

## Evaluation of the food-rationality-trend in Hungary based on FAO-data.

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## Introduction

The article delves into the comprehensive analysis of food statistics, elucidating the main milestones achieved by the research team at MY-X across various institutions. Through meticulous curation using the resources available on the MIAU-platform, a vast dataset has been assembled, refined iteratively until yielding estimations. These estimations are accompanied by intricate graphical representations, enabling a nuanced understanding of the directional trajectory of a country's food dynamics.

Currently, this analysis is conducted manually, entailing a significant investment of time and effort. The process involves intricate operations, from data gathering to refinement, culminating in the interpretation of graphical representations. Despite the labour-intensive nature of this approach, it lays the groundwork for future automation.

The essence of the methodology lies in its ability to distil complex food statistics into comprehensible insights. By leveraging the resources provided by MIAU, the team has been able to discern trends and patterns within the data, offering glimpses into the overarching narrative of a country's food landscape.

The article further explores the potential implications of these findings, envisioning a future where such analyses are seamlessly automated. This transition holds promise for expediting decision-making processes and facilitating more informed policy interventions in the realm of food security and nutrition.

Furthermore, it's pertinent to note that this methodology has been applied to only three countries thus far, owing to its manual nature. However, there are plans to expand this analysis to encompass a broader spectrum of countries in the future, facilitated by automation. This evolution promises to enhance the scalability and efficiency of the process, allowing for a more comprehensive understanding of global food dynamics and their implications.

In conclusion, while the current methodology necessitates manual intervention, it serves as a crucial stepping stone towards the realization of a fully automated system for analysing food statistics. Through ongoing refinement and innovation, the team endeavours to streamline the process, ensuring that insights gleaned from data analysis contribute meaningfully to the discourse surrounding food security and nutrition.

## Previous projects

Dr Roberto Ridolfi, currently serving as the Assistant-Director-General for Programme Support and Technical Cooperation at the United Nations Food and Agriculture Organization (FAO), has had a distinguished career spanning several decades.

Ridolfi's journey began in 1994 when he joined the European Commission. Throughout his tenure, he held various positions in different delegations, including Malawi, Namibia, and Kosovo, as a development and economic advisor. During the accession negotiations from 2001 to 2004, he played a crucial role as the principal coordinator dealing with environment and transport in Public-Private Partnerships (PPP).

In 2005, Ridolfi was appointed as Ambassador/Head of delegation to the European Union in Suva, where he served until 2007, overseeing relations with 15 Pacific countries and territories. Subsequently, from 2010 to September 2013, he served in Uganda by the High Representative for Foreign Policy of the EU.

His tenure in Uganda was marked by managing programs dealing with critical issues such as environment, climate change, food security, human development, migration, and asylum. Notably, he spearheaded the One-Billion-Euro Food Facility in 50 countries during his time as head of unit of Europe Aid.

Throughout his career, Ridolfi has displayed exceptional leadership and dedication to addressing global challenges. His academic background includes an MSc in Engineering, an MBA, and a PhD in A. Technology.

At FAO, Ridolfi's leadership in initiatives related to FAOSTAT, the organization's database for agricultural production, food security, and dietary trends data, has been exemplary. Under his guidance, FAOSTAT has become a trusted resource, providing reliable data and insights to decision-makers and experts in the fields of food security and agricultural development.

In summary, Dr Roberto Ridolfi's illustrious career has been characterized by his tireless efforts to promote sustainable development and address global challenges in agriculture and food security. Through his leadership and expertise, he has made significant contributions to advancing the goals of FAO and improving the lives of people worldwide.

### **I recall a few words from him:**

*"We realized that access to energy especially decentralized, in remote rural areas where the grid doesn't work is fundamental," Ridolfi said, adding that food waste mainly affects 780 smallholder farmers. "FAO analysis shows that we could have an increase of 80% on productivity of rural areas by providing [electricity] access."*

*"There is no storage, there is no processing facility, there is no energy to enable and empower the economic transformation of the life of many, many poor people," he said.*

Ridolfi pointed to Mini grids as a significant opportunity for scaling agriculture, pointing to pilots by ENGIE and Enel in Uganda and Zambia, but said better regulatory frameworks were needed, as well as access to blended finance to reduce risk and entice banks to enter the market more aggressively.

