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Inflation and Distributive Conflict: a theoretical perspective

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Inflation and Distributive Conflict: a theoretical perspective.

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Conflicting claims models have stressed the race between prices and money wages, in the struggle among capitalists and workers, as the main inflationary pressure. We discuss how conflicting-claims inflation models describe conflict inflation and the related outcome for income distribution. The paper therefore contrasts alternative theoretical perspectives underlying conflicting claims models. We also discuss how these approaches provide a criticism to the New-Keynesian Phillips curve. We also explore the relations between demand-pull and cost-push inflation and endogenous money theory. A deeper understanding of distributive conflict requires an analytical exposition of the relation between prices and distribution. In general, conflicting claims models rely on Kaleckian explanation of distribution, based on the notion of mark-up pricing according to the degree of monopoly. Conflict inflation allows wage bargaining to affect income distribution and, thus, the real mark-up level. However, this theory contains unsolved theoretical shortcomings, lacking an ultimate explanation for profits and overlooking input-output relations. An alternative theory of distribution can be found in modern appraisals of the Classical surplus approach. We examine how this approach has been extended to the study of inflation, providing a consistent relation between inflation and distributive conflict.

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1 CONFLICT INFLATION

The regular coexistence of price level increases with labor unemployment and spare capacity is a stylized fact supporting cost-push interpretations of inflation (Morlin, 2021b). This view contrasts with the dominant theory of inflation, according to which inflation accelerates (decelerates) when aggregate demand exceeds (falls behind) potential output. The fact that aggregate demand is often below potential output suggests that inflation causes are found in cost dynamics.

To analyze the effect of costs on inflation, we must remember that costs consist basically of wages and inputs costs. Prices must also repay a profit rate, at values compatible with capitals competition, and rent, owing to the use of scarce resources. Inputs are priced according to their own production costs, which, in turn, also depend on the compensations of labor, capital, and land, and input prices. Repeating this process, we conclude that production prices can be decomposed into the basic distributive variables that reward the social groups involved in producing the economy's output. The income generated in production is primarily distributed as wages, rewarding the provision of labor, profits for the anticipation of capital, and rent, compensating the hire of scarce and privately-owned resources. After that, these compensations are partially redistributed in the form of taxes, interest, and transfers, whose value depends on tax rates, interest rate, exchange rate, and international prices. In a monetary economy, distributive variables are set in nominal terms. Altogether, they determine relative prices, the price level, and distributive outcomes (Bastos, 2010; Morlin, 2021a).

At this point, the conflict over income distribution among social groups comes into play in the determination of inflation. Given productive techniques, a rise in prices can be traced back to the increase in at least one of the distributive variables.¹ Indeed, inflation arises when social groups successfully ask for nominal increases, making the price level no longer compatible with the set of distributive variables. By means of nominal increases, classes seek an increase in real terms (which implies a larger income share). When workers obtain wage increases through bargaining, capitalists try to protect their profits, passing higher unit labor costs on to prices. A higher cost of living leads to further wage

¹ In the case of an open economy, the rise in prices can be caused by the rise in the international price of inputs or tradable goods. However, an increase in these prices is caused by an increase in foreign distributive variables in the first place. In Morlin (2021a), we discuss the open economy case in more detail. See also Morlin and Bastos (2019a) and Morlin and Bastos (2019b).

demands in a process that may be repeated many times. Along these lines, we can argue that inflation is a consequence of distributive conflict (as Okishio 1977, Rowthorn 1977, Stirati 2001, Lavoie, 2014, p. 541-573).² In this case, the *real* outcome for distributive variables is only known at the end of each period, as changes in their nominal value affect the price level and relative prices (Pivetti, 1991; Serrano, 1993).

Structuralist authors underlined that production bottlenecks could cause inflation (Noyola Vázquez, 1956; Pérez Caldentey, 2019; Sunkel, 1958). We can frame a similar argument as follows. In a growing economy, production in certain sectors can approach full capacity within the cost-minimizing technique before other sectors. Additional production may be carried out with a less productive technique to attend demand in these sectors. For example, production may employ a technique requiring a higher input of labor per unit of output. When this happens, relative prices will change. The point here is that such adjustments of relative prices can temporarily cause inflation, even when nominal distributive variables are not the original cause of price rise. However, after the price increase, social groups tend to react by asking for increases in their compensations to preserve their purchasing power. Thus, the inflationary propagation of original shocks through income claims is another manifestation of conflict inflation.³

Conflicting claims models have stressed the race between prices and money wages, in the struggle among capitalists and workers as the main inflationary pressure. “Therefore, roughly speaking, inflation comes about when the capitalist classes are not strong enough to depress the real wage rate without proceeding to raise prices and the labouring classes are not strong enough to win a higher real wage rate at the sacrifice of profits, preventing the capitalist classes from raising prices” (Okishio, 1977).

Although the relation between inflation and distributive conflict can be found in previous economic literature,⁴ Rowthorn’s (1977) contribution is acknowledged as the foundation of conflict claims modeling. Inspired in the original Phillips curve and in the Marxian notion of reserve army of labor, Rowthorn explicitly

² See also Dutt (1987) Dalziel (1990), Setterfield (2007), Serrano (2010).

³ Historically, a common argument against cost-push explanations of inflation is that relative price adjustments do not necessarily cause inflation. However, these adjustments tend to be inflationary because otherwise, they would require that while some prices and incomes nominally increase, others decrease. Social groups reject nominal decreases to avoid real losses. Money wages are rigid downwards, and capitalists will not give up on profits if not compelled by competition.

