial h} = \frac{-\alpha s_{\Pi} \frac{1}{v}}{(s_{\Pi} \frac{h}{v} - \beta)^2} < 0$$

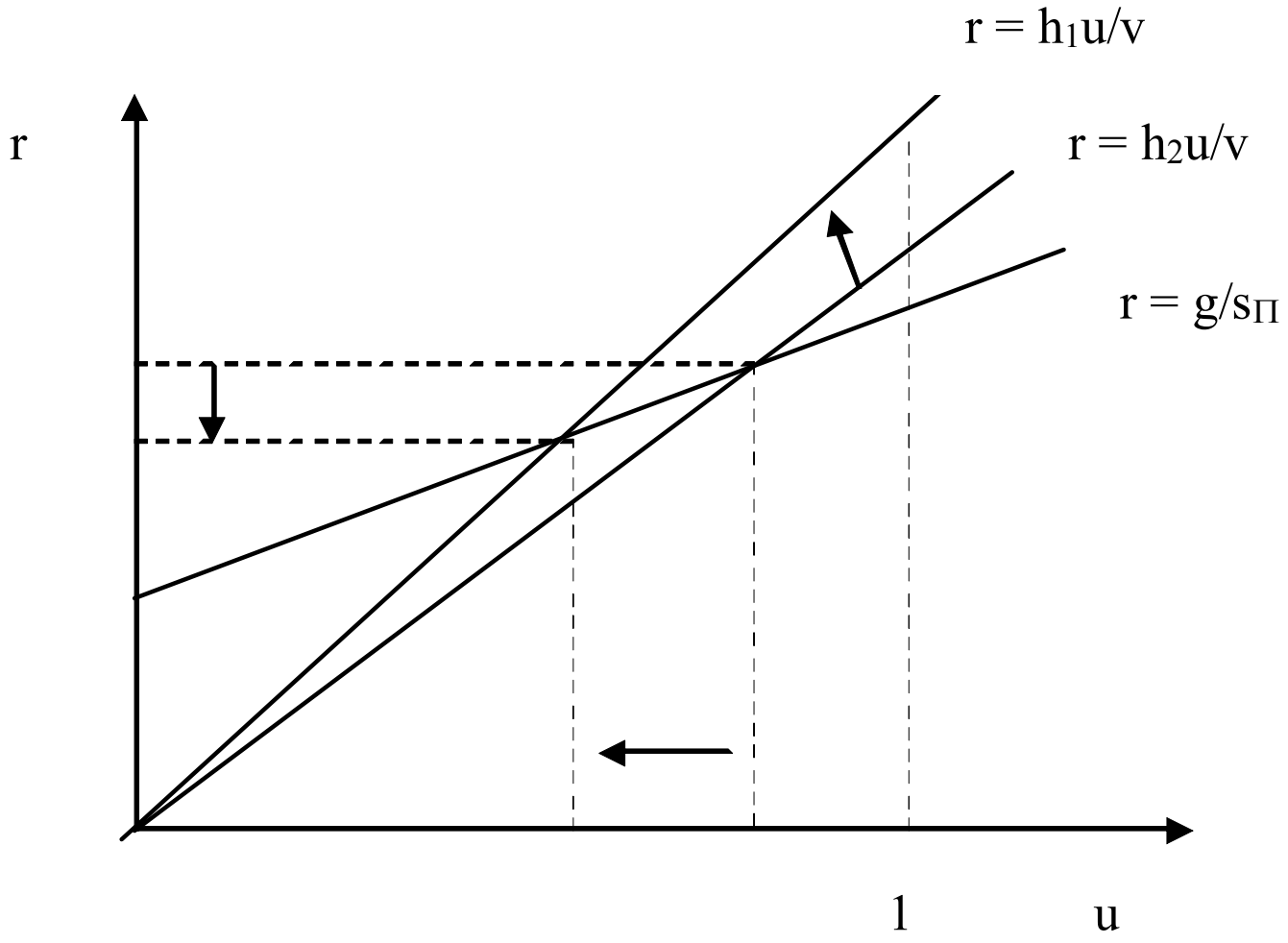
$$(30)\quad \frac{\partial g^*}{\partial h} = \frac{-\alpha\beta s_{\Pi} \frac{1}{v}}{(s_{\Pi} \frac{h}{v} - \beta)^2} < 0$$

$$(31)\quad \frac{\partial r^*}{\partial h} = \frac{-\alpha\beta \frac{1}{v}}{(s_{\Pi} \frac{h}{v} - \beta)^2} < 0$$

Rate of capital accumulation and rate of capacity utilisation: increasing profit share/decreasing wage share



Rate of profit and rate of capacity utilisation: increasing profit share/decreasing wage share



The Bhaduri/Marglin-model: different demand and accumulation regimes

Bhaduri/Marglin (1990), Marglin/Bhaduri (1990, 1991)

„(...) a higher profit share and a higher rate of capacity utilization can each be argued to induce higher profit expectations, the first because the unit return goes up, the second because the likelihood of selling extra units of output increases.“ (Marglin/Bhaduri 1990, p. 163)

(1) $$r = hu\frac{1}{v}$$

(15) $$h = 1 - \frac{1}{1+m}$$

(16) $$\sigma = s_{\Pi} hu\frac{1}{v}$$

(32) $$g = \frac{I}{K} = \alpha + \beta u + \tau h, \qquad \beta, \tau > 0$$

➔ investment decisions are determined by animal spirits, capacity utilisation and unit costs/unit profits/profit share

(18) $$g = \sigma$$

(19) $$\frac{\partial \sigma}{\partial u} - \frac{\partial g}{\partial u} > 0 \Rightarrow s_{\Pi}\frac{h}{v} - \beta > 0.$$

Equilibrium:

$$(33)\quad u^* = \frac{\alpha + \tau h}{s_{\Pi}\frac{h}{v} - \beta}$$

$$(34)\quad g^* = \sigma^* = \alpha + \beta\frac{\alpha + \tau h}{s_{\Pi}\frac{h}{v} - \beta} + \tau h = \frac{s_{\Pi}\frac{h}{v}(\alpha + \tau h)}{s_{\Pi}\frac{h}{v} - \beta}$$

$$(35)\quad r^* = \frac{\frac{h}{v}(\alpha + \tau h)}{s_{\Pi}\frac{h}{v} - \beta}$$

The paradox of saving

Note that from (33) we have: $\alpha + \tau h > 0$

$$(36)\quad \frac{\partial u^*}{\partial s_{\Pi}} = \frac{-\frac{h}{v}(\alpha + \tau h)}{(s_{\Pi}\frac{h}{v} - \beta)^2} < 0$$

$$(37)\quad \frac{\partial g^*}{\partial s_{\Pi}} = \frac{-\frac{h}{v}\beta(\alpha + \tau h)}{(s_{\Pi}\frac{h}{v} - \beta)^2} < 0$$

$$(38)\quad \frac{\partial r^*}{\partial s_{\Pi}} = \frac{-\frac{h^2}{v^2}(\alpha + \tau h)}{(s_{\Pi}\frac{h}{v} - \beta)^2} < 0$$

An increasing profit share/decreasing wage share:

$$(39)\quad \frac{\partial u^*}{\partial h} = \frac{-\tau\beta - s_\Pi \frac{1}{v}\alpha}{(s_\Pi \frac{h}{v} - \beta)^2} < 0 \text{ or } > 0$$

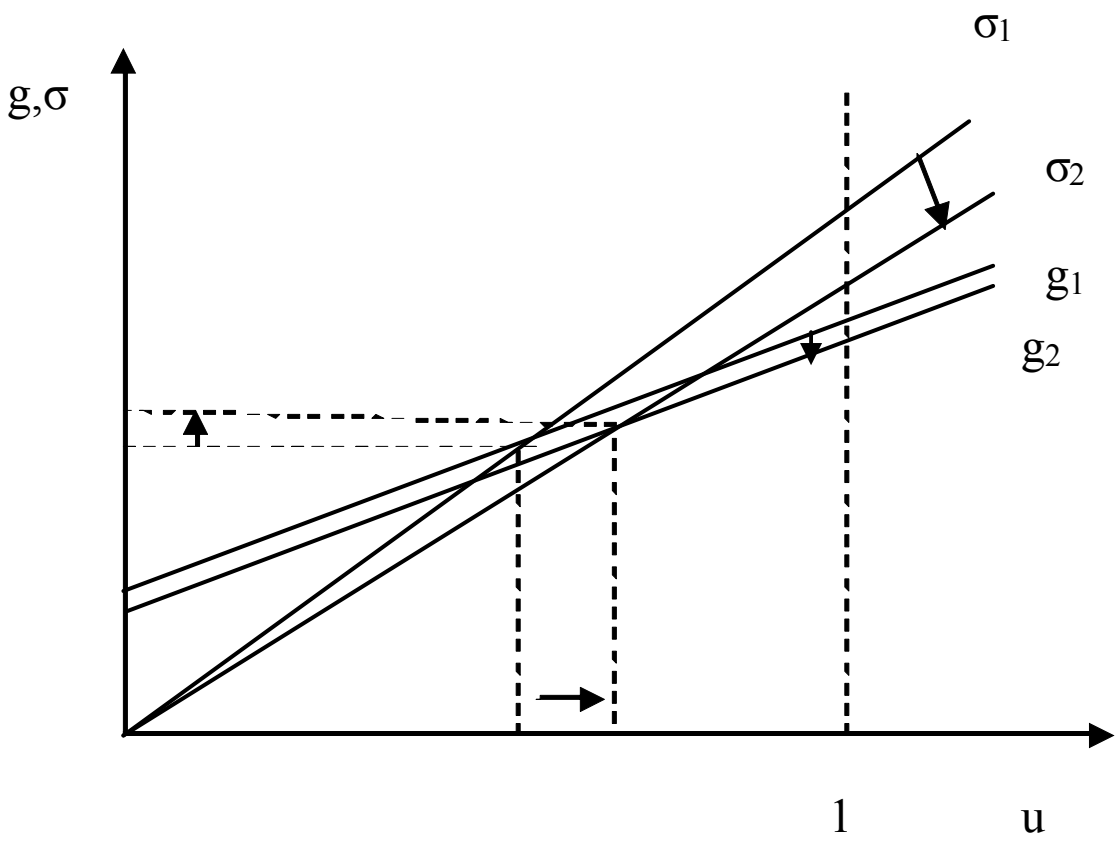
$$(40)\quad \frac{\partial g^*}{\partial h} = \beta \frac{-\tau\beta - s_\Pi \frac{1}{v}\alpha}{(s_\Pi \frac{h}{v} - \beta)^2} + \tau > 0 \text{ or } < 0$$

