

# Nowcasting Food Inflation using Online Prices

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# CEFIS Daily Online Price Indices

We collect web-scraped food price data, with daily frequency, from five major online retail chains in Turkey from July 2018 to present and compute food price indices.

The screenshot shows a web browser displaying the CEFIS Daily Food Price Indices application. The browser address bar shows the URL `cefis-food-indices.streamlit.app`. The page title is "CEFIS Daily Food Price Indices". On the left, there is a sidebar menu with the following options:

- Select Figure Options
  - Choose whether figures are displayed in daily or monthly frequency: **Daily**
  - Choose whether figures are displayed in levels or growth rates: **Level**
- Select Indices
  - Choose the subindex for the upper figure: **Antep Fıstığı (Pistachio)**
  - Choose the upper figure type: **Price Index**

The main content area contains the following text:

## CEFIS Daily Food Price Indices

The [CEFIS](#) Food Price Indices are a result of an extensive data collection process, where we gather daily food price data from five major online retail chains in Turkey. This process, which has been ongoing since July 2018, allows us to extract a vast amount of price data each day. We follow the procedure established by the Turkish Statistical Institute (TurkStat), classifying the prices into one of the 131 food and non-alcoholic beverages subcategory provided by TurkStat. For each subcategory, we take the geometric average of all prices in that subcategory each day. After obtaining geometric prices, we index all subcategories using the base period January 2020 = 100. In cases where we were unable to collect data, we use linear interpolation to estimate the values of missing observations. After forming 131 daily food subindices, we multiply the subindex weights used by TurkStat by our daily subindex values to obtain our daily main food index. For more information on our methodology, please see our [methodology page](#).

In this dashboard, we display the subindices that are used to create our main food index in the upper figure. You can choose any subindex or its associated price level using the left menu. We also display the main food index and the competing index in the lower figure. You can also choose the competing index using the left menu.

You can download all our data as excel file [here](#).

**The November 2023 month-on-month CEFIS food inflation is 11.48% (Day Adjusted).**

**The November 2023 year-on-year CEFIS food inflation is 73.51% (Day Adjusted).**

# Using data up to the end of December 2020, we have published one article

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## Nowcasting Turkish Food Inflation Using Daily Online Prices

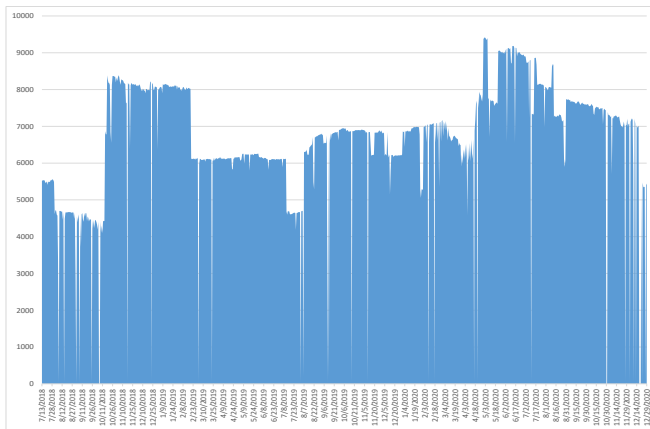
[Barış Soybilgen](#) , [M. Ege Yazgan](#) & [Hüseyin Kaya](#)[Journal of Business Cycle Research](#) **19**, 171–190 (2023) | [Cite this article](#)**158** Accesses | **1** Altmetric | [Metrics](#)

### Abstract

This study uses a sample of daily food prices scraped from retail chains' websites for the period from July 2018 to December 2020, comprising over 5.9 million data points. Using these food prices, we construct 132 food price subindexes compatible with official data published by the Turkish Statistical Institute (Turkstat), which are published only once a month. We then use the online food price subindexes to calculate the primary food inflation rate. We find that

## Number of prices collected each days

We first focus on the results of the paper (up to December 2020).  
Then we show more recent results.



