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Article Inflation and income distribution in Brazil from a Kaleckian perspective

European Journal of Economics and Economic Policies: Intervention (EJEEP)

Provided in Cooperation with: Edward Elgar Publishing

Suggested Citation: Rolim, Lilian (2024) : Inflation and income distribution in Brazil from a Kaleckian perspective, European Journal of Economics and Economic Policies: Intervention (EJEEP), ISSN 2052-7772, Edward Elgar Publishing, Cheltenham, Vol. 21, Iss. 2, pp. 279-308, https://doi.org/10.4337/ejeep.2024.02.05

This Version is available at: https://hdl.handle.net/10419/304376

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Invited Article

European Journal of Economics and Economic Policies: Intervention, Vol. 21 No. 2, 2024, pp. 279-308

Inflation and income distribution in Brazil from a Kaleckian perspective*

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This article shows that income inequality and inflation in Brazil are multidimensional phenomena linked to the unemployment rate and to the foreign sector. Consequently, the relationship between inflation and income distribution depends on the source of inflationary pressures, as evident in the 2000 to 2020 period. This reflects significant differences in the dynamics of inflation in the tradable and non-tradable goods sectors and is consistent with the Kaleckian framework. Yet, a missing inequality puzzle is identified, suggesting that changes in the Industry sector's relation with the foreign sector altered some of the relationships analyzed. The article also investigates the influence of the foreign sector on the intensity of the domestic distributive conflict in Brazil and discusses some implications of an intensified distributive conflict in terms of policies and regulations that alter the bargaining power of workers.

Keywords: *income inequality, distributive conflict, foreign sector, Phillips curve, inflation-targeting regime*

JEL codes: D33, E31, E52

The distribution of income is both a cause and a consequence of inflationary processes. Davidson (1978: 347)

1 INTRODUCTION

Significant income inequality, a history of high inflation rates and high real interest rates are three well-known aspects of the Brazilian economy. Indeed, Brazil is one of the most unequal countries in the world, with the top 10 per cent of its population capturing 59 per cent of total national income while the bottom half of the population captures only around 10 per cent (Chancel et al. 2021). Brazil has also experienced a period of hyper-inflation, when its inflation rates were among the highest in the world (Bastos et al. 2022), and, even after the Real Plan in the 1990s and the stabilization of its inflation rates, it systematically presents inflation rates above those of the advanced economies (IMF 2023). Finally, Brazil often appears as (one of) the country(ies) with the highest real interest rates (Infinity Asset Management 2023; Nassif et al. 2020).

* This article was prepared for the 27th Annual FMM Conference on 'Inflation, Distributional Conflict and Just Transition' in Berlin, Germany, in October 2023.

Received 9 February 2024, accepted 15 May 2024

The literature dealing with the dynamics of these variables emphasizes their connection with the foreign sector. For instance, there is an emphasis on the connection between exchange rates and inflation rates in Brazil (Baltar, C.T. 2015; Bastos et al. 2022; Braga 2013; Pimentel et al. 2016; Santoro 2020), which is particularly relevant due to the strong pass-through effect in the country and its exposure to intense nominal exchange rates movements (Farhi 2007; Prates 2002, 2015). This creates a strong link between the inflation-targeting regime and the foreign sector, and many authors argue that inflation control relies mostly on domestic currency appreciations (Araújo/Arestis 2019; Modenesi/de Araújo 2013; Morlin 2022; Nassif et al. 2020; Vernengo 2008). Moreover, the Brazilian distributive conflict and income distribution are particularly influenced by the foreign sector since foreign prices and exchange rates significantly affect, among other things, the price of imported final goods and inputs and prices in certain sectors (Santoro/Rolim 2023).

This article contributes to this literature by investigating the relationship between inflation and inequality in Brazil from 2000 to 2020. This period is particularly interesting for such analysis because it includes an inclusive economic growth period between 2004 and 2014 (Baltar, P. 2015) as well as its reversal since 2015. The analysis follows the Kaleckian framework, which shows that inflation and inequality are determined by the same processes and that their relationship may change according to the inflationary source (Blecker 2011; Dutt 1987; Rowthorn 1977; Lavoie 2022; Rolim/Marins 2022). The data presented in this article confirms the importance of the foreign sector as well as of domestic factors, such as the unemployment rate. Inflation and income distribution in Brazil can thus be considered multidimensional phenomena that are ambiguously related to each other. Indeed, during the period analyzed, the relationship between inflation and the profit share¹ in Brazil has followed different patterns depending on the inflationary source. The importance of the foreign sector is further explored in this article through an analysis of its influence on the strength of the distributive conflict in Brazil and a discussion of the possible implications in terms of policies and regulations that affect the bargaining power of workers.

The remainder of this article is organized as follows. In Section 2, a brief review of the Kaleckian approach to inflation and income distribution is presented. Section 3 discusses the relationship between inflation and income distribution in Brazil and suggests a theoretical framework for explaining this relationship. The following sections analyze further this relationship, with Section 4 investigating the differences between the economic sectors, Section 5 attempting to measure the intensity of the distributive conflict, and Section 6 discussing policies and regulations implemented to manage the distributive conflict. Section 7 presents the concluding remarks.

2 A KALECKIAN APPROACH TO INFLATION AND INCOME DISTRIBUTION

The relationship between inflation and income distribution in the Kaleckian approach is analyzed through the conflicting-claims inflation model based on the work of Dutt (1987)

^{1.} We use the profit share as a proxy to income inequality. Due to the scope of our analysis, we do not deal with the personal income distribution. In general, there is a negative correlation between the wage share and the Gini index. Thus, in the 2000s, when the wage share was growing in Brazil, a decrease in the Gini index (calculated from household surveys) was also observed. Yet, Souza/Medeiros (2015) show that household surveys underestimate the Gini coefficient. Using tax data, the authors find a stable Gini coefficient from 2006 to 2012.

and Rowthorn (1977).² Since Brazil is a commodity exporter with significant heterogeneity in its productive structure, our discussion goes beyond the basic conflicting-claims inflation model and considers both types of pricing procedures explored by Kalecki (1954: ch. 1), which are associated with different supply conditions.³ Thus, we assume that industry sector prices are determined by costs, while primary sector prices are determined by demand.⁴ Accordingly, the average price level of the consumption basket is given by equation (1):

$$p_a = \alpha p_m + (1 - \alpha) p_d \tag{1}$$

where α is the share of industry goods, p_m is the average price in the industry sector, and p_d is the average price in the primary sector.

While we assume that p_d is exogenous (for instance, determined in international commodities markets), in the industry sector, prices depend on costs. The simplest variant of cost-determined pricing is the mark-up pricing, where a fixed gross costing margin is added to unit direct costs (Lavoie 2022: ch. 3). In an open economy, firms import commodities or semi-finished goods, so unit direct costs are composed of labor and material costs. In this context, the mark-up pricing equation is given by equation (2) (Ibid.: ch. 8):

$$p_m = (1+\theta)(1+j)w/y_m \tag{2}$$

where θ is the mark-up rate over unit direct costs, which covers profits and unit indirect costs at a standard rate of capacity utilization, *j* is the ratio of material costs per unit to unit labor costs,⁵ *w* are nominal wages, and *y_m* is labor productivity in the industry sector.

