Ben - Joe Consumer Price Index

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Abstract

We observe fluctuations in the Ben-Joe consumer price index (CPI) for Embry-Riddle Daytona Beach campus students during the COVID-19 pandemic. We created this index by measuring a basket of goods consumed by an typical student on campus. The Ben-Joe index was calculated using market basket method for ERAU students. These dollar values in market basket were updated every month. In this study, we compare Ben-Joe index with the nation's CPI (Urban). The US witnessed a period of deflation following the announcement of COVID restrictions. This phenomenon was also observed on campus and consequently reflected in the Ben-Joe Index, albeit with a little lag. This deflation on campus was driven largely by a change in the price of the basic meal plan (14 meals a week), but was slightly offset by increase in housing costs. While meal plans decreased in price as a result of the cancellation of in-person classes and an evacuation of dormitories, housing prices increased because of enhanced demand created by new policies of the school. The US CPI primarily decreased due to lower energy prices as well as lower energy consumption. While both CPIs saw an overall decrease due to different material goods, the reason both decreased was due to the overall economic inactivity caused by the COVID pandemic.

Methodology

Because it is important to gauge the overall well being of students on the campus, it is therefore pertinent to create a reliable measure of what students pay on campus for typical goods and services. Thus, level of prices can track expenses paid for by students and measure the level of inflation targeted to the students. This can have impact on the economic development of resources at the campus. A number of items are surveyed from students that are both considered as essential consumption items as well as non-essential but important for development. Sizeable fluctuations create shock in consumption patterns and thereby have psychological and socioeconomic impacts. Data collected need to be from standardized sources and some idiosyncratic sources that may be used by students are not included in these calculations. The method used for creation of this index is survey based, which determines the consumption pattern of students and therefore budget share, which then helps create a cost of basket. When a new item is added or old item deleted, then the budget shares are scaled up or down to equalize the cost of basket for the point in time when the change was introduced. This enables continuity in the basket. Some limitations of this study are that just like CPI, this index cannot measure quality changes, wealth effects and substitution effects. The Ben-Joe SPI has been compared to the BLS Urban CPI to measure both the efficacy of this index and to see how the patterns between the two compare.

Theory

The cost of the basket at time 't' is equal to the summation of the products of budget shares (weight) and the price of the individual items. Consumer price index for the year 't' is defined as CPI(t) = Ct/CB where Ct is the cost of the basket in year 't' and CB is the cost of the basket in the base year. Inflation is the rate of change of CPI defined as (CPI(t) - CPI(t-1)) / CPI(t) where CPI(t) is the current period CPI and CPI(t-1) is the CPI for the previous period.

Monthly Basket Costs

Base Basket Cost: $10,153.30 (March 2020)

Average Basket Cost: $9622.17

Minimum Basket Cost: $8435.03 (July 2021)

Maximum Basket Cost: $10147.36 (April 2020)

Monthly CPI Values

Base CPI Value: 100 (March 2020)

Average CPI: 94.7702

Minimum CPI: 83.080 (July 2021)

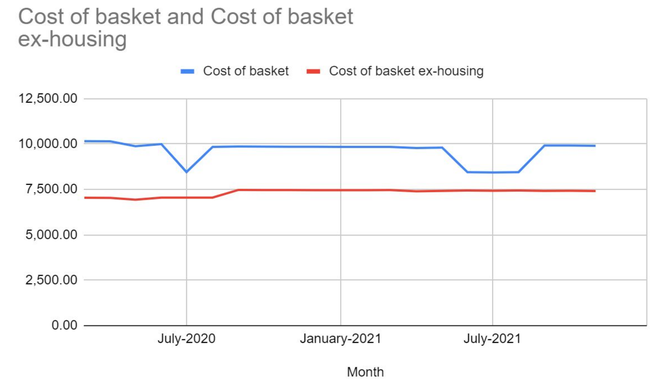
Maximum CPI: 99.9414 (April 2020)

Contributing Factors

From month to month many goods did not see a substantial increase or decrease in their prices, often there was one or two items that had a substantial change and others remained stable or had only a slight change of a few cents. The one thing that does change over summer is student housing meal plans. Currently we have not smoothened this shock but going forward we have plans to smoothen this out as it is a seasonal fluctuation. With COVID-19 still being very present, the demand for some goods, such as cleaning products, remained high and drove those products often to being out of stock while conducting the monthly price evaluations. Supply logistics also play a part in the distribution of the prices recorded in this index. The last but certainly not the least contributing factor in CPI variances is the cost of campus itself such as meal plans, housing and tuition. While these do not generally have a sudden massive spike, a rise in housing would have a substantial increase on the CPI number while the raise in the price of canned fruit at Walmart would not necessarily have the same impact.

Results

From the research conducted and data obtained, the first year of the Ben-Joe Index has come to a close and a model has been generated for the consumer price index for the Daytona Beach campus. This index has managed to track prices and availability of products throughout a year of the COVID-19 pandemic, beginning right before the initial campus closure to present day. This index has allowed the campus to see how the data varies month to month, how the cost of living shifts for both students and faculty on campus, and how COVID-19 and other logistical matters have shifted prices, products and availability for the local area.



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