# Product Categories

Table 1: Number of prices collected for each product group

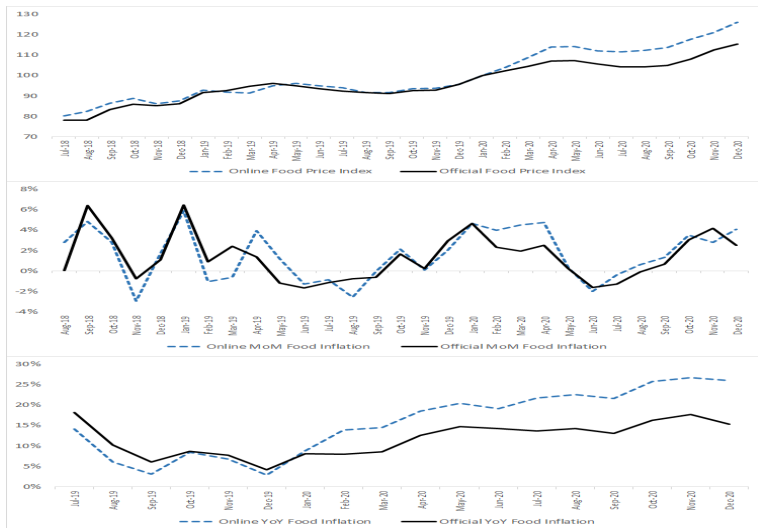
Product	Daily		Monthly		Product	Daily		Monthly	
	mean	median	mean	median		mean	median	mean	median
Pistachio	17.9	18.0	537.7	536.5	Canned vegetables	134.7	136.0	4045.9	4022.0
Pear	10.1	11.0	303.1	317.0	Cracker	46.8	35.0	1404.5	1063.0
Sun-flower seed	11.4	12.0	341.2	349.5	Cream cheese	53.4	56.0	1603.2	1620.5
Sun-flower oil	74.6	76.0	2241.4	2296.0	Dry bean	20.0	22.0	601.0	645.0
Ayran	58.4	62.0	1753.1	1823.5	Dried apricot	12.8	13.0	385.1	366.5
Quince	3.3	4.0	99.9	104.0	Onion	16.3	17.0	488.9	496.0
Almond	25.7	26.0	770.4	754.5	Lamb	25.9	26.0	778.1	750.0
Condiment-spices	200.9	208.0	6033.9	5955.5	Roasted chick-pea	33.7	34.0	1012.6	1004.5
Dessert	7.9	8.0	237.6	240.0	Lemon	6.3	7.0	189.3	207.5
Honey	83.4	73.0	2504.1	2201.0	Turkish delight	22.3	21.0	671.0	638.5
Fresh fish	8.3	8.0	248.6	235.5	Mineral water	49.6	53.0	1488.6	1579.5
Baby food	14.2	13.0	425.8	401.0	Macaroni	183.9	207.0	5521.9	5844.0
Cabbage	3.6	4.0	109.2	98.0	Tangerine	3.8	3.0	113.6	104.5
White cheese	105.2	92.0	3158.8	2841.5	Mushroom	5.6	5.0	168.2	152.0
Biscuit	196.6	154.0	5904.1	4763.5	Margarine	77.2	80.0	2319.3	2398.0

## Replication of Turkstat Food Index

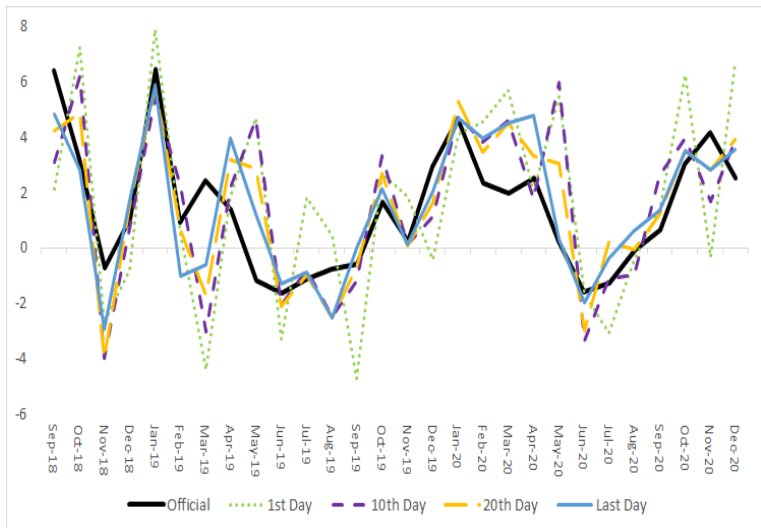
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We replicate Turkstat's procedure by using online prices to construct food subindexes. For each subcategory, we take the geometric average of all prices in that subcategory each day. After obtaining geometric prices, we index all subcategories using the base period January 2020 = 100. After forming 132 daily food subindexes, we multiply the subindex weights used by Turkstat by our daily subindex values to obtain our daily main food index.

