Price Spreads from Farm to Consumer Analysis

1 Introduction

Agriculture plays a crucial role in the economy, influencing both producers (farmers) and consumers. One of the key factors that affects food prices is the **price spread**, which refers to the difference between the price that consumers pay for food and the price that farmers receive for the same products. Understanding this spread is essential to evaluate the fairness of food pricing and the economic sustainability of farming.

The **U.S. Department of Agriculture (USDA)**, through its **Economic Research Service (ERS)**, offers valuable insights into agricultural economics by reporting **price spreads** for a variety of food products sold in retail stores. These price spreads provide a comparison between the retail prices consumers pay and the farm prices that producers receive for agricultural commodities.

This analysis focuses on **flour prices** (and other agricultural products) from the ERS dataset, which tracks how the prices consumers pay for products like flour, sugar, and bread compare to the prices farmers receive for the raw commodities.

2 Data Overview

The dataset, *"Price Spreads from Farm to Consumer"*, includes data on various agricultural products, including:

- **Flour (White, All-Purpose)**: The price consumers pay for flour compared to what farmers receive.
- **Vegetable Oil**: Price comparisons between farm and retail prices of vegetable oil.
- **Sugar**: Analyzing the price spread for sugar.
- **Bread**: Investigating the differences in prices for bread, from farm to consumer.

The dataset also contains information on consumer habits, with *market baskets* representing typical annual purchases of these products by U.S. households. This dataset is updated regularly, allowing users to track long-term trends.

3 Objective

In this analysis, we aim to:

- Analyze the price spread of flour from farm to consumer over time.
- Examine how other agricultural products, such as vegetable oil and sugar, compare to flour in terms of price spread.
- Explore consumer price trends and understand how economic factors such as inflation and production costs influence retail and farm prices.

4 Relation to Agriculture & Consumer Habits

4.1 Agricultural Impact

Farmers are the backbone of the agricultural economy, but the amount they earn for their produce is heavily influenced by various middlemen in the supply chain, such as processors, distributors, and retailers. The **farm-to-consumer price spread** is crucial for understanding the distribution of value in the food industry. A **large gap** between farm value and retail price can indicate a discrepancy in how much farmers are receiving versus the profits made at the retail level.

4.2 Consumer Habits

Consumers are influenced by the prices they encounter at the retail level, and the price they pay for everyday goods like **flour, sugar, and bread** directly impacts their purchasing decisions. Understanding the relationship between **farm prices** and **consumer prices** can help consumers make more informed decisions about their spending habits and raise awareness about the economics of the food industry.

5 Data Source

The data used in this analysis comes from the **USDA ERS Price Spreads from Farm to Consumer** dataset, which provides detailed information on various food products sold at retail and the corresponding farm prices. The dataset can be downloaded from the https://www.ers.usda.gov/data-products/price-spreads-from-farm-to-consumer/USDA ERS website.

6 Loading and Preparing the Data

We have already downloaded the following CSV files for analysis:

- `flour.csv`

- `sugar.csv`
- `butter.csv`
- `bread.csv`

We will now load these datasets into the analysis environment to begin our exploration.

7 Dataset Columns

The datasets consist of the following columns:

- **Year**: The year of the data point.
- **Attribute**: This could represent the type of data (e.g., "Retail price-Dollars", "Farm value-Dollars", "Farm share-Percent").
- **Value**: The corresponding value for the attribute in that year.

For example, the `flour.csv` file contains data on the **retail price**, **farm value**, and **farm share percentage** for flour across different years.

8 Analysis Steps

The analysis will follow these steps:

1. **Data Exploration**: We will begin by exploring the data to identify trends, correlations, and noteworthy observations.
2. **Price Spread Calculation**: We will compute the price spread for each product to highlight the differences between farm value and retail price.
3. **Time Series Analysis**: Using time series methods, we will investigate long-term trends in the price spread.
4. **Prediction Model**: A forecasting model will be developed to predict future trends in farm-to-consumer price spreads.

9 Conclusion

This analysis aims to provide valuable insights into the **agricultural economics** of food pricing. By understanding the dynamics of the **price spread**, we can gain a better understanding of the underlying **economic conditions** that shape food pricing, from the farm to the consumer. Through this analysis, we hope to shed light on the **fairness** of pricing systems and the **economic pressures** faced by both farmers and consumers.