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Palley, Thomas I.

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Rethinking wage vs. profit-led growth theory with implications for policy analysis

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Working Paper

Thomas I. Palley[1]

Rethinking wage vs. profit-led growth theory with implications for policy analysis[2]

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Keywords: wage-led, profit-led, Lucas critique, income distribution, financialization

JEL references: E12, O41, O33

[1] Independent Economist, Washington, DC, Mail@thomaspalley.com

[2] This paper was prepared for and presented at the annual conference of the Research Network in Macroeconomics and Macroeconomic Policies, sponsored by the IMK, to be held in Berlin, Germany on October 30 – November 1, 2014. I thank conference participants for their comments. Any errors are mine.

Rethinking wage vs. profit-led growth theory with implications for policy analysis[1]

Abstract

The distinction between wage-led and profit-led growth is a major feature of Post-Keynesian economics and it has triggered an extensive econometric literature aimed at identifying whether economies are wage or profit-led. That literature treats the economy's character as exogenously given. This paper questions that assumption and shows an economy's character is endogenous and subject to policy influence. This generates a Post-Keynesian analogue of the Lucas critique whereby the econometrically identified character of the economy depends on policy rather than being a natural characteristic. Over the past twenty years, policy has made economies appear more profit-led by lowering workers' share of the wage bill and tax rates on shareholder income. Increasing workers' wage bill share increases growth and capacity utilization regardless of whether the economy is wage-led, profit-led or conflictive. That speaks to making it the primary focus of policy efforts.

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Thomas I. Palley
Independent Economist
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1. Introduction: the endogeneity of wage and profit-led regimes

The distinction between wage and profit-led growth is a major feature of neo-Kaleckian growth theory.[2] 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 policy that increases the wage share is a powerful means of raising growth and 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).

These policy implications have triggered an extensive econometric literature that aims to identify whether economies and economic regions are wage or profit-led.[3] The implicit fundamental assumption within that empirical literature is an economy's or an economic region's character (i.e. whether it is wage or profit-led) is exogenously determined by deep primitive parameters. The current paper questions that assumption and explores the foundations of what determines whether an economy is wage or profit-led. The paper shows that the character of an economy depends on both exogenous primitive parameters and on characteristics that are endogenous and potentially subject to policy influence.

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[2] The neo-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.

[3] See Stockhammer and Onaran, 2004; Hein and Vogel, 2008; Stockhammer and Ederer, 2008; Hein and Tarassow, 2009; Stockhammer, Ederer and Onaran, 2009; and Stockhammer, Hein and Grafl, 2011.

The paper has both novel theoretical and policy implications. The theoretical analysis gives rise to a Post-Keynesian analogue of the Lucas critique (Lucas, 1976). Lucas argued that the estimated econometric impact of policy was endogenous and depended on agents' expectations of policy. In like vein, the current paper shows that whether an economy is wage or profit-led will depend on existing policies. Consequently, it is not possible to classify an economy as being intrinsically wage or profit-led. Instead, the econometrically identified character of the economy is contingent on policy and may change with changes in policy.

At the policy level, the paper shows that the growth – inequality trade-off posed by profit-led economies can be finessed by changing the distribution of the wage share. 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 literature

Before developing the details of the argument, it is worth pointing out and distinguishing another developing literature that has some resemblances to the argument developed in this paper. That literature does not question the underlying wage versus profit-led construction of growth theory, but instead focuses on potential pitfalls in the econometric identification of wage and profit-led demand regimes.

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 demand 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.

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.

Lastly, 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 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, in econometric estimates a national economy can appear profit-led while the economic region is wage-led.

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

I now turn to the argument of the paper which centers on the role of income and wealth distribution for determining the economy's regime character. Figure 1 describes the structure of income and wealth distribution in the standard neo-Kaleckian (NK) growth model. Income is divided into profits and wages, with the profit and wage share being determined by firms' mark-up in accordance with Kaleckian mark-up 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 labor 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 of that is capitalists receive all profit income.

