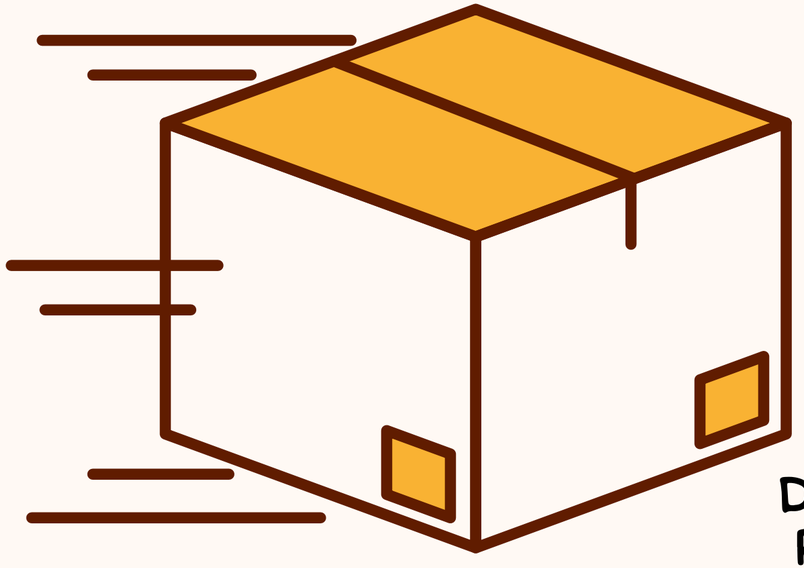
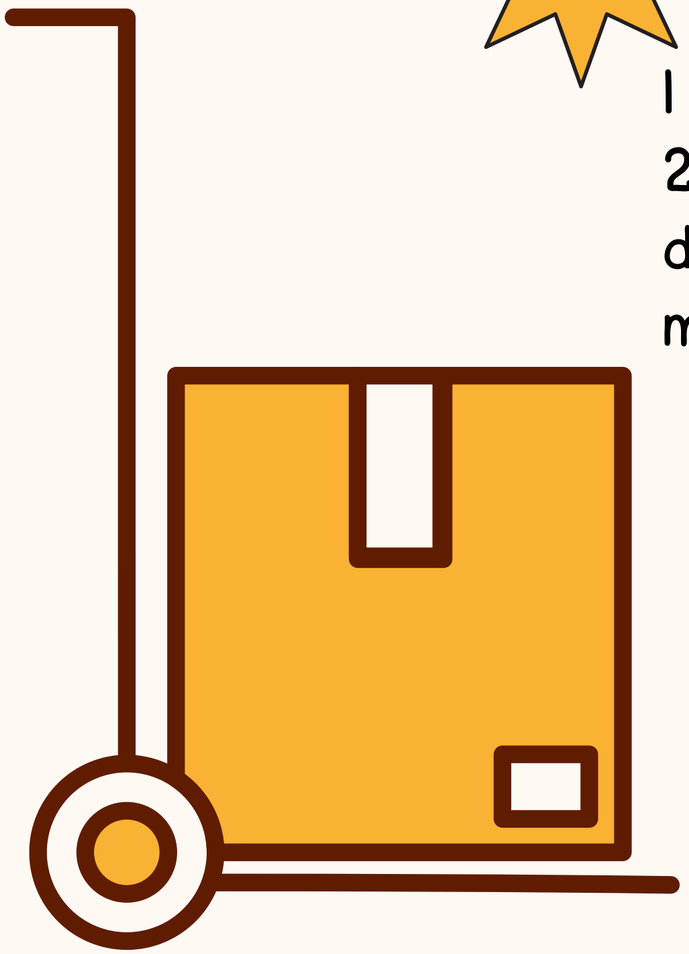
Analysis of the U.S. Import Price Index

