ERF Policy Brief

Winners and Losers of Price Inflation in Tunisia

Fatma Marrakchi Charfi and Massimiliano Cali

About the authors

Fatma Marrakchi Charfi is a Professor of economics and Director of the Laboratory of International Economic Integration at the University of Tunis El Manar - Faculty of Economics and Management of Tunis. She has published extensively in indexed academic journals on topics related to exchange rate policy, monetary policy and international trade.

Massimiliano Cali is the Senio Ccountry Economist for the World Bank in Tunisia. He has over 20-year experience as a development economist in development banks, ministries and think tanks. He has published extensively in academic journals and books and holds a PhD in Economic Geography from the London School of Economics.

In a nutshell

- *The global inflation episode of 2021-23 highlighted, once again, the importance of understanding the sources of inflation, especially in developing countries.*
- *The poorest income quintiles are disproportionately affected by rising prices. Hence, these low-income groups face a double burden: as employees, their wages contribute the least to inflation, and as members of the most disadvantaged social strata, they experience a greater impact from inflation than the average income earner.*
- *There is suggestive evidence of a positive relationship between the extent of inflation due to profits per unit of capital and market concentration. This suggests that policies promoting competition can be important in mitigating inflationary pressures.*

1. Introduction

The post-COVID-19 supply bottlenecks and the rally in global commodity prices in 2022-23 generated a resurgence of interest among economists and policymakers in the determinants of high inflation, a key drag on incomes and economic growth, particularly in developing countries. As a net commodity importer, Tunisia was significantly affected by the recent shocks and its inflation rate rose significantly, reaching 9.3 percent in 2023, the highest annual rate in decades. This resurgence of inflation raises important questions about how this shock is distributed among economic agents. Who bears the burden of inflation and who benefits from inflationary pressures, particularly between employees and business owners? To address these questions, this note applies a new decomposition of the Consumer Price Index (CPI) between 2002 and 2023 into the underlying contribution of the supply side, including profits, wages, import prices, and taxes net of subsidies.

The results of this decomposition suggest that profits per unit of capital (capital rents) accounted for the lion's share of annual inflation after the 2020 COVID-19 pandemic—61 percent on average. Import prices were responsible for around 40.9 percent and wages only accounted for 21.9 percent.[1] Increased capital rents determined a hike in prices of 4.9 and 4.2 percentage points in 2022 and 2023, respectively. This is double the effect of profits in the Eurozone in 2022 estimated by Hansen et al. (2023). An extension of the decomposition analysis also shows that during the last period, labor and capital productivity increased marginally and hence resulted in only a small inflation-reducing effect.

A complementary analysis shows that the latest inflation episode in 2020-23 was more acute for poorer households. Prices grew faster for product categories that are relatively more consumed by lower income households, such as food and non-alcoholic beverages; alcoholic beverages and tobacco; housing and utilities; and clothing and footwear. Poorer households, therefore, faced a double burden from the recent inflation episode: as wage earners, their income contributes the least to inflation, and as members of the most disadvantaged social strata, they experience a greater impact from inflation than the average income earner.

[1] These shares sum to more than 100 percent as capital and labor productivity contributed negatively to price growth during the same period.

Finally, the study leverages sectoral data to provide suggestive evidence that the extent of inflation due to capital rents is positively related to market concentration. This is consistent with the policy recommendation that promoting open competition and trade, such as by reducing barriers to entry and trade across sectors, is key to keeping inflation in check.

The brief is structured as follows. The next section describes Tunisia's trajectory of inflation in the last two decades. Section three presents the data and the methodology of the decomposition, while section four presents the results of the decomposition. Section five discusses the relation between capital rents and market concentration, and section six concludes.

