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Determinants of Inflation in Agriculture, Food Industry and Commercial Sector

SUMMARY

Unfortunately, the years 2022 and 2023 will become „famous” in economic history publications for the runaway inflation in the domestic economy. However, the process was determined by several factors, one glaring example being the extremely high food price inflation. The aim of our study is to investigate the evolution of profit margins and margins of companies operating in the domestic agricultural, food and retail sectors between 2014 and 2021, based on the study by Konczal, M., & Lusiani, N. (2022). The research objective is thus to test the extent to which the factors that contribute to the profit-price spiral that drives inflationary effects increased after the pandemic. Our hypothesis is that, in the wake of the pandemic, companies in the sectors studied significantly increased the two variables determining profitability, which subsequently contributed to a dramatic increase in food prices. In addition, we examine how the value added of the sectors under study has changed, where we hypothesise that the companies in the sectors under study have sought to compensate for the impact of the previous significant wage dynamics.

Keywords: sector analysis, EBITDA margin, spreads, covid pandemic, greedflation

Jel-codes: E27, E31, E32

INTRODUCTION

The study analyses the causes of domestic inflation in three sectors. These sectors are agriculture, food and retail trade. The main objective of the research is to test, from the data available up to 2021, the extent to which the EBITDA margin and markup in the sectors under study have been affected by the significant increase in inflation in 2022.

Literary Review

One way of thinking about inflation is that as prices rise, the value of money falls. However, the price of a good or service is influenced by many factors, including basic supply and demand conditions. While low rates of inflation (around 2%) are seen as a sign of a healthy economy, higher rates are harmful - they increase costs and also risk making a country's exports uncompetitive (O'Neill, et al., 2017)

There are several factors that can be responsible for the evolution of inflation rates, among which a distinction should be made between demand-side and supply-side factors. (Czczeli, et al., 2023) Complex crises are characterised by the co-existence of supply-side (cost inflation) and demand-side inflation. (Matolcsy, 2022) (Lagarde, 2022) Cost inflation is caused by an increase in the price of inputs used in production, which makes

it more expensive to produce the product. This includes not only the increase in the cost of inputs, but also the increase in wages. The latter is typical in economies where the bargaining power of workers is increasing (Lagarde, 2022).

Businesses need to monitor their costs closely. There are two ways in which they can offset increases in input, labour and other production costs, either by producing more efficiently (but this usually requires investment) or by simply passing them on to consumers. Generally speaking, volatile prices are a challenge for businesses and can lead to firms restraining their investment decisions, and some low-margin businesses may be threatened by the resulting economic conditions (O'Neill, et al., 2017).

One of the most severe inflation crises in decades is prompting a search for explanations. Possible causes include: disrupted supply chains due to Covid-19, governments spending too much and rising wages. But a surge in corporate margins is another possible cause that deserves attention. (White, 2023) Most EU member states have described the resulting inflation as supply-side. (Czczeli, et al., 2023)

Recently, the profit inflation argument has received a lot of attention. The essence of profit inflation is that firms have taken advantage of pandemic and war-related supply chain bottlenecks and pressure on energy prices to raise the prices of their products, thereby further contributing to pandemic inflation and causing windfall profits. (Matamoros, 2023) That is, firms have raised their own prices more than necessary to cover up for widespread price increases, thereby increasing inflation.

We often hear that energy prices are blamed for inflation. This is why the IMF's Eurozone Inflation Report has also addressed the issue. The part of economic growth that is due to price increases is expressed in terms of the GDP deflator. It was found that the magnitude of the increase in the GDP deflator following the current energy crisis was similar to the first oil price shock in the 1970s, but the composition was different. Following the first oil price shock (1973), GDP deflator growth increased significantly, almost exclusively due to accelerating labour costs, while firm profits declined. The magnitude of the current increase in the GDP deflator inflation rate is similar to the first oil price shock, albeit from a much lower inflation baseline (Hansen, et al, 2023) Moreover, history has made it clear that workers and their wages are not a threat to price stability. (Matamoros, 2023) Currently, profits have played a larger role than labour costs so far. (Hansen, et al., 2023)

Profit-price spiral, also known as greedflation, explains what has happened. The basic idea of greedflation is that companies

deliberately trigger inflation to raise their prices, thereby maximising their profit margins, and this generates even further increases, i.e. an endless upward spiral.

