

## The weight of wages: a core measure that reweights the IPCA

- ▶ A recurring criticism of inflation metrics typically associated with labor market dynamics, such as labor-intensive services and slack-sensitive services, is that they cover items that represent less than 10% of the IPCA.
- ▶ In order to better capture inflationary pressures from the labor market, we propose a new core inflation measure that reweights the entire basket of the consumer price index IPCA. This involves increasing the weight of items with higher labor compensation costs. The data on labor market intensity for each item is derived from the input-output table of the national accounts system.
- ▶ The comparison between the reweighted index and the headline IPCA reveals that prices of the most labor-intensive items are being adjusted more sharply than the headline index. In other words, the tight labor market has been a significant factor in inflationary dynamics. This trend has been observed since 2H22, coinciding with the period when the unemployment rate dropped below 9% (which, according to our estimates, is the neutral level for inflationary dynamics). As a result, cautious monetary policy decisions are necessary.

**Different metrics point to a tight job market.** The unemployment rate has steadily declined to a historically low level (7.4% seasonally adjusted in the latest report), with growth in both formal and informal employment. According to FGV's Consumer Survey, the perception of labor market conditions is the best since late 2014. In this context, real wages continue to rise.

**A tight labor market, with real wage growth, can exert pressure on prices from both the supply and demand sides.** On the supply side, wages and social contributions are part of the production cost of goods and services. On the demand side, wage hikes increase the real wage bill and stimulate spending. Therefore, it is crucial to identify which IPCA items are most sensitive to labor market dynamics.

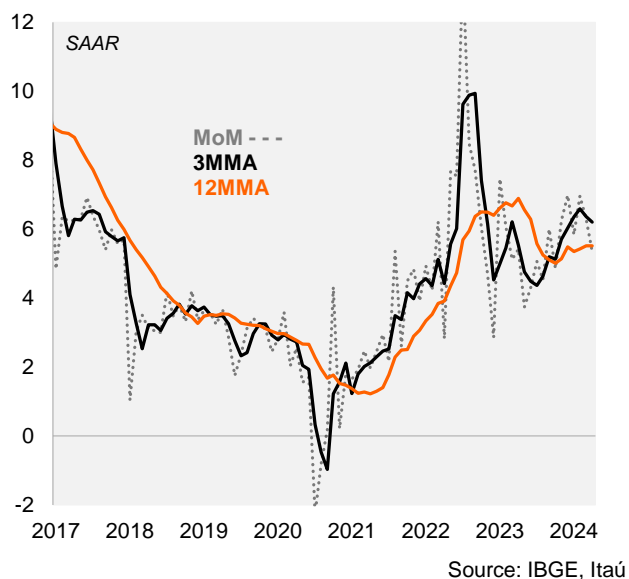
**Service items typically have a stronger connection to the tightness of the labor market, as salaries are a significant cost in the sector.** Monitoring specific services to gauge the impact of the job market on inflation has become more common over the years. The two most closely watched aggregate metrics are (i) labor-intensive services, initially introduced by the Central Bank in 2013<sup>1</sup> and (ii) slack-sensitive services, introduced by the Central Bank in 2022.<sup>2</sup>

**The two metrics have recently accelerated (see graphs), but a recurring criticism is that they analyze items that represent a small portion of the IPCA, less than 10% of the total.** Labor-intensive services, which include labor, medical and dental services, beauty services and housekeeping, are currently at 6% (seasonally adjusted annualized 3-month moving average) and represent approximately 7% of the overall IPCA (17% of services). Slack-sensitive services, which include items that are more sensitive to the output gap and to the unemployment rate than to inflationary inertia, are at 5.2% and represent just 10% of the overall IPCA (28% of services).