➔ paradox of costs is not generally valid

➔ 'stagnationist' or 'exhilarationist' demand regime (39)

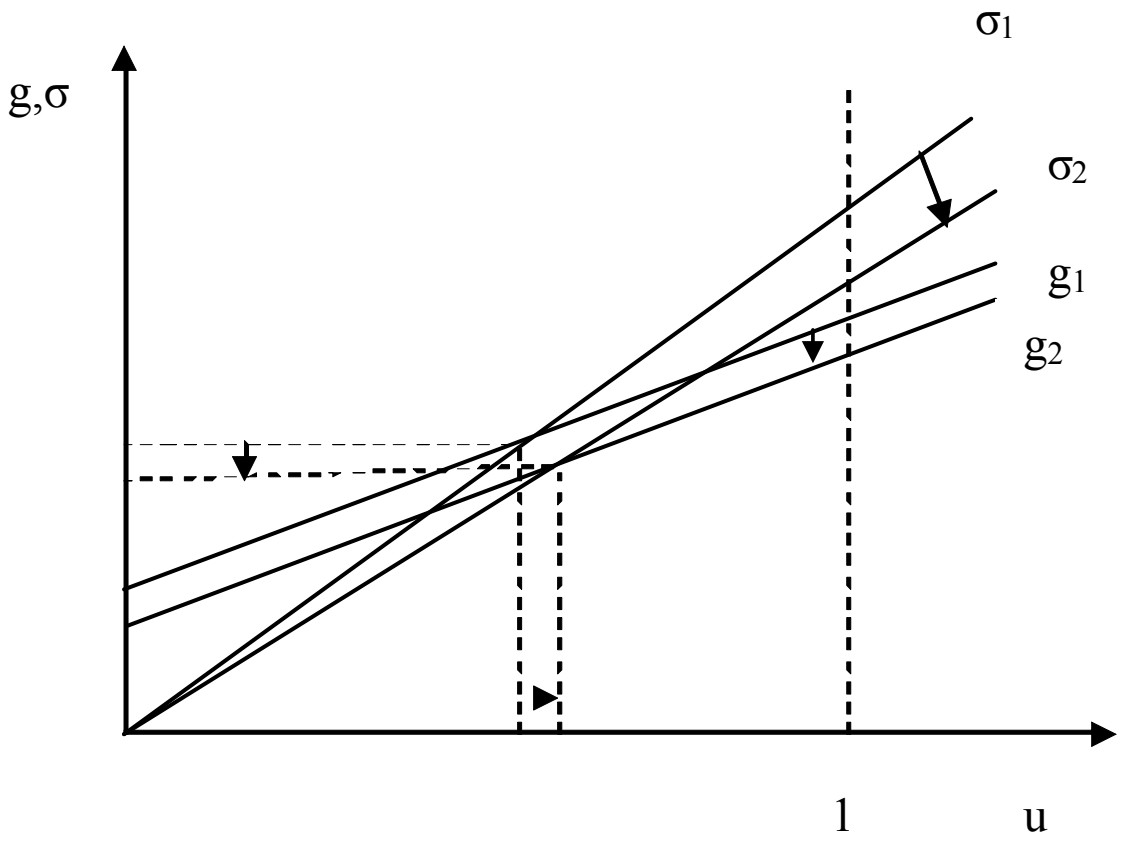
➔ wage-led or profit-led growth (40)

Rate of capital accumulation and rate of capacity utilisation: increasing wage share/decreasing profit share



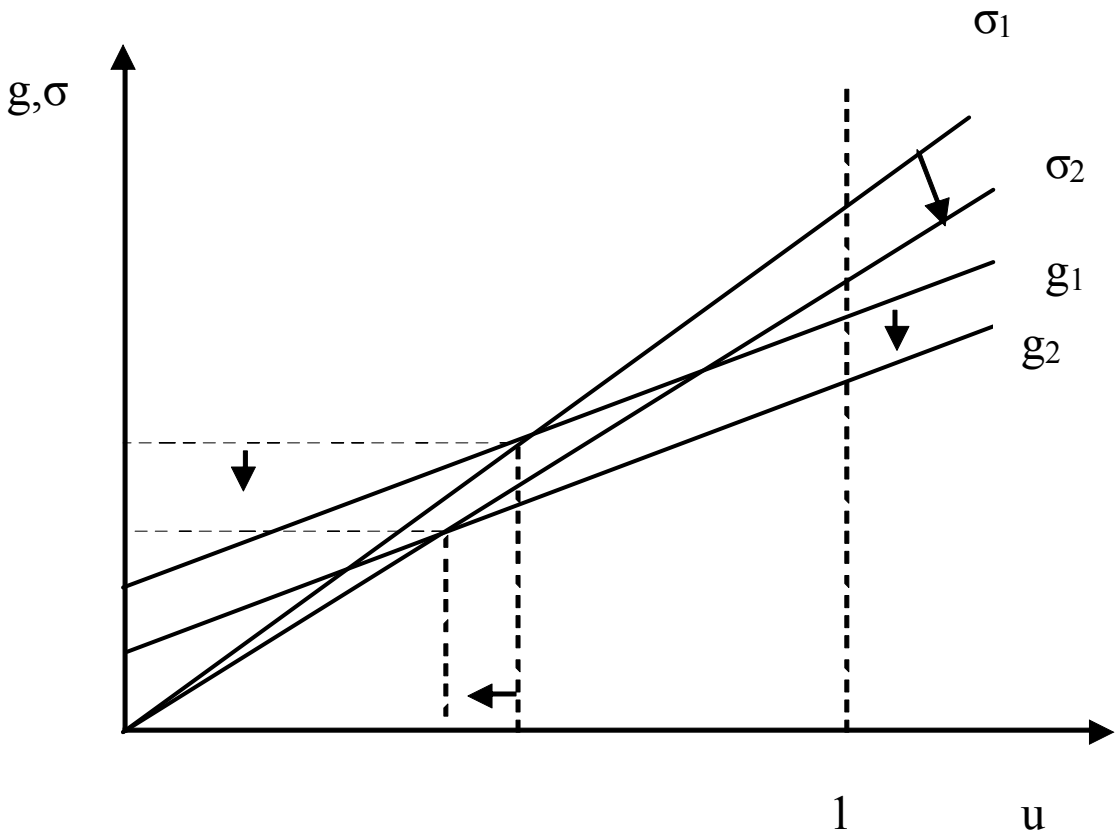
➔ stagnationist demand + wage-led growth

Rate of capital accumulation and rate of capacity utilisation: increasing wage share/decreasing profit share



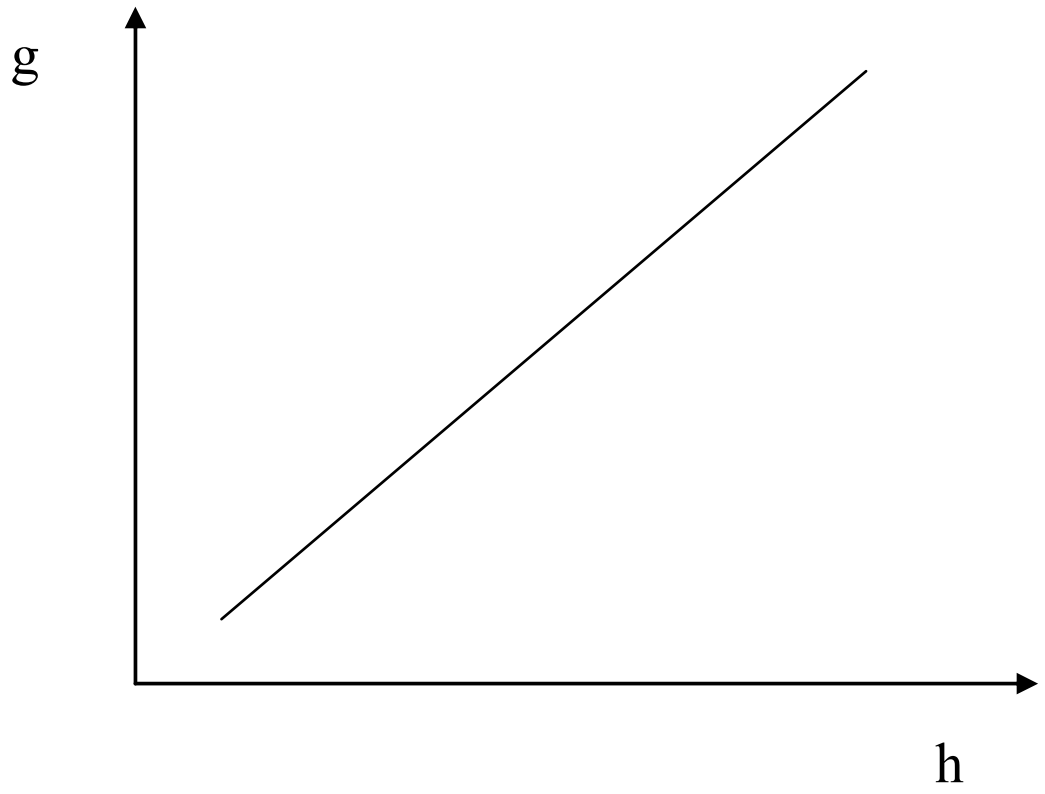
➔ stagnationist demand + profit-led growth

