The Limits of the Wage-led Growth Strategy and the Iron Law of Capitalism: A Theoretical Appraisal

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ABSTRACT

The purpose of this paper is twofold. It identifies the recent development of a profound critique of Kaleckian models of growth and distribution that enables the possibility of endogenous regimes. I also present and discuss a theoretical model in which the IS curve is non-linear and demand regimes are unstable. Different theoretical and policy approaches can be fitted in this model, although it is recognized that under the capitalist system, a sort of iron law arises. Thus, it is not possible to permanently pursue the so-called wage-led growth strategy since the regime changes according to the distribution of income.

Keywords: Growth models, distribution, wage-led growth, Kaleckian models
JEL Classification: E11, D33, O41

Introduction

Post-Keynesians have emphasized the critical role of demand in determining economic growth. The Cambridge economic school has signified an alternative macroeconomic approach that has widely influenced policy. Since the work of Bhaduri and Marglin (1990) and Kurz (1991), the analysis of distribution and growth has witnessed major progress, both theoretically and empirically. Most empirical studies that have determined the character of aggregate demand have found that advanced economies are likely to be wage-led. Nevertheless, there has been growing criticism of post-Kaleckian models in recent years. One of these critiques is that it neglects the adequacy of econometric methods to assess whether the demand is wage-led or profit-led. Moreover, if the regime is endogenous to functional income distribution, then methods that ignore potential regime switches over time are flawed. These critiques open a theoretical debate around the nature of demand and growth regimes, specifically, if they can be considered as exogenously given.

This paper argues that there is a growing literature that represents a step forward in understanding the character of growth and demand. This new literature can be framed as

the third generation of Kaleckian models of growth in which non-linearities of investment are considered, enabling the possibility of endogenous regimes. However, this literature is far from unanimity regarding critical policy aspects as they differ in the viability of pursuing a virtuous cycle of increasing real wages with high economic growth. Thus, for some scholars, the wage-led growth strategy is a viable policy orientation even when the economy is identified as profit-led. On the contrary, there is another approach in which demand and growth regimes are unstable, so any attempt to pursue a wage-led strategy will inevitably fail. This latter critique emphasizes a feature of the capitalist mode of production that can be understood as a sort of iron law. This describes the fact that demand and growth regimes will shift in reaction to persistent distributional changes in any direction, either towards profits or wages.

To take this in-depth critique into account in terms of the characterization of capitalism as well as the instability of growth and demand regimes under the post-Kaleckian framework, I developed a simple theoretical model in which there is a unique value for profit share π that will maximize capacity utilization, and another critical value of π that maximizes profit rate and capital accumulation. There is no reason to assume that these critical values will be the same. This characteristic shall allow a new view to the profit-led and wage-led debate. Unlike Bhaduri and Marglin (1990), my model allows for different demand and growth regimes that are not based on the relative responsiveness of capital accumulation to changes in capacity utilization and profit share. Instead, the functional distribution of income is the main factor that enables the identification of the type of regime. Thus, for low (high) profit shares, the economy will be profit-led (wage-led). Therefore, distributional change in one direction will harm the profit-ledness or wage-ledness of the economy; in other words, as Nikiforos (2016, p. 392) stated, "the pursuit of distribution-led growth contains the seeds of its own destruction."

The model synthesizes different policy frameworks and historical periods in recent capitalist development and presents them as particular moments in income distribution. These theories have tried to account for various stages of the post-World War II capitalism. The golden age of capitalism is described as a period in which increasing wages boosted the economy. Nevertheless, this era touched its limit during the oil crisis. This crisis has been understood as an example of profit squeeze crisis. Moreover, the underconsumptionist approach is represented in the model as it draws an economy where pursuing higher profits has created stagnation, which has been described in the characterization of the neoliberalism era. The model also presents the theoretical possibility of the trickle-down economy.

The rest of this paper proceeds as follows: section 2 gives an overview of the development of Kaleckian models of distribution and growth from the Kalecki-Steindl

closure to the recent critiques. Section 3 develops a simple endogenous regime model and presents its main results. In section 4, I discuss the implications of this critique in terms of policy and theoretical analysis. Finally, I present some concluding remarks.

The evolution of Kaleckian models of growth and distribution

Neo-Kaleckian models

Keynes' analysis is the starting point for studying what has been known as effective demand. Keynesian legacy is strongly disputed among different schools of thought, but in this article, I emphasize the post-Keynesian approach since it develops a long-run understanding of the economy released from the neo-classical influence. The primacy of investment demand as the engine for growth, its independence from saving, the Keynesian paradox of thrift, as well as the multiplier effect, constitute some of the core notions that post-Keynesians incorporate in their analysis. Indeed, Post-Keynesians do not make up a homogeneous theoretical body. For instance, the Kaldor-Passinetti growth approach relies on the full employment assumption, which is strongly criticized by several post-Keynesians as a valid assumption for capitalist economies beyond the Golden Age (Hein 2014). The Kaldor-Robinson model incorporates independent investment and saving functions in the growth model. Still, this approach neglects capacity utilization as an adjustable variable, assuming that the economy is on the wage-profit frontier (Hein 2014, p. 175).