By: Vaishna Subbaiah



Data Science Progrmaming
12/17/25

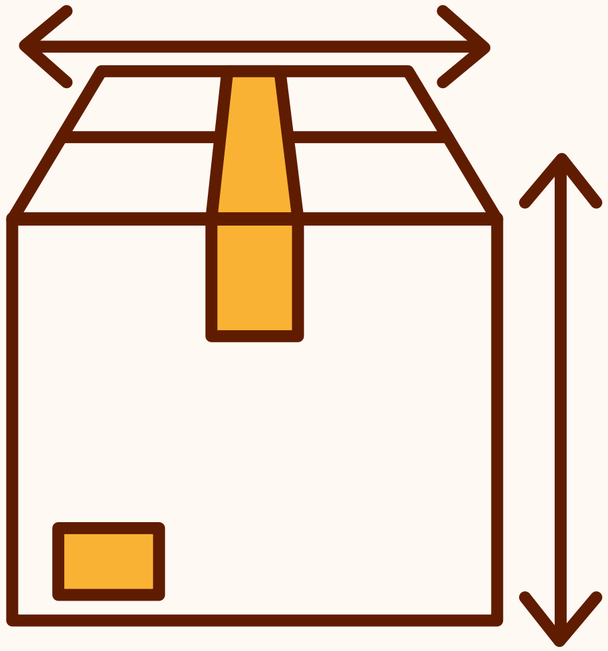
Introduction



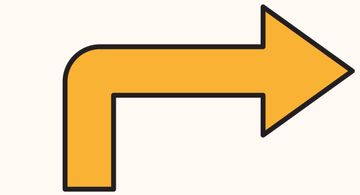
I used Python to analyze the U.S. Import Price Index from 2015 to 2024. The goal was to prove that the pandemic didn't just make things more expensive, but it actually made the entire market more unstable.

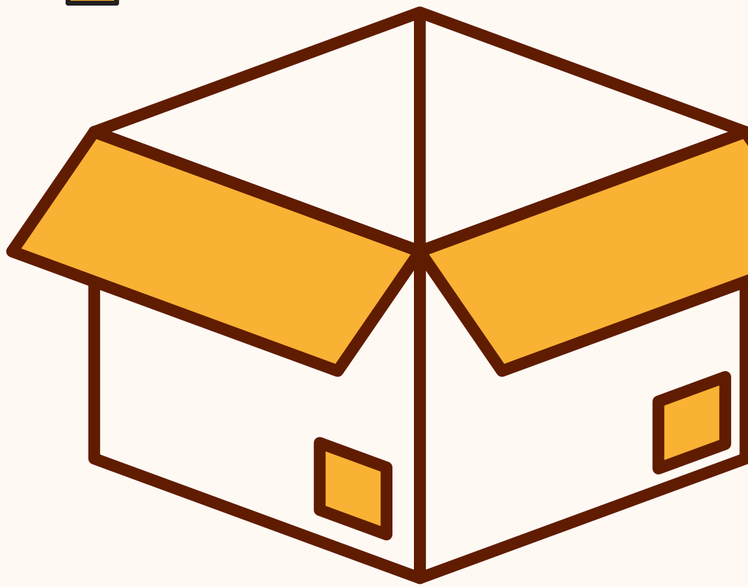
- Supply Chain Managers and U.S. Retailers → need to anticipate cost spikes.
- Economists → help to track the long-term impact of the pandemic on global trade stability.