*"There is no way that a tariff of electricity in a city coming from a hydropower plant or a big solar or wind installation will be cheaper than the tariff of decentralized solutions, so we need finance to come into the picture for agriculture to become sustainable, avoiding losses and assuring food security to all,"* he said.

Nor do diesel generators make economic sense, selling for \$1.5 per kilowatt hour in some sub-Saharan African countries, he noted.

Lastly, he stressed the need for more entrepreneurs.

*"We would need thousands and thousands more small, brave entrepreneurs going into rural Africa and promoting these kinds of business,"* Ridolfi said.

## Backgrounds and benchmarks

The foundation of this analysis rests upon a multifaceted understanding of food dynamics, drawing inspiration from diverse sources and methodologies. One of the primary benchmarks guiding this endeavour is the rich history of statistical analysis, particularly within the realm of food security and nutrition. Drawing from established frameworks and methodologies, such as those utilized in assessing agricultural yields and consumption patterns, provides a solid foundation for our approach.

Additionally, the exploration of historical precedents, such as traditional methods of food assessment and resource allocation, offers valuable insights into the evolution of food statistics. By studying past practices and their efficacy, we gain a deeper appreciation for the complexities inherent in analysing food dynamics and identifying meaningful trends.

Furthermore, technological advancements play a pivotal role in shaping our approach to food statistics. The digitalization of data and the proliferation of sophisticated analytical tools have revolutionized the field, enabling more granular insights and predictive modelling. Leveraging cutting-edge technologies allows us to transcend traditional limitations and explore new avenues for understanding food systems.

Moreover, the concept of benchmarking against established metrics and performance indicators serves as a guiding principle in our analysis.

By comparing current food statistics against historical data and industry standards, we can identify areas of improvement and track progress over time. This iterative process of benchmarking fosters continuous improvement and ensures the reliability and validity of our findings.

In summary, the backgrounds and benchmarks underpinning our analysis of food statistics encompass a multidimensional approach, integrating historical insights, technological advancements, and established metrics. By drawing upon these diverse sources, we strive to develop a comprehensive understanding of global food dynamics and contribute meaningfully to the discourse surrounding food security and nutrition.

## Scenarios/Expanding Coverage

1. The first step is getting to know, mastering, and interpreting the data.
  1. Data Quality: Ensuring the data is accurate, reliable, and comprehensive can be challenging, especially if it comes from multiple sources or lacks proper documentation.
  2. Data Complexity: Dealing with large datasets or datasets with complex structures can make it difficult to extract meaningful insights without proper analysis techniques.
  3. Data Interpretation: Interpreting the data correctly requires domain knowledge and expertise. Misinterpretation can lead to erroneous conclusions and decisions.
  4. Data Preparation: Cleaning and preparing the data for analysis can be time-consuming and tedious, involving tasks such as handling missing values, removing duplicates, and standardizing formats.
  5. Data Relevance: Identifying which data points are relevant to the analysis and which can be disregarded is crucial for obtaining accurate insights.
  6. Data Privacy and Security: Ensuring compliance with data privacy regulations and implementing security measures to protect sensitive information is essential to prevent unauthorized access or data breaches.

see Figure #1 indicates the years, the foods, which are healthy, and which are not – in a subjective way, marked with 0 or 1 (according to the Excel RANK()-function: 0 = the more/the better, 1 = the less/the better), and in which year how many grams were consumed per person per day . The food unit is Gram/day/capita.

