

**Consumer Price Index for College Students**

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**Introduction:** The Consumer Price Index, or CPI, is a statistically based theory that measures changes in costs of goods needed to uphold a certain standard of living over time. It is a reliable way to measure what consumers must spend in order to maintain a consistent level of well-being. CPI typically relies on the *Laspeyres Index,* which states that the base period is optimal. To compare costs of living over time, the cost of the base period bundle is calculated and then compared to future costs. The U.S Bureau of Labor Statistics uses the bundle calculated in 1982-1984 as their base period. However, for this project I will be calculating a CPI Index for the month of February 2020 to be used as my initial base period. It is also important to note that this particular CPI Index will exclusively focus on the cost of standard of living for the average college student in the United States of America.

**Basket of Goods for the Average College Student in America:**

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When coming up with goods for my basket, I first had to decide which goods are completely necessary for college students to purchase on a monthly basis. In doing so I went with the four categories that I felt cover the majority of expenses that come with living on a college campus. The necessities category covers items needed for a healthy standard of living such as food, toothpaste, body wash, etc. The medical expenses category covers basic household supplies for minor illnesses or cuts and bruises. The education expenses cover costs for completing classwork. The Last category, rent expense, I decided to cover in a separate bundle due to the wide variance in rent expense across different regions. I will go more into this separate bundle after I cover the first three categories mentioned above. I then chose to focus on the three retail/convenience stores Walmart, Target, and County Market to get my product prices. I chose these three because they are located across the country and are fairly consistent in prices from store to store. These two factors were important in making sure that this bundle of goods was accessible to the widest range of college students possible. I chose to leave out various expenses such as entertainment, alcohol, away from home eating, and ride share app expenses simply because those expenses vary an incredible amount among different types of students. For example, some students might spend over $50 a week on various social activities such as going to bars, but then others do not spend much at all. It made the most sense to me to keep this bundle limited to what is absolutely necessary to live a healthy life on a college campus.

**Necessities:** The goal for the necessities category was to try and keep it as cost efficient as possible, as most college students are shopping on a tight budget. Keeping this in mind I went with cheap foods someone could live off, such as ramen noodles, cereals, canned soup. For the two types of cereals, General Mill’s Cinnamon Toast Crunch and Kellogg’s Frosted Mini Wheats, I used the price of a 12 OZ package. The frosted mini wheats only came in 24 OZ packages at Walmart, so I used the equations:

***Size of a box of Frosted Mini Wheats from Walmart(24)/size from Target(12)= 2***

***🡺 adjusted price=store price per 24 OZ/2***

to keep the prices consistent with the units compared to the other two stores. I used this same method (adjusting any numbers as necessary) to fix any discrepancies in units I came across throughout the process. Then through a combination of personal experience and polls sent out to multiple GroupMe chats, I determined that the average cereal buyer goes through approximately 4 12 OZ boxes of cereal a month. As a result, I figured that my final prices for the cereals per month should represent the cost of buying two boxes of each per month. I used various polls, and personal experience to determine average consumption of products per month throughout the process as well. For some products, there was a range on the prices of items. This is an example of yet another obstacle I ran into. For a 10.5 OZ unit of Cambell’s Chicken with rice soup, Walmart had a reported price range of $1.48-$5.57. I called the store to see exactly what this price range represented. The range represents how much the price can vary across different locations or at different times depending on supply. In these cases, I used the equation:

***median price=((max price-minimum price)/2)+minimum price***

to find the median price in the range. I then used that median price to represent my cost of a single 10.5 OZ unit of soup. I believe that this is the most accurate estimation of what a student would be paying for these products if they walked into any store across the country.

**Medical Expenses:** For the medical expense category, I chose three basic items that cover at home treatment for minor illnesses or injuries a college student may face. Ibuprofen can cover flu like symptoms and headaches, along with other aches and pains. Nyquil can help with sleeplessness and coughs. Neosporin would cover any minor cuts and scrapes.

**Education Expenses:** Education expenses was one of the hardest expenses to record accurately since these can really vary between students. Same as before, I used polls in a variety of GroupMe chats, which received 68 responses, towards how much people think they spend per semester on textbooks for their classes, and for their coursework (which includes any online program expenses such as Connect, or Proctor-U). I then averaged all of the data to get a solid estimation of what the average student spends per semester on various textbooks and coursework.

In order to get the final estimated cost per month of each item within the bundle, I took the single unit costs that I mentioned finding in the above paragraphs and multiplied it by the amount of average consumption per month of each. For example, I found the price of a 12 OZ box of General Mills Cinnamon Toast Crunch from Walmart to be approximately $2.98(single unit cost). I then estimated that an average college student using my bundle would go through 2 12 OZ units of Cinnamon Toast Crunch a month. So I used the following equation:

***Single unit cost x # of units consumed per month= cost per month***

***🡺 2.98 x 2 = $5.96 per month spent on CTC/Walmart***

Some products were more complicated. For example, Angel Soft Toilet Paper came in packages of 6 mega rolls. I estimated that an average college student would go through two rolls a month. To find the average amount spent on this product per month I used the following equations:

***# of rolls used a month/# of rolls in package=% of package used per month***

***🡺 2/6= .33% 🡺 single unit price(6 mega rolls) x % of package used each month***

***🡺 5.28 x .33 = 1.7424/Walmart***

I used the same thought process for Scott’s Paper Towels. Another product that was slightly different were the ibuprofen tablets. The tablets were 200 mg each and came in a 500-count package. From my surveys, I determined that the average college student goes through one package every three years. So, I used the equation:

***Single unit price/36 months = cost per month***

Lastly, for my two goods listed under education expenses, textbooks and online course work, I used the equation:

***Single unit price x (1/4 or .25) = cost per month***

since you only have to make these purchases once every 4-month semester of college.