Assuming that domestic production is divided between the industry and primary sectors, with a share β of the value added being produced in the industry sector, and that nominal wages are equal in both sectors, the wage share is a weighted average between the wage share in the industry sector (obtained from equation (2)) and the wage share in the primary sector, as follows:

$$\omega = \beta \frac{wL_m}{wL_m + [\theta(1+j)w/y_m]Y_m} + (1-\beta)\frac{wL_d}{p_d Y_d} = \beta \frac{1}{1+\theta(1+j)} + (1-\beta)\frac{w}{p_d/y_d}$$
(3)

where L_x is total employment and Y_x is the total real output in the industry (x = m) and primary (x = d) sectors.

Finally, the real wage is obtained by dividing the nominal wage by the price level from equation (1), as follows:

4. For simplicity, we omit the services sector in this theoretical discussion.

5. Note that, at the macroeconomic level, we have to assume that all material inputs are imported (Lavoie 2023).

^{2.} See Hein/Häusler (2024) for a comparison between the main variants of this model and Blecker (2011) for an open economy model.

^{3.} Since the relationship between inflation and distribution is our primary research interest in this article, we do not investigate the role of overhead labor in determining the profit share (Lavoie 2022: ch. 3). Positive and constant overhead labor costs can explain cyclical fluctuations in the profit share without necessarily being related to changes in prices. Thus, in this case, changes in distribution would not be linked to the inflation dynamics.

$$w_{r} = \frac{w}{p_{a}} = \frac{w}{\alpha p_{m} + (1 - \alpha)p_{d}} = \frac{w}{\alpha (1 + \theta)(1 + j)\frac{w}{y_{m}} + (1 - \alpha)p_{d}}$$

$$= \frac{1}{\alpha (1 + \theta)(1 + j)\frac{1}{y_{m}} + (1 - \alpha)\frac{p_{d}}{w}}$$
(4)

2.1 Cost-determined prices dynamics

When supply is elastic due to spare productive capacity, increases in demand are met with increases in production and prices tend to be determined by firms based on their average unit direct costs, which are constant up to full capacity, and the average price of their competitors (Kalecki 1954: ch. 1). This tends to be the case of the finished goods industries, wherein prices are cost-determined. In this section, we analyze the proximate sources of inflation in cost-determined prices in an *ex post* assessment based on Lavoie (2022: ch. 8).

These proximate sources of inflation are obtained by taking the growth rates of the components of equation (2), as shown in equation (5):

$$\hat{p}_m = \hat{\Theta} + \hat{J} + \hat{w} - \hat{y}_m \tag{5}$$

where $\Theta = (1 + \theta)$ and J = (1 + j).

The first proximate source of inflation is an increase in the mark-up ($\hat{\Theta} > 0$ and $\hat{\theta} > 0$). It has been defined as 'profit inflation' by Davidson (1978). In this case, inflation is accompanied by a lower wage share ($\partial \omega / \partial \theta < 0$ in equation (3)) and a lower real wage ($\partial w_r / \partial \theta < 0$ in equation (4)). This type of inflation is assumed to be relevant only in short periods, since one would not expect a continuous increase in the profit share for extended periods (Lavoie 2022: ch. 8).⁶

While higher mark-up rates tend to be associated with increases in market concentration (Autor et al. 2020), in an open economy mark-up rates can be sensitive to international conditions (Blecker 1989). Thus, when firms become more (less) competitive relative to foreign competitors, which can be captured by a higher (lower) real exchange rate, they tend to increase (decrease) their mark-up rates. These changes in the mark-up rates could drive domestic inflation in case firms are concerned with their competitiveness relative to foreign firms that sell in the domestic market. In this case, an increase in foreign prices or a currency depreciation could lead to profit inflation and could generate a reduction in real wages and in the wage share (Blecker 2011).⁷

The second proximate source of inflation is an increase in the ratio of material costs per unit to unit labor costs $(\hat{J} > 0 \text{ and } \hat{j} > 0)$.⁸ According to Hein/Mundt (2012), three main factors may explain an increase in this ratio: (i) an increase in the price of imported inputs denominated in foreign currency, (ii) an increase in the nominal exchange rate (domestic currency depreciation), and (iii) changes in the participation of imported inputs per unit of output. An increase in *j* caused by any of these three reasons increases prices as long as

^{6.} Nevertheless, this type of inflation became more widely discussed recently, as some authors claim that profits are the main drivers of inflation rates in the post-pandemic context in developed economies (Weber/Wasner 2023, among others).

^{7.} For empirical evidence on the effect of the real exchange rate on the wage share, see Ribeiro et al. (2020).

^{8.} See Morlin (2023) for a formalization of this type of inflation within a conflicting claims inflation model.

firms do not reduce their mark-up rates in the same proportion. Under these circumstances, the increase in *j* would have a negative effect on the wage share $(\partial \omega / \partial j < 0$ in equation (3)) and a negative effect on real wages $(\partial w_r / \partial j < 0$ in equation (4)). It is interesting to note that the increase in domestic prices due to higher prices of imported inputs is reinforced by an increase in domestic profits, since firms mark-up those costs $(\partial j w / y_m)$. Consequently, as long as firms do not reduce the mark-up rates when *j* increases, a lower wage share is obtained.

An inflationary process associated with an increase in the price of imported inputs denominated in foreign currency can be defined as imported inflation. It occurs when an increase in prices in the foreign sector leads to increases in prices in the domestic economy. Its transmission mechanism can be imported goods or imported inputs as well as domestically produced goods whose prices are determined in foreign markets, such as commodities, making it relevant for demand-determined prices as well, as discussed below. Therefore, imported inflation is strongly associated with oil or food price shocks and can exert a strong distributive effect on nominal incomes (Canto et al. 2023), in addition to creating inflation inequality, since low-income workers consume relatively more of these goods and will face a larger increase in the price of their consumption basket (Cravino/Levchenko 2017; Gouvêa 2022; Hobijn/Lagakos 2005).⁹

The third proximate source of inflation is the growth of nominal wages ($\hat{w} > 0$). It can be associated with an increase in workers' bargaining power, but Dutt (1987) and Rowthorn (1977) also explain it as deriving from a persistent difference between the real wage desired by workers and the real wage that they obtain, with this difference maintained by price adjustments as firms try to achieve their desired mark-up rates. In this context, nominal wage adjustments in the industry sector that are entirely passed on to prices simply become inflation, without leading to changes in the functional income distribution. However, when prices do not increase in the same proportion as wages, the higher inflation rate coexists with a distributive shift that is beneficial to workers if firms accept a reduction in their mark-up rates in face of strong nominal wage growth ($\Theta < 0$). In an open economy with a primary sector, it is likely that some redistribution in favor of workers always exists because an increase in nominal wages leads, ceteris paribus, to a decrease in the ratio of material costs per unit to unit labor costs (I < 0) and to an increase in the w/p_d ratio in equation (3). Yet, unless mark-up rates are reduced to such an extent that they completely absorb the increase in unit costs, wage increases become (at least partially) price inflation.

This is the only type of inflation discussed in this article that is associated with increases in the real wage and the wage share. This positive relationship is illustrated by the inequality-augmented Phillips curve, which first appeared in Rolim et al. (2024) and will be discussed in more detail in Section 3.3. This is also the only type of inflation that is related to one of the main explanations for inflation rates in the main-stream: tight labor markets associated with strong aggregate demand. Yet, the conflict inflation explanation for the Phillips curve relating the level of inflation with the level of unemployment assumes that nominal wages evolve according to workers' bargaining power, which can be affected by political, institutional and social factors (Setterfield/ Blecker 2022; Summa/Braga 2020).