More Details: <https://miau.my-x.hu/miau/311/fao/>

	Country	Hungary					
	Unit	g/capita/day					
	<b>Amount / Value</b>	<b>Years</b>					
Healthy/ Unhealthy	<b>Foods</b>	<b>1961</b>	<b>1962</b>	<b>1963</b>	<b>1964</b>	<b>1965</b>	<b>1966</b>
1	Alcoholic Beverages	188	195	201	211	218	219
0	Apples and products	50	51	62	52	43	49
0	Bananas	0	0	0	0	0	0
0	Barley and products	0	0	0	0	0	0
0	Beans	2	5	3	3	6	3
1	Beer	106	108	112	116	121	127

## #1 A brief overview of the basic information. 77 values

**Source: Own presentation**

- In the second step, we delineate what constitutes healthy and unhealthy. Healthy items are denoted by 0, while unhealthy items are denoted by 1. Alongside this classification, we assign numerical identifiers to the products for each year. The data spans from 1961 to 2013, encompassing a total of 77 products.

This step involves assessing the nutritional content and health impact of each product to determine its classification as healthy or unhealthy. Factors such as nutrient density, presence of additives or preservatives, and adherence to dietary guidelines are considered in this evaluation process. Each product is assigned a binary value based on whether it aligns with health-promoting criteria (0) or deviates from it (1), and the one that is 1 is marked in blue.

This is a general designation. Where there is a 0, you can even consume more of it, where there is a 1, less.

Furthermore, assigning numerical identifiers to the products for each year allows for tracking changes in consumption patterns and health trends over time. This step enables us to analyse the prevalence of healthy and unhealthy choices in the diet and identify potential areas for intervention or improvement in public health policies and initiatives.

See figure #2 contains the Foods and their numbers (0 or 1). In the figure #3, you can see some foods that are healthy, in the #4, which are not healthy, and in the figure #5, you can see the ranking.

**Source: Own presentation**

## #2 Foods and accompanying numbers.

Healthy or Unhealthy	Foods
1	Alcoholic Beverages
0	Apples and products
0	Bananas
0	Barley and products
0	Beans
1	Beer
1	Beverages, Alcoholic
1	Beverages, Fermented
0	Cassava and products
0	Cereals - Excluding Beer
0	Cereals, Other
0	Citrus, Other
0	Cloves

## #3 Healthy Foods.

Healthy
Apples and products
Bananas
Barley and products
Beans
Cassava and products

Unhealthy
Alcoholic Beverages
Beer
Beverages, Alcoholic
Beverages Fermented
Palm Oil

## #4 Unhealthy Foods.

OAM	1961	1962	1963
Alcoholic Beverages	1	2	3
Apples and products	47	46	29
Bananas	53	52	51
Barley and products	42	42	42
Beans	29	2	3
Beer	1	2	3

## #5 Ranking.

- Afterward, we input this dataset into the MIAU COCO Y0 database, where we filter the data and obtain multiple tables indicating which data points require further analysis. All data are

given in the same gram/day/capita format. All data points are standardized to one million for ease of comparison, facilitating clearer interpretation of the results. This standardized approach enhances our ability to discern patterns and trends, making it easier to identify significant insights from the data.

The test is shown in Figure 6, where you can see the years at the top and the first names of the dishes on the left. In the last line of Figure 7, we can see the one million, to which we will compare later. **Source: Own presentation**

2011	2012	2013	comparison
10	15	12	1000000
3	49	1	1000000
23	21	25	1000000
23	1	24	1000000
19	12	32	1000000
15	20	21	1000000

Ranking	1961	1962	1963	1964
Alcoholic Beverages	1	2	3	4
Apples and products	47	46	29	45
Bananas	53	52	51	50
Barley and products	42	42	42	42
Beans	29	2	3	4
Beer	1	2	3	4

## #6 Years, food, and ranking.

## #7 Comparison to a million.

- This is another table from the previous experiment, where we get 52 numerical values. Adding these values to 1961 gives 2013, indicating the appropriate data points for further analysis. Then we select these data points and mark them in yellow, as shown in figure #9, so that we know which data we will continue to work with.

