

# **SOURCE OF WEIGHTS**

20-22 SEPTEMBER 2021

TURKSTAT

**Price Statistics Department**

# Compilation of Weights

## Source of Expenditure Weights

- Household budget survey (HBS) complemented by supplementary data from other sources
- HBS should be conducted on a regular basis (at least every five years) to permit changes in consumption patterns to be taken into account
- National accounts

# Compilation of Weights

## Advantages of the Household Budget Survey

- The HBS can be tailored to the particular needs of the CPI.
- The HBS can provide information on regional breakdowns of expenditures.
- The HBS provides data about household characteristics such as income and number of members.
- The HBS can provide information on the types of outlet where purchases are made and the brands purchased.
- The statistical quality indicators (e.g. standard error and coefficient of variation) for the weights can be calculated.

## Compilation of Weights

An annual HBS is optimal for a CPI.

- It permits the annual updating of the weights.

Reducing the substitution bias associated with out-of-date weights.

- It avoids one-off set-up costs.

- Also facilitates the use of multi-year weights to.

Reduce sampling error.

Smooth out atypical expenditure patterns e.g. from natural disasters or political events (if considered appropriate to do so).

# Compilation of Weights

## Disadvantages of the Household Budget Survey

- HBS's are resource intensive and costly.
- Measurement issues.

Prestige effect

Telescoping effect

Recall effect (under-reporting)

These problems have been overcome in some smaller countries by using a methodology based on a sample survey of people's receipts.

# Compilation of Weights

## NATIONAL ACCOUNTS

The use of National Accounts weights ensures consistency and comparability between the CPI and national accounts definitions and classification systems for household consumption.

This is an advantage when compiling a CPI.

- ✓ As a macro-economic indicator.
- ✓ For use as a deflator.

## Compilation of Weights

National Accounts have two inherent advantages:

- The Household Consumption element of National Accounts is derived mainly from the HBS but national accountants will often use other sources of information before finalizing the results. The fact that National Accounts go through this additional quality assurance process and re-estimation should increase the reliability of the weights.
- Even if the HBS is updated infrequently, CPI weights can still be updated at regular intervals from national accounts data for higher level aggregates at the division or group level.

## Compilation of Weights

### **There are three inherent disadvantages with National Accounts data:**

- It is generally only available at the national level so deconstruction of the national accounts data may be necessary using other available sources of information.
- National accountants apply an element of discretion and judgment when making operational decisions relating to the construction of National Accounts.
- It is generally not as timely as HBS data.



## Compilation of Weights

- ❖ Most CPIs adopt a Laspeyres-type formulation.
  - ✓ Only base-period weights generally available.
- ❖ Due to the frequency and time taken in collecting the necessary expenditure data, weights are sometimes estimated using price-updating.
- ❖ Where the basket is not updated annually, the compiler should guard against choosing a basket reference period where economic conditions are temporarily atypical.

## Compilation of Weights

- ❖ If different sources of weights are used, then their reference periods do not necessarily have to be of the same vintage although this is desirable.
  - E.g. national accounts for higher level and more recent HBS data at a more detailed level.
  
- ❖ Chain linking.
  - When weights are updated, the index using the updated weights needs to be calculated for an overlapping period with the index using the previous weights.

# Compilation of Weights

## Weight reference periods and price updating

- ❖ Because of the time lag associated with the collection and compilation of expenditure data, the period covered by the latest available data will not coincide with the reference period for the CPI weights.
- ❖ A common practice is to re-value the expenditure data to the appropriate reference period by index linking, using appropriate components of the CPI.
  - Price updating is usually applied at the lowest level for which weights that agree with the fixed basket concept are available in the CPI (similar process for mutli-year HBS data).

## Compilation of Weights

### Weight reference periods and price updating

- ❖ Because of the time lag associated with the collection and compilation of expenditure data, the period covered by the latest available data will not coincide with the reference period for the CPI weights.
- ❖ A common practice is to re-value the expenditure data to the appropriate reference period by index linking, using appropriate components of the CPI.
  - Price updating is usually applied at the lowest level for which weights that agree with the fixed basket concept are available in the CPI (similar process for mutli-year HBS data).