Moreover, this type of inflation can also be affected by international conditions. For instance, Vernengo/Caldentey (2023) contend that the depreciation of a domestic

^{9.} In the current post-pandemic context, this type of inflation has also gained more attention, and some authors consider it one of the key explanations for the higher inflation rates as well as for the increase in profits (Lavoie 2023).

currency creates the need for nominal wage adjustments, since the purchasing power of workers may be dramatically reduced. This is often the case of emerging market economies, which are characterized by a strong pass-through of foreign prices and/or the nominal exchange rate to domestic prices (Farhi 2007). Therefore, a foreign price shock may trigger an inflationary process in the domestic economy as workers try to protect their real wages and firms react to protect their profit margins.

Finally, the fourth proximate cause of changes in price levels is productivity growth in the industry sector $(\hat{y}_m > 0)$. It can be more appropriate to name it a 'deflationary source', since increases in productivity tend to reduce prices, *ceteris paribus*, by reducing unit labor costs. Productivity growth can be distributive-neutral if the decrease in unit labor costs is entirely passed on to prices. However, technological development is intrinsically linked to the class conflict (Rugitsky 2013), and it is strategically used by firms to increase mark-up rates. When labor-saving innovations take place, unit labor costs are affected, allowing for changes in the wage share (Lima 2004). Thus, productivity growth can increase firms' strength relative to workers, becoming an additional factor in the conflict over the income distribution (Rolim et al. 2023).¹⁰

2.2 Demand-determined prices dynamics

Albeit being called 'demand-determined' prices, these prices are determined by interactions between (inelastic) supply and demand. Indeed, raw materials are produced in conditions that are much closer to perfect competition than industrial goods (Kalecki 1971: ch. 14). Under perfect competition, firms are price-takers and they expand production until full capacity.¹¹ Therefore, they face an increasing marginal cost curve and only increase production if they observe a price increase (Kalecki 1977: ch. 8). When supply conditions are constant and there is an increase in demand, these prices tend to increase. Similarly, when demand is constant and supply conditions change in an adverse manner, a price increase may also take place.

The distributive impact of changes in demand-determined prices is relatively straightforward. Equations (3) and (4) indicate that an increase in demand-determined prices (p_d) reduces the wage share and real wages. The dynamics of these variables is explained by the simple fact that prices are increasing without any corresponding increase in labor costs. In these conditions, higher prices mean a reduction in workers' purchasing power and an increase in aggregate profits relative to aggregate wages.

International conditions are extremely relevant in the case of demand-determined prices. Most primary sector products are commodities whose prices are negotiated in international markets, which makes them susceptible to strong speculation pressures (Kalecki 1954), and set in U.S. dollars. For instance, when the nominal exchange rate changes or when international demand and supply conditions change, there is a direct effect on commodities' prices denominated in domestic currency. This reduces real wages because workers' consumption basket is partially composed of commodities, such as energy and food. This also decreases the wage share because firms that produce these goods observe an increase in their revenue without experiencing any cost increases.¹² Thus, whenever exports are mostly set in dollars and prices in dollars are not very sensitive to exchange

11. Note that this is a very stylized characterization of raw materials for theoretical purposes. Some types of raw materials are closer to this definition than others.

^{10.} Note that increases in y_d necessarily reduce the wage share (equation (3)). Yet, we do not emphasize this aspect because it may not be associated with price changes due to the demand-determined nature of prices in the primary sector.

rates over a reasonable period, currency depreciations raise mark-up rates and profits rather than making exports cheaper (Gopinath 2015). One may expect to find this effect for markets where exporters are price-takers (e.g. commodities) as well as markets wherein a pricing-to-market strategy is adopted (Krugman 1986).¹³

As pointed out above, demand-determined prices are another channel of 'imported inflation'. Actually, they can also trigger the inflationary process that was previously described as being associated with an increase in the ratio of material costs per unit to unit labor costs (the j parameter in equation (2)) if material inputs prices are demand-determined and set in international markets. The effects associated with a higher j add to the direct effects of higher demand-determined prices discussed in the current section, since they operate in the same direction.

3 INFLATION AND INCOME DISTRIBUTION IN BRAZIL

The Kaleckian approach outlined above suggests that the relationship between inflation and inequality depends on the source of inflationary pressures. In the current section, we identify the main explanations for inflation in Brazil from 2000 to 2020 in order to understand the relationship between both variables. Based on the literature on inflation) and the foreign sector (representing imported inflation), which seem to prevail in the country's inflation dynamics.¹⁴ For simplicity and data availability, the behavior of income inequality is captured by the profit share.¹⁵ Moreover, inflation is captured by the growth rate of the Broad Consumer Price Index (IBGE 2023a) and we calculate an index for foreign prices in domestic currency that captures the combined effect of nominal exchange rates and foreign prices denominated in foreign currency, thus summarizing the influence of the foreign sector.¹⁶

The analysis covers a period in which Brazil has followed the inflation-targeting regime, which was adopted in 1999.¹⁷ As shown in Figure 1, the period between 2000 and 2020 is marked by different subperiods that identify different patterns for the key variables. The first subperiod, from 2000 to 2003, starts right after the adoption

^{12.} This effect can be observed by exporters as well as by producers who sell to the domestic market since domestic prices tend to follow the foreign price. It is also mentioned by Rossi/Galbraith (2016) as a key reason why a currency depreciation generates industrial pay inequality.

^{13.} These effects are much less prevalent in the U.S. due to its 'privileged insularity' resulting from the prominence of its currency in world goods trade (Gopinath 2015: 7).

^{14.} Other factors related to the theoretical background presented in Section 2, such as productivity growth, will be analyzed in more detail in Section 5.

^{15.} The profit share is calculated by assuming that mixed income is composed of capital and labor income in the same proportion as the rest of income (Gollin 2002).

^{16.} A detailed description of the adjustments applied to the data reported in this article is available in the Appendix.

^{17.} The initial inflation target was 8 per cent per year, which was reduced to 6 per cent in 2000, 4 per cent in 2001, and 3.5 per cent in 2002. The target was set to 8.5 per cent in 2003 and 5.5 per cent in 2004. From 2005 to 2018, the inflation target was set to 4.5 per cent. Since 2019, the target has been reduced by 0.25 percentage points each year in order to achieve 3 per cent in 2024. Thus, the target was set to 4.25 per cent in 2019 and 4 per cent in 2020. The tolerance band was initially set to ± 2 percentage points. It increased to ± 2.5 percentage points from 2003 to 2005, but was brought back to ± 2 percentage points in 2006. Since 2017, the tolerance band is ± 1.5 percentage points. During the period analyzed in this article, inflation has been kept within the tolerance band in 2000, 2004, 2005 to 2014, 2016, and 2018 to 2020.



Source: Original and calculated series based on BCB (2023) and IBGE (2023a, b, c, d, e, f). *Notes:* Quarterly series de-seasonalized using the X-13 filter. The base period for all indexes is the first quarter of 2000. Author's own elaboration.

Figure 1 Main macroeconomic series (2000–2020)

of the inflation-targeting regime in Brazil. It is the period with the highest and most volatile inflation rates across all subperiods, due to different pressures. For instance, in 2002, a strong currency depreciation was observed, which was related to the high degree of uncertainty after President Lula's first election and to an increase in risk aversion in international financial markets (Prates 2015). This period was also characterized by high unemployment rates and some growth in foreign prices in domestic currency. The latter resulted from the increase in foreign prices in foreign currency and the nominal exchange rate depreciation that characterized most of the period. In terms of income inequality, it was a period of high and increasing profit share levels.