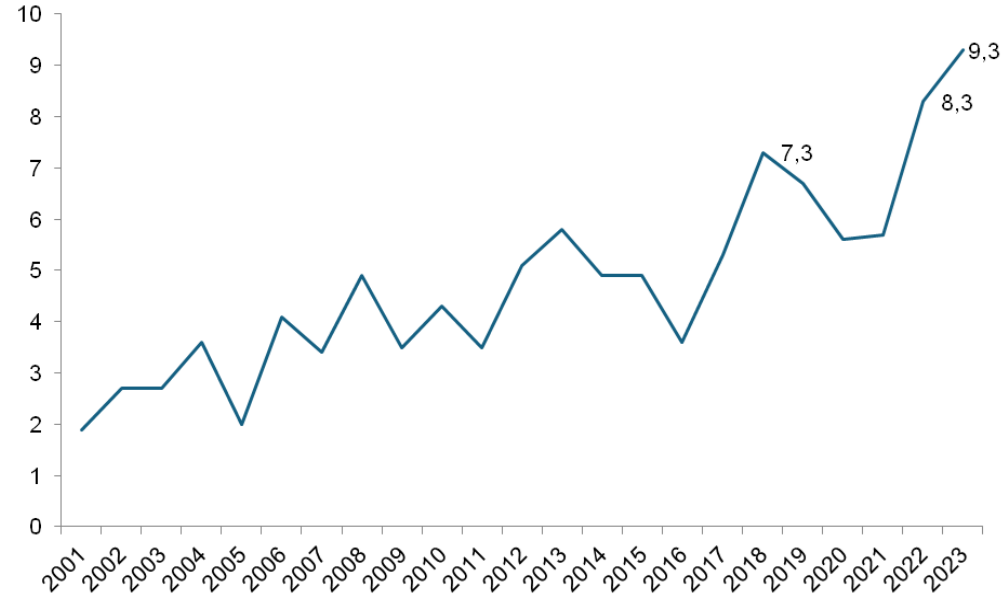
2. Inflation in Tunisia in the last two decades

Tunisia experienced a relatively stable price growth in the pre-2011 period when the annual inflation rate averaged 3.3 percent (in 2001–10). The rate climbed to 5.3 percent between 2011 and 2020, and further to 7.7 percent from 2021 to 2023 (Figure 1). The high inflation rate in the latter period mirrored trends observed in many countries worldwide following the COVID-19 pandemic. The inflationary surge in Tunisia began in mid-2021 with the post-COVID-19 supply chain bottleneck, and it was further intensified by the war in Ukraine.

On a quarterly basis, year-on-year inflation rose from 4.9 percent in the first quarter of 2021 to 8.3 percent in the fourth quarter of 2023, peaking at 10.3 percent in the first quarter of 2023. Since then, inflation has dropped to 6.2 percent in December 2024 and further to 5.7 percent by the end of February 2025. Given Tunisia's reliance on oil and food imports, inflation remains a significant concern, particularly during periods of limited economic growth. Core inflation, which excludes food and energy products, also increased in the same period, rising from 5.6 percent to 7.5 percent, with a peak of 7.9 percent in the first half of 2023. It then declined to 6.3 percent in December 2024 and 5.7 percent in February 2025. This is partly explained by the subsidization of food and energy products, such as wheat and its derivatives and energy products.

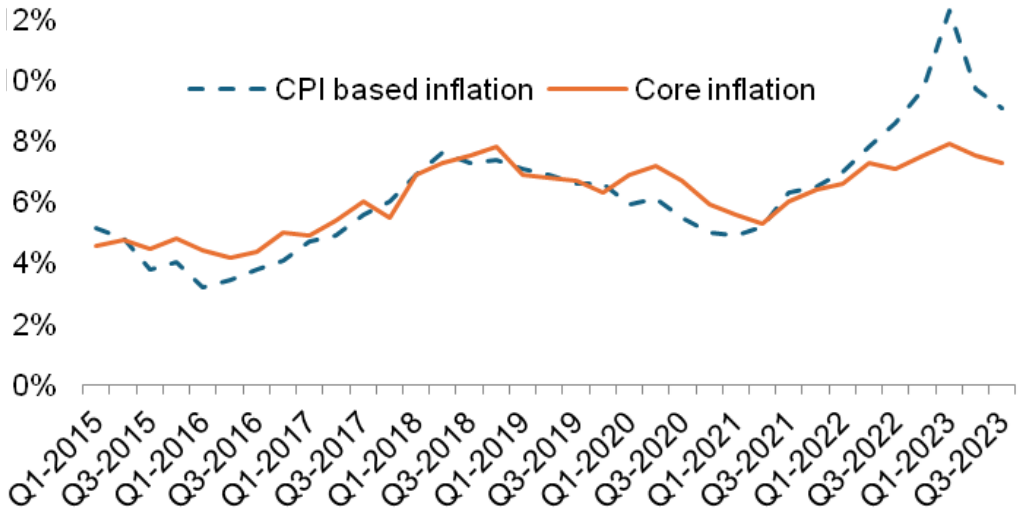
As shown in Figure 2, core inflation generally exceeded headline inflation (CPI-based inflation). However, at the end of the first half of 2021, headline inflation began to outpace core inflation, reflecting faster increases in administered prices compared to non-administered prices. Particularly, in May 2021, electricity tariffs were adjusted to impose higher costs on large consumers.