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

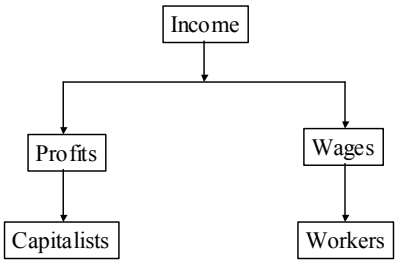
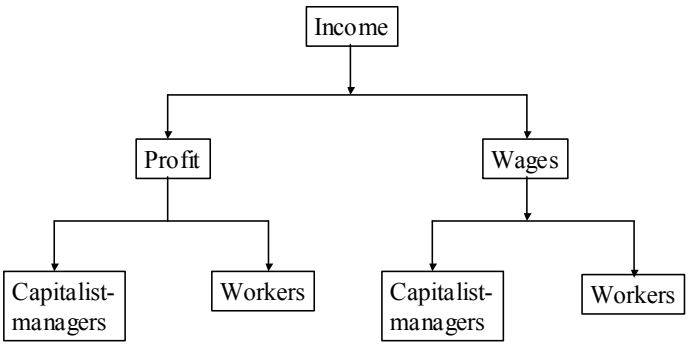


Figure 2 describes an alternative structure of income and wealth distribution as used by Palley (2005). There are two critical changes from Figure 1. First, capitalists are identified as capitalist-managers and they receive some wage income in their role as managers. Second, workers have a positive propensity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

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



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 on the differences in propensities to consume of capitalists and

workers and on the sensitivity of investment spending to the profit share. These characteristics are taken as primitive and beyond policy's reach. 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 can be impacted by policy, so that policy can thereby influence whether an economy is wage or profit-led by impacting the aggregate demand response to changes in the functional distribution of income.

3. The standard NK growth model with regime exogeneity

For purposes of benchmarking and comparison, this section presents the standard NK growth model based on the structure of income and wealth distribution shown in Figure 1. Section 4 then presents an amended version of the standard NK growth 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 NK growth model.

The standard NK growth model is described by the following nine equations

(1) $Y = W + \Pi$

(2) $W = [1-z]Y$

(3) $\Pi = zY$

(4) $I/K = I = \alpha_0 + \alpha_1 u + \alpha_2 \pi$ $\qquad \alpha_0 > 0, \alpha_1 > 0, \alpha_2 > 0$

(5) $\pi = zu$

(6) $z = z(\psi)$ $\qquad z_\psi > 0, 0 \leq z \leq 1$

(7) $S/K = S = \beta\pi$ $\qquad 0 \leq \beta \leq 1$

(8) $I = S$

(9) $g = I/K$

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 = capitalists' propensity to save, 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. Equation (4) determines the rate of capital accumulation which is a positive function of capacity utilization and the profit rate. 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 mark-up. That power can reflect both goods market monopoly power and labor 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.[4]

As is widely recognized, the standard 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

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

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.

Figure 1 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

$dz/du = [S_u - I_u]/[I_z - S_z] = [\beta z - \alpha_1 - \alpha_2 z]/[\alpha_2 - \beta]u$

$S_u = \beta z$, $S_z = \beta u$, $I_u = \alpha_1 + \alpha_2 z$, $I_z = \alpha_2 u$

If the Keynesian multiplier stability condition holds then $[S_u - I_u] > 0$, so that the slope of the IS depends 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 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 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 investment is more sensitive to the profit share. A vertical IS represents the border between conflictive and profit-led regimes. Table 1 describes the analytical characteristics of profit-led, wage-led, and conflictive economies.