Rate of capital accumulation and rate of capacity utilisation: increasing wage share/decreasing profit share



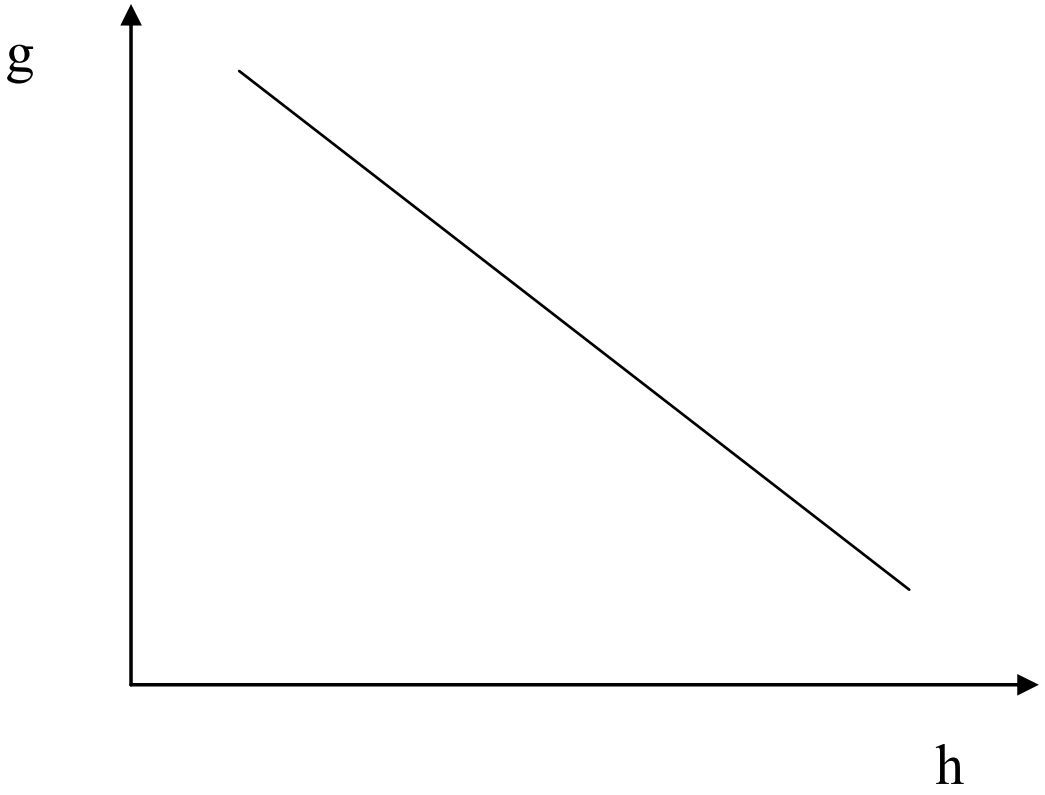
➔ exhilarationist demand + profit-led growth

Profit-led accumulation/growth



➔ low propensity to save out of profits, weak effect of capacity utilisation on accumulation, strong effect of unit profits/unit wage costs on accumulation

Wage-led accumulation/growth



➔ high propensity to save out of profits, strong effect of capacity utilisation on accumulation, weak effect of unit profits/unit wage costs on accumulation

$$(41)\quad \frac{\partial r^*}{\partial h} = \frac{1}{v}\frac{(\alpha + \tau h)}{s_\Pi \frac{h}{v} - \beta} + \frac{h}{v}\frac{-\tau\beta - s_\Pi \frac{1}{v}\alpha}{(s_\Pi \frac{h}{v} - \beta)^2}$$

➔ positive direct effect of increasing profit share on the profit rate but negative indirect effect via capacity utilisation

➔ overall effect is not determined

„Particular models such as that of ‘cooperative capitalism’ enunciated by the left Keynesian social democrats, the Marxian model of ‘profit squeeze’ or even the conservative model relying on ‘supply-side’ stimulus through high profitability and a low real wage, fit into the more general Keynesian theoretical scheme. They become particular variants of the theoretical framework presented here.“ (Bhaduri/Marglin 1990, p. 388)

➔ demand and growth regimes may switch over time

➔ empirical research has to determine the prevailing demand and growth regime!

4. Extending the basic Kaleckian model: workers‘ saving and open economy

Literature: Blecker (1989, 2002, 2011), Bhaduri/Marglin (1990), (Hein/Vogel 2008)

Hein/Vogel (2008)

Open economy, no activity by the state, import of (raw) materials, export of goods which compete with foreign producers, foreign prices are given and change in step. Nominal exchage rate (domestic currency/foreign currency) is exogenous

(1) $$p = (1+m)\left(\frac{w}{y} + p_f e \mu\right), \qquad m > 0$$

➔ mark-up pricing on constant unit variable costs

(2) $$z = \frac{p_f e \mu}{\frac{w}{y}}$$

➔ relationship between unit material and unit labour costs

(3) $$p = (1+m)\frac{w}{y}\left(1 + \frac{p_f e \mu}{\frac{w}{y}}\right) = (1+m)\frac{w}{y}(1+z)$$

➔ Prices depend on mark-up, unit labour costs, and relationship between unit material and unit labour costs

p	prices
p_f	foreign prices
m	mark-up
w	nominal wage rate
y	labour-productivity
e	nominal exchange rate
μ	unit material inputs
z	relationship between unit material costs and unit labour costs

Profit share depends on mark-up and on the relationship between material and labour costs

$$\textbf{(4)}\quad h = \frac{\Pi}{\Pi + W} = \frac{m\frac{w}{y}(1+z)}{m\frac{w}{y}(1+z)+\frac{w}{y}} = \frac{m(1+z)}{1+m(1+z)} = \frac{1}{\frac{1}{(1+z)m}+1}$$

International competitiveness is given by real exchange rate

$$\textbf{(5)}\quad e_r = \frac{ep_f}{p}$$

h	profit share
Π	profits
W	wages
e_r	real exchange rate

Rising real exchange rate implies increasing competiveness

$$\textbf{(6)}\quad \hat{e}_r = \hat{e} + \hat{p}_f - \hat{p}$$

Increasing profit share caused by an increasing mark-up implies falling competiveness

$$\textbf{(7)} \quad \frac{\partial e_r}{\partial m} = \frac{-ep_f\left(\frac{w}{y} + p_f e\mu\right)}{p^2} < 0$$

Increasing profit share caused by falling nominal wages implies increasing competiveness

$$\textbf{(8)} \quad \frac{\partial e_r}{\partial w} = \frac{-ep_f(1+m)\frac{1}{y}}{p^2} < 0$$

Increasing profit share caused by nominal depreciation of domestic currency implies increasing competiveness

$$\textbf{(9)} \quad \frac{\partial e_r}{\partial e} = \frac{p_f p - ep_f(1+m)p_f\mu}{p^2} = \frac{p-(1+m)\mu ep_f}{\frac{p^2}{p_f}} > 0$$

(10)

$$e_r = e_r(h), \qquad \frac{\partial e_r}{\partial h} > 0, \text{ if } \Delta z > 0 \text{ and } \Delta m = 0,$$

$$\frac{\partial e_r}{\partial h} < 0, \text{ if } \Delta z = 0 \text{ and } \Delta m > 0.$$

- Increasing profit share caused by an increasing mark-up
➔ falling competitiveness

- Increasing profit share caused by falling nominal wages:
➔ increasing competitiveness

- Increasing profit share caused by nominal depreciation:
➔ increasing competitiveness

(11) $$S = pI + X - M = pI + NX$$

(12) $$\sigma = g + b$$

(13) $$\sigma = \frac{S_{\Pi} + S_W}{pK} = \frac{s_{\Pi}\Pi + s_W(pY - \Pi)}{pK}$$

$$= \left[s_W + (s_{\Pi} - s_W)h\right]\frac{u}{v},$$

$$0 < s_W < s_{\Pi} < 1$$

S	saving
I	investment
X	exports
M	imports
NX	net exports
σ	savings rate
g	rate of capital accumulation
b	net export rate
Y	output
K	capital stock
u	rate of capacity utilization
v	capital-potential output-ratio

(14) $$g = \alpha + \beta u + \tau h, \qquad \alpha, \beta, \tau > 0, \qquad g > 0 \text{ only if } r > r_{min}$$

Net exports depend positively on international competitiveness which is affected by profit share (but not uniquely) and on domestic activity (Marshall-Lerner condition assumed to hold)

(15) $$b = \psi e_r(h) - \phi u, \qquad \psi, \phi > 0$$

(16) $$\frac{\partial \sigma}{\partial u} - \frac{\partial g}{\partial u} - \frac{\partial b}{\partial u} > 0 \qquad \Rightarrow \qquad \left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi > 0.$$

(17) $$u^* = \frac{\alpha + \tau h + \psi e_r(h)}{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi}$$

(18) $$g^* = \frac{\left\{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} + \phi\right\}(\alpha + \tau h) + \beta\psi e_r(h)}{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi}$$

(17a)

$$\frac{\partial u^*}{\partial h} = \frac{\tau - (s_\Pi - s_W)\frac{u}{v} + \psi \frac{\partial e_r}{\partial h}}{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi}$$

(18a)

$$\frac{\partial g^*}{\partial h} = \frac{\tau\left\{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} + \phi\right\} - \beta(s_\Pi - s_W)\frac{u}{v} + \beta\psi \frac{\partial e_r}{\partial h}}{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi}$$

- Change of goods market equilibrium in the face of a change in the profits share: undetermined

➔ Partial positive effect on investment, negative effect on consumption, undetermined effect on net exports

Further implications:

➔ Aggressive wage policies will be successful in rasing the wage share, even with a constant mark-up. In a wage-led economy this will have expansionary effects on domestic demand. However, net exports are affected in the negative, so that the overall effects even in a domestically wage-led economy must not be positive. In a profit-led domestic economy, overall negative effects will emerge for sure.

