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Wage- vs. profit-led growth: the role of the distribution of wages in determining regime character

Thomas I. Palley*

The wage- versus profit-led distinction is a cornerstone of post-Keynesian growth theory. However, the existing theoretical literature focuses on the functional distribution of income and ignores the distribution of wages. This paper shows how the distribution of wages affects whether an economy is wage- or profit-led. Since the distribution of wages impacts personal income distribution, that explains why income inequality can also impact regime character. Increases in workers' wage share always increase growth and capacity utilization regardless of the economy's character. Furthermore, an increase in workers' wage share can flip an economy from being profit-led to wage-led.

Key words: Wage-led, Profit-led, Wage distribution, Personal income distribution
JEL classifications: E12, O41, O33

1. Introduction: wage- versus profit-led growth

The distinction between wage- and profit-led growth is a major feature of Kaleckian growth theory.[1] The essence of the distinction is that in a wage-led economy, an increase in the wage share (i.e. a decrease in the profit share) increases economic activity and growth, whereas in a profit-led economy it has the reverse effects. This distinction has important implications for policy, especially in the current environment of stagnation and high unemployment. If economies are wage-led, it suggests that policy that increases the wage share is a powerful means of raising growth and

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Address for correspondence: Thomas Palley; email: mail@thomaspalley.com

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[1] The Kaleckian growth model was pioneered by Rowthorn (1982), Taylor (1983) and Dutt (1984). The analytic distinction between wage- and profit-led growth was first developed by Bhaduri and Marglin (1990), who use the labels of 'stagnationist' and 'exhilarationist'. The terminology of wage-led and profit-led economies seems to have been first introduced by Taylor (1991, p. 72). Stockhammer (2011) and Lavoie and Stockhammer (2012) provide comprehensive reviews of this extensive literature. Hein (2014) and Lavoie (2014) have recently introduced a distinction between neo-Kaleckian and post-Kaleckian growth models. The former generate wage-led outcomes exclusively: the latter can generate either wage-led or profit-led outcomes.

lowering unemployment. The converse holds for economies that are profit-led (though that policy recommendation then raises difficult questions about trade-offs between growth and income distribution).

Wage- versus profit-led growth theory focuses on the functional distribution of income. The current paper explores the role of the distribution of wage income and shows that the wage distribution affects whether an economy is wage- or profit-led. Since the distribution of wages impacts personal income distribution, that explains why income inequality can also impact regime character. The paper has important policy implications, as it shows that the growth–inequality trade-off posed by profit-led economies can be finessed by making the wage distribution more egalitarian. Consequently, it may be possible to have faster growth and less inequality in economies that appear profit-led. Even more significantly, if the wage distribution is changed sufficiently, the economy can flip from being profit-led to being wage-led.

2. Some preliminaries: relation to other recent literature

The current paper shows how an economy's regime can flip with changes in the wage distribution. That possibility links to other recent papers that explore why a regime might change endogenously or why it might be econometrically misidentified.

Palley (2014a) argues that the investment-saving (IS) balance relation may be non-linear and backward bending in capacity utilization–profit share space. Since the slope of the IS defines whether an economy is wage- or profit-led, that means the economy can potentially shift between wage- and profit-led regimes if the profit share increases or decreases.

A second econometric identification problem (Palley, 2014a, p. 79) concerns shifts of the IS schedule and the slope of the profit share function. If the profit share is a positive function of capacity utilization, shifts of the IS schedule can make it look empirically as if the economy is profit-led when it is in fact wage-led. Conversely, if the profit share is a negative function of capacity utilization, shifts of the IS schedule can make it look empirically as if the economy is wage-led when it is in fact profit-led.

This econometric identification problem has also been theorized by Stockhammer and Michell (2014). They show that an economy with a Minsky debt channel and a Marx reserve army effect can appear profit-led even if it is actually wage-led. As capacity utilization rises, the wage share rises because of the diminished reserve army effect. However, debt also rises because of the Minsky channel, and rising debt can pull down aggregate demand and growth. Consequently, if the Minsky channel dominates, the economy will appear profit-led because of the coincidence of a rising wage share and slowing growth. Kapeller and Schütz (2015) have also shown how consumer debt can make a wage-led economy look profit-led.

Blecker (2014) argues that econometric estimates may misidentify an economy's characteristics because of differences in the short- and long-run response of AD to changes in the wage share. In particular, if consumption is slow to respond to increases in the wage share because of lags in household recognition of changes in permanent income, empirical estimates that fail to take a sufficiently long time horizon may make the economy look profit-led when it may actually be wage-led.