In the following period, from 2004 to 2014, Brazil experienced inclusive economic growth, being able to combine higher economic growth rates, lower unemployment rates, and less inequality in the income distribution. While the redistribution of income

towards the working class was associated with a lower unemployment rate,¹⁸ it also resulted from numerous institutional changes that directly increased the wage share and/or increased workers' bargaining power: direct cash transfers, expansion of the pension system, increases in the real minimum wage, labor formalization, among other measures (Baltar, P. 2015: Biancarelli 2014: Serrano/Summa 2012). It was also a period of lower and less volatile inflation rates. During most of this period, foreign prices in domestic currency remained relatively stable. This resulted from a particular combination of increasing commodity international prices (which was very significant from 2002 to 2011 and is reflected in Figure 1 by the increase in foreign prices in foreign currency). which benefited Brazilian export products, and appreciating domestic currency associated with the commercial and financial surplus (Prates 2015). Consequently, the appreciated domestic currency largely compensated the increase in commodity prices, which contributed to the inflationary control in Brazil (Braga 2013). An additional measure used to control inflation during this period were monitored prices, which were used to attenuate inflationary pressures from other sources. As discussed by Carvalho (2018), these interventions generated negative consequences for some productive sectors and were followed by significant positive price adjustments that created strong inflationary pressures in 2015.

Finally, the period between 2015 and 2020 was marked by dramatic changes in the Brazilian economy.¹⁹ It started with the beginning of President Dilma Rousseff's second term, in which she faced numerous political challenges that culminated in her impeachment in 2016. In terms of economic policies, it was a period of austerity and reforms that can only be understood if one considers the political struggles brought about by full (or high) employment (Kalecki 1943), as will be discussed in Section 6. Thus, the period from 2015 to 2020 was a reversal of the previous period in terms of the unemployment rate and the profit share, since both exhibit an upward trend. There is also a reversal in terms of the foreign prices in domestic currency, which began to grow at a faster speed, in particular due to the behavior of the nominal exchange rate. The combination of a higher unemployment rate with growing foreign prices in domestic currency explains the dynamics of the profit share in the period, as discussed below. It is also relevant for the dynamics of the inflation rate, which reduced significantly after 2016.

3.1 In search for a Phillips curve in Brazil

We start our empirical analysis by investigating whether the Phillips curve relating unemployment and inflation can be a useful concept for understanding the dynamics of inflation in Brazil. In a Kaleckian perspective, the Phillips curve can be obtained by considering the role of workers' bargaining power (Hein/Häusler 2024), but it may be insufficient to fully explain the dynamics of inflation, in particular in an open economy.

The first graph in Figure 2 reports the relationship between inflation and unemployment considering the period from 2000 to 2020. Taking the inflation rate for nonmonitored goods (i.e. free prices),²⁰ the relationship between inflation and unemployment does not seem to fit the theoretical Phillips curve, since the relationship is not significant.

19. Note that the data for 2020 is significantly influenced by the pandemic context.

20. Our analysis considers non-monitored goods because their prices are more likely to be explained by the theoretical framework outlined in Section 2 than monitored goods prices. Yet,

^{18.} Note that the lower unemployment rate resulted from the improvement in economic activity as well as from the reduction in the labor market participation rate (Baltar/Leone 2015).



Sources: Original and calculated series based on BCB (2023) and IBGE (2023a, b, c, d). *Notes:* Quarterly series de-seasonalized using the X-13 filter. Dark-grey region reports the confidence interval at the 90 per cent confidence level. Author's own elaboration.

Figure 2 Phillips curve (2000–2020)

Thus, there does not seem to be a systematic negative relationship between inflation and unemployment in Brazil.

In order to understand better why the Phillips curve does not seem to describe the inflation dynamics in Brazil, we look at the behavior of non-monitored prices by splitting this category into tradable goods and non-tradable goods. As discussed by Baltar, C.T. (2015), the main difference between these two sectors is their exposure to international competition. For instance, there is a large share of services in the non-tradable goods sector, meaning not only that it faces less international competition, but also that wage costs are more relevant for prices in this sector. Conversely, international conditions play a larger role in pricing decisions in the tradable goods sector, with implications for mark-up rates in this sector as well. Actually, in some cases, mark-up rates in the tradable goods sectors are endogenous to prices determined at international markets (e.g. commodities).

Thus, the particularities of each sector suggest that their inflation dynamics is likely to differ, with inflation in the non-tradable goods sector being much more responsive to changes in domestic conditions such as the unemployment rate. Indeed, this is confirmed by the second and third graphs in Figure 2, which report the Phillips curve for the tradable and non-tradable goods sectors, respectively. While there does not seem to be a Phillips curve in the tradable goods sector, a significant negative relationship between inflation and unemployment is verified for the non-tradable goods sector. It could be explained, in a Kaleckian approach, by lower unemployment rates increasing workers' bargaining

adjustments in these prices tend to follow an inflation index and can be (indirectly) related to the main inflation drivers discussed in this article. For an analysis of monitored goods prices in Brazil, see Braga (2013) and Campedelli (2021), among others.

power and generating wage inflation that becomes price inflation as firms try to protect their profit margins.

The separation between the tradable goods and non-tradable goods sectors is helpful to reconcile the empirical evidence with the Phillips curve, but we still have to explain why the Phillips curve does not seem to be valid for the Brazilian economy taken as a whole or for the tradable goods sector in particular. This requires taking into consideration another explanatory variable that is particularly relevant for sectors that are exposed to international competition (such as the tradable goods sector) and periphery economies in general: the exchange rate and foreign prices. Considering the literature concerning the Brazilian economy, there is considerable evidence that exchange rates and commodity prices (or other indicators of imported inflation) are the most important inflationary pressures in the country (Bastos et al. 2015, 2022; Braga/Summa 2016; Morlin 2022; Nassif et al. 2020; Santoro 2020).

Indeed, the first graph in Figure 3 provides evidence of the strong connection between inflation rates and changes in foreign prices in domestic currency. Considering the non-monitored goods, there is a positive relationship between the growth rate of foreign prices in domestic currency and the domestic inflation rate, which is statistically significant. There is also a significant positive relationship in the tradable goods sector, while in the non-tradable goods sector the relationship is not significant. Thus, the relationship between inflation and the foreign sector reflects the effect of foreign prices in domestic currency on the dynamics of prices of tradable goods. This is in line with this sector's stronger exposure to international conditions (Baltar, C.T. 2015).

These results suggest that inflation in Brazil is a multidimensional phenomenon. This seems a logical consequence of an economy with strong productive heterogeneity, wherein different sectors tend to respond differently to changes in key economic variables. Consequently, Brazil can present qualitatively different inflationary processes that are more connected to either the domestic or international factors, as observed in the period between 2000 and 2020.

3.2 Unemployment, foreign prices in domestic currency, and inequality in Brazil

If price dynamics in Brazil is so closely linked to unemployment and foreign prices in domestic currency growth, these variables must also be relevant for the dynamics of its functional distribution. After all, in a Kaleckian approach, one could say that prices and distribution are just two sides of the same process. However, from the distributive perspective, what matters is the level of foreign prices instead of their growth rate. Thus, in this section we investigate the relationship between the aggregate profit share, unemployment, and foreign prices in domestic currency index.²¹

Figure 4a reports the relationship between the profit share and the unemployment rate in Brazil for the period between 2000 and 2020. It reveals a statistically significant positive relationship between both variables, thus identifying a correlation that is in line with the Kaleckian hypothesis that changes in the unemployment rate alter the bargaining power of workers and can induce changes in the functional income distribution. However, as reported in Figure 4b, the relationship between foreign prices in domestic currency and

21. Note that, while the previous section discussed the price dynamics of goods consumed in Brazil (including imported goods), the current section focuses on the distribution of the value added generated by production in aggregate terms. The distinction between tradable and non-tradable goods from the previous section is no longer considered, but the current analysis is complemented by the sectoral analysis in Section 4.