# Household Budget Survey in Turkey

## Objectives

- To get data on the determination of the commodities and weights for the consumer price indices,
- To monitor the changes of households' consumption patterns,
- To collect data on income distribution,
- Determination of number and level of poor people
- To obtain required data for analysis on households' living standards, feeding problems, calculations on minimum wage and other social and economic analysis.

# Household Budget Survey in Turkey

- The estimation level for 2003 HBS and following surveys is
  - whole Turkey at urban and rural breakdown*
  - NUTS level 1 (12 regions at urban and rural breakdown)*
  - NUTS level 2 (26 regions)*
- Beginning from 2004; it would be possible to have estimates on Turkey at urban/rural discrimination by using each year's survey itself and to have estimates on regional discrimination by using the combination of each year's data and last two years' data.

# Household Budget Survey in Turkey

- The 2003 Household Budget Survey was carried out to 2160 households monthly, 25920 households totally.
- The 2004 and 2005 Household Budget Surveys were carried out to 720 households monthly.
- The 2006 Household Budget Survey is being carried out to 720 households monthly beginning from since January 1<sup>st</sup>, 2006.

# Household Budget Survey in Turkey

- 2004 Household Budget Survey was carried out by following different sample households alternately each month.
- For instance, information about socio-economic situation, consumption expenditures and members' income of the 720 sample households were compiled in January.
- In February, the survey was carried out on different 720 households representing the households of January.
- This rotation continued until the end of December.



# Household Budget Survey in Turkey

- Household information was compiled by interview, diary keeping and observation methods.
- Each interviewer recorded the data on consumption expenditures and income of 6 sample households monthly on average as a result of 8 times of visit including 1 visit prior to the survey month, twice during the first and second weeks, once during the third and fourth weeks and once following the end of the survey month.

# Household Budget Survey in Turkey

- Prior to the survey month, the information about the socio-economic status of the households is obtained in the first visit to the sample households and how to fill the book of record is explained.
- During the visits in the survey month, consumption expenditures of the sample household are obtained through the books of record and interviewing method. Information about employment status, economic activities, occupations, performance in jobs and income of the household members in the survey month and during the last year was compiled in the last interview at the end of the survey month.

# Household Budget Survey in Turkey

- Expenditures should be made for the household.
- Expenditures should be made for consumption purposes.
- Consumption expenditures are covered under COICOP groups
- Consumption expenditures of the household were compiled in accordance with the measurement criteria (ownership, usage, payment) within a survey period
- Consumption expenditures within the survey period are covered. In the survey, the following information is compiled:
  - Purchased consumer goods and services,
  - Type of purchase (in cash or installment purchase, own production, in-kind received etc.),
  - Amount of purchased goods and services(how much/many),
  - Value of these items
  - Place of purchase.

# Weights in Turkish CPI

Weights for calculating CPI in a given year are mainly based on the data from the HBS (%90).

These data are also supplemented and verified using other statistical sources. Such as; tourist expenditure survey (%9), special survey for institutional population (%1) and non-statistical sources (administrative data).

## Weights in Turkish CPI

Weights are changed every year. The present weights are based on the sum of HBS 2017-2018-2019 results.

The sum of three years are not simple summation of the row data. Monthly consumptions of 2017 and 2018 are deflated to the same month of 2019 using the general index change by regions. So the final HBS results reflect the 2019 household consumption.

## Weights in Turkish CPI

At the first step of weighting structure, commodities produced by households for own consumption, imputed rents from dwellings resided by owners and income in-kind excluded.

For the insurance and games of chance net consumption application is used.

For the cars, first hand expenditures are directly included. For the second hand expenditures, sales between households are excluded and sales from dealer to households are included with 10% profit margin which is decided by a questionnaire.

## Weights in Turkish CPI

After this step, the basket of CPI is obtained and then the weighting structure of both for Turkey and 26 regions are constituted.