➔ Nominal wage moderation or nominal depreciation will be expanionary in a domestic profit-led regime. But if the domestic regime is wage-led, the overall effects are uncertain: wage moderation or nominal depreciation will stimulate net exports, but the associated redistribution in favour of profits will have depressing effects on domestic demand in a wage-led economy. The overall effects may hence be negative.

➔ Generally: An overall wage-led regime becomes less likely in an open economy setting.

➔ Empirical method: single equation estimation approaches (Bowles/Boyer 1995)

➔ Limitations:

- Interactions between components of aggregate demand are not considered (➔ Onaran/Stockhammer 2004, Stockhammer/Onaran 2005, Hein/Vogel 2009).
- No feedback from accumulation to distribution (➔ Onaran/Stockhammer 2005, Stockhammer/Onaran 2004)
- Money and finance are not included (➔ Hein/Schoder 2011, Onaran/Stockhammer/Grafl 2011)

➔ Partial model of a private open real economy

Table 1: Demand regimes according to single equation estimation approaches of the Bhaduri/Marglin (1990) model

	Period	Aus-tria	Ger-many	Nether-lands	France	Italy	Spain	Euro area	UK	US	Japan	China
Bowles/ Boyer (1995)	1953/ 61 – 1987	…	profit-led	…	profit-led	…	…	…	wage-led	wage-led	profit-led	…
Gordon (1995)	1955 – 1988	…	…	…	…	…	…	…	…	profit-led	…	…
Naastepad (2006)	1960 – 2000	…	…	wage-led	…	…	…	…	…	…	…	…
Naastepad/ Storm (2007)	1960 – 2000	…	wage-led	wage-led	wage-led	wage-led	wage-led	…	wage-led	profit-led	profit-led	…
Ederer/ Stockhammer (2007)	1960 – 2004	…	…	…	profit-led	…	…	…	…	…	…	…
Stockhammer/ Ederer (2008)	1960 – 2005	profit-led	…	…	…	…	…	…	…	…	…	…
Ederer (2008)	1960 – 2005	…	…	wage-led	…	…	…	…	…	…	…	…
Hein/ Vogel (2008)	1960 – 2005	profit-led	wage-led	profit-led	wage-led	…	…	…	wage-led	wage-led	…	…
Hein/ Vogel (2009)	1960 – 2005	…	wage-led	…	wage-led	…	…	…	…	…	…	…
Stockhammer/ Onaran/ Ederer (2009)	1960 – 2005	…	…	…	…	…	…	wage-led	…	…	…	…
Onaran/ Stockhammer/ Grafl (2011)	1962 – 2007	…	…	…	…	…	…	…	…	wage-led	…	…
Stockhammer/ Hein/ Grafl (2011)	1970 – 2005	…	wage-led	…	…	…	…	…	…	…	…	…
Molero Simmaro (2011)	1978 – 2007	…	…	…	…	…	…	…	…	…	…	profit-led
Onaran/ Galanis (2012)	1960s – 2007	…	wage-led	…	wage-led	wage-led	…	wage-led	wage-led	wage-led	wage-led	profit-led

Source: Hein (2012, pp. 118-119)

Economic policies

- Pursuing a strategy of profit-led growth via the net export channel by relying on a kind of ‘beggar thy neighbour’ policy, may be a successful way for small open economies (f.e. Austria, Netherlands).

- However, it cannot work for medium-sized and large open economies because it will reduce aggregate demand in these economies already in the short run, and in the medium to long run it will also harm the countries‘ trading partners (see: Germany in the EMU!) and, thus finally, the world economy as a whole.

- For medium-sized and large open economies, as Germany, economic policy strategies have to take into account wage-led nature of aggregate demand.

Conclusions and open questions

- Kaleckian models allow for integrated treatment of distribution struggle and principle of effective demand
- Demand and growth regimes can be estimated
- Endogeneity of rate of capacity utilisation may be problematic, has been extensively discussed and will surely be discussed in the future.
- Extensions are required: productivity growth, money and finance, overhead labour, …

5. Extending the basic Kaleckian model: technical progress

Literature: Bhaduri (2006), Cassetti (2003), Dutt (2003; 2006), Hein/Tarassow (2010), Kaldor (1957; 1961; 1966), Lima (2000; 2004), Lavoie (1992, chapter 6.3), Naastepad (2006), Rowthorn (1981)

Hein/Tarassow (2010)

Procedure (Setterfield/Cornwall 2002)

1. Demand regime: based on Bhaduri/Marglin (1990), Blecker (1989), productivity growth is exogenous
2. Productivity regime: based on Rowthorn (1981), Dutt (2003), Cassetti (2003), determination of productivity growth taking GDP or capital stock growth as exogenous
3. Overall regime: interaction of demand and productivity regime, effects of a change in the profit share

Assumptions:

- Distribution is exogenous
- Technical progress is labour saving and capital-embodied

➔ Harrod-neutral technical progress: $K/Y^p = v$ is constant

- Prices of imported inputs, competing international final goods and exchange rates are given

2. The theoretical model

2.1. The demand regime

S: saving	Y: output
I: investment	K: capital stock
Ex: export	Π : profits
Im: import	u: rate of capacity utilisation
σ: saving rate	h: profit share
g: rate of capital accumulation	v: capital-potential output-ratio
b: net export rate	$e_{r:}$ real exchange rate
r: rate of profit	

Goods market equilibrium for an open economy

$$(1) \quad S = pI + (Ex - Im)$$

Normalised by the capital stock

$$(2) \quad \sigma = g + b$$

Saving function a la Kaldor, Kalecki

$$(3) \quad \sigma = \frac{S_\Pi + S_W}{K} = \frac{s_\Pi \Pi + s_W (Y - \Pi)}{K} = \left[s_W + (s_\Pi - s_W)h\right]\frac{u}{v},$$

$$0 \le s_W < s_\Pi \le 1$$

Bhaduri/Marglin investment function plus positive effect of technical progress

$$(4) \quad g = \alpha + \beta u + \tau h + \omega \hat{y}, \quad \alpha, \beta, \tau, \omega > 0, \quad g > 0 \text{ für } r > r_{min}$$

Net export rate depends positively on international competitiveness which is affected positive by profit share and negatively on domestic activity (Marshall-Lerner condition assumed to hold)

$$(5) \qquad b = \psi e_r(h) - \phi u, \qquad \psi, \phi > 0$$

Real exchange rate and hence international competitiveness is positively related to profit share

$$(6) \qquad e_r = e_r(h), \qquad \frac{\partial e_r}{\partial h} \geq 0$$

Stability condition for goods market equilibrium

$$(7) \qquad \frac{\partial \sigma}{\partial u} - \frac{\partial g}{\partial u} - \frac{\partial b}{\partial u} > 0 \qquad \Rightarrow \qquad \left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi > 0$$

Equilibrium

$$(8) \qquad u^* = \frac{\alpha + \tau h + \omega \hat{y} + \psi e_r(h)}{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi}$$

$$(9) \qquad g^* = \frac{\left\{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} + \phi\right\}(\alpha + \tau h + \omega \hat{y}) + \beta \psi e_r(h)}{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi}$$

Change of goods market equilibrium in the face of a change in the profits share is undetermined. We get positive partial effects via investment and net exports but a negative partial effect via consumption

(8') $$\frac{\partial u^*}{\partial h} = \frac{\tau - (s_\Pi - s_W)\frac{u}{v} + \psi \frac{\partial e_r}{\partial h}}{[s_W + (s_\Pi - s_W)h]\frac{1}{v} - \beta + \phi}$$

(9') $$\frac{\partial g^*}{\partial h} = \frac{\tau\left\{[s_W + (s_\Pi - s_W)h]\frac{1}{v} + \phi\right\} - \beta(s_\Pi - s_W)\frac{u}{v} + \beta\psi\frac{\partial e_r}{\partial h}}{[s_W + (s_\Pi - s_W)h]\frac{1}{v} - \beta + \phi}$$

$\frac{\partial u^*}{\partial h} > 0, \frac{\partial g^*}{\partial h} > 0$: Profit-led

$\frac{\partial u^*}{\partial h} < 0, \frac{\partial g^*}{\partial h} < 0$: Wage-led

2.2 The productivity regime

(10a) $\hat{y} = \eta + \rho u - \theta h, \qquad \eta, \rho, \theta > 0$

or

(10b) $\hat{y} = \eta + \varepsilon g - \theta h, \qquad \eta, \varepsilon, \theta > 0$

ρ: Verdoorn‘s law (Verdoorn 1949, Kaldor 1966)

ε: Kaldor‘s technical progress function (Kaldor 1957, 1961)

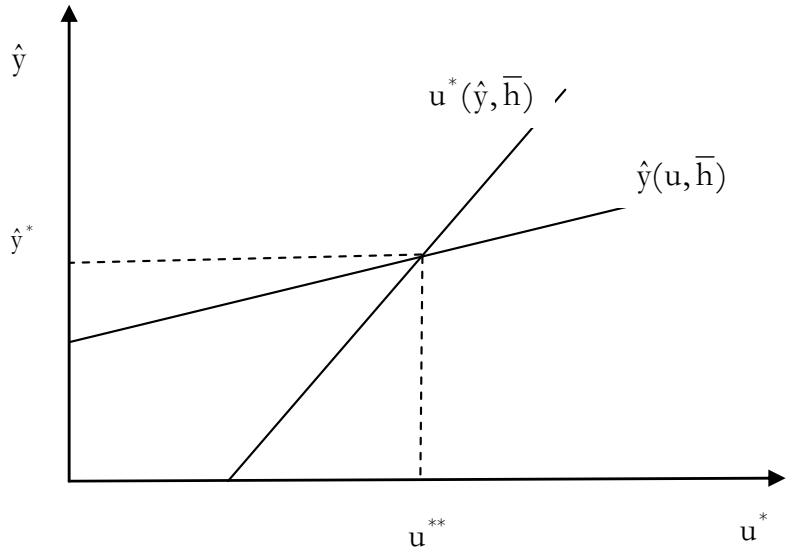
θ: wage-push effect (Marx 1867, Hicks 1932)