Finally, there is a significant open economy literature (see Blecker, 1989; Stockhammer *et al.*, 2009; Rezai, 2011) that explains why national economies and economic regions of which they are a part may exhibit different demand regime

characteristics. The reason is leakages of demand via imports. Thus, an increase in the wage share may lower aggregate demand in a national economy via its combined effects on investment and imports, but increase aggregate demand in the economic region to which the country belongs. Consequently, econometric estimates of individual national economies can generate profit-led results even though the overall economic region is wage-led.

3. The significance of income and wealth distribution for regime character

The central focus of the paper is the role of income distribution in determining an economy's regime character. Conventional wage- versus profit-led models focus on the impact of the functional distribution of income and ignore the impact of other dimensions of income distribution. Figure 1 describes the structure of income and wealth distribution in the conventional neo-Kaleckian (NK) growth model. Income is divided into profits and wages, with the profit and wage share being determined by firms' markup in accordance with Kaleckian markup pricing theory. All profit income accrues to capitalists, and all wage income accrues to workers. This pattern reflects two assumptions. First, capitalists are assumed to receive no labour income (wages). Second, workers are assumed to consume all their income and have zero saving. Since they save nothing, they have no ownership share and receive no share of profits. The corollary is that capitalists receive all profit income.

Figure 2 describes an alternative structure of income and wealth distribution as used by Palley (2005). There are two critical changes from Figure 1. First, capitalists are identified as capitalist-managers and receive some wage income in their role as managers. Second, workers have a positive propensity to save so that they own part of the capital stock (wealth) and therefore receive a share of profits.

A comparison of Figures 1 and 2 illuminates the central message of the paper. In Figure 1, policy can affect the wage–profit split. However, whether the economy is wage- or profit-led depends exclusively on the differences in propensities to consume of capitalists and workers and on the sensitivity of investment spending to the profit share. In Figure 2, changes in the wage–profit split must pass through a filter that divides both profits and wages between capitalist-managers and workers before affecting consumption spending. Those filters impact the aggregate demand effects of the functional distribution of income, thereby affecting whether an economy is wage- or profit-led. They can also be impacted by policy, so that policy can influence whether an economy is wage- or profit-led.

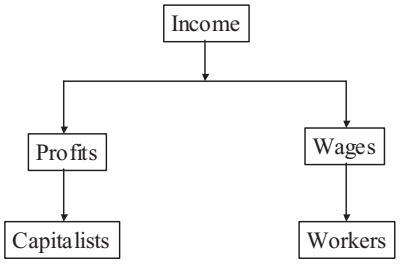

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Figure 1. *Income and wealth distribution in the conventional NK model.*

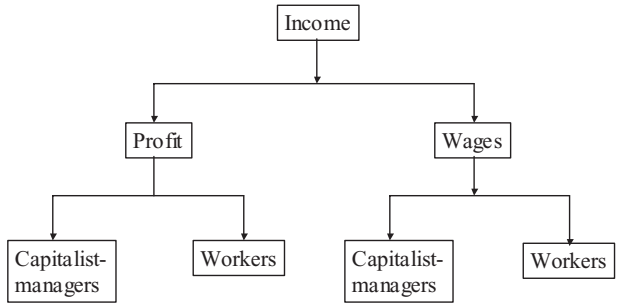

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Figure 2. *Income and wealth distribution in an alternative NK model.*

4. The conventional wage- versus profit-led growth model

For purposes of benchmarking and comparison, this section presents the conventional NK growth model based on the structure of income and wealth distribution shown in Figure 1. Section 5 then presents an amended version of the conventional model that incorporates the structure of income and wealth distribution shown in Figure 2. That amended model is used to explore how income and wealth distribution impact the properties of the standard model.