⁴ As in Robinson (1938), Aujac (1954), Okishio (1977), Furtado (1954, 1963) and Noyola Vázquez (1956). See also Morlin (2021b) for a review on the debate in the US in the post-war period.

introduced the unemployment rate among the determinants of workers' wage claims. The stylized fact that lower unemployment correlates with a higher rate of change in money wages (Phillips, 1958) is consistent with the fact that when unemployment is low, workers experience higher bargaining power in wage negotiations.⁵ Meanwhile, when unemployment is high, workers fear losing their jobs and face lower bargaining power. Hence, the rate of change of money wages may depend more on the bargaining conditions than on workers' aspirations. Indeed, "[w]orkers may feel that the real wage is much too low compared to what they consider to be the just rate, but they may have few means to implement their beliefs" (Lavoie, 2014, p. 550). Apart from labor market conditions, institutional and political factors affect workers' bargaining position, such as labor laws, strength of unions and employer's associations, social rights,⁶ and political representation of class interests.⁷

While on the one side, fear of unemployment discourages wage claims, on the other, competition imposes boundaries to price increases. If capitalists were able to *immediately* and *completely* pass through changes in their costs into prices, workers' effort to rise real wages would be vain. In this case, an increase in money wages would always imply a proportional rise in prices. Real wages would remain unchanged in this process (Tarling and Wilkinson, 1985).

Before a deeper discussion on conflicting claims models, let us briefly review two relevant matters for inflation theory. In the next section, we discuss endogenous money theory, a theoretical development in macroeconomics which is fundamental to the understanding of inflation. Endogenous money theory rejects the traditional explanation of inflation according to exogenous changes in the quantity of money. However, it is still compatible with a demand-pull theory of inflation, as in the New-Keynesian Phillips curve. We therefore dedicate another section to discuss the New-Keynesian approach to inflation theory, which considers excess demand as the most relevant determinant of inflation rather

5 Indeed, despite later neoclassical reinterpretations of the Phillips curve, the original work of Phillips proposed an explanation of the rate of change of wages based on an interplay between market and institutional variables, compatible with the role played by bargaining power in determining wages (Forder, 2014).

6 According to Esping-Andersen (1990, p.11), "the balance of class power is fundamentally altered when workers enjoy social rights, for the social wage lessens the worker's dependence on the market and employers, and thus turns into a potential power resource".

7 Korpi (2002) and Kristal (2010) provide evidence on the impact of workers' political representations on the wage share.

than supply shocks or the distributive struggle. The section also revisits the main critiques against this view, contrasting it with the perspective of conflict inflation.

Conflict inflation theories contend that prices change autonomously from movements in money supply, relying on some passive adjustment of the money supply to the price rise. Endogenous money theory, as defended by modern post-Keynesian approaches, points that the quantity of money supply is determined by the demand for money by clients which banks find creditworthy, which, in turn, depends on output and the price level (Lavoie, 2014; Wray et al., 1998). Accordingly, the growth of money aggregates is determined by inflation and output growth. This framework builds on early contributions of Kaldor (1985) and Moore (1988a,b). Opposing the monetarist view of the exogenous supply of money, Kaldor emphasizes a broad definition of the monetary base in terms of the high liquidity of many financial assets, discussing the money creation by banks through credit. The author argues that the money supply is determined by the demand for money, given the level of income and the interest rate set by the monetary authority (Kaldor, 1985). This criticism also stressed that central banks are unable to control the money supply. What monetary policy actually determines, according to this view, is the basic interest rate of the economy. Indeed, Moore (1988a, p. 381) states, “[m]onetary endogeneity implies that central banks do not exogenously determine the quantity of credit money in existence, but rather the price at which it is supplied, that is, the short-term interest rate. The money supply is endogenously determined by market forces.”

The notion that money supply is endogenous is widespread in modern macroeconomic theory, currently accepted by post-Keynesian and New-Keynesian approaches. Indeed, this view is also compatible with the operation of Central Banks. According to McLeay et al. (2014, p. 21), “[t]he supply of both reserves and currency (which together make up base money) is determined by banks’ demand for reserves both for the settlement of payments and to meet demand for currency from their customers — demand that the central bank typically accommodates”. In turn, commercial banks’ regular operations create and destroy money. In particular, banks create new money supply, in the form of deposits, when lending to borrowers. The decision to make a new loan usually depends on the existence of profitable lending opportunities. The availability of reserves does not constrain this process. However, the requirement of profitability of banks facing a competitive market, the regulatory policy constraint to preserve financial stability, and banks’ restriction to lend due to mitigation of risks may constraint

the supply of new loans (McLeay et al., 2014). In other words, the demand for credit drives bank loans. Banks are willing to lend money whenever borrowers are believed to be able to honor their commitments.

The direction of causality between money supply and the price level has long been the object of controversy in economic theory. Arguments supporting the endogeneity of money supply appeared together with cost-push inflation theory in James Steuart and Thomas Tooke (Smith, 2011; Yang, 1999). We can discuss this point in the light of the equation of exchange (see 1), according to Green (1992, p. 14) “ a common point of reference for all approaches to the problem of inflation since the relationships it expresses simply constitute a truism and do not in themselves imply causality”.

$$M^S V = PQ \quad (1)$$

Suppose the evolution of costs determines both the price level (P) and inflation. In that case, for a given level of real output (Q), movements in prices must be compensated by changes in money supply (the left-hand side of equation 1). Note that, here, money supply consists of the product of the nominal amount of money in circulation and the velocity of circulation (*i.e.*, the frequency in which a unit of currency is traded). If the output level (Q) is determined elsewhere and does not directly relate to prices, positive inflation implies growth in $M^S V$. In this regard, we emphasize that classical political economy did not establish a direct relation between output and prices, rather keeping an analytical distinction of the theory of value — determining prices and distribution — on the one hand, and the theory of output and accumulation on the other (Garegnani, 1984). Thus, a separate determination of output and prices support this argument. In terms of post-Keynesian approaches, output level and growth are determined by effective demand level and growth,⁸ while costs determine the price level and inflation.

Contrasting with the previous exposition is the Quantitative Theory of Money, which was formulated in different terms over the history of economics. In a simple appraisal, quantitative theory contents that changes in the money supply determine the inflation rate. Thus, this means that in the equation 2, the left-hand side is exogenous and determines the right-hand side. Its original formulation reflected an extension of the analysis of the determination of commodity prices through the interaction between supply and demand, as in mercantilist analysis.