Methodology



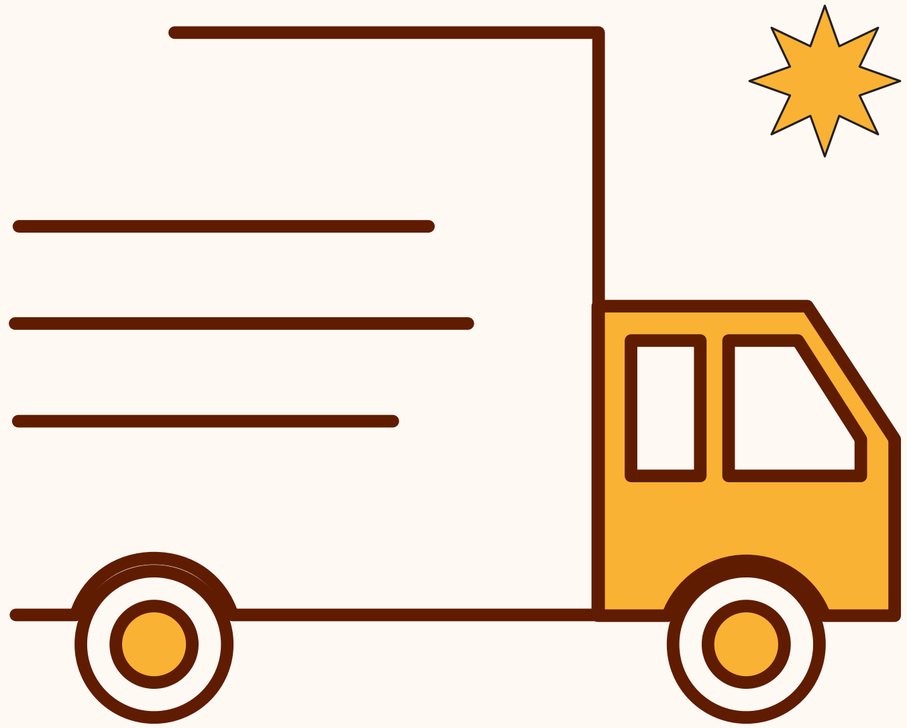
- Data Source: CSV dataset containing the U.S. Import Price Index.
- Tools: Jupyter Notebooks, Pandas for data cleaning, NumPy for calculations, and Matplotlib for visualization.
- Features Used: I worked with the Year, Month, and Value columns, eventually combining them to create a datetime index to calculate annual trends and monthly shifts.

