Distributive conflict in a post-Kaleckian model with two classes of workers

Conflito distributivo em um modelo pós-kaleckiano com duas classes de trabalhadores

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RESUMO: Este artigo desenvolve um modelo pós-kaleckiano para avaliar os efeitos das mudanças na distribuição de renda (funcional e pessoal) no crescimento econômico. Desenvolvemos especificamente um modelo analítico que incorpora o conflito inerente entre trabalhadores e capitalistas e as tensões intraclasse entre trabalhadores com diferentes níveis de renda (tanto para rendas baixas quanto altas). As descobertas esclarecem os efeitos esperados dessas variações distributivas nas demandas dinâmicas da economia e no regime de acumulação. A análise desenvolvida abre a possibilidade de avançar essa abordagem teórica em múltiplas direções.
KEYWORDS: Distribuição de renda; desigualdade salarial; crescimento econômico.

ABSTRACT: This article develops a post-Kaleckian model to evaluate the effects of changes in (functional and personal) income distribution on economic growth. We specifically developed an analytical model that incorporates the inherent conflict between workers and capitalists and the intra-class tensions among workers with different income levels (for both low and high incomes). The findings clarify the expected effects of these distributional variations on the economy's dynamic demands and accumulation regime. The analysis developed opens up the possibility of advancing this theoretical approach in multiple directions.
KEYWORDS: Income distribution; wage inequality; economic growth.
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1. INTRODUCTION

Kalekian-inspired canonical models emphasize the relationship between the functional distribution of income and economic growth. Traditionally, these models focus on the effects of variations in the share of profits (or wages) in national income on aggregate demand, the degree of capacity utilization, and capital accumulation. The neo-Kaleckian models assume a positive relationship between share of wages in national income and the level of aggregate demand (see Amadeo, 1986; Rowthorn, 1981; Dutt, 1984). In contrast, post-Kaleckian models (following the tradition of Bhaduri and Marglin, 1990; Kurz, 1990) present a wider range of outcomes, including the possibility of regimes where aggregate demand is *profit-led*[1].

The neo- and post-Kaleckian research agenda has moved in different directions. There are versions that deal with trade openness (Von Armin, Tavani and Carvalho, (2014; Blecker, 1989, 2016; Nah and Lavoie , 2017), models that incorporate the fiscal role of the state and public indebtedness (Ko, 2018: Ribeiro and Lima, 2018)], models that introduce the role of household indebtedness and even integration with the more holistic approach, such as Stock-Flow Consistent.

Despite recent advances and new developments in neo- and post-Kaleckian literature, some of the theoretical literature also points to the limitations of this branch of models. In that vein, we can split the limitations of these models into theoretical and empirical issues. Regarding the first set, some of the criticisms are directed at the specification of the neo-Kaleckian investment function and potential Harrodian instability (Skott, 2010). Other criticisms are due to the long-term endogeneity of the degree of capacity utilization (Lavoie, 2015; Skott (2016), the pricing theory behind these models (Steedman, 1992), as well as other issues pointed out by the Sraffians (Serrano, 1995; Cesaratto, 2015).

However, recent empirical literature has revealed a reduction in workers' income (measured as the share of wages in total income) alongside growing income inequality and an increase in private consumption. These findings challenge many of the conclusions drawn from earlier models. In other words, empirical evidence suggests that redistributing income favoring the wage share does not necessarily lead to reduced consumption. Consequently, the effects of such changes on output may differ from those predicted by specific models[2].

In addition, another possible source of different results is the omission of the

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[1] The most traditional versions of these models incorporate the most common dimension of inequality, which is the inequality related to the functional distribution of income. This appears, for example, when it is assumed that the savings rate of salary income is lower than the savings rate of profit income (or even null).

[2] In addition to the criticisms leveled at the post-Kaleckian model for its limitations in capturing more recent economic phenomena, it is important to note that some studies have analyzed the restrictions inherent in the model in the tradition of Bhaduri and Marglin (1990). For example, Avritzer et al. (2021), by emphasizing the theoretical differences between the Kaleckian model and the supermultiplier model, demonstrate that the results obtained empirically for the Brazilian economy align with the supermultiplier

debt stock in these traditional models. Empirical evidence suggests that for the US, the debt cycle is an important variable in explaining the growth of inequality. That issue, however, has been partially addressed by Burle and Carvalho (2021), and our aim is to discuss the inter and intra wage-share distribution.

This phenomenon can be attributed to changes in the distribution of income among different social strata, with high-income workers taking a greater share of the total output. In recent years, particularly in the aftermath of the financial crisis, wage income has become more unevenly distributed (Carvalho and Rezai, 2016). The top income bracket has increased its share of output, while lower income brackets have experienced a decline in their respective shares.

Concerns about the possible effects of the emergence of a class of workers with 'super' salaries are not new in the literature. This debate gained traction with the rise of income inequality observed in the 1970s and 1980s. This development highlights a fundamental issue in contemporary capitalism, i.e., the strengthening of a new social class: the 'technobureaucracy'.

More specifically, during the second half of the twentieth century, the rise of large business conglomerates and the increasingly technical-scientific nature of the production process has led to the growing prominence of capitalist managers (the technobureaucracy). A class of workers has emerged that is not directly involved in the production process but is, instead, responsible for organizing and managing production. In contemporary capitalism, this class represents a significant segment of society (Lavoie, 2009; Piketty, 2014).

Therefore, the upper segment of income distribution in countries should not be solely interpreted as being the outcome of profit appropriation by capitalists. It comprises both the managerial class and renters. Considering these considerations, the Kaleckian approach to growth and distribution has revisited the structure of its models, transcending the traditional dichotomy between workers and capitalists. In other words, the assumption of homogeneous workers and an income distribution between profits and wages is being re-assessed, with the personal distribution of income now assuming a significant role.

Within the Kaleckian approach to growth and distribution models, more recent analyses (of particular interest in this paper) have incorporated different class structures among workers (e.g., managerial versus direct labor or high versus low-wage workers). Integrating new social classes into the analysis enables alternative explanations for income concentration, such as examining the increasing income disparity among social strata, particularly from the perspective of wage inequality.

Relaxing the assumption of wage homogeneity reveals significant changes in the dynamics of the economy, primarily through the savings channel. Given that capitalist managers earn high salaries, their greater propensity to save influences

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model's predictions. While in the post-Kaleckian model, economic growth is driven by capitalist investment, the authors' estimates indicate that investment is driven by economic growth.

aggregate savings, aggregate demand, and, consequently, the dynamics of capital accumulation and the economy's output growth rate.

