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Household Borrowing and the Possibility of "Consumption-Driven, Profit-Led Growth"

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Working Paper No. 39

January 25, 2016

ABSTRACT

We first show that, with a Kaleckian structure that is consistent with Pasinetti (1962), the relationship between distribution and growth is more robust than conventional wisdom suggests. Next, we extend our model by incorporating borrowing and emulation effects into workers' consumption behavior, under different assumptions about how debt is serviced. Our results demonstrate that borrowing and emulation transform the relationship between distribution and growth, giving rise to the possibility of a "consumption-driven, profit-led" growth regime (Kapeller and Schütz, 2015) and what we call the "paradox of inequality." A key conclusion is that the wage-or -profit led characteristics of the growth process, rather than being invariant, can be altered by social constructs such as borrowing and consumption norms that change over time.

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[*]Earlier versions of this paper were presented at the Meetings of the Eastern Economic Association, Boston, March 6-9, 2014 and at the Fundação de Economia e Estatística (FEE), Porto Alegre, Brazil, August 12, 2014. We would like to thank, without implicating, conference and seminar participants and, in particular, Bruno Paim for their helpful comments. Mark Setterfield would like to thank the Institute for New Economic Thinking and the Dana Foundation for their generous financial support.

JEL Codes: E12, E44, O41

Keywords: Borrowing, saving, emulation, debt servicing, wage-led growth, profit-led growth

1 Introduction

In both Classical and Cambridge growth theory, fixity of the capacity utilization rate results in a strict trade-off between the real wage and the rate of profit and, as a result, the real wage and the rate of growth. Given the labour to output ratio required by the process of production, and since $r \equiv \pi u$ (where r is the rate of profit, π is the profit share, and u is the rate of capacity utilization measured as the ratio of real output to the capital stock), an increase in the real wage will reduce the profit share of income and hence (given that capacity utilization is fixed) the profit rate. In the presence of a standard Marxian or Robinsonian accumulation function, in which the rate of accumulation varies directly with the rate of profit, this ensures that any redistribution of income towards wages is inimical to growth.[1] In the Kalecki-Steindl model, however, capacity utilization is allowed to vary even in the long run. In the canonical version of this model (on which see, for example, Lavoie (2014, chpt.6)), variability in the rate of capacity utilization produces the "paradox of costs," according to which an increase in the wage share of income *increases* the rate of growth.

In view of these diametrically opposed results, it is perhaps not surprising that the question as to whether or not it is appropriate to treat the rate of capacity utilization as variable in the long run has been a source of considerable controversy. The Classical/Cambridge position is based on the existence of a fixed "normal" rate of capacity utilization, u_n, with the long run or steady-state requirement that $u = u_n$ ruling out variability of the actual rate of capacity utilization (u) in the long run. Kaleckians, meanwhile, argue that u_n is a convention that can vary in response to changes in u, so that equality between u and u_n can be achieved without forfeiting the notion of u as an adjusting variable in the long run (Lavoie, 1995, 1996; Dutt, 1997).

An important feature of the landmark contributions of Marglin and Bhaduri (1990) and Bhaduri and Marglin (1990) is their demonstration that fixed versus variable capacity utilization is not the

[1] In a Robinsonian model the decline in the growth rate would be transitory in the presence of the Keynesian stability condition, since the latter will ensure that a decline in the rate of profit leads to a greater decline in saving than investment. In the presence of a fixed rate of capacity utilization the resulting excess demand in the goods market will then drive up prices and so lower the real wage, raising the rates of profit and growth.

decisive determinant of the relationship between distribution and growth. In a model that allows for variation in the rate of capacity utilization, they show that a rise in the wage share can either increase or decrease the rate of growth – that is, growth can be either *wage-led* or *profit-led* – given the appropriate form of the investment function.[2] The modifications to the investment function required to effect this synthesis of Classical/Cambridge and Kalecki-Steindl growth theory have not met with universal approval.[3]. But the possibility that growth may be either wage- or profit-led even if capacity utilization is variable in the long run has captured the imaginations of heterodox growth theorists, and since the publication of Marglin and Bhaduri (1990) and Bhaduri and Marglin (1990), a number of other possible sources of essentially the same result have been proposed, including saving by workers and open-economy effects (Blecker, 2002).[4]

This paper explores the relationship between household borrowing and wage- versus profit-led growth in a three-class (workers, managers, and capitalists) economy in which less affluent worker households emulate the consumption patterns of more affluent households (managers and capitalists). We are not the first to introduce these innovations into a Kaleckian growth framework (see, for example, Dutt (2005, 2006, 2008); Palley (2005, 2012, 2013); Lavoie (2009); Kim (2012), and Kapeller and Schütz (2015), among others). Our particular interest, however, is in the possibility that emulation and borrowing can transform a wage-led economy into a profit-led economy. With debt-financed, emulation-driven consumption, can redistribution toward profits boost growth through the *consumption* channel (rather than by boosting *investment* sufficiently to offset adverse effects on consumption, as in the classic profit-led growth models of Marglin and Bhaduri (1990) and Bhaduri and Marglin (1990))? In other words, do emulation and household borrowing promote the emergence of *consumption-driven, profit-led* growth, as suggested by Kapeller and

[2]The Bhaduri-Marglin investment function can be thought of as weakening the "strong" accelerator effect characteristic of the canonical Kaleckian investment function (Blecker, 2002, p.135).