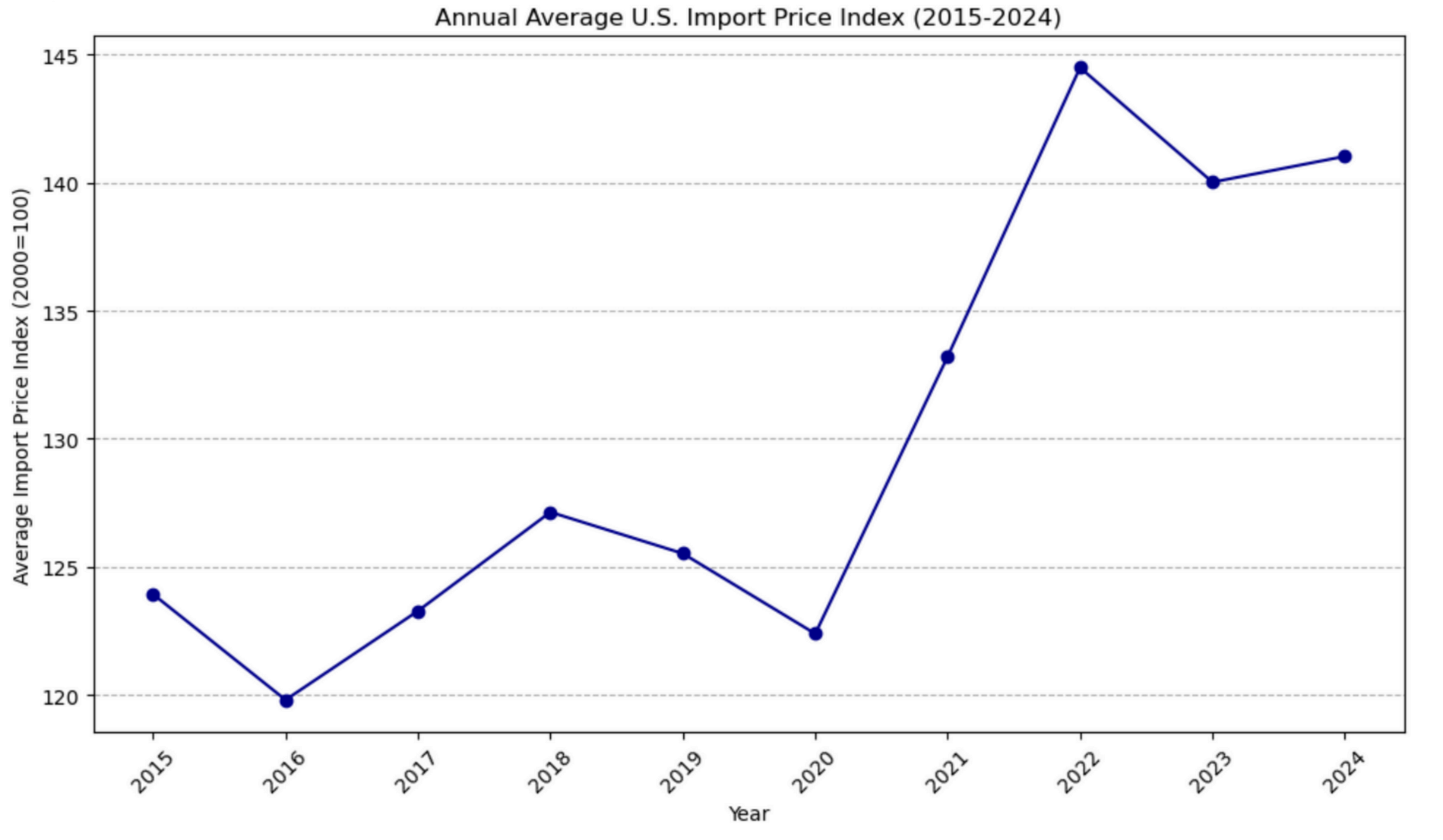




Question 1: How have U.S. import prices changed from 2015 to 2024?

What was the long-term direction of import costs over the 9 years?