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Intercept = 40 Slope = 0.38 P-value = 0.0000000000048

(a) Profit share and unemployment



(b) Profit share and foreign prices in domestic currency

Source: Original and calculated series based on BCB (2023) and IBGE (2023a, b, c, d, e, f). *Notes:* Quarterly series de-seasonalized using the X-13 filter. Dark-grey region reports the confidence interval at the 90 per cent confidence level. The base period for the index is the first quarter of 2000. Author's own elaboration.

Figure 4 Profit share and its explanatory variables (2000 to 2020)

the profit share is non-linear, exhibiting a U-shape. The linear curve plotted in the figure indicates an overall negative correlation between foreign prices in domestic currency and the profit share, which is unexpected from the theoretical framework outlined above and reflects a specific subperiod. As discussed below, the non-linearity captured in this figure suggests that the relationship between both variables has changed through time.

Indeed, the theoretical framework discussed in Section 2 suggested a positive relationship between the profit share and foreign prices in domestic currency. This would be explained by three main channels: (i) the positive effect of a higher material cost per unit to unit labor costs ratio (j) on the profit share; (ii) the possibility that an increase in foreign prices in domestic currency improves the international competitiveness of the domestic firms, leading to higher mark-up rate (θ); and (iii) increase in demand-determined prices without a corresponding increase in unit costs. Thus, the negative correlation between the profit share and foreign prices in domestic currency suggests that one or more of these channels may have not operated as expected.

This unexpected result leads us to a subperiod analysis, as reported in Figure 5. In line with the results for the entire period, we find that in all subperiods there is a positive relationship between unemployment and the profit share. Yet, the level around which this relation takes place has shifted across time. This movement has probably been linked to changes in the institutional framework and the level of foreign prices in domestic currency. The same applies to the angular coefficient of the curve, which increased from the first to the second subperiod and was probably influenced by the institutional changes that have allowed decreases in the unemployment rate to exert a stronger effect on income distribution. On the other hand, differently from the results for the entire period, from 2000 to 2003 and from 2015 to 2020, there has been a positive relationship between foreign prices in domestic currency and the profit share. Thus, it is only the subperiod from 2004 to 2014 that presents a negative correlation between these variables, which cannot be explained from the theoretical discussion presented so far and will be dealt with carefully in Section 4. Nevertheless, from the data presented so far, we can conclude that income inequality in Brazil is also a multidimensional phenomenon, although its relationship with its main determinants changes through time.

3.3 The relationship between inequality and inflation in Brazil

The analysis presented until now has shown that inflation and distribution in Brazil have multiple determinants. Historically, there is a strong relationship between these variables with domestic determinants (e.g. the labor market) and foreign determinants (e.g. foreign prices and the nominal exchange rate). Based on the empirical analysis presented so far, we can elaborate theoretical relationships that could explain the patterns identified for the Brazilian economy. In this sense, we complement the theoretical discussion from Section 2 by showing how inflation and inequality are simultaneously affected by isolated shocks associated with two inflationary sources that seem to be relevant for this economy.

The first case would be the inflationary process associated with domestic determinants, in particular, the labor market. In Brazil, this inflationary process is mainly associated with the dynamics in the non-tradable goods sector, as previously discussed. It can be described by the inequality-augmented Phillips curve (Rolim et al. 2024) plotted in Figure 6a, according to which a reduction in the unemployment rate would lead to an upward movement along the curve, combining higher inflation rates with lower inequality.

The second case would be the inflationary process caused by foreign determinants, such as an exchange rate or foreign price shock, which seems to be more relevant to



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(b) Profit share and foreign prices in domestic currency

Source: Original and calculated series based on BCB (2023) and IBGE (2023a, b, c, d, e, f). *Notes:* Quarterly series de-seasonalized using the X-13 filter. Dark-grey region reports the confidence interval at the 90 per cent confidence level. The base period for the index is the first quarter of 2000. Regression coefficients for Figure 5a: 2000–2003: Intercept = 42, Slope = 0.25, P-value = 0.046; 2004–2014: Intercept = 40, Slope = 0.46, P-value = 0.000; 2015–2020: Intercept = 37, Slope = 0.48, P-value = 0.001. Regression coefficients for Figure 5b: 2000–2003: Intercept = 45, Slope = 0.0067, P-value = 0.130; 2004–2014: Intercept = 48, Slope = -0.018, P-value = 0.0260; 2015–2020: Intercept = 37, Slope = 0.018, P-value = 0.000. Author's own elaboration.

Figure 5 Subperiod analysis for the profit share (2000–2020)



Source: Author's own elaboration based on Rolim et al. (2024) and Rolim (2024).

Figure 6 Types of inflationary processes

the tradable goods sector in Brazil.²² This case is represented in Figure 6b, in which there is an increase in the growth rate of foreign prices in domestic currency from zero in t = 0 to a positive value in t = 1. The immediate effect is an increase the inflation rate and the profit share, as captured by an upward and rightward shift of the inequality-augmented Phillips curve. In the following periods, we would not expect to observe further changes in the inflation rate, but the positive growth rate of foreign prices in domestic currency suggests that the profit share would continue to increase, as captured by the rightward shifts of the curve.²³ Therefore, the implied relationship between inequality and inflation would be positive.

These theoretical relationships provide an adequate explanation for the relationship between inflation and inequality in Brazil that is compatible with their multidimensional determination. Considering the subperiod analysis, in the period between 2000 and 2003, in which unemployment was relatively stable at a high level and inflation was mostly associated with the dynamics of foreign prices in domestic currency, we would observe shifts of the inequality-augmented Phillips curve, which would increase inequality. The following period, between 2004 and 2014, would be characterized by a significant downward shift of the inequality-augmented Phillips curve, since the expansion of labor protection contributed to a reduction in the profit share which was further enhanced by a movement along this curve through the reduction in unemployment rates. Such movement along the curve explains the higher inflation rates, which were also related to an increase in foreign prices in domestic currency after 2011. Finally, the period between 2015 and 2020 was a period in which the unemployment rate increased significantly, as previously described,

^{22.} The similarities between this second case and profit inflation are discussed by Rolim (2024). Due to these similarities, their graphical representation is very similar.

^{23.} This effect is expected to be relevant in the short run and it will lose its relevance if the domestic inflation rate reaches the same level of the foreign inflation rate. This could occur through wage indexation, for instance.

which contributed to a decrease in the inflation rate and an increase in inequality – i.e. the economy was moving along the inequality-augmented Phillips curve. Yet, it was also a period in which the level and growth rate of foreign prices in domestic currency were at their maximum value, causing upward and rightward shifts of the inequality-augmented Phillips curve. Both factors operated to increase the profit share, while inflation was reduced due to the decrease in the bargaining power of workers, thus compensating the inflationary pressures associated with the foreign sector.