In this broad theoretical context, Kalecki points to excess capacity and monopolistic competition as two prominent features of modern capitalist economies. Kalecki's influence propitiated the rise of a novel approach to addressing growth and distribution. The initial contributions by Michal Kalecki (2017 [1943], 1954, 1971) and Steindl (1976 [1952]) were formalized by Rowthorn (1981), Dutt (1984) and Dutt (1987). One of its virtues is its explicit and systematic inclusion of functional distribution in the analysis. Behind this, there is an understanding of capitalist economies as compounded by social classes—capitalists who receive profits and workers who receive wages. In particular, Kaleckian models, from the first generation, proceed with a microeconomic theory of firms and a pricing mechanism.

Kalecki developed a microeconomic theory of firms that revealed some critical points worth mentioning. First, the idea that industrial firms operate under excess capacity goes directly against the neoclassical framework, that is, its conception according to which firms use all their capacity, and capital and labor are not kept idle (Hein 2014). The awareness of excess capacity even under normal conditions allows the introduction of demand as an element subjected to policy considerations. Thus, excess capacity implies that mismatches

between supply and demand can be solved through adjustments in quantities instead of prices.

However, microeconomic Kaleckian's contributions go further. Excess capacity is possible in an oligopolistic environment where firms can set prices according to the so-called mark-up over unit variable costs. This understanding of the pricing mechanism is, in fact, a theory on functional distribution. Hence, the notion of mark-up links pricing behavior with functional income distribution, connecting the microeconomic theory of firms with a macroeconomic view of distribution between social classes.

In the canonical Kaleckian model, profit rate and capacity utilization are endogenous variables determined jointly by the equality between investment and saving. Therefore, the functional form of investment becomes a vital determinant of the results these models enable. Blecker and Setterfield (2019) define the canonical Kaleckian investment function as follows:

$$g^i = \alpha + g_1 r + g_2 u \tag{1}$$

This representation is called the Rowthorn-Dutt-Taylor investment function and draws that investment responds positively to animal spirits (α), profit rate (r), and capacity utilization (u). The form of investment function reflects the fallacy of aggregation through two paradoxes, the paradox of thrift and the paradox of costs. The former is that an exogenous increase in saving rate harms overall growth, and the latter is that an increase in the profit share will also harm growth. Therefore, the Kaleckian-Steindl framework offers the theoretical foundation for a wage-led growth strategy since wages are considered not only a cost but also a component of effective demand. This dual nature of wages highlights the possibility of a common strategy between classes if a better real wage improves capitalist sales, fostering the overall economy.

Post-Kaleckian models

The previous Kaleckian model was rapidly contested, giving rise to a new family of growth and distribution models, propitiated by Bhaduri and Marglin (1990) and Kurz (1991), who built upon the Kalecki-Steindl model. In the investment function described in equation (1), profit share is embedded in capacity utilization (u). Thus, Bhaduri and Marglin (1990) proposed a new investment function in which profit share and capacity utilization are treated separately. This straightforward modification makes the economy potentially profit-led, depending on structural parameters that can be econometrically estimated. I call this model the post-Kaleckian model, following Hein's terminology (Hein

2014). The new investment function takes the following specification, where profit share is an independent driver of investment:

$$g^i = \alpha + \beta u + \theta \pi \tag{2}$$

One main result of this new version of the investment function is that the paradox of cost is no longer universally valid. This is because parameter values play a pivotal role in determining the economic regime. The key parameters are those that define the sign of the IS curve's slope. Hence, considering that the Keynesian stability condition holds, if the investment is more sensitive than saving to changes in profit share, then the demand regime will be profit-led. On the contrary, if savings are more sensitive than investments with respect to profit share, then the economy is wage-led. Moreover, a third regime is possible, namely the conflictual stagnationist or conflictive regime, where demand is wage-led whereas the growth regime is profit-led.

The model described above led to a series of empirical papers that have sought to determine if the economies are wage-led or profit-led by applying econometric methods to macroeconomic time-series data (some of these studies are, for example, Tavani, Flaschel, and Taylor (2011), Stockhammer and Onaran (2013). One of the most complete empirical assessments was made by Onaran and Galanis (2013). This work assesses the impact of a 1%-point increase in the profit share on aggregate demand components such as investment and consumption for 15 countries and the Eurozone. The results show that large economies such as the United Kingdom, United States, Germany, and France are wage-led. In contrast, small and open economies like Canada and Australia are profit-led as they depend more on the external sector, and consumption propensities do not vary too much among social classes. A hypothetical simultaneous rise in the profit rate across countries harms the global aggregate demand because the global economy, as a whole, is wage-led. Thus, it turns out that profit-led economies such as Canada, Argentina, Mexico, and India become wage-led when a simultaneous increase in wages takes place.

The emerging critique: A third generation of Kaleckian models?

Post-Kaleckian models of growth and distribution have not been exempt from critiques both on analytical and empirical grounds. For instance, Skott (2017) criticizes, among other things, that wage-led and profit-led literature relies on too restrictive underlying assumptions. Income distribution may be affected by aggregate demand; in consequence, profit share is not necessarily an exogenous variable. Moreover, the impact of distributional change on growth and demand can be shock-dependent because a profit-led regime may appear as such for specific shocks but not for others. Heise (2019), in turn, contests the

focus on functional income distribution since higher wage shares would accrue to upper classes with a lower propensity to consume without stimulating aggregate demand. Heise also notices that real wage is determined "once the nominal rate, technology, and the market structure of commodity markets are set" (Heise 2019, p. 5). Consequently, real wages cannot be a relevant policy instrument.