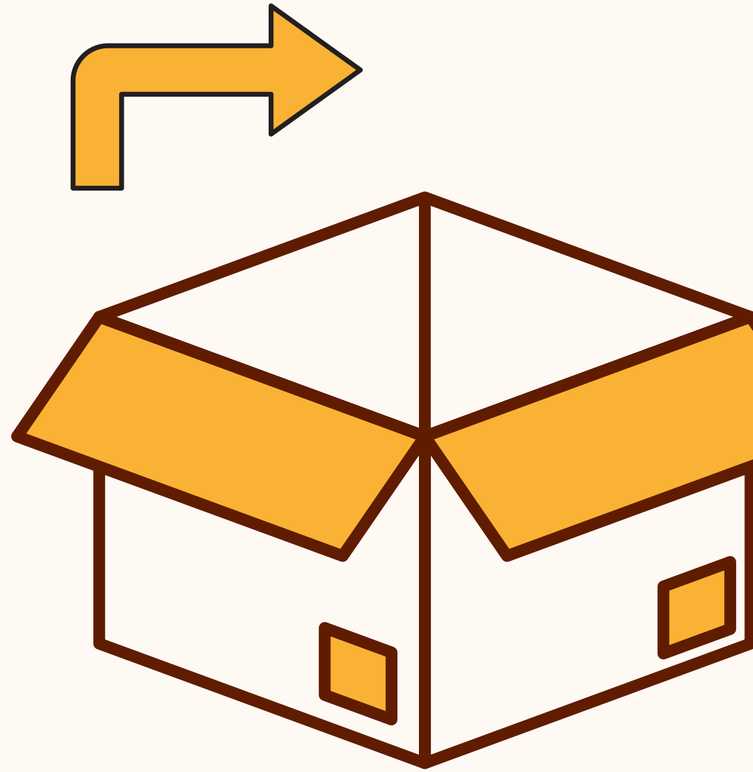




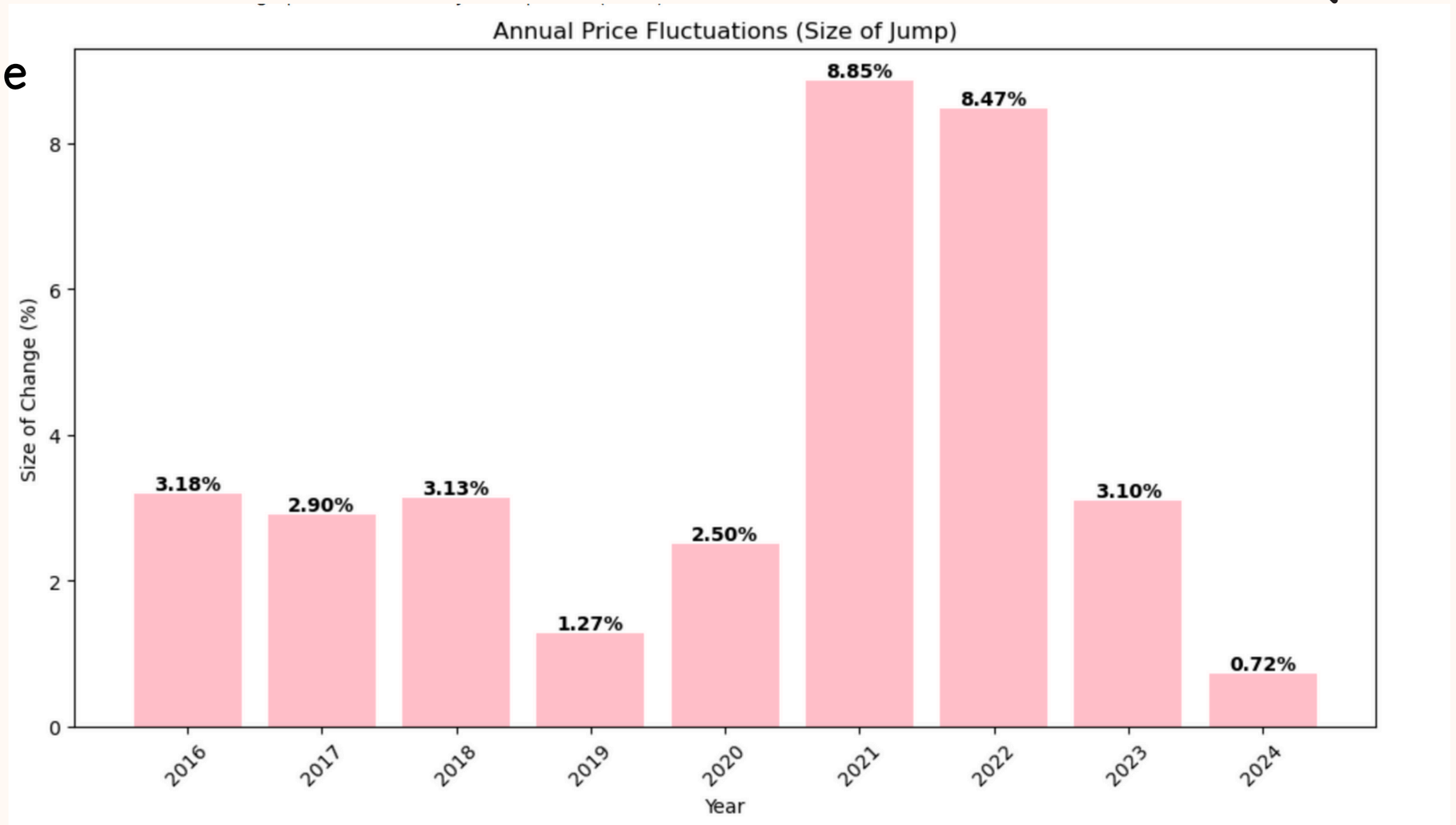
- Used a line graph to show the overall trend.
- Set the x-axis to cover 2015 through 2024

Question 2: Which years experienced the largest size of annual price change?

What are the "shocks" to the system when measuring the size of the gap between each year?