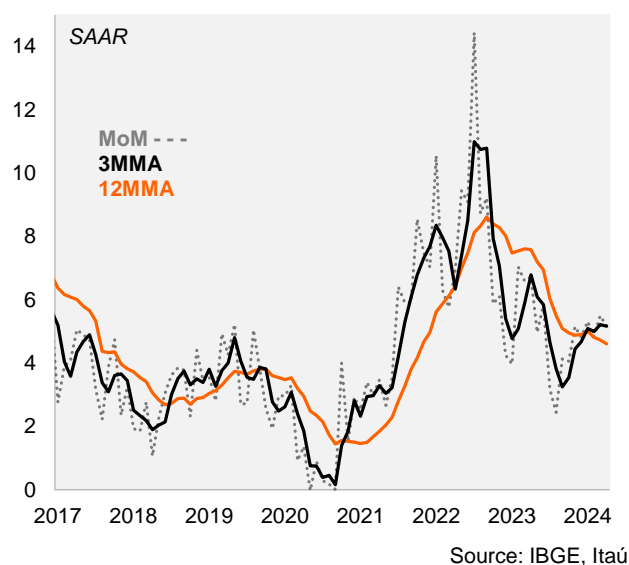
<sup>1</sup> See box in the December 2013 Inflation Report: "Segmentação da Inflação de Serviços," available at <https://www.bcb.gov.br/content/ri/relatorioinflacao/201312/RELINF201312-ri201312b3p.pdf>

<sup>2</sup> See box in the December 2022 Inflation Report: "Análise da inflação de serviços sob as óticas da ociosidade e da inércia," available at <https://www.bcb.gov.br/content/ri/relatorioinflacao/202212/ri202212b4p.pdf>

**Labor-intensive services have accelerated at the margin, but represent only 7% of the overall index**



**Slack-sensitive services have also accelerated at the margin, but represent only 10% of the overall index**



To address criticism of the low weight of the above-mentioned core measures by exclusion, we will focus on constructing an inflation index that utilizes all available information in the IPCA. This will involve reweighting all items in the indicator to increase the weight of items with higher wage costs.

By analyzing the entire IPCA, we can track the contribution of the tight labor market not only to a portion of services but also to goods and regulated prices. Items like building maintenance fees, educational courses, postage, and others that carry elevated labor costs are now considered in the new index. The construction of the index is explained below.

We reweighted the IPCA based on data from the input-output tables (TRU) provided by census bureau IBGE in the national accounts system. First, we identified the cost of labor compensation (salaries and social contributions) in each sector and the weight of each product (i) in the total production of the sector (j). Hence, we were able to determine the labor cost of each product.

$$compensation\ cost_i = \frac{\sum_j production_i\ in\ the\ sector_j * compensation\ cost_j}{Total\ production_i}$$

We thus defined the labor intensity of each product (i) as:

$$Labor\ intensity_i = \frac{compensation\ cost_i}{production\ cost_i}$$

As a second step, we matched products from the input-output tables with IPCA items and reweighted the index as follows:

$$weight'_i = \frac{weight_i * Labor\ intensity_i}{\sum_i weight_i * Labor\ intensity_i}$$

where  $weight'_i$  is the new weight of each item in the reweighted index and  $\sum weight'_i = 100\%$ .

As expected, in the reweighted metric, the weight of services increased while the weights of food, electricity, and gasoline declined, given that that labor intensity is not as significant in these products (see table).

Reweighted index: heavier weight for services, lighter weight for food

Weight	IPCA	Reweighted	
<b>Headline</b>	100.0	100.0	=
<b>Food &amp; beverage</b>	21.0	11.6	▼
Food at home	15.1	6.2	▼
Food out of home	5.9	5.4	▼
<b>Housing</b>	15.4	10.1	▼
<b>Household articles</b>	3.8	2.6	▼
<b>Apparel</b>	4.8	5.0	▲
<b>Transportation</b>	20.9	19.0	▼
<b>Health and personal care</b>	13.3	13.2	▼
<b>Personal spending</b>	10.1	20.8	▲
<b>Education</b>	5.9	14.9	▲
<b>Communication</b>	4.8	2.8	▼
<b>Regulated prices</b>	25.9	23.4	▼
Residential electricity	4.1	0.8	▼
Gasoline	5.0	0.4	▼
<b>Market-set prices</b>	74.1	76.6	▲
Food at home	15.1	6.2	▼
Industrials	23.4	17.0	▼
Services	35.5	53.4	▲

Source: IBGE, Itaú

Comparing the reweighted index and the IPCA, one realizes that the most labor-intensive items are undergoing sharper price adjustments than the overall index. In other words, the tight labor market has been a relevant factor in inflationary dynamics. While the headline inflation index<sup>3</sup> climbed 3.7% yoy in April, the reweighted index<sup>4</sup> advanced 5% in the same period.