Furthermore, the same authors cited above have questioned empirical assessments of the economic regimes. Heise (2019) argues that the distribution-to-growth relationship is simply assumed in empirical studies. Also, most studies have only estimated short-run effects on aggregate demand components, even though the post-Kaleckian approach is supposed to be based on a long-run analysis. Heise (2019) and Skott (2017) raise concerns about the inconclusive and contradictory results of demand and growth regime identification. Biased results can be obtained if feedback effects are not controlled in OLS equations (Skott 2017, p. 354). This last critique has started to be addressed in recent studies (see, for instance, Burle and Carvalho (2021)). Blecker (2016) points out that empirical estimations of demand regime may vary according to the length of time horizon because investment and net exports may respond positively to lower labor costs only in the short-run. In contrast, higher wages can stimulate long-run aggregate demand. Therefore, economies identified as profit-led would be, in fact, wage-led in the long run.

Criticism of post-Kaleckian models has also discussed the functional form of investment and saving functions. In this section, I present what I characterize, after neo-Kaleckian and post-Kaleckian models, as the third generation of Kaleckian models. Since the second decade of the XXIst century, there has been a rise in theoretical analyses which have emphasized the non-linearity of investment and the endogeneity of the demand regime, inspired in part by You (1994) and Taylor (1990). Nevertheless, Prante (2019) has shown that endogeneity of economic regimes can be obtained even in the most basic post-Kaleckian model, meaning that a persistent increase in real wages can modify the distribution-ledness of the economy and, paradoxically, be able to switch the economy from profit-led to the wage-led regime, since the distributional effects and, therefore, the Keynesian multiplier, are not constant.

Regarding the refusal of linear investment function, recent critiques of post-Kaleckian models are not homogeneous in their conclusions. The policy proposals they draw differ in crucial aspects. At this point, a sort of classification is needed. On the one hand, some of these critiques sustain that the virtuous process of increasing real wages and high economic growth is achievable with the right policies. On the other hand, other critiques have concluded that in the intrinsic dynamic of capitalism, any attempt to pursue a virtuous process of a wage-led strategy is unsustainable.

Within the first group of critiques, some authors have pointed out that more equitable income distribution among workers affects the distribution-ledness of the economy by boosting aggregate demand (Lavoie and Nah (2021), Carvalho and Rezai (2016)). This effect can even switch the economy from a profit-led to a wage-led regime when workers' participation in the wage bill is big enough (Palley 2017). Under these works, more equitable income between workers makes the economy more wage-led.

Palley (2013) expands post-Kaleckian models to include non-linearities in the IS schedule. He proposes an inverted-U shape profit share curve and a backward bend IS in the (π, u) space. The latter curve can represent the three usual post-Kaleckian regimes, namely, wage-led, profit-led and conflictive, depending on the level of profit shares. Combining both curves creates up to six distinct zones where an economy can move throughout the business cycle. This model characterizes different stages in the US economic history, drawing attention to the need to include non-linearities in empirical estimations. In Palley (2014), the author criticizes that the identification of wage-led and profit-led regimes relies on exogenous primitive parameters, neglecting that economic regimes can be influenced by policy through changes in the distribution variable. This is a variant of the Lucas critique applied to post-Kaleckian models. In his paper, he modifies the saving function by adding new policy-dependent variables such as the workers' share of the wage bill and capital ownership. Thus, regardless of the economic regime, any increase in the worker's share of the wage bill or the ownership of capital boosts economic growth and capacity utilization.

When it comes to the second form of critique, the starting point is the recognition of a logical impossibility according to which an economy cannot maintain higher capacity utilization when the output is only wages or profits. Given a profit-led or wage-led economy, there must be a threshold in the distribution that constitutes a barrier to pursuing economic growth. This critique enables what I call a *non-virtuous approach* to the endogeneity of regimes. From this perspective, essential contributions are Köhler (2018), Nikiforos (2016) and Nikiforos (2022).

Köhler (2018) analyses endogenous regime shifts in a Kaleckian framework. He assumes a perfectly exogenous distribution and incorporates an investment function that draws a non-linear relationship with profit share, alongside the usual assumption of Kaleckian models. The non-linear investment makes the economic regime partially dependent on the level of profit share. Hence, IS curve can assume three different functional forms or "constellations," depending on the distinct signs in the second partial derivative of utilization with respect to profit share. The most relevant case from these three cases is the dynamic case in which the second derivative of capacity utilization is negative, representing an inverted U-shape IS curve in the (π, u) space. It is only in this case that

the regime switch becomes possible. However, this scenario still depends on the "deep parameters," making the endogeneity of his model a result of too restrictive conditions. Moreover, it can be shown that negative animal spirits are a necessary condition to locate the economy in the dynamic case, which means that the endogenous regime is only possible when firms have negative long-run business expectations.

Another contribution to this strand of post-Kaleckian critiques was developed by Nikiforos (2016). In this article, he proposes a linear version of the Goodwin predator-prey model in which potential growth is the predator and distribution of income is the prey. In the analysis of the long-run case, the author states two critical assumptions. First, the unstable character of income distribution implies that the direction of distribution reinforces the asymmetric power relationship between classes. Second, the direction of distribution depends on the type of regime. Thus, if the economy is profit-led (wage-led), the direction of distribution will tend to favor profits (wages), even when this kind of distribution can harm the economy. The proposed model sets up an endogenous dynamic in which the economy switches between profit- and wage-led regimes over time.

Similarly, in Nikiforos (2022), the author adapts Hirschman's notion of involvement to analyze the distributional conflict of classes. In his analysis, endogenous mechanisms make the demand and growth regime unstable. The difference between the propensity to save and the propensity to invest out of profits defines the concept of wage-ledness. This notion will determine the fluctuating involvement of each social class.