It is important to work only with this data because it is the correct data.

Figure #8 shows the first table we work with.

Here, the data is already exchanged, because we select the foods, which ones are necessary and which ones are not, rather than the years.

Ranking	Alcoholic beverages	Apples and products	Bananas	Barley and products	Beans	Beer
1961	1	47	53	42	29	1
1962	2	46	52	42	2	2
1963	3	29	51	42	3	3
1964	4	45	50	42	4	4
1965	5	51	49	42	1	5
1966	6	48	48	42	6	6
1967	7	35	46	42	38	7
1968	8	27	38	42	35	8

## #8 The figure we are working with. (ranking)

**Source: Own presentation**



Figure #9 shows the index values, they are marked with an S, where S1 is the best because it is the number one best food. **Source: Own presentation**

Step (2)	Alcoholic beverages	Apples and products	Bananas	Barley and products	Beans	Beer
S1	358014.8	71701.5	150.5	152474.4	93	52
S2	194.5	71700.5	149.5	152473.4	92	51
S3	193.5	71699.5	50	152472.4	91	50
S4	192.5	71698.5	49	152471.4	90	49
S5	191.5	22287	48	48.5	89	48
S6	190.5	22286	47	47.5	88	47
S7	189.5	22285	46	46.5	87	46
S8	188.5	22284	45	45.5	86	45

**#9 Filter out the year in which number 52 is found.**

**The index values.**

- After marking the necessary data points in yellow, we proceed to identify the table immediately following the 52 marked points. This table is then copied to a separate worksheet where the included data points are highlighted. With this refined selection, we apply another filter to obtain the most accurate information, ensuring thorough analysis and precise insights.

Figure #10 shows all the data marked in yellow, which we will continue to work with. Then we must work with the first table, but only with the data marked in yellow. Then comes the next trial.

**Source: Own presentation**

OAM	Beer	Cassava and products	Cereals - Excluding beer	Cereals, Other
1961	1	2	4	14
1962	2	2	7	14
1963	3	2	6	14
1964	4	2	5	14
1965	5	2	1	14
1966	6	2	2	14
1967	7	2	3	14
1968	8	2	8	14

**#10 Only the necessary data.  
29 values.**

Sunflower seed Oil	Sweeteners, other	Tree nuts	Vegetables	Comparison
1	43	27	44	1000000
5	43	30	38	1000000
4	43	22	10	1000000
7	28	26	43	1000000
2	43	23	49	1000000
3	43	7	36	1000000
6	30	15	28	1000000
8	30	19	29	1000000

**#11 Only the necessary data  
and comparison.**

6. After that, we perform another round of filtering to further refine the data. In this step, the data points that are essential for us are already highlighted in orange. This is also the board where we must look for the number 52, because it is the correct one. In such cases, we always work with the first table, but this table helps us determine which is the correct data.

**Source: Own presentation**

Figure #12 shows the first table with which we can go further towards the result.

Ranking	Beer	Cassava and products	Cereals - Excluding beer	Cereals, Other	Citrus, Other	Cloves
1961	1	2	4	14	38	29
1962	2	2	7	14	38	29
1963	3	2	6	14	38	29
1964	4	2	5	14	38	2
1965	5	2	1	14	38	29
1966	6	2	2	14	38	29
1967	7	2	3	14	38	29
1968	8	2	8	14	38	29

**#12 Also the first table we work with.**

The next filter shows Figure #13, where we are again looking for Figure 52, but it is marked with a different colour. We need these to collect the ones we really need in the next table.

Step (2)	Beer	Cassava and products	Cereals - Excluding beer	Cereals, Other	Citrus, Other	Cloves
S1	210505.5	16117	19884	52	72471.5	52
S2	113560	51	19883	51	72470.5	51
S3	113162.5	50	19882	50	72469.5	50
S4	113158	49	19881	49	69783	49
S5	113157	48	19880	48	69782	48
S6	113156	47	4493.5	47	69781	47
S7	113155	46	4492.5	46	69780	46
S8	113154	45	4491.5	45	69779	45

**#13 Number 52 in another filter table result.**

Figure #14 shows the first table, which is important for us, where 52 was shown in the previous table. We have collected these and use them to complete the last step to the result. This contains the data we really need.