The conventional growth model is described by the following nine equations:

$$Y = W + \Pi \tag{1}$$

$$W = [1 - z]Y \tag{2}$$

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$$\Pi = zY \tag{3}$$

$$I / K = I = \alpha_0 + \alpha_1 u + \alpha_2 z + \alpha_3 \pi \qquad \alpha_0 > 0, \alpha_1 > 0, \alpha_2 > 0, \alpha_3 > 0 \tag{4}$$

$$\pi = zu \tag{5}$$

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$$z = z(\psi) \qquad z_\psi > 0, \; 0 \le z \le 1 \tag{6}$$

$$S / K = S = \beta_K \pi \qquad 0 \le \beta_K \le 1 \tag{7}$$

$$I = S \tag{8}$$

$$g = I / K \tag{9}$$

Y = national income, W = wage bill, Π = profits, z = profit share of national income, I = investment, K = capital stock, S = capitalists' saving, u = capacity utilization rate (Y/K), π = profit rate (Π/K), z = profit share, β_K = capitalists' propensity to save, and ψ = firms' bargaining power or other variables positively impacting the profit share.

Equation (1) defines national income as consisting of wages and profits. Equation (2) determines wages as a share of national income, while equation (3) determines profits as a share of national income. The assumption is that the entire wage share is paid to workers and the entire profit share is paid to capitalists, in accordance with Figure 1. This implies a deeper microeconomic assumption that workers consume all their wage income and do no saving, so they own none of the capital stock.

Equation (4) determines the rate of capital accumulation, which is a positive function of capacity utilization, the profit share and the profit rate. The inclusion of both a profit share and a profit rate effect is discussed further below.

Equation (5) determines the profit rate, which equals the product of the profit share and the rate of capacity utilization. Equation (6) determines the profit share which, in accordance with Kaleckian distribution theory, is a positive function of firms' power to set the price markup. That power can reflect both goods market monopoly power and labour market bargaining power.

Equation (7) determines the aggregate saving rate, which depends only on capitalists' saving out of profit income, since workers save nothing. The aggregate saving rate depends positively on capitalists' propensity to save. Equation (8) is the dynamic IS condition that ensures investment–saving balance, and equation (9) determines the growth rate which is equal to the rate of capital accumulation.[2]

As is widely recognized, the conventional NK growth model has three regimes: wage-led, conflictive, and profit-led. These regimes refer to the impact of an exogenous change in the profit share. In a wage-led regime, a higher profit share lowers capacity utilization and growth. In a conflictive regime, a higher profit share lowers capacity utilization but increases growth. In a profit-led regime, a higher profit share raises capacity utilization and growth. As discussed below, the different regimes can be characterized by reference to the slope of the IS schedule in [u, z] space.

Tabela

Figure 3 provides a graphical analogue of the model given by equations (4)–(9) for the case of a wage-led economy. The PP line corresponds to equation (6). The IS schedule corresponds to equation (8). The slope of the IS schedule is given by

$$dz/du|_{IS} = \left[S_u - I_u\right]/\left[I_z - S_z\right] = \left[\beta_K z - \alpha_1 - \alpha_3 z\right]/\left\{\alpha_2 + \left[\alpha_3 - \beta_K\right]u\right\}$$

$$S_u = \beta_K z, S_z = \beta_K u, I_u = \alpha_1 + \alpha_3 z, I_z = \alpha_2 + \alpha_3 u.$$

If the Keynesian multiplier stability condition ($\beta_K - \alpha_3 > 0$) holds, then $[S_u - I_u] > 0$, so that the slope of the IS depends exclusively on the sign of the denominator (i.e. the relative sensitivity of investment and saving to the profit share).

The IS is negatively sloped for wage-led economies, the logic being an increase in profit share lowers AD (I response < S response), causing reduced capacity utilization. The IS is positively sloped in profit-led economies. The logic is that an increase in the profit share increases AD (I response > S response), causing increased capacity utilization. Conflictive economies occupy a middle ground between wage-led and profit-led economies. In a conflictive regime, the IS curve is negatively sloped but its slope is larger in absolute value than the wage-led case. This reflects the fact that investment is

[2] For simplicity, depreciation is assumed to be zero so that the distinction between gross and net capital formation can be ignored.

more sensitive to the profit share but the saving response is still larger so that capacity utilization falls (I_z is larger than the wage-led case, but I_z - S_z is still negative). However, growth increases because of the greater sensitivity of investment to the profit share. A vertical IS represents the border between conflictive and profit-led regimes.[3] Table 1 describes the analytical characteristics of profit-led, wage-led, and conflictive economies.