Thus, the theoretical explanation based on the Kaleckian literature and the inequalityaugmented Phillips curve extended to an open economy seems to describe adequately the dynamics of the Brazilian economy from 2000 to 2020. The only exception was the period between 2004 and 2014, when a negative association between the profit share and foreign prices in domestic currency was observed. This is a relevant issue since this negative relationship, which is particularly relevant for the period between 2007 and 2014, is observed even when the effect of the unemployment rate is controlled for. Theoretically, the strong increase in foreign prices in domestic currency from 2011 onward could have exerted a positive effect on the profit share, partially compensating for the effect of low unemployment rates, so that the profit share could have been larger than observed. Yet, this was not the case and there seems to be a missing inequality puzzle in the recent dynamics of the Brazilian economy, which would challenge the relationship between foreign prices and the exchange rate with the profit share assumed in the Kaleckian literature. Indeed, the sectoral analysis presented in the next section provides some insights into this direction.

4 THE MISSING INEQUALITY PUZZLE: A SECTORAL ANALYSIS

Considering the period from 2000 to 2020, we observe significant differences in the dynamics of the profit share for each sector, as reported in Figure 7a. The Service sector presented the lowest level and the most stable profit share, which fluctuated around 40.98 per cent with very little variability. Thus, this is a sector characterized by low profit margins in comparison to the rest of the economy. Moreover, the stability of the profit share in a context of growing unit labor costs (Figure 7b) indicates that the latter simply became price growth, without causing distributive changes.



Source: Calculated series based on IBGE (2023e). The base year for the index for each sector is 2000. Author's own elaboration.

Figure 7 Profit share and unit labor costs (2000–2020)

On the other hand, the Agriculture and Industry sectors are closely linked to the dynamics of the aggregate profit share. These sectors represented, in 2020, 6.59 per cent and 22.51 per cent of value added, respectively. Yet, despite representing together less than 50 per cent of value added, they are key to explaining the dynamics of the functional income distribution in a context of a stable profit share in the Service sector – although it should be noted that the decrease in the profit share in the Brazilian economy until 2013 was also explained by a strong composition effect (Martins 2017).

Interestingly, the profit share of the Industry and Agriculture sectors tended to go in opposite directions during most of the period analyzed. In the Agriculture sector, whose average profit share was equal to 60.07 per cent, there was a significant reduction in the profit share from 2003 to 2005, but it increased significantly since then.²⁴ On the other hand, there was a continuous decrease of the profit share in the Industry sector from 2004 to 2016, when it started to increase continuously until the end of our sample. The average profit share in this sector was equal to 51.86 per cent. Since the profit share for the entire economy has followed a pattern similar to that of the Industry sector, the pattern in the Industry sector and its larger share of value-added more than compensated the dynamics in the Agriculture sector.

Therefore, in order to explain the dynamics of income distribution in Brazil - and the missing inequality puzzle - we must understand the differing dynamics of inequality in the Agriculture and Industry sectors. To do so, we start with the relationship between the profit share and unemployment in each sector reported in Figure 8a, which indicates that the positive relationship between the profit share and unemployment for the entire economy is explained solely by the Industry sector. Indeed, the inequality-unemployment relationship for the Services sector is nearly horizontal and its slope is not statistically significant. This confirms that increases in the bargaining power of workers due to lower unemployment rates are insufficient to change the profit margin in this sector – possibly because firms in this sector have less market power and are more labor intensive, operating with lower profit margins than other sectors. Thus, cost increases are unlikely to be absorbed by profit margins reductions. We also find a negative and insignificant relationship between the profit share and unemployment in the Agriculture sector, which indicates that unemployment is not a variable explaining the distributive dynamics in the sector and seems coherent with the demand-determined nature of goods produced in this sector (Kalecki 1954).

Also the relationship between the profit share and foreign prices differs across sectors, as reported in Figure 8b. In line with the stability of the profit share in the Services sector, it is only mildly (and not statistically significantly) sensitive to changes in foreign prices in domestic currency. On the other hand, there is a clear and significant relationship between the profit share and foreign prices in domestic currency in the Agriculture and Industry sectors. In the Agriculture sector, there is a positive correlation between both variables, suggesting that when foreign prices and/or the nominal exchange rate increase, producers benefit from an increase in prices above nominal wage growth, thus generating an increase in profit margins. Conversely, in the Industry sector there is a negative relationship between the profit share and foreign prices in domestic currency.

24. Mixed income is particularly large in the Agriculture sector, being larger than aggregate wages. Due to the definition of the wage share employed in our analysis, this dimension is not considered. In case the division of mixed income between labor and capital income in the Agriculture sector differs considerably from the division of the remaining income, our estimates for the profit share in this sector can be biased.

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Source: Original and calculated series based on BCB (2023) and IBGE (2023a, b, c, d, e). *Notes:* Dark-grey region reports the confidence interval at the 90 per cent confidence level. The base period for the index is the first quarter of 2000. Regression coefficients for Figure 8a: Agriculture: Intercept = 68, Slope = -0.65, P-value = 0.2; Industry: Intercept = 37, Slope = 1.2, P-value = 0.000; Services: Intercept = 41, Slope = 0.035, P-value = 0.36; Total: Intercept = 48, Slope = 0.057, P-value = 0.000; Industry: Intercept = 57, Slope = -0.025, P-value = 0.005; Services: Intercept = 41, Slope = -0.002, P-value = 0.12; Total: Intercept = 46, Slope = -0.0086, P-value = 0.039. Author's own elaboration.

Figure 8 Sectoral analysis for the profit share (2000–2020)

From a Kaleckian standpoint, this latter result is rather unexpected, since it is assumed that higher foreign prices increase domestic firms' competitiveness, thus allowing them to set higher mark-up rates (Blecker 1989, 2011). While the Kaleckian perspective considers that this outcome in the industry sector would be related to foreign industrial price increases (while we capture foreign prices in general), the nominal exchange rate has increased since 2012, being the most important factor behind the increase in foreign prices in domestic currency reported in Figure 1 and possibly favoring the industrial sector as well.²⁵

Santoro/Rolim (2023) investigate this issue and suggest that the decrease in the profit share in the manufacturing industry sector in Brazil from 2004 to 2014 cannot be explained solely by the increase in nominal wages in the sector in a context where productivity growth was weak. This period was also marked by a shift in the relationship between the external sector and the Industry sector, with the latter becoming increasingly more dependent on imported inputs and presenting reduced international competitiveness (Hiratuka/Sarti 2015; Marcato/Ultremare 2018; Montanha et al. 2022; Sarti/Hiratuka 2017). Consequently, the changing relationship of the Industry sector with the foreign sector is part of the explanation for the decrease in the mark-up rate in the sector (Martins 2017; Santoro/Rolim 2023).

25. These nuances suggest that the hypothesis outlined in this section should be further investigated by analyzing the price dynamics of industrial goods exported by Brazil at the international level. This analysis is not undertaken in this article due to the macroeconomic nature of the analysis.

Thus, instead of being able to take advantage of currency depreciations by increasing profitability, this sector became more vulnerable to depreciations. In the period between 2004 and 2011, the stability of foreign prices in domestic currency was beneficial to the domestic firms in the Industry sector: despite the nominal wage growth, unit costs did not increase as much. However, these firms could not entirely pass on to prices the unit cost increases and were forced to reduce their mark-up rates to prevent a loss in competitiveness. When the foreign price in domestic currency index began to increase in mid-2011, domestic firms could not take advantage of the depreciation of the domestic currency because they could not pass on to prices the total increase in costs associated with higher labor costs and higher imported input costs. As a result, the profit share in the sector continued to fall until 2015.