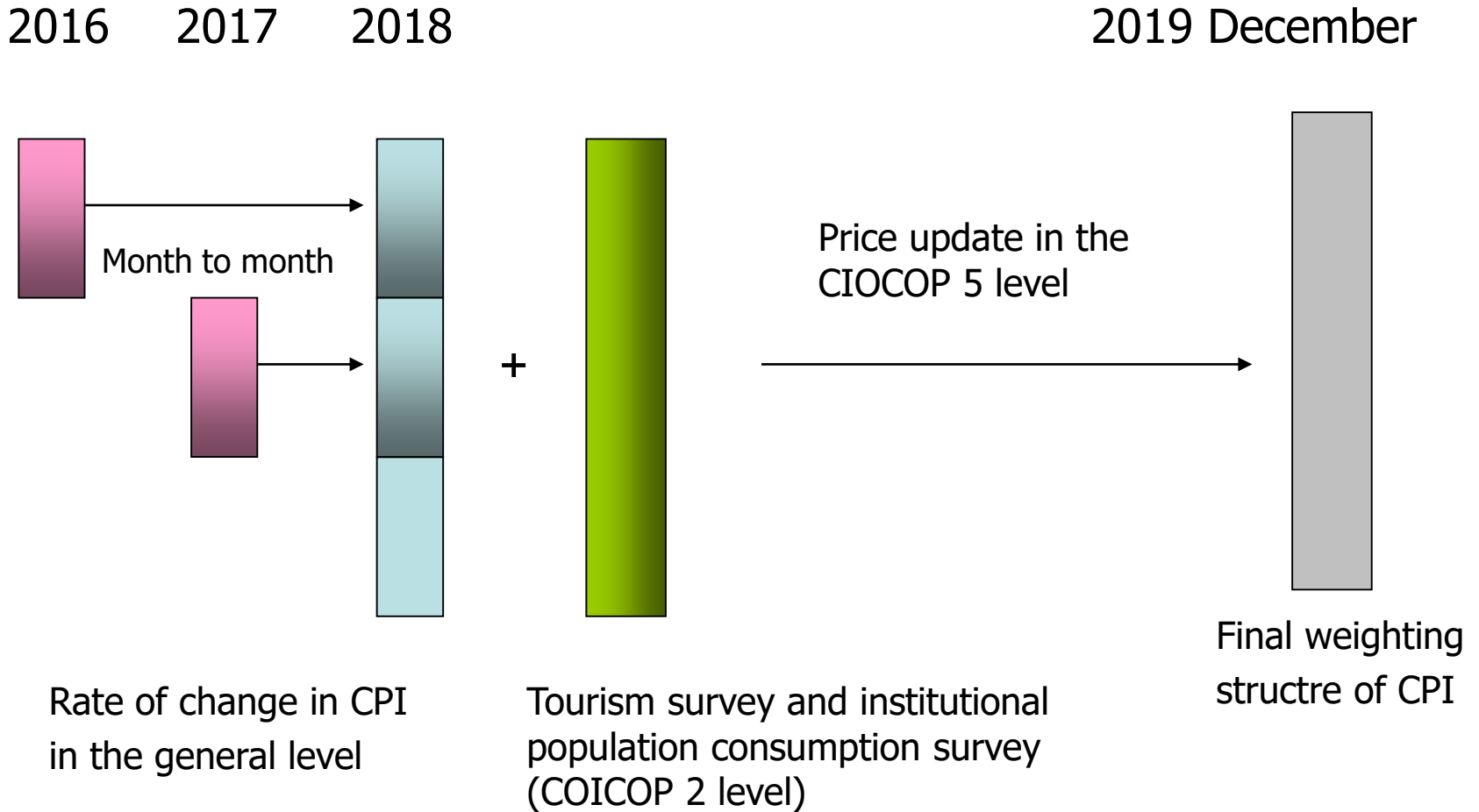
The consumption of tourists and the consumption expenditures of institutional population are then added to 12 main groups.