An increase in the profit share (z) shifts the PP schedule up. It also shifts up and rotates clockwise the accumulation function shown in the southwest quadrant of Figure 3. An increase in the profit share also changes the slope of the IS schedule. Inspection of the expression for the slope of the IS shows that there is no effect on the sign of the denominator as $d[I_z - S_z]/dz = 0$. However, the numerator becomes larger as $d[S_u - I_u]/dz = \beta_K - \alpha_3 > 0$, which increases the absolute value of the slope of the IS. If the economy is wage-led, an increase in the profit share can therefore potentially shift the economy from a wage-led regime to a conflictive regime. If the

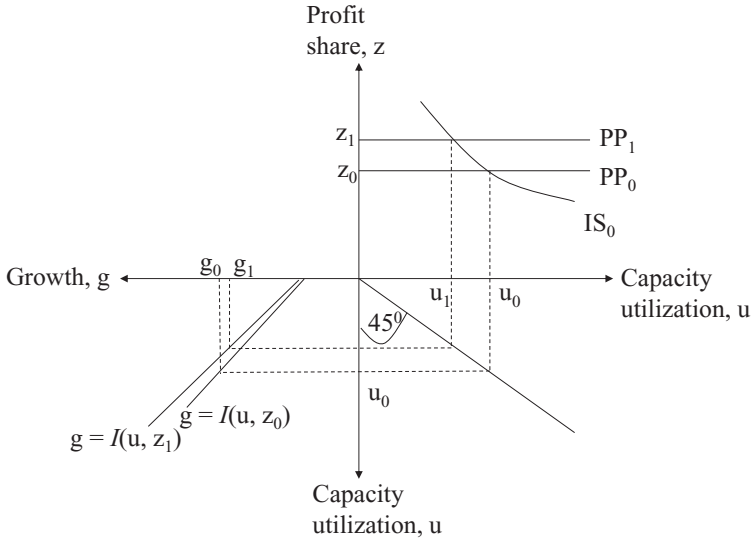

Figure 3. *The wage-led neo-Kaleckian growth ($z_1 > z_0$).*

Table 1. *Conditions describing profit-led, wage-led and conflictive regimes.*

	Capacity utilization	Investment -Saving response	Growth rate
Profit-led	$u_z > 0$	$I_z - S_z > 0$	$I_u u_z + I_z > 0$
Wage-led	$u_z < 0$	$I_z - S_z < 0$	$I_u u_z + I_z < 0$
Conflictive	$u_z < 0$	$I_z - S_z < 0$	$I_u u_z + I_z > 0$

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[3] The Keynesian multiplier stability condition and its relevance for post-Keynesian growth theory is discussed by Lavoie (2014, pp. 348–52). The Keynesian stability condition requires that $\beta_K > \alpha_3$. If $\alpha_2 = 0$ and the Keynesian stability condition holds, the denominator in the expression for the slope of the IS schedule is unambiguously negative. In that case, the economy is either wage-led or conflictive (Dutt, 1984). The implication is that the investment function must also include the profit share as a separate stand-alone argument for the economy to be capable of being profit-led. Blecker (2002, p. 137) terms this requirement a 'strong profit share effect'.

economy is profit-led, an increase in the profit share makes the economy marginally less profit-led because the slope of the IS becomes more positive. Though the investment function is linear in z, the IS schedule is nonlinear. Consequently, in addition to the sign of the change in the profit share, the size of the profit share also matters for the economy's responsiveness.

Figure 3 shows the effects of an increase in the profit share when the economy remains wage-led. Both capacity utilization and growth fall because of the relatively weak profit share effect on investment.[4] If the economy were profit-led, the IS schedule in Figure 3 would be positively sloped. In this case, an increase in the profit share would raise equilibrium capacity utilization, and growth unambiguously increases because of a positive capacity utilization effect on investment spending that reinforces the positive profit rate effect.

Finally, the inclusion of both a profit share ($\alpha_2 z$) effect and a profit rate ($\alpha_3 \pi$) effect in the investment function is essential for the existence of a profit-led regime.[5] The Keynesian multiplier stability condition is $\beta_K > \alpha_3$, which implies the numerator in the expression for the slope of the IS schedule is positive. If there no profit share effect ($\alpha_2 = 0$), the denominator in the expression for the slope of the IS schedule is unambiguously negative. In that case, the economy must be either wage-led or conflictive (Dutt, 1984). The implication is that the investment function must include the profit share as a separate stand-alone argument for the economy to be capable of being profit-led. Blecker (2002, p. 137) terms this requirement a 'strong profit share effect'. The impact of the profit share on investment operates through two channels: the profit rate (α_3) and the profit share (α_2). It is this double channel that enables the economy to be potentially profit-led.