Figure 1. The rising inflation rate (CPI-based inflation)



Source: National Institute of Statistics of Tunisia.
Notes: Annual percent change

Figure 2. Since 2021, inflation measured by the CPI has exceeded core inflation



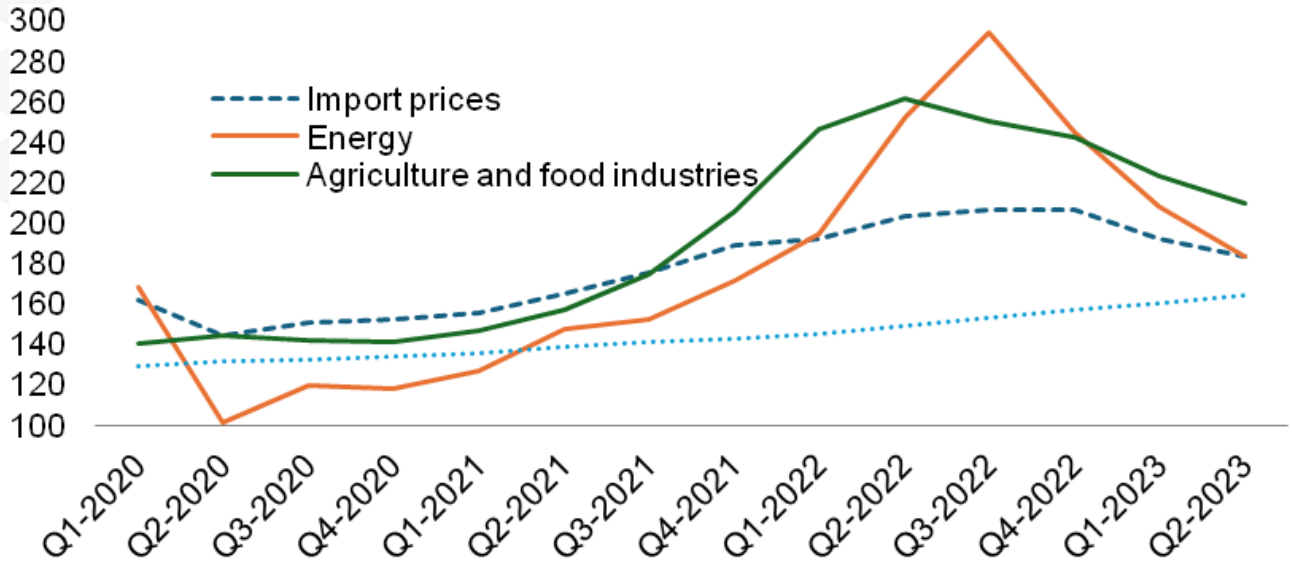
Source: Central Bank of Tunisia.
Notes: Annualized percent change

Furthermore, between February 2021 and November 2022, there were eight successive increases in fuel prices.

Following the rally in global commodity prices, the sectors most affected by rising import prices were energy and food products, as shown in Figure 3. Between the third quarter of 2021 and the third quarter of 2022, import prices rose by 17.3 percent, with energy prices surging by 92.7 percent and agricultural products (which include a large share for cereals) increasing by 43.7 percent. In contrast, the CPI rose by only 8.6 percent during the same period.

A portion of this imported inflation permeated the domestic economy through higher input costs (a second-round effect). From September 2021 to September 2023, the CPI increased by 18.9 percent, driven by significant increases in food prices (29.3 percent), electricity prices (15.1 percent), and fuel prices (18.8 percent). These categories, which account for one-third of total household consumption, contributed to nearly 50 percent of inflation over the past two years, despite subsidies on these products. The rise in food prices outpaced the increase in energy prices, especially in 2023.

Figure 3. Energy and food products were most affected by rising import prices in 2022-23



Source: National Institute of Statistics of Tunisia.
Notes: Price levels, 2015=100

3. Data and methodology

A novel decomposition of the Consumer Price Index (CPI) in Tunisia from 2002 to 2023 is applied here to identify the main drivers of inflation. By leveraging the supply-side decomposition of income, the analysis estimates that profits per unit of capital have been the largest source of inflation throughout the period in Tunisia. That was particularly evident during the latest inflation episode (2021-23), when profits accounted for most of the price growth, substantially more than import prices and wages.

Building on Blanchard (1986), we follow the methodology introduced by Hansen et al. (2023) to perform a new decomposition of inflation in Tunisia during the period 2002-23. The original framework in Blanchard (1986) and followed by Hansen (2023) explains inflation through the prism of the supply side of the economy. In this perspective, inflation can be thought of as a product of distributional conflicts whereby different economic actors want to increase their prices relative to others.