Following these theoretical observations, Carrillo-Maldonado and Nikiforos (2022) estimate a time-varying distribution-led regime for the US. By applying a time-varying parameter structural vector autoregressive model, their econometric estimation simulates the effect of a one unit of wage share shock on real GDP growth, finding that the US has become more profit-led since the late 1940s. Still, from the 1970s, it became less and less profit-led. This study is consistent with the cyclical behaviour of the distribution-ledness anticipated theoretically.

A simple Kaleckian model with endogenous economic regime

As I have pointed out in section two, a vital feature of the critiques is that post-Keynesian models rule out the possibility of non-linearities in the investment function and, therefore, in the IS curve. In particular, the inclusion of non-linearities in growth models can be traced back to Kaldor (1940). Recent developments based on non-linear relationships between accumulation and distribution are a cornerstone in the endogeneity of economic regimes. This section presents a simple one-sector Kaleckian model that describes a closed economy without a government sector. This model shares similarities

with Köhler (2018) but has an important distinction. Köhler's model assumes a negative monotonic relationship between profits and investment. This relationship is also known as the propensity to invest out of profits (Nikiforos 2016, p. 397). This way of conceiving a propensity to invest denies the possibility that there would be a positive relationship between profits and investment for certain levels of profit shares. In this section, the way to specify this relationship shall be the following:

$$g^i_\pi = \pi(\mu - \gamma\pi) + C, 0 < \pi < 1; \mu, \gamma > 0; \gamma > \frac{\mu}{2} \tag{3}$$

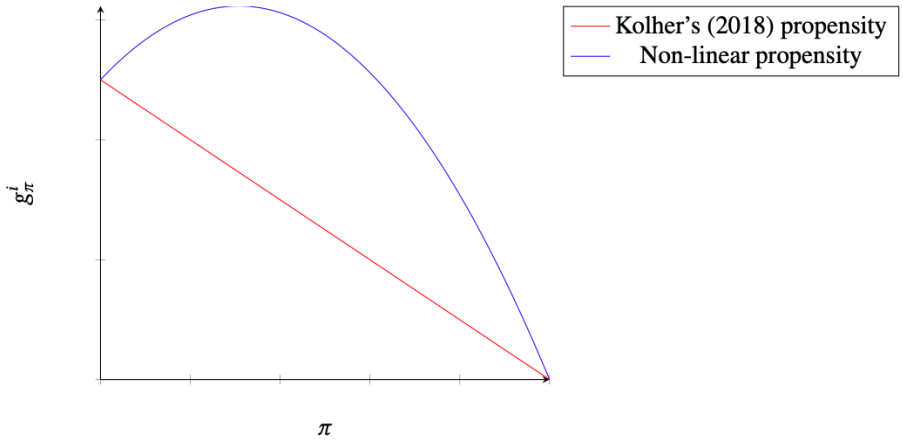

Figure 1: Two ways to represent propensity to invest

In equation (3), γ and μ are structural parameters that will vary according to each specific economy. This equation has a functional form that allows for a region with increasing propensity to invest beside a region with declining propensities, as can be seen in Figure 1.

Arguments that explain decreasing propensities to invest out of profits are linked to the profit-investment puzzle literature. This literature arose in the last decades as an effort to explain why despite increasing profits, the investment-to-profit ratio has slowed down in advanced economies (Stockhammer 2006), especially in the US. Different reasons have been provided. One relates this phenomenon to the capitalist's facet of ostentation which is expressed by the consumption of luxury goods (Forges Davanzati and Pacella 2013). According to this view that takes a Veblenian approach, capitalists are not only interested in differentiating themselves from the working class but also seek ostentation to compete with other capitalists. This competition triggers spending on luxury goods that can relegate investment to a secondary level.

Additionally, Orhangazi (2019) presents an exploratory study on the role of intangible assets in a declining investment-profit ratio. The author claims that trademarks, patents, and other intangible assets, allow non-financial corporations to get profits without

expanding fixed capital investment. These arguments can account for the weakened link between profits and investment that occurs when distribution tends to favor capitalists, as in the case of the recent trends in income inequality.

The non-linear propensity to invest can also be based on how businessmen assess their investment decisions. For instance, Nikiforos (2016) pointed out that since current profits form profit expectations and profits represent the basis for investment through retained earnings, then current profits must incentivize investment demand. The figure changes when profits are higher and higher, and then other factors, such as market size, come into consideration. In other words, high profits entail a relative abundance of retained earnings so that profit's influence on investment weakens, and profits do not constrain investment anymore. This argument has historic grounds in the neoliberal era when increasing profits are spent in the form of share buy-backs or distributed dividends instead of capital investments.

On the other hand, initial increasing propensities to invest are based on relatively small profit shares. For a low level of the profit share, investment will react positively to any increment of distribution toward profits (see figure 1). Since high real wages threaten capitalists' profitability, capitalists will pursue any labor-saving technical change that can reduce their wage bill. Thus, the quest for profitability will boost investment spending at least for sufficiently small profit shares. This argument is related to the Marxist theory of technical change, according to which wage increments accelerate innovations and reduce labor costs.