In this context, this article aims to contribute to the literature by developing a post-Kaleckian model, enabling analysis of the effects of changes in functional and personal income distribution. More specifically, the paper seeks to construct a framework that integrates the impact of income distribution within the working class and between workers and capitalists.

This study builds upon the foundational works of Tavani and Vadusevan (2014) and Carvalho and Rezai (2016). Drawing from these contributions, we develop the savings and investment functions, introducing a key innovation: incorporating two distinct categories of workers differentiated by their income levels. The analysis is carefully structured to facilitate a deeper understanding of how changes in income distribution, driven by variations in the income shares of each group of workers, influence economic dynamics. In contrast to previous studies, this approach analyzes intra-wage inequality, not through a single wage disparity parameter but by examining changes in the wage share across different income strata. This framework provides a detailed analysis of how these variations affect demand regimes, accumulation processes, and profit rates.

The article is divided into four sections, in addition to this introduction. Section 2 introduces the debate on the rise of a new social class in contemporary capitalism. Section 3 develops a simple post-Kaleckian model of distribution and growth, in which it is possible to analyze the effects of changes in the functional and personal income distribution. Section 4 summarizes the main findings and concludes the paper.

2. THEORETICAL FRAMEWORK

Since the structural crisis of the 1970s, global economies have transitioned toward financial rentier capitalism within the mode of production. In this context, the financialization of economies has taken on a central role in shaping organizational dynamics. Consequently, a defining characteristic of this new configuration of capitalism is the emergence of the capitalist managerial class. This class can be viewed as an intermediary group between capitalists and workers, although, in practice, it exhibits behavior which is more akin to those of the former.

On the one hand, the salaries of this class are primarily tied to technical and scientific knowledge. In contemporary capitalism, there is an increasingly strong link between intellectual expertise and the accumulation of income. As a result, wealth is no longer predominantly derived from inheritance (of income and property). It is also noteworthy that executives in large corporations can often determine their own compensation, just as members of the state's top bureaucracy influence their salaries. On the other hand, this class also generates capitalist income, receiving rents such as interest, dividends, and real estate earnings (Bresser-Pereira, 2014).

In summary, within this new productive configuration, technobureaucrats participate in social products in two ways: they receive high salaries and share profits. Their substantial income provides them with greater access to financial markets, thereby enhancing their capacity to accumulate wealth (Lin and Tomaskovic-Devey, 2013).

In this context, there has been a historical shift in income distribution[3], with managers increasingly capturing a larger share of the social product. This trend has profound social implications. Several scholars contend that the underlying cause of these transformations is the growing income disparity, central to the rise in social inequalities (Piketty, 2014; Duménil and Lévy, 2011).

In recent years, executive compensation has risen significantly. The growth of high remuneration linked to executive roles, coupled with the increasing wealth of this class, has contributed to the intensification of income inequality, particularly in terms of intra-wage disparities. According to Piketty (2014, p. 291), the widening income gap in recent years, particularly in developed countries, has been primarily driven by labor income, with a disproportionate concentration at the top of the distribution. In this context, the variation in compensation for top executives emerges as a key factor in explaining the rise in inequality.

Given the implications of the rise of this social class on income distribution and economic dynamics, several studies within the Kaleckian tradition of growth and distribution models have reconsidered how the class structure is integrated into economic analysis. Specifically, these works incorporate concepts such as the emergence of a third social class. Furthermore, they investigate the impact of wage inequality on the patterns of growth and accumulation.

Some studies categorize manager costs as part of the indirect costs and, by extension, as part of the indirect labor. Lavoie primarily developed this perspective (1992, 1995, 1996, 2009, 2014). Other works categorize this class as part of direct labor (Tavani and Vasudevan, 2014; Palley, 2013, 2014a, 2014b; Carvalho and Rezai, 2016; Hein and Prante, 2018). The remainder of this section reviews some of the key contributions in the literature.

2.1 Managers as Part of Overhead Costs: Marc Lavoie's Approach

One of the key contributions of the author lies in the distinction between direct and indirect labor (Lavoie, 1992, 1995, 1996, 1997). Managerial labor is classified as indirect labor. Two important points are introduced: first, the salaries paid to managers are considered to be part of the indirect costs; second, pricing is assumed to occur based on a target rate of return on total costs, rather than the traditional Kaleckian pricing model, which is based on a markup over direct unit costs. More specifically, it is based on target-return pricing procedures, resulting in changes in managerial labor influencing prices (Lavoie, 2009). Then, by altering the composition of costs, managers' salaries affect the prices that firms set for their final products.

[3] For an analysis of changes in income inequality from a global perspective, see Goda (2013).

The basic structure of Lavoie's 2009 model is given below. The total output of an economy is expressed as the sum of profits and wages:

$$pY = wL + rpK \qquad (1)$$

where p is the price level, Y is the actual output level, w is the average nominal wage, $L =$ employment, $r =$ the rate of profit, and $K =$ the capital stock. The equation can be rewritten as:

$$p = w\frac{L}{Y} + rp\frac{K}{Y} \qquad (2)$$

Two types of work are considered: managerial work (L_f), associated with the upper and middle classes and assumed to be fixed, and ordinary workers (L_v), which vary according to the production level. Therefore, total labor is given by:

$$L = L_f + L_v \qquad (3)$$

Constant returns to scale are assumed and variable labor productivity (y_v) is constant until production reaches its full capacity, Y^*. This implies that variable and marginal costs are constant:

$$L_v = \frac{Y}{y_v} \qquad (4)$$

The amount of managerial work (non-productive work) depends on the degree of utilization of total capacity, i.e.:

$$L_f = \frac{Y^*}{y_f} \qquad (5)$$

The equations below show how the nominal wages of variable workers (w_v) and managers (w_f) are defined:

$$w_v = w \qquad (6)$$

$$w_f = \psi\, w_v \qquad (7)$$

$$w = \frac{w_v L_v + w_f L_f}{L} \qquad (8)$$

Lavoie (2009) considered that managers' salaries are set using a ψ parameter multiplied by the salary which ordinary workers receive. In this way, managers are paid ψ times more than ordinary workers. This parameter is crucial because it allows the analysis of economic dynamics through variations in managerial wages.