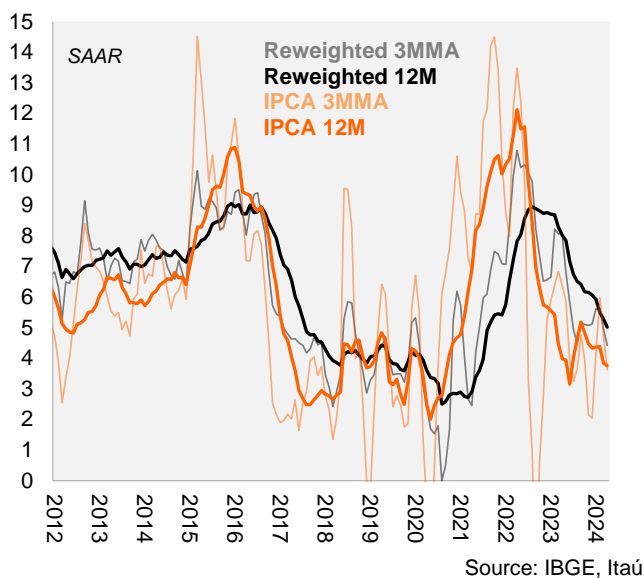
This dynamic has been in place since 2H22, coinciding with the period in which the unemployment rate fell below 9%. Importantly, the reweighted index was also above the headline IPCA in the pre-2015 period, marked by a positive output gap and unemployment also below 9%. In 2018 and 2019 – when inflation was hovering around the target – price changes in the most labor-intensive items were more in line with the headline index, stressing the importance of the degree of slack in containing inflation.

At the margin, the reweighted index has shown some moderation, but still requires caution on the part of monetary policymakers. The gap between the two indices until April is 0.8 percentage points, thus above the historical average of decoupling between the series (0.2pp since 2012) but below the most recent average (1.3pp since 2023).

<sup>3</sup> Airfares were excluded from the analysis because of high volatility.

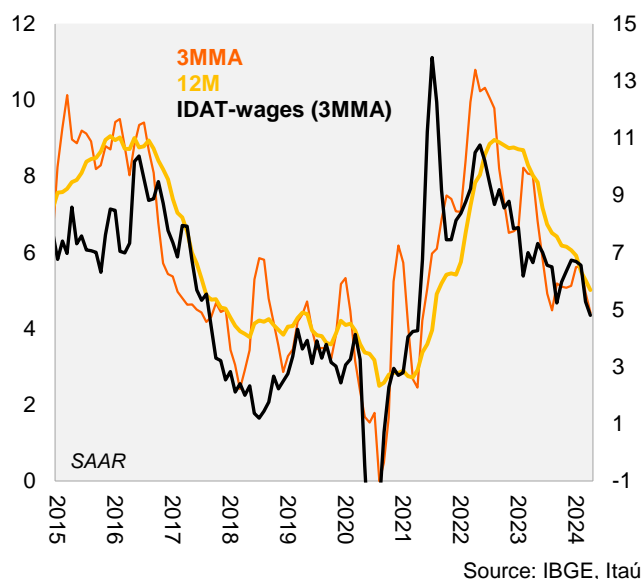
<sup>4</sup> Also excludes airfares.

**Labor-intensive items are undergoing sharper adjustments than the headline indicator since 2H22, despite some moderation at the margin**



**As expected, the reweighted index also has good correlation with IDAT-Wages because we increased the weights of items that carry higher labor costs.**

**Reweighted index shows good correlation with IDAT-Wages**



**Importantly, the new index has a better correlation with the fundamentals of unemployment and inertia.** We estimated a simple regression in which inflation is a function of unemployment and inertia. The explanatory power of the regression (R2) with the new index is greater than with the overall index, labor-intensive services, or slack-sensitive services.

