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‘Financialisation’ in a comparative static, stock-flow consistent Post-Kaleckian distribution and growth model[*]

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Abstract

Into an analytical stock-flow consistent Post-Kaleckian distribution and growth model the following transmission channels of ‘financialisaton’ are integrated. 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 a ‘management’s preference channel’ and an ‘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. In the model the total effect of ‘financialisation’ is derived, the development of firms’ outside finance-capital ratio is endogenised, and the medium-run stability and viability of the financial structure and of capital accumulation is checked.

JEL code: E12, E21, E22, E25, E44

Key words: ‘Financialisation’, distribution, growth, instability, Post-Kaleckian model

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1. Introduction

We develop a simple analytical stock-flow consistent Post-Kaleckian distribution and growth model, which attempts to include some effects of 'financialisation', which can be understood with (Epstein, 2005, p. 3) as an ' (…) increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies'. Recently, some stock-flow consistent distribution and growth models integrating issues of 'financialisation' have been presented.[1] However, these models have not paid much attention to changes in distribution between capital and labour caused by changes in the financial regime and to the related macroeconomic effects via consumption and investment. Also instability problems regarding the financial structure of the corporate sector have been hardly addressed. Therefore, we attempt to present a simple model which tackles some of these issues.

Into the model to be developed the following transmission channels of 'financialisaton' are integrated. 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 a 'management's preference channel' and an '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. Most importantly, the development of firms' outside finance-capital ratio is endogenised in order to check the medium-run stability and viability of the financial structure and capital accumulation in different potential accumulation regimes under the conditions of 'financialisation'.

[1] See Godley/Lavoie (2007, pp. 378-444), Lavoie (2008), Skott/Ryoo (2008a,b), Taylor (2004, pp. 272-278), and van Treeck (2009). For an overview see Hein/van Treeck (2008).

2. The basic model

We assume a closed economy without economic activity of the state. Under given conditions of production, there is just one type of commodity produced which can be used for consumption and investment purposes. There is a constant relation between the employed volume of labour (L) and real output (Y), i.e. there is no overhead-labour and no technical change, so that we get a constant labour-output ratio (a). The capital-potential output ratio (v), the relation between the real capital stock (K) and potential real output (Y^v), is also constant. The capital stock is assumed not to depreciate. The rate of capacity utilisation (u) is given by the relation between actual real output and potential real output. The basic model can be described by the following equations.

Pricing and distribution

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

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

$$r = \frac{\Pi}{pK} = \frac{\Pi}{pY}\frac{Y}{Y^v}\frac{Y^v}{K} = hu\frac{1}{v}, \tag{3}$$

Financing of capital stock and rentiers' income

$$pK = B + E^R + E^F, \tag{4}$$

$$\gamma = \frac{B + E^R}{pK}, \tag{5}$$

$$\phi = \frac{E^F}{pK}, \tag{6}$$

$$\Pi = \Pi^F + R, \tag{7}$$

$$R = e(E^R + B), \tag{8}$$

Saving, investment and goods market equilibrium

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

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

$$g = \sigma, \tag{11}$$

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

Writing w for the nominal wage rate, we assume that firms set prices (p) according to a mark-up (m) on constant unit labour costs up to full capacity output. Following Kalecki (1954, pp. 17-18), the mark-up is determined by the degree of price competition in the goods market and by the relative powers of capital and labour in the labour market (equation 1). The profit share (h), i.e. the proportion of profits (Π) in nominal output (pY), is therefore determined by the mark-up (equation 2). The profit rate (r) relates the annual flow of profits to the nominal capital stock (equation 3).

The pace of accumulation in our model is determined by firms' decisions to invest, independently of saving, because firms have access to short-term (or initial) finance for production purposes supplied by a developed banking sector, not modelled here. We assume that long-term finance of the capital stock consists of firms' accumulated retained earnings (E^F), long-term credit granted by rentiers' households (B), and equity issued by the firms and held by rentiers' households (E^R) (equation 4). Part of firms' liabilities ($B+E^R$) is therefore held by 'outsiders' to the firm, i.e. rentiers' households, whereas another part (E^F) is controlled by 'insiders', either by the management or by owner managers. Since in our model we assume prices in goods and financial markets to be constant – capital gains are hence omitted from the analysis –, we assume that rentiers are interested in short-run maximum

dividend and interest payments, whereas management favours long-term growth of the firm.[2] The rentiers' share in capital stock, the outside finance-capital ratio, is given by γ (equation 5), whereas ϕ denotes the accumulated retained earnings-capital ratio or the inside finance-capital ratio (equation 6). We assume these ratios to be constant in the short run, but to be variable and hence to be endogenously determined in the medium run.