8 See Serrano (1995), Freitas and Serrano (2015), Morlin (2022), and Morlin et al. (2021).

Thus, money itself — in the form of gold or silver — was also a commodity. Hence, an inflow of metal in a specific country depreciated the metal's value, increasing the general price of all other commodities with respect to metal (Green, 1992, p. 27-28). Proponents of the quantity theory assumed that both output and velocity of circulation are stable. For this reason, an exogenous increase in m could only cause inflation.⁹ The stability of V may be due to the fact that institutional factors shaping the time periodicity of transactions tend to change slowly (Snowdon and Vane, 2005, p. 50-53). As a result, nominal variables are affected by changes in money supply, while real variables, as income, remain stable. In this case, money is neutral, and inflation consists strictly of a monetary phenomenon lacking any influence from real causes.

$$\hat{m}^s + \hat{v} = \pi + g \quad (2)$$

Finally, as pointed previously, the New-Keynesian approach accepts the notion of endogenous money. In this view, inflation arises due to a short-term real disequilibrium caused by an excess of demand with respect to natural output (Pérez Caldentey, 2019, p. 128). In turn, excess demand results from a divergence between the interest rate and the natural interest rate — *i.e.*, the one that brings aggregate supply and demand into equilibrium. Thus, this explanation of inflation contrasts with the distributive conflict perspective.

The last paragraphs show that the widely acknowledged endogeneity of money dismisses explanations of inflation based on changes in the money supply, as in the Quantitative Theory of Money. However, adopting an endogenous money perspective does not necessarily mean endorsing a conflict inflation view. Indeed, a demand-pull inflation theory is consistent with endogenous money supply in the New Keynesian approach. This theory is further explored in the following paragraphs.

⁹ Still, Green (1992) caveats that some authors allowed for a short-run nonprice effect of a metal inflow.

The New-Keynesian Phillips Curve describes how past inflation, expected future inflation and aggregate demand drive the current inflation rate. According to Woodford (2003), modern mainstream approach to inflation recalls a “Wicksellian flavor”. Wicksell (1898b) states that inflation arises from the discrepancy between the money interest rate (prevailing in the loans market) and the natural interest rate, which is defined as the rate at which the supply of savings is equal to the demand for loans. Wicksell stresses that banks accommodate additional demand for loans without raising the interest rate in a pure credit economy. The author, thus, introduces a notion of endogenous money. When the money interest rate remains below the natural rate, “entrepreneurs will in the first instance obtain a surplus profit (at the cost of the capitalists) over and above their real entrepreneur profit or wage” (Wicksell, 1898b, p. 127). Hence, the return on real investment net of interest remains higher than when the interest rate equals the natural rate. In turn, this pushes the expansion of production through investment, raising the demand for raw materials, and capital goods, causing the rise of prices of commodities. An inflationary process emerges, persisting until the banking system corrects the discrepancy between money and natural rates. Symmetric reasoning describes the case in which the money rate is above the natural rate, causing a cumulative deflation (Wicksell, 1898a,b).¹⁰

Likewise, the New Keynesian view posits the existence of a natural interest rate under which the rate of inflation is stable. Nevertheless, we must point out a difference between the two perspectives. While the natural interest rate ensured the stability of the price level in Wicksell, it ensures the stability of the inflation rate in the New Keynesian view. Anchored inflation expectations stabilize inflation around a trend in the New Keynesian Phillips Curve. This conclusion is obtained when the coefficient of expected inflation in the Phillips curve is equal to one. In some models, this result requires a complete effect of the past inflation on current inflation through the change in inflation expectations. In this case, increases in inflation rate in the past are fully included in agents’ current expectations. In a hybrid New Keynesian Phillips Curve — as proposed in Galí and Gertler (1999) — both past inflation and forward-looking expectations

¹⁰ A relevant feature of this approach is money neutrality, found in the inability of the money interest rate in influencing the natural interest rate. As pointed before, the money interest rate converges towards the natural interest rate in the long term. Hence, the latter is ultimately determined by real rather than monetary factors. See also Garegnani (1979) and Pivetti (2001).

affect current inflation. Then, the combined effect of past and expected inflation should be complete, *i.e.*, the sum of the coefficients of past inflation and expected inflation must be equal to one. In both cases, this hypothesis allows new-Keynesians to reject the trade-off between inflation and unemployment in the long term, advocating in favor of the existence of a natural rate of unemployment (see, for instance, Gordon 2011). The unemployment rate consistent with stable inflation is labeled as the Non-Accelerating Inflation Rate of Unemployment (NAIRU). In the long run, the determination of real values of equilibrium output and unemployment is unaffected by the inflation rate.

According to the New Keynesian approach, when the interest rate set by the monetary authority differs from the natural interest rate, actual output diverges from the potential output determined by supply-side conditions. Thus, an interest rate higher than the natural rate generates an excess of aggregate demand. Alternatively, if the interest rate is lower than the natural, output remains below potential output, causing the decrease in inflation rate (Woodford, 2003). In sum, in this approach, “the natural real rate of interest is the rate associated with the absence of the nominal rigidities that account for short-run monetary nonneutralities, and the gap between the actual interest rate and the natural real rate represents the key channel through which central bank actions affect the economy” (Walsh, 2005, p. 464).

Considering this, New-Keynesian economists focused on formulating monetary policy rules to stabilize inflation, as, for instance, the inflation targeting policy (Taylor, 1999). Monetary policy is executed by Central Banks and centers on pegging the basic interest rate to stabilize inflation. According to this view, stabilizing inflation is equivalent to stabilizing the output gap. Thus, monetary policy should concentrate efforts on the first goal. This property has been labeled as the ‘divine coincidence’ and implies no trade-off between stabilizing inflation and the output gap (Blanchard and Galí, 2007).

Even though an excess of demand is generally considered the cause of inflation acceleration, cost shocks also cause inflation in New-Keynesian models. Asymmetric cost shocks under nominal rigidity of prices and wages can accelerate inflation while relative prices adjust to the change in relative costs (Ball and Mankiw, 1994). An obvious example is the oil-shocks of the 1970s (Gordon, 1984). Moreover, Ravenna and Walsh (2006) argue that monetary policy shocks can temporarily raise inflation due to the effect of the nominal rate of interest on the marginal cost of firms — effect known as the cost-channel. Nevertheless, cost

increases consist only of a temporary cause of inflation. In the long term, inflation is solely caused by the excess of demand, since, in this time horizon, the nominal rigidity of prices and wage is absent, and cost shocks are assumed to have zero mean (Carlin and Soskice, 2014). As shown by Serrano (2019), dropping the zero mean assumption is enough to ensure the existence of cost-push inflation in the New Keynesian Phillips Curve, even in the long term.