### Source: Own presentation

Ranking	Cereals, Other	Cloves	Miscellaneous	Plantains	Sesa messed Oil	Soyabeans	Vegetables	Comparison
1961	14	29	22	3	1	22	44	1000000
1962	14	29	22	3	1	22	38	1000000
1963	14	29	22	3	1	22	10	1000000
1964	14	2	22	3	1	22	43	1000000
1965	14	29	22	3	1	22	49	1000000
1966	14	29	22	3	1	22	36	1000000
1967	14	29	22	3	1	22	28	1000000
1968	14	29	22	3	1	22	29	1000000
1969	14	29	22	3	1	22	17	1000000
1970	14	2	22	3	1	22	30	1000000
1971	14	29	22	3	1	22	25	1000000
1972	14	29	22	3	1	22	22	1000000

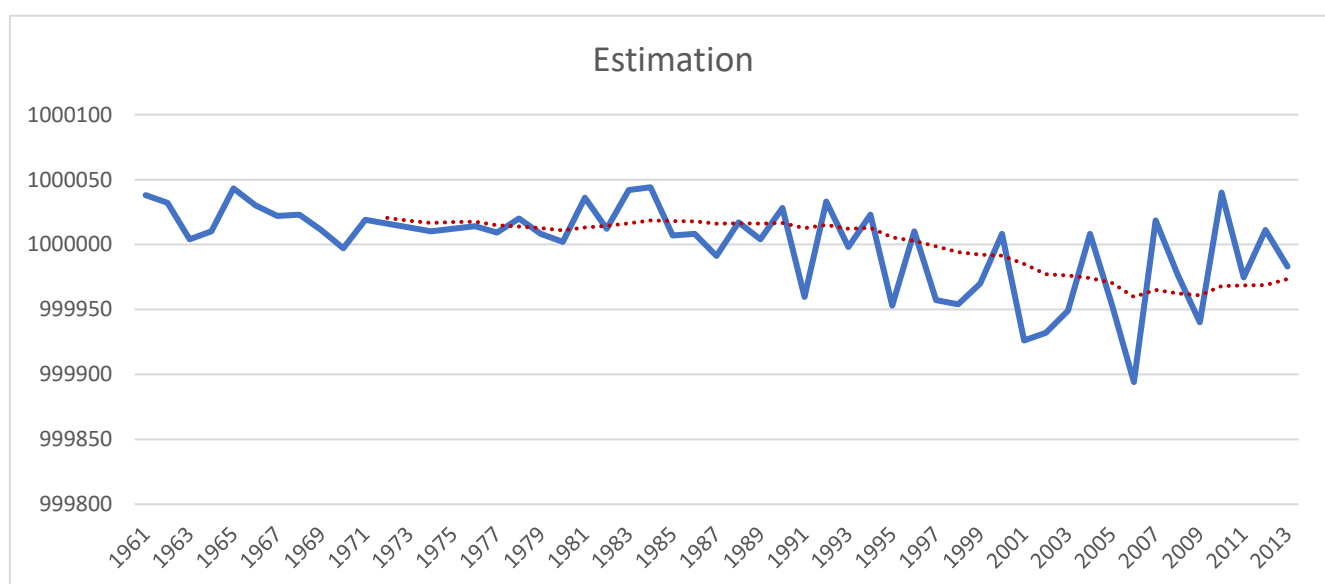
**#14 "The destination is nearly upon us."**

**7 values.**

7. In the last step, we get the estimate (#15). Which is the result, we get a table and the accompanying diagram (#16). If this value does not reach 1 million, it means a decline in food consumption for the given year, and if it exceeds 1 million, it means an improvement.