Total profits (Π) split into firms' retained profits (Π^F), on the one hand, and dividends plus interest paid to rentiers' households (R), on the other hand (equation 7). Interest payments to rentiers' households are given by the rate of interest and the stock of debt, with the rate of interest as a distribution parameter being an exogenous variable for income generation and capital accumulation, mainly determined by monetary policies and risk and liquidity assessments of banks and rentiers, following the Post-Keynesian 'horizontalist' view of endogenous money and credit.[3] Dividend payments, given by the dividend rate and the stock of equity held by rentiers' households, are also determined by the power struggle between rentiers (shareholders) and firms (management), with rentiers being interested in high dividends for income purposes and management being in favour of retained earnings for firms' real investment and growth purposes. We omit the effects of rentiers' portfolio choice from our considerations in order to simplify further analysis. In what follows we synthesise dividend and interest payments to rentiers and consider just one rentiers' rate of return on bonds and equity (e), which together with the stock of equity and bonds held by rentiers determines rentiers' income (equation 8). Rentiers' rate of return is determined by the power struggle between managers and rentiers and is hence the crucial variable when it comes to the discussion of the effects of increasing shareholder power vis-à-vis management and labourers.

[2] On the 'owner-management-conflict' within in the firm based on a microeconomic 'growth-profit-trade-off', see Crotty (1990), Stockhammer (2005-6), and Hein/van Treeck (2008).

[3] For a survey of the Post-Keynesian endogenous money approach and its implementation into Post-Keynesian models of distribution and growth, see Hein (2008a).

Changes in the rentiers' rate of return may cause a change in the mark-up in firms' pricing in incompletely competitive goods markets (equation 1), if the determinants of the mark-up are affected as well by the rise of shareholder power, in particular the degree of price competition in the goods market and the relative power of workers and labour unions in the labour market. In the face of increasing shareholder power, we consider the mark-up to be dividend-inelastic in the short run. But in the medium run, the mark-up is likely to become dividend-elastic because of decreasing price competition in the goods market associated with mergers and acquisitions and hostile takeovers in the corporate sector, and in particular because of weakened bargaining power of labourers caused by a policy of 'downsize and distribute' and increasing unemployment (Lazonick/O'Sullivan, 2000).[4] The profit share (equation 2) will hence become elastic with respect to the rentiers' rate of return.

In order to simplify the analysis, we assume a classical saving hypothesis, i.e. labourers do not save. The part of profits retained is completely saved by definition. The part of profits distributed to rentiers' households, the interest and dividend payments, is used by those households according to their propensity to save (s_R). Therefore, we get the saving rate (σ) in equation (9) which relates total saving to the nominal capital stock. In our model, we consider only rentiers' consumption out of current income flows. Increasing stock prices and rising (stock market) wealth associated with 'financialisation' will further lower the overall saving rate, in particular when households can borrow extensively against collateral. However, this will be associated with increasing household debt which might feed back negatively on consumption.[5] These aspects are not modelled here.

[4] For empirical results supporting this assumption, see Dumenil/Levy (2005), Epstein/Power (2003), and Epstein/Jayadev (2005).
[5] See the models by Bhaduri/Laski/Riese (2006), Dutt (2005, 2006), and Palley (1994).

The accumulation rate (g), relating net investment (I) to the capital stock, in equation (10) is based on the investment function proposed by Bhaduri/Marglin (1990).[6] Investment decisions are assumed to be positively affected by the rate of capacity utilisation and by the profit share, because both increase the (expected) profit rate. Distributed profits, the dividends and interest payments to rentiers, have a negative impact on investment, because they reduce retained earnings and firms' own means of finance. This also limits the access to external funds in imperfect capital markets, according to Kalecki's (1937) 'principle of increasing risk'.

Given shareholders' desire for short-term profits – compared to management's desire for long-term growth of the firm – increasing shareholder power vis-à-vis management will increase the rentiers' rate of return and reduce available funds for real investment and growth of the firm. But increasing shareholder power will not only affect internal funds and thus firms' finance constraints but also management's preferences: Management's 'animal spirits', reflected in the constant α in the investment function, will decline and might even become negative when managers are aligned with shareholders through stock option programmes and the threat of hostile takeovers in an active market of corporate control. Our investment function hence captures the two channels of transmission of increasing shareholder power on real investment, the 'internal finance channel' and the 'management's preferences channel'.[7]

The goods market equilibrium is determined by the equality of saving and investment decisions (equation 11). The goods market stability condition requires that the saving rate responds more elastically to changes in capacity utilisation than capital accumulation does (condition 12). Our model thus generates the following goods market equilibrium values:

[6] For an otherwise similar model with an investment generating the 'stagnationist' version of the Kaleckian distribution and growth model, which is more in line with the original ideas of Kalecki, see Hein (2008b).