(10a’,b’) $\frac{\partial \hat{y}}{\partial h} = -\theta < 0$

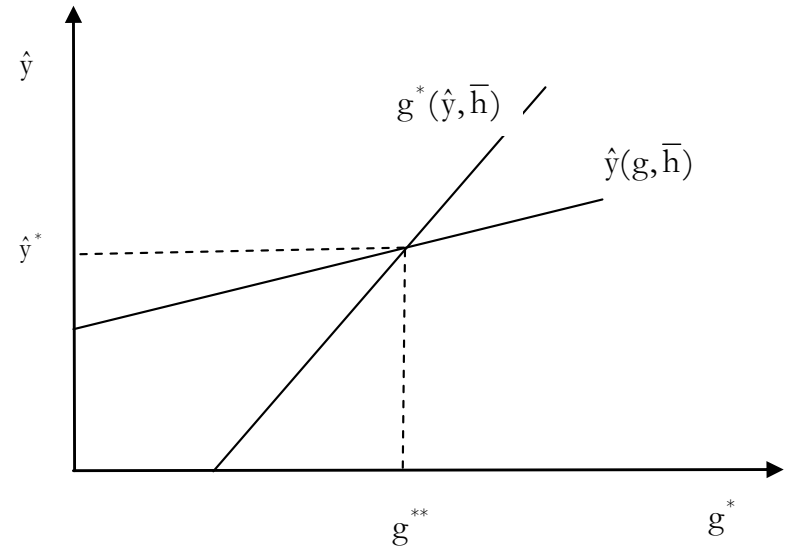
2.3 The overall regime

Figure 1: Growth equilibrium with endogenous productivity growth

a) Capacity utilisation and productivity growth



b) Capacity accumulation and productivity growth



➔Endogenously determined:
u**, g**, r** and y^*

Existence and stability condition for overall equilbrium

(11) $$\left[s_W + \left(s_\Pi - s_W\right)h\right]\frac{1}{v} - \beta + \phi - \omega\rho > 0$$

(12) $$\left(1 - \omega\varepsilon\right)\left\{\left[s_W + \left(s_\Pi - s_W\right)h\right]\frac{1}{v} + \phi\right\} - \beta > 0$$

Inserting equations (10a) and (8) yields the overall equilibrium rates of capacity utilisation and productivity growth:

$$u^{**} = \frac{\alpha + (\tau - \theta\omega)h + \psi e_r(h) + \omega\eta}{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi - \omega\rho}. \tag{A1}$$

$$\hat{y}^{*} = \frac{(\eta - \theta h)\left\{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi\right\} + \rho\left[\alpha + \tau h + \psi e_r(h)\right]}{\left[s_W + (s_\Pi - s_W)h\right]\frac{1}{v} - \beta + \phi - \omega\rho}. \tag{A2}$$

$$\frac{\partial u^{**}}{\partial h} = \frac{\tau - (s_{\Pi} - s_W)\frac{u}{v} + \psi \frac{\partial e_r}{\partial h} - \theta\omega}{[s_W + (s_{\Pi} - s_W)h]\frac{1}{v} - \beta + \phi - \rho\omega}, \qquad \text{(A1')}$$

- Denominator has to be positive from the existence and stability condition of the overall equilibrium (equation 11).

- Positive effects of an increasing profit share via investment (τ) and net exports [$\psi(\partial e_r / \partial h)$],

- Negative effect via consumption [$-(s_{\Pi} - s_W)(u/v)$], and via productivity growth ($-\theta\omega$)

➔ Overall effect may be positive (profit-led) or negative (wage-led)

$$\frac{\partial \hat{y}^*}{\partial h} = \frac{\rho\left[\tau - (s_\Pi - s_W)\frac{u}{v} + \psi\frac{\partial e_r}{\partial h}\right] - \theta\left\{[s_W + (s_\Pi - s_W)h]\frac{1}{v} - \beta + \phi\right\}}{[s_W + (s_\Pi - s_W)h]\frac{1}{v} - \beta + \phi - \rho\omega} \qquad \text{(A2')}$$

- The effect via goods market activity $\{\rho[\tau - (s_\Pi - s_W)(u/v) + \psi(\partial e_r/\partial h)]\}$ may be positive or negative depending on the nature of the demand regime.

- The second term $(-\theta\{[s_W + (s_\Pi - s_W)h](1/v) - \beta + \phi\})$ captures the directly negative effect of an increase in the profit share on productivity growth via the cost-push channel and is negative in any case, because the term in brackets has to be positive from the goods market stability condition.

➔ In a wage-led demand regime, the overall effect of an increasing profit share on productivity growth will be negative, whereas in a profit-led demand regime the overall effect of a rising profit share on productivity growth may be either positive or negative.

Figure 2: Increasing profit share and wage-led demand regime

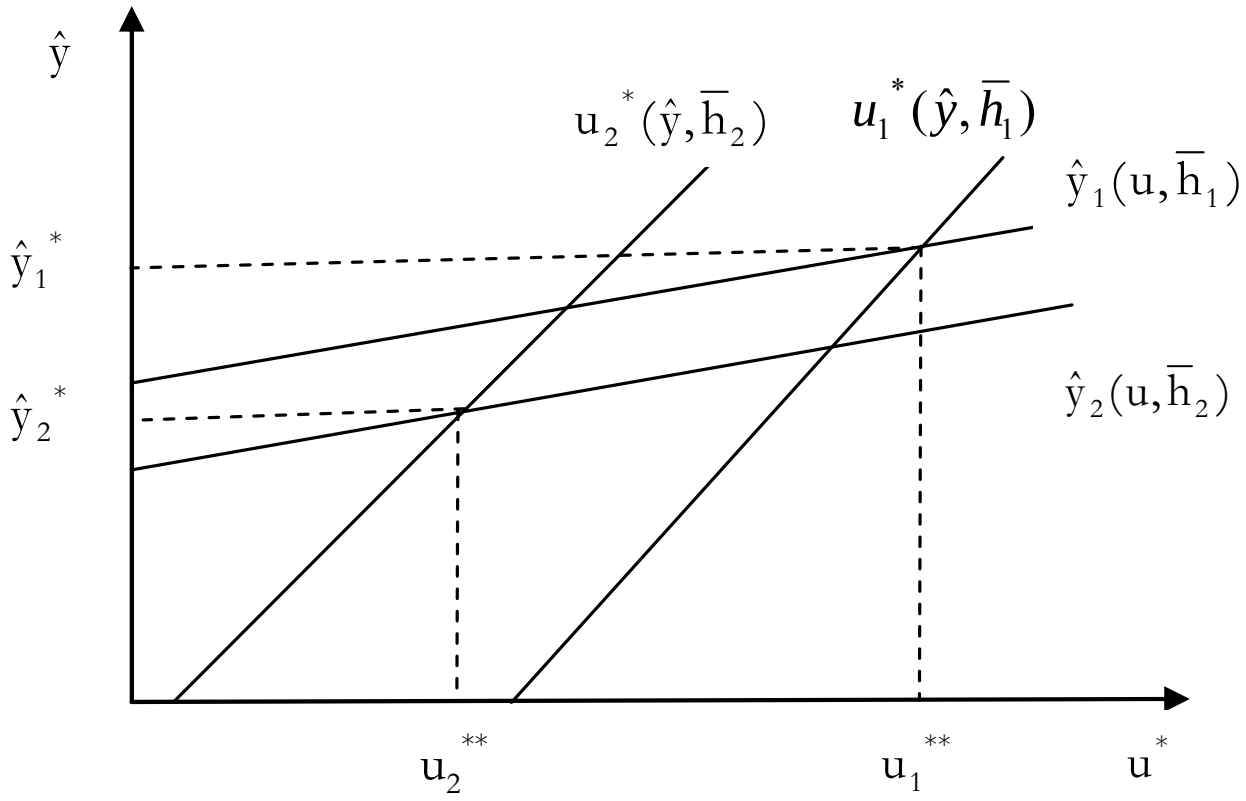
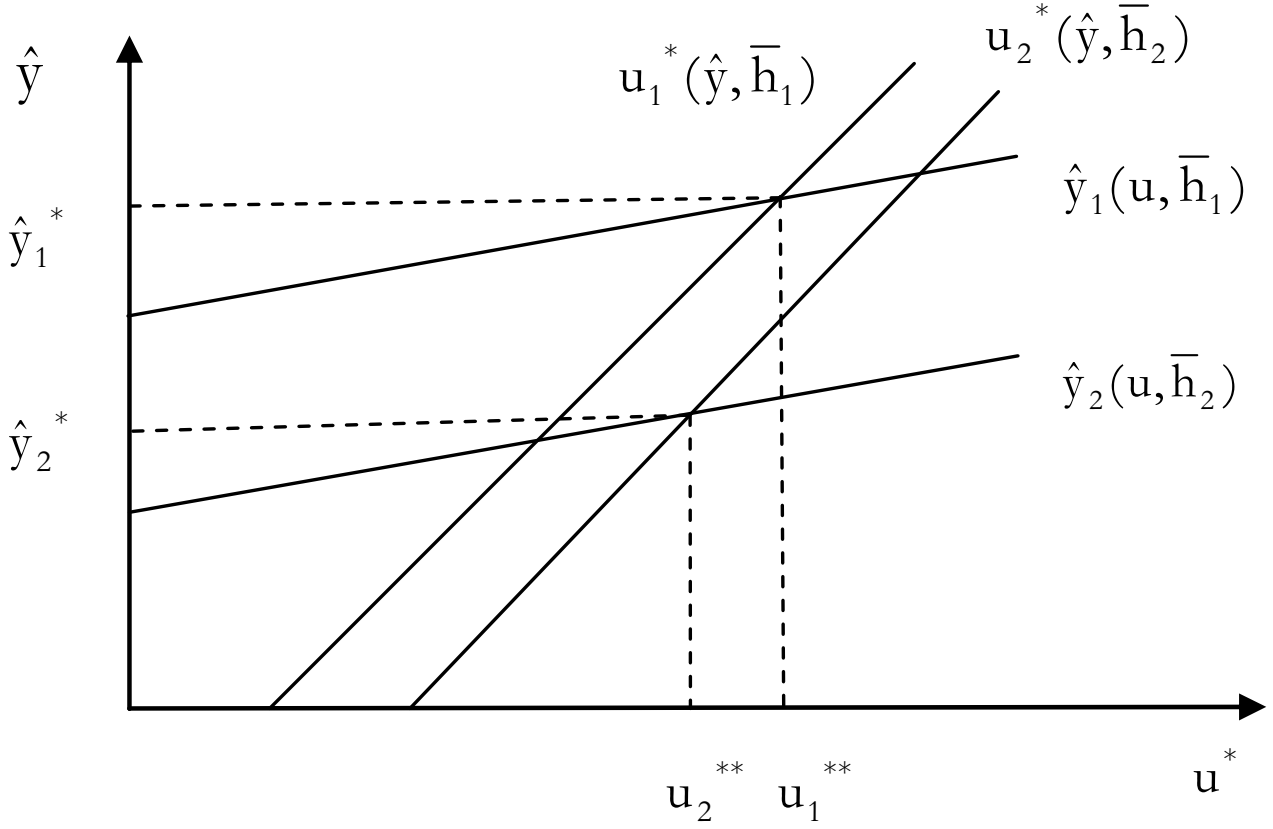
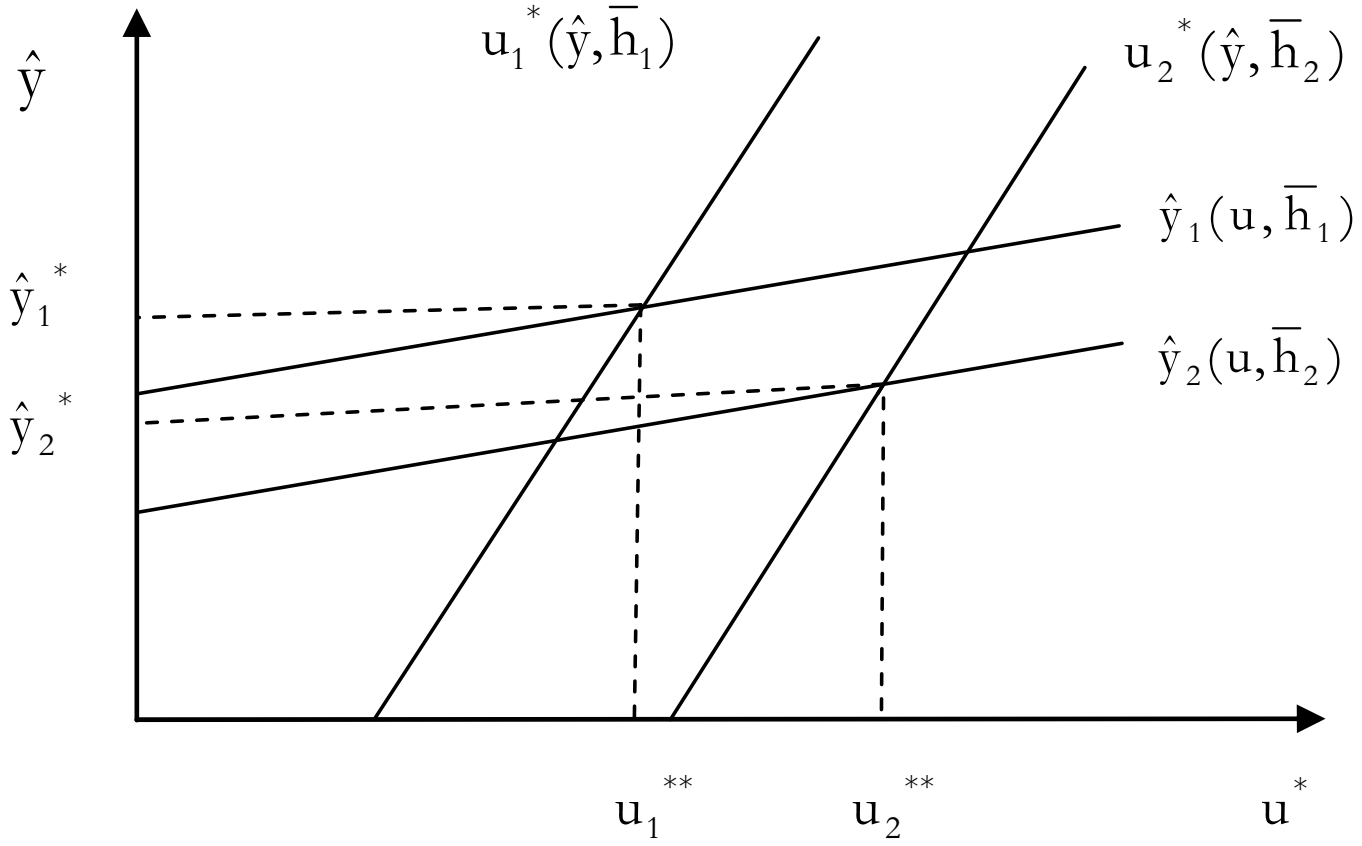


