Econ 1923 - CPI project

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Due: March 4th, noon

1 Formalities

This is a group project. All members of the group are expected to substantially contribute to the project at all stages.

The solution to this project should be submitted as a Jupyter notebook either in R or Python. The names of the group members and the section they are in should be clearly stated at the top of the notebook. The list of names indicates that everyone contributed to the project.

Only one notebook per group should be submitted by one of the members. The other members should upload a short text file stating their team, and that the solution was submitted by another member. All submissions should be done by the deadline (3/4 at noon).

Any exceptions to these rules should be discussed with me no later than 2/28.

2 Definition of the Index

2.1 Items and weights

Products, services and their mix should be decided. Your basket must include at least 8 ingredients. For example,

$$0.14 \cdot Energy + 0.22 \cdot Cereal + 0.25 \cdot Transportation + 0.33 Movies + 0.06 \cdot Fruits.$$

The above example is arbitrary (and includes only 5 products).[1] Your choice should be justified. Use the online and other resources to build a reasonable

[1] Always, weights should be positive and sum to one.

basket of goods that represents, in your opinion, students. There are no correct or incorrect answers, I am looking for a well justified answer.

2.2 Locations and weights

The locations where these prices are measured. List at least three locations based on where the team members either live now, lived in the past, or want to live in the future.[2] Choose weights for these locations according to your liking.

2.3 Finalizing the basket

Combining the choices of items and locations, find all the series names. assign a wight for each series that combines the weights that you chose for the items and the weights you chose for the locations.

3 Downloading the data

3.1 Refine the basket

First, verify that the series you created in the previous section exist in the BLS' API. If some items do not exist, take them out and re-weight. If a certain location produces all the missing series, replace that location with a bigger or more general location.[3]

After you made all the changes and adjustments, state the final basket and the weights for each item in the basket. Table format will be great here.

3.2 Downloading

Make an API call to download the data for the basket you created. I ask that you have data for the last 5 years: January 2017 to January 2022. Make sure your API call retrieves data for this range.

Include the general CPI (CUUR0000SA0) in your API call.

Question: Are all the series you downloaded in a monthly frequency? If not, how can you fix that (i.e. interpolate).

[2]Sorry, but this is only for US locations. You can't choose Amsterdam.

[3]For example, if you can't find any series for Pittsburgh, consider using Philadelphia instead or the Northeast.

4 Aggregating

Compute your version of the CPI based on the weights in 2.3.

5 Inflation

Compute the 12-month inflation for several lags based on your CPI and compare it with inflation based on the general CPI. Compare and discuss the results.

Bonus: Put both on one graph and make sure the two lines are clearly labeled as well as the axes.

6 Format

The group project should be in a Jupyter notebook that includes the answers and analysis listed above. I'm not looking for anything fancy but the following guidelines should be followed:

- Markdown should be used to create titles and to write your verbal answers to the questions.
- The names of the group members should appear at the top of the notebook.
- All variables and functions should have meaningful names (I know this is a subjective term).
- All code should be clearly and meaningfully commented, especially functions!

7 Grading Criteria

The project overall will be taken into account when a grade is determined. The following elements will be taken into account (including but not limited to...)

- How well explained is the process of constructing the index,

- Solving data problems (e.g. missing series, series which are not in a monthly frequency),
- Documenting the code in a clear way,
- The overall organization of the notebook,
- The discussion following the results on inflation.