[7] For empirical estimations of investment functions including these effects of rising shareholder power, see Stockhammer (2004), Orhangazi (2008), and van Treeck (2008a).

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

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

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

In what follows, the effects of increasing shareholder power in an era of 'financialisation' on stable goods market equilibria only will be discussed. Increasing shareholder power will, firstly, affect management's preferences and hence 'animal spirits' in the negative, and, secondly, it will be associated with an increasing rentiers' rate of return.

3. Short-run effects of increasing shareholder power

For the discussion of the short-run effects of increasing shareholder power we assume γ and ϕ to be given and constant. We also assume that firms are unable to shift increasing dividend payments to prices, because the determinants of the mark-up will change rather slowly. The mark-up and the profit share will therefore remain constant in the short run, too.

An increase in shareholder value orientation of management's investment decisions, and hence a decrease in 'animal spirits', as indicated by α in the investment function, has uniquely negative effects on the endogenous variables. This is so, because 'animal spirits' display unambiguously positive relationships with the equilibrium rates of capacity utilisation, profit and capital accumulation, as can easily be seen from equations (13) - (15):

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

An increase in the rentiers' rate of return, however, has ambiguous effects. It affects firms' investment through the availability of internal funds and the access to external finance, but it also has an influence on the income of rentiers' households and hence on consumption. With the outside finance-capital ratio, as well as the mark-up and the profit share, being constant in the short run, we obtain the following effects of a change in the rentiers' rate of return on the equilibrium rates of capacity utilisation, profit and capital accumulation:

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

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

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

The effects of a change in the rentiers' rate of return may be positive or negative, depending on the parameter values in the saving and investment functions of the model:

$$\frac{\partial u^*}{\partial e} > 0, \qquad \text{if:} \qquad 1 - s_R > \theta, \tag{13a'}$$

$$\frac{\partial r^*}{\partial e} > 0, \qquad \text{if:} \qquad 1 - s_R > \theta, \tag{14a'}$$

$$\frac{\partial g^*}{\partial e} > 0, \qquad \text{if:} \qquad 1 - s_R > \theta\frac{h}{v\beta}. \tag{15a'}$$

Assuming the stability condition (12) for the goods market equilibrium to hold implies for equation (15a'): $\frac{h}{v\beta} > 1$. Therefore, we get the following cases for the short-run equilibrium in Table 1.

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

The 'normal' case of a negative impact of an increase in the rentiers' rate of return on the equilibrium values of capacity utilisation, the profit rate and the rate of capital accumulation will be given if: $1-s_R<\theta$. Therefore, this case is the more likely the higher the rentiers' propensity to save and the higher the responsiveness of firms' real investment with respect to distributed profits and hence to internal funds. With this parameter constellation, the increase in consumption demand associated with redistribution of income from firms to rentiers' households is insufficient to compensate for the negative effects on firms' investment. In the 'normal' case, the effect of an increasing rentiers' rate of return on the equilibrium rates of capacity utilisation, profit and capital accumulation amplifies the negative effects of rising shareholder power via management's 'animal spirits' on these variables and we obtain the overall 'contractive' regime (Table 2).

Table 2: 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

In the 'puzzling' case, we have an opposite parameter constellation: $1-s_R > \theta\frac{h}{v\beta}$. A low propensity to save out of rentiers' income, a low responsiveness of investment with respect to distributed profits and internal funds, and a high elasticity with respect to capacity utilisation allow for a positive effect of an increasing rentiers' rate of return on the equilibrium rates of capacity utilisation, profit and capital accumulation. In the 'puzzling' case, the effect of an increasing rentiers' rate of return on the equilibrium rates of capacity utilisation, profit and capital accumulation may over-compensate the negative effects of rising shareholder power via management's 'animal spirits'. If this condition holds, we will obtain a 'finance-led' accumulation regime (Boyer, 2000), and hence an overall positive effect of increasing shareholder power on the rates of capacity utilisation, profit and capital accumulation (Table 2).