The idea of the decomposition is to allocate the overall changes in the prices of goods and services consumed in the economy to each production factor. This is possible by decomposing the GDP deflator (nominal GDP relative to real GDP) into the sum of unit labor costs (wages per unit of production), unit profits (profits per unit of production), and taxes net of subsidies per unit of production.

GDP deflator = Nominal GDP / Real GDP = Unit wage + Unit profit + Unit tax net of subsidies.

We further decompose the weight of the unit wage as well as the unit profit into two parts to separate productivity from the pure rent effect on inflation for each production factor. By dividing and multiplying the first term by employment, the unit labor cost can be decomposed into wages per worker and labor productivity. Similarly, by dividing and multiplying the profit per unit produced by the capital stock, the unit profit can be decomposed into capital productivity and profit per unit of capital, which reflects capital rents.

We use this decomposition of the deflator to derive the components of inflation based on the CPI. To do so, we add the foreign contribution, i.e., changes in import prices to the GDP deflator. Inflation rate based on the CPI can be decomposed into unit labor cost plus unit profit, using GDP at factor cost, as the domestic component, to which the share of taxes net of subsidies and a foreign component (import prices) are added.

This decomposition is then adjusted to break down the consumer price inflation, noticing that the latter is equal to the GDP deflator plus the foreign contribution, i.e., import price changes:

$$lnp_s - ln\widehat{p_s} = \frac{\frac{L_s}{y_s} - \frac{L_s}{\widehat{y_s}}}{\widehat{p_s}} + \frac{\frac{F_s}{y_s} - \frac{F_s}{\widehat{y_s}}}{\widehat{p_s}} + (lnp_s^I - ln\widehat{p_s^I})\lambda_s + changes\ in\ net\ taxes$$

Where the symbol ^ denotes the value of the variable the year before; p_s is price in sector s at time t; L is wage, F is profit, y is GDP, $p_s^I p_s^I$ is import price in s, and $\lambda_s \lambda_s$ is the share of imports in consumption in the sector.

In order to implement this decomposition of consumption inflation, we need four sets of data: (i) nominal and real GDP by sector; (ii) nominal wages and sectoral profits; (iii) the share of domestic gross value added in sectoral consumption; and (iv) sectoral taxes, net of subsidies. After accounting for domestic components, the residual can be attributed to the foreign contribution through import prices. For Tunisia, data for (i) and (ii) are sourced from the national accounts published annually by the National Statistical Institute (INS); data for (iii) are obtained from the OECD's TiVA (Trade in Value Added) database; and data for (iv) are derived from various IOT (input-output tables of the Social Accounting Matrix).