However, the non-linear investment presented is not complete without a fundamental conception of profit shares as the starting point for entrepreneurs' motives. It is essential to recall the notion of social surplus according to which the product that is not required to ensure the system's reproduction, like restoring the working force through wages, becomes the social surplus available for accumulation purposes. Since capitalism is inherently linked to the existence of profits that this social surplus makes possible, capital accumulation itself makes sense only once there are profits that can fall into capitalist hands. Previous versions of neo-Kaleckian models discussed here implicitly suppose that investment is carried out even without profits if there is capacity utilization. In the model this section presents, the investment function is entirely dependent on positive levels of profit shares. Over the existence of these profits, entrepreneurial animal spirits and capacity utilization play their respective roles. In other words, capacity utilization and animal spirits are subordinated factors (to profits) that influence investment, if and only if there are no nil profits.

A third-degree relationship between profit-share and investment (equation 5) is required to illustrate the transition between different growth regimes. A second-degree

equation means a negative monotonic relationship between profit shares and marginal growth because this equation is concave throughout all possible levels of profits. Nevertheless, a third-degree equation allows both a concave and a convex segment. The curve is convex for small shares of profits, denoting that under the capitalist economy, redistribution toward profits will be an incentive for growth. In contrast, the curve's segment becomes concave for significant shares of profits, showing the opposition between growth and profits. Moreover, a second-degree equation complicates the system's solution since the first derivative would not be continuous throughout the relevant domain. Having explained the foundations for a non-linear investment function, the classic Kaleckian model with modified capital accumulation is structured as follows:

$$r = \frac{\pi u}{V} \tag{4}$$

$$g^i = \pi \left[\alpha + \beta u + \pi(1-\pi)\right]; \alpha, \beta > 0 \tag{5}$$

$$g^s = s_p r; s_p \epsilon (0,1) \tag{6}$$

There are three endogenous variables: the profit rate r, capacity utilization u, and capital accumulation g^i. The first equation (4) is the classic profit curve which relates profit rate to profit share (π), capacity utilization (u), and capital-potential output ratio (V). Equation (5) is the non-linear investment equation[1] that depicts the non-linear propensity to invest as well as the subordination of u and α to positive profit shares. Thus, investment exists only if there is a non-zero profit share. Parameter α stands for animal spirits; beta is the investment's sensitivity to changes in capacity utilization. This non-linear investment has similarities with Köhler (2018), but for simplicity, γ_1 and γ_2 in Köhler's model (2018:19) are equalized to one. This change does not alter the analytical results. Finally, equation (6) is the saving function which follows the standard form—saving equals the propensity to save out of profit multiplied by the profit rate (r).

After combining the three equations, capacity utilization as an expression of exogenous parameters is obtained. Here, the usual Keynesian stability, according to which savings are more sensitive to changes in capacity than investment ($\frac{s_p}{V} > \beta$), holds. Then, the reduced forms for the three endogenous variables are the following:

$$u^* = \left(\frac{V}{s_p - V\beta}\right)\left[\alpha + \pi(1-\pi)\right] \tag{7}$$

[1]This specific equation generates the following investment's sensibility to profits: $g^i_\pi = \pi(2-3\pi) + \alpha + \beta u$, which is consistent with (3) , since $\mu = 2$ and $\gamma = 3$; and the remaining part, $\alpha + \beta u$, represents the constant C in (3).

$$r^* = (\frac{\pi}{s_p - V\beta})\,[\alpha + \pi(1-\pi)] \tag{8}$$

$$g^{i*} = (\frac{s_p\pi}{s_p - V\beta})\,[\alpha + \pi(1-\pi)] \tag{9}$$

The relevance of these reduced forms is that they differentiate demand and growth regimes depending on the state of the distribution between profits and wages. To see this, we need to check the first and second derivatives[2].

$$\frac{\partial u^*}{\pi} = (\frac{V}{s_p - V\beta})(1-2\pi) \tag{10}$$

$$\frac{\partial r^*}{\pi} = (\frac{1}{s_p - V\beta})(\alpha + 2\pi - 3\pi^2) \tag{11}$$

$$\frac{\partial g^{i*}}{\pi} = (\frac{s_p}{s_p - V\beta})(\alpha + 2\pi - 3\pi^2) \tag{12}$$

Partial derivatives show that there is a level of profit share that maximizes utilization (u), and another profit share that maximizes profit rate (r) and capital accumulation (g^{i*}). The second-order derivatives are:

$$\frac{\partial^2 u^*}{\partial \pi^2} = -(\frac{2V}{s_p - V\beta}) < 0 \tag{13}$$

$$\frac{\partial^2 r^*}{\partial \pi^2} = \frac{2-6\pi}{s_p - V\beta} \tag{14}$$

$$\frac{\partial^2 g^*}{\partial \pi^2} = \frac{s_p(2-6\pi)}{s_p - V\beta} \tag{15}$$

Equations (14) and (15) outline that the profit rate curve shall be convex until a certain level ($\pi = 1/3$). Beyond this point, the profit curve draws a concave form in which the equation achieves its maximum point. Equation (15) describes the fact that over all the distribution line, the utilization curve is concave, implying that there is a level of profit share that maximizes utilization capacity.

The profit curve arrives at its maximum level with respect to profit share when $\pi = \frac{1}{3} + \frac{\sqrt{4+12\alpha}}{6}$, which equals 2/3 if we assume $\alpha = 0$ (positive α will move this optimal point towards higher values of π^*). While the utilization curve arrives at its maximum level when $\pi = 1/2$, and this level is independent of any other exogenous variable. Contrary to the profit curve, capacity utilization does not depend on animal spirits (α).