Figure 3: Increasing profit share and profit-led demand regime
a) Contractive overall regime



b) Intermediate overall regime



c) Expansive overall regime

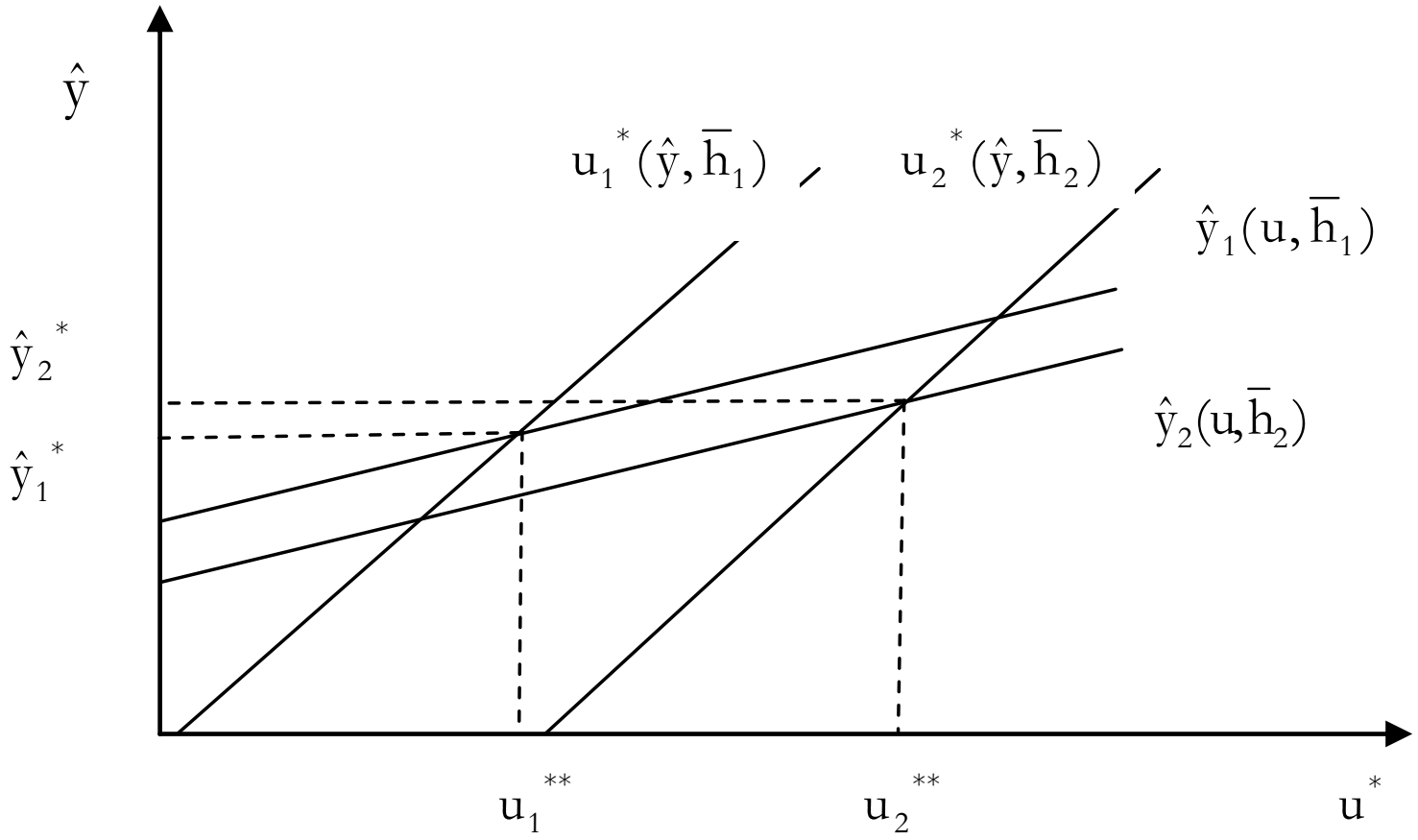


Table 2: Overall effects of a change in the profit share

	Wage-led demand regime: $(\partial u^* / \partial h) < 0, (\partial g^* / \partial h) < 0$	Profit-led demand regime: $(\partial u^* / \partial h) > 0, (\partial g^* / \partial h) > 0$		
$\partial u^{**} / \partial h$	–	–	+	+
$\partial g^{**} / \partial h$	–	–	+	+
$\partial \hat{y}^* / \partial h$	–	–	–	+
Overall regime when profit share is increasing	Contractive	Contrac-tive	Inter-me-diate	Expan-sive

6. Kaleckian models with a rentiers class: financialisation, distribution and growth

Literature: Hein (2008, Part II; 2012, chapters 2-5), Hein/van Treeck (2010), Dutt (1992; 1995), Lavoie (1992, chapter 6.5; 1993; 1995)

Macroeconomics of finance-dominated capitalism (Hein 2012)