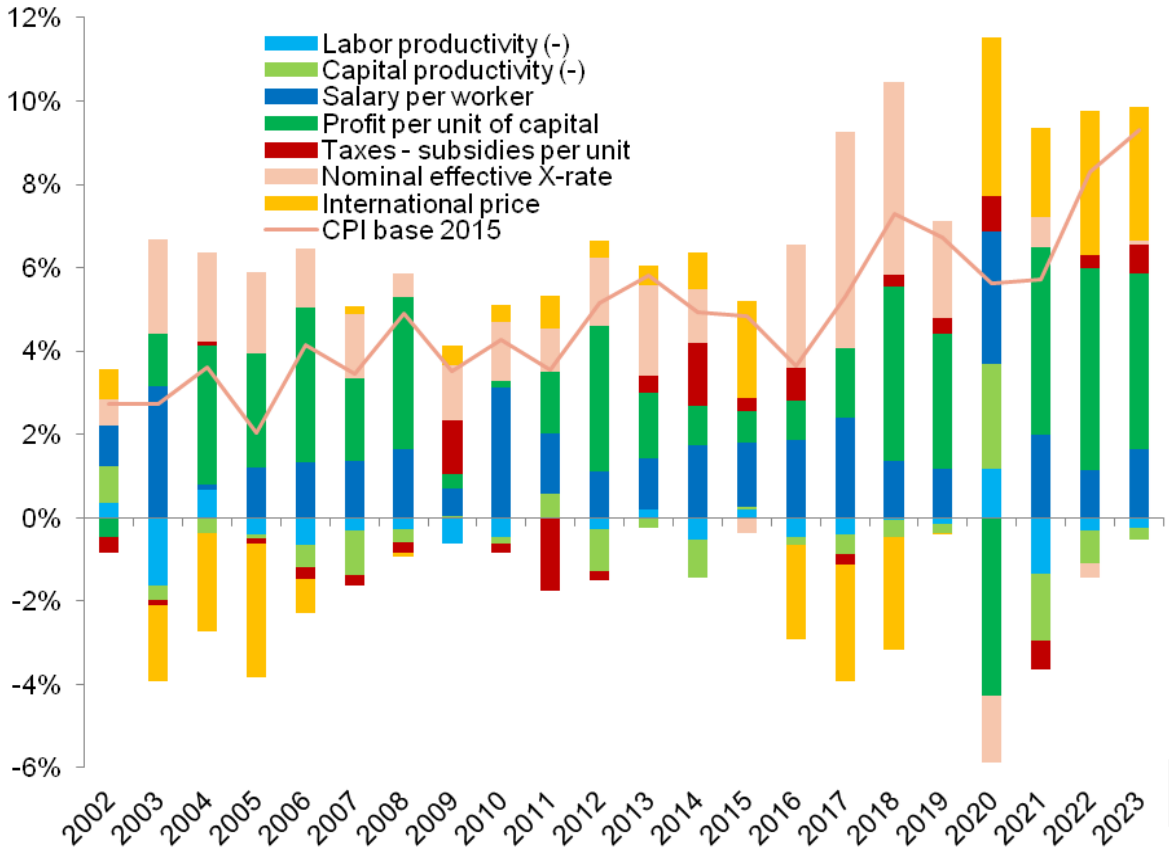
4. Results

The results of the decomposition are shown in Figure 4. After 2020, profits per unit of capital accounted for the largest share of annual inflation, averaging 61 percent. Import prices represented approximately 38 percent, while wages contributed only 21.9 percent. At the same time, marginal increases in capital and labor productivity contributed negatively to inflation, accounting for, on average, -13.7 percent and -10.0 percent of price growth over the same period. The increase in profits hiked prices by 4.9 and 4.2 percentage points in 2022 and 2023, respectively. Capital contribution is significantly larger than that estimated by Hansen et al. (2023) for the Eurozone in 2022, who found that capital rent accounted for around three percentage points (relative to an inflation rate of 6.5 percent over this period).

Profits had a major role in explaining inflation throughout most of the past two decades. The exceptions have been the crisis periods, including the post-revolution period (2011) and the COVID-19 pandemic (2020), when economic activity sharply declined. The substantial contribution of import prices to inflation between 2020 and 2023 stems primarily from the rising global commodity prices discussed above.

Figure 4 also shows that the increase in prices from entrepreneurs' profits has not been accompanied by

Figure 4. Profits per unit of capital accounted for most annual inflation post-COVID-19



Source: Authors' calculations based on the data from National Institute of Statistics of Tunisia.
Notes: Annual percent change in price levels, decomposed by underlying factor

improvements in productivity (both labor and capital) including during the latest inflation episode. As a result, productivity had only a minimal inflation-reducing impact. The productivity improvement effect, which is supposed to lower inflation, explains why the total contribution of the positive drivers of inflation—namely profits, wage costs, and import prices—exceeds 100 percent.

The results suggest that businesses may have been more resilient to the shock than workers. One reason for this may be that prices are more flexible than wages—companies can quickly adjust prices to protect their profitability, while wages are more rigid due to prior wage negotiations. Another reason may lie in the ability of companies to form alliances and concentrate activity in the hands of a small number of economic operators, which can provide firms with significant market power. The next section provides some suggestive evidence of the extent to which such market power may drive this prominent capital rent effect on inflation.