The degree of capacity utilization (u) is the ratio between output and output at full capacity, while the v coefficient expresses the capital/output ratio given by existing technology. Formally:

$$u = \frac{Y}{Y^*} \qquad (9)$$

$$v = \frac{K}{Y^*} \qquad (10)$$

If f is defined as the ratio of variable work to fixed work, then:

$$f = \frac{y_v}{y_f} \tag{11}$$

Therefore, equation (2) can now be rewritten as:

$$p = w\left(1 + f\,\frac{\psi}{u}\right) y_v + rp\,\frac{v}{u} \tag{12}$$

The equation shows the price of a production unit, in terms of labor costs per unit produced and profits per unit of production. The first term of the equation reflects the average cost of production, considering the degree of capacity utilization in the economy. From this, it is possible to deduce the cost of profits curve in terms of real wages:

$$r^{PC} = \frac{u}{v}\left[1 - \frac{\frac{w}{p}\left(1+f\,\frac{\psi}{u}\right)}{y_v}\right] \tag{13}$$

Finally, the real wage is defined in terms of efficiency: $\frac{w/p}{y_v}$. In traditional Kaleckian models, price determination follows a markup rule applied to total direct costs. In contrast, within the framework of a single vertically integrated sector, direct costs are treated as variable labor costs. Consequently, the pricing equation can be reformulated as:

$$p = \left(1 + \theta\right)\frac{w}{y_v} \tag{14}$$

The innovation of this model lies in the definition of the degree of markup, θ. Lavoie argues that firms determine their prices by considering total costs, including managerial labor. Moreover, firms aim to achieve a standard rate of return, r^{PC}. To formalize the pricing equation based on the standard rate of return, it is assumed that the capacity utilization rate equals the standard rate, u_s.

From equation (13), the unit costs are equal to $w\left(1+f\,\frac{w}{y_v}\right)$ and, therefore, the pricing equation which is compatible with the target return will be:

$$p = \frac{\left(1 + \Theta\right)\left(w\right)\left(1+f\,\frac{\psi}{u_s}\right)}{y_v} \tag{15}$$

where $\Theta = \frac{r_s\,v}{u_s - r_s v}$.

After some manipulation, it is also possible to show that:

$$p = \left(\frac{u_s + f\psi}{u_s - r_s v}\right)\frac{w}{y_v} \tag{16}$$

Equation (16) can be rewritten in terms of the real wage:

$$\frac{w}{p} = \frac{(u_s - r_s)y_v}{u_s + f\psi} \quad (17)$$

It is now possible to define a new profit-cost equation, r^{PC}, derived from the combination of equations (13) and (17):

$$r^{PC} = \frac{(f\psi + r_s v)u - (u_s - r_s v)f\psi}{v(u_s - r_s v)} \quad (18)$$

The profit share in income π is given by:

$$\pi = \frac{\theta}{(1+\theta)} = \frac{r_s v + f\psi}{u_s - r_s v} \quad (19)$$

The savings function is typically Kaleckian in that only the saving of profits is considered. Similarly, the investment function is that of the canonical neo-Kaleckian model, as defined in Rowthorn (1981):

$$g^s = s_\pi \ \pi \quad (20)$$

$$g^i = \alpha + \beta \ u + \gamma \ r \quad (21)$$

Equilibrium is obtained by the equality between (20) and (21) equations. The rate of profit is isolated to find the effective demand function:

$$r^{DE} = \frac{\beta u + \alpha}{s_\pi - \gamma} \quad (22)$$

Based on this formalization, it is important to know the effect on effective demand caused by including management costs. More specifically, is the increase in the participation of these workers in total work or the increase in ψ capable of raising effective demand, the degree of capacity utilization, profits, and, ultimately, investment? To find this result, it is necessary to derive the r^{PC} curve about ψ (or f):

$$\frac{dr^{PC}}{d\psi} = \frac{f(u_s - r_s v)\,(u - u_s)}{[v(u_s + f\psi)]^2} \quad (23)$$

In equation (23), when the economy's degree of capacity utilization is above its normal level, an increase in the wages of capitalist managers will positively affect effective demand. This implies that, when the economy operates above standard capacity, an increase in overhead costs has a positive effect on profits. Alternatively, an expansion in prices (given by the target rate of return) more than offsets the rise in capitalist managers' wages (Lavoie, 2009).

On the other hand, if the economy is operating below its normal capacity utilization, increases in total costs – due to increases in managerial salaries – reduce the economy's profitability. As a result, the effects of investments, the degree of capacity utilization, and aggregate demand are adverse.

Considering the long-term effects on the economy, increases in managerial salaries can positively impact the degree of capacity utilization. Consequently, this can drive economic growth, particularly if the economy is in a recessionary period. From this perspective, the increased propensity of the upper classes to consume absorbs the negative effects of higher price levels (Lavoie, 2009, p. 381). In other words, the fall in consumption by ordinary workers is counterbalanced by the demand associated with the higher salaries of managers. In this case, the economy shows an increase in the degree of capacity utilization, the rate of profit, and, finally, investment.

Alternatively, when the economy is expanding and operating beyond its standard capacity, the stimulus to increase profits can lead to oversupply. The additional costs of managers' salaries are passed on to prices, reducing the purchasing power of lower-paid workers. This leads to a fall in aggregate demand, the rate of profit, and the rate of accumulation. In this sense, the author concludes that:

> "If higher rates of accumulation are the target of an economy, firms should increase the relative weight of their managerial expenses (as defined by f and ψ) when the economy is stagnating, not when it is booming. An educated guess would lead us to believe that firms tend to do the converse, expanding the relative importance of managerial staff and their remuneration when times are good, and cutting heavily (again in relative terms) into unproductive staff when times are bad" (Lavoie, 2009, p. 381).

In addition, it is possible to extend the analysis by including savings from wages. It is assumed that only managerial workers save, i.e.:

$$S_{fw} = s_{fw}\psi L_f \tag{24}$$

The aggregate savings function, considering managerial savings g^{sg}, will be:

$$g^{sg} = s_c r + s_{fr}\left(1 - s_{fr}\right)r + \frac{s_{fw}\psi f\left(u_s - r_s v\right)}{(u_s + fv)v}\left(1 - s_{cg}\right)r_{cg} \tag{25}$$

where s_c is the corporate retention rate, s_{fw} is the propensity to save managerial wages, and s_{fr} is rental income.

The first term in equation (25) represents the accumulated profits of companies, while the second is the savings of capitalist managers that come from capital gains. The last term represents managers' savings derived from their wages. This function also considers savings from financial income and the rate of return on capital (r_{cg}), which is the ratio of earnings per unit of capital.

