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Macroeconomic implications and growth regimes under alternative interpretations of household debt

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This paper attempts to contribute to the ongoing literature that relates consumer debt to income inequality. The most prevalent interpretation of consumer debt is working households' emulation of upper classes' consumption patterns or horizontal consumption emulation reminiscent of 'keeping up with the Joneses'. This paper suggests an alternative link between consumer debt and income inequality: working households borrow to sustain their established standard of living. Furthermore, the borrowing function used allows the examination of alternative working households' borrowing behaviours. The findings suggest that massive borrowing triggered by income inequality can be sustainable under high rates of economic growth. Also, cross-scenario comparisons show that different borrowing behaviours have both quantitative and qualitative effects on the short and the long run, in the growth regime and in macroeconomic stability.

Keywords: consumer borrowing, inequality, growth regime, macroeconomic stability, simulation

JEL codes: E120, E210, E250, E440, E470, O410

1 INTRODUCTION

Since the early 1970s, the share of consumption in GDP was rising in almost all advanced economies and remained high until the onset of the global financial crisis in 2007–2008. During the 1980s, this trend was coupled with a decline in the personal saving rate that lasted until the beginning of the 2000s and remains up to now well below the levels of the 1980s. Moreover, in the 1980s income inequality started to rise. The increase in the share of consumption in GDP was attributed not to the household sector as a whole but to the consumption patterns of the households at the top of the income distribution, mostly due to higher financial property revenues, while households at the bottom experienced on average little or no consumption growth (Blecker 1990; Cynamon/Fazzari 2015). However, one could argue that, given profit earners have a lower propensity to consume than wage earners, rising inequality should make consumption as a share of GDP fall instead of increase. This 'paradox' was explained by the increasing debt-to-income ratio of

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households at the bottom of the personal income distribution, which also started in the mid 1980s (Cynamon/Fazzari 2015).

Recent empirical work supports the relation between rising income inequality and increasing household debt, especially for the middle- and low-income classes (Boushey/Weller 2008; Cynamon/Fazzari 2008; 2015). However, it is still difficult to presume the motives behind low- and middle-class households' decision to borrow. Is it that households formed optimistic expectations in an economic environment with rising inequality and decelerating income growth, while at the same time access to credit had become easier? Or is it the two fundamental factors that determine households' consumer behaviour, acknowledged long ago by Duesenberry (1967) and Veblen (2009): (a) every individual's consumption behaviour depends on that of the other individuals (who might be a neighbour or an upper-class representative)?; and (b) individuals tend to maintain their historical consumption path (consumption patterns are not easily reversed)?

Most of the recent theoretical work with formal models deals with the first two questions that are related either to Minsky's or Veblen's work; working-class households increase borrowing because they either form optimistic expectations or emulate upper-class consumption patterns (Palley 1994; Dutt 2008; Zezza 2008; Hein 2012; Ryoo/Kim 2014; Ryoo 2016; Setterfield/Kim 2016). Other scholars provide models that combine the two interpretations of consumer borrowing and introduce inter-class income inequality by splitting the working class into two teams, one being negatively affected by increases in the profit share while the other remains unaffected, and hence those who fall behind borrow to keep up with the consumption levels of those with a similar social status (Kapeller/Schütz 2014; 2015). The third interpretation of consumer debt (maintenance of historical consumption paths) is the least investigated, with only a few exceptions (see Lapavistas 2013 for a discussion; Marsellou 2011; 2018 for a formal model).

The aim of this paper is to emphasize the third question, mostly related to Duesenberry's (1967) 'relative income hypothesis', which proposes that the link between rising inequality and households' indebtedness is based on households' effort to maintain their historically obtained standard of living. As working households experience income inequality both directly (stagnant wages) and indirectly (welfare-state retrenchment, privatizations, labour and capital market deregulation), they struggle to maintain their standard of living, often through credit.

In particular, we follow the modelling approach of Dutt (2006), but we change his assumption that workers borrow according to their income level. Changing this assumption by introducing a borrowing function where working households attempt to sustain their living standards allows the investigation of the macroeconomic implications of alternative borrowing behaviours. In addition, the mathematical form of this function allows for the examination of two more borrowing behaviours: (a) working households borrow to smooth consumption with relatively low income inequality; and (b) working households borrow according to the interest payments' affordability, which is reminiscent of a Minskyan process. These latter two cases are used for analytical and comparative purposes.

The remainder of the paper proceeds as follows. Section 2 examines the structure of the model and derives three borrowing-behaviour scenarios. Section 3 examines the behaviour of the model in the short run, performs comparative statics analysis, and discusses the differences with respect to the alternative borrowing behaviours. Section 4 examines the long-run dynamics and discusses issues of growth regimes and macroeconomic stability. Section 5 presents and discusses the results of the numerical analysis. The paper closes with some conclusions in Section 6.

2 MODEL STRUCTURE

2.1 Production and investment

A closed economy without a public sector is assumed. Hence, national income (Y) equals consumption (C), comprising workers' consumption (C_w) and industrial capitalists' consumption (C_c), and investment (I).

$$Y = C + I = C_w + C_c + I \quad (1)$$

National income is distributed between wages, wL and gross profits, Π . Wages are split between interest payments on debt (iD_w) and net wages ($(wL)_n$).

$$Y = wL + \Pi = (wL)_n + iD_w + \Pi \quad (2)$$

The functional distribution of income is exogenous, but in a broad sense it is endogenized through the endogenous variable of interest payments on debt.

The economy produces a single good with two factors of production, homogeneous labour (L) and capital (K), and uses a fixed coefficient production function. There is no overhead labour. The supply of labour is endogenous and its growth rate is equal to the rate of capital accumulation. Following Kalecki (1971), the gross profit share ($\pi = \Pi/Y$) depends on the mark-up firms set on unit labour costs to determine prices in oligopolistic markets. Firms function with excess capacity. There is no inflation, that is, all variables are in real terms.