# Weights in Turkish CPI

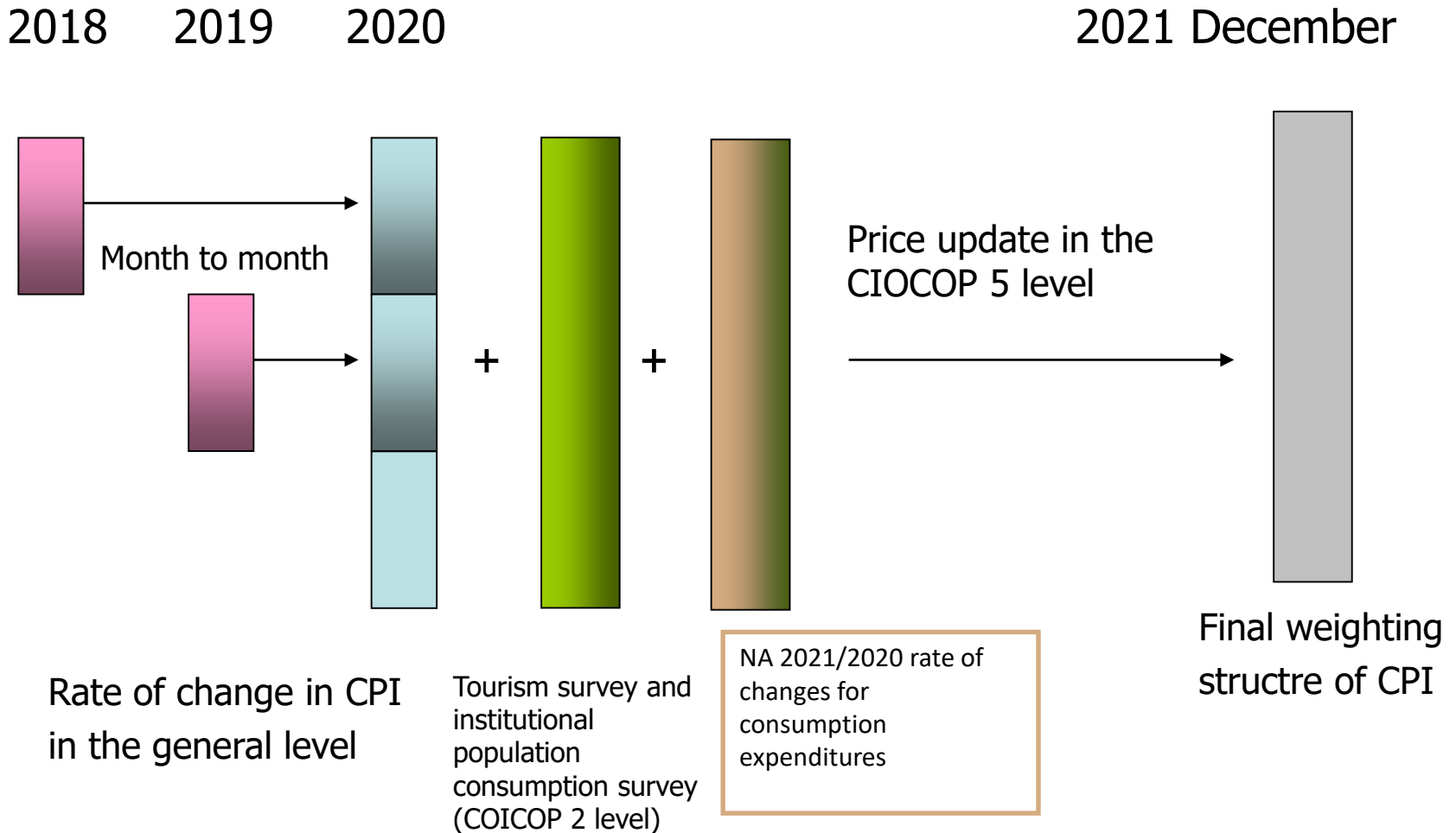
At the final step, these weighting structures are price-updated to December t-1. For the weights to be used in 2021, 2020 weights coming from HBS data are price updated by the ratio of December 2021 over average of 2020 in 5 digit COICOP level.



# Weights in Turkish CPI (before pandemic)



# Weights in Turkish CPI (after pandemic)



# Definition of “Seasonal Products”

“Seasonal Products” mean those goods and services that are not available for purchase, or purchased in small or negligible volumes, for certain months in a typical annual cyclical pattern. The in-season period is meant to cover at least one month.

# Definitions

“An elementary product group” means a set of product-offers that are sampled in order to represent one or more consumption segments in the HICP.

“Product-offer” means a specified good or service that is offered for purchase at a stated price, in a specified outlet or by a specified provider, under specific terms of supply, and thus defines a unique entity at any one time.

# Legal Framework

COMMISSION REGULATION (EC) No 330/2009 of 22 April 2009 laying down detailed rules for the Implementation of Council Regulation (EC) No 2494/95 as regards minimum standards for the treatment of seasonal products in the Harmonized Indices Of Consumer Prices (HICP).