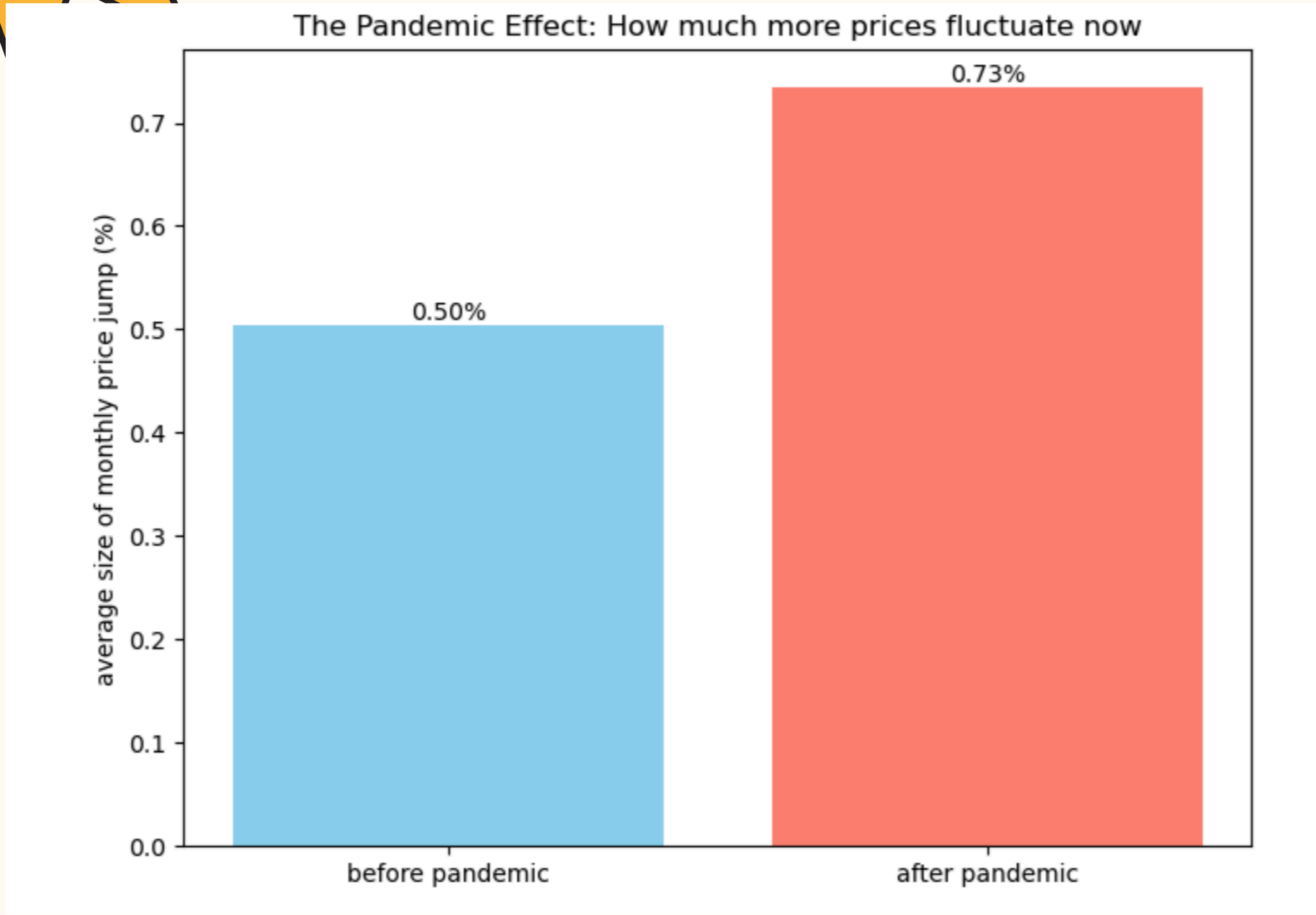


- Used pct_change() to find the jump from one year to the next
- Applied the absolute value function.
  - wanted to show the total scale of the movement



Question 3: How did the pandemic affect the stability of import prices?

How does the market's "jumpiness" compare before and after the 2020 COVID-19 outbreak?