Finally, an 'intermediate' case may arise if: $\theta < 1-s_R < \theta\frac{h}{v\beta}$. In this case, an increase in the rentiers' rate of return is accompanied by rising rates of capacity utilisation and profit, but by a falling rate of capital accumulation. What is required for the 'intermediate' case, on the one hand, is a low rentiers' propensity to save, which boosts consumption demand in the face of redistribution in favour of rentiers, and a low responsiveness of firms' investment with respect to distributed profits and hence internal funds, which limits the negative effects of redistribution on firms' investment. On the other hand, however, in the 'intermediate' case we also have a low responsiveness of investment with respect to capacity utilisation which, in sum, is not able to over-compensate the negative effects of a rise in the rentiers' rate of return through internal funds. In the 'intermediate' case, the negative effects of increasing shareholder power via management's preferences ('animal spirits') is compensated by the effects of a rising rentiers' rate of return with respect to capacity utilisation and the profit rate, but the negative effect on capital accumulation is reinforced. For the former, it is again

required that increasing shareholder power is associated with a strong effect of the increase in the rentiers' rate of return but with a low effect via management's 'animal spirits'. If these conditions hold, we will obtain a 'profits without investment' regime (Cordonnier, 2006) (Table 2).

4. Medium-run equilibrium and stability

In the medium run of our model, we have to take into account that firms may be able to shift a higher rate of return demanded by rentiers to prices and that the mark-up, and hence the gross profit share (including dividend and interest payments), may increase. Therefore, with a dividend-elastic mark-up we have $\frac{\partial h}{\partial e} \geq 0$, and the labour income share will decrease in the face of a rising rentiers' rate of return.

In the medium run analysis, the effects of a change in the rentiers' rate of return on the stocks of debt and equity held by rentiers, and hence on the inside and outside finance-capital ratios, have to be considered as well. Since $\gamma + \phi = 1$, it is sufficient to analyse the dynamics of γ. We do not consider households' portfolio choice between bonds and equity in the face of relative changes in dividend and interest rates. On the one hand, this is to simplify the analysis, on the other hand, we hold that households' portfolio choice seems to be dominated by institutional and historical factors which only change slowly in the course of time, despite short- and medium-run variations in the dividend rate (relative to the interest rate). Further on, changes in households' portfolio decisions would only affect firms' investment decisions in our model if firms' internal means of finance were affected. But there is no effect via Tobin's q or Kaldor's valuation ratio in our investment function, different from other Post-Keynesian

stock-flow consistent approaches (Skott/Ryoo, 2008a,b; van Treeck 2009).[8] We doubt that in an era of 'financialisation' an increase in Tobin's q triggered by increasing shareholder power, share buybacks, increasing dividend payments and enforced changes in management's preferences should be considered to be causing rising real investment.[9] For these reasons it seems to be sufficient to treat the effects of changes in the rentiers' rate of return on the outside finance-capital ratio, and then to analyse the related effects on capital accumulation.

The accumulation of bonds and equity held by rentiers is given by rentiers' income and the propensity to save out of this income:

$$\Delta\left(E^R + B\right) = s_R e\left(E^R + B\right). \tag{16}$$

For the growth rate of debt plus equity held by rentiers we get:

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

If we assume that prices remain constant, which means that mark-ups and distribution may change but not the price level, the growth rates of the outside finance-capital ratio depends on the growth rate of outside finance and on the growth rate of the real capital stock. From equation (6) we get:

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

In medium-run equilibrium the endogenously determined value of γ has to be constant, hence $\hat{\gamma} = 0$ has to hold. Introducing this condition into equation (18) and making use of equation (15) yields the following medium-run equilibrium value for the outside finance-capital ratio:

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[8] If these models do away with a strong coefficient on Tobin's q in the investment function, 'profits without investment' (van Treeck, 2009) or even 'contractive' accumulation regimes are generated (Godley/Lavoie, 2007, pp. 378-444; Lavoie, 2008).

[9] Medlen (2003) provides empirical support for our doubts. According to his observations there was a positive correlation in the US (1968-2001) between Tobin's q, on the one hand, and the relationship between mergers to new real investment, on the other hand. This is the exact opposite of what Tobin's q would suggest, because a rise in Tobin's q should be correlated with higher real net investment relative to mergers and acquisitions.