4.1. Inflation across the income distribution

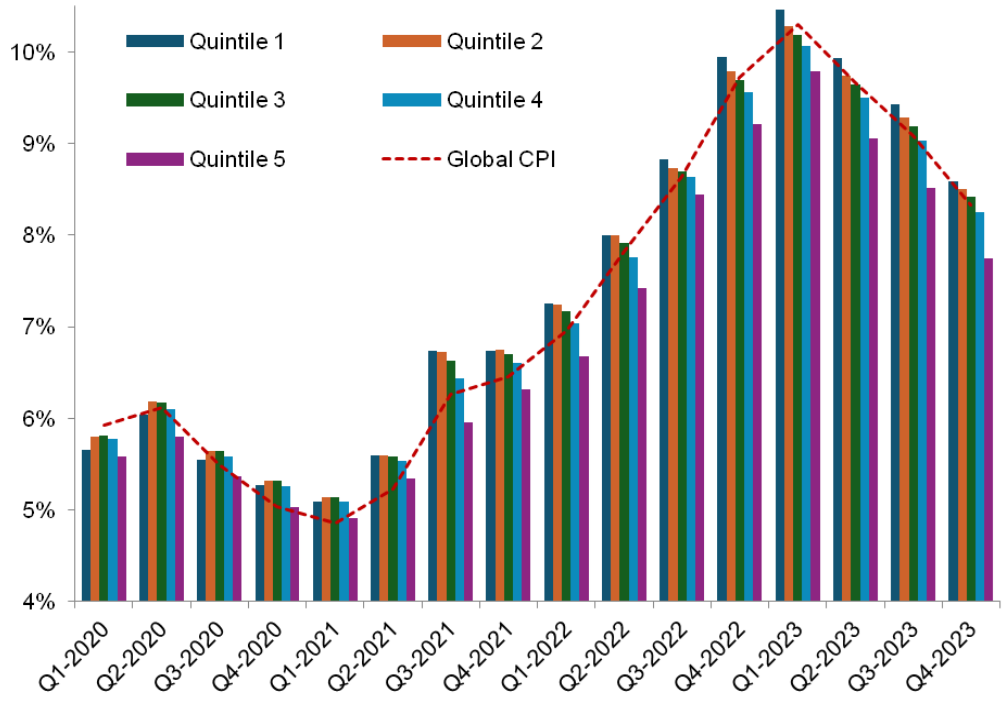
A relevant complementary question is how the impact of the latest post-COVID-19 inflation episode is felt across the income distribution. To address the question, we use household survey data from 2015 (the latest pre-COVID-19 data available) to identify the consumption basket by population quintiles of consumption. We then re-compute the average inflation by quintiles according to the distribution of their consumption across categories of products.

The results show that the incidence of price inflation was regressive in 2021-23, with the extent of inflation declining as one moves from the poorest to the richest quintiles of the consumption distribution (Figure 5). That is especially pronounced since the third quarter of 2021. This reflects the fact that the prices of goods and services consumed more heavily by poorer households increased more than the average. A case in point is the food, beverages, and tobacco product group, which accounts for 41.2 percent of the consumption basket of the bottom quintile, compared to only 26.2 percent for the top quintile. In 2021-23, the price of this product group increased by 10.5 percent relative to an average annual inflation of 7.8 percent for all products combined. This contrasts with the price evolution of other product categories more heavily consumed by the top quintiles of the income distribution, such as housing, water, gas, electricity, and other fuels, which experienced an average annual inflation of only 5.6 percent in 2021-23.

5. Inflation and market concentration

In this section, we investigate the relationship between capital rent in prices and market concentration. This is arguably one of the key factors that could affect the extent to which price increases are driven by capital

Figure 5. The impact of inflation has been regressive after Covid



Source: Authors' calculations based on the data from National institute of statistics of Tunisia
Notes: Annual percent change in price levels, by quintile of the consumption distribution

rents. Indeed, the relationship between competition and prices is at the core of the establishment of competition authorities and industry regulators, as one of the key outcomes of industry concentration is the ability of economic agents to charge prices above the economically efficient level. An extensive body of literature has established a causal relationship between barriers to entry and industry concentration with market prices (e.g., Atkin et al., 2017).