5. The distribution of wages and wage- vs. profit-led growth

This section augments the conventional model to allow both worker and capitalist households to receive profit and wage income along the lines described in Figure 2. These changes affect only aggregate saving and have no effect on the investment function. Because workers save, there is a need to re-specify the model's description of saving behaviour, and there is also a need to account for ownership shares of the capital stock.

The re-specified equations of saving behaviour, the distribution of the wage bill, and the distribution of ownership are given by

$$\varphi_K + \varphi_L = 1 \tag{10}$$

$$\sigma_K + \sigma_L = 1 \qquad \sigma_K > \varphi_K,\ \sigma_L < \varphi_L,\ \sigma_K > \sigma_L,\ \varphi_K < \varphi_L \tag{11}$$

$$S = S_K + S_L \tag{12}$$

[4] If the economy had transitioned into a conflictive regime, then utilization would still fall but growth would increase because of the dominant effect of a higher profit on capital accumulation.

[5] In the Bhaduri–Marglin (1990) model, $\alpha_3 = 0$, so there is only a profit share effect and no profit rate effect. Equation (4) is therefore a more general specification that encompasses the Bhaduri–Marglin model.

$$S_K = \beta_K\{[1-\varphi_L][1-z]u + [1-\sigma_L]zu\} \qquad 0 < \beta_L < \beta_K \leq 1 \qquad (13)$$

$$S_L = \beta_L\{\varphi_L[1-z]u + \sigma_L zu\} \qquad 0 < \beta_L \leq 1 \qquad (14)$$

φ_K = capitalist-managers' share of the wage bill, φ_L = workers' share of the wage bill, σ_K = capitalist-managers' ownership share, σ_L = workers' ownership share, S_K = capitalist-managers' saving rate, S_L = workers' saving rate, β_K = capitalist-managers' propensity to save, and β_L = workers' propensity to save. The restrictions on the size of wage and ownership shares ensure that capitalist-managers own the bulk of the capital stock and get the bulk of their income from profits, while workers get the bulk of their income from wages.

Equations (10) and (11) ensure that household wage and ownership shares sum to unity. In the current model, the distribution of ownership is taken as exogenous.[6] Equation (12) defines aggregate saving, which consists of capitalist-manager and worker saving. Equation (13) determines capitalist saving out of their share of wage and profit income, while equation (14) determines workers' saving out of their share of wage and profit income. Capitalist-managers' propensity to save is assumed to be greater than that of workers. Combing equations (12), (13) and (14) yields

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$$S = \beta_L\{\varphi_L[1-z]u + \sigma_L zu\} + \beta_K\{[1-\varphi_L][1-z]u + [1-\sigma_L]zu\}. \qquad (15)$$

Differentiating (15) with respect to z, φ_L and σ_L yields

$$dS/dz = \{\beta_L - \beta_K\}\{\sigma_L - \varphi_L\}u > 0$$

$$dS/d\varphi_L = [\beta_L - \beta_K][1-z]u < 0$$

$$dS/d\sigma_L = [\beta_L - \beta_K]zu < 0.$$

An increase in the profit share increases aggregate saving. The logic is that it shifts income from wages to profits. As workers receive a smaller share of profits than they do of wages ($\sigma_L < \varphi_L$), that effectively transfers income from workers to capitalist-managers, and the latter have a higher propensity to save. An increase in workers' share of the wage bill transfers wage income from high-saving capitalist-managers to lower-saving workers, causing aggregate saving to fall. An increase in workers' ownership share transfers profit income from high-saving capitalist-managers to lower-saving workers, causing aggregate saving to fall.

The macroeconomic effects of changes in the distributional parameters in the augmented model are shown in Table 2. The capacity utilization and growth effects can be understood in terms of the ISPP diagram shown in Figure 3. An increase in the

[6] A full long-run analysis requires determination of ownership shares as in Palley (2012). That is a complex task beyond the scope of the current paper, which aims only to show how a more realistic representation of wage and profit distribution across households introduces channels that can change the character of the economic regime.

Table 2. *The capacity utilization and growth effects of income and ownership redistribution in the augmented model.*

	Wage-led	Conflictive	Profit-led
du/dz	-	-	+
dg/dz	-	+	+
$du/d\varphi_L$	+	+	+
$dg/d\varphi_L$	+	+	+
$du/d\sigma_L$	+	+	+
$dg/d\sigma_L$	+	+	+

profit share shifts the PP function up and causes a leftward movement up along the IS schedule. An increase in workers' share of the wage bill shifts the IS right and leaves the PP unchanged. The same effects hold for an increase in workers' ownership share. The signs of effects on capacity utilization and growth are shown in Table 2 and are intuitively consistent with the standard model.