# Weighting

Article 2 of COMMISSION REGULATION (EC) No 2454/97 defines the “weighting reference period” of the HICP as the 12-month period of consumption or expenditure from which the weightings are estimated for the compilation of the latest HICP index figure;

Article 3 of COMMISSION REGULATION (EC) No 2454/97 defines that the member states should each month produce HICPs using weightings which reflect consumers’ expenditure patterns in a weighting reference period.

# Prices

Article 6 of COMMISSION REGULATION (EC) No 1749/96 stipulates: where, exceptionally, the target sample requires observations less frequently than monthly, estimated prices shall be used for those months where observed prices are not required.

# Main Provisions

Weightings at the level of COICOP/HICP divisions, groups and classes are required not to vary between months during the year. Nevertheless, weightings at a more detailed level of COICOP/HICP might be allowed to reflect a seasonally varying consumption on pattern.



## Scope

The minimum standards shall apply to seasonal products within the following COICOP/HICP classes and groups:

- 01.1.6.1 Fresh fruits
- 01.1.7.1 Fresh vegetables
- 03.1.2 Garments (not baby-garments)
- 03.2.1 Footwear

Where appropriate, the minimum standards shall serve as a guidance also in relation to seasonal products within COICOP/HICP classes and groups other than listed above.

# Implementation of Commission Regulation

Commission Regulation (EC) No 330/2009 on the treatment of seasonal products

Seasonal products' means; goods and services that are available for purchase in some period of the year but are not available for purchase for certain periods in a typical annual cyclical.

Two methods:

- Strict annual weights method: Prices in out-of-season months are estimated
- Class-confined seasonal weights method: Weights are put to zero in out-of-season months and so prices for the products are not needed.

# Implementation of Commission Regulation

Strict annual weights method: Two estimation methods ensure a sufficient level of comparability

Counter-seasonal estimation:

- Recommended when the year clearly has two seasons where summer products replace winter products and vice versa and where in each month of the year there are sufficient seasonal products available.
- Use only the prices of seasonal products that are in-season to estimate the index for out-of-season products and disregard the products that are available all the year

# Implementation of Commission Regulation

## All-seasonal estimation

- Recommended when the seasonal pattern is not so clearly dichotomous or when the number of available seasonal products is small in part of the year and so counter-seasonal estimation is not feasible.

# Implementation of Commission Regulation

## All-seasonal estimation

- In the all-seasonal estimation method the index of out-of-season products is estimated using the price developments of all available products in the COICOP class, group or on a more detailed level such as for strata. For example, if all-seasonal estimation method is used in the case of summer fruit the price index of summer fruit during the winter months is estimated using data for all fruits available in winter

# Implementation of Commission Regulation

## Class-confined seasonal weights method

- The weights are variable with the aim to allow for zero weights for products that are out-of-season.
- When weights are zero no price data are needed for the index calculation.
- The weights of the in-season products are adjusted to ensure that the total weight of the COICOP class or group or on a more detailed level such as strata is constant through the year.

# Seasonal Products in current Turkish CPI

COICOP	FRESH FRUITS	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
01161010200	Orange	*****	*****	*****	*****	*****					*****	*****	*****
01161020100	Grape							*****	*****	*****	*****		
01161050100	Pear	*****	*****	*****				*****	*****	*****	*****	*****	*****
01161070100	Quince	*****	*****	*****							*****	*****	*****
01161100100	Strawberry				*****	*****	*****						
01161120100	Apple	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
01161130100	Plum						*****	*****	*****	*****			
01161210100	Water melon						*****	*****	*****	*****			
01161220100	Melon							*****	*****	*****	*****		
01161230100	Apricot						*****	*****	*****				
01161270100	Cherry						*****	*****	*****				
01161280100	Kiwi	*****	*****	*****	*****	*****					*****	*****	*****
01161300100	Lemon	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
01161310100	Tangarine	*****	*****	*****							*****	*****	*****
01161340100	Banana	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
01161350100	Pomegranate	*****	*****								*****	*****	*****
01161370100	Peach						*****	*****	*****	*****			