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

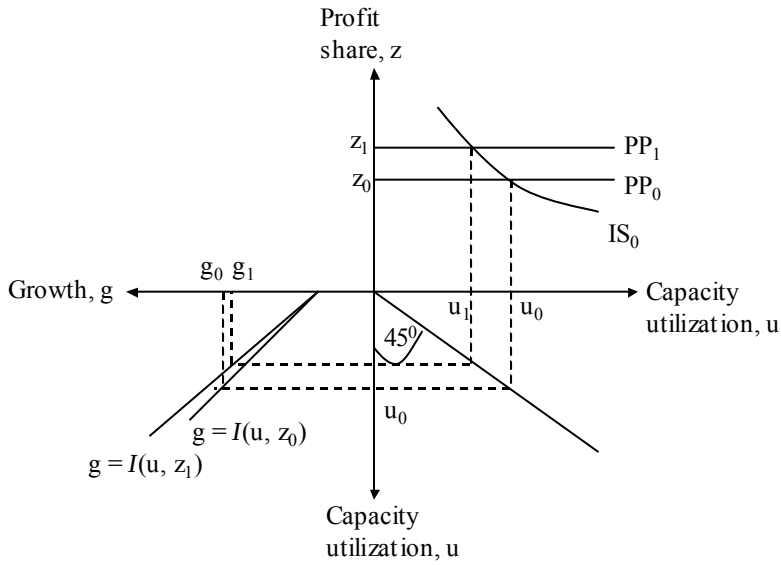
	Capacity utilization	**Investment -Saving response**	**Growth rate**
Profit-led	$u_z > 0$	$I_z - S_z > 0$	$I_u u_z + I_z > 0$
Wage-led	$u_z < 0$	$I_z - S_z < 0$	$I_u u_z + I_z < 0$
Conflictive	$u_z < 0$	$I_z - S_z < 0$	$I_u u_z + I_z > 0$

An increase in the profit share (z) shifts the PP schedule up. It also 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 there is no effect on the sign of the denominator as $d[I_z - S_z]/dz = 0$. However, the numerator becomes larger as $d[S_u - I_u]/dz = \beta - \alpha_2 > 0$, 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 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.

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.[5]

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

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



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.

4. An augmented NK model with regime endogeneity

This section augments the basic NK model to incorporate personal income and wealth distribution along the lines described in Figure 2. These changes only affect saving and have no effect on the investment function. Now, because workers save there is need to re-specify the model's description of saving behavior. The re-specified equations of saving behavior are given by:

(10) $\varphi_K + \varphi_L = 1$

(11) $\sigma_K + \sigma_L = 1$

(12) $S = S_K + S_L$

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

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

φ_K = capitalist-managers' share of the wage bill, φ_L = workers' share of the wage bill, σ_K = capitalist-managers' ownership share, and σ_L = workers' ownership share, S_K = capitalist-managers' saving, S_L = workers' saving, β_K = capitalist-managers' propensity to save, and β_L = workers' propensity to save.

Equations (10) and (11) ensure that the wage and ownership shares sum to unity.[6] Equation (12) defines aggregate saving as consisting 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:

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

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 it shifts income from wages to profits. As workers receive a smaller share of profits than they do of wages, 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

[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 simply to show that a more realistic representation of income and wealth distribution introduces channels that can change the character of the economic regime.

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 profit share shifts the PP function up and shifts the IS schedule left. 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 sign of effect on capacity utilization and growth are shown in Table 2 and they 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 is always raises capacity utilization and growth. That is because they result in reduced aggregate saving and increased aggregate demand.

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	-	+	+
$du/d\varphi_L$	+	+	+
$dg/d\varphi_L$	+	+	+
$du/d\sigma_L$	+	+	+
$dg/d\sigma_L$	+	+	+

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

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

Its slope is:

$dz/du = [S_u - I_u]/[I_z - S_z]$

$$=\{\beta_L\{\varphi_L[1 - z] + \sigma_L z\} + \beta_K\{[1 - \varphi_L][1 - z]+[1 - \sigma_L]z\} - \alpha_1 - \alpha_2 z\}/$$

$$\{\alpha_2 - \beta_L\{\sigma_L - \varphi_L\} - \beta_K\{[1 - \sigma_L] -[1 - \varphi_L]\}\}u$$

The important feature of this expression is 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 that 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. Increasing workers' ownership share can therefore shift the economy from being wage-led to profit-

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

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.

These two results relate to the finding of Carvalho and Rezai (2013) that an economy can flip from being wage to profit-led if aggregate saving rate is a positive function of income inequality. The results also relate 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 last 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.

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[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.

Lastly, as noted by 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, internal wage bill redistribution toward workers is expansionary even when the economy is profit-led.