The new effective demand function is:

$$r^{ED} = \frac{u + \alpha + \left(1 - s_{cg}\right)r_{cg}}{s_c + s_{fr}\left(1 - s_c\right) - g_r} - \frac{s_{fw}\psi f\left(u_s - r_s v\right)}{\left[s_c + s_{fr}\left(1 - s_c\right) - \gamma\right]\left(u_s + f\psi\right)v} \tag{26}$$

Reducing managerial wages can make the savings associated with technobureaucratic remuneration equal to zero. In this case, the dynamics of the model be-have similarly to the previous one. A reduction in the propensity to save from profit income or the corporate retention rate increases effective demand, positively impacting the rate of capacity utilization and profits. An increase in managers' savings has a negative impact on effective demand due to the reduction in consumption.

From this perspective, an increase in managerial labor costs reduces the effective demand curve (without considering managerial savings, this has no impact on the effective demand curve):

$$\frac{dr^{ed}}{d\psi} = \frac{u_s s_{fw} f\left(u_s - r_s v\right)}{v\left[s_c + s_{fr}\left(1 - s_c\right) - \gamma\right]\left(u_s + f\psi\right)} < 0 \tag{27}$$

When the economy is above the normal utilization rate, the negative effects of the increase in the cost of managerial work are reinforced by the savings of this type of worker, reducing the potential for consumption. When the economy operates below capacity, the expansionary effects of high management salaries can be reduced or canceled due to the reductionist effects on effective demand caused by savings.

Lavoie (2009) defined the necessary condition for an increase in managerial wages to have a positive impact on the dynamics of the economy. In other words, it induces an increase in capacity utilization when the economy is operating below capacity. For this to happen, managers' propensity to save must be low compared to the difference between the actual degree of capacity utilization and what is considered normal (Lavoie, 2009, p. 388):

$$s_{fw} < \frac{[s_c + s_{fr}\left(1 - s_c\right) - g_r]\left(u_s - u\right)}{u_s} = \nu \tag{28}$$

In summary, the main result of this approach is to show that the participation of the managerial class impacts the economy, depending on the level of capacity utilization installed in the economy.

2.2 Managers as a Type of Direct Work

In this class of models, managerial wages do not affect prices. Furthermore, there are essentially two ways in which the class of managers is integrated into the analysis: the first admits the existence of a third social class (Palley, 2013, 2014, 2017; Tavani and Vasudevan, 2014; Hein and Prante, 2018); and the second assumes the traditional structure of two social classes but admits that the workers are heterogeneous (Carvalho and Rezai, 2016). Next, we present models that represent each approach.

Managerial Class and Inequality-Led Regimes: The Tavani and Vasudevan Model

Tavani and Vasudevan (2014) presented a model with three social classes: capitalists, workers, and capitalist managers. The model makes it possible to analyze the effect of the increase in the income share of managers on the dynamics of the economy, assuming the hypothesis that managers are 'unproductive', as in classical approaches.

Managers are responsible for supervising 'regular' workers and, in doing so, receive higher wages. This wage differential contributes to greater income inequality, primarily associated with labor earnings (Tavani and Vasudevan, 2014).

In this context, the dynamics of investment are directly linked to inequality. The interaction between income inequality and the level of investment gives rise to two accumulation regimes: the *low-inequality* (*high-inequality*) regime is characterized by low (high) sensitivity of investment to the economy's profit levels.

Income heterogeneity plays a fundamental role in the aggregate behavior of the economy, as it influences aggregate consumption, aggregate savings, and, ultimately, investment. The main equations of the model are presented below.

National income Y is given by:

$$Y = w_L L + w_M M + rK \tag{29}$$

where $L\,(M)$ represents the total number of workers (managers) in the economy, $w_L(w_M)$ denotes the real wage paid to workers (managers), r is the profit rate, and K is the capital stock. The production function assumes fixed proportions of capital and labor, as follows:

$$Y = min\left[aL,\, bM,\, vu\ K\right] \tag{30}$$

a represents labor productivity, b is the output to managerial input ratio, u is the degree of capacity utilization, and v is the constant output/capital ratio at full capacity. From the equations, it is possible to derive the profit share function in income:

$$\pi = 1 - \frac{w_L}{a} - \frac{w_M}{b} \tag{31}$$

The role of managers in this economy is to extract productivity gains from workers directly involved in the production process. This implies a relationship among labor, managerial labor, and profit share. The relationship between labor productivity and output per unit of managerial labor is defined as $a = b/\phi$ (where $\phi = L/M$). The authors emphasize that, even though managerial activity may be perceived as unproductive, it is important for entrepreneurs, as it impacts the returns generated by 'regular' workers.

Recognizing this relationship, the profit share is rewritten as:

$$\pi = 1 - \frac{w_L}{a}\left(1 + \frac{\eta}{\phi}\right) \tag{32}$$

In the profit share equation, the parameter $\eta = w_M / w_L$ represents the wage premium paid to managers. In this sense, η is a measure of income inequality. As we emphasize, a common element in this literature is setting a parameter to represent wage inequality.

The investment function is the typical neo-Kaleckian function:

$$g^i = \frac{I}{K} = \alpha + \beta u + \gamma r = \alpha + v\left(\gamma\pi + \lambda\right)u \ ; \ \lambda = \frac{\beta}{v} \tag{33}$$

By substituting (32) into (33) we obtain:

$$g^i = \alpha + v\left[\gamma\left(1 - \omega\right)\left(1 + \frac{\eta}{\phi}\right) + \lambda\right]u \tag{34}$$

The wage share in total output is defined as ω:

$$\omega = \frac{\left(1 - \pi\right)}{\left(1 + \frac{\eta}{\phi}\right)} = \frac{\phi}{\left(\eta + \phi\right)}\left(1 - \pi\right) \tag{35}$$

An increase in the ratio between regular workers and managers has a positive effect on the wage share in total income and the profit share. An expansion of the wage share is associated with an increase in workers. The effect on profits is related to higher production and sales due to the higher level of employment. However, the authors emphasize that the effect is more significant on profits than on wages: $\frac{d\pi}{d\phi} > \frac{d\omega}{d\phi}$.