[2]Further derivatives with respect to the rest of exogeous variables can be found in Appendix A.

The profit-share level will determine the final effect on demand and growth if there is a redistribution toward profits. If profits are higher than the level that maximizes profit rate, then an exogenous increment of π will make u and r decrease. However, if this increase in profit share happens when the current profit share is below the point which maximizes utilization of capacity, then we get that u and r increase. Thus, depending on the relative distribution between profit and wages, we can observe whether this economy is in the profit-led region or the wage-led part. In addition, there is a third region, between the critical values of profit share (π_u^* and π_r^*), in which the economy will face a *conflictive regime*. Here, when profit share increases, the profit rate goes down while capacity utilization goes up[3].

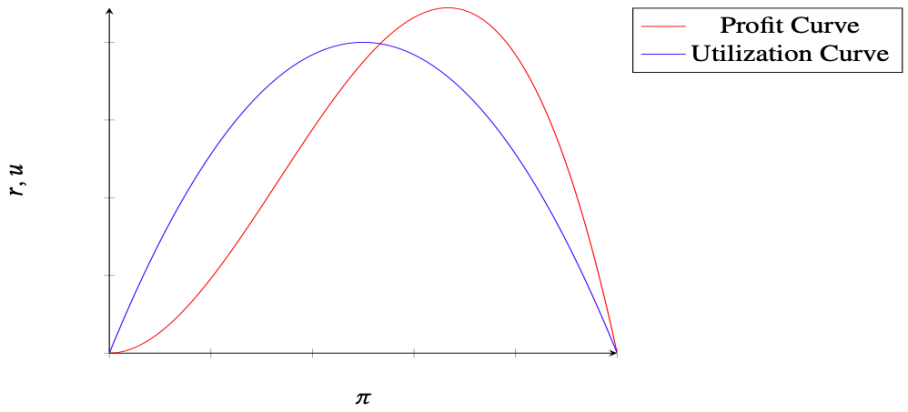

Figure 2: Profit curve and Utilization curve

One crucial feature of this model is that the shape of utilization and profit curves do not depend on parameter values other than the usual Keynesian stability condition. This result is consistent with the idea that, under the capitalist system, just one "constellation" that depicts instability of demand and growth regimes is possible. The economy regime is thus independent of "deep parameters" and is inherently dependent on functional distribution. In other words, parameters such as animal spirits, the propensity to save, and responsiveness of investment to capacity and profits can only change the critical values of r and u. Still, they cannot change the shape of the curves. This model rules out the static scenario described by Köhler (2018), according to which the regimes can still be exogenous if certain conditions are met.

A graphic representation of the profit (equation 8) and utilization curves (equation 7) can be seen in figure 2. This figure indicates that the maximum point of the profit curve is achieved on the right-hand side of the utilization curve's maximum point (also known as the IS curve). This result leads to three scenarios explained before. Thus, pursuing

[3] An extension of the model with workers' positive propensity to save is presented in Appendix B. The model with the participation of capitalists in the wage bill and workers' participation in profits is presented in Appendix C. The primary results are not altered.

increasing profit shares will, sooner or later, shift the regime of the economy towards a wage-led one and vice versa. Furthermore, suppose we represent on a horizontal line the different possible divisions of the output between profits and wages (as in figure 3). In that case, we shall see that as profit share gets a higher part of the distribution, this economy will tend to be wage-led. The conflictive zone is the region between the profit share that maximizes capacity utilization and the "optimal" profit share for r. In this region, r still goes up, but u declines.

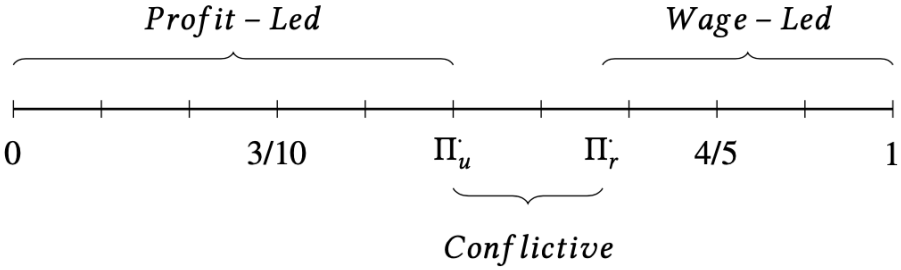

Figure 3: Regime zones on the disribution of income

Each of these regions can be defined according to what would be the effect of an exogenous increase in the profit share on the endogenous variables(r, u, g^i). Table 1 summarizes these effects by presenting the partial derivative of the reduced forms. Thus, when the actual profit share is above the profit level that maximizes the profit rate, a redistribution of income that benefits capitalists (Table 1's first row) will decrease all model's endogenous variables. In this case, demand and growth regimes are wage-led. We see the opposite case when the profit share is below the level of profit that maximizes capacity utilization. This scenario describes the fact that this economy is in the profit-led region (Table 1's third row). The third kind of regime is the conflictive one. Here, increasing profit share occurs between the optimal points of utilization and profit curves, but, at this point, utilization starts decreasing while the profit rate is still growing. This region implies that while higher profit shares stimulate profit rate, utilization decreases, as shown in the second row of Table 1.