5. The effect of fiscal policy on the economy's regime

This section adds fiscal policy into the mix to show how fiscal policy is also impacts the economy's characteristics. For current purposes, the treatment is partial and focuses exclusively on the impact of taxes, ignoring government spending and the financial stock effects of budget deficits and surpluses. This partial treatment is justified because the focus is on the narrow question of showing how fiscal policy can impact the wage versus profit-led character of an economy.[10]

The inclusion of taxes changes the investment and saving functions as follows:

(17) $I/K = I = \alpha_0 + \alpha_1 u + \alpha_2[1 - t_\pi]\pi \qquad \alpha_0 > 0, \alpha_1 > 0, \alpha_2 > 0$

(18) $S = S_K + S_L$

(19) $S_K = \beta_K\{[1 - t_W][1-\varphi_L][1-z]u + [1-t_\pi][1-t_D][1-\sigma_L]z[1-t_\pi][1-t_D]u\} \qquad 0 < \beta_L < \beta_K \leq 1$

(20) $S_L = \beta_L\{[1 - t_W]\varphi_L[1-z]u + [1 - t_\pi][1 - t_D]\sigma_L zu\} \qquad 0 < \beta_L \leq 1$

(21) $S = \{\beta_L\{[1-t_W]\varphi_L[1-z]+[1-t_\pi][1-t_D]\sigma_L z\}+\beta_K\{[1-t_W][1-\varphi_L][1-z]+[1-t_\pi][1-t_D][1-\sigma_L]z\}\}u$

t_π = corporate profits tax rate, t_W = wage tax rate, t_D = distributed profit (dividends) tax. In this particular model economy there are three types of taxes: a tax on corporate profits, a tax on wage income, and a tax on profits attributable to shareholders. In this

[10] Palley (2013a) provides a comprehensive analysis of the impact of fiscal policy on growth and distribution in the neo-Kaleckian model.

specification profits are taxed twice. The corporate profit tax rate can be negative if firms receive subsidies to invest. It is also assumed capitalists and workers pay the same tax rate on wage and profit income. Other taxes and differential tax rates to reflect such features as progressivity are also possible.

The IS schedule is then given by:

$$(22)\ \alpha_0 + \alpha_1 u + \alpha_2[1 - t_\pi]zu = \beta_L\{[1-t_W]\varphi_L[1-z]+[1-t_\pi][1-t_D]\sigma_L z\}u + \beta_K\{[1-t_W][1-\varphi_L][1-z]+[1-t_\pi][1-t_D][1-\sigma_L]z\}u$$

Its slope is:

$$dz/du = [S_u - I_u]/[I_z - S_z]$$

$$= \{\beta_L\{[1-t_W]\varphi_L[1-z]+[1-t_\pi][1-t_D]\sigma_L z\} + \beta_K\{[1-t_W][1-\varphi_L][1-z]+[1-t_\pi][1-t_D][1-\sigma_L]z\}-\alpha_1-\alpha_2[1-t_\pi]z\}/ \{\alpha_2[1-t_\pi] - \beta_L\{[1-t_\pi][1-t_D]\sigma_L - [1-t_W]\varphi_L\} - \beta_K\{[1-t_\pi][1-t_D]\,[1-\sigma_L] - [1-t_W]\,[1-\varphi_L]\}\}u$$

Once again, assuming the Keynesian multiplier stability condition holds ($[S_u - I_u] > 0$), the characterization of the economy depends on the sign of the denominator. If it is positive, the economy is profit-led. If it is negative, it is wage-led or conflictive.

Inspection of the denominator shows that reductions in the corporate profit rate (t_π) make it more likely the denominator is positive so that the economy is profit-led. The reason is a lower corporate profit tax makes investment more sensitive to an increase in the profit share. Conversely, a higher corporate profit rate makes it more likely that the economy is wage-led.

Reductions in the wage tax (t_W) lower the denominator making it more likely the economy is wage-led. The logic is that a lower wage tax means there is a larger aggregate

demand effect from an increase in the wage share. Conversely, a higher wage tax makes it more likely the economy is profit-led.

Lastly, a reduction in the tax on profits attributable to shareholders (t_D) makes it more likely that the denominator is positive so that the economy is profit-led. The reason is a lower tax on shareholder profits means there is a larger aggregate demand effect from an increase in the profit share. Conversely, a higher tax on shareholder profits makes it more likely the economy is wage-led.