Managers are assumed to have a positive marginal propensity to save, s_M , and they contribute to financing the accumulation process, along with capitalists. The total savings in the economy is given by:

$$g^s = v\left[1 - \omega\left(1 + \frac{\eta}{\phi}\right)\left(1 - s_M\right)\right]u \tag{36}$$

To develop the dynamics of the model, the authors admit that the degree of capacity utilization increases (decreases) to accommodate excess demand (supply) in the goods market. Thus, considering $\chi > 0$, the macroeconomic equilibrium between savings and investment is given by:

$$\dot{u} = \chi\left(g^i - g^s\right) \tag{37}$$

$$\dot{u} = \chi\left[\alpha - vu\left[\left(1 - \gamma\right)\left(1 - \omega\right) - \lambda - \omega\frac{\eta}{\phi}\left(1 - \gamma - s_M\right)\right]\right] \tag{38}$$

The Keynesian stability condition assumes that $\frac{d\dot{u}}{u} < 0$. Savings are more sensitive to changes in the degree of capacity utilization than investment. To verify when the stability condition holds, it is essential to observe changes in capacity utilization over time. Tavani and Vasudevan (2014) defined an equation for wage inequality (η), noting that shifts in *u* happen when wage inequality is fully realized:

$$\eta = \left(\frac{\omega}{\phi}\right)\left[\frac{(1-\gamma)(1-\phi)-\lambda]}{(1-\gamma-s_M)}\right] \tag{39}$$

If $1 - s_M > \gamma$, the regime is characterized by low responsiveness, which characterizes a low response investment to profits. In other words, an increase in wage inequality implies a more significant savings response. In this context, the increase in the share of higher incomes in total income (reflected in greater wage inequality) increases wage costs, leading to a decrease in profits. Lower profits reduce the incentive to invest. However, the rise in income from wages boosts total consumption, so the increase in consumption offsets the reduction in investment. In this context, the economic dynamic is characterized as a *wage-led regime*. However, the economy's structure is also influenced by inequality, especially among the highest wage earners, since the increase in the wage bill can be directed towards distributive top managers and executives.

Conversely, if $\gamma > 1 - s_M$, the regime is characterized by its high responsiveness, i.e., a high sensitivity of investment to profit. Investment's reaction to wage inequality is stronger than that of savings. In this context, a redistribution of income in favor of wages results in a decrease in the level of utilization of productive capacity, thus characterizing the economy as a *profit-led regime*. This concept of being 'profit-led' is a key economic theory that helps us understand the dynamics of investment and income redistribution. In turn, an increase in the wage gap simultaneously reduces aggregate demand. This is because managers tend to have greater propensity to save and an increase in executive salaries reduces profits.

The results suggest that aggregate demand and income inequality move in the same direction in both accumulation regimes. Therefore, the economy is always *inequality-led*. This characteristic is associated with the earnings of top executives. Managers create a channel of distributive conflict between capitalists and workers.

From this perspective, the authors point out that inequality has significant macroeconomic effects. This trend towards an increase in the share of the wage share at the top of the distribution simultaneously reinforces the increase in income inequality and the increase in aggregate demand.

Personal Income Distribution and Aggregate Demand: The Carvalho and Rezai Model

Carvalho and Rezai (2016) analyzed the effects of intra-wage inequality on aggregate demand and the economic regime, adopting an approach that recognizes the heterogeneity of workers, i.e., those with low and high incomes. It is assumed that high-income workers are more likely to save than low-income workers. In addition, the traditional structure of two social classes is accepted: workers and capitalists.

One of the main innovations of this approach lies in the definition of aggregate savings. The propensity to save, in the working class, becomes a positive function of wage inequality (Carvalho and Rezai, 2016). Formalizing this, we have:

$$g_s^w = \frac{S_w}{K} = s_W\left[\sigma\right]\Psi u \tag{40}$$

$$g_s^\pi = \frac{S_\pi}{K} = S_\pi\left(1 - \Psi\right)u \tag{41}$$

where Ψ $(1 - \Psi)$ is the wage share (profit share); $S_w\left(S_\pi\right)$ is the propensity to save in the working class (capitalist), u is the degree of capacity utilization, and σ is the parameter that represents the level of inequality among wages.

Workers' propensity to save, s_W, depends on the level of inequality among wages, σ. Greater income inequality generated greater s_W (Carvalho and Rezai, 2016). Therefore, the economy's new aggregate savings function is given by:

$$g^s = \frac{S}{K} = s_W\left[\sigma\right]\Psi u + s_\pi\left(1 - \Psi\right)u \tag{42}$$

The investment function is rewritten as:

$$g^i = \frac{I}{K} = \alpha + \left(\beta + \gamma\left(1 - \Psi\right)\right)u \tag{43}$$

In equilibrium, the degree of capacity utilization is given by:

$$u^* = \frac{\alpha}{s_W\left(\sigma\right)\Psi + s_{\pi}\left(1-\Psi\right) - \left[\beta+\gamma\left(1-\Psi\right)\right]} = \frac{\alpha}{\Delta} \tag{44}$$

where $\Delta = s_W\left(\sigma\right)\Psi + s_\pi\left(1 - \Psi\right) - [\beta + \gamma\left(1 - \Psi\right)\}$.

The equation shows that production is determined by autonomous investment (α) and the multiplier (Δ). From this equation, it is also possible to see that an increase in income inequality (the redistribution of income from lower-paid workers to those with higher wages) hurts aggregate demand since it increases savings in the economy, reducing consumption spending:

$$\frac{du^*}{d\sigma} = \frac{s_W\left(\sigma\right)'\Psi\alpha}{\Delta} < 0 \tag{45}$$

The new insight is that intra-salary inequality, by influencing aggregate demand, can alter the demand regime:

$$\frac{du^*}{d\Psi} = \frac{s_\pi - s_W\left[\sigma\right] - \gamma}{\Delta} \tag{46}$$

If the difference between profit and wage savings is high, the regime of the economy is *wage-led*; otherwise, it is *profit-led*.