[3]See, for example, the dissenting views of Mott and Slattery (1994).

[4]Some of these results were contemporaneous with those of Marglin and Bhaduri (1990) and Bhaduri and Marglin (1990) – see especially Blecker (1989), who showed that international price competition increases the possibility of a profit-led regime. The identification of new influences on the wage- or profit-led character of the growth process continues: see, for example, Patriarca and Sardoni (2014), who identify the rate of depreciation as affecting the response of growth to redistributions of income.

Schütz (2015)?[5] We explore this possibility with a particular focus on the precise debt-servicing behavior of debtor households, drawing on the alternative approaches to debt-servicing outlined by Cynamon and Fazzari (2012) as modeled by Setterfield and Kim (2016) and Setterfield et al. (2016). We also reflect on the possibility that wage- and profit-led growth are the products of different institutional regimes in capitalist economies, rather than innate and immutable properties of such economies (Palley, 2014).

The remainder of the paper is organized as follows. We begin with a baseline Kaleckian model that allows for saving out of wage income by workers. We show that in the steady state, a *stock-flow consistent* treatment of this model adherent to Pasinetti (1962), means that the introduction of saving by workers does not alter the relationship between distribution and growth – contrary to the conventional wisdom associated with, for example, Blecker (2002) and Taylor (1990).

Next, drawing on the stock-flow consistent models of Setterfield and Kim (2016) and Setterfield et al. (2016), we extend the baseline model to allow for borrowing by workers and emulation effects in consumption. Examination of the short-run or temporary equilibria and comparative statics of these models reveals the proclivity of household borrowing and emulation effects to give rise to consumption-driven, profit-led growth, under different assumptions about household debt-servicing behavior. In the fourth section we reflect on the implications of our results for the debate over wage- versus profit-led growth. In particular, we reflect on the possibility that such outcomes are likely to be influenced by different *institutional regimes* in capitalism. The final section offers some conclusions.

2 A baseline model with worker savings

In this section, we outline a baseline two-class (capitalists and workers) Kaleckian growth model in which there is no borrowing and hence no debt accumulation by households. We do, however, allow for saving by workers. Our purpose in departing from the canonical Kaleckian model (in

[5]Consumption-driven, profit-led growth is one example of a general class of growth regimes that Hein and Dodig (2014), following Cordonnier (2006), term "profits without investment" regimes.

which there is no worker saving) in the construction of our baseline model is as follows. In the next section, where we develop an extended model that features (*inter alia*) emulation effects in consumption together with household borrowing and debt accumulation, working households are assumed to save. Incorporating saving by workers into the baseline model developed in this section will therefore better serve to isolate the marginal impact of the key features of our extended model (its three-class structure, coupled with emulation effects in consumption and the accumulation of debt by workers) on the propensity of the growth process to exhibit either wage- or profit-led characteristics.

As is well known, the Kaleckian model is based on a two-way interaction between the rate of accumulation and the rate of profit derived from the investment behavior of firms and the saving behavior of households.[6] We begin, following (Stockhammer, 1999), with an investment function of the form:

$$g_K = \kappa_0 + \kappa_r r \tag{1}$$

where $g = I/K$ is the rate of accumulation (the product of aggregate investment, I, and the reciprocal of the capital stock, K) and r is the rate of profit. This investment function is Robinsonian or "'neo-Keynesian" rather than Kaleckian, since it lacks the independent accelerator term (according to which the rate of accumulation varies directly with the rate of capacity utilization independently of the profit rate) associated with the canonical Kaleckian growth model.[7]. A key distinction between Robinsonian and Kaleckian growth theory is, however, variability of the rate of capacity utilization, which is a feature of the latter but not the former. Long run variability of the rate of capacity utilization is assumed in what follows. As will become clear below, in tandem with equation (1), this makes the resulting model stagnationist but renders the growth rate invariant with respect to the profit share – so that initially growth is neither wage- not profit-led. Since our

[6] As is also well known, saving-investment balance is maintained at all times in the Kaleckian model, as a result of which there is never disequilibrium in the goods market. In this (and other) respects, the model is therefore distinct from growth models in the Keynesian tradition that can be associated with the work of Harrod.

[7] See, for example, (Lavoie, 2014, chpt.6)

ultimate objective is to analyze the effects of borrowing and emulation on the relationship between distribution and growth, we take this to be a suitably neutral starting point for our investigation.