The important take-away from these simple observations is the wage versus profit-led character of the economy depends on fiscal policy settings and is therefore impacted by policy.

6. The effect of financialization on the economy's regime

Financialization refers to the dominance of the real economy and economic policy by financial institutions and financial interests.[11] Recently, there has been much interest in its impacts which include affecting firms' financial policies, stock market wealth effects, and increased household debt. This section examines how financialization impacts the character of the economy and growth outcomes. The model that is presented below is highly stylized but it captures the essential features of financialization. Debt plays a critical role within analyses of financialization and for simplicity only worker households are assumed to have debt.

The equations of the model augmented for the major effects of financialization are:

Business sector:

[11] Two recent major studies on financialization are Hein (2012) and Palley (2013c).

(23) $I/K = I = \alpha_0 + \alpha_1 u + \alpha_2 \pi + \alpha_3[1-\lambda]\pi + \alpha_4 q$ $\alpha_0 > 0, \alpha_1 > 0, \alpha_2 > 0, \alpha_3 > 0, \alpha_4 > 0$

(24) $\pi = zu$

(25) $z = z(\psi)$ $z_\psi > 0, 0 \leq z \leq 1$

Financial sector:

(26) $V = q[\pi + iD]$ $q > 0$

(27) $B = gD$

(28) $M = D$

Goods market:

(29) $S_L = \beta_L\{\varphi_L[1-z]u + \sigma_L[\lambda zu + rD] - rD\} - B - \nu_L\{\sigma_L[V + M] - D\}$

(30) $S_K = \beta_K\{[1-\varphi_L][1-z]u + [1-\sigma_L][\lambda zu + rD]\} - \nu_K[1-\sigma_L][V + M]$ $\nu_L \geq \nu_K > 0$

(31) $S = S_L + S_K$

(32) $I = S$

(33) $g = I/K$

λ = share of profits distributed to owners, V = value of the stock market per unit of capital, q = stock market valuation ratio, r = real interest rate, D = real debt of worker households per unit of capital, B = real borrowing per unit of capital, M = real money stock per unit of capital, ν_L= workers' propensity to consume out of wealth, and ν_K = capitalist-managers' propensity to consume out of wealth.

Equations (23), (24), and (25) constitute the business sector and determine the rate of capital accumulation, the profit rate, and the profit share respectively. The only changes from before concern equation (23) in which the rate of capital accumulation now depends positively on retained profits and the stock market valuation ratio. The retained

profit effect captures the impact of cash flows on investment (Fazzari et al., 1988), and the stock market valuation effect reflects Tobin's q (Brainard and Tobin, 1977).

Equations (26) - (28) constitute the financial sector. Equation (26) determines the value of stock market wealth, which is a multiple (q) of total business sector profits. Those profits consist of profits on production and interest income on worker household borrowing. Equation (27) determines steady state borrowing by workers. Debt must grow at the same rate as the capital stock to maintain a steady debt-capital ratio.[12] Equation (28) determines the money supply. The monetary system is assumed to be one of endogenous credit money in which loans create deposits (see Moore, 1988). Banks are treated as intermediaries that have no operating costs: they make loans, create deposits, and pay all loan interest income to bank owners.

Equations (29) – (33) constitute the goods market sector, with equations (29) and (30) being the modified aggregate saving functions of worker and capitalist-manager households. Dividend income is reduced to reflect the fact that firms retain part of profits, but it is increased by loan interest income received from banks. Worker household disposable income is reduced by loan interest payments, which in turn reduces worker saving. Worker saving is also reduced by worker borrowing, and workers are assumed to spend all their borrowing on consumption. Borrowing therefore reduces their saving one-for-one. Finally, saving by both workers and capitalist-managers is reduced by a consumption wealth effect. Worker wealth consists of their ownership share of the stock market and money balances less debt. Capitalist-manager wealth consists of their

[12] See Dutt (2005, 2006) and Palley (2010, 2013b Chapter 9) for comprehensive treatments of the neo-Kaleckian growth model with debt.

ownership share of the stock market and money balances. Money balances are assumed to be allocated across households in the same proportion as stock market ownership.