The personal income distribution influences wage savings and affects the economy's demand regime. There are two transmission channels: the first occurs to the extent that an increase in income inequality raises the savings of high-income wages and weakens the positive effects of the functional redistribution of income on aggregate demand; the second relates to how changes in the savings rate reduce both the multiplier and the capacity utilization degree, subtly impacting investment and savings, often with ambiguous effects on the demand regime. To demonstrate these findings, we examine the derivative concerning σ:

$$\frac{\frac{du^*}{d\Psi}}{d\sigma} = \frac{u^*}{\Delta}\frac{dS_W}{d\sigma} - \frac{du^*}{d\Psi}\frac{1}{\Delta}\frac{dS_W}{d\sigma} = \frac{1}{\Delta}\left[u^* + 2\Psi\frac{du^*}{d\Psi}\right]\frac{dS_W}{d\sigma} \tag{47}$$

The first component of the derivative reflects the impact of wage savings on the economic regime. An increase in wage savings (resulting from greater income inequality) reduces the difference between ($s_\pi - s_w$), increasing the likelihood of the economy being profit-led. The second term captures the effects of wage inequality on the multiplier. When the economy is wage-led (profit-led), the multiplier effect is positive (negative), respectively.

In summary, if the economy is wage-led, redistribution from profits to wages reinforces the regime type. The same is true if it is weakly profit-led. The results suggest that greater income equality, especially wage equality, can make the economy more wage-led. Conversely, if the economy is strongly profit-led, the increase in income concentration intensifies the dynamics led by profitability. Furthermore, whenever there is an increase in wage inequality, there is consequently an increase in the propensity to save from wages[4].

3. THE MODEL

The model developed in this section was inspired by the work of Tavani and Vasudevan (2014) and Carvalho and Rezai (2016). Our approach uniquely explains both functional and personal income distribution effects using a single analytical model, allowing for specific insights into the impact of income distribution across social classes.

The basic equations of the model are presented below. National income is given by:

$$Y = \Pi + W_L + W_H \tag{48}$$

where Π is the total mass of profits that make up the national product, W_L is the total wage paid to lower-paid workers, and W_H represents the mass of high-income wages.

The equation can be rewritten as:

$$Y = rK + w_L L + w_H M \tag{49}$$

where L (H) represents low-paid (high-paid) workers, respectively; w_L is the

[4] On these results, there are papers that show results in which the opposite is possible (Frank et al., (2014), as highlighted by Prante (2018). For a more detailed critique of the results of Carvalho and Rezai (2016), see Prante (2018).

real wage paid to workers and w_H represents manager compensation (high-paid workers). The parameters a and b are proxies for labor productivity and the ratio of output to managerial inputs, respectively.

From this equation, the profit share can be written as:

$$\pi = 1 - \frac{w_L}{a} - \frac{w_H}{b} \quad (50)$$

It should be noted that this equation takes wage shares as separate arguments and that profit is defined endogenously. It is assumed that high-income workers can act directly and indirectly in the production process, through managerial functions. In other words, they can be allocated to other administrative functions, be part of the state technobureaucracy, or even be allocated to other sectors that do not directly affect the productivity of 'ordinary' workers. Therefore, unlike Tavani and Vasudevan (2014), there is no relationship between the productivity of ordinary workers and managers[5].

The investment function is written as:

$$g^i = \alpha + \gamma\left(1 - \frac{w_L}{a} - \frac{w_H}{b}\right) + \beta u \quad (51)$$

The savings function considers that both workers and capitalists save. Workers' savings are given by:

$$S_W = \left[s_{wL}\left(\frac{w_L}{a}\right) + s_{wH}\left(\frac{w_H}{b}\right)\right].Y \quad (52)$$

where s_{wL} is the propensity of low-paid workers to save but have little capacity to save because a large part of their income (if not all of it) is spent on consumption. On the other hand, s_{wH} represents the propensity to save associated with high-paid workers, who can save more due to their higher income. Thus, $s_{wH} > s_{wL}$.

The savings of capitalists, on the other hand, are given by:

$$S_\pi = s_\pi\left(1 - \frac{w_L}{a} - \frac{w_H}{b}\right).Y \quad (53)$$

where s_π is the capitalists' propensity to save. Therefore, the economy's aggregate savings are:

$$S = S_\pi + S_W \quad (54)$$

$$g^s = \frac{S}{K} = \left[s_\pi\left(1 - \frac{w_L}{a} - \frac{w_H}{b}\right) + s_{wL}\left(\frac{w_L}{a}\right) + s_{wH}\left(\frac{w_H}{b}\right)\right]\frac{u}{v} \quad (55)$$

[5] Nevertheless, let us assume that $b > a$ because managerial (supervisory) work can be more efficient in increasing production compared to the individual productivity of each worker. This is especially true in a context where a manager supervises many workers and can increase the overall efficiency of the production system.

After some algebraic manipulations, this equation can be written as:

$$g^{s} = \frac{S}{K} = \left[s_{\pi} + \frac{w_L}{a}\left(s_{wL} - s_{\pi}\right) + \frac{w_H}{b}\left(s_{wH} - s_{\pi}\right)\right]\frac{u}{v} \tag{56}$$

where $s_{\pi} > s_{wH} > s_{wL}$.

Equilibrium in the goods market is achieved by the following equality:

$$g^{i} = g^{s} \tag{57}$$

In equilibrium, the degree of capacity utilization is given by:

$$u^{*} = \frac{\alpha + \gamma.\left(1 - \frac{w_L}{a} - \frac{w_H}{b}\right)}{s(.) - \beta} \tag{58}$$

where $s(.) = \left[s_{\pi} + \frac{w_L}{a}\left(s_{wL} - s_{\pi}\right) + \frac{w_H}{b}\left(s_{wH} - s_{\pi}\right)\right].v^{-1}$

The stability condition requires that the economy's aggregate savings be more sensitive to changes in the degree of utilization than investment[6] Thus, in equation (58), the denominator is positive.

Based on the degree of utilization of equilibrium capacity, it is possible to identify the effects of changes in the income shares of workers (of low and high income) and capitalists.

3.1 Effects of changes in the functional distribution of income

a) We begin by analyzing the effects of changes in u^{*} resulting from variations in the wage share associated with low-income workers.

Considering that the respective low and high wage shares are denoted by $\omega_L = w_L / a$ and $\omega_H = w_H / b$, then we can state:

$$\frac{du^{*}}{d\omega_L} = \frac{-\left[s(\bullet) - \beta\right].\gamma - \left[\alpha + \gamma.\left(1 - \omega_L - \omega_H\right)\right].\frac{ds(\bullet)}{d\omega_L}}{\left[s(\bullet) - \beta\right]^{2}} \tag{59}$$

Since we need to assume $s(\bullet) > \beta$, the sign of the expression depends on the sign of $ds(\bullet)/d\omega_L$. It is straightforward that is negative[7] and the size depends on how big is the gap between s_{wL} and s_{π}. This happens because when the share of low-income wages increases, the average savings rate falls. The demand regime will depend on this difference for a shift from wage-led to profit-led to occur. If we have very close propensities to save among the classes, the demand regime will undoubt-

[6] It is usual in the neo-kaleckian and Keynesian tradition. The term inside the brackets represents the average propensity to save. If the average propensity to save is lower than the investment sensitivity, the model doesn't achieve stability in the goods market.