Part of the gross profits are consumed by industrial capitalists (C_c) and the rest are saved to finance investment. The saving rate out of profits, s , is assumed constant.

$$\Pi = \underbrace{s\Pi}_R + \underbrace{(1-s)\Pi}_{C_c} \quad (3)$$

The profit rate is denoted as $r = \Pi/K$.¹ Dividing both terms of the ratio by output, Y , we take the rate of profit in terms of capacity utilization.

$$r = \frac{\Pi}{K} = \pi u \quad (4)$$

We denote the investment rate, that is, the growth rate of K , as:

$$g = I/K, \quad (5)$$

where I is gross investment, since for convenience there is no depreciation. Following Jarsulic (1990) and Dutt (1995; 2006), it is assumed that investment demand is exogenously fixed at a point in time, while in the long run we assume that industrial capitalists adjust their actual investment rate to their desired rate of investment:

$$\frac{dg}{dt} = \Lambda(g^t - g), \quad 0 < \Lambda \leq 1, \quad (6)$$

where g^t is the desired accumulation rate and Λ is the speed of adjustment. This approach captures Kalecki's (and later Steindl's) assumption that current variables affect investment several periods later and produce a pure differential equation system that allows the

1. The technical capital–potential-output ratio is assumed constant. This way the output-to-capital ratio can be used as a proxy for capacity utilization. See Taylor (1985; 1991), Dutt (2006), Lima/Meirelles (2007), Charles (2008a), etc.

economy's dynamics to be portrayed in phase diagrams instead of a complex mixed difference–differential equation (Dutt 1995; 2006).²

Desired investment depends on capitalists' internal funds (saving out of gross profits, that is, $s\Pi$). Dividing by K we obtain the desired investment rate as a function of the gross profit rate, which according to equation (4) equals the product of capacity utilization and the gross profit share:

$$g^f = \gamma_0 + \gamma_r s\pi u, 0 < \gamma_0, \gamma_r < 1, \tag{7}$$

where γ_0 and γ_r are positive parameters, with γ_0 standing for the animal spirits of the private sector or the state of business confidence (Hein 2006), while γ_r captures the sensitivity of desired investment to profits. This type of investment function is also used in Jarsulic (1996), Charles (2008a; 2008b) and Isaac/Kim (2013), and diverges from the canonical Kaleckian investment function in that capacity utilization is not incorporated alone but in conjunction with the profit share. This formulation offers the advantage that it allows profit-led as well as wage-led demand and growth regimes to emerge.

The economy is a mature monetary economy and credit is generated endogenously. Only working households borrow (for simplicity the model does not incorporate firms' borrowing) and commercial banks are the sole providers of credit. The rate of interest is set by the central bank, an assumption often made by post-Keynesian authors of all persuasions (Lavoie 1995).

2.2 Workers' consumption and borrowing

Workers' consumption equals the sum of the net wage³ and the amount of new borrowing (B_w).

$$C_w = Y(1 - \pi) - iD_w + B_w \tag{8}$$

Equation (8) departs from the standard Kaleckian assumption that workers consume only their whole wage income in each period. Note that, for as long as the interest payments do not exceed the amount of new borrowing (that is, $B_w > iD_w$), the propensity of workers' consumption (out of all available financial resources) is larger than one.

Workers' debt, D_w , is assumed to adjust to new borrowing according to the following relation:

$$B_w = dD_w/dt. \tag{9}$$

Workers' borrowing behaviour is determined by the following double adjustment mechanism relation:

$$B_w = \beta_1 [w^f L - Y(1 - \pi)] + \beta_2 [\lambda Y(1 - \pi) - iD_w], \tag{10}$$

where w^f is the wage target or 'conventional wage'⁴ and represents the standard of living that working households have historically established, $Y(1 - \pi)$ is the actual wage bill, and

2. This method, initially developed by Gandolfo (1980), is common in the post-Keynesian literature (Semmler 1987; Jarsulic 1988; 1990; 1996; Dutt 1992a; 1992b; 2005; Asada 2001; 2004).

3. Where the workers' wage is derived by $Y = wL + \Pi \Rightarrow wL = Y - \Pi = Y(1 - \Pi/Y) = Y(1 - \pi)$, and workers net wage is $wL - iD_w = Y(1 - \pi) - iD_w$.

4. We borrow the term 'conventional wage' from Marglin (1984) to form a mechanism where a deviation of the conventional wage from the actual wage may lead to new borrowing. In Marglin's model, however, a deviation from the conventional wage triggers wage inflation. The terms 'conventional wage' and 'wage target' are used interchangeably.

$\lambda Y(1 - \pi)$ denotes the maximum affordable interest payment.⁵ λ is workers' maximum debt-service-to-income ratio, which is assumed constant and $0 < \lambda < 1$ and reflects the lending practices.⁶ The adjustment coefficients $0 < \beta_1, \beta_2 < 1$ reflect household borrowing norms and motivations. The relative size of these coefficients provides relative weights to these components of household decision-making.

It is assumed that the conventional wage bill ($w^f L$) depends on the output. Hence, given that we normalize all variables by K and L/K is assumed constant, we have it that changes in the conventional wage depend on changes in the output–capital ratio, u :

$$w^f = \alpha_0 + \alpha_1 u, \quad (11)$$

where $\alpha_i > 0$ for $i = 0, 1$ are fixed parameters and u is the output–capital ratio, Y/K , which is a measure of the rate of capacity utilization.

As mentioned before, the conventional wage represents the cost of the socially and historically determined standard of living that working households have established during a period of their lives. This standard of living includes both the goods and services purchased privately and those granted by the public sector.⁷ As capacity utilization represents the course of economic activity it is assumed that the conventional wage is affected by this course. In this model, the volume of this impact (which is essential for the scenario setting) depends on how intense – that is, how excessive – income inequality is.⁸ For instance, rising income inequality since the 1980s was largely a result of welfare-state retrenchment and the overall neoliberal privatization efforts in conjunction with wage-moderation policies. More specifically, this policy mix, which caused the increase of income inequality, squeezed working households' standard of living in two ways: through low actual wage growth despite overall economic growth, and through the several public goods and services previously consumed for 'free' that have to be purchased from the private sector (healthcare insurance, pension plans, decent schools, university education, etc.). This means that the standard of living working households have attained in previous years, w^f , now costs more, and the current actual wage cannot support it alone.

In terms of equation (11), the latter cause of income inequality and workers' standard-of-living deterioration is captured by the α_1 parameter; this modelling approach allows (personal) income inequality to play a decisive role in the policy regime determination at the scenario setting. For instance, higher economic activity combined with intense income inequality (high α_1) tends to produce different macroeconomic outcomes from those in the absence of intense income inequality (low α_1).⁹ In this way, rising income

5. This formulation draws from empirical research suggesting that credit demand is affected differently by changes in income, interest rates and interest payments. For instance, interest payments have a more significant effect on credit demand than the cost of borrowing, especially for the low- and middle-income borrowers (Attanasio et al. 2008; Karlan/Zinman 2008).

6. An λ over 30 per cent may signal solvency problems for households with inefficient safety margins. However, during the era of financialization, looser credit-rationing processes and predatory lending practices resulted in higher and unsustainable household borrowing (Agarwal et al. 2014). Gross/Souleles (2002), based on data of individual US credit-card accounts, found that consumers increased credit-card debt following increases in their credit limits.