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

This medium-run equilibrium will be stable if: $\frac{\partial\hat{\gamma}}{\partial\gamma} < 0$. Starting from equations (18) and making use of equation (15) yields:

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

Taking into account that we assume the goods market equilibrium to be stable, it follows for the medium-run stability condition of the outside finance-capital ratio:

$$\begin{aligned} \frac{\partial\hat{\gamma}}{\partial\gamma} < 0 \quad \text{if:} \qquad & \beta(1 - s_R) - \theta\frac{h}{v} > 0 \\ & \Leftrightarrow 1 - s_R > \theta\frac{h}{v\beta}. \end{aligned} \tag{20'}$$

Stability of γ requires a low rentiers' propensity to save, a low responsiveness of firms' investment with respect to distributed profits and internal funds, and a high elasticity with respect to capacity utilisation. This is tantamount to a positive relationship of the rate of capital accumulation with the outside finance-capital ratio. From equation (15) we obtain:

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

$$\begin{aligned} \frac{\partial g^*}{\partial\gamma} > 0 \text{ if:} \qquad & \beta(1 - s_R) - \theta\frac{h}{v} > 0 \\ & \Leftrightarrow 1 - s_R > \theta\frac{h}{v\beta}. \end{aligned} \tag{15b'}$$

Most importantly, it has to be noted that medium-run stability of the outside finance-capital ratio requires a 'puzzling' case effect of a change in the rentiers' rate of return on the short-run equilibrium rate of capital accumulation, as can be seen in condition (15a').

5. Medium-run effects of 'financialisaton' and rising shareholder power

We are now in a position to discuss the medium-run effects of a rising rentiers' rate of return and decreasing management's 'animal spirits'. From equation (19) we obtain the following effects of a change in the rentiers' rate of return on the equilibrium outside finance-capital ratio:

$$\frac{\partial \gamma^*}{\partial e} = \frac{s_R\left(\frac{h}{v}-\beta\right)-\gamma\left[\beta(1-s_R)-\theta\frac{h}{v}\right]+\frac{\partial h}{\partial e}\frac{1}{v}\left[e(\theta\gamma+s_R)-\alpha-2\tau h\right]}{e\left[\beta(1-s_R)-\theta\frac{h}{v}\right]}. \tag{19a}$$

For the evaluation of the effects of an increasing rentiers' rate of return we have to distinguish the 'medium-run stable' from the 'medium-run unstable' case.

For the stable case, in which $\beta(1-s_R)-\theta\frac{h}{v}>0$ has to hold, we obtain:

$$\frac{\partial \gamma^*}{\partial e}>0$$

$$\text{if:} \quad \beta(1-s_R)-\theta\frac{h}{v}>0, \tag{19a'}$$

$$\text{and:} \quad \frac{s_R\left(\frac{h}{v}-\beta\right)+\frac{\partial h}{\partial e}\frac{1}{v}\left(s_R e-\alpha-2\tau h\right)}{\left[\beta(1-s_R)-\theta\frac{h}{v}\right]-\frac{\partial h}{\partial e}\frac{1}{v}e}>\gamma.$$

In the medium-run stable case, the effect of a change in the rentiers' rate of return on the outside finance-capital ratio depends on the initial value of the rentiers' share in the capital stock.

In the medium-run unstable case, we have $\beta(1-s_R)-\theta\frac{h}{v}<0$ and the inspection of equation (19a) yields:

$$\frac{\partial\gamma^*}{\partial e}<0$$

$$\text{if}: \quad \beta(1-s_R)-\rho s_R\frac{h}{v}<0, \tag{19a''}$$

$$\text{and}: \quad \frac{s_R\left(\frac{h}{v}-\beta\right)-\gamma\left[\beta(1-s_R)-\theta\frac{h}{v}\right]+\frac{\partial h}{\partial e}\frac{1}{v}e(\theta\gamma+s_R)}{\frac{\partial h}{\partial e}\frac{1}{v}}>\alpha+2\tau h.$$

A change in the rentiers' rate of return will have an adverse effect on the equilibrium outside finance-capital ratio, provided that 'animal spirits' (α) are not too strong and the effect of the profit share on firms' investment is weak.

Evaluating the effects of an increasing rentiers' rate of return on the medium-run equilibrium rate of capital accumulation, we obtain from equation (18), in which the condition $\hat{\gamma}=0$ has to hold:

$$g^{**}=s_R e. \tag{21}$$

The effect of a rising rentiers' rate of return on the medium-run equilibrium rate of capital accumulation, given the propensity to save out of rentiers' income, is thus by necessity positive in all cases:

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

This finding follows straight forward from the condition for medium-run equilibrium, which requires the constancy of γ and hence that capital stock has to grow at the same rate as the sum of debt plus equity held by rentiers' households. An increase in dividend (and also in interest) payments to rentiers in relation to the capital stock therefore requires increasing

capital stock growth in order to obtain a medium-run equilibrium.[10] We call this medium-run equilibrium rate of capital accumulation the 'warranted rate' (g**), because it is the rate of accumulation which is required for the constancy of the outside finance-capital ratio. However, it is in no way guaranteed that the goods market equilibrium rate of capital accumulation will adjust to that rate. Our 'warranted rate' of accumulation is thus in a sense reminiscent of Harrod's (1939) 'warranted rate of growth'. However, in our case it is neither related to goods market equilibrium, nor to desired capacity utilisation, but to a constant financial structure of the firm sector.