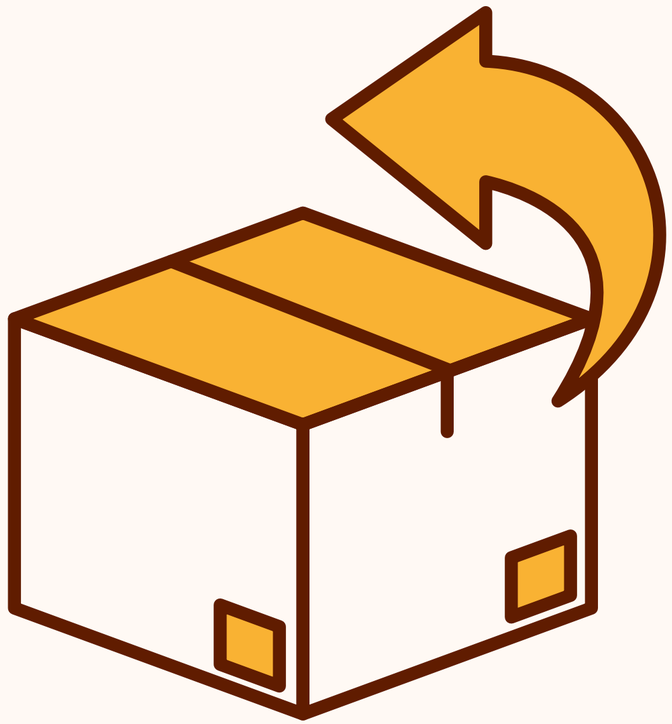


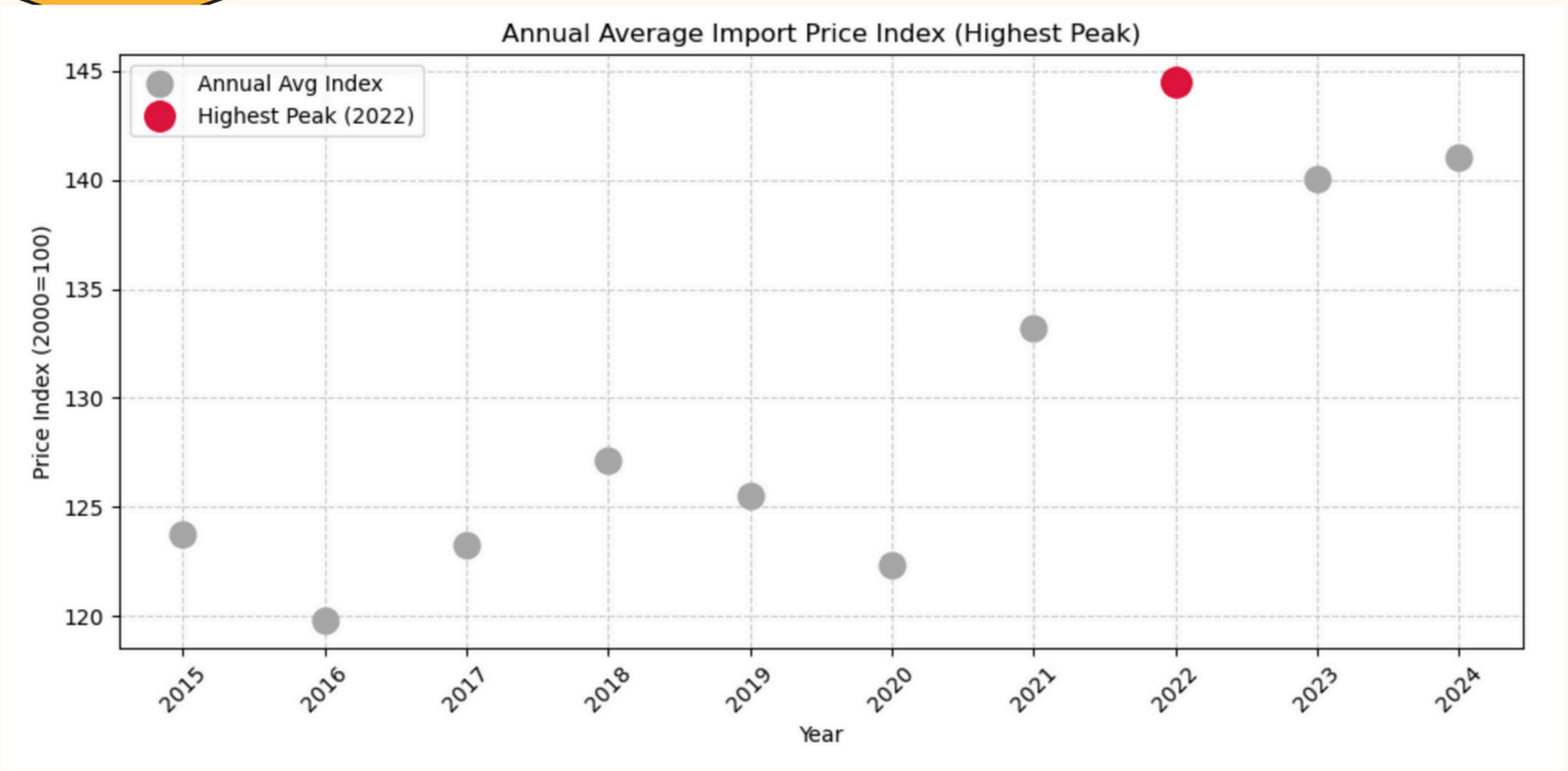
- Split the data into two groups
- Calculated the average monthly fluctuation for both periods