7. As a concept, it is reminiscent of the notion of the net social wage. See, for instance, Maniatis (2003; 2014).

8. Income inequality is an essential part of the functioning of capitalist economies, and under specific circumstances, such as when neoliberal economic policies prevail, it tends to increase excessively.

9. Note that α_1 is an exogenous parameter and we choose its value according to each scenario.

inequality is linked to households' decision to borrow reflecting the 'necessitous demand for credit' (Pollin 1988; 1990) to finance the losses in their standard of living.¹⁰

Inserting equation (11) into (10) and then normalizing by K , we obtain the final form of workers' borrowing function:

$$B_w/K = \beta_1 \alpha_0 \ell + [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)]u - \beta_2 i \delta_w, \quad (12)$$

where $\ell = L/K$ is the fixed labour intensity, $\delta_w = D_w/K$ is workers' debt–capital ratio, $\beta_1 \alpha_0 \ell$ is workers' autonomous borrowing, $(\beta_1 - \lambda \beta_2)$ is the sensitivity of workers' borrowing with respect to changes in the actual wage bill with $-1 < \beta_1 - \lambda \beta_2 < 1$ because $0 < \beta_1, \beta_2$ and $\lambda < 1$. $\alpha_1 \beta_1 \ell$ reflects the sensitivity of workers' borrowing to changes in the conventional wage, and $\beta_2 i$ reflects the sensitivity of workers' borrowing to changes in δ_w .

The term $\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)$ in equation (12) represents the impact of changes in capacity utilization on workers' borrowing. This term is the combined effect resulting from changes in the conventional wage, the actual wage, and the maximum affordable interest payment. As such, it provides the basis for multiple parameter scenarios (Table 1 summarizes these scenarios):

Scenario 1

Income inequality is high (the term $\alpha_1 \beta_1 \ell$ is high) and workers' decision to borrow is affected more by changes in the wage gap than in the interest payment gap, implying that $\beta_1 > \beta_2 \Rightarrow \beta_1 - \lambda \beta_2 > 0$. An increase in economic activity will have a positive impact on workers' borrowing (as $\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi) > 0$) and an accelerating effect on workers' debt. This outcome is attributed to the strong effect of capacity utilization on the conventional wage and is driven by workers' tendency to sustain their standard of living.

Scenario 2

Income inequality is low (the term $\alpha_1 \beta_1 \ell$ is low) and workers' decision to borrow is affected more by changes in the wage gap than in the interest payment gap, implying that $\beta_1 > \beta_2 \Rightarrow \beta_1 - \lambda \beta_2 > 0$. Consequently, an increase in economic activity (captured by u) will have a negative impact on workers' borrowing (as $\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi) < 0$) and a decelerating effect on workers' debt. Hence working households borrow to smooth consumption.

Scenario 3

Income inequality is low (meaning the term $\beta_1 \alpha_1 \ell$ is low) and workers' decision to borrow is affected more by changes in the interest payment gap than in the wage gap, implying that $\beta_1 < \beta_2 \Rightarrow \beta_1 - \lambda \beta_2 < 0$. Consequently, an increase in economic activity will always have a positive impact on workers' borrowing (as $\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi) > 0$) and an accelerating effect on workers' debt. This behaviour is reminiscent of a modest Minskyan process.

10. For instance, the imposition of tuition fees in universities created the market for student loans; in the absence of universal health insurance, healthcare costs are among the basic reasons (others being income and job loss) for filing for bankruptcy.

Table 1 Scenario set-up

Scenario	Inequality	Weight	Overall impact	$\frac{\partial \frac{\beta_w}{K}}{\partial u}$
Scenario 1	$\beta_1 \alpha_1 \ell$ high	$\beta_1 - \lambda \beta_2 > 0$	$\beta_1 \alpha_1 \ell > (\beta_1 - \lambda \beta_2)(1 - \pi)$	> 0
Scenario 2	$\beta_1 \alpha_1 \ell$ low	$\beta_1 - \lambda \beta_2 > 0$	$\beta_1 \alpha_1 \ell < (\beta_1 - \lambda \beta_2)(1 - \pi)$	< 0
Scenario 3	$\beta_1 \alpha_1 \ell$ low	$\beta_1 - \lambda \beta_2 < 0$	$\beta_1 \alpha_1 \ell > (\beta_1 - \lambda \beta_2)(1 - \pi)$	> 0

This relation $(\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi))$ also allows for a fourth scenario where there is intense income inequality and working households give more weight to the interest payment gap than to the wage gap. However, its analysis does not add to our understanding of the behavioural possibilities since it is still a Minskyan-type scenario $(\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi) > 0)$, which we technically fuel by increasing the first term $\beta_1 \alpha_1 \ell$ via a higher α_1 . The result would be an overfuelled Minskyan-type scenario, since what happens in the field of the standard of living is not the crucial factor upon which their borrowing decisions are based.

We now explicitly model aggregate consumption, in which we add capitalists' and working households' consumption (equations (3) and (8), respectively) after we insert equations (10) and (11) into the latter, and then normalize by K :

$$C/K = \beta_1 \alpha_0 \ell + [\alpha_1 \beta_1 \ell + (1 - \beta_1 + \lambda \beta_2)(1 - \pi) + (1 - s)\pi]u - (1 + \beta_2)i\delta_w. \quad (13)$$

3 SHORT-RUN EQUILIBRIUM

In the short-run equilibrium, the goods market clears. Investment is fixed at a point in time, following Dutt (1995; 2005; 2006), as well as the level of consumer debt and capital stock. We insert equations (13) and (8) into (1) and then solve for the short-run equilibrium value of capacity utilization u^* and the profit rate r^* according to equation (4):

$$u^* = \frac{g + \beta_1 \alpha_0 \ell - (1 + \beta_2)i\delta_w}{\pi s - [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)]} \quad (14)$$

$$r^* = \pi u^* = \frac{\pi [g + \beta_1 \alpha_0 \ell - (1 + \beta_2)i\delta_w]}{\pi s - [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)]}. \quad (15)$$

The stability condition requires that the denominator in equations (14)–(15), which is a standard multiplier, is positive. In particular, it shows the impact on saving by an increase in capacity utilization: the first term represents the additional saving by industrial capitalists and the other two terms represent the additional consumption due to workers' borrowing. This stability condition implies that saving increases with total income and particularly that the increase in saving by gross profits more than offsets the increase in consumption due to workers' borrowing.¹¹ To ensure that we always have a positive u^* and r^* we require that the numerator in (14)–(15) is positive.