Given that:[8]

$$r = \pi u$$

Substituting this expression into equation (1), we arrive at:

$$g_K = \kappa_0 + \kappa_r \pi u \tag{2}$$

Turning now to household behavior, we begin by reiterating the assumption that there are two classes of income recipients (capitalists and workers) so that:

$$Y = WN + \Pi = (1 - \pi)Y + \pi Y \tag{3}$$

where Y is aggregate real income, WN is the wage bill (the product of the real wage, W, and the level of employment, N), and Π and π are (respectively) total profits and the profit share of income. If we now make the conventional (in Kaleckian macrodynamics) assumption that only capitalist households save, aggregate saving, S, can be written as:

$$S = (1 - c_\pi)\pi Y \tag{4}$$

where c_π is capitalists' propensity to spend so that $1 - c_\pi$ is their propensity to save. Introducing the assumption of saving-investment balance ($I = S$) and standardizing by K, equation (4) becomes:

$$g^s = (1 - c_\pi)\pi u \tag{5}$$

where g^s is the rate of accumulation consistent with saving-investment balance and u represents

[8]The decomposition of the rate of profit that follows can be treated as true by definition, or can alternatively be viewed as a behavioral equation that, in Kaleckian macrodynamics, embeds the relationship between the profit share of income and the mark up applied to unit costs by firms in the process of mark-up pricing.

the rate of capacity utilization (proxied by the ratio of aggregate output to the total capital stock). It follows from equations (2) and (5) that under the equilibrium condition $g = g^s$:

$$u = \frac{\kappa_0}{[(1 - c_\pi) - \kappa_r)]\pi} \tag{6}$$

Note that:

$$\frac{du}{d\pi} = \frac{-\kappa_0([1 - c_\pi] - \kappa_r)}{([(1 - c_\pi) - \kappa_r)]\pi)^2} < 0 \tag{7}$$

since $(1 - c_\pi) - \kappa_r > 0$ by the Keynesian stability condition,[9] while:

$$\frac{dg_K}{d\pi} = \kappa_r u + \kappa_r \pi \frac{du}{d\pi} = \frac{\kappa_r \kappa_0}{[(1 - c_\pi - \kappa_r]\pi} - \frac{\kappa_r \kappa_0 [(1 - c_\pi - \kappa_r]\pi}{([(1 - c_\pi - \kappa_r]\pi)^2} = 0 \tag{8}$$

In other words – and as intimated earlier – the baseline model developed in this section is stagnationist (redistribution towards wages will boost capacity utilization) but growth is invariant with respect to the rate of capacity utilization.

Suppose now that $c_W \neq 1$ where c_W is the propensity to spend of workers. In response to this assumption, it seems straightforward to write:

$$S = (1 - c_\pi)\pi Y + (1 - c_W)(1 - \pi)Y \tag{9}$$

from which, assuming saving-investment balance ($I = S$) and standardizing by K, it follows that:

$$g^s = ([1 - c_\pi]\pi + [1 - c_W][1 - \pi])u \tag{10}$$

This last expression is equivalent to equation [8.17] in Blecker (2002, p.138) and equation [A6] in Taylor (1990, p.330). It now appears to be true that with $g = g^s$ in equilibrium:

[9] This is a necessary condition for the stability of the equilibrium configuration identified in equation (6) and demands that savings responds more aggressively to variations in the rate of capacity utilization than does investment.

$$\kappa_0 + \kappa_r \pi u = ([1 - c_\pi]\pi + [1 - c_W][1 - \pi])u \tag{11}$$

$$\Rightarrow u = \frac{\kappa_0}{([c_W - c_\pi] - \kappa_r)\pi + (1 - c_W)} \tag{12}$$

from which it follows that:

$$\frac{du}{d\pi} = \frac{-\kappa_0([c_W - c_\pi] - \kappa_r)}{[([c_W - c_\pi] - \kappa_r)\pi + (1 - c_W)]^2} \tag{13}$$

Now, the Keynesian stability condition requires only that:

$$[1 - c_\pi]\pi + [1 - c_W][1 - \pi] > \kappa_r \pi \tag{14}$$

$$\Rightarrow ([c_W - c_\pi] - \kappa_r)\pi > -(1 - c_W) \tag{15}$$

which condition can clearly be satisfied even if $[c_W - c_\pi] - \kappa_r < 0$. This means that in equation (13):

$$\frac{du}{d\pi} \gtreqless 0 \Longleftrightarrow (c_W - c_\pi) - \kappa_r \gtreqless 0 \tag{16}$$

Note further that:

$$\frac{dg_K}{d\pi} = \kappa_r u + \kappa_r \pi \frac{du}{d\pi} = \frac{\kappa_r \kappa_0 (1 - c_W)}{[([c_W - c_\pi] - \kappa_r)\pi + (1 - c_W)]^2} > 0 \tag{17}$$

Following Blecker (2002) and Taylor (1990), the conclusion appears to be that merely by introducing worker saving, the sign of $du/d\pi$ becomes ambiguous,[10] while the invariance of growth with respect to the profit share is transformed so that the growth process becomes profit-led.

[10]It appears from equation (16) that the possibility of exhilarationism ($du/d\pi > 0$) is *increasing* in the value of c_W. Caution is required when interpreting this result, however, since as previously demonstrated, in the limit (with $c_W = 1$) the Keynesian stability condition is transformed, bringing about an unambiguous result of stagnationism (see equation (7)).

On closer inspection, however, the conclusions reached above are revealed to be incorrect, because they lack stock-flow consistency. Specifically, the model does not conform to the "institutional principle" (Pasinetti, 1962), according to which when workers save, they amass a stock of assets from which they subsequently derive income in proportion to what they own. In a model in which the only asset is capital, the analysis above fails to recognize that when workers save, they contribute to the funding of current investment, as a result of which they own capital and hence earn a share of profits. The formulation of the saving equation in (9) above, together with the associated expression for the rate of accumulation consistent with savings-investment balance in equation (10), are incomplete because they fail to take into account the fact that some share of total profits must accrue to workers rather than capitalists.