COCO: Y0	Cereals, Other	Cloves	Miscellaneous	Plantains	Sesa messed Oil	Soyabeans	Vegetables	Estimation	Fact+0	Delta	Delta/Fact
1961	89.5	65.5	25	499925.6	0	49	499883.6	1000038	1000000	-38.1	0
1962	89.5	65.5	25	499925.6	0	49	499877.6	1000032	1000000	-32.1	0
1963	89.5	65.5	25	499925.6	0	49	499849.6	1000004	1000000	-4.1	0
1964	89.5	38.5	25	499925.6	0	49	499882.6	1000010	1000000	-10.1	0
1965	89.5	65.5	25	499925.6	0	49	499888.6	1000043	1000000	-43.1	0
1966	89.5	65.5	25	499925.6	0	49	499875.6	1000030	1000000	-30.1	0
1967	89.5	65.5	25	499925.6	0	49	499867.6	1000022	1000000	-22.1	0
1968	89.5	65.5	25	499925.6	0	49	499868.6	1000023	1000000	-23.1	0

**#15 The table of the result (HU).**



**#16 Chart for the estimate (HU).**

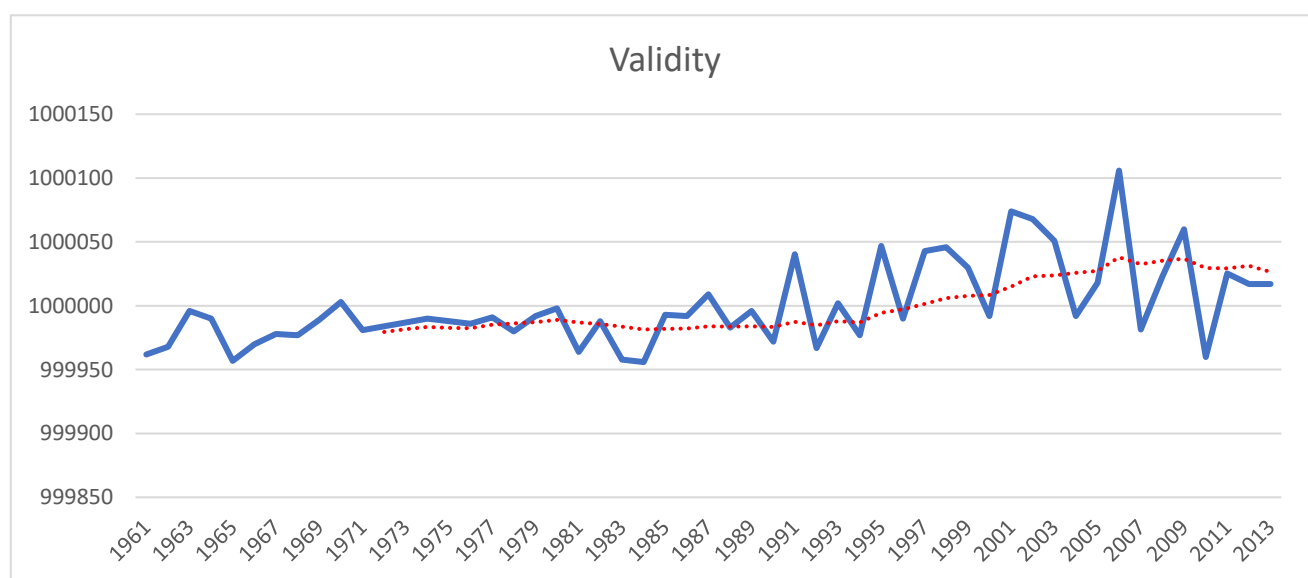
This shows how much it jumps in the given country, how much the value we were looking.

8. Here you can see figure #17, where we can see the validity, this is the reflection of the estimate, and we also received the corresponding diagram (#18).