$$\Pi_t = \alpha_0 + \alpha_1 IPCA12M_{t-1} + \alpha_2 Unemployment\ rate_t$$

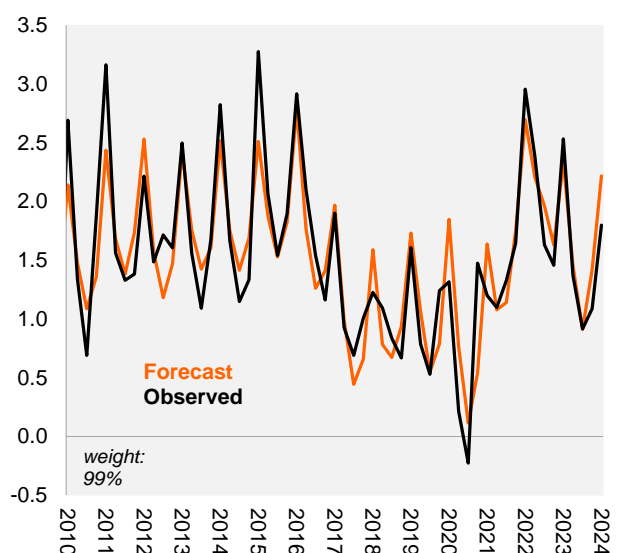
**Inertia and the output gap offer a good explanation of the dynamics of the reweighted index**

	IPCA ex-airfare		Reweighted IPCA (ex-airfare)		Labor-intensive services		Slack-sensitive services	
<b>Weight</b>	<b>99%</b>		<b>99%</b>		<b>7%</b>		<b>10%</b>	
Constant	1.0	0.1	3.2	0.0	1.5	0.0	3.7	0.0
Unemployment rate	0.0	0.9	-0.2	0.0	-0.1	0.0	-0.2	0.0
Inertia	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1
<b>R2</b>	<b>28%</b>		<b>64%</b>		<b>77%</b>		<b>57%</b>	

Sample: 2007-2024  
Source: IBGE, Itaú.

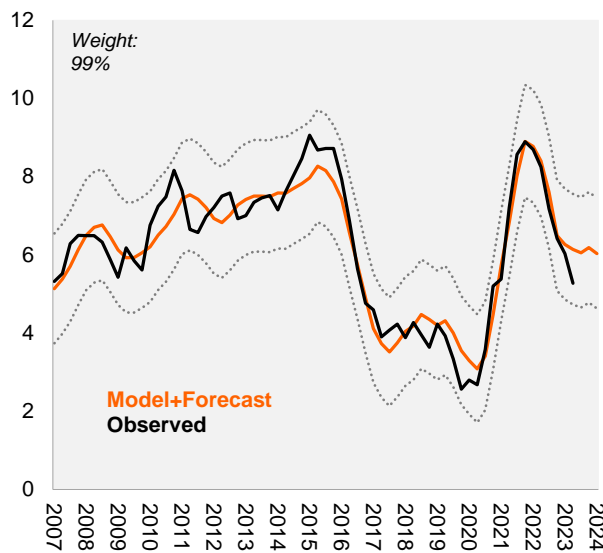
The model accurately captured the dynamics of the reweighted index over the past few years and indicates that it will continue to run above the headline indicator in the upcoming quarters, requiring cautious monetary policy decisions.

**Model properly captures the dynamics of the reweighted index...**



Source: IBGE, Itaú

**... and suggests that it will remain above headline inflation**



Source: IBGE, Itaú

**Conclusion:**

Recent unemployment data points to a heated job market with no signs of cooling down. Wage adjustments have been running above inflation since late 2022, likely exerting pressure on costs in the most labor-intensive sectors.

We therefore propose a new weighting of the IPCA that increases the weights of items with higher wage and social contribution costs. Its biggest advantage is that it fully encompasses inflation, rather than being limited to a small part of the index.

By comparing the reweighted index with the headline IPCA, we can see that the most labor-intensive items are experiencing sharper price adjustments. This highlights the need for caution in monetary policy decisions, given that the labor market is not expected to cool down.