An alternative explanation for the absence of cost-push inflation in the long term lies in the effort of reconciling the New Keynesian Phillips Curve with the general equilibrium analysis. In this case, relative prices and income distribution are assumed to converge to general equilibrium positions (Woodford, 2003). Moreover, the economy converges towards the natural output and the natural interest rate, which result from the real equilibrium obtained without the nominal rigidity. Relative prices, wages, and profit rates converge to real equilibrium levels compatible with supply and demand schedules at the microeconomic level. In equilibrium, relative prices match supply and demand, and income distribution depends on factors' marginal productivity. In this case, the underlying logic of conflict inflation theory cannot operate since it requires that social groups can persistently shift income distribution through changes in their nominal compensations.

Therefore, even though some New-Keynesian scholars aim to introduce conflict inflation within this theoretical framework (as, for instance, Carlin and Soskice, 2014), conflict can only be assigned a transient role and cannot be consistently taken as the main cause of inflation. In contrast, conflict inflation theory rejects that relative prices and income distribution are determined according to supply and demand schedules, as in general equilibrium theory. Rather, conflict inflation admits that nominal shocks can persistently affect distribution. Distributive variables do not converge to a predetermined equilibrium value in this view. In fact, they may remain persistently different after a nominal shock. If this is the case, cost-shocks tend to be positive on average, so that costs can be considered a recurrent cause of inflation (Serrano, 2019).

Critics have raised many arguments against the New-Keynesian theory of inflation. First, it relies on the notion of a natural interest rate. In other words, New Keynesians assume that there is a single value for the real interest rate that equalizes investment and full employment savings. The negative interest-elasticity of investment must be founded on the labor-capital substitution mechanism along the lines of the neoclassical approach (Petri, 2015, p. 316). Thus, the

investment curve needs to be derived from a persistent demand for capital, conceived as a single factor (value-capital, rather than a set of capital goods). Nevertheless, neoclassical labor-capital substitution must be rejected in the light of the Cambridge controversy in capital theory (Garegnani, 1978; Lazzarini, 2011; Petri, 2019). The idea that “the proportions in which factors are employed vary with the prices of their services” requires that the quantity of factors are defined independently from the relative prices (Garegnani, 1978, p. 349). But this is not the case for the ‘single factor’ capital, which is measured according to the value of the capital goods. In addition, the possibility of reverse capital deepening shows that the value of capital per worker may increase when the interest rate increases. In conclusion, the Cambridge controversy makes it very difficult to rely on the negative interest-elasticity of investment. Finally, Petri (2015) argues that even if we concede negative interest-elasticity, neoclassical theory cannot determine the flow of investment in each period without assuming full-employment of labor to hold continuously, which is unreasonable.

Critics have also contested assumptions and results of the New-Keynesian Phillips Curve from an empirical perspective.¹¹ Smithin (2004) criticized the arbitrariness of estimates of the value of the natural interest rate. Furthermore, evidence of hysteresis in the unemployment rate challenges the notion of NAIRU (Stanley, 2004, 2013). Hysteresis means that persistent deviations from equilibrium position affect the equilibrium itself. Hysteresis appears in unemployment in the form of a non-stationary unemployment rate. Hence, there is not a long-term value towards which the unemployment rate converges. Critics also find evidence supporting the view that demand shocks have a persistent impact on unemployment (Storm and Naastepad, 2009). Further empirical findings support the rejection of the accelerationist Phillips curve present in the New-Keynesian models, suggesting the existence of a long-term trade-off between inflation and unemployment (Stirati and Paternesi Meloni, 2018; Summa and Braga).¹² These results also challenge important conclusions of the New-Keynesian theory as the long-term neutrality of monetary policy. Finally, recent criticism has focused on

¹¹ Serrano (2019) provides an assessment of the New-Keynesian Phillips Curve under the relaxation of its assumptions. By these means, he shows that relaxing the assumption of full inflationary inertia (or, in the hybrid models, a complete combined effect of past and expected inflation over current inflation) is enough to dismiss important conclusions of this approach as the no permanent trade-off between inflation and unemployment.

¹² Such findings have also been acknowledged by supporters of the New-Keynesian approach, as Blanchard (2016); Blanchard et al. (2015); Gordon (2018).

the inability of the New-Keynesian Phillips Curve in explaining the contemporary economic events of the so-called Secular Stagnation (Serrano et al., 2020).

4 KALECKIAN CONFLICTING CLAIMS MODELS

A deeper understanding of conflict inflation requires introducing an analytical exposition of the relation between prices and distribution. For this reason, we present how this approach describes conflict inflation, mainly based on the exposition of Lavoie (2014), adapting the notation. Lavoie (2014) departs from the decomposition of aggregate income into wages and average mark-up, as proposed by Weintraub (1978). By definition, aggregate income (Y) is equal to aggregate output in a closed economy. From this identity, follows the equation below, where output is measured as the product between real net output (Q) and the price level (P_t).

$$P_t Q_t = Y_t \quad (3)$$

Furthermore, aggregate income can be decomposed into the wage bill (W) plus aggregate profit. Weintraub (1978, p.45) also takes the total profits as equal to an average mark-up on labor costs (μ_t), as presented below.

$$P_t Q_t = W_t(1 + \mu_t) \quad (4)$$

In addition, the wage bill can be written as the product between the number of workers and the average wage rate (w), which gives us the following equation:

$$P_t Q_t = w_t L_t(1 + \mu_t) \quad (5)$$

Finally, dividing both sides of equation 5 per Q_t , we obtain the equation 6.

$$P_t = w_t l_t(1 + \mu_t) \quad (6)$$

Here, l stands for the labor-output ratio of this economy and is inversely related to labor productivity. Moreover, the term $(1 + \mu_t)$ expresses the ratio of prices to money wages. Rearranging equation 6, we find a correspondence between the mark-up and the real wage rate, shown in equation 7. Given productivity, a higher mark-up implies a lower real wage.