As shown above, under the condition of the short-run 'puzzling' case regarding the effects of a rising rentiers' rate of return (15a'), the stability condition for the medium-run equilibrium outside finance-capital ratio (20') is met. The goods market equilibrium rate of capital accumulation will thus adjust to the 'warranted rate' when the rentiers' rate of return increases, and the new medium-run equilibrium will be reached. This adjustment process may be disturbed but not prevented by the two additional effects of rising shareholder power in our model.

First, in the short and the medium run, the negative effects of falling animal spirits associated with rising shareholder power reduce the positive impact of a rising rentiers' rate of return on capital accumulation. Second, in the medium run, the mark-up and hence the profit share is assumed to be elastic with respect to the rentiers' rate of return. This has an additional effect on the goods market equilibrium rate of capital accumulation, as can be derived from equation (15):

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

[10] Since an increasing rentiers' rate of return also affects the value of the equilibrium outside finance-capital ratio, as shown above, the required increase in capital stock may initially not need to be proportionate to the increase in outside finance.

As can be seen from the second term in the numerator of equation (15c), the effect of an increasing profit share on capital accumulation may be positive or negative, depending on the relative importance of the rate of capacity utilisation and the profit share in firms' investment decisions. If capital accumulation is profit-led, medium-run redistribution in favour of gross profits will give an extra push to the goods market equilibrium rate of capital accumulation. If accumulation is wage-led, however, redistribution in favour of gross profits will reduce the short-run positive effect of a rising rentiers' rate of return.

If for one of these reasons the increase in capital accumulation following an increase in the rentiers' rate of return is not sufficient to meet the increased 'warranted rate' in equation (21), the outside finance-capital ratio will grow according to equation (18), and this will push up the goods market equilibrium rate of capital accumulation according to equation (15) and thus stabilise the system. Therefore, the conditions for the short-run 'puzzling' case are sufficient for medium-run stability of the 'finance-led growth' regime.

Under the conditions of the short-run 'normal' and 'intermediate' cases, capital accumulation will fall when the rentiers' rate of return increases and the new equilibrium will not be reached; the stability condition for medium-run equilibrium (20') is not met. With the short-run 'normal' and 'intermediate' cases prevailing, which implies instability of the medium-run outside finance-capital ratio, the 'waranted rate' of capital accumulation in equation (21), therefore, contains a kind of Harrodian 'knife-edge' instability property (Harrod, 1939). However, this instability is not related to the actual and the goods market equilibrium rate of capital accumulation, as in Harrod, but to the goods market equilibrium rate of capital accumulation and the rate of accumulation required for a constant outside finance-capital ratio. If the goods market equilibrium rate of capital accumulation in equation (15) by accident is equal to the 'warranted rate' in equation (21), capital stock will keep on growing at that rate. But any deviation from the 'warranted rate' will cause exploding

deviation from this rate. If the goods market equilibrium rate of capital accumulation falls short of the 'warranted rate', the outside finance-capital ratio will rise, according to equation (18), and this will feed back negatively on capital accumulation, according to equation (15), making capital accumulation fall further below the 'warranted rate' and the outside finance-capital ratio rise further above the equilibrium rate. If the goods market equilibrium rate of capital accumulation exceeds the 'warranted rate', the outside finance-capital ratio will fall (equation 18), and this will feed back positively on capital accumulation (equation 15), making it diverge even further from the 'warranted rate', and so on. The medium-run cumulative disequilibrium process will hence be characterised either by rising outside finance-capital ratios and falling rates of capital accumulation, or it will show decreasing outside finance-capital ratios and increasing rates of capital accumulation. We therefore attain a 'paradox of outside finance' reminiscent of Steindl's (1976, pp. 113-122) 'paradox of debt'.[11] Falling (rising) rates of capital accumulation induce firms to attempt to reduce (raise) the outside finance-capital ratio, but the macroeconomic effects of such a behaviour is that this ratio will increase (fall).

In the 'contractive' and the 'profits without investment' regimes, an increase in the rentiers' rate of return shifting the 'warranted rate' upwards will thus trigger a cumulatively downward process of the goods market equilibrium rate of capital accumulation and a cumulatively upwards process of the outside finance-capital ratio. A decrease in managements' animal spirits associated with rising shareholder power will exacerbate this process. Redistribution at the expense of labour in the medium run via the dividend-elastic mark-up will also reinforce this process if accumulation is wage-led, and it will dampen it without being able to prevent it, if accumulation is profit-led.