# Strict Annual Weight

First out of season month

2020 Yılı taze meyve çetelesi

TAZE MEYVE	OCAK	SUBAT	MART	NISAN	MAYIS	HAZIRAN	TEMMUZ	AGUSTOS	EYLUL	EKIM	KASIM	ARALIK
Portakal	*****	*****	*****	*****	*****						*****	*****
Üzüm							*****	*****	*****	*****		
Armut	*****	*****	*****				*****	*****	*****	*****	*****	*****
Ayva	*****	*****	*****							*****	*****	*****
Çilek				*****	*****	*****						
Elma	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
Erik						*****	*****	*****	*****			
Karpuz						*****	*****	*****	*****			
Kavun							*****	*****	*****	*****		
Kayısı						*****	*****	*****				
Kiraz						*****	*****	*****				
Kivi	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
										*****	*****	*****
						*****	*****	*****	*****	*****	*****	*****
						*****	*****	*****	*****	*****	*****	*****
Nar	*****	*****								*****	*****	*****
Seftali						*****	*****	*****	*****			

**Estimation Price (First out of season)**

2019 November, December,  
2020 January To May

Second and other out of season months



# Strict Annual Weight

TAZE MEYVELER	etki	OCAK	SUBAT	MART	NISAN	MAYIS	HAZIRAN	TEMMUZ	AGUSTOS	EYLUL	EKIM	KASIM	ARALIK
Portakal	0.12	3.00	3.00	3.50	4.00	4.00	?					2.50	3.00
Üzüm	0.11							*****	*****	*****	*****		
Armut	0.05	*****	*****	*****				*****	*****	*****	*****	*****	*****
Ayva	0.02	*****	*****	*****							*****	*****	*****
Çilek	0.05				*****	*****	*****						
Elma	0.19	*****	*****	*****	*****	*****	4.50	4.90	*****	*****	*****	*****	*****
Erik	0.05						6.00	7.00	*****	*****			
Karpuz	0.20						1.45	1.75	*****	*****			
Kavun	0.09								*****	*****	*****	*****	
							5.00	7.00	*****	*****			
						*****							*****
						*****							*****
Mandalina	0.13	*****	*****								*****	*****	*****
Yerli Muz	0.16	*****	*****	*****	*****	*****	10.00	10.95	*****	*****	*****	*****	*****
İthal Muz	0.06	*****	*****	*****	*****	*****	14.00	13.50	*****	*****	*****	*****	*****
Nar	0.03	*****	*****								*****	*****	*****
Seftali	0.06						6.00	8.00	*****	*****			

Arithmetic average of 2019 November and December with 2020 January to May is called typical price for June 2020

$$\text{Average}(2.50, \dots, 4.00) = 3.29$$

# Strict Annual Weight

TAZE MEYVELER	etki	OCAK	SUBAT	MART	NISAN	MAYIS	HAZIRAN	TEMMUZ	AGUSTOS	EYLUL	EKIM	KASIM	ARALIK
Portakal	0.12	3.00	3.00	3.50	4.00	4.00	3.29	3.77				2.50	3.00
Üzüm	0.11							*****	*****	*****	*****		
Armut	0.05	*****	*****	*****				*****	*****	*****	*****	*****	*****
Ayva	0.02	*****	*****	*****							*****	*****	*****
Çilek	0.05				*****	*****	*****						
Elma	0.19	*****	*****	*****	*****	*****	4.50	4.90					
Erik	0.05						6.00	7.00					
Karpuz	0.06						1.45	1.75					
Kavun	0.06							*****	*****	*****	*****		
Kayısı	0.06						5.00	7.00					
Kiraz	0.06						8.00	10.00					
Kivi	0.01	*****	*****	*****	*****	*****					*****	*****	*****
Limon	0.09	*****	*****	*****	*****	*****	8.50	8.90					
Mandalina	0.10	*****	*****	*****	*****	*****					*****	*****	*****
Yerli Muz	0.06						10.00	10.95					
İthal Muz	0.06						14.00	13.50					
Nar	0.03	*****	*****								*****	*****	*****
Seftali	0.06						6.00	8.00					

**COEFFICIENT**=(8.89\*0.19+.....+33.33\*0.06)/  
(0.19+.....+0.06)=**14.67**

**Estimation Price** =3.29\*(1+14.67/100)=3.77

$4.90/4.50*100-100=8.89$

$7.00/6.00*100-100=16.67$

$1.75/1.45*100-100=20.69$

$7.00/5.00*100-100=40.00$

$10.00/8.00*100-100=25.00$

$8.90/8.50*100-100=4.71$

$10.95/10.00*100-100=9.50$

$14.00/13.50*100-100=-3.57$

$8.00/6.00*100-100=33.33$

**Thank you...**