$$\frac{1}{(1 + \mu_t)} = \frac{w_t l_t}{P_t} = \omega_t l_t \quad (7)$$

The product between the real wage (ω_t) and the labor-output ratio (l_t) also expresses the wage-share in this economy. A simple operation in equation 5 shows that this term corresponds to the ratio between the wage bill and the nominal output ($\frac{w_t L_t}{P_t Q_t}$), which represents the wage-share in this economy. Moreover, it follows that the wage-share can be written as $\frac{1}{(1+\mu_t)}$. Conversely, the profit share is given by:

$$\frac{P_t Q_t - w_t L_t}{P_t Q_t} = \omega_t l_t \mu_t \quad (8)$$

Since the total income is given by $w_t L_t (1 + \mu_t)$, it follows that the profit share also corresponds to $\frac{w_t L_t \mu_t}{w_t L_t (1 + \mu_t)}$, which can be expressed as $\frac{\mu_t}{(1 + \mu_t)}$. Therefore, whatever determines the mark-up regulates the functional income distribution under stable prices (Cassetti, 2002; Lavoie, 2014).

In the Kaleckian view, firms set prices by adding a mark-up on unit production costs. The mark-up depends solely on the degree of monopoly found in the respective market (Kalecki, 1954). Hence, the aggregation of the mark-ups found in the economy determines income distribution between workers and capitalists. In other words, the average mark-up of the economy is determined by the market power of firms observed in different markets. As a consequence, workers would not be able to change distribution through wage negotiations. However, Kalecki (1971) eventually admitted that strong labor activism could impose wage increases that would not be passed through prices, reducing firms' mark-up.

Taking growth rates from equation 6, we can derive an interpretation of the causes of inflation (Lavoie, 2014; Weintraub, 1978). Thus, inflation (π) is written as the sum of the rate of change of money wages, rate of change labor-output ratio (so that productivity growth reduces inflation), and the rate of change of the ratio of prices to money wages (caused by changes in the average mark-up)¹³, all for the same period.

$$\hat{\pi}_t = \hat{w}_t + \hat{l}_t + (1 + \hat{\mu}_t) \quad (9)$$

¹³ Note that the rate of change of $(1 + \mu_t)$ can be rewritten in terms of the change in the average mark-up.

$$(1 + \hat{\mu}_t) = \frac{\dot{\mu}_t}{(1 + \mu_t)}$$

where $\dot{\mu}_t$ stands for the derivative of μ_t with respect to time (or the change in time, in the discrete case).

Although the market structure determines the baseline mark-up, the mark-up's real value may change in conflicting claims models. By introducing bargaining power of workers and capitalists, authors¹⁴ aim to address the possibility mentioned by Kalecki (1971) that strong unions may compress firm's mark-ups. Following Lavoie (2014), we can set the general features of these conflicting claims models. First, we assume, for the sake of simplification, that productivity is constant ($\hat{l} = 0$). Hence, the dynamics of inflation is dominated by movements in wages and mark-ups (see equation 9). Moreover, wages negotiated between workers and firms are regulated by the bargaining power of workers (Ω_1), the degree of formal and informal wage indexation (Ω_2), past inflation rate (π_{t-1}), and the aspiration gap. Equation 10 shows how money wages change according to these effects. Indexation and past inflation affect money wages because workers seek to recover wages' purchasing power after price increases. In general, models assume indexation is incomplete — *i.e.* Ω_2 is less than one. In turn, the aspiration gap corresponds to the difference between worker's targeted real wage (ω_w) and the actual real wage (ω_t).

$$\hat{w}_t = \Omega_1(\omega_w - \omega_{t-1}) + \Omega_2\pi_{t-1} \quad (10)$$

Firms increase prices to keep the mark-up close to the desired mark-up. As shown above, there is an inverse relationship between the mark-up and the real wage for a given technology. Thus, the firm's desired mark-up can be expressed in terms of a targeted real wage (ω_f). The difference between the actual real wage and the targeted real wage defines firm's aspiration gap (Lavoie, 2014). Whenever the gap is positive, firms raise prices to an extent that also depends on the bargaining power of firms (ψ_1). Furthermore, firms pass through unit labor cost increase — which, in the absence of productivity changes, corresponds to wage increases — into prices, in a degree determined by the price indexation factor (ψ_2). Equation 11 summarizes these relations.

$$\pi_t = \psi_1(\omega_t - \omega_f) + \psi_2\hat{w}_t \quad (11)$$

¹⁴ See, for instance, Cassetti (2002), Lavoie (2014)

In this model, equilibrium real wage and inflation rate are achieved when prices and wages rise at the same rate, stabilizing income distribution. The following expressions describe the equilibrium.

$$\omega^* = \frac{\Omega_1(1 - \psi_2)\omega_w + \psi_1(1 - \Omega_2)\omega_f}{\Omega_1(1 - \psi_2) + \psi_1(1 - \Omega_2)} \quad (12)$$

$$\pi^* = \frac{\psi_1\Omega_1(\omega_w - \omega_f)}{\Omega_1(1 - \psi_2) + \psi_1(1 - \Omega_2)} \quad (13)$$

In general, firms can only partially index prices to costs, and workers can only partially index wages to the cost of living. Besides, both sides present limited bargaining power, which implies that equilibrium real wage lies within the real wage targets of workers and firms. In this general case, neither side achieves its desired outcome (Dalziel, 1990; Lavoie, 2014). Thus, the equilibrium real wage is a weighted average of workers' and firms' real wage target. It increases with the bargaining power of workers and with wage indexation. It decreases with the bargaining power of firms and the speed of price adjustment after wage increases. Whatever increases the equilibrium real wage decreases the equilibrium level of the mark-up. Therefore, the baseline mark-up determined by the firm's market power is allowed to change due to inflation. Mark-up varies according to the relative bargaining power of workers and capitalists, the speed of adjustment of prices to wage increases, and the speed at which wage claims react to price increases.