As regards the effects of financialization, there are two distinct sets of questions. First, how does the introduction of variables associated with financialization change the character of the system, possibly causing a switch of regimes? Second, how does deepening of financialization affect capacity utilization and growth outcomes?
The variables of interest are profit retention policy as captured by the payout ratio (λ), the stock market valuation ratio (q), the interest rate on debt (i), and bank lending to worker households (D).

As before, the behavior of the economy can be understood through the ISPP diagram contained in Figure 3, with its character being determined by the slope of the IS schedule. The reduced form IS schedule is given by

$$(34)\ \alpha_0 + \alpha_1 u + \alpha_2 zu + \alpha_3[1-\lambda]zu + \alpha_4 q =$$

$$\beta_L\{\varphi_L[1-z]u+\sigma_L[\lambda zu+rD] - rD\} - gD - \nu_L\{\sigma_L[q[zu+iD] + D] - D\}$$

$$+ \beta_K\{[1-\varphi_L][1-z]u+[1-\sigma_L][\lambda zu+rD]\} - \nu_K[1-\sigma_L][q[zu+rD] + D]$$

The slope of the IS is given by:

$$dz/du = [S_u - I_u]/[I_z - S_z]$$

$$S_u = \beta_L\{\varphi_L[1-z]+\sigma_L\lambda z\} - \nu_L\sigma_L qz + \beta_K\{[1-\varphi_L][1-z]+[1-\sigma_L]\lambda z\} - \nu_K[1-\sigma_L]qz$$

$$I_u = \alpha_1 + \alpha_2 z + \alpha_3[1-\lambda]z$$

$$I_z = \{\alpha_2 + \alpha_3[1-\lambda]\}u$$

$$S_z = \{\beta_L\{\sigma_L\lambda - \varphi_L\} - \nu_L\sigma_L q + \beta_K\{[1-\sigma_L]\lambda - [1-\varphi_L]\} - \nu_K[1-\sigma_L]q\}u$$

The slope of the IS continues to determine whether the economy is wage-led, conflictive, or profit-led. If the Keynesian multiplier stability condition holds ($[S_u - I_u] > 0$), the sign

of the slope depends on the sign of the denominator which determines the character of the economy.

As regards the numerator, financialization has impacts via the payout ratio (λ) and the stock market valuation ratio (q). An increase in the payout ratio reduces the magnitude of I_u and increases the magnitude of S_u, which makes it more likely the numerator is positive. An increase in the stock market valuation ratio decreases the magnitude of S_u. An increase in the payout ratio tends to stabilize the economy, whereas an increase in the stock market valuation ratio tends to destabilize it.

As regards the denominator, financialization again has impacts via the payout ratio (λ) and the stock market valuation ratio (q). An increase in the payout ratio reduces the magnitude of I_z and increases the magnitude of S_z, making it more likely the denominator is negative and the economy wage-led. The logic is profits have less impact on investment as they are being paid out and more of profit is being saved. Balanced against that, an increase in the stock market valuation ratio has no effect on I_z but decreases the magnitude of S_z, making it more likely the denominator is positive and the economy profit-led. Financialization can therefore shift the economy in a wage-led or profit-led direction, depending on the relative magnitude of effects.

As in the standard model, an increase in the profit share resulting from an increase in firms' power (ψ) shifts the PP function up. The effect on capacity utilization (u) and growth (g) therefore depends on whether the economy is wage-led, conflictive, or profit-led.

With regard to the impact of deepening of financialization, increasing the payout ratio (λ) and lowering retained profit ratio lowers the investment rate and increases the

saving rate. The IS therefore shifts left, lowering capacity utilization and growth in all regimes.

An increase in the stock market valuation ratio (q) increases the investment rate and lowers the saving rate. The IS therefore shifts right, raising capacity utilization and growth in all regimes. This positive impact of higher stock market prices (q) constitutes an "asset price Keynesianism" channel.

An increase in the real interest rate (r) increases the net transfer of income from worker households to capitalist-manager households. It therefore increases the saving rate, which shifts the IS left and lowers capacity utilization and growth in all regimes.