The implications of this are far reaching because of the result that Pasinetti (1962) subsequently derives from the institutional principle – namely, that contrary to Taylor (1990) and Blecker (2002), the expression $g^s = (1 - c_\pi)\pi u$ can be generalized to the case where $c_W \neq 1$.[11] It follows that even with $c_W \neq 0$, the equilibrium solution for u in equation (6), together with the comparative static results showing that $du/d\pi < 0, dg_K/d\pi = 0$) in equations (7) and (8), hold. The basic properties of the baseline model – stagnationism, coupled with the invariance of growth to changes in the distribution of income – are robust with respect to the introduction of saving by workers. This exercise suggests that in the process of its emergence and development, Kaleckian growth theory lost sight of Pasinetti's comments on neo-Keynesian growth theory, and that a rediscovery of Pasinetti (and more generally, the principles of stock-flow consistent macroeconomic theorizing) is required in order to take proper account of the relationship between distribution and growth.[12]

[11] The basis of this claim is replicated in the Appendix A of this paper.

[12] It is important to keep this result in context, however. Hence as will become clear in what follows, stock-flow consistent macro modeling is not, in general, destructive of the basic insight associated with Taylor (1990) and Blecker (2002) – that changes in workers' saving behavior can transform the growth regime of the economy.

3 An extended model: borrowing by worker households

Drawing on Setterfield and Kim (2016) and Setterfield et al. (2016), we begin by explicitly incorporating managerial class to the model.[13] Equation (3) is therefore replaced with:

$$Y = W_p N + W_r \alpha N + \Pi \tag{18}$$

where W_r is the real wage of supervisory workers, W_p is the real wage of production workers, N is the number of production workers employed, and $\alpha < 1$ denotes the necessary ratio of managers to production workers (given by the technology of the production process). We treat the three types of income recipients (production and non-supervisory workers, supervisory workers, and capitalists) as two distinct types of households (working and rentier households), so that $W_R \alpha N + \Pi$ becomes the income of rentiers (capitalists and supervisory workers).

The fixed real wage earned by workers is assumed to be a fraction of the real wage of managers:

$$W_r = \phi W_p \tag{19}$$

where $\phi > 1$. Total real wage income is then:

$$W = W_p N + W_r M \tag{20}$$
$$\Rightarrow W = W_p N + \phi W_p \alpha N = (1 + \phi\alpha) W_p N$$

By denoting workers' wage share of total income as ω_p and managers' wage share as ω_r, it follows that:

$$\omega_r = \phi \alpha \omega_p \tag{21}$$

[13] Accounting relationships demonstrating the stock-flow consistency of the model developed in this section are summarized in the social accounting matrices (Tables 3 and 4) found in Appendix B of this paper.

Note, then, that on the basis of equations (18) and (21):

$$1 - \pi = (1 + \phi\alpha)\omega_p \tag{22}$$
$$\Rightarrow \omega_p = \frac{1 - \pi}{1 + \phi\alpha}$$

Aggregate consumption is written as:

$$C = C_W + C_R + \dot{D} \tag{23}$$

where C_W and C_R are consumption out of profit and/or wage income by working and rentier households, and borrowing by working households to finance additional consumption (independently of their income) is denoted as $\dot{D}$. Borrowing by working households is then modeled as:

$$\dot{D} = \beta(C^T - C_W), \beta > 0 \tag{24}$$

where β is an adjustment parameter that depends on various factors including both household borrowing and financial market lending norms. C^T is a target level of consumption to which working households aspire. We assume that this target level is determined by workers' desire to emulate rentier households, and is therefore specified as:

$$C^T = \eta C_R \tag{25}$$

where the parameter η represents the propensity to emulate.

The consumption of rentiers is described as a fixed proportion of their total wage, profit, and interest income

$$C_R = c_\pi[W_r\alpha N + \Pi + i(D - D_W)] \tag{26}$$

We consider two different consumption and saving behaviors on the part of workers, meanwhile. First, following Setterfield and Kim (2016), workers' behavior conforms to a distinct hierarchy or

"pecking order", according to which they first consume from current income, then service their debts, and finally treat saving as a residual determined by prior consumption and debt servicing outlays. Formally:

$$C_W = c_W W_p N \tag{27}$$

$$S_W = (1 - c_W) W_p N - i D_R \tag{28}$$

The motivation for this behavior can be found in Cynamon and Fazzari (2012) and Lusardi et al. (2011). Cynamon and Fazzari (2012) argue that debt servicing expenditures by households are better thought of as a monetary outlay undertaken volitionally by households, rather than an autonomous deduction from gross household income. At the same time, Lusardi et al. (2011) observe that "just as corporations tend to fund themselves first by drawing upon internal funds, households address financial shocks first by drawing down savings" (Lusardi et al., 2011, p.27).