Analysts who doubt the inflationary effects of the profit-price spiral argue that in an inflationary environment, profits naturally increase, but it does not follow that inflation is caused by profit increases (Smolyansky, 2023).

The average profit margin of US companies increased from 1% to 8% between 1980 and 2014. (De Loecker, et al., 2020) Historically, there was a unique margin movement across industries in 2021, with pre-global profit margins increasing between 1.6 and 2.7% in 2021. (Konczal & Lusiani, 2022) Many of the largest consumer-generic S&P 500 companies admitted to benefiting from increased prices as their net profits increased year over year. These companies have used their increased earnings for shareholder payouts and dividends, as well as share buybacks and even acquisitions (Buchholz, 2023).

In order to understand the processes behind the increase in after-tax (net) profits, it is necessary to look at the evolution of gross profit (EBIT - earnings before interest and tax), depreciation and amortisation (EBITDA - earnings before interest, tax and depreciation), interest expense (interest) and effective income tax (tax) (Smolyansky, 2023)

Macroeconomic Situation

Inflation in the European Union was 1.6% at the end of 2019, compared with 4.1% in Hungary. This inflation level was boosted by several factors by 2022, the most significant of which were the increase in energy prices, the rise in food prices and the exchange rate. In Hungary, inflation increased from 4.1% at the end of 2019 to 38.01%, of which 15.32% was due to the increase in food prices and 8.82% to the increase in energy prices. Over the same period, EU inflation rose from 1.6% in 2019 to 16.48% in 2022. For the European Union, the largest inflation-increasing item was the increase in energy prices, which led to an increase in inflation of around 8%, while the increase in food prices contributed only 3.85% to the increase. It can be seen that the main factor behind the 38% inflation in Hungary was the increase in food prices (Figure 1).

METHODS

Konczal, M., & Lusiani, N. (2022) examined market markups in the United States between 1955 and 2021. Their study was based on and improved the methodology of De Loecker et al. 2020, which interpreted market markups as the ratio of sales revenue to the value of goods sold (hereafter: PVP) with some adjustment factors. The authors examined three aspects, the evolution of firm size and mark-ups, the movement of mark-ups in the sectoral dimension and the predictive factors affecting the 2021 mark-ups. The US example showed that premiums calculated using the De Locker et al 2020 methodology increased significantly despite the pandemic. In particular, spreads for firms with the highest spreads in the historical period increased strongly, with sectoral increases in the financial sector, oil, and real estate. We formulated the research question of our study by testing the study by De Locker et al (2020) and Konczal - Lusiani (2022) in a domestic setting. Research question: did companies use their market power in their pricing policies, i.e. did the higher profit expectations of companies contribute to inflationary effects. In this context, we formulated our hypothesis that, as in the US study, the increasing profitability of companies may have contributed to the increase in inflation from 2021 onwards. Our sample was drawn from the Orbis database and included companies that filed annual reports in Hungary in each year between 2013 and 2021. The criteria for this were set in accordance with Act C of 2000, i.e. turnover of HUF 2.4 billion, balance sheet total of HUF 1.2 billion, and number of employees of more than 50, of which at least 2 criteria were met in each year. For our analysis we used a panel approach, i.e. only firms with data available for each year were considered. This gave us a total of 313 companies. The sample cannot be considered representative, but it covers a significant proportion of companies filing annual accounts.

The variables examined were:

- Markups (Net sales / Cost of goods sold - Sales/COGS)
- EBITDA margin (Operating profit after depreciation and amortisation / Net sales)
- The time horizon for the study was set at 2013-2021.

The research question was answered based on descriptive statistics and analysis of variance.