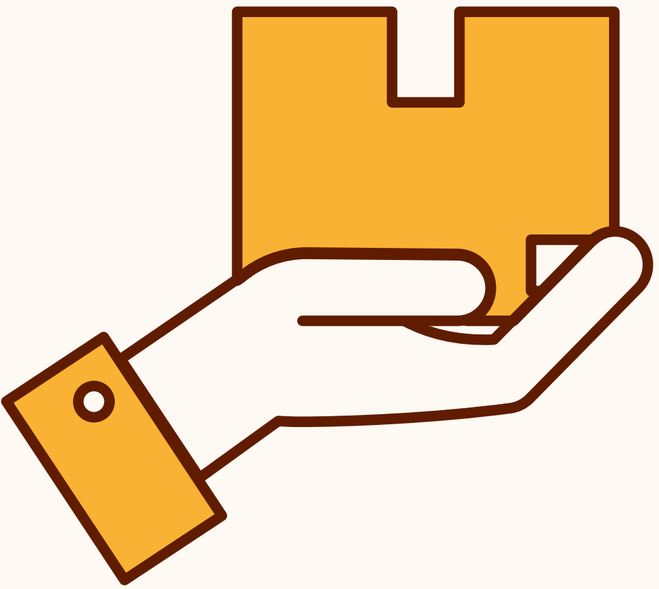
Question 4: Which year reached the highest overall price index for imports?

When was the absolute "peak" in the data?

- Used idxmax() to scan the data and find the exact year when the price index hit its highest point.
- Used a larger red marker at the highest point

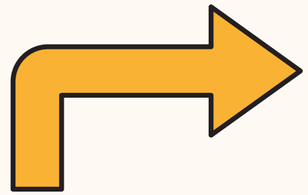






The Future

- Are specific industries (Fuel or Electronics) the primary drivers of these 8%+ annual shocks?
- Interested in connecting the information discovered with global shipping rates to see if the price fluctuations are caused by the goods themselves or the cost of moving them.



Appendix

- pct_change(): Used to calculate the percentage difference between years.
- abs(): Used to ensure all market "shocks" were measured as positive values.
- idxmax(): Used to automatically locate the exact date of the highest price peak.
- the U.S. Import Price Index is a number that tracks the average change in the price of goods bought by U.S. residents from foreign sellers.

year	month	value
2015	Jan	126
2016	Jan	117.8
2017	Jan	122.3
2018	Jan	126.5
2019	Jan	124.6
2020	Jan	125.2
2021	Jan	126.5
2022	Jan	140.1
2023	Jan	141.3
2024	Jan	139.4

Thank You!