For the sake of comparison, we also consider a more conventional treatment of debt servicing as an initial deduction from income, the remainder of which is then either consumed or saved. In this case, workers' consumption and saving behavior becomes:

$$C_W = c_W (W_p N - i D_R) \tag{29}$$

$$S_W = (1 - c_W)(W_p N - i D_R) \tag{30}$$

3.1 Scenario 1

Goods market equilibrium in our model can be stated as:

$$Y = C_W + C_R + \dot{D} + I \tag{31}$$

Substituting equations (1), (24), (26), and (27) into this equilibrium condition and normalizing all variables by the capital stock, we obtain the following reduced form expressions for the equilibrium rates of capacity utilization, profit and accumulation:

Table 1: Comparative Statics: Scenario 1

	κ_0	π	i	d_R	η
u	$+$	$?$	$+$	$+$	$+$
r	$+$	$?$	$+$	$+$	$+$
g_K	$+$	$?$	$+$	$+$	$+$

Note: Positive d_R is assumed.

$$u = \frac{\kappa_0 + id_R c_\pi(1+\beta\eta)}{\{1 - [c_\pi(1+\beta\eta) + \kappa_r]\pi - \frac{[1-\pi][c_W(1-\beta)+c_\pi(1+\beta\eta)\phi\alpha]}{1+\phi\alpha}\}} \tag{32}$$

$$r = \frac{\pi[\kappa_0 + id_R c_\pi(1+\beta\eta)]}{\{1 - [c_\pi(1+\beta\eta) + \kappa_r]\pi - \frac{[1-\pi][c_W(1-\beta)+c_\pi(1+\beta\eta)\phi\alpha]}{1+\phi\alpha}\}} \tag{33}$$

$$g_K = \kappa_0 + \frac{\kappa_r\pi[\kappa_0 + id_R c_\pi(1+\beta\eta)]}{\{1 - [c_\pi(1+\beta\eta) + \kappa_r]\pi - \frac{[1-\pi][c_W(1-\beta)+c_\pi(1+\beta\eta)\phi\alpha]}{1+\phi\alpha}\}} \tag{34}$$

Table 1 reports the comparative statistic results for u, r and g_K. Our discussion in what follows naturally focuses on the response of the growth rate to variation in the profit share, π.[14]

Note that given the form of the investment function:

$$\frac{\partial g_K}{\partial \pi} = \frac{\partial g_k}{\partial \pi} + \frac{\partial g_k}{\partial u}\frac{\partial u}{\partial \pi} = \kappa_r u + \kappa_r \pi \frac{\partial u}{\partial \pi} \tag{35}$$

Given that $\kappa_r u, \kappa_r \pi \gg 0$, the sign of $dg_K/d\pi$ depends on the sign of $du/d\pi$. From equation (32),

[14]The results reported in Table 1 indicate that increased debt servicing generates higher growth ($\partial g_K/\partial i, \partial g_K/\partial d_R > 0$). This seems counter to ordinary Keynesian logic, since it implies that income transfers from high marginal propensity to consume working households to low marginal propensity to consume rentier households induce faster growth. Due to working households' "pecking order" approach to debt servicing commitments, however, workers' debt servicing generates a transfer of income *not spent* by working households towards rentier households, who then spend part of this transfer income. The result is thus revealed as quite in keeping with the basic Keynesian theory of demand formation. For more detailed discussion, see Setterfield and Kim (2016) and Setterfield et al. (2016).

we observe that:[15]

$$\frac{du}{d\pi} \gtreqless 0 \iff \kappa_r(1+\alpha\phi) + c_\pi(1+\beta\eta) - c_W(1-\beta) \gtreqless 0 \tag{36}$$

Recall that with no managerial class ($\phi = 0$) and no borrowing or emulation by working households ($\beta = 0, \eta = 0$), we get (from equation (8)) $dg_K/d\pi = 0$. The ambiguity of the sign of (36) and hence (35) reveal the impact on the properties of the growth process resulting solely from the key innovations (introduction of a managerial class, worker borrowing to finance consumption, emulation effects in consumption) introduced in this paper, given the assumption that debt-servicing is treated as a household expense and a strict substitute for savings. Unlike the baseline model, in which growth is invariant with respect to distribution, in the extended model, the growth process can be either wage- or profit-led. Indeed, borrowing and emulation incline the economy towards profit-led growth. To see this, note that in order for (36) to be negative and set up the possibility of wage-led growth, ($dg_K/d\pi < 0$ in (35)), we must observe:

$$c_\pi(1+\beta\eta) - c_W(1-\beta) < 0$$

$$c_\pi - c_W + \beta(c_\pi\eta + c_W) < 0 \tag{37}$$

In other words, the effect of redistributing income towards profits must impede demand formation and growth through the consumption channel. It is self-evident, however, that despite the fact that $c_\pi - c_W < 0$ by hypothesis, the inequality in (37) is far from guaranteed because with borrowing and emulation, $\beta, \eta > 0$. Borrowing and emulation behavior therefore imply that any redistribution of income towards profits may boost demand formation and hence growth *through the consumption channel*, setting up what might be termed a "paradox of inequality" whereby,

[15]Note, in passing, that is clear by inspection of (36) that a decrease in the size of c_W (i.e., an increase in workers' propensity to save) will increase the size of $du/d\pi$, increasing the likelihood that we will observe $du/d\pi > 0$ and hence $dg_K/d\pi > 0$ (profit-led growth). This is consistent with the basic insight of Taylor (1990) and Blecker (2002) that workers' saving behavior can alter the growth regime of the economy. What we have now demonstrated is that, as suggested earlier, stock-flow consistent macro modeling is not, in general, destructive of this insight.