According to Santoro/Rolim (2023), this pattern has intensified the distributive conflict in Brazil. There were two sources of negative pressures upon the profit share in the Industry sector, while the Agriculture sector was experiencing an increase in the profit share and the Service sector could keep a stable profit share. However, while the increase in unit labor costs in the Service sector could not pressure profit margins in this sector, it was passed on to prices, causing a significant increase in inflation in this sector (Santos et al. 2018), which translated into higher inflation rates in the entire economy.

In sum, this sectoral analysis suggests that Kalecki's (1954) theory based on two types of prices is extremely relevant to investigate the dynamics of the functional income distribution in Brazil. The relationship between the profit share and its domestic and foreign determinants can change in terms of sign and intensity depending on the sector. Moreover, the missing inequality puzzle suggests that there are additional channels through which the foreign sector influences the profit share, in particular in the Industry sector. While the Kaleckian literature has mostly emphasized the competitiveness channel, it seems that the cost channel associated with imported inputs can also play a significant role.

5 MEASURING THE DISTRIBUTIVE CONFLICT

Our analysis so far has pointed towards two variables that explain the dynamics of inflation and inequality in Brazil: the unemployment rate and foreign prices in domestic currency. The latter variable is particularly important to the strength of the distributive conflict in Brazil, since it can create a discrepancy between changes in production prices (more relevant to firms) and in consumption prices (more relevant to workers and consumers) that can either attenuate the conflict (whenever production prices grow more than consumption prices) or strengthen it (in the opposite case). Indeed, the difference between the dynamics of production (value added) and consumption prices is due to the composition, coverage and treatment to imported goods underlying each index (Silva et al. 2017). This latter aspect suggests that the difference between both indexes is, at least partially, explained by the evolution of foreign prices in domestic currency.

The decomposition of the wage share provides information with respect to the effect of these factors on the class conflict. Following Saramago et al. (2018), we decompose the wage share into three components: real wage,²⁶ labor productivity,²⁷ and relative prices (ratio of the production prices deflator to the inflation rate), as follows:

27. Labor productivity refers to the average units of output produced by each worker.

^{26.} The real wage is given by the sum of workers' remuneration and workers' share of mixed income divided by the price level. Differently from Saramago et al. (2018), we deflate the real wage using the Broad Consumer Price Index.

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$$\omega = \frac{W}{Y} = \frac{W/L}{Y/L} = \frac{\frac{W}{p_w L}}{\frac{Y}{p_Y L} \frac{p_Y}{p_Y}} = \frac{w_r}{y\tau}$$
(6)

where W is the aggregate nominal wage, p_w is the Broad Consumer Price Index, p_Y is the price of value added, w_r is the real wage, y is the labor productivity, and τ is the relative prices between production and consumption. According to this decomposition, increases in τ allow for increases in w_r even when y is constant and without pressuring profit margins – thus, increases in τ tend to ease the distributive conflict. This is because nominal wage adjustments tend to be more sensitive to the inflation rate than to production prices. Therefore, when the growth rate of production prices is larger than the inflation rate (and τ increases), firms can more easily accept nominal wage adjustments indexed by the inflation rate, attenuating the distributive conflict. In the opposite situation, firms observe price increases that fall behind the inflation rate experienced by workers and the conflict over income distribution intensifies. Moreover, whenever y and τ are constant, real wages can only increase if the wage share increases – in other words, real wages can only increase if profit margins decrease.

The results for this decomposition are reported in Figure 9, along with the wage share.²⁸ The decomposition of the wage share indicates a strong real wage growth from 2004 to 2013, but it remained relatively stable after that. This increase was partially compensated by an increase in productivity that took place until 2013. Moreover, the significant increase in production prices relative to consumption prices until 2014 also allowed for real wage increases that did not exert a strong pressure upon profit margins. Thus, a favorable dynamics of relative prices and labor productivity attenuated the distributive conflict. Yet, the wage share did grow (corresponding to a decrease in profit margins), suggesting some opposition between real wages and profit margins: even in this context. Conversely, the combination of stable τ and stable (or declining) y after 2015 generated a direct opposition between real wages and profit margins: the former could only increase if there were increases in the latter – and vice versa. Such a direct opposition between them reveals the strengthening of the distributive conflict in the country.

In a Kaleckian view, a direct implication of a more explicit distributive conflict is to generate higher inflation rates – thus, there is a domestic inflation component that is triggered by the change in relative prices associated with the dynamics of foreign prices and exchange rates.²⁹ Yet, the distributive conflict that takes place through nominal wage and price adjustments is only one of the spheres where the class conflict unfolds. Another arena is the political sphere, as suggested by Kalecki (1943) and explored in the next section.

^{28.} Due to space constraints, we do not analyze the decomposition of the wage share for each sector. It should be noted that there are significant differences between the sectors, especially in terms of labor productivity and relative prices.

^{29.} For a discussion on the relation between foreign price shocks and the domestic distributive conflict in a simulation model, see Rolim/Marins (2024).



Source: Calculated series based on IBGE (2023a, e). The base year for all indexes is 2000. Author's own elaboration.

Figure 9 Wage share decomposition (2000–2020)

6 MANAGING THE DISTRIBUTIVE CONFLICT

The inflation-targeting regime is one of the tools used to manage the distributive conflict in Brazil. It was adopted in mid-1999, replacing the fixed exchange rate peg that could no longer be sustained after the devaluation in the beginning of 1999 (Vernengo 2008). Idiosyncratic characteristics of the Brazilian economy, which are shared with other emerging markets, lead to a strong association between inflation-targeting and exchange rates, since these economies present strong pass-through, currency mismatch, and high volatility of capital flows (Farhi 2007; Prates 2002, 2015).

These characteristics exert important implications to the nature of the inflationtargeting regime in Brazil. Firstly, the Central Bank of Brazil still undertakes substantial foreign exchange market interventions (Caldentey/Vernengo 2013; Marins/Prates 2019; Prates 2015).³⁰ Secondly, the main transmission mechanism of monetary policy in Brazil is the exchange rate, so inflationary control depends on domestic currency appreciations (Araújo/Arestis 2019; Modenesi/de Araújo 2013; Morlin 2022; Nassif et al.

^{30.} While currency depreciations create numerous difficulties under the inflation-targeting regime, foreign exchange market interventions can also avoid currency appreciations – either as an objective by itself or as the result of other objectives, such as increasing the stock of foreign reserves, as suggested in BCB (2010), for instance.

2020; Vernengo 2008). As discussed by Rolim/Marins (2022), the exchange rate channel is particularly relevant in emerging market economies and reflects structural characteristics of these countries. However, a price stabilization strategy so closely linked to the dynamics of the exchange rate poses important challenges, since its dynamics is strongly determined by international liquidity cycles (Prates 2002, 2015). Thus, it is not always the case that an increase in the domestic interest rate is sufficient to generate a currency appreciation.

This aspect creates potential difficulties for managing the distributive conflict in Brazil through the inflation-targeting regime. In addition, while the financial sector tends to be favored by the combination of high interest rates and appreciated domestic currency (Erber 2011; Vernengo 2008), the distributive effect of monetary policy is complex. Higher unemployment rates induced by monetary tightening can reduce the bargaining power of workers and decrease the wage share (Rochon/Setterfield 2007), but an exchange rate appreciation weakens the distributive conflict and may generate a redistribution of income towards workers. In sum, if the inflation-targeting regime operates through different transmission mechanisms that have opposite effects on income distribution, its distributive effect depends on the relative strength of these transmission mechanisms (Rolim/Marins 2022).