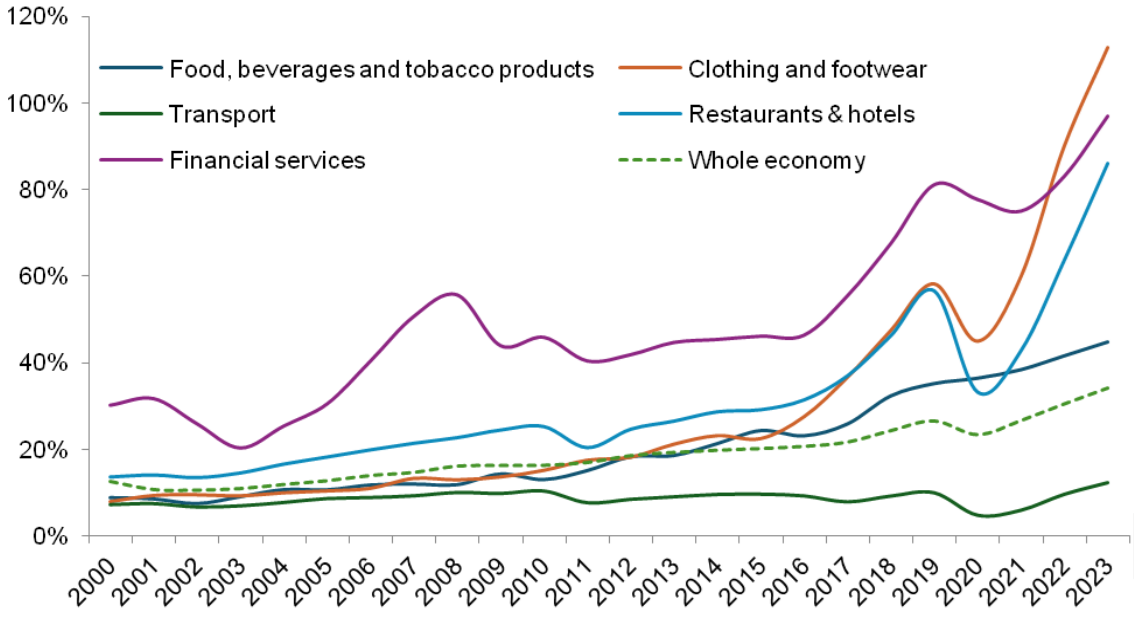
To test the relationship between profit per unit of capital and the different measures of market concentration, we run the analysis at the sectoral level over time. The macro nature of the data used to decompose inflation allows us to perform the decomposition only for five relatively aggregated sectors: food; finance; textile and clothing; hotels, restaurants, and cafes; and transport services, which are contestable markets. On the other hand, telecommunications and other public utilities (fuel, electricity, gas, and water) are markets dominated by state-owned enterprises which typically act as monopolists.

Figure 6 shows that in these sectors, particularly after 2010, profits per unit of capital invested played a larger role in explaining inflation than in the economy as a whole. Between 2000 and 2010, the share of profit per unit of capital in inflation was above the average in financial services and in the restaurants and hotels sector. Since 2011, the textile and clothing sector, along with the food sector, recorded profit shares per unit of capital invested above the national average. After 2020, in financial services, textile and clothing, and restaurants and hotels, capital rents explained most of the inflation rate.

We compute various measures of concentration at the sector-year level from administrative records on Tunisian registered firms, the *Registre National des Entreprises* (RNE). This data spans the universe of all private and public sector firms and includes information such as firms' four-digit economic activity, revenues, employment, and trade. We use the data to construct three main measures of concentration at the four-digit sectoral level (the finest possible disaggregation): (i) the market dominance index, i.e. the sum of squared differences in market share between consecutive firms in the four-digit sector; (ii) the Herfindahl-Hirschman Index (HHI) of market concentration, i.e. the sum of the squares of market share of each firm in the four-digit sector; (iii) the share of total revenue by the top 10 percent of firms by revenues within the four-digit sector. We then aggregate these measures at the sectoral level to match the inflation decomposition data by taking the average of the four-digit concentration measures within a macro sector, weighting each four-digit by its share in the sector's revenue in every year. We were only able to construct measures for the period 2000-21, as reliable data on RNE income is only available up to 2021.

Table 1 shows the descriptive statistics for the capital rent and concentration variables for the five sectors for the period of our analysis as well as for the revolution period (2011-21). On average, the capital rent increases

Figure 6. In the last years profit per unit of capital became a bigger driver of inflation in several sectors



Source: Authors' calculations based on the data from National institute of statistics of Tunisia
Notes: Share of profit per unit of capital in total inflation by sector

Table 1. Summary statistics for the variables in the analysis

	Obs	Mean	Std. Dev.	Min	Max
Capital Rent	110	0.25	0.18	0.05	0.81
Dominance	110	0.07	0.10	0.00	0.49
HHI	110	0.15	0.16	0.01	0.56
Share Top 10%	110	0.66	0.16	0.36	0.92
Post-2010					
Capital Rent	55	0.32	0.19	0.05	0.81
Dominance	55	0.08	0.11	0.00	0.49
HHI	55	0.15	0.16	0.01	0.56
Share Top 10%	55	0.65	0.17	0.36	0.92

Source: Authors' estimation.

prices in a sector by 0.25 percentage points per year, a value that increases to 0.32 for the post-revolution period. The variable shows considerable variation, with a range between 0.05 and 0.81. As it is typically the case, the dominance index is smaller than the HHI but both exhibit considerable variations with the standard deviation larger than the mean. Statistics remain fairly constant in the post-revolution period.