1. Distribution of income between **shareholders (rentiers), firms (managers) and workers** is affected (Distribution channel).
2 Rising shareholder power, dividend payments and share buybacks affect **objectives and constraints of firms and hence investment** (preference channel and internal means of finance channel)
3. Financial asset price booms, house price booms, and financial market liberalisation allow for **wealth-based and debt-financed consumption**
4. Different types of capitalism under financialisation: **debt-led consumption boom** vs. **export-led mercantilist** ➔ regional as well as global **current account imbalances**

Kaleckian macro model of distribution and growth

Hein (2012, Chapter 3)

Table 3.1 Balance sheet matrix

	Workers households	Rentiers households	Firms	Σ
Loans		$+B$	$-B$	0
Equities		$+E_R$	$-E_R$	0
Capital			pK	pK
Σ	0	$+B+E_R$	$+E_F$	$pK = B+E_R+E_F$

Table 3.2 Transaction flow matrix

	Workers households	Rentiers households	Firms current	Firms Capital	Σ
Consumption	$-C_W$	$-C_R$	$+C_W+C_R$		0
Investment			$+I$	$-I$	0
Wages	$+W$		$-W$		0
Retained profits			$-\Pi_F$	$+\Delta E_F$	0
Distributed profits: dividends and interest		$+R$	$-R$		0
Change in equity		$-\Delta E_R$		$+\Delta E_R$	0
Change in loans		$-\Delta B$		$+\Delta B$	0
Σ	0	0	0	0	0

1. ‘Financialisation’ is assumed to affect distribution between firms and rentiers in the short run, and distribution between capital and labour through a dividend-elastic mark-up in firms’ price setting in the medium run.
2. Firms’ investment is affected through the ‘preference channel’ and the ‘internal means of finance channel’.
3. Consumption is influenced via distribution of dividends in the short run and via a reduction in the labour income share in the medium run.
4. The development of firms’ outside finance-capital ratio is endogenised in order to check the medium-run stability and viability of the potential accumulation regimes.

The basic model

Pricing and distribution

(1) $p=[1+m(e)]wa, \qquad m>0, \frac{\partial m}{\partial e} \geq 0$ Mark-up pricing

(2) $h = \frac{\Pi}{pY} = 1 - \frac{1}{1+m(e)}, \qquad \frac{\partial h}{\partial e} \geq 0$ Profit share

(3) $r = \frac{\Pi}{pK} = \frac{\Pi}{pY}\frac{Y}{Y^p}\frac{Y^p}{K} = hu\frac{1}{v}$ Profit rate

p: price, m: mark-up, e: rentiers‘ rate of return, w: nominal wage rate, a: labour coefficient, h: profit share, Π: profits, real income, r: rate of profit, K: capital stock, Y^p: potential output, u: rate of capacity utilisation, v: capital-potential output-ratio

Financing of capital stock and rentiers' income

(4) $pK = B + E^R + E^F$ Finance of capital stock

(5) $\gamma = \frac{B + E^R}{pK}$ Outside finance-capital ratio

(6) $\phi = \frac{E^F}{pK}$ Inside finance-capital ratio

(7) $\Pi = \Pi^F + R$ Total profits

(8) $R = e\left(E^R + B\right)$ Rentiers'income

B: debt, E^R: equity held by rentiers, E^F: equity held by firms, Π^F: retained profits, R: rentiers' income

Saving, investment and goods market equilibrium

Saving function

(9) $$\sigma = \frac{S}{pK} = \frac{\Pi - R + s_R R}{pK} = r - (1 - s_R)e\gamma, \qquad 0 < s_R \leq 1$$

Investment function

(10) $$g = \frac{I}{pK} = \alpha + \beta u + \tau h - \theta e\gamma, \qquad \alpha, \beta, \tau, \theta \geq 0,$$

Goods market equilibrium

(11) $$g = \sigma,$$

Stability condition

(12) $$\frac{\partial \sigma}{\partial u} - \frac{\partial g}{\partial u} > 0 \quad \Rightarrow \quad \frac{h}{v} - \beta > 0.$$

Goods market equilibrium:

$$(13) \qquad u^* = \frac{\alpha + \tau h + e\gamma\left(1 - s_R - \theta\right)}{\frac{h}{v} - \beta},$$

$$(14) \qquad r^* = \frac{\frac{h}{v}\left[\alpha + \tau h + e\gamma\left(1 - s_R - \theta\right)\right]}{\frac{h}{v} - \beta},$$

$$(15) \qquad g^* = \frac{\frac{h}{v}\left(\alpha + \tau h\right) + e\gamma\left[\beta\left(1 - s_R\right) - \theta\frac{h}{v}\right]}{\frac{h}{v} - \beta}.$$

Short-run effects of 'financialisation' and increasing shareholder power

(profit share + financial structure constant)

'Preference channel': negative effects of increasing shareholder power

because: $\frac{\partial u}{\partial \alpha} > 0$, $\frac{\partial r}{\partial \alpha} > 0$ and $\frac{\partial g}{\partial \alpha} > 0$.

'Internal means of finance channel': ambiguous effects

(13a) $$\frac{\partial u^*}{\partial e} = \frac{(1 - s_R - \theta)\gamma}{\frac{h}{v} - \beta},$$

(14a) $$\frac{\partial r^*}{\partial e} = \frac{\frac{h}{v}(1 - s_R - \theta)\gamma}{\frac{h}{v} - \beta},$$

(15a) $$\frac{\partial g^*}{\partial e} = \frac{\gamma\left[\beta(1 - s_R) - \theta\frac{h}{v}\right]}{\frac{h}{v} - \beta}.$$

Table 2: Short-run cases for a change in the rentiers' rate of return			
	'Normal' case	*'Intermediate' case*	*'Puzzling' case*
	$1-s_R<\theta$	$\theta<1-s_R<\frac{\theta h}{v\beta}$	$\frac{\theta h}{v\beta}<1-s_R$
$\frac{\partial u}{\partial e}$	$-$	$+$	$+$
$\frac{\partial r}{\partial e}$	$-$	$+$	$+$
$\frac{\partial g}{\partial e}$	$-$	$-$	$+$

Table 3: Short-run accumulation regimes under the conditions of 'financialisation' and rising shareholder power			
	'Contractive' regime	*'Profits without investment' regime*	*'Finance-led growth' regime*
Effect via management's animal spirits	weak/strong	weak	weak
Effect via rentiers' rate of return	'normal' case	'intermediate case'	'puzzling' case

Medium equilibrium and stability

- dividend-elastic mark-up and profit share
- outside finance-capital ratio endogenous

$$(16) \qquad \Delta\left(E^R + B\right) = s_R e\left(E^R + B\right)$$

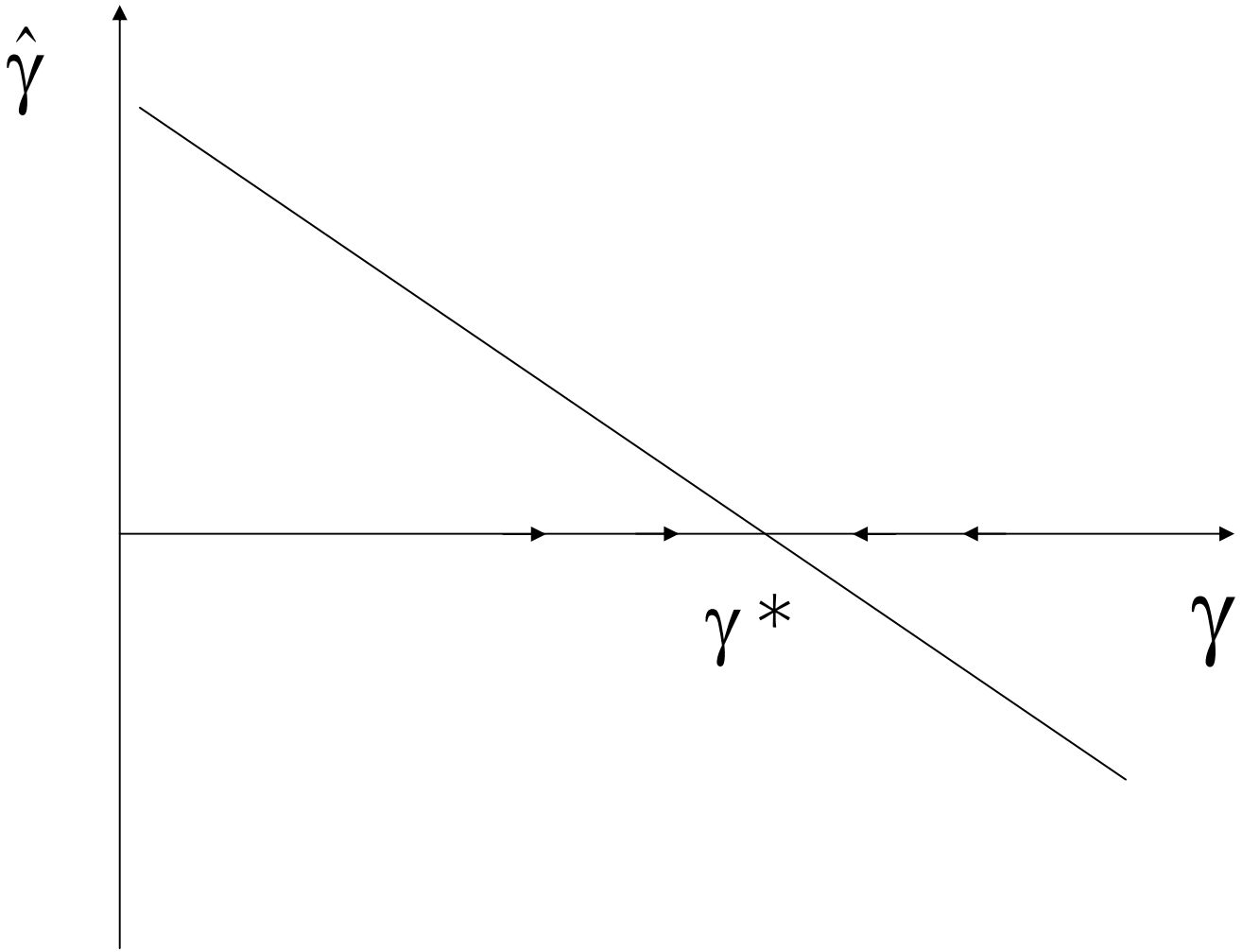
$$(17) \qquad \frac{\Delta\left(E^R + B\right)}{\left(E^R + B\right)} = s_R e\,.$$

$$(18) \qquad \hat{\gamma} = \frac{\Delta\left(E^R + B\right)}{\left(E^R + B\right)} - \hat{K} = s_R e - g\,.$$