This means that the Brazilian inflation-targeting regime may be insufficient to control inflation rates and manage the distributive conflict in the direction desired by the elites. This is both because the condition for exchange rate appreciations through monetary policy is not always guaranteed (Prates 2002, 2015) and because the distributive effect of the interest rate is ambiguous (Rolim/Marins 2022). Therefore, other tools are required to manage the distributive conflict, in particular when it becomes more acute and the inflation-targeting regime cannot generate a strong currency appreciation through increases in the nominal interest rate, such as in the mid-2010s.³¹

In this context, the distributive conflict was managed by a combination of fiscal austerity and neoliberal reforms, which was probably the most significant response to the exacerbated class conflict that had reached its peak in 2014. On the one hand, a strong increase in the unemployment rate was observed from 2015 onward (Figure 1). While possibly linked to the monetary tightening, it also resulted from the significant fiscal austerity that was implemented in Brazil. As argued by Serrano/Summa (2018), the (undeclared) aim of such a policy shift was to reduce the bargaining power of workers through unemployment in order to weaken real wage growth – thus moderating the distributive conflict. In 2016, the constitutional amendment to freeze public expenditure ceilings for at least 10 years provided a longer-term nature to fiscal austerity (Orair/Gobetti 2017). On the other hand, a significant labor market reform was approved in 2017, thus increasing labor flexibility in a permanent manner, and a pension reform altering the retirement age for employees was approved in 2019. As a result, the bargaining power of workers was significantly reduced through a cyclical factor (unemployment rate) and an institutional factor (neoliberal reforms), characterizing a strong response to the political struggles brought about by full (or high) employment (Kalecki 1943). Inflation fell despite the continuous increase in foreign prices in domestic currency, but there was a significant reversal of the income redistribution process that had characterized the previous period.

^{31.} The base nominal interest rate increased from 10.17 per cent per year in January 2014 to 14.15 per cent per year in December 2015, but the nominal exchange rate continued to exhibit a positive trend (Figure 1). For an analysis of the correlation between interest rate differentials and nominal exchange rates during this period, see Marins/Prates (2019).

7 CONCLUSION

This article argued that inflation and income distribution in Brazil are multidimensional phenomena. In line with the Kaleckian approach, this means that both variables respond to domestic and foreign determinants. If inflation pressures arise mostly from the labor market (for instance, from reductions in the unemployment rate), inflation tends to take place together with a redistribution of income towards workers. If foreign determinants such as foreign prices and nominal exchange rates are the main inflationary sources, inflation may occur simultaneously with an increase in the profit share – although we could identify an exception for this pattern during the period analyzed. An important implication of this characteristic of the Brazilian economy is that the foreign sector influences and mediates the relationship between income inequality, inflation, and interest rates.

This poses two significant challenges for the Brazilian economy. Firstly, addressing multidimensional inflation rates requires multiple tools, which is not considered under the inflation-targeting regime. However, multiple tools may be insufficient and, given that diverse inflationary processes entail different distributive implications, one could argue for varying degrees of tolerance depending on other objectives (although adequately implementing this would be exceptionally challenging). Secondly, our analysis indicates that the foreign sector plays a crucial role in mediating the intensity of the distributive conflict in Brazil,³² to such an extent that the sustainability of redistributive conflict while also reducing the dependency on an appreciated domestic currency is a significant challenge for the Brazilian economy.

While these implications have been derived from an analysis of the Brazilian economy, it is likely that they apply to other emerging market economies with a strong pass-through effect of foreign prices and exchange rates to domestic prices and similar productive structures. Likewise, the analysis presented in the article provides insights into the connection between inflation and inequality in developed countries in the post-COVID-19 and Ukraine–Russia war context, since these countries are being exposed to a type of inflation (linked to foreign price shocks) that Brazil tends to experience in a structural manner.

ACKNOWLEDGEMENTS

I am grateful for comments and suggestions from Nathalie Marins, Gilberto Tadeu Lima, João Santoro, Carolina Troncoso Baltar, Fernanda Ultremare, and two anonymous reviewers.

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32. Note that the possibility of a reverse channel, in which a country's domestic distributive conflict affects its external performance (for instance, through import demand), is also valid (Cícero/ Lima 2023).

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APPENDIX

The following methodology was implemented to obtain some of the data reported in the article:

- Unemployment rate (quarterly): This series was calculated by combining three data sources. For every pair of data sources, the level of the series for the unemployment rate were made compatible by calculating the ratio between them for a period that was covered by both sources. Thus, data from IBGE (2023c) was adjusted to the level of IBGE (2023b) by considering their values in March, 2002. This created a monthly series that became a quarterly series by taking the average values for each quarter. Then, the new series was adjusted to the level of the most recent survey (IBGE 2023d) by considering their values in the first quarter of 2012. Whenever a given period was available in two sources, we considered the value available in the most recent survey.
- Wage and profit shares (annual): The wage share series was calculated by dividing aggregate labor compensation (sum of wages and social contributions) by the sum of aggregate labor compensation and aggregate profits, thus reflecting the hypothesis that mixed income is composed of wage and profit income in the same proportion as the rest of income (Gollin 2002). All series were obtained from the annual national accounts (IBGE 2023e). The profit share is equal to one minus the wage share.
- Profit share (quarterly): Following the same procedure used to calculate the quarterly unemployment rate, the quarterly data for aggregate wages combined data from IBGE (2023c), IBGE (2023b), and IBGE (2023d) and adjusted all series to the level compatible with IBGE (2023d). Aggregate wages were calculated as the average labor income multiplied by the employed population. The quarterly wage share was calculated by taking the ratio between aggregate wages to value added from the quarterly national accounts (IBGE 2023f). The level of the new quarterly series is significantly below the wage share calculated from the annual national accounts. Thus, following Bastos (2012), the quarterly wage share was used as an indicator variable to transform the annual wage share into a quarterly series using Denton's (1971) interpolation method. The resulting quarterly wage share obtained from the interpolation method presents a level compatible with the wage share in the national accounts, but the dynamics across the quarters within each year is described by the behavior of the wage share calculated from data at higher frequency. The quarterly profit share is equal to one minus the quarterly wage share.
- Foreign prices (quarterly): Following Baltar, C.T. (2015), foreign prices are calculated by considering the real exchange rate decomposition:

$$er_t = \frac{P_t^f e_t}{P_t^d} = \frac{P_t^{f*}}{P_t^d}$$
(a1)

where er_t is the real exchange rate, P_t^f is the foreign price expressed in foreign currency, e_t is the nominal exchange rate, P_t^d is the domestic price level, and P_t^{f*} is the foreign price in domestic currency. In growth rates, this relationship is expressed as:

$$1 + \hat{r}_t = \frac{(1 + \hat{p}_t^{f*})(1 + \hat{e})}{1 + \hat{p}_t^d} = \frac{1 + \hat{p}_t^{f*}}{1 + \hat{p}_t^d}$$
(a2)

An index for foreign prices in foreign currency, in which the first observation takes the value of 100, was calculated using \hat{P}_t^f :

$$\hat{p}_t^f = \frac{(1+\hat{er}_t)(1+\hat{p}_t^d)}{1+\hat{e}} - 1$$
(a3)

Similarly, an index for foreign prices in domestic currency was calculated by considering its growth rate, which is given by:

$$\hat{P}_t^{f*} = (1 + \hat{r}_t) \left(1 + \hat{P}_t^d \right) - 1 \tag{a4}$$

The effective real exchange rate was obtained from BCB (2023) and the inflation rate measured by the Broad Consumer Price Index was obtained from IBGE (2023a). In both cases, the average of the monthly series for each quarter was considered.