The equilibrium inflation rate depends on the relative bargaining power of both workers and firms. The higher the bargaining power of workers, the higher the inflation rate and the real wage rate. Conversely, a higher bargaining power in firm's side generates a combination of higher inflation – since firms raise prices more quickly – and lower equilibrium real wage. Moreover, a greater discrepancy between real wage targeted by workers and firms, that is, a greater degree of conflict between workers' and firms' income claims, leads to a higher rate of inflation (Lavoie, 2014)

A particular case of the model is found in Rowthorn's (1977) inaugural contribution. The author assumes that firms fully index prices when inflation exceeds a threshold. We introduce this assumption by taking $\psi_2 = 1$ in equation 12, when the inflation rate is above the threshold. In this case, it follows that the equilibrium wage-share exactly corresponds to the wage-share targeted by firms. Thus, the

equilibrium wage share is not affected by the workers' target, and an increase in ω_w only affects inflation and money wage growth. Hence, workers' aspiration gap is not partially closed by real wage increases. Rowthorn (1977) further assumes that above the same threshold, workers include expected inflation in their wage claims. Consequently, even though workers cannot affect real wages through money wage increases (because firms can immediately raise prices), a persistent aspiration gap and the impact of expectations lead to increasingly higher wage demands. In these conditions, small cost shocks may drive the economy towards an accelerationist process (Rowthorn, 1977, p.227-229).¹⁵ However, since workers are no longer able to affect income distribution, it is hard to justify the rationality behind higher wage demands (in case its *real* outcome is supposed to be null).

In spite of its contribution, Kaleckian conflicting claim models contain unsolved theoretical shortcomings. Next section discusses critiques on the Kaleckian explanation of distribution embodied in these inflation models. As an alternative, we explore a Classical-Keynesian contribution to inflation theory.

¹⁵ The same outcome of the assumption of complete price indexation emerges if firms have a complete bargaining power, *i.e.* if the parameter ψ_1 tends to infinity. In this case, "[f]irms do not let the margin of profit fall below its target level and they can respond immediately to any increase in their wage costs" (Lavoie, 2014, p. 552). Hence, workers are not able to affect the real wages by means of wage bargaining.

5 THE CLASSICAL-KEYNESIAN APPROACH TO INFLATION

5.1 *Critique on the Kaleckian distributive closure*

In the Kaleckian view, firms set prices by adding a mark-up on unit costs. The magnitude of this mark-up depends on the average of the market prices for the same commodity, weighted by the quantity produced by each firm (Kalecki, 1954, p.12-18). However, Pivetti (1991, p.105-119) argues that basing the determination of mark-up on the degree of monopoly does not provide a proper explanation of income distribution. Pivetti (1991) argues that as the competition among firms can change market-shares, the weights would oscillate, leaving the mark-up unstable or indeterminate. Moreover, this measure does not consider the role of potential entrants. A high mark-up (associated with a high profit rate) can attract new entrants to the market. Naturally, we expect that incumbent firms anticipate this possibility and set prices within certain limits to avoid losing market-share¹⁶. More importantly, this explanation of the mark-up does not set a lower limit for the profit rate. This framework seems to allow for the possibility of a profit rate equal to zero in a fully competitive industry. It does not explicitly consider the requirement of a minimum positive profit rate for capitalists to carry on production (Pivetti, 1991). Finally, as shown before, the process of wage bargaining and price inflation sets an equilibrium mark-up different from the one consistent with the degree of monopoly. In this case, the distributive conflict changes the mark-up, even when the market structure across industries remains the same. Hence, the link between the degree of monopoly and income distribution is loosened, weakening the explanatory power of the former.¹⁷

Furthermore, Steedman (1992) argues that Kaleckian mark-up pricing overlooks implications of input-output relations. In other words, it does not explicitly

¹⁶ See, for instance, Sylos Labini (1957).

¹⁷ In his earlier writings Kalecki had shown skepticism regarding the ability of workers to affect functional income distribution through wage bargaining (see, for instance, Kalecki, 1943). In 1954, in *Theory of Economics Dynamics*, Kalecki broadened the notion of degree of monopoly to include the effect of workers' bargaining power. Kalecki (1954) expressed the wage share as an inverse function of (an aggregated measure of) mark-up, determined by the degree of monopoly across different industries. However, he also pondered that strong trade unions may reduce the degree of monopoly (Kalecki, 1954, p. 17-18). According to Kalecki (1954, p. 18), a "high ratio of profits to wages strengthens the bargaining position of trade unions in their demands for wage increases since higher wages are then compatible with 'reasonable profits' at existing price levels". This process pressures profits, encouraging firms to adopt a "policy of lower profit margins". The argument was further explored in Kalecki (1971). See also López (2010, p. 67-90), Rugitsky (2013) and Pivetti (1991, p. 108-113).

consider that firm's costs depend on other firm's prices — and, hence, on the mark-ups found in other industries. Steedman (1992) adds that the average mark-up of the economy cannot be properly defined as an 'average'. The problem is that the weights of this average (the output value of different industries) depend on relative prices and, thus, on the mark-ups. Finally, competition implies that mark-up in one industry cannot remain persistently independent of the mark-up in other industries. However, if this is the case, the concentration within each industry might no longer be the main determinant of the respective mark-up.

5.2 *Inflation in the Classical-Keynesian approach*

The Classical surplus approach, recovered by Sraffa (1960), relies on political and institutional factors to explain income distribution. Relative prices and distribution are determined together in the same step of the analysis (within the same system of equations). Therefore, the interaction between inflation and distributive conflict emerges straightforwardly.

The Classical approach distinguishes normal and market values for prices and distributive variables in order to introduce a systematic analysis of the long-term regularities observed in capitalist economies (Eatwell, 1982). In this view, competition within markets establishes a normal price for commodities around which market prices tend to gravitate. Normal prices (or production prices) are set according to persistent long-term forces affecting prices and distribution. Temporary changes in effectual demand, for instance, are assumed to affect market prices without affecting normal prices. Competition among capitals also generates a tendency of convergence towards a normal profit rate. Thus, production price is defined as the price required for production to be regularly brought to market, standing for a necessary condition for supply. Hence, production prices must be enough to repay inputs costs, as well as wages, profits, and rents in its normal rates, which hold under competition (Salvadori and Signorino, 2013; Vianello, 1989).