# Comparison of CEFIS and TURKSTAT Price Indices



# "Nowcasting" with simple averages





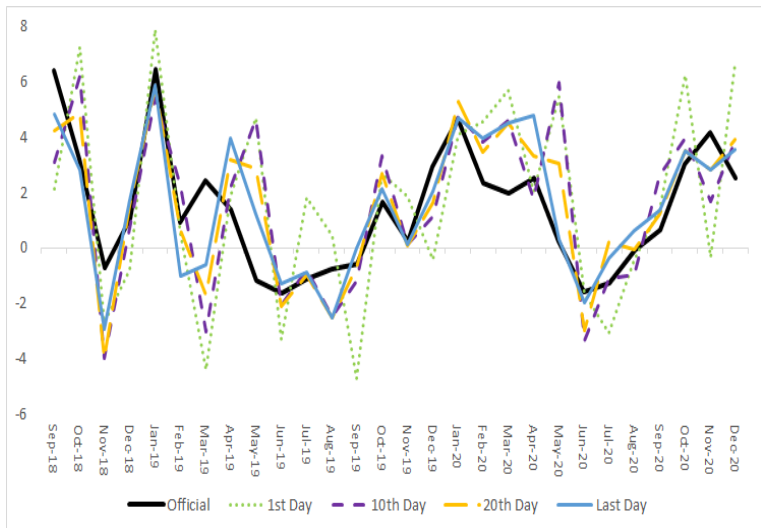
## Nowcasting with regressions

$x_{i,h}$ ,  $i = 1, 2, \dots, N$  denotes our monthly MoM food inflation rates calculated at day  $h$ , and  $y_i^f$  denotes the official monthly MoM food inflation rates.

We link  $x_{i,h}$  with  $y_i^f$  using the following linear regression model:

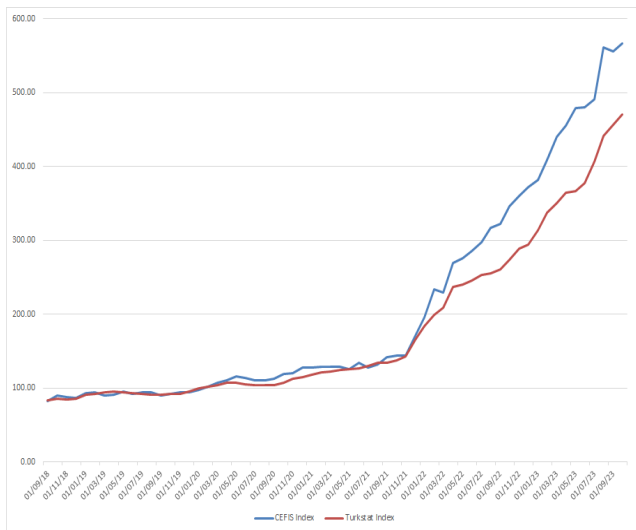
$$y_i^f = c + \beta_{i,h}x_{i,h} + \varepsilon_i; \quad h = 1, 10, 20, 31.$$

# Nowcasting with regressions

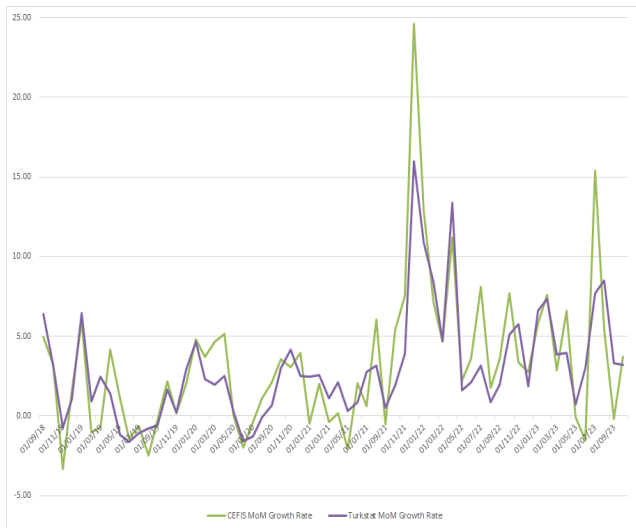


Recent data. CEFIS and Turkstat Indices.

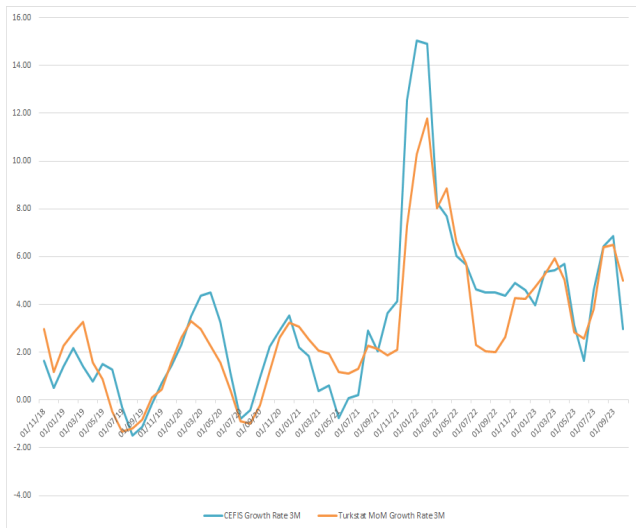
<https://cefis-food-indices.streamlit.app/>