contrary to conventional Keynesian wisdom, transferring income from high propensity to consume workers to low propensity to consume rentiers boosts consumption spending. This is the essence of consumption-driven, profit-led growth: the growth regime is profit-led not because the impact of an increase in the profit share on growth operating through the investment channel outweighs its impact operating through the consumption channel, but because borrowing and emulation incline working households to more than offset the drop in consumption out of current income (resulting from $c_\pi - c_W < 0$) by increasing their debt-financed autonomous consumption spending in an effort to "keep up with the Joneses". In short, regardless of the corporate response, the household sector now contributes positively to demand formation and growth in response to a redistribution of income towards profits.

3.2 Scenario 2

If we replace equation (27) with equation (29), goods market equilibrium now implies:

$$u = \frac{\kappa_0 + id_R[c_\pi(1+\beta\eta) - c_W(1-\beta)]}{\{1 - [c_\pi(1+\beta\eta) + \kappa_r]\pi - \frac{[1-\pi][c_W(1-\beta)+c_\pi(1+\beta\eta)\phi\alpha]}{1+\phi\alpha}\}} \tag{38}$$

$$r = \pi u = \frac{\pi[\kappa_0 + id_R(c_\pi[1+\beta\eta] - c_W[1-\beta])]}{\{1 - [c_\pi(1+\beta\eta) + \kappa_r]\pi - \frac{[1-\pi][c_W(1-\beta)+c_\pi(1+\beta\eta)\phi\alpha]}{1+\phi\alpha}\}} \tag{39}$$

$$g_K = \kappa_0 + \frac{\kappa_r\pi[\kappa_0 + id_R(c_\pi[1+\beta\eta] - c_W[1-\beta])]}{\{1 - [c_\pi(1+\beta\eta) + \kappa_r]\pi - \frac{[1-\pi][c_W(1-\beta)+c_\pi(1+\beta\eta)\phi\alpha]}{1+\phi\alpha}\}} \tag{40}$$

Table 2 reports the comparative statistic results associated with this system for u, r and g_K. Once again, we focus on the response of g_K to π.

Since the form of the investment function is unchanged, it remains the case that the sign of

Table 2: Comparative Statics: Scenario 2

	κ_0	π	i	d_R	η
u	$+$	$?$	$?$	$?$	$+$
r	$+$	$?$	$?$	$?$	$+$
g_K	$+$	$?$	$?$	$?$	$+$

Note: Positive d_R is assumed.

$dg_K/d\pi$ depends on the sign of $du/d\pi$ in equation (35). From equation (38):

$$\frac{du}{d\pi} \gtreqless 0 \iff [\kappa_0 + id_R(c_\pi[1+\beta\eta] - c_W[1-\beta])][\kappa_r(1+\alpha\phi) + c_\pi(1+\beta\eta) - c_W(1-\beta)] \gtreqless 0 \quad (41)$$

Bearing in mind that growth is invariant with respect to distribution in the baseline model, scrutiny of the expression in (41) once again reveals the impact on the properties of the growth process resulting from the borrowing and emulation behavior introduced in this paper, this time given the assumption that working households treat debt-servicing as an initial deduction from income.

In the first instance, it is clear that the sign of $du/d\pi$ in (41) and hence $dg_K/d\pi$ in (35) is once again ambiguous. In this second scenario, however, the ambiguous impact of debt servicing on growth (dg_K/di, $dg_K/dd_R \gtrless 0$) adds to the ambiguity of $du/d\pi$ by introducing a new term ($\kappa_0 + id_R(c_\pi[1+\beta\eta] - c_W[1-\beta])$) into the expression for $du/d\pi$ in (41).[16] Hence note that if $c_\pi(1+\beta\eta) - c_W(1-\beta) > 0$, then $\kappa_0 + id_R(c_\pi[1+\beta\eta] - c_W[1-\beta]) > 0$, which increases the size of $du/d\pi$ relative to its value in (36). This quantitative effect amplifies the consumption-driven, profit-led growth result that would otherwise emerge from emulation and borrowing in scenario 1. Suppose, however, that $c_\pi(1+\beta\eta) - c_W(1-\beta) < 0$, but that we nevertheless observe $\kappa_r(1+\alpha\phi) + c_\pi(1+\beta\eta) - c_W(1-\beta) > 0$. In scenario 1, this would suffice to ensure $du/d\pi, dg_K/d\pi > 0$. But in scenario 2, we may find that $\kappa_0 + id_R(c_\pi[1+\beta\eta] - c_W[1-\beta]) < 0 \Rightarrow du/d\pi < 0$, with the consequence that we may observe $dg_K/d\pi < 0$. Intuitively, this qualita-

[16] See Setterfield et al. (2016) for extensive discussion of the ambiguous effect of debt servicing on demand formation when debt servicing is treated as an initial deduction from income.

tive effect on the properties of the growth regime arises because debt servicing is now playing its "traditional" Keynesian role of redistributing income from high marginal propensity to consume debtor households to low marginal propensity to consume creditor households and, in the process, acting as a drag on demand formation and growth. What all this draws to attention is that the different treatment of debt servicing behavior in scenario 2 is now *modifying* the nature of the growth process that would otherwise emerge in scenario 1. This modification may be purely quantitative, in the sense that even when $du/d\pi < 0$ in (41) we may still observe $dg_K/d\pi > 0$ in (35): the *size* of the consumption-driven, profit-led growth effect introduced by borrowing and emulation will be diminished. Alternatively, if households treat debt servicing as a deduction from income, the modification of the growth process may be qualitative: the paradox of inequality can disappear so that what would otherwise (in scenario 1) be a consumption-driven, profit-led growth process may, in fact, be wage-led.