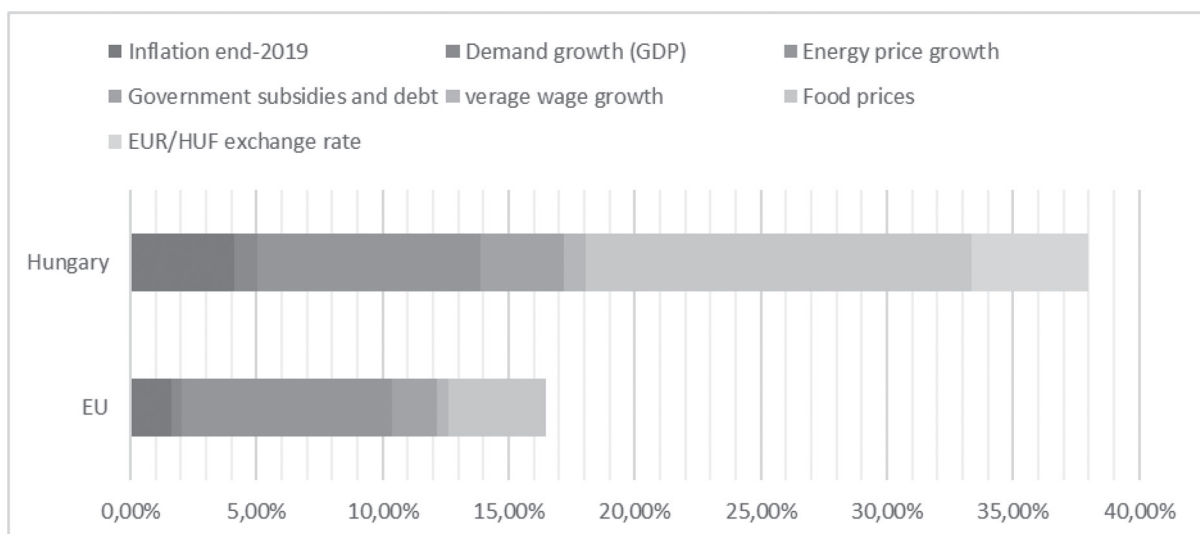


Figure 1. Components of inflation in Hungary and the EU 2019-2022

Source: Own calculation based on Eurostat and Hungarian Statistical Office

RESULTS

In this section, we assess the EBITDA margins of the three sectors separately, assessing the mark-up that determines the retail margin, broken down by quartile and by the top and bottom 10%. Finally, we test the variance of the EBITDA margin across the three sectors using a multivariate analysis of variance. Figure 2 shows the evolution of the EBITDA margin in agriculture from 2013 onwards. From the analysis of the data, we can see that the margin decreased until 2016. From 2017 to 2019, the margins decreased again, but from 2020 onwards, the margin started to increase above the upper quartile, but decreased below the median. When looking by firm size, it was found that the smaller the firm, the higher the margin in agribusiness.

The Figure 3. shows the evolution of profit margins in the food industry. According to the data, 2015 was a successful year in several quartiles and percentiles, while from 2016 onwards there is a steady increase in profit margins, except for the bottom percentile (p10), where there is a steady decline in the data. In contrast to agriculture, in this sector pandemics have not had a significant upward impact on food margins. Also in this sector, the lower a firm is, the higher the profit margin it tends to earn.

The EBITDA margin of the commercial sector is shown in Figure 4. Until 2018, EBITDA margins increased in most quartiles and percentiles, from 2019 onwards profit margins are expected to decrease due to higher wage dynamics. From 2020 onwards, an interesting trend emerges (except for the bottom quartile). The evolution of profit margins in the commercial sector follows the evolution of profit margins in the agricultural sector, with a one year lag. This is particularly evident for the top 10%, the top quartile. At the median, we observe a larger increase in profit margins for agribusiness, while the bottom percentile also shows a larger increase in commercial sector profit margins than the bottom percentile for agribusiness.

The Figure 5. shows the mark-ups in the retail sector, as this indicator is the dominant one in this sector. The data show that from 2013 onwards, there has been a continuous increase in most quartiles and percentiles. Thus, in contrast to the studies by Konczal and Lusiani (2022), Hungary has not seen a significant increase in mark-ups, with the rate of increase matching the trends.

Our findings were also tested using multivariate statistical methods in two dimensions, one for firm size and the other for sectoral characteristics. No significant difference was found for sectoral characteristics, so this is not reported. However, for firm size, the smaller the firm, the higher the EBITDA margin and the higher the