**This is just a small tweak to the result.**

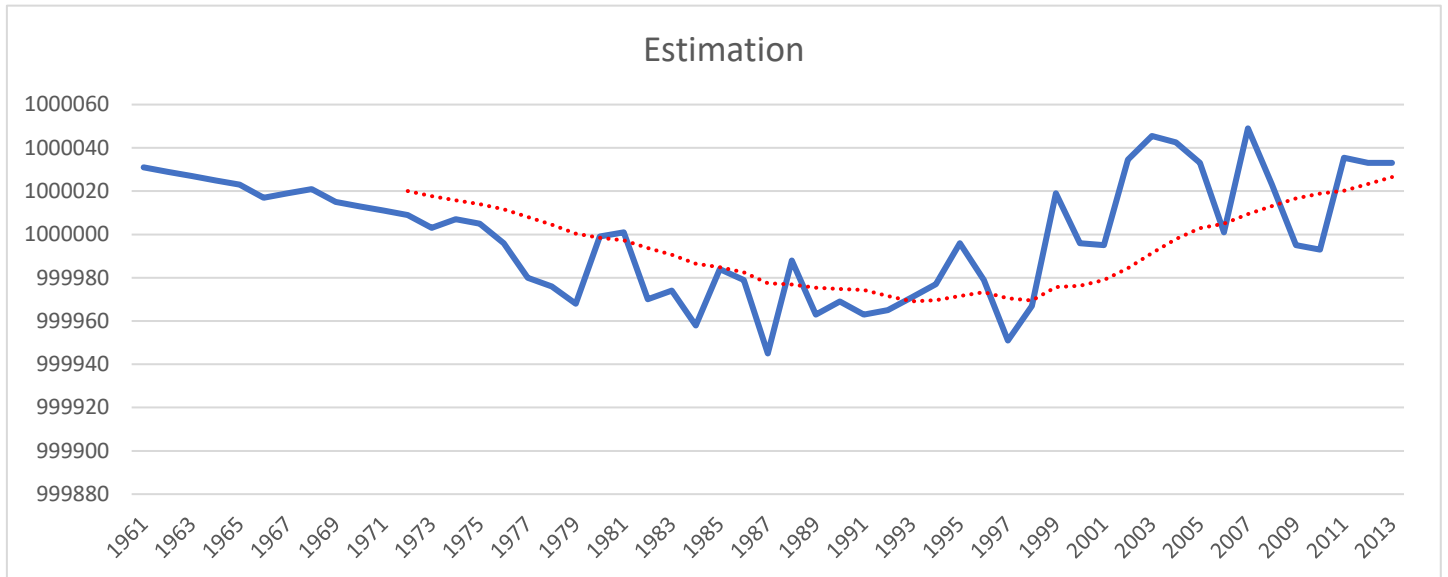
COCO: Y0	Cereals, Other	Cloves	Miscellaneous	Plantains	Sesa messed Oil	Soyabeans	Vegetables	Estimation	Fact+0	Delta	Delta/Fact	Validity
1961	39	24	31	50	499937.9	31	499848.9	999961.9	1000000	38.1	0	1
1962	39	24	31	50	499937.9	31	499854.9	999967.9	1000000	32.1	0	1
1963	39	24	31	50	499937.9	31	499882.9	999995.9	1000000	4.1	0	1
1964	39	51	31	50	499937.9	31	499849.9	999989.9	1000000	10.1	0	1
1965	39	24	31	50	499937.9	31	499843.9	999956.9	1000000	43.1	0	1
1966	39	24	31	50	499937.9	31	499856.9	999969.9	1000000	30.1	0	1
1967	39	24	31	50	499937.9	31	499864.9	999977.9	1000000	22.1	0	1
1968	39	24	31	50	499937.9	31	499863.9	999976.9	1000000	23.1	0	1

#17 The validation table, here you can see the reflection of the estimate (HU).