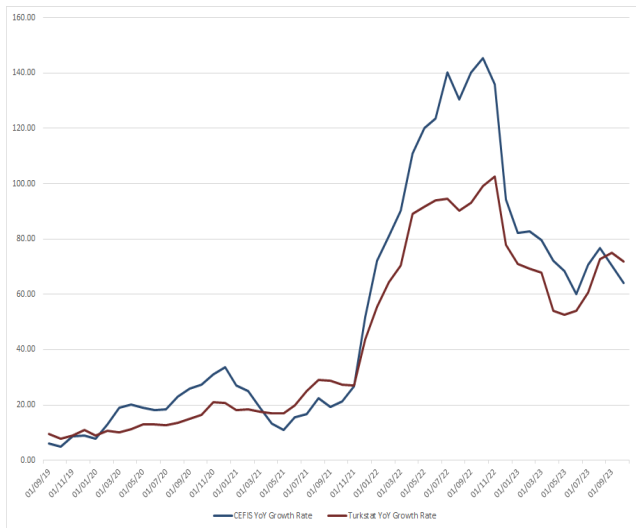
# CEFIS and Turkstat MoM inflation



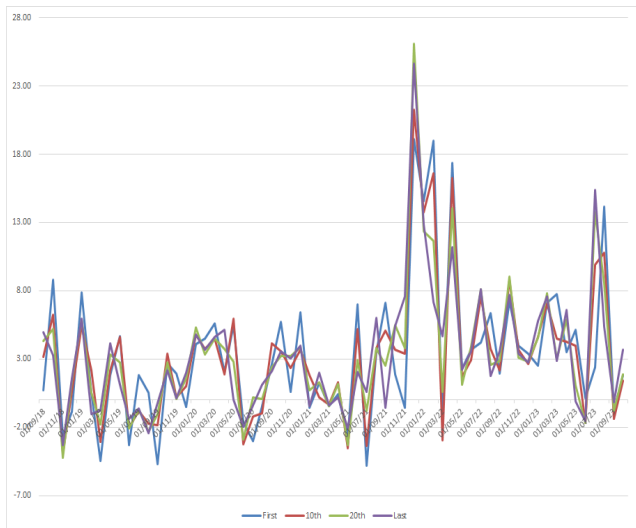
# CEFIS and Turkstat MoM Inflation 3 Month Averages



# CEFIS and Turkstat YoY inflation



# Monthly Inflation Measured Different Dates



## Where do we go from here? Classification problems.

product_name	category	accuracy	hata	expected_categ
great mountain kinoa siyah	soğuk çay	6.72222E+15	1	baharat
şölen ozmo fun çilekli	gofret	9.98611E+15	1	?
sinangil glutensiz un	ekmek	8.95849E+13	1	buğday unu
fit fit kayısıllı meyve diski	meyve suyu	9.99294E+15	1	?
milka mini snow balls	kek	8.33183E+15	1	?
kellogg granola çikolata parçacıklı ve fıındıklı	bisküvi	9.76307E+15	1	tahıl gevreği
up limon aromalı gazlı içecek pet	soğuk çay	9.11942E+15	1	gazoz meyveli
patiswiss beyaz çikolatalı çilek draje	sakız	9.97691E+15	1	?
bağcıvan light dilimli tost peyniri	kaşar peyniri	9.99401E+15	1	=
pınar krema yağlı	kremler peynir	6.51486E+15	1	?
nestle purelife purefresh çilek aromalı gazlı içecek	su	9.9904E+15	1	gazoz meyveli
lolipop meyveli	gofret	7.49641E+15	1	?
divan scottishshortbread çikolatalı portakallı kurabiye	bisküvi	9.9958E+15	1	=
cibus galbani toz permesan peyniri	kaşar peyniri	9.27554E+15	1	?
sauchef pizza sosu	ketçap	9.36078E+15	1	?
hero baby yulafli karışık meyve pürelı kavanoz mama	meyve suyu	9.80506E+15	1	?
melis jalapeno sos	sosis	9.45688E+15	1	?
duru bakliyat kavurmalı bulgur pilavı	bulgur	9.85448E+15	1	hazır et yemekle
nestle nesfit badem balı bar	bal	9.99486E+15	1	?
pınar kahvaltı keyfi dilimli tost peyniri	kaşar peyniri	9.99257E+15	1	=
oreo double vanilya karamel	dondurma	9.92609E+15	1	bisküvi