An interesting feature of Table 2 is that, regardless of whether the economy is wage- or profit-led, redistributions of the wage share and ownership share to workers always raise capacity utilization and growth. That is because they result in reduced aggregate saving and increased aggregate demand.

Table 2 shows that the effect of a change in the profit share depends on whether the economy is wage-led, conflictive, or profit-led. That depends on the slope of the IS schedule. The IS schedule is given by

$$\alpha_0 + \alpha_1 u + \alpha_2 z + \alpha_3 zu = \beta_L\{\varphi_L[1-z]u + \sigma_L zu\} + \beta_K\{[1-\varphi_L][1-z]u + [1-\sigma_L]zu\}. \quad (16)$$

Its slope is

$$dz/du = [S_u - I_u]/[I_z - S_z] = \{\beta_L\{\varphi_L[1-z] + \sigma_L z\} + \beta_K\{[1-\varphi_L][1-z] + [1-\sigma_L]z\} - \alpha_1 - \alpha_3 z\}/\{\alpha_2 + \{\alpha_3 - \beta_L\{\sigma_L - \varphi_L\} - \beta_K\{[1-\sigma_L] - [1-\varphi_L]\}\}u\}.$$

The important feature of this expression is that the slope depends on all three distributional parameters (z, φ_L and σ_L). As before, if the Keynesian multiplier stability condition ($S_u - I_u > 0$) holds, the numerator is positive and the sign of the slope depends exclusively on the sign of the denominator. The economy is wage-led or conflictive if the denominator is negative and profit-led if it is positive.

Increases in the profit share (z) have no effect on the denominator, so changes in the functional distribution of income have no impact on whether an economy is wage-led or profit-led.[7] Increases in workers' ownership share (σ_L) increase the denominator, making it more likely that it is positive and the economy is profit-led. Ironically,

[7] Endogenous variations of the profit share resulting from changes in capacity utilization are associated with the alternative concepts of wage squeeze and profit squeeze. If the profit share rises with capacity

increasing workers' ownership share can shift the economy from being wage-led to profit-led and vice versa.[8] The logic is that if workers own more, they receive a greater share of profits and spend a greater share of profits, giving profits more bang-for-buck.

Increases in workers' wage share (φ_L) reduce the denominator, making it more likely that it is negative and the economy is wage-led.[9] Increasing workers' share of the wage bill can therefore shift the economy from being profit-led to wage-led and vice versa. The logic is that if workers receive a greater share of wages, a greater share of wages is spent, giving wages more bang-for-buck. This result relates to the finding reported in Palley (2014b) that the character of the economy can flip endogenously if workers' share of the wage bill is a positive function of the rate of capacity utilization.

The interesting thing about the two above experiments is that they both shift income to workers, but they have different effects on the regime. Increasing workers' ownership share makes it more likely that the economy is profit-led. Increasing workers' share of the wage bill makes it more likely that the economy is wage-led. It makes a difference how workers' share of total income is increased. The past thirty years have witnessed a decline in workers' wage and ownership share: the former has made the economy more profit-led, while the latter has made it more wage-led.

Furthermore, as noted in Palley (2005), a profit-led economy can exhibit quasi-wage-led characteristics. If the economy is profit-led, a small shift in the wage bill from capitalist-managers to workers that does not change the regime will still reduce aggregate saving and shift the IS right so that growth and capacity utilization increase. Thus, wage bill redistribution towards workers is expansionary even when the economy is profit-led.

Finally, the finding that changes in the wage distribution can change the character of the economy relates to the finding of Carvalho and Rezai (2015) that an economy can flip from being wage- to profit-led if the aggregate saving rate out of wage income is a positive function of income inequality. In their model, increased income inequality is assumed to increase the propensity to save out of wage income. Though not talked of in terms of the wage distribution, their definition of increased income inequality can be interpreted in terms of a transfer of wage income from low-saving households (i.e. workers) to high-saving households (i.e. capitalist-managers). Since changes in the distribution of wages can change an economy's character, changes in the personal distribution of income can also be associated with changes in the economy's character. This correspondence between changed wage distribution and personal income inequality can be seen from the following model. Personal income inequality is defined by the ratio of capitalist-manager total income to worker total income, as follows:

$$| = Y_K / Y_L \quad (16)$$

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utilisation, the economy is characterised by wage-squeeze dynamics. If the profit share falls with capacity utilisation, the economy is characterised by profit-squeeze dynamics. In principle, an economy can also be characterised by both types of dynamic if the profit share exhibits different behaviour patterns at different rates of capacity utilisation (Palley, 2014a).