11. The denominator of equation (14) is the sensitivity of saving to changes in u ; that is, by differentiating the saving function $\frac{S}{K} = \pi u - \beta_1 \alpha_0 \ell - [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)]u + \beta_2 i\delta_w$ with respect to u we obtain $\frac{\partial \frac{S}{K}}{\partial u} = \pi s - \alpha_1 \beta_1 \ell + (\beta_1 - \lambda \beta_2)(1 - \pi)$.

3.1 Comparative statics analysis

Table 2 reports the comparative statics results for u^* and r^* derived from the temporary equilibria (14)–(15) with respect to π , i , δ_w , s , α_0 , α_1 and λ .

As the effects of the parameters on both the equilibrium values of capacity utilization and the profit rate are always of the same sign, the following discussion focuses on capacity utilization. We observe that the parameters involved in working households’ borrowing (equation (10)) and the wage target (equation (11)) (that is, λ , α_0 , α_1) increase borrowing that fuels consumption, aggregate demand and hence capacity utilization. In particular, as α_1 captures the sensitivity of the conventional wage to changes in economic activity, a higher α_1 increases the wage gap and hence working households’ borrowing according to (10). α_0 is an autonomous term that increases borrowing directly. Working households increase borrowing following increases in the level of the interest payments they are allowed to take, that is, with a higher λ . Consequently consumption, aggregate demand and capacity utilization increase. On the other hand, as workers borrow, they accumulate debt that has to be serviced during each period. This is a burden on aggregate demand because it redistributes income from working households to capitalist households which have a lower propensity to consume. As expected, both the interest rate and the debt-to-capital ratio have a negative impact on capacity utilization. The propensity to save out of profits in the short run also has a negative impact on capacity utilization because it reduces capitalists’ consumption while they accumulate internal funds to finance investment plans that will be realized several periods later. The impact of the profit share on capacity utilization, however, is ambiguous, implying that the demand regime may be wage- or profit-led. The derivative of u^* with respect to π yields two possibilities:

$$\frac{\partial u^*}{\partial \pi} = \begin{cases} \frac{-(s - \beta_1 + \lambda\beta_2)u}{\pi s - [\alpha_1\beta_1\ell - (\beta_1 - \lambda\beta_2)(1 - \pi)]} > 0, & \text{if } s < \beta_1 - \lambda\beta_2 \\ \frac{-(s - \beta_1 + \lambda\beta_2)u}{\pi s - [\alpha_1\beta_1\ell - (\beta_1 - \lambda\beta_2)(1 - \pi)]} < 0, & \text{if } s > \beta_1 - \lambda\beta_2. \end{cases} \quad (16)$$

Obviously, the sign of $\frac{\partial u^*}{\partial \pi}$ depends on the sign of the numerator, which by rearranging we take as $(1 - s) - [1 - (\beta_1 - \lambda\beta_2)]$, namely capitalists’ propensity to consume out of profits $(1 - s)$ and workers’ propensity to consume out of their available income and financial sources $(1 - (\beta_1 - \lambda\beta_2))$. It seems reasonable to assume that the propensity to consume (save) out of wages is higher (lower) than out of profits (see Kalecki 1937; Kaldor 1955). That assumption implies that the economy is stagnationist ($s > \beta_1 - \lambda\beta_2$, that is, $\frac{\partial u^*}{\partial \pi} < 0$). Otherwise, the economy can also be exhilarationist.

The sign of $\frac{\partial r^*}{\partial \pi}$ depends on the sign of the numerator, which is the difference of the sensitivity of borrowing with respect to changes in conventional and actual wage. A positive numerator occurs in the first and third scenarios and hence the paradox of costs applies. By contrast, in the second scenario where income inequality is low, the paradox of costs does not apply.

Table 2 Short-run comparative statics

	π	i	δ_w	s	α_0	α_1	λ
u	?	–	–	–	+	+	+
r	?	–	–	–	+	+	+

$$\frac{\partial r^*}{\partial \pi} = \begin{cases} \frac{-(\alpha_1 \beta_1 \ell - \beta_1 + \lambda \beta_2) u}{\pi s - [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)]} < 0, & \text{if } \alpha_1 \beta_1 \ell > \beta_1 - \lambda \beta_2 \\ \frac{-(\alpha_1 \beta_1 \ell - \beta_1 + \lambda \beta_2) u}{\pi s - [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)]} > 0, & \text{if } \alpha_1 \beta_1 \ell < \beta_1 - \lambda \beta_2 \end{cases} \quad (17)$$

The above considerations reveal that the introduction of income inequality through the conventional wage mechanism (11) into the working households' borrowing equation forms behaviours that produce qualitatively different macroeconomic results upon changes in income distribution. Even if the sign of $\frac{\partial r^*}{\partial \pi}$ is assumed to be negative, its volume is affected with implications on the growth regime, as we will see when we examine the long-run dynamics.

4 LONG-RUN EQUILIBRIA

In this section, we perform the long-run analysis. We allow D_w , K and g to change over time and we focus on the dynamics of g and δ_w .

The differential equation describing the path of δ_w (overhats denote growth rates) is specified as follows:

$$\widehat{\delta}_w = \widehat{D}_w - \widehat{K}. \quad (18)$$

Inserting equations (5), (9), (12) and (14) consecutively into (18), we obtain:

$$\begin{aligned} \frac{d\delta_w}{dt} &= \beta_1 \alpha_0 \ell + [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)] \\ &\quad \left[\frac{g + \beta_1 \alpha_0 \ell - (1 + \beta_2) i \delta_w}{\pi s - [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)]} \right] - \beta_2 i \delta_w - g \delta_w. \end{aligned} \quad (19)$$

The term $g \delta_w$ in equation (19) implies the presence of non-linearity and hence its investigation will be performed through a phase portrait analysis.

The dynamic path of the rate of accumulation is specified by equation (6), into which equations (7) and (14) are inserted.

$$\frac{dg}{dt} = \Lambda \left\{ \gamma_0 + s \pi \gamma_r \left[\frac{g + \beta_1 \alpha_0 \ell - (1 + \beta_2) i \delta_w}{\pi s - [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)]} \right] - g \right\} \quad (20)$$

For simplicity, we henceforth use the following notation: $\pi s - [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)] = \Gamma$ and $\pi s - \Gamma = \alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)$.