[7] $\frac{ds(\cdot)}{dw_L} = (s_{wL} - s_{\pi}).v^{-1} < 0$

edly be profit-led. If the difference among the propensities to save is higher enough, there will be a chance of the regime becoming wage-led.

The idea is that if the difference among the propensities to save of the classes is close to zero, the distribution in favor of lower wages does not generate an increase in consumption, does not change the average propensity to save and possibly reduces investment through the negative acceleration effect.

More specifically, a rise in the wages of low-income workers positively impacts the level of consumption because this class has the highest propensity to consume. At the same time, the wage increase reduces the profit share and, consequently, investments. When the effect on aggregate demand resulting from the increase in consumption exceeds the fall resulting from the reduction in investment, the demand regime is said to be wage-led.

To understand the results of these changes on the economy's rate of accumulation, we replace u^* in the previous investment (55) equations[8] and find that:

$$\frac{dg^{i*}}{d\omega_L} = \frac{dg^{s*}}{d\omega_L} = \left[\frac{ds(\cdot)}{d\omega_L}.u^* + s(\cdot).\frac{du^*}{d\omega_L}\right] \tag{60}$$

We know that $\frac{ds(\cdot)}{d\omega_L} < 0$ and $\frac{du^*}{d\omega_L} \lesseqgtr 0$. If the demand regime is profit-led, the accumulation regime necessarily will be too. If the demand regime is wage-led, the accumulation regime can be either wage-led or profit-led, depending on the calibration. However, it will most likely continue to be wage-led because we can't have a high profit-share sensitivity in the investment function to keep the model stable. The exception depends on a combination of low savings sensitivity to the profit-share (but higher than investment) and high animal spirits values in the investment function.

b) The derivative of u^*, with respect to the wage share associated with high-income workers, is given by:

$$\frac{du^*}{d\omega_H} = \frac{-[s(\cdot)-\beta].\gamma - [\alpha + \gamma.(1-\omega_L-\omega_H)].\frac{ds(\cdot)}{d\omega_H}}{[s(\cdot)-\beta]^2} \tag{61}$$

The result is comparable to that in equation (59). However, if the difference in savings is minimal (as is expected), the regime will be characterized as being profit-led. An increase in the income share of these workers may adversely affect the degree of capacity utilization. The positive wage shock is not directed toward consumer goods to the same extent as in the previous case. This implies that the reduction in investment (caused by the decline in profit share) may outweigh the increase in consumption.

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[8] In the steady state, $g^{i*} = g^{s*}$.

By replacing u^* in the investment equation (55), we find that:

$$\frac{dg^{i*}}{d\omega_H} = \frac{dg^{s*}}{d\omega_H} = \left[\frac{ds(\cdot)}{d\omega_H}.u^* + s(\cdot).\frac{du^*}{d\omega_H}\right] \quad (62)$$

The sign of the derivative particularly depends on the sensitivity of investment to the degree of capacity utilization. If this sensitivity is low, the derivative will be positive, and the accumulation regime will be wage-led.

3.2 Effects of Changes in Personal Income Distribution

In this section, we present the model results, considering the interpersonal distribution of income by aiming to analyze the effects of intra-wage distribution on economic dynamics. The model uses the same equations as the previous section for savings, investment, and the rate of profit, but introduces new equations for wage shares. We consider two scenarios:

i) The first scenario assumes that the profit share remains constant, meaning that variations between the lower and higher wage shares offset each other.

ii) The second scenario allows inter-salary changes to influence the profit share.

Scenario 1: Intra-wage redistribution with constant Profit Share

In this scenario, no change in wage distribution affects the profit share. The hypothesis is:

$$d(\omega_H) = d(\omega_L) \quad (63)$$

In equation (63), we show that an increase in the lower wage share equals a decrease in the higher wage share. This is a strong assumption and should be approached with caution, as it requires the adjustment to occur through changes in productivity (parameters a and b)[9].

Given that, now we are dealing with the respective wage shares:

$$\omega = \omega_L + \omega_H \quad (64)$$

Then, we have:

$$\omega_H = \omega - \omega_L \quad (65)$$

Substituting this, the new equation representing the profit share is[10]:

$$\pi = 1 - \omega_L - (\omega - \omega_L) \quad (66)$$

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[9] Note that productivity endogeneity has not been modeled. Nevertheless, we stress that the effects of labor productivity on income distribution are fundamental.

[10] Note that, since $b > a$, the profit share given by equation (67) is lower than that given by equation (50) and so changes in the personal distribution of income influence the functional distribution.

The new aggregate savings equation is:

$$g^s = \frac{S}{K} = \left[s_\pi + \omega_L \left(s_{wL} - s_\pi\right) + \left(\omega - \omega_L\right) \left(s_{wH} - s_\pi\right)\right].\frac{u}{v} \tag{67}$$

The new investment function is:

$$g^i = \alpha + \gamma \left[1 - \omega_L - \left(\omega - \omega_L\right)\right] + \beta u \tag{68}$$

After algebraic manipulations, the equation for the degree of capacity utilization becomes:

$$u^* = \frac{\alpha + \gamma.\left[1 - \omega_L - \left(\omega - \omega_L\right)\right]}{s\left(\cdot\right) - \beta} \tag{69}$$

where $s\left(\cdot\right) = \left[s_\pi + \omega_L \left(s_{wL} - s_\pi\right) + \left(\omega - \omega_L\right) \left(s_{wH} - s_\pi\right)\right].v^{-1}$.

The accumulation rate of the economy is:

$$g^* = \frac{s\left(\cdot\right).\left(\alpha + \gamma.\pi\right)}{s\left(\cdot\right) - \beta} \tag{70}$$

We analyze the effects of intra-wage redistribution favoring lower-income workers. Taking the derivative concerning ω_L gives:

$$\frac{du^*}{d\omega_L} = \frac{-\left(\alpha + \gamma.\pi\right)}{\left[s\left(\cdot\right) - \beta\right]^2}.\frac{ds\left(\cdot\right)}{d\omega_L} > 0 \tag{71}$$

As $ds\left(\cdot\right)/d\omega_L < 0$, the result of equation (71) is unambiguous[11]. We can only have wage-led demand regime. The only possible opposite case would emerge if the propensities to save were equal between high-income and low-income workers. But in that case, we wouldn't have a 'low' wage-led demand regime, but a neutral distributive result, where there would be no positive or negative effect over the capacity utilization in the steady state.