[8] Increases in σ_L reduce S_z, which increases $[I_z - S_z]$, making it more likely the denominator is positive so that the economy is profit-led.

[9] Increases in φ_L increase S_z, which lowers $[I_z - S_z]$, making it more likely the denominator is negative so that the economy is wage-led. If φ_L is large, an increase in z disproportionately hits workers and benefits capitalists, causing saving to rise.

Ω = index of income inequality, Y_K = total income of capitalist-managers and Y_L = total income of workers. For the US economy, this inequality index can be thought of as approximating the ratio of the incomes of the top 20% of households relative to the bottom 80%. In the USA, managerial workers constitute approximately 20% of employment, while production and non-supervisory workers constitute approximately 80% of employment. Capitalist-managers' and workers' total income are defined respectively as

$$Y_K = \varphi_K[1-z]Y + \sigma_K zY \tag{17}$$

$$Y_L = \varphi_L[1-z]Y + \sigma_L zY \tag{18}$$

$$Y = Y_K + Y_L. \tag{19}$$

Y = total income. Substituting equations (17) and (18) in (16) yields

$$\Omega = \{\varphi_K[1-z] + \sigma_K z\}/\{\varphi_L[1-z] + \sigma_L z\} = \Omega(z, \varphi_K, \sigma_K). \tag{20}$$

It can then be shown that an increase in capitalist-managers' share of the wage bill increases inequality ($d\Omega/d\varphi_K > 0$), as does an increase in capitalist-managers' ownership share ($d\Omega/d\sigma_K > 0$). The corollary is that an increase in workers' share of the wage bill decreases inequality ($d\Omega/d\varphi_L < 0$), as does an increase in workers' ownership share ($d\Omega/d\sigma_L < 0$). Carvalho and Rezai's (2015) analysis is analogous to a shift in the distribution of wages from workers to capitalist-managers, which increases income inequality.[10] Empirically, the latter was the driving force behind increased US income inequality in the period 1980–2000, but the profit share has also increased since then.

6. Conclusion: implications for policy

The wage- versus profit-led distinction has become a cornerstone of post-Keynesian growth theory and policy analysis. In developing this important conceptual framework, the theoretical literature has focused on the functional distribution of income and ignored the distribution of wages. The current paper has shown the importance of the distribution of wages for whether an economy is wage- or profit-led, and changes in the distribution of wages can change an economy's character.

Increases in workers' wage share always increase growth and capacity utilization regardless of the economy's character. That suggests policymakers should aim to increase workers' wage share, as that stimulates economic activity and growth without negative impacts on investment spending.

The fact that changes in the wage distribution can change an economy's character highlights both a potential econometric and a policy pitfall. The econometric pitfall is that estimates of whether an economy is wage- or profit-led will depend on the configuration

[10] Carvalho and Rezai (2015) do not identify whether the change in income inequality comes from wage bill redistribution or profit redistribution. An increase in workers' share of the wage bill lowers income inequality and makes the economy more prone to being wage-led. An increase in workers' share of profits also lowers income inequality, but it makes the economy more prone to being profit-led. That makes it important to identify the underlying cause of changes in income inequality.

of policies (e.g. minimum wage and labour laws) in place during the sample period.[11] The policy pitfall is the danger of a trap whereby an economy is econometrically identified as profit-led, thereby encouraging policies that focus on the profit share at the expense of the wage share. However, the economy may be profit-led only because of policies that have changed the distribution of wages and lowered workers' share. Both these pitfalls are particularly germane for the US economy, in which division of the wage bill has dramatically shifted towards capitalist-managers due to the explosion in top-management pay.

Rather than increase the profit share to stimulate growth and economic activity, policy should strive to increase workers' share of the wage bill. That unambiguously stimulates growth and can render the economy wage-led, at which stage the appropriate policy would be to increase the wage share, which is the exact opposite of the apparent initial recommendation. Additionally, policy could increase workers' ownership share, thereby giving worker households a greater share of profit income out of which they would consume relatively more.