We now derive the isoclines of the above differential equations (19)–(20) by setting $\frac{d\delta_w}{dt} = 0$ and $\frac{dg}{dt} = 0$ and solving for g :

$$g = \frac{\alpha_0 \beta_1 \ell \pi s - i \delta_w [(1 + \beta_2) \pi s - \Gamma]}{-(\pi s - \Gamma) + \delta_w \Gamma} \quad (21)$$

$$g = \frac{\gamma_0 \Gamma + \alpha_0 \beta_1 \ell \pi s \gamma_r}{\Gamma - s \pi \gamma_r} - \frac{\pi s \gamma_r (1 + \beta_2) i \delta_w}{\Gamma - s \pi \gamma_r}. \quad (22)$$

Isocline (21) is a hyperbola representing a negative relation between δ_w and g (see Figure 1). As debt accumulates, a larger part of income and additional borrowing finance the

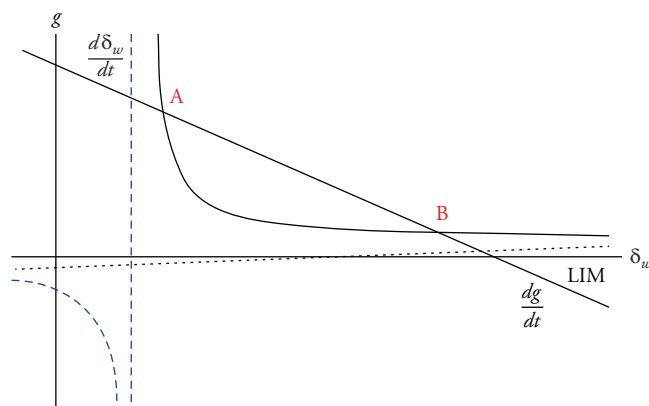


Figure 1 Dynamics of δ_w and g

accumulated debt commitments, thus contracting aggregate demand and growth. Secondly, an increase in δ_w initially causes a stronger negative effect on g , while when the levels of δ_w are already high, g becomes less responsive. This is due to the fact that the higher is δ_w , the lower is consumption’s contribution to changes in aggregate demand, leaving g almost intact. Isocline (22) is a downward-sloping line with a positive intercept and denominator.¹²

Solving the system of the differential equations yields two equilibrium points, A and B:

Equilibrium point A

$$\delta_{w,A} = \frac{\gamma_0 \Gamma - \sqrt{\Delta} + (\alpha_0 \beta_1 \ell - i \beta_2) s \pi \gamma_r - i [\Gamma - s \pi (1 + \beta_2)]}{2 i s \gamma_r \pi (1 + \beta_2)}$$

$$g_A = \frac{\gamma_0 \Gamma + \sqrt{\Delta} + (\alpha_0 \beta_1 \ell + i \beta_2) s \pi \gamma_r + i [\Gamma - s \pi (1 + \beta_2)]}{2 (\Gamma - s \gamma_r \pi)}$$

Equilibrium point B

$$\delta_{w,B} = \frac{\gamma_0 \Gamma + \sqrt{\Delta} + (\alpha_0 \beta_1 \ell - i \beta_2) s \pi \gamma_r - i [\Gamma - s \pi (1 + \beta_2)]}{2 i s \gamma_r \pi (1 + \beta_2)}$$

$$g_B = \frac{\gamma_0 \Gamma - \sqrt{\Delta} + (\alpha_0 \beta_1 \ell + i \beta_2) s \pi \gamma_r + i [\Gamma - s \pi (1 + \beta_2)]}{2 (\Gamma - s \gamma_r \pi)},$$

12. By assumption, the denominator is positive because it represents the standard Keynesian macroeconomic stability condition in the goods market, which requires the saving rate to respond more to changes in capacity utilization than the investment rate.

$$\frac{\partial g^s}{\partial u} > \frac{\partial g^I}{\partial u} \Rightarrow \pi s + (1 - \pi)(\beta_1 - \lambda \beta_2) - \alpha_1 \beta_1 \ell > s \pi \gamma_r \Rightarrow \Gamma > s \pi \gamma_r \tag{23}$$

where

$$\Delta = -4\pi i(1 + \beta_2)[(s\pi - \Gamma)\gamma_0 + \pi\beta_0(s - \gamma_r)]\gamma_r + [i(s\pi - \Gamma) + \Gamma\gamma_0 + i\pi\beta_2(s - \gamma_r + \pi\beta_0\gamma_r)]^2.$$

We assume $\Delta > 0$, so that the system yields two roots.

Equilibrium point A corresponds to high levels of g and low levels of δ_w , while equilibrium point B represents a low g and high δ_w . The economy must always remain above the LIM line, which ensures that all possible combinations of g and δ_w correspond to positive levels of u .

The stability properties of the dynamic system require that the Jacobian matrix gives a positive determinant and a negative trace.

$$\mathbf{J} = \begin{vmatrix} -g + \frac{i[\Gamma - s\pi(1 + \beta_2)]}{\Gamma} - \delta_w - \frac{\Gamma - s\pi}{\Gamma} & \\ \frac{-\Lambda\pi i(1 + \beta_2)s\gamma_r}{\Gamma} & -\frac{\Lambda(\Gamma - s\pi\gamma_r)}{\Gamma} \end{vmatrix} \quad (24)$$

Evaluating the determinant of the Jacobian matrix at equilibrium point A, we obtain:

$$\text{Det}[\mathbf{J}(\delta_{w,A}, g_A)] = \Lambda\sqrt{\Delta}/\Gamma, \quad (25)$$

which is always positive since $\sqrt{\Delta}$, Λ and Γ are positive. Recall that $\Gamma = \pi s + (1 - \pi)(\beta_1 - \lambda\beta_2) - \alpha_1\beta_1\ell$ is the short-run stability condition that implies that the increase in saving by gross profits more than offsets the increase in consumption due to workers' borrowing, and it is assumed to be positive.

If one of the following conditions is satisfied – (i) $\beta_1 < \lambda\beta_2$, (ii) $\beta_1 > \lambda\beta_2$ and $\alpha_1\beta_1\ell > (\beta_1 - \lambda\beta_2)(1 - \pi)$, or (iii) $\beta_1 > \lambda\beta_2$ and $\frac{i(s\pi - \Gamma)(1 + \beta_2)}{\Gamma} < g_A + i\beta_2 + \Lambda\left(\frac{\Gamma - s\pi\gamma_r}{\Gamma}\right)$ – then the equilibrium point A is locally asymptotically stable. To prove this, we obtain the trace at equilibrium point A:

$$\text{Tr}[\mathbf{J}(\delta_{w,A}, g_A)] = -g_A - i\beta_2 - \left[\frac{i(s\pi - \Gamma)(1 + \beta_2)}{\Gamma}\right] - \Lambda\left(\frac{\Gamma - s\pi\gamma_r}{\Gamma}\right). \quad (26)$$

At point A, g is always positive and $\Gamma - s\pi\gamma_r$ is assumed positive as it is the standard Keynesian macroeconomic stability condition in the goods market.¹³ This assumption, in combination with conditions (i) and (ii), which imply that the short-run stability condition also applies ($s\pi - \Gamma > 0$), ensure that the trace at A is negative and hence the equilibrium at point A is locally asymptotically stable.