[11] On the 'paradox of debt' see also Dutt (1995) and Lavoie (1995).

Finally, we have to examine the effects of falling management's 'animal spirits' regarding real investment. From equation (19) we obtain for the effect of 'animal spirits' on the medium-run equilibrium outside finance-capital ratio:

$$\frac{\partial \gamma^*}{\partial \alpha} = \frac{-\frac{h}{v}}{e\left[\beta(1-s_R)-\theta\frac{h}{v}\right]}. \tag{19b}$$

In the medium-run stable case, in which $\beta(1-s_R)-\theta\frac{h}{v}>0$, we get $\frac{\partial \gamma^*}{\partial \alpha}<0$. Falling 'animal spirits' associated with rising shareholder value orientation will hence increase the equilibrium outside finance-capital ratio. Medium instability implies $\beta(1-s_R)-\theta\frac{h}{v}<0$ and hence $\frac{\partial \gamma^*}{\partial \alpha}>0$. Decreasing 'animal spirits' will thus shift the (unstable) equilibrium outside finance-capital ratio downwards.

For the effects of 'animal spirits' on the medium-run 'warranted rate' of capital accumulation we obtain from equation (21):

$$\frac{\partial g^{**}}{\partial \alpha} = 0. \tag{21b}$$

Since the 'warranted rate' of capital accumulation required for a constant outside finance-capital ratio is determined exclusively by rentiers' saving out of dividend and interest payments relative to the capital stock, changes in management's 'animal spirits' have no effect on this rate. A change in animal spirits will only affect the goods market equilibrium rate of capital accumulation. As discussed above, this will exacerbate cumulatively diverging processes of the goods market equilibrium rate of capital accumulation from the 'warranted rate' in the medium-run unstable case, and it will modify, but not prevent the adjustment process in the medium-run stable case.

6. Summary and conclusions

We can now summarise the effects of 'financialisation' in our Post-Kaleckian distribution and growth model. For our purposes, 'financialisation' has been understood as meaning increasing shareholder power vis-à-vis management and labourers, causing lower management's 'animal spirits' regarding real investment and a higher rentiers' rate of return in the short run, and a falling labour income share in the medium run. Summarising the main findings in Table 3, we distinguish between short- und medium-run effects, between a stable medium-run equilibrium and an unstable one, and between 'contractive', 'profits without investment' and 'finance-led growth' regimes. The short-run equilibrium condition is assumed to be fulfilled in any case.

In the parameter constellation generating the medium-run stable case and a 'finance-led growth' regime, we obtain that decreasing management's 'animal spirits' have a negative effect on the equilibrium rates of capacity utilisation, profit and capital accumulation in the short run. These negative effects, however, are over-compensated by the positive effects of an increasing rentiers' rate of return, provided that increasing shareholder power is associated with a relatively weak decline in management's 'animal spirits'. In the medium run, the mark-up and the profit share will increase, and the equilibrium outside finance-capital ratio will rise, fall or even remain constant, depending on the initial values of this ratio. The effect of a rising rentiers' rate of return on the medium-run equilibrium rate of capital accumulation, on the 'warranted rate', is positive. And since we are dealing here with a stable equilibrium outside finance-capital ratio, the 'warranted rate' of capital accumulation has therefore to be stable, too, because it has been derived from the constancy condition for the outside finance-capital ratio. Changing 'animal spirits' have no effect on the medium-run equilibrium rate of capital accumulation (the 'warranted rate') but only affect the equilibrium outside finance-capital ratio in an adverse way, i.e. the medium-run equilibrium value of this ratio will rise in the face of falling management's 'animal spirits'.