Bibliography

Bhaduri, A. and Marglin, S. A. 1990. Unemployment and the real wage: the economic basis for contesting political ideologies, *Cambridge Journal of Economics*, vol. 14, 375–93

Blecker, R. 1989. International competition, income distribution and economic growth, *Cambridge Journal of Economics*, vol. 13, no. 3, 395–412

———. 2002. Distribution, demand and growth in neo-Kaleckian macro-models, 129–52 in Setterfield, M. (ed.), *The Economics of Demand-Led Growth: Challenging the Supply-Side Vision of the Long Run*, Cheltenham, UK, Edward Elgar

———. 2014. Wage-Led versus Profit-Led Demand Regimes: The Long and the Short of It, paper presented at the Annual Conference of the Research Network in Macroeconomics and Macroeconomic Policies, Berlin, 30 October–1 November

Carvalho, L. and Rezai, A. 2015. Personal income inequality and aggregate demand, *Cambridge Journal of Economics*, published online, March 15

Dutt, A. K. 1984. Stagnation, income distribution and monopoly power, *Cambridge Journal of Economics*, vol. 8, 25–40

Hein, E. 2014. *Distribution and Growth After Keynes: A Post-Keynesian Guide*, Cheltenham, UK, Edward Elgar

Kapeller, J. and Schütz, B. 2015. Conspicuous consumption, inequality and debt: the nature of consumption-driven profit-led regimes, *Metroeconomica*, vol. 66, no. 1, 51–70

Lavoie, M. 2014. *Post-Keynesian Economics: New Foundations*, Cheltenham, UK, Edward Elgar

Lavoie, M. and Stockhammer, E. 2012. *'Wage-Led Growth: Concept, Theories, and Policies', Conditions of Work and Employment Series No. 41*, ILO, Geneva

Lucas, R. E. Jr. 1976. Econometric policy evaluation: a critique, pp. 19–46 in Brunner, K., and Meltzer, A. (eds.), *The Phillips Curve and Labor Markets*, vol. 1, Carnegie-Rochester Conference Series on Public Policy, Amsterdam, North-Holland

Palley, T. I. 2005. Class conflict and the Cambridge theory of distribution, in Gibson, B. (ed.), *The Economics of Joan Robinson: A Centennial Celebration*, Cheltenham, UK, Edward Elgar

———. 2012. Wealth and wealth distribution in the neo-Kaleckian growth model, *Journal of Post Keynesian Economics*, vol. 34, Spring, 449–70

———. 2014a. Enriching the neo-Kaleckian growth model: nonlinearities, political economy, and q theory, 71–84 in Dullien, S., Hein, E., and Truger, A. (eds.), *Macroeconomics, Development and Economic Policies: Festschrift for Jan Priewe*, Marburg, Metropolis-Verlag

[11] This has some resemblance with Lucas's (1976) critique of econometric estimations of policy impact, which he argued was endogenous and depended on agents' expectations of policy. In a like vein, the current paper shows that the econometrically identified character of an economy is affected by in-sample period policies so that it is contingent on policy and may change with changes in policy. In addition to labour market regulations, fiscal policy is also relevant because tax rates can impact the sensitivity of investment and saving to changes in the profit share.

———. 2014b. The middle class in macroeconomics and growth theory: a three class neo-Kaleckian-Goodwin model, *Cambridge Journal of Economics*, web access, July
Rezai, A. 2011. *'The Political Economy Implications of General Equilibrium Analysis in Open Economy Macro Models'*, manuscript, Department of Socio-Economics, Vienna University of Economics and Business, Vienna, Austria
Rowthorn, R. 1982. Demand, real wages and growth, *Studi Economici*, vol. 19, 3–54
Stockhammer, E. 2011. Wage-led growth: an introduction, *International Journal of Labor Research*, vol. 3, no. 2, 167–88
Stockhammer, E. and Michell, J. 2014. 'Pseudo-Goodwin Cycles in a Minsky Model', Post Keynesian Economics Study Group, Working Paper 1405
Stockhammer, E., Onaran, Ő. and Ederer, S. 2009. Functional income distribution and aggregate demand in the Euro area, *Cambridge Journal of Economics*, vol. 33, no. 1, 139–59
Taylor, L. 1983. *Structuralist Macroeconomics*, New York, Basic Books
———. 1991. *Income Distribution, Inflation, and Growth*, Cambridge, MA, MIT Press