Finally, after calculating all of these prices per store, I then found one average price for each product from the three separate store prices for that product. Using CTC as the example once again:

***(Walmart Price + Target Price + County Market price)/3= final average price per month for that product***

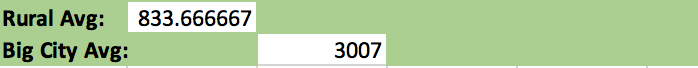
***🡺( 5.96 + 5.98 + 7.58)/3 = 6.51***

I then summed all of these final average prices to get a final total of approximately $157.58 per month for this bundle of goods. One major limitation of this strategy was that my resource pool was pretty small and limited. Getting a lot of the above information from a few local GroupMe chats means that the information might not represent students in the U.S as a whole very well.

**Basket of Goods for Rent by Region:**

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*Info gathered from www.rentjungle.com*

**Rent Expense Per Month:** Rent expense was an expense I had to include in some way. It is the largest expense many college students face every month, but the problem is it is also the hardest expense to record because it varies so much by region. Because of this issue, I decided to split this cost up in a separate bundle. The colleges I chose to represent were University of Illinois Urbana/ Champaign, University of California, LA (Westwood Village Area), University of Alabama Tuscaloosa, and finally New York University, NY (Greenwich Village). I chose these four options to represent a wide range of regions, from the west coast, to the south, to the east coast. Also, Urbana/Champaign, IL and Tuscaloosa, AL represent the costs that a student attending a more rural area can expect to pay on average for rent. On the other hand, the Westwood Village, LA and Greenwich Village, NY represent the costs that a student attending a big city college can expect to pay on average for rent. I do believe that the totaled average here is a bit hard to use in any manor due to the significant difference between rural living and big city living. As a result, I also totaled the average cost of rural living and the average cost of big city living as shown above. Another limitation of this method is that I only chose two of each. It also does not represent the cost of dorm living. According to the Washington Post, “Housing and food tends to be much higher at schools in big cities such as New York or Washington, where real estate is expensive. Yet in some of those cities, it is still cheaper to live on campus than to rent a private apartment, according to a [recent study](http://www.trulia.com/blog/trends/campus-housing/)by real estate Web site Trulia.” (www.washingtonpost.com). Because of the higher cost of rent expense in big cities, more students do end up staying in dorms for more years of their college experience. This CPI index fails to represent those students.

**Finding Prices for this Basket of Goods in the Next Period:** A big advantage of my basket of goods is that all of the goods and units for those goods stay very consistent from period to period. Next month, Walmart, Target, and County Market will still be selling the same 12 OZ boxes of cereal, or frozen pizzas that represent my basket. As a result, the BLS should use the exact same products, unit sizes, and methods that I had used here to get their updated prices. I would also recommend running through surveys again to make sure average consumption stays consistent. It is best to keep as much consistent as possible in order to ensure the accuracy of the CPI Index.

**Constructing the Index:** The Laspeyres cost of living index will be used to calculate the CPI of this basket of goods. The Laspeyres Index, or CPI equation is as follows:

For this equation the **total expenses per month** value, $157.58, from the above product basket from February will serve as the reference period cost for future months. The BLS will want to update this information using the methods described in the previous paragraphs and **calculate a total expenses per month** value for future months. These future values will serve as the current cost of bundle, to be compared to the reference period found here. In addition, the BLS will want to make a second CPI Index using the Rent Expense information found above. If the BLS is trying to find the standard of living cost for a rural college student, they should us the **Rural Average** value, $833.67, as the reference period cost of bundle. On the other hand, if they are trying to find the standard of living cost for a big city college student, they should use the **Big City Average** value, $3007, as the reference period cost of bundle. Once they are finished finding both indices, they should add the two together for their final price index. The final result would be as follows:

**For a Rural College Student:**

**+ = Final CPI Index**

**Or**

**+ = Final CPI Index**

**For a Big City Student:**

**+ = Final CPI Index**

**Or**

**+ = Final CPI Index**

From month to month, the rent expenses will probably be the ones that fluctuate the most. Rent expenses are often unpredictable and can change due to effects from the real-estate market, new ownership, demand, time of year, etc. The expenses that will change the least will be those listed under the necessities and medical expense categories in my product basket of goods. Walmart, Target, and County market typically keep their prices pretty consistent on most of the basic items I listed throughout the year. Also, since the medical expenses are purchased so infrequently it would take a pretty large price hike to have much of an impact on those product’s monthly expenses.

**Summary and Overall Assessment:** In conclusion, the goal of this index was to stay simple and stick exclusively to products necessary to uphold a healthy standard of living in college. As a result, this consumer price index will maintain a high quality and accuracy over time. In addition, splitting cost of rent into two separate categories, rural and big city, will ensure this CPI represents a much larger base of college students here in the U.S accurately. The CPI for the average college student should end up being considerably lower than that of the average consumer. This is due to college students having a much smaller budget, and on average a lower standard of living than consumers out of college. A problem the BLS may face when constructing this index over time may come from inconsistencies in my average consumption per month totals found through GroupMe polls. With greater resources, the BLS has the capability to gather a wider range of more accurate information to adjust those numbers. From this project I learned how complicated data collection can be. Every consumer’s bundle and standard of living is different, so it can be a real challenge to create a single index that accurately represents a wide range of people. For example, it was very tough to figure out a way to record rent expense in a way that satisfied me. It took until after both of my CPI progress reports to really figure it out. I do think this project was a worthwhile first look into data collection at this level. I look forward to expanding on what I’ve accomplished here in future projects.

Works Cited

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