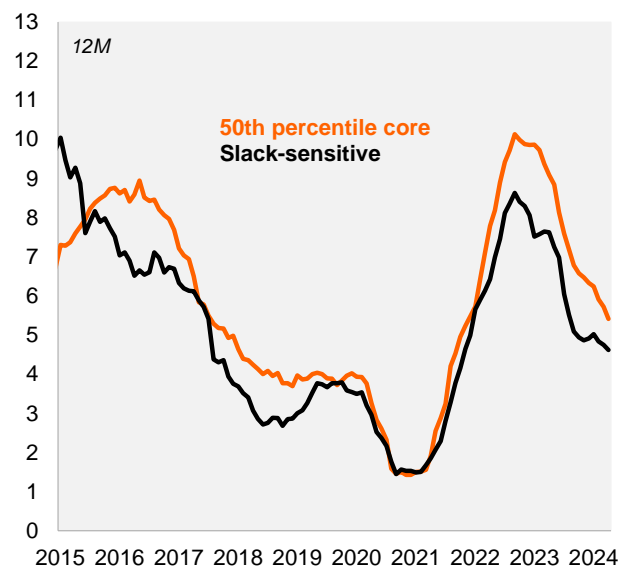
**Julia Gottlieb**  
**Luciana Ribeiro**

**Attachment:**

**Based on the classification of labor intensity of the various IPCA items, it is possible to construct other alternative inflation core measures.**

- 1) **50th percentile core:** we only aggregate items with a work intensity greater than the average, remaining with around 51% of the IPCA. Comparing this core with the slack-sensitive items defined by the central bank (10% of the IPCA), we see that while the first has accumulated a 5.4% increase in 12 months, the BCB aggregation has accumulated a 4.6% increase in the same period.

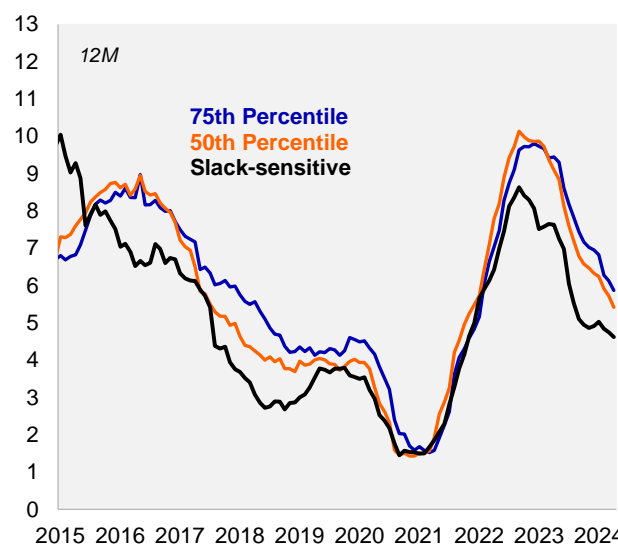
**50th percentile core is above the slack-sensitive measure**



Source: IBGE, Itaú

- 2) **75th percentile core:** like the previous one, we only aggregate items with a work intensity greater than the 75th percentile, remaining with around 37% of the IPCA. When comparing this core with slack-sensitive items defined by the central bank (10% of the IPCA) and with the 50th percentile core, we observe that the higher the labor intensity, the greater the level of price adjustment at the margin.

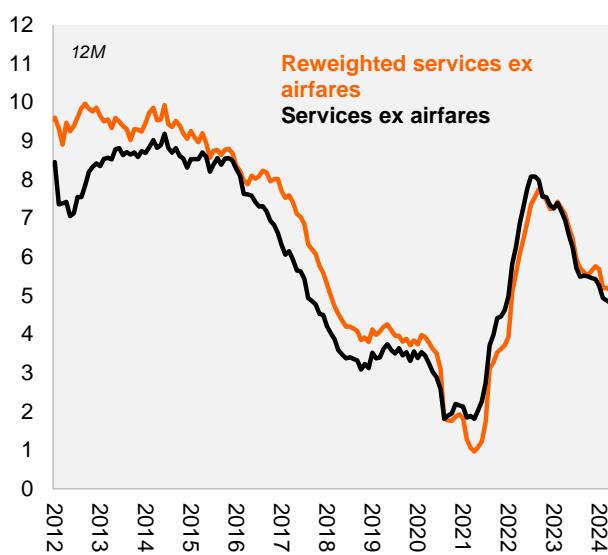
**Greater readjustments in more labor-intensive items**



Source: IBGE, Itaú

- 3) **Reweighted services ex-airfares:** we only reweight service items based on labor intensity. This core measure is very similar to total services, resulting in smaller gains in this case.

**Reweighted services are close to the services**



Source: IBGE, Itaú

Macro Research – Itaú

Mario Mesquita – Chief Economist

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