In the absence of plausible sources of exogenous variation in industry concentration, we are only able to explore the correlations between capital rent in prices and concentration. We do so by running the following regression:

$$I_{st}^{K} = \alpha_s + \gamma_t + \beta C_{st} + \varepsilon_{st}$$

Where $I_{st}^{K} I_{st}^{K}$ is the capital rent of inflation (measured in percentage points) in sector s in year t; α and γ are sector and year fixed effects, respectively; C is the concentration measure; and ε is the error term.

Table 2 reports the results, which show a positive relation between capital rent and concentration. The odd columns show that all three concentration measures have a positive relation with capital rent, although the share of the top 10 percent coefficient is not significant at standard levels. The result for the HHI suggests that an increase in HHI by one standard deviation is associated with an increase in the capital rent in the sector by 0.07 percentage points, or a 27 percent increase from the mean value. In the even columns, we restrict the analysis to the post-revolution period to check for meaningful changes in the relation following the overhaul of the political institutions after 2010. During this period, the positive relation becomes stronger and more significant. The coefficients of dominance and HHI more than double in magnitude and that of the share of the top 10 percent almost doubles, although it remains not statistically significant. The coefficient of HHI implies that a one standard deviation increase in concentration is associated with a 46 percent increase in capital rent relative to the post-2010 mean value. If causal, that would represent a substantial impact of market concentration on capital rents.

6. Conclusion

This study proposes a novel decomposition of Tunisia's CPI into its supply-side components from 2002 to 2023. The results suggest that over the entire period, profits

Table 2. The positive relation between industry concentration and inflation related to capital rent

	(1)	(2)	(3)	(4)	(5)	(6)
Period	**2000-21**	**Post-2010**	**2000-21**	**Post-2010**	**2000-21**	**Post-2010**
Dominance	0.382**	0.883**				
	(0.101)	(0.249)				
HHI			0.426**	0.935**		
			(0.113)	(0.306)		
Share top 10%					0.551	0.943
					(0.476)	(0.633)
Observations	110	55	110	55	110	55
R-squared	0.724	0.782	0.720	0.734	0.737	0.742
Number of industries	5	5	5	5	5	5

Source: Authors' estimation.
*Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is the percentage point price inflation in the year linked to capital rents. Every regression includes sector and year fixed effects. Regressions span the period 2000-2021 unless otherwise indicated. The sectors include: food, finance, textile and garments, hotels, restaurants and cafe, transport services.*

per unit of capital accounted for the largest share of inflation, particularly during the post-COVID-19 years, when they accounted for close to two-thirds of overall inflation. Import prices, driven primarily by rising international prices, contributed another 38.2 percent, while wages accounted for only 21.9 percent of inflation in 2021-23. During this period, inflation had a regressive impact, as it weighed more heavily on poorer than richer households. Since the former rely more on labor income than the latter, they lose out twice from inflation: as workers and as consumers.

The analysis also reveals a strong correlation between profit-driven inflation and market concentration. Particularly in post-revolution years, market concentration across sectors and time was associated with a higher contribution of capital rents to inflation. While the data do not allow us to test for causality, the relation we find is suggestive of the role of fostering policies to promote competition and trade to combat inflation.

References

Atkin, D., Faber, B. and Gonzalez-Navarro, M. (2018), Retail Globalization and Household Welfare: Evidence from Mexico. Journal of Political Economy, 126(1): 1-73

Blanchard O. (1986) The Wage Price Spiral, The Quarterly Journal of Economics, 1986, vol. 101, issue 3, 543-565.

Hansen, N.-J., Toscani, F. and J. Zhou (2023), Euro Area Inflation after the Pandemic and Energy Shock: Import Prices, Profits and Wages, IMF Working Paper 23/131.

ERF at a Glance: *The Economic Research Forum (ERF) is a regional network dedicated to promoting high-quality economic research for sustainable development in the Arab countries, Iran and Turkey. Established in 1993, ERF's core objectives are to build a strong research capacity in the region; to encourage the production of independent, high-quality research; and to disseminate research output to a wide and diverse audience. To achieve these objectives, ERF's portfolio of activities includes managing carefully selected regional research initiatives; providing training and mentoring to junior researchers; and disseminating the research findings through seminars, conferences and a variety of publications. The network is headquartered in Egypt but its affiliates come primarily from different countries in the region.*

Contact Information

ERF Office
Address: 21 Al-Sad Al-Aaly St. Dokki, Giza, Egypt
PO Box 12311
Tel: +202 333 18 600 - 603
Fax: +202 333 18 604
Email: erf@erf.org.eg
Website: http://www.erf.org.eg

Follow us

economic-research-forum *ERFlatest* *TheERFLatest* *www.erf.org.eg*