Table 3: Short- and medium-run effects of 'financialisation' and rising shareholder power				
		'Contractive' regime	*'Profits without investment' regime*	*'Finance-led growth' regime*
		$\beta(1-s_R)-\theta\frac{h}{v}$		
		–	–	+
Short run				
Rentiers' rate of return, profit share and outside finance-capital ratio	$\frac{\partial h}{\partial e}, \frac{\partial \gamma}{\partial e}$ (short run)	0	0	0
Animal spirits and goods market equilibrium	$\frac{\partial u^*}{\partial \alpha}, \frac{\partial r^*}{\partial \alpha}, \frac{\partial g^*}{\partial \alpha}$ (13, 14, 15)	+	+	+
Rentiers' rate of return and equilibrium rates of capacity utilisation and profit	$\frac{\partial u^*}{\partial e}, \frac{\partial r^*}{\partial e}$ (13a, 14a)	–	+	+
Rentiers' rate of return and equilibrium rate of capital accumulation	$\frac{\partial g^*}{\partial e}$ (15a)	–	–	+
Medium run				
Rentiers' rate of return and profit share	$\frac{\partial h}{\partial e}$ (medium run)	+	+	+
Stability of equilibrium outside finance-capital ratio	$\frac{\partial \hat{\gamma}}{\partial \gamma}$ (20)	+ (unstable)	+ (unstable)	– (stable)
Rentiers' rate of return and equilibrium outside finance-capital ratio	$\frac{\partial \gamma^*}{\partial e}$ (19a)	+/0/–	+/0/–	+/0/–
Rentiers' rate of return and equilibrium rate of capital accumulation ('warranted rate')	$\frac{\partial g^{**}}{\partial e}$ (21a)	+	+	+
Animal spirits and equilibrium outside finance-capital ratio	$\frac{\partial \gamma^*}{\partial \alpha}$ (19b)	+	+	–
Animal spirits and equilibrium rate of capital accumulation ('warranted rate')	$\frac{\partial g^{**}}{\partial \alpha}$ (21b)	0	0	0

From this it follows that a 'finance-led growth' regime, which is characterised by high or rising rates of capacity utilisation, profit and capital accumulation in the face low 'animal spirits' and a high and rising rentiers' rate of return, may be a viable regime, not only in the short but also in the medium run. However, the 'finance-led growth' regime and a medium-run stable outside finance-capital ratio require a special parameter constellation: a low rentiers' propensity to save, a low elasticity of investment with respect to distributed profits and hence to internal funds, a high responsiveness with respect to capacity utilisation, and a weak effect of a change in 'animal spirits' on investment.

In the probably more realistic parameter constellation yielding the medium-run unstable case and the 'profits without investment' or the 'contractive' regimes,[12] the short-run negative effects of rising shareholder power on the real equilibrium via management's preferences are reinforced by the effects of an increasing rentiers' rate of return with respect to capital accumulation. The effects of the increasing rentiers' rate of return on the short-run equilibrium rates of capacity and profit may be negative, which will then give the short-run 'normal' case and the 'contractive' regime. Or they may be positive and over-compensate the negative effect of increasing shareholder power via management's 'animal spirits', and the short-run 'intermediate' case and the 'profits without investment' regime are obtained. In the medium run with a rising mark-up and an endogenously determined outside finance-capital ratio, a rising rentiers' rate of return reduces the equilibrium outside finance-capital ratio, provided managements 'animal spirits' are weak and the effect of unit profits on investment is not too strong. A rising rentiers' rate of return increases the medium-run equilibrium rate of capital accumulation, the 'warranted rate'. The depressing effect of rising shareholder power on management's 'animal spirits' reinforces the diminishing effect of the rising rentiers' rate of return on the equilibrium outside finance-capital ratio.

[12] Empirical analysis for the US (van Treeck/Hein/Dünhaupt, 2007; van Treeck, 2008b) and the estimations by van Treeck (2008a) suggest that the US has been dominated by a 'profits without investment' regime since the early 1980s.

In the medium-run unstable equilibrium, the equilibrium values of the outside finance-capital ratio and of the rate of capital accumulation in the 'profits without investment' and the 'contractive' regimes will only be attained by a fluke. If by accident the economy is in such an equilibrium, the effects of rising shareholder power – via falling 'animal spirits' and a rising rentiers' rate of return – will probably reduce the equilibrium outside finance-capital ratio and surely increase the 'warranted' rate of capital accumulation. The actual value of the outside finance-capital ratio will then exceed its new equilibrium value, whereas the actual rate of capital accumulation will fall short of the respective new 'warranted rate'. We will hence see a disequilibrium process with rising outside finance-capital ratios and falling rates of capital accumulation which reinforce each other. The medium-run equilibrium, therefore, displays 'knife-edge'-instability properties and the disequilibrium process contains a 'paradox of outside finance'.

Of course, this is not to argue that economies with a 'profits without investment' or a 'contractive' regime are cumulatively unstable, because there may be other forces in the economy at work (in particular monetary and fiscal policies) which contain this instability. However, based on the results of our simple model, we would argue that under the conditions of the 'contractive' and the 'profits without investment' regimes there is a considerable systemic medium-run instability potential regarding the financial structure of the economy and capital accumulation. Therefore, a regime of 'profits without investment' in the face of rising shareholder power, as observed in the US since the early 1980s, may emerge under specific conditions. In the medium to long run, however, the financial structure of this regime and the rate of capital accumulation will turn out to be fragile and unstable.

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