Table 1: Partial derivatives of an increase in profit share

	$\frac{\partial r^*}{\partial \pi}$	$\frac{\partial u^*}{\partial \pi}$	$\frac{\partial g^*}{\partial \pi}$
$\Pi > \Pi^*_r$	$-$	$-$	$-$
$\Pi^*_r > \Pi > \Pi^*_u$	$+$	$-$	$+$
$\Pi < \Pi^*_u$	$+$	$+$	$+$

The presentation of this model is not complete without an assessment of the contradictory aims between classes. The fact that workers and capitalists have conflicting interests can be expressed by evaluating where, in the distribution line, workers and

capitalists maximize their utility function. The workers' interests rest in two variables. First, the working class is interested in their total income $1 - \pi = w$, and second, the total employment level, which can be approximated by capacity utilization since I am not modeling labor markets. Thus, a way to express the worker's utility function is $U^w = u(1 - \pi)$. By applying the first-order optimization condition, we get the profit share that maximizes this utility function (for simplicity's sake, I assume $\alpha = 0$).

$$\pi_w^{max} = 1/3$$

This result means wages represent two-thirds of total output. The effect of animal spirits (α) will push the workers' optimal level of profits upwards.

Differently, capitalists will have other priorities that will be accordingly expressed in their utility function. They are not only concerned about the profit share, but they also consider the profitability of their capital, which is the profit rate. Ultimately, this social class will aim to maximize $U^k = \pi r$. The result is the following:

$$\pi_k^{max} = 3/4$$

And as before, positive values of animal spirits shall increase this optimal point.

The paradox here is that capitalists as a class maximize their utility function when the economy lies in the wage-led region ($2/3<\pi<1$), while workers as a class maximize their utility when the economy is profit-led ($0 < \pi < 1/2$). This result reveals the antagonistic relationship between social classes. When workers or capitalists successfully pursue their interests, they harm the overall economy. This also shows the fiction of a common growth strategy that can benefit both classes.

It is essential to clarify that social classes *aim* to maximize their utility function. They cannot control the functioning of the economy. Believing this would mean that capitalists or workers can manipulate utilization, which would contradict the Kaleckian assumption of endogenous capacity utilization. At most, at this level of abstraction, social classes can alter the distribution between profits and wages. The purpose of the previous exercise is to illustrate how social classes will tend to push distribution in opposite directions by being consistent with their respective and differentiated interests, creating a source of instability in this model.

The character of capitalism and the limit of pursuing a wage-led growth strategy

The previous section has presented a simple Kaleckian model of growth and distribution in which demand and growth regimes are endogenous to the level of distribution between profits and wages. This model seeks to contribute to the rise of a critique of previous Kaleckian models that considers demand and growth regimes as exogenous features and, as detailed in section 2, are logically and empirically problematic.

The understanding of mature capitalist economies is a crucial determinant of the nature of any proposed policies. Thus, based on traditional post-Kaleckian models, authors have defended the suitability of policies that strengthen the world of work even when the domestic regime of the economy is characterized by a profit-led regime (Onaran and Galanis 2013, Lavoie and Stockhammer 2013). Lavoie and Stockhammer (2013) have pointed out the idea that a wage-led growth strategy is not only desirable but also doable. This strategy makes sense in response to the weakening aggregate demand caused by the preponderancy of profits over wages in the last decades. Nevertheless, the wage-led growth strategy can rapidly achieve its limits as lower profit shares would negatively impact investment decisions and, ultimately, the economy's growth. Moreover, since capitalists and workers have opposite interests, it is only a matter of time to see the inadequacy of persistent growing wages to promote economic growth. This feature of the capitalist system is what this paper has proposed as a source of instability in demand and growth regimes.

This approach allows a comprehensive analysis of the different historical phases that western capitalist economies have passed through after WWII. Hence, policy and theoretical explanations of the dynamics of capitalism can belong to the proposed model as different *distributional moments*. Thus, when increasing real wages is coupled with high economic growth rates, the economy is in the profit-led zone. Historically this feature corresponds to the Golden age of capitalism. Moreover, redistribution towards profits that cannot boost the economy corresponds to the wage-led area in the model. The last forty years of neoliberal policies and trickle-down doctrine in many developed economies belong to this zone. The policy perspective that describes this kind of economy is the underconsumptionist theory. Finally, what has been considered a profit squeeze crisis in the seventies before the rise of neoliberalism belongs to an economy in the profit-led zone since higher real wages cannot expand the economy.

The instability of demand and growth regimes[4] is a feature of any capitalist economy. It can be described as an *iron law* as behavioral parameters of investment and saving

[4]Interestingly, controlling for the stability of the regime is being included in recent empirical assessment of demand and distribution (for a example see (Stockhammer, Rabinovich, and Reddy 2021)

cannot modify the fact that capitalists and workers pursue opposite objectives. This way of characterizing the capitalist system is consistent with the historical development of western economies in the last century, when transitions among regimes have been closely related to important changes in the functional distribution of income. While political processes would modify factorial distribution, ultimately, any policy is constrained by the impossibility of achieving a long-run common beneficial strategy between classes. In other words, policies can influence income distribution, but policies cannot arbitrarily determine demand and growth regimes. The paper's approach, described in a Kaleckian framework, tries to incorporate this restriction in a system where the possibility of maintaining full employment is seen as a threat to the capitalist's interests, which Kalecki (1943) himself has considered. Otherwise, the necessity of making viable an alternative model, the socialist economy, would not be a concern for Kalecki, who has dedicated part of his work to this matter (Kalecki 1969; Kalecki 1972).