Evaluating the determinant at equilibrium point B, we obtain a negative sign (because $\sqrt{\Delta}$, Λ and $\Gamma > 0$), which makes equilibrium point B a saddle:

$$\text{Det}[\mathbf{J}(\delta_{w,B}, g_B)] = -\Lambda\sqrt{\Delta}/\Gamma < 0. \quad (27)$$

Consequently, if the initial position of the economy is in the neighbourhood of point A, the system will converge to the locally stable point A, while if the initial position of the system is in the neighbourhood of B then the economy will move towards excessive values of δ_w and extremely low values of growth. The analysis suggests that structural instability is inherent to the model even if the real side of the economy is stable (which is assumed by

13. See previous footnote.

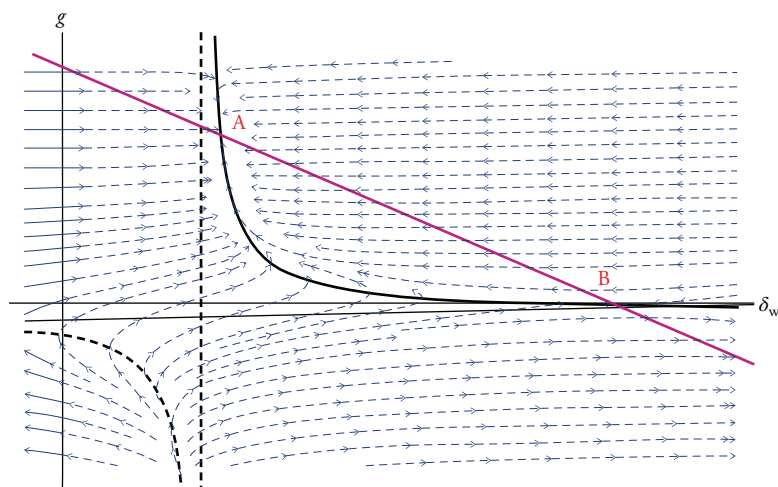


Figure 2 Dynamics of δ_w and g

the standard macroeconomic stability condition). Financial variables may play a destabilizing role especially when long-run growth is weak. This is also found in Jarsulic (1990), Dutt (1995) and Charles (2008a). Note that the stability properties are not affected by different borrowing behaviours or by changes in the parameter constellation, but they may become stronger or weaker (Jarsulic 1990). Specifically, whether equilibrium points tend to come closer to each other, instability increases because a sudden shock might produce oscillations that are able to move the system from the stable to the unstable path, while when the two points become more distant instability decreases. This stability analysis draws from the mathematical stability analysis (Jarsulic 1990). The vector field of the system is illustrated in Figure 2.

5 NUMERICAL ANALYSIS

This section presents the simulation results of the dynamics of our model followed by the comparative statics analysis. The simulations have been performed using the Mathematica software. For the calibration of the model, empirically plausible parameter values are used, which are presented in Table 3. Firstly, note that scenario 1 is divided into sub-scenarios 1a and 1b, with 1b being different from 1a only for parameter α_1 . This differentiation serves to provide two different growth regimes within the same scenario (that is, 1); scenario 1a gives a positive $\alpha_1\beta_1\ell - (\beta_1 - \lambda\beta_2)$ while in 1b this relation is negative. This relation plays a role in whether the growth regime is wage-led or profit-led (see below). The more intense income inequality is, the higher $\frac{\partial u}{\partial \pi}$ is, and hence if income inequality is not intense enough, the impact of borrowing will not be sufficient to drive growth, rendering a profit-led growth regime possible.

Secondly, for the first five behavioural parameters (those above the dashed line) we chose values that are plausible and at the same time qualify the requirements for each scenario parameter setting. We also report the Euclidean distance between the asymptotically stable equilibrium point A and the saddle point B. The simulation analysis allows us

Table 3 Calibration of the model: scenarios 1 (a and b), 2 and 3

Parameter	1a values	1b values	2 values	3 values	Source
α_0	0.38	0.38	0.75	1.00	Authors' calculations ^a
α_1	1.00	0.95	0.60	0.10	Authors' calculations ^a
β_1	0.40	0.40	0.40	0.29	Authors' calculations ^a
β_2	0.14	0.14	0.14	0.97	Authors' calculations ^a
ℓ	0.90	0.90	0.80	1.00	Authors' calculations ^a
i	0.065	0.065	0.065	0.065	(av. 1995–2010) OECD
s	0.75	0.75	0.75	0.75	Lavoie/Godley (2001)
λ	0.30	0.30	0.30	0.30	According to bank practices
π	0.43	0.43	0.43	0.43	(EU av. 1995–2010) AMECO
γ_r	0.351	0.351	0.351	0.351	Fazzari et al. (2008)
γ_0	0.045	0.045	0.045	0.045	Benchmark value ^b
$\alpha_1\beta_1\ell$	0.36	0.34	0.192	0.029	
$\beta_1 - \lambda\beta_2$	0.358	0.358	0.358	-0.001	
$\alpha_1\beta_1\ell - (\beta_1 - \lambda\beta_2)(1 - \pi)$	0.155	0.137	-0.012	0.029	
$\alpha_1\beta_1\ell - (\beta_1 - \lambda\beta_2)$	0.002	-0.016	-0.166	0.03	
Euclidean distance	0.665	0.684	1.734	0.819	

Notes:

a. Set according to each scenario's setting requirements of the term $\alpha_1\beta_1\ell - (\beta_1 - \lambda\beta_2)(1 - \pi)$, the Keynesian stability condition, and the capacity utilization rate being less than unity. The rest of the parameter values (below the dashed line) are the same across the scenarios.

b. The values for γ_0 in the literature range from -0.061 (in Onaran/Galanis 2012) and -0.018 (in Hein/Vogel 2008) to 0.085 (in Lavoie et al. 2004). All three coefficient estimators are based on observations of the US economy. Our benchmark value is close to the middle of this range so that it fits in all scenarios.

to calculate the distance between the two equilibrium points, which seems to be the closest arithmetical approach to the stability analysis performed in Jarsulic (1990). It is used to examine whether the two equilibrium points tend to approach each other or become more distant, and by that infer if macroeconomic stability becomes stronger or weaker upon parameter changes. The results suggest that the more macroeconomically stable scenario is the second (1.734), followed by the third (0.819); and the least stable is the first (0.665 and 0.684 for 1a and 1b, respectively).