The results in this sub-section demonstrate that in addition to borrowing and emulation *per se*, the precise manner in which debtor households choose to service their debts can also affect the wage- or profit-led character of the growth process.

4 Implications for wage- versus profit-led growth

As we have seen, borrowing and emulation can qualitatively change the character of the growth process, inclining the economy to become profit-led. The likelihood of this is influenced by the way in which debtor households service their debts, but regardless of whether debtors treat their debt servicing obligations as an initial deduction from income or a discretionary expense that is treated as a substitute for savings, the possibility arises that borrowing and emulation will lead to the emergence of a consumption-driven, profit-led economy.

A long tradition in macroeconomics – chiefly associated with Regulation Theory and Social Structure of Accumulation Theory, but also central to the work of Keynesians such as Cornwall (1990) – posits that even if the income-generating process has a "fundamental" character (for ex-

ample, output is determined in accordance with the principle of effective demand), its precise properties at any point in time are influenced by an enduring but transmutable institutional framework within which the income-generating process is embedded.[17] On this view, capitalism is not a single unchanging entity with timeless "laws of motion", but rather something that evolves through discrete stages, regimes, or episodes, during which macroeconomic outcomes reflect both the fundamental character of the system and the influence of a historically-specific institutional framework.

Recent work on wage-versus profit-led growth dovetails with this thinking – and in particular, with variants of it that have emphasized distributional norms and policy rules as important constituents of the economy's institutional framework (see, for example, Setterfield and Cornwall (2002)). Hence Palley (2014) shows that in a model with worker saving and owner/managers, in which workers receive some part of profit income and owner/managers receive some part of wage income, the impact on growth of a change in the profit share depends on exactly who (workers or owner/managers) gains and who loses, all of which is influenced by fiscal policy (specifically, the structure of income taxation). Hence the wage- or profit-led character of the growth process depends in part on the *policy regime*, so that changes in policy conventions (decisions about what types of income should be taxed and to what degree) can alter how growth responds to a change in the profit share. Carvalho and Rezai (2015), meanwhile, show that when increases in income inequality involve increases in *wage* inequality, a general increase in inequality will increase the propensity to save out of wages and hence the likelihood that growth will be profit-led. Hence the wage- or profit-led character of the growth process depends in part on the *distributional regime*, so that changes in distributional norms (such as the demise of "value sharing" and the rise of the "winner takes all" ethos that Setterfield and Cornwall (2002) identify with the end of the Golden Age) affect the response of growth to changes in the profit share.

This suggests a broader interpretation of the results presented in this paper – that in addition to the changes in the distributional and policy regimes explored by Palley (2014) and Carvalho and

[17] See, for example, Setterfield (2011) for a brief discussion of these traditions and the relationship between them.

Rezai (2015), the "financialization" of the household (changing norms in the financial and household sectors that have affected the ability and proclivity of lower-income households to borrow in order to shore up consumption spending in response to adverse changes in the distribution of income and/or "keep up with the Joneses"), which can be thought of as a major institutional feature of the post-1980 neoliberal era (Palley, 2002; Cynamon and Fazzari, 2008; Barba and Pivetti, 2009; Wisman, 2009, 2013), has brought about changes to the growth process that fundamentally affect the response of growth to changes in the distribution of income. This broader interpretation suggests that the results in this paper provide further reason to think of the wage- or profit-led character of the growth process as social constructs rather than innate features of capitalism. Two important corollaries of this observation are as follows. First, we should expect to observe enduring but transmutable stages/regimes/episodes of growth that may be either wage- or profit-led, rather than a single growth process embodying an immutable relationship between growth and distribution. Second, to the extent that macroeconomic policy rules can be thought of as contributing to the economy's institutional framework, the wage- or profit-led character of the growth process are reflections (in part) of policy choices.

5 Conclusions

This paper examines the relationship between household debt servicing behavior and wage- versus profit-led growth in a three-class (workers, managers, and capitalists) economy in which less affluent worker households, who both save and borrow to finance consumption expenditures, are inclined to emulate the consumption patterns of more affluent households (managers and capitalists). We begin with a baseline, two-class (capitalists and workers) model with worker saving, showing that contrary to conventional wisdom (Blecker, 2002; Taylor, 1990), a stock-flow consistent treatment of this baseline case reveals that worker saving does not in and of itself alter the relationship between distribution and growth. This result amounts to little more than a recovery of insights associated with Pasinetti (1962), where workers use their saving to accumulate corpo-

rate equity (and thus receive a share of total profit income). The possibility arises, however, that it overlooks an important portfolio issue: what if there is a class structure to the wealth accumulation process, so that working households use their savings to accumulate bank deposits rather than corporate equity (which according to authors such as Skott (2014), is more in-keeping with the stylized facts)? Moreover, what if workers, spurred by emulation effects, borrow to finance consumption expenditures even as they save and are, as a result, net borrowers (negative net-worth households), again as per the stylized facts (Palley, 2002; Cynamon and Fazzari, 2008; Barba and Pivetti, 2009; Wisman, 2009, 2013)? What is the impact of these developments on the properties of the growth process, and how (if at all) are these properties affected by the way in which debtor households choose to service their debts?