Nevertheless, the system of price equations proposed by Sraffa (1960) analyzes real variables: relative prices, real wages, and (real) profit rate. This system allows for different distributive closures. Classical economists analyzed distribution taking the real wage as determined according to the socially established level of subsistence (Stirati, 1994). In this case, the profit rate is determined as a residual

in the system of price equations, together with relative prices. History has shown, however, that workers may be able to decouple real wages from the subsistence level, obtaining also a share of the surplus (Pivetti, 1999; Sraffa, 1960). For this reason, Sraffa (1960) takes the profit rate as exogenous with respect to the system of price equations, thereby determining real wages endogenously and together with relative prices. The author also suggested that the profit rate is determined according to the level of the money interest rate.¹⁸ As we see below, Pivetti (1991) builds on this suggestion, which also allowed for an analysis of inflation.¹⁹

Studying inflation requires taking an additional step. We must define not only the set of relative prices but also the price level. Addressing this issue, Pivetti (1991, 2007) introduces money wages, and the interest rate (as a monetary determinant of the profit rate) into the price equations system, obtaining the price level and commodity prices expressed in money proper.²⁰

Stirati (2001) follows the same procedure, setting a framework to discuss inflation along the lines of the Classical surplus approach. Starting with *nominal* production prices, equation 14 presents the price equations in matrix form.

$$P = PA(1 + i) + PA\rho + lw \quad (14)$$

In this equation, P represents a row vector of prices. The technical coefficients are given by A , a squared matrix of input coefficients per unit of output, and l , the row vector of labor inputs per unit of output. We will assume these technical coefficients remain unchanged. In turn, w stands for the money wage (uniform across industries, by assumption), and i stands for the nominal interest rate. Finally, ρ represents a diagonal matrix of industry-specific premiums

¹⁸ As stated by Sraffa (1960, p.33): “The rate of profits, as a ratio, has a significance which is independent of any prices, and can well be ‘given’ before the prices are fixed. It is accordingly susceptible of being determined from outside the system of production, in particular by the level of the money rates of interest”.

¹⁹ In the last decades, advanced economies presented low interest rates along with fall in the wage share. This event may have raised interpretations that real wage rate decrease independently from movements in the interest rate (Stirati, 2013). If this is the case, the real wage rate would regain its analytical position as the external variable to the production system. In contrast, the profit rate would be determined as a residual. Stirati (2013) also explores alternative interpretations to this phenomenon in the light of the Classical surplus approach to distribution.

²⁰ In the author’s words: “Given the rate of interest to be earned on long-term riskless financial assets, and given the money wage, which is the direct outcome of wage bargaining, the price level can be determined in a system of price equations *à la* Sraffa (in which, however, both the wage rate and commodity prices are expressed in money proper), together with the distribution of income between profits and wages” (Pivetti, 2007, p. 243).

compensating risk and market-power.²¹ Since ρ tends to be stable, we assume that it is equal to zero to focus on the impact of changes on wage rate and interest rate.

Furthermore, equation 14 shows that the interest rate is assumed to determine the normal profit rate, following the monetary theory of distribution (Pivetti, 1991). In other words, the money spent in the purchase of inputs in the previous period yields an earning equivalent to the interest rate on the anticipated investment. According to Pivetti (1991), if competition equalizes earnings of different applications of capital, then the normal profit rate cannot persistently differ from the interest rate. Since the nominal interest rate is considered a monetary phenomenon, autonomously set by the monetary authority — accounting for political and economic constraints —, it must determine the normal profit rate rather than the opposite.²² A nominal determination of the (thus, nominal) normal profit rate implies that the real outcome for the profit rate is affected by inflation, as we discuss later.

In equilibrium, the price level and relative prices are stable and are determined as in the equation 15 — where I represents the identity matrix.

$$P = I[I - (1 + i)A]^{-1}w \quad (15)$$

By post-multiplying the row vector of prices by a column vector representing quantities (which can be, for instance, proportional to the output or the consumer's bundle), we obtain a measure of the price level. Let us consider the column vector Q , as the vector of output. Then, a measure for inflation (π) can be obtained as in equation 16. Note that this measure corresponds to the output deflator.

$$1 + \pi_t = \frac{P_t Q}{P_{t-1} Q} \quad (16)$$

21 The compensation of market-power depends on the existence of persistent barriers to entry restraining the equalization of profit rates by competition. This component is associated with features of the industry, as minimum operational scale and initially required investment. In the Classical surplus approach, competition is related to free mobility of capital across industries, while market-power arises when capital movements face some restraint (Eatwell, 1982; Salvadori and Signorino, 2013).

22 More precisely, the author argues that the normal profit rate of each productive sector is determined by two components (Pivetti, 1991). The first is the interest rate of long-term fixed and risk-free security, best represented by public securities. The second component corresponds to the remuneration of 'risk and trouble' of productive investment, changing according to the economic sector. This second component is captured in the price equations (14) by the matrix ρ .

In this framework, inflation arises during the transition between two long-period positions of relative prices and income distribution. From the previous expressions, it is evident that, in the absence of changes in the technical coefficients, changes in w and i (which correspond to the basic distributive variables) regulate the changes in the price level.

Competition constraints firms to set prices following the price of capital goods at the beginning of the production process: the historical cost of capital. This comes from the following reasoning. The interest rate on the free-risk asset sets the minimum return on advanced capital to allow production to happen. Hence, competition among capitalists will bring the return on advanced capital in production into equality with the risk-free interest rate (abstracting from the industry-specific premium compensating illiquidity). Different investment opportunities must yield the same return in proportion to the amount of capital advanced in the presence of competition. Hence, capital advanced in production taking place from period t to $t + 1$ must provide the same return as the interest rate of the risk-free asset. This return must be proportional to the monetary value of the capital advanced in period t , either in the form of capital goods or bonds. In the case of productive investment, this value corresponds to the historical costs of capital (Pivetti, 1991).

As prices may change in time, the cost of inputs required for production can rise. In this case, a discrepancy between the historical cost of capital and reproduction costs of capital arises, *i.e.*, the value of capital at the end of the production period. Reproduction cost of capital “is actually the relevant magnitude as far as the rate of profit is concerned, since profits are what remains of the value of the product after deducting wages and the reproduction cost of capital” (Pivetti, 1991, p. 53). Under these conditions, changes in the production costs (as wage increases) can change the profit rate as measured in terms of the reproduction cost of capital.