The solution of the system for each scenario (the long-run equilibrium values of our endogenous variables δ_w^* , g^* , u^* and r^*) is reported in Table 4 together with the wage gap and debt sustainability for both the asymptotically stable equilibrium point A and the saddle point B. It is interesting to note that each motivation behind workers' borrowing, while keeping the rest of the economy's structure the same, has different quantitative and qualitative effects on the economy's macro-dynamics. Another noticeable point is that, as expected from the mathematical model, in all scenarios the asymptotically stable equilibrium point A corresponds to high levels of long-run growth and low levels of debt-capital ratios while the unstable (saddle) point B corresponds to extremely low levels of growth and high levels of debt-capital ratios. In addition, at point A capacity utilization and the rate of profit are positive and their values are plausible, while at the unstable

Table 4 Simulation results: equilibrium points, rate of capacity utilization, profit rate, wage gap and debt sustainability

Scen.	A					B						
	δ_w^*	g^*	u^*	r^*	$w.g.$	$d.s.$	δ_w^*	g^*	u^*	r^*	$w.g.$	$d.s.$
1a	1.759	0.154	0.964	0.415	0.660	0.051	2.416	0.051	0.052	0.022	0.359	-0.148
1b	1.726	0.130	0.755	0.325	0.557	0.017	2.406	0.051	0.049	0.021	0.356	-0.148
2	1.717	0.126	0.713	0.306	0.536	0.010	3.451	0.060	0.132	0.057	0.588	-0.202
3	1.700	0.119	0.653	0.281	0.693	0.001	2.517	0.053	0.071	0.030	0.967	-0.152

Note: w.g. = the wage gap defined as $w'/l - u(1 - \pi)$; d.s. = debt sustainability defined as $\lambda u(1 - \pi) > i\delta_w$.

point B they are extremely low. Also, at point A working households' debt is sustainable, while at point B households are in a state of excessive debt accumulation reminiscent of a Ponzi scheme (their new borrowing falls short of their interest payments).

With respect to cross-scenario analysis, we observe that the first scenario at point A performs better than the second and third scenarios in terms of long-run growth, capacity utilization and the profit rate; and working households' debt is more sustainable, although they are significantly more indebted. This happens for both variants of scenario 1, the only difference being that 1b's performance is a little bit lower than 1a's because in 1a income inequality is more intense and hence working households' borrowing provides a stronger boost on long-run growth. This is also the reason why growth is higher in scenario 1 compared to scenarios 2 and 3, while at the same time workers' debt is more sustainable. These results show that in the presence of income inequality, higher borrowing and hence debt can be sustainable under high rates of accumulation. The other two scenarios (2 and 3), at the local asymptotically stable point A, perform similarly, and both at significantly lower levels than the first scenario. Note, however, that the Minskyan behaviour is constrained by the setting of the maximum affordable interest payment ($\lambda = 0.30$ is a threshold used in standard banking practices), in the absence of which we would expect a higher performance, yet at the expense of macroeconomic stability. Recall that, according to the Euclidean distance measure, it is the least macroeconomically stable scenario. Finally, it is noteworthy that although in scenarios 1a and 1b workers' debt is the most sustainable, the wage gap is amplified to such an extent that under less favourable macroeconomic conditions a drop in the rate of accumulation could cause a collapse in household finances.

Table 5 reports the simulation results of the comparative statics analysis. We detect the impact of small changes in the parameters on the equilibrium values of our endogenous variables (δ_w^* , g^* , u^* and r^*). We also examine changes in the volume of the models' stability by comparing whether the distance of the pair of equilibrium points increased or decreased upon the change of the parameters in comparison to the distance of the initial pair of equilibrium points. As we have already emphasized, an increase in the distance between equilibrium points A' and B' in relation to the distance of the initial A and B means that the system becomes more stable and vice versa.

Our analysis focuses on the locally asymptotically stable equilibrium point A and the corresponding stability analysis, but, for the sake of completeness, we also present the results for the unstable equilibrium point B. Firstly, we find that the impact of parameters α_0 , α_1 , β_1 , β_2 , λ , γ_0 and γ_r on the equilibrium values of the endogenous variables is similar in all three scenarios (for brevity we report only one line). On the other hand, parameters π , i and s have a different impact on the endogenous variables and macroeconomic stability according to each scenario. Among the first set of parameters, those related to working households' borrowing have a positive impact on δ_w^* , g^* , u^* and r^* , given that increased borrowing increases consumption, aggregate demand, the profit rate, and hence long-run growth. However, each parameter's change has a different impact on the system's stability performance. Parameters α_0 and β_1 , which are attached to the wage-gap part of the borrowing function, tend to increase macroeconomic stability. However, α_1 , which reflects increasing income inequality, and β_2 and λ , which are both related to the interest-payments-gap part of the borrowing function, tend to reduce macroeconomic stability.

Regarding the parameters related to the investment function, they both promote long-run growth, capacity utilization and the profit rate while they reduce the equilibrium value of δ_w^* . Still, autonomous demand for investment, γ_0 , tends to increase the stability of the system, in contrast to the sensitivity of investment to profits, γ_r . This happens because an increase in γ_0 causes a parallel shift in the $\frac{d\delta_w}{dt}$ isocline without affecting isocline $\frac{d\delta_w}{dt}$, making

Table 5 Simulation results: comparative statics

Par.	Scen.	Eq. point A → A'				Eq. point B → B'				Stability
		$\Delta\delta_w^*$	Δg^*	Δu^*	Δr^*	$\Delta\delta_w^*$	Δg^*	Δu^*	Δr^*	
α_0	All	+	+	+	+	+	+	+	+	+
α_1	All	+	+	+	+	-	-	-	-	-
β_1	All	+	+	+	+	+	+	+	+	+
β_2	All	+	+	+	+	-	-	-	-	-
λ	All	+	+	+	+	-	-	-	-	-
γ_0	All	-	+	+	+	+	-	-	-	+
γ_r	All	-	+	+	+	-	+	+	+	-
π	1a	-	-	-	-	+	+	+	+	+
	1b	+	+	-	+	-	-	+	-	-
	2	+	+	-	+	-	-	+	-	-
	3	-	-	-	-	+	+	+	+	+
i	1	+	-	-	-	-	+	+	+	-
	2	+	-	-	-	-	+	+	+	-
	3	-	-	-	-	-	-	-	-	-
s	1	-	-	-	-	+	+	+	+	+
	2	+	+	-	-	-	-	+	+	-
	3	-	-	-	-	+	+	+	+	+

Note: When all scenarios share the same direction, the first scenario results are reported.

the two equilibrium points more distant, while γ_r shifts the isocline $\frac{dg}{dt}$ in a clockwise manner, which renders the reduction of the distance between A' and B' possible.