By extending our baseline model in order to address these questions, we show that with debt-financed consumption spurred by emulation effects, an increase in the profit share can boost growth. In other words, when inequality puts pressure on working households to borrow in order to maintain their targeted consumption standards, *consumption-driven, profit-led growth* (Kapeller and Schütz, 2015) can arise in an economy in which growth is otherwise invariant with respect to distribution. As a result, an increase in inequality will boost growth, in part because of the positive effects of increased inequality on demand formation emanating from the consumption channel – a result we term the "paradox of inequality". This finding emerges regardless of whether debtor households treat their debt-servicing obligations as an initial deduction from income, or as a discretionary expense that is treated as a substitute for savings. Debt servicing behavior does, however, affect the *likelihood* that borrowing and debt accumulation by working households will give rise to the emergence of profit-led growth.

Our results are consistent with an emerging literature that suggests that wage- and profit-led growth are not innate and immutable properties of capitalist economies, but are, instead, social constructs brought about the institutional framework (including distributional, policy, and financial norms) within which the income-generating process is embedded (Palley, 2014). This suggests that wage- or profit-led growth may be observed as discrete stages/regimes/episodes of growth in the

same economy at different points in time, and that such observance is (at least in part) a matter of policy choice.

Appendix A: Pasinetti's institutional principle

Per Pasinetti (1962), the claim that $g^s = (1 - c_\pi)\pi u$ can be generalized to the case where $c_W \neq 1$ on the basis of the institutional principle can be demonstrated as follows. In equilibrium:

$$\begin{aligned} I &= S \\ \Rightarrow I_\pi + I_W &= S_\pi + S_W \end{aligned}$$

with:

$$\begin{aligned} I_\pi &= S_\pi \\ I_W &= S_W \end{aligned}$$

where I_π is the quantity of investment funded by capitalists' savings, S_π, and I_W is the quantity of investment funded by workers' savings, S_W. As before, we can therefore write:

$$\begin{aligned} I_\pi &= (1 - c_\pi)\Pi_\pi \\ \Rightarrow \frac{I_\pi}{K_\pi} &= (1 - c_\pi)\frac{\Pi_\pi}{K_\pi} \end{aligned}$$

where Π_π is profit income earned by capitalists and K_π is the capital stock owned by capitalists. Note, however, that in the steady state:

$$\frac{I_\pi}{K_\pi} = \frac{\dot{K_\pi}}{K_\pi} = \frac{\dot{K}}{K} \tag{42}$$

(in other words, the share of the capital stock owned by capitalists, K_π/K, is constant). Moreover, since capital in this model is a homogeneous good, it must be the case that[18]:

$$\frac{\Pi_\pi}{K_\pi} = \frac{\pi Y}{K} = r = \pi u \tag{43}$$

(in other words, the rate of return earned by capitalists is the same as the rate of return on all capital assets). Substitution into the expression for I_π/K_π derived above yields:

$$g^s = s_\pi \pi u$$

[18]The equivalent condition in a model with heterogeneous capital would be brought about by appeal to the principle of long-run equalization of the rates of return.

which is, of course, identical to equation (5). In sum, stock-flow consistency means that even with $c_W \neq 0$, the rate of accumulation consistent with saving-investment balance in Kaleckian setting is given by equation (5), and this is consistent with Pasinetti's institutional principle (Pasinetti, 1962).

Appendix B: Social Accounting Matrices

Table 3: Balance Sheet Matrix

	Workers	Rentiers	Firms	Banks	Sum
Capital			K		K
Deposits	D_W	D_R		$-(D_W + D_R)$	0
Loans	$-D$			D	0
Equity		E	$-E$		0
Net worth	$D_W - D$	$D_R + E$	$K - E$	$D - (D_W + D_R)$	K

Table 4: Transaction Flow Matrix

			Firms		Banks		
	Workers	Rentiers	Current	Capital	Current	Capital	Sum
Consumption by wage	$-C_W$	$-C_R$	$C_W + C_R$				0
Consumption by debt	$-\dot{D}$		$\dot{D}$				0
Investment			I	$-I$			0
Wages	$W_p N$	$W_r \alpha N$	$-W$				0
Firms' profits		Π	$-\Pi$				0
Deposit interest	iD_W	iD_R			$-i(D_W + D_R)$		0
Loan interest	$-iD$				iD		0
Deposit flows	$-\dot{D_W}$	$-\dot{D_R}$				$(\dot{D_W} + \dot{D_R})$	0
Loan flows	$\dot{D}$					$-\dot{D}$	0
Issues of equities		$-\dot{E}$		$\dot{E}$			0
Sum	0	0	0	0	0	0	0

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