However, about the accumulation regime, we can see from equation (70) that:

$$\frac{dg^*}{d\omega_L} = \frac{\left\{s\left(\cdot\right).\left[1 - \left(\alpha + \gamma.\pi\right)\right] - \beta\right\}.\frac{ds\left(\cdot\right)}{d\omega_L}}{\left[s\left(\cdot\right) - \beta\right]^2} \tag{72}$$

While the demand regime will inevitably be wage-led, the accumulation regime depends exclusively on the sign of $\alpha + \gamma.\pi > 1$. If this happens, the accumulation regime becomes wage-led. However, we can accept that this is a very unlikely case due to the need to have very high parameters values for the animal spirits and for the profit effect in the investment function.

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11 $\frac{ds(\cdot)}{d\omega_L} = (s_{wL} - s_{wH}).v^{-1} < 0$

This finding partially aligns with the conclusions of Carvalho and Rezai (2016): greater income equality, reflected as lower wage inequality, increases the likelihood of the demand regime being wage-led.

Scenario 2: Inter-wage redistribution with change in Profit Share

We now consider a scenario where a change in wage distribution affects the profit share. To this end, we propose a change in the wage mass between the two types of workers. Given that parameters a and b are constant, this implies that the profit share changes. This connection between personal and functional income distribution is unique and represents one of the significant contributions of this work.

Initially, we propose a redistribution from high-income workers to low-income workers and assume that:

$$d\left(w_H\right) = d\left(w_L\right) \tag{73}$$

Given that:

$$w = w_L + w_H \tag{74}$$

We have:

$$w_H = w - w_L \tag{75}$$

Substituting this, the new equation representing the profit share is[12]:

$$\pi = 1 - \frac{w_L}{a} - \frac{w - w_L}{b} \tag{76}$$

The new aggregate savings equation is:

$$g^s = \frac{S}{K} = \left[s_\pi + \frac{w_L}{a}\left(s_{wL} - s_\pi\right) + \frac{w - w_L}{b}\left(s_{wH} - s_\pi\right)\right]\frac{u}{v} \tag{77}$$

The new investment function is:

$$g^i = \alpha + \gamma\left[1 - \frac{w_L}{a} - \frac{w - w_L}{b}\right] + \beta u \tag{78}$$

After algebraic manipulations, the equation for the degree of capacity utilization becomes:

$$u^* = \frac{\alpha + \gamma.\left[1 - \left(\frac{w_L}{a}\right) - \left(\frac{w - w_L}{b}\right)\right]}{s\left(\cdot\right) - \beta} \tag{79}$$

[12] Note that, since $b > a$, the profit share given by equation (67) is lower than that given by equation (50) and so changes in the personal distribution of income influence the functional distribution.

where $s(\cdot)=\left[s_\pi+\frac{w_L}{a}\left(s_{wL}-s_\pi\right)+\frac{w-w_L}{b}\left(s_{wH}-s_\pi\right)\right].v^{-1}$.

The accumulation rate of the economy is:

$$g^*=\frac{s(\cdot).\left\{\alpha+\gamma.\left[1-\left(\frac{w_L}{a}\right)-\left(\frac{w-w_L}{b}\right)\right]\right\}}{s(\cdot)-\beta} \tag{80}$$

We analyze the effects of intra-wage redistribution favoring lower-income workers. Taking the derivative concerning w_L gives:

$$\frac{du^*}{dw_L}=\frac{\gamma.\left[a^{-1}+b^{-1}\right].\left[s(\cdot)-\beta\right]-\left\{\alpha+\gamma.\pi\right\}.\frac{ds(\cdot)}{dw_L}}{\left[s(\cdot)-\beta\right]^2} \tag{81}$$

where $\frac{ds(\cdot)}{dw_L}=\left[\left(s_{wL}-s_\pi\right).a^{-1}-\left(s_{wH}-s_\pi\right).b^{-1}\right].v^{-1}$

The result of equation (81) is ambiguous. The first term, $\gamma.\left[a^{-1}+b^{-1}\right].\left[s(\cdot)-\beta\right]$ is positive, necessary. The second term, $-\left\{\alpha+\gamma.\pi\right\}.\frac{ds(\cdot)}{dw_L}$, could be positive if $\frac{ds(\cdot)}{dw_L}<0$. However, the effect on the average savings rate is now unclear. As labor productivity is considered, the effect can be either positive or negative, leaving the whole expression ambiguous.

Let us consider the effect on the accumulation rate, assuming changes in the profit share. Utilizing the same assumptions as before, we have:

$$\frac{dg^*}{dw_L}=\left[\frac{ds(\cdot)}{dw_L}.\,u^*+s(\cdot).\frac{du^*}{dw_L}\right] \tag{82}$$

In this case, if $ds(\cdot)/dw_L<0$, then we certainly find $du^*/dw_L>0$. However, if $ds(\cdot)/dw_L<0$, (caused by high labor productivity differences) we can also have $\frac{du^*}{dw_L}<0$, as a possibility. Depending on size effect, we can also have a profit-led accumulation regime.

This result contradicts the findings of Carvalho and Rezai (2016) in that greater income equality, reflected in lower wage inequality (or similar propensities to save), increases the likelihood of the accumulation regime being profit-led.

4. CONCLUDING REMARKS

Throughout this paper, we demonstrate that inter-wage inequality also plays a central role in aggregate demand and accumulation dynamics. The structure of the analysis undertaken advances the literature by considering how the social product is divided, particularly in contemporary economies. More specifically, we integrate the role of the division of the wage mass and high salaries associated with the distributive top into the discussion.

To this end, we develop a basic post-Kaleckian model that illustrates the effects of distributive conflict, considering both functional income distribution and intra-wage conflict. By incorporating the framework of two social classes, we aim to align the analysis more closely with the way the social product is distributed in contemporary economies, mainly by accounting for the existence of a managerial class that appropriates a share of the income.

The approach presented here represents an improvement in literature, particularly the work of Carvalho and Rezai (2016), by demonstrating how changes in the personal distribution of income can influence the functional distribution. As such, the results are innovative in integrating this possibility into the analysis.

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