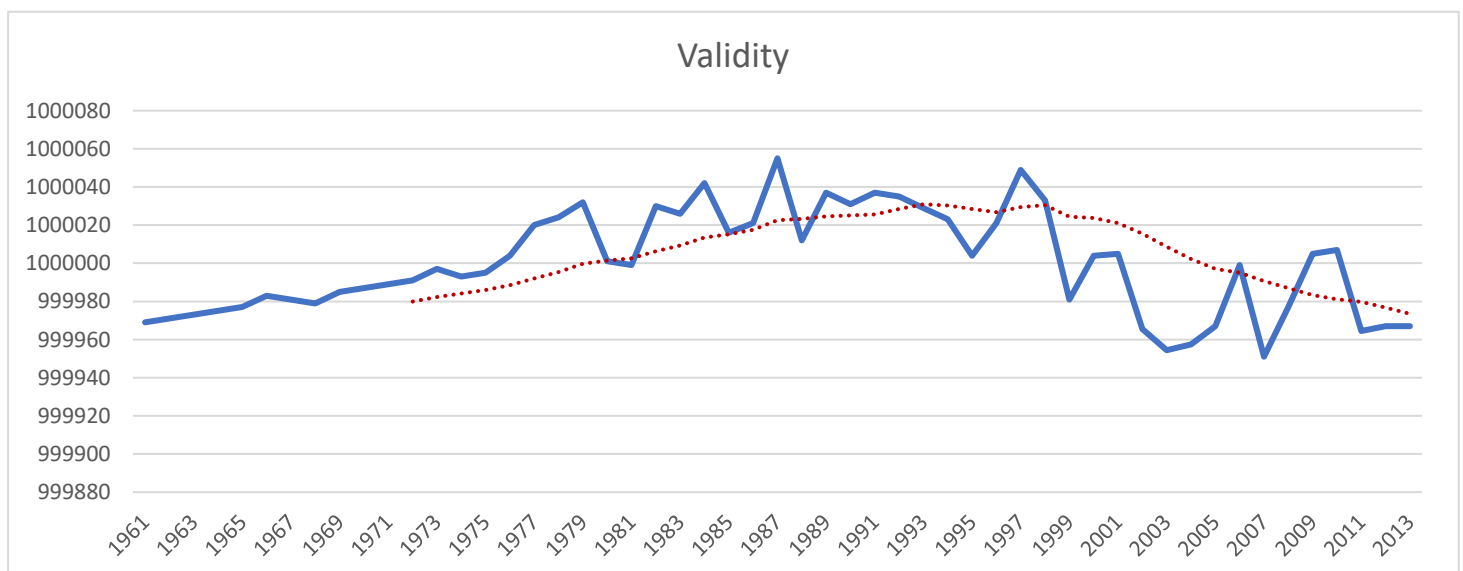
#18 Here you can observe the validation diagram (HU).

8. Here you can see the two diagrams that match the **Turkish** information. Figure #19 shows the Estimation diagram, you can read exactly how far it goes down, that is, how far it decreases, and from where its value rises. The validity figure #20, shows the reflection of the estimate.



**#19 Chart for the estimate (TR).**

This shows how much it jumps in the given country, how much the value we were looking (TR).



**#20 Here you can observe the validation diagram (TR).**

## Discussion

At the initial stages of the project, significant time investment is necessary due to the manual nature of the process.

This manual approach is crucial for understanding the steps involved and laying the groundwork for automation.

The manual solution typically takes several days, or even up to a week, to complete, involving numerous operations and the need to gather essential information.

## Conclusions

The aim is to determine whether a specific country is progressing in the right direction through the application of a tailored filter.

I seek to discern whether a country is developing or not, utilizing all available data to make this determination.

By analysing the data comprehensively, I aim to ascertain whether the country is moving in the correct trajectory.

## Future

In the future, my goal is to automate all the manual processes involved and ensure that the system can provide filtering results for any selected country, rather than just 1-2 countries.

While this will require time and effort, I am dedicated to automating the process as soon as possible and expanding the analysis to cover as many countries as feasible.

## References

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