Conclusion

A solid understanding of capitalism requires framing the role of policy in the correct dimensions. This implies recognizing the limits of economic policy when it comes to promoting sustainable growth with increasing real wages. This paper showed that a new generation of Kaleckian models that emphasizes the endogeneity of economic regimes has appeared over the last years, criticizing the assumptions and results of the so-called post-Kaleckian models initiated by Bhaduri and Marglin (1990) and Kurz (1991). I also presented a simple Kaleckian model of growth and distribution that takes into account these critiques. As a result, this model is a simple way to represent the endogeneity of regimes and their unstable nature in a way that overcomes Palley's critique on the influence of "deep parameters" in determining demand and growth regimes.

This paper represents an effort to reflect the transitions of regimes that western capitalist economies have passed through in the last decades since WWII. These transitions configure what I have called the iron law of capitalism. This law describes a critical attribute of any advanced capitalist economy. It stresses that distributive conflict sooner or later blocks any possibility of a common strategy that benefits workers and capitalists. In other words, the wage-led growth strategy is ruled out, and the debate on the long-run description of the economies must focus on how to create adequate conditions to transit towards a post-capitalist society. Moreover, this understanding of the capitalist system can include different economic theories as an expression of distributional moments, making sense of specific historical contexts that various theories have tried to explain.

The rise of a new generation of Kaleckian growth and distribution models creates room for a more relevant policy agenda within the post-Kaleckian research program. In line with Heise (2019), to strengthen the policy relevance of wage-led and profit-led literature, there must be a broader perspective that would include, among others, competition and monetary variables as tools to influence the distribution of income and promote equitable growth. If the capitalist system constraints any persistent orientation in favor of workers, post-Keynesian economists must expand the range of options available and push the economy beyond the structural and historical limits of capitalism, that is, towards an economy increasingly aligned with social wellbeing instead of profits. The proposal of the present paper is in line with this project, setting up the basis for a broader discussion on the meaning and future of capitalist dynamics and the limits and options of policy.

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Appendix A: Further derivatives of the model

$$\frac{\partial u^*}{\partial V} = \frac{s_p(\alpha + \pi(1-\pi))}{(s_p - V\beta)^2} > 0 \tag{16}$$

$$\frac{\partial u^*}{\partial \alpha} = \frac{1}{s_p - V\beta} > 0 \tag{17}$$

$$\frac{\partial u^*}{\partial s_p} = -\frac{V(\alpha + \pi(1-\pi))}{(s_p - V\beta)^2} < 0 \tag{18}$$

$$\frac{\partial u^*}{\partial \beta} = \frac{V^2(\alpha + \pi(1-\pi))}{(s_p - V\beta)^2} > 0 \tag{19}$$

$$\frac{\partial r^*}{\partial V} = \frac{\pi\beta(\alpha + \pi(1-\pi))}{(s_p - V\beta)^2} > 0 \tag{20}$$

$$\frac{\partial r^*}{\partial \alpha} = \frac{\pi}{s_p - V\beta} > 0 \tag{21}$$

$$\frac{\partial r^*}{\partial s_p} = -\frac{\pi(\alpha + \pi(1-\pi))}{(s_p - V\beta)^2} < 0 \tag{22}$$

$$\frac{\partial r^*}{\partial \beta} = \frac{\pi V(\alpha + \pi(1-\pi))}{(s_p - V\beta)^2} > 0 \tag{23}$$

Appendix B: Model with savings out of wages

In this appendix, I modify the simple model presented in section 3 to include the scenario in which workers save part of their income. With this new assumption, we obtain a new saving function:

$$g^s = s_p\frac{\pi u}{V} + s_w(1-\pi)\frac{u}{V} \tag{24}$$

Thus, equalizing this new saving equation with the investment equation, we get the u^* and r^*.

$$u^* = \frac{V\pi(\alpha + \pi(1-\pi))}{\pi(s_p - s_w) + s_w - V\beta\pi} \tag{25}$$

$$r^* = \frac{\pi^2(\alpha + \pi(1-\pi))}{\pi(s_p - s_w) + s_w - V\beta\pi} \tag{26}$$

Higher propensity to save out of wages, or, put in another way, a smaller difference between the propensity to save among classes makes the wage-led regime zone start at a point which is located more on the right side of the distribution line, amplifying the room that corresponds to the profit-led regime. At the same time, an exogenous increase of s_w depresses utilisation and profit rate. The main results of the most straightforward model version hold.

Appendix C: Model with workers' wage share and workers' ownership

The saving function is modifiefd.

$$g^s = s_p \left[\sigma_1 \pi + \sigma_2 (1-\pi)\right] \frac{u}{V} + s_w \left[(1-\sigma_1)\,\pi + (1-\sigma_2)\,(1-\pi)\right] \frac{u}{V} \tag{27}$$

Where σ_1 and σ_2 are the participation of capitalists in the profit share (ownership) and wage bill, respectively.

$$u^* = \frac{V\pi(\alpha + \pi(1-\pi))}{\pi\sigma_1(s_p - s_w) + \sigma_2\left[\pi\,(s_w - s_p) + s_p - s_w\right] + s_w - \beta\pi} \tag{28}$$

$$r^* = \frac{\pi^2(\alpha + \pi(1-\pi))}{\pi\sigma_1(s_p - s_w) + \sigma_2\left[\pi\,(s_w - s_p) + s_p - s_w\right] + s_w - \beta\pi} \tag{29}$$

Here, the same Palley's results hold (Palley 2014). When the workers' share and ownership increase (which means that σ_1 and σ_2 go down), then capacity utilisation also goes up, regardless of which section of the distribution or regime we are located in.