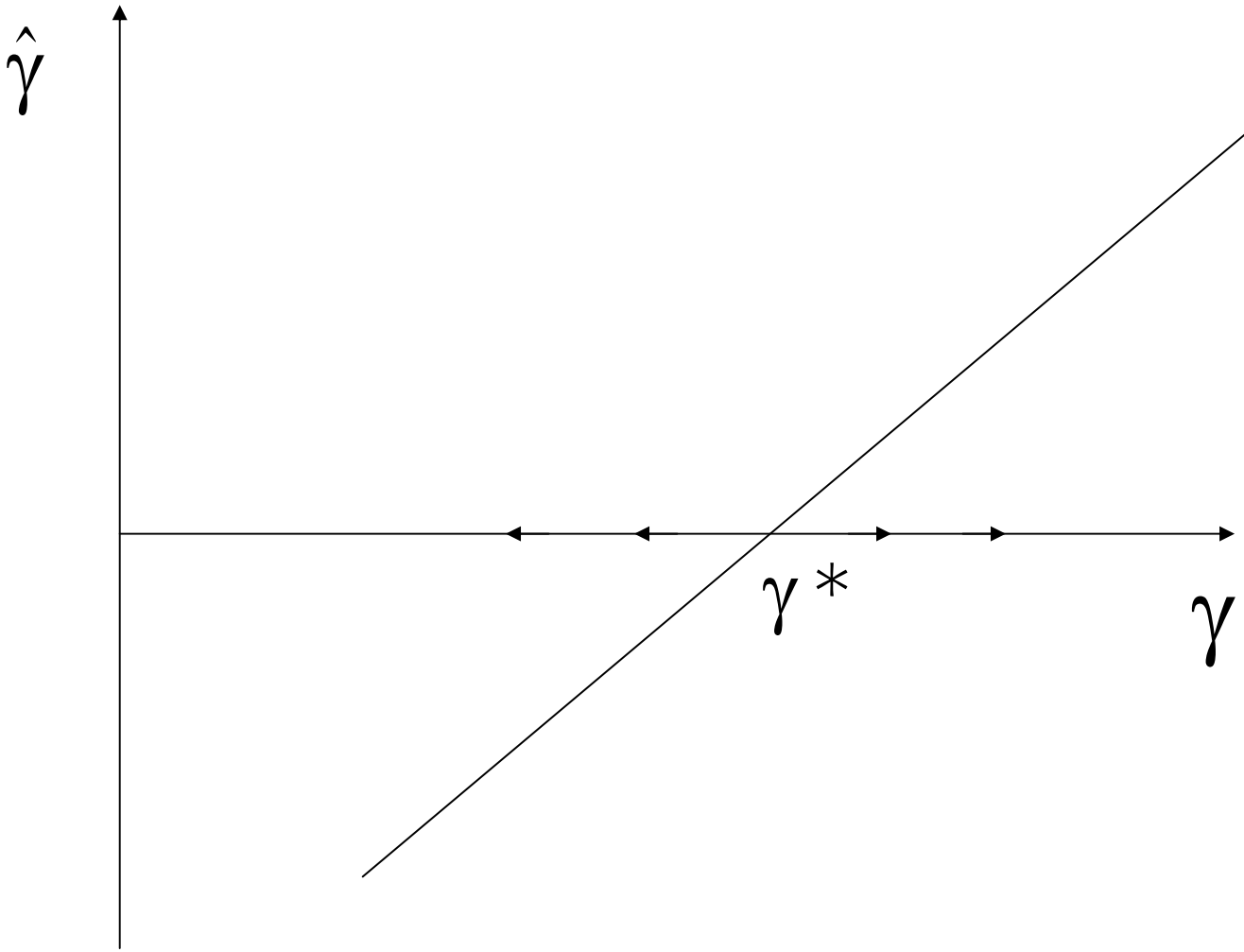
Equilibrium outside finance-capital ratio:

$$(19) \qquad \gamma^* = \frac{s_R e\left(\frac{h}{v} - \beta\right) - \frac{h}{v}\left(\alpha + \tau h\right)}{e\left[\beta\left(1 - s_R\right) - \theta\frac{h}{v}\right]}\,.$$

Stable equilibrium outside finance-capital ratio



Unstable equilibrium outside finance-capital ratio



Medium-run stability if: $\frac{\partial \hat{\gamma}}{\partial \gamma} < 0$.

(20) $$\frac{\partial \hat{\gamma}}{\partial \gamma} = \frac{-e\left[\beta(1-s_R) - \theta\frac{h}{v}\right]}{\frac{h}{v} - \beta}.$$

(20') $$\frac{\partial \hat{\gamma}}{\partial \gamma} < 0 \quad \text{if}: \qquad \beta(1-s_R) - \theta\frac{h}{v} > 0$$

$$\Leftrightarrow 1 - s_R > \theta\frac{h}{v\beta}.$$

➔ condition for short-run 'puzzling case'!

Medium-run stability requires a positive relationship between the rate of capital accumulation and the outside finance-capital ratio.

$$\text{(15b)} \qquad \frac{\partial g^*}{\partial \gamma} = \frac{e\left[\beta\left(1-s_R\right)-\theta\frac{h}{v}\right]}{\frac{h}{v}-\beta},$$

$$\text{(15b')} \qquad \frac{\partial g^*}{\partial \gamma} > 0 \text{ if : } \quad \beta\left(1-s_R\right)-\theta\frac{h}{v} > 0$$

$$\Leftrightarrow 1-s_R > \theta\frac{h}{v\beta}.$$

Effect of a change in the rentiers‘ rate of return on the medium-run equilibrium rate of capital accumulation

(21) $$g^{**} = s_R e$$

➔ ‚warranted rate‘ of capital accumulation:
rate of capital accumulation required for a constant outside finance-capital ratio

(21a) $$\frac{\partial g^{**}}{\partial e} = s_R > 0$$

1. Medium-run stabiliy/short-run ‘finance-led‘ growth regime:
   g* rises when e increases and medium-run equilibrium is attained; falling ‚animal spirits‘ and effects of falling wage share can only modify adjustment process but not prevent it, as long as stability condition is maintained.

2. Medium-run instability/short-run ‚contractive‘ or ‚profits without investment‘ regimes:
   g* falls when e rises, new equilibrium will not be reached

➔ ‚knife edge‘ instability of g and γ, reinforcing each other

➔ ‚paradox of outside finance‘: rising (falling) γ in the face of falling (rising) g

Medium-run ‚unstable' case:

‚Knife edge' instability of g** and γ^*
short-run ‚contractive' or ‚profits without investment' regimes
and the ‚paradox of outside finance'

$$(18) \qquad \hat{\gamma} = \frac{\Delta\left(E^R + B\right)}{\left(E^R + B\right)} - \hat{K} = s_R e - g = g^{**} - g^*$$

$$(15) \qquad g^* = \frac{\frac{h}{v}\left(\alpha + \tau h\right) + e\gamma\left[\beta\left(1 - s_R\right) - \theta\frac{h}{v}\right]}{\frac{h}{v} - \beta}$$

$g^* < g^{**} \rightarrow \Delta\gamma > 0 \rightarrow \Delta g^* < 0 \rightarrow \Delta\gamma > 0 \rightarrow \Delta g^* < 0 \ldots$

$g^* > g^{**} \rightarrow \Delta\gamma < 0 \rightarrow \Delta g^* > 0 \rightarrow \Delta\gamma < 0 \rightarrow \Delta g^* > 0 \ldots$

Decreasing animal spirits will reinforce cumulative instability

Falling wage share will reinforce if accumulation is wage-led,
and it will dampen it if accumulation is profit-led without being able to prevent it.

Short run

(dividend inelastic profit share, constant outside fincance-capital ratio):

- ‚Contractive' regime, ‚profits without investment' regime and ‚finance-led growth' regime are possible
- Fallacies of composition in ‚contractive' (‚paradox of profits') and ‚finance-led growth' (‚paradox of growth') regimes

Medium run

(dividend elastic profit share, endogenous outside finance-capital ratio)

- Stable ‚finance-led-growth' regime is possible: low rentiers' propensity to save, low elasticity of firms' investment with respect to internal funds and high elasticity with respect to demand + weak effect of shareholder power on managements' preferences + weak redistribution at the expense of labour
- Short-run ‚contractive' and ‚profits without investment' regimes turn unstable

  ➔ ‚knife-edge instability of capital accumulation and outside finance-capital ratio

  ➔ ‚paradox of outside finance': rising shareholder power triggers falling rates of capital accumulation and rising outside finance-capital ratio (Steindl [1952] 1976: paradox of debt)

➔Although the goods market equilbrium may be stable, financial structure generates instability in ‚contractive' and ‚profits without investment' regimes.

Further Kaleckian type models

- household debt: Dutt (2005, 2006), Hein (2012, Chapter 5), Kapeller/Schütz (2012)
- household debt plus corporate debt: Godley/Lavoie (2007), Lavoie (2008), Skott/Ryoo (2008), van Treeck (2009), Isaac/Kim (2013)
- Minskyan financial fragility issues: Charles (2008), Fujita/Sasaki (2011), Lima/Meirelles (2007), Meirelles/Lima (2006), Ryoo (2013)
- long-run effects financialisation on productivity growth: Hein (2012, Chapter 4)