Lastly, the effect of increased indebtedness (*D*) has ambiguous implications. On the positive side, it lowers worker saving by increasing consumption borrowing (g*D*). It also increases wealth by creating money balances that give rise to a consumption wealth effect for capitalist-manager households. On the negative side, it creates a net negative wealth effect for worker households that increases worker saving. It also increases the net debt service transfer from workers to capitalist-managers which increases aggregate saving, with the magnitude of this effect depending on the level of interest rates and the difference in propensities to save. The direction of shift of the IS and the impact on capacity utilization and growth is therefore ambiguous. However, the higher are interest rates, the more likely the effect is to be negative. To the extent that financialization promotes higher interest rates, that would tend to make deepening of financialization a drag on capacity utilization and growth.[13]

[13] In its initial stage financialization seems to have raised the real interest rate. Now, it has pushed economies into stagnation, which has lowered the real interest rate.

Table 4 summarizes the impact of deepening of financialization on capacity utilization and growth. Because the effects are the same across regimes there is no need to distinguish by regime type.

Table 3. The economic impacts of deepening of financialization.

	$d\lambda$	dq	dr	dD
du	-	+	-	?
dg	-	+	-	?

7. Implications for policy analysis

The possibility that the character of the economic regime is affected by policy settings has significant implications for policy analysis. The existing theoretical construction of wage versus profit-led growth takes the economy's character as given, as if it were a product of nature. The above arguments show that it is not. The economy's regime character depends on workers' share of the wage bill and their ownership share, which are parameters that can be affected by policy. Additionally, it depends directly on the mix of taxes and tax rate settings, and it can also be affected by financialization.

At the theoretical level, the fact that policy can affect which structure prevails generates a Post-Keynesian analogue of Lucas's (1976) critique of econometric assessments of policy. Lucas argued that conventional econometric assessments of policy impacts were unreliable because underlying behaviors would change in response to

policy changes, rendering obsolete the initial econometric estimates policy on which policy was decided. Post-Keynesian econometric assessments seek to identify whether the economy is wage-led or profit-led. In fact, the econometrically observed character of the economy depends on policy and may change with policy. That is because policy affects how changes in the wage-profit split are spread across households, thereby impacting the response of the economy to changes in the wage profit split.

At the practical policy level, the endogeneity of the economy's character with respect to policy raises significant policy issues. Suppose econometricians report that the economy is profit-led. Does that mean policy should aim to increase the profit share? If growth and increased utilization are the only goals of macroeconomic policy, conventional neo-Kaleckian reasoning suggests "yes". However, the above arguments show that the economy may look profit-led because workers' wage share has been reduced and is low. In that event, the solution is not to increase the profit share, but rather to increases workers' share of the wage bill. That 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.

These observations suggest that the current policy approach is theoretically flawed, and it also holds some practical dangers. In particular, there is the danger of a trap whereby the 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 only look profit-led because of policies conducive that econometric finding.

We can use the above analysis to derive a sense of optimal policy. Increases in workers' wage share always increases growth and capacity utilization regardless of the economy's character. That suggests policymakers should aim to increase workers' wage share. Doing so will tend to make the economy wage-led. That then speaks to lowering the profit share to further raise growth and capacity utilization. However, to maintain investment spending and growth, policy should then lower the corporate profit tax rate and replace lost revenues with a tax on distributions to shareholders. That is the type of policy mix that held from 1945-75. Since then, policymakers have lowered workers' wage and ownership share and reduced shareholder taxes. From a Post-Keynesian perspective, it explains the long-term drift toward stagnation, and it also explains why economies may now tend to appear profit-led (or at least non-wage-led) in econometric assessments.

8. Conclusion

This paper has shown that the wage versus profit-led characteristic of an economy is not a product of nature that is exogenously given. Instead, it is impacted by policies that affect the personal distribution of income. Consequently, an economy can only be described as wage or profit-led in a contingent sense, which has implications for interpretations of econometric assessments.

Over the past twenty years, policy has inclined to making economies appear more profit-led. That is because policy has contributed to reducing workers' share of the wage bill and lowering tax rates on distributions to shareholders.

Increasing the workers share of the wage bill unambiguously increases growth and capacity utilization regardless of whether the economy is wage-led, profit-led or conflictive. That speaks to making it the primary focus of policy efforts.

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