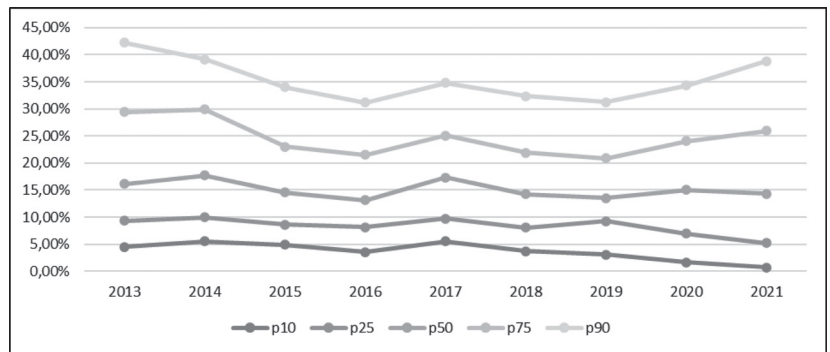


Figure 2. EBITDA margin of Agriculture (n=193)

Source: Own calculation

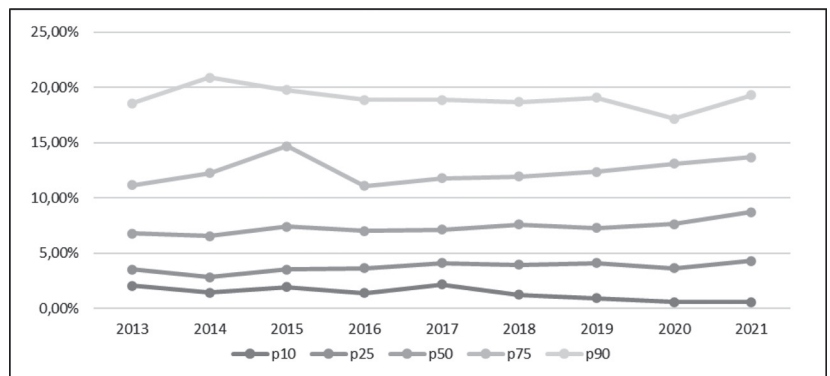


Figure 3. EBITDA margin of Food Industry (n=90)

Source: Own calculation

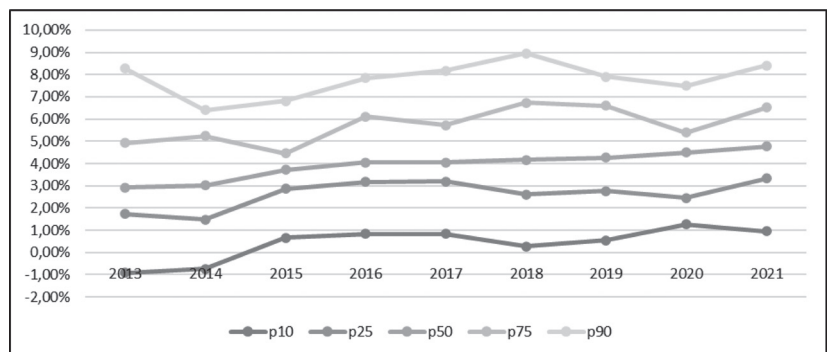


Figure 4. EBITDA margin of Commerce (n=30)

Source: Own calculation

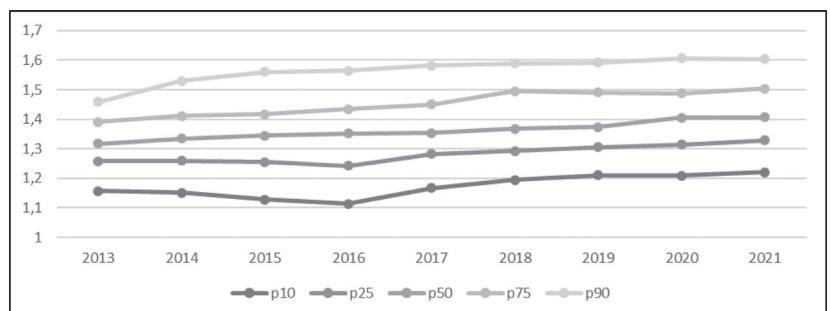


Figure 5. Markups of Commerce

Source: Own calculation

Table 1. F-test statistics

ANOVA		Sum of Squares	df	Mean Square	F	Sig.
Marg_EBITDA21	Between Groups	0,68	2	0,34	14,416	0,000
	Within Groups	7,331	311	0,024		
	Total	8,01	313			
Marg_EBITDA20	Between Groups	0,706	2	0,353	26,485	0,000
	Within Groups	4,147	311	0,013		
	Total	4,854	313			
AVGMarg_EBITDA19_13	Between Groups	0,788	2	0,394	38,796	0,000
	Within Groups	3,158	311	0,01		
	Total	3,946	313			

Source: Own calculation

mark-up. No significant differences were found for mark-ups and sectoral characteristics. For this indicator too, the highest mark-ups for the years under consideration were found in the agricultural sector (average of 13-19, mark-ups in 2020 and 2021). For the EBITDA margin, the analysis revealed significant differences in three of the periods examined, based on the significance level of the F-test. The test conditions were met and the variables were suitable for analysis of variance. (Table 1.)