As Stirati (2001) shows, assuming the interest rate remains stable at its initial level (i_0), the profit rate will be given by equation 17. Using the result in equation 16, we can obtain equation 18, which expresses the profit rate as the ratio between the nominal interest rate and the rate of change in the price level.

$$(1 + r_t) = (1 + i_0) \frac{P_{t-1}Q}{P_t Q} \quad (17)$$

$$(1 + r_t) = \frac{(1 + i_0)}{(1 + \pi_t)} \quad (18)$$

This result sets a relation between inflation and distributive conflict because wage increases affect distribution at least temporarily. After a while, real wages return to their previous value as higher costs are passed through into prices if there are no further wage increases. Nevertheless, a persistent change in distribution can occur if money wages keep increasing at a stable rate (Pivetti, 1991; Stirati, 2001). Suppose the rate of interest determines the normal profit rate. In that case, the *real* rate of interest is the one consistent with the distributive result after changes in money wages and prices (Pivetti, 1991). Then, the profit rate would not only depend on the nominal interest rate but also on the growth rate of money wages (Pivetti, 2007; Serrano, 1993). Therefore, together with monetary policy, the bargaining power of workers can determine income distribution.

This approach provides a useful framework for discussing the sources of inflation, its impact on distribution, and its relationship with unemployment,²³ consistently with both the conflicting claims view and classical theory of distribution (Stirati, 2001). One of its distinctive features corresponds to taking the profit rate as determined according to the monetary theory of distribution. Distribution is also affected by the monopoly power generated by restrictions to competition (which appear in the variable ρ in equation 14). Nevertheless, according to the monetary theory of distribution, monopoly power may affect distribution, but it cannot be considered the ultimate cause of profits (Pivetti, 1991, p. 108-113). This view contrasts with Kaleckian models of inflation in which distribution depends on the degree of monopoly and the relative bargaining power of workers in wage negotiations *and* on bargaining power of firms in price setting.

23 As in the Phillips curve. See Stirati (2001) and Serrano (2019).

Inflation emerges from the dispute among social groups over the distribution of the surplus. As incomes are defined in nominal terms, price changes affect their purchasing power. Prices rise when the claims of social groups are incompatible with the total income generated in production.

The consistency of the view that conflict is the main cause of inflation depends on two important premises. First, earnings are set in nominal terms. That is the case for wage agreements (Keynes, 1937, p. 8-9), but also for profits (Pivetti, 1991). When workers resist the fall in nominal wages, they prevent real losses. Therefore, nominal changes affect income distribution. Nevertheless, models assuming full indexation of prices to money wages do not allow for changes in distribution (as in Rowthorn, 1977). These models have thus been considered incompatible with the conflict inflation view (Serrano, 2010).

Second, income distribution does not converge towards a predetermined real equilibrium. This premise implies that the conflict over wage agreements and other nominal distributive variables has a persistent effect on distribution. If otherwise, conflict had a merely temporary effect on distribution, it could only be a transient and eventual cause of inflation (as in Carlin and Soskice, 2014). In that case, the main causes of inflation must be elsewhere (as excess demand and expectations in the New Keynesian Phillips curve). In the Kaleckian perspective, accepting the persistent effect of conflict over income distribution violates the determination of distribution according to the forces of competition. That perspective can be consistent only if one is willing to concede that the wage bargaining process is inside the Kaleckian definition of the degree of monopoly of firms (as done in Reynolds, 1983). Recent contributions rely on firms' bargaining power to explain the mark-up, combining the role of the forces of competition and firms' relative power with respect to workers (Lavoie, 2014).

Under these two premises — namely, if income distribution is affected by nominal variables, and is not tied to a predetermined real equilibrium — conflict can be a persistent cause of inflation.

These conditions are unambiguously attended in the Classical-Keynesian approach. This approach analytically separates the theory of value and distribution from the theory of output and accumulation (Garegnani, 1983). Differently from the marginalist approach, income distribution is not determined by factors' productivity. Rather, income distribution does not maintain a necessary functional

relation with output or other production variables in the Classical-Keynesian approach (Garegnani, 1983). Distribution is affected by political and institutional factors, which express the dispute of social classes over the surplus. That reveals the contingent and historical nature of income distribution in economic systems, particularly capitalism. Inflation, wage bargaining, and changes in nominal variables are one sphere of the distributive conflict (Pivetti, 1991; Serrano, 1993; Stirati, 2001). Expressing the price equations system in money proper connects the Classical approach to distribution with conflict inflation, thereby setting a monetary theory of distribution (Pivetti, 1991). Therefore, nominal variables can permanently affect distribution.

Inflation is dominantly a cost-push phenomenon in conflict inflation (Morlin, 2021b). Theories of inflation relying mainly on excess demand are not compatible with this view. We discussed the New Keynesian Phillips curve, exposing its main weaknesses as the notion of a natural interest rate (Petri, 2019), the assumption of a stable NAIRU (Storm and Naastepad, 2009), and the incompatibility with recent economic events (Stirati and Paternesi Meloni, 2018; Summa and Braga). Conversely, the empirical regularity captured in the Phillips curve can be understood as an outcome of wage bargaining and cost-push inflation. The lower the unemployment rate, the greater workers' bargaining power is, which speeds up wage growth and thus inflation (Rowthorn, 1977; Serrano, 2019; Stirati, 2001). In contrast with the New-Keynesian view, the interaction between inflation and income distribution in this conflict-augmented Phillips curve is a source of non-neutrality of money both in short and in the long run (Pivetti, 2007; Serrano, 2019).

This paper reviewed competing explanations for inflation. We focused on conflict inflation theories, comparing the underlying distributive closures. We argued that the Classical-Keynesian approach provides a straightforward foundation to conflict inflation theory, thereby being advantageous with respect to the Kaleckian foundations of conflicting claims models. In further developments, we build on conflict inflation theory to discuss open economy models of inflation (Morlin, 2021a; Morlin and Bastos, 2019b). In that case, new sources of distributive conflict emerge, and additional variables must be considered as the exchange rate and international prices. The theoretical basis of conflict inflation therefore allows for further developments in macroeconomics.

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