Changes in income distribution (that is, the profit share) lead to different macroeconomic implications across scenarios. This differentiation is attributed to the ambiguity of the sign of $\frac{dg^*}{d\pi}$, which implies that the growth regime may be either wage-led or profit-led. In particular, by differentiating the desired investment function and substituting for $\frac{\partial u}{\partial \pi}$, we obtain equation (28):

$$\frac{\partial g^*}{\partial \pi} = s\gamma_r u + s\gamma_r \pi \frac{\partial u}{\partial \pi} = s\gamma_r \left(u + \pi \frac{\partial u}{\partial \pi} \right) = s\gamma_r \left[-\frac{u}{\Gamma} [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)] \right]. \quad (28)$$

Recall that the economy is stagnationist ($\frac{\partial u}{\partial \pi} < 0$) in all scenarios.¹⁴ Given that all other parameters are positive, the sign of equation (28) depends on the sign of $\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)$, which reflects the impact on borrowing of changes in the conventional wage, $\alpha_1 \beta_1 \ell$, and changes in the actual wage, $-(\beta_1 - \lambda \beta_2)$.

Scenario 1a represents the more intense inequality, hence its impact on borrowing is stronger than that of the actual wage ($\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2) > 0$). A higher profit share initially will cause a fall in capacity utilization, which will be further reinforced as it triggers a significant fall in working households' borrowing (hence, δ_w^* falls). Therefore, $\frac{\partial u}{\partial \pi}$ will be negative and large enough to render $u + \pi \frac{\partial u}{\partial \pi}$ negative and hence g^* to fall, implying a wage-led growth regime. r^* falls for the same reason.

In scenario 1b, income inequality is assumed to be slightly less intense than in scenario 1a, implying that its impact on borrowing is weaker than that of the actual wage ($\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2) < 0$) but still $\pi r - [\alpha_1 \beta_1 \ell - (\beta_1 - \lambda \beta_2)(1 - \pi)] > 0$. As a result, workers'

14. See equation (16) and the related discussion.

borrowing increases, with a higher profit share partially offsetting the fall in consumption and capacity utilization. In consequence, the fall in capacity utilization is not as strong as the increase in the profit share, and the profit rate increases. Long-run growth increases as well, implying a profit-led growth regime.

In the second scenario, workers' borrowing offsets the negative effects of an increase in the profit share by smoothing consumption and hence capacity utilization. As a result, we obtain a higher δ_w^* which implies that income distribution deteriorates for working households in a twofold way, while capacity utilization experiences a minor deterioration. Consequently, the impact of a higher π on capacity utilization ($\frac{\partial u}{\partial \pi}$) is small, resulting in a positive $u + \pi \frac{\partial u}{\partial \pi}$ which implies a profit-led growth regime. Moreover, the paradox of costs does not apply, as the increase in the profit share exceeds any fall in capacity utilization.

In the third scenario, a higher π will cause capacity utilization to fall, which in turn leads working households to reduce borrowing. In this scenario, working households' propensity to consume out of financial resources is the highest and as a consequence the negative reaction will be the strongest. The combination of the direct and indirect effects of a higher π on capacity utilization may cause the growth rate to fall as well. The same reasoning applies for the profit rate.

The above analysis reveals the existence of a trade-off between long-run growth, δ_w , and macroeconomic stability. The policy implication that arises is that policy-makers aiming to reduce income inequality through income distribution policies will face either faster economic growth and less stable macroeconomic conditions or slower economic growth and a more stable economy. A possible detachment from this trade-off could be the stimulation of the 'animal spirits' which boost economic growth and macroeconomic stability at the same time, while they more likely confine δ_w^* because of higher g . From a monetary policy point of view, lower interest rates will also generate faster economic growth and enhance macroeconomic stability, with δ_w^* scaling down in scenarios 1 and 2.

Higher interest rates are contractionary irrespective of working households' borrowing behaviour, and destabilize the economy. In scenarios 1 and 2 this impact is coupled with rising δ_w^* . In scenario 1 a higher interest rate increases δ_w^* because of the fall in the rate of accumulation, while in scenario 2, where workers offset any fall in their income and consumption with borrowing, workers will be engaged in additional borrowing. Only in the third scenario, which shares some Minskyan insights, will workers who are averse to higher interest payments reduce borrowing and debt.

A higher s has a contractionary effect when workers focus on the interest payments' affordability or income inequality is high (scenarios 1 and 3). The economy equilibrates at a lower level of aggregate demand and growth, but with lower workers' borrowing and debt and a more stable macroeconomic environment. On the other hand, in scenario 2 a higher s may have a positive impact on growth as the adverse effects are averted by workers' borrowing.

6 CONCLUSIONS

This paper attempts to contribute to our understanding of the potential links between rising income inequality and consumer debt accumulation. A neo-Kaleckian model of growth and income distribution is developed, suggesting that working households borrow in order to sustain their standard of living rather than 'get ahead' of their class consumption patterns or 'keep up with the Joneses'. A second or complementary aim of this research was to examine and compare competing views of borrowing behaviour suggested either by the theoretical or the empirical literature. The borrowing function used allowed for this investigation.

Our analysis suggests that borrowing, triggered by intense income inequality, can be sustainable for as long as it ensures high rates of economic growth. However, we saw that at this point, the wage gap is so wide that, in the event of a shock, which would abruptly end the favourable macroeconomic conditions, household finances would exhibit a dramatic failure. Another interesting finding is that changes in income distribution reveal a trade-off between long-run growth, the household debt–capital ratio and macroeconomic stability across all scenarios. The policy implications of this model indicate that policy-makers’ efforts to reduce income inequality through income distribution policies alone will face either faster economic growth and less stable macroeconomic conditions or slower economic growth and improved macroeconomic stability. Possible detachment from this trade-off requires a policy mix that combines measures for the recovery of working households’ living standards (that is, through public expenditures in social sectors and the welfare state) and policies that improve the ‘animal spirits’ together with lower interest rates which boost economic growth and macroeconomic stability at the same time.

Regarding cross-scenario comparisons, we find that different working households’ borrowing behaviours have both quantitative and qualitative effects on the short and the long run, in the growth regime and macroeconomic stability. The scenario that assumes intense income inequality performs better than the one that does not assume inequality (the second) and the Minskyan variant (the third) in terms of long-run growth, capacity utilization, the profit rate and working households’ debt sustainability. According to the Euclidean distance measure of macroeconomic stability, the model is more stable under the second scenario and less stable under the first intense income inequality.

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