Figure 6 shows that the highest profit margin in 2021 was observed in the agricultural sector, followed by the food industry. The retail sector is shown to have the lowest profit margin.

In addition to the average figure, a statistical test, a post-hoc test, was also used to examine between which sectors a significant difference in value could be detected. Using the most conservative Scheffé test, it was found that in 2021 the EBITDA margin was significantly different for agribusiness compared to retail and food, while there was no difference between commerce and food industry.

CONCLUSION

The sharp rise in food prices played a significant role in inflation in 2022. There are three main sectors that can have

a significant impact on this, and we have examined the evolution of EBITDA margins for these sectors, testing the extent to which the profit inflation and mark-up increases seen in the US example contributed to the significant price increase. Our analysis found that the EBITDA margin of the agricultural sector was the highest in the time series examined, which in itself is certainly not a detrimental trend. However, the fact that, following the pandemic, the profitability of the retail sector, and consequently its prices, significantly trailed the profit margin in agribusiness, suggests that operators passed on the input side of the price increase to consumer prices. It is observed, but not significant, differences in firm size and EBITDA margin, but it is clear from the data that the smaller the firm, the higher the profit margin it can achieve, so it is mainly the smaller firms that have experienced a significant increase in profits due to the pandemic and the drought in the agricultural sector. An important message of the study is that companies are able to maintain their profitability and pass it on to other actors in the supply chain. In addition, it is perceived that they are using their cost increases as a further hedge to further increase their prices.

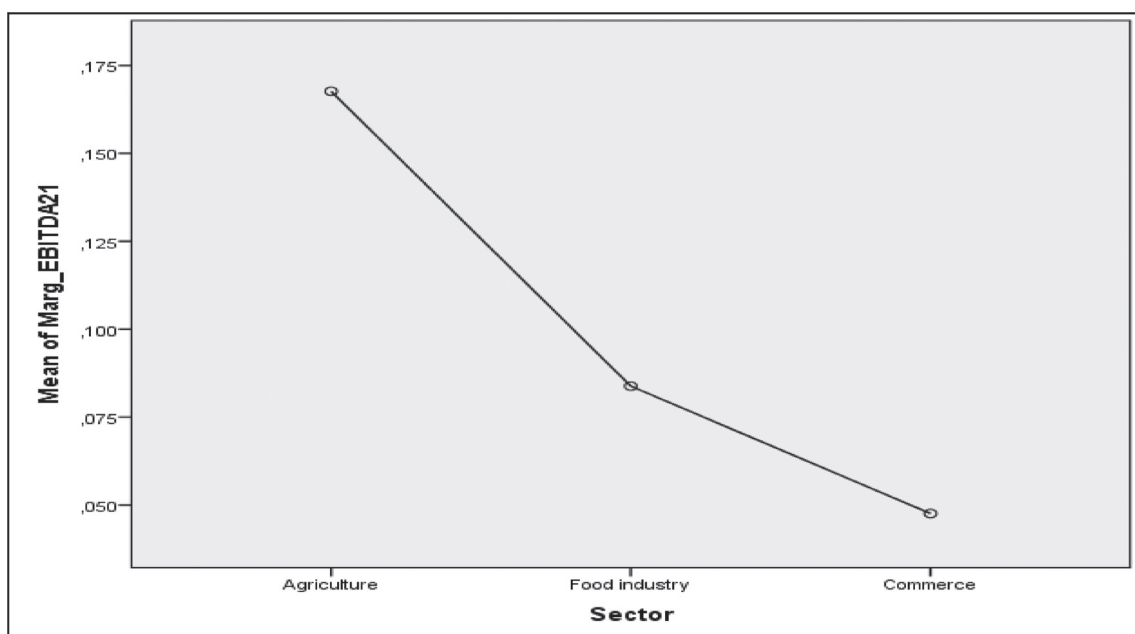


Figure 6. Markups of Commerce

Source: Own calculation

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