Getting the most from Consumer Expenditure Survey (CE) tables

For the 2016 Tables

Nicholas Zwileneff
Bureau of Labor Statistics

Version date 12/19/17

This paper provides insight to aid in understanding and utilizing information available on the CE tables. A number of different tables are available and knowing more about them can often help in providing more desirable and better tailored data.

Consider the variance rows when interpreting the numbers

Care should be taken when analyzing detailed expenditure subcategories in both the standard and prepublication tables, as a small number of consumer units (CU) reporting an expenditure can cause the mean dollar estimate to be imprecise. Users should consider the coefficient of variation (CV) published with the dollar amounts. Expenditures and income levels with CVs of 25 % and over are generally considered unreliable. For further information on standard error and variance in the CE, see the online CE reports "Standard Errors in the 2016 Consumer Expenditure Survey" (Swanson, 2017) and "How does the variability of Consumer Expenditure data impact your analysis?" (Cobet, 2017).

Consider the *Consumer unit characteristics* section when interpreting the numbers

There are a number of demographic characteristics at the beginning of the tables that can be used to assist in analyzing data in a column, or when comparing different columns in a table or tables. Nationally published articles often site the Bureau of Labor Statistics CE data in a manner that may appear misleading by not having mentioned or considered the characteristics. Customers using our tables often contact us to verify that they are interpreting our data correctly and quite often they are not seeing the whole picture. They hone in on a particular expenditure or income mean estimate that they are interested in, and overlook the CU characteristics section at the beginning of the table. Some characteristics and examples follow, in the order as they appear on the tables.

--Number of consumer units (in thousands)

This is the first row on the top of our published tables. It is the weighted U.S. population from the Interview Survey. For 2016 the published weight is 129,549 representing 129 million CUs. While this figure applies to the Income statistics which all come from the Interview survey, it cannot be used to multiply food expenditures and other items which come from the Diary Survey. For the *All consumer units* column the calculation would be very close but in the other table columns with smaller subsets of the total population the disparity in weights is sometimes quite significant. For example, using the Income prepublication table from 2016 we have an *All consumer unit* column Diary weight that is 99.9 percent of the Interview weight (129,461,459 of 129,549,180). The *Less than $15,000* income column on the other hand has a Diary weight that is only 92.5 percent (16,074,138 of 17,367,961) of the Interview weight. The full Interview and Diary column weights can be found at the very last rows of the integrated prepublication tables, available on request.

--Average number of People in consumer unit

Our 2016 quintile table shows the lowest and highest quintiles mean food expenditures of $3,862 and $12,513 respectively. The highest quintile spends 324 percent, or more than three times as much on food than the lowest 20 percent. Although the two columns each represent an equal number of weighted CUs, they are not similar in size. Taking into account that the lowest quintile has an average of 1.6 people per CU while the highest quintile has 3.1 people, the apparent difference per

person changes considerably. Per-capita food spending by the top quintile was 167 percent, less than two times higher than the lowest quintile: $4,036 compared to $2,414.

--Adults 65 and older

Looking at the people that make up the first and fifth quintiles we see that *Adults 65 and older* make up about one quarter of the first quintile and around one sixteenth of the top quintile. If interested in seniors there is a column in the Age table where the reference person of the CU is 65 or older. The *Adults 65 and older row* has a mean value that shows they make up about three quarters of the population in this column: 1.4 of the 1.7 average number of people. These CUs have on average one half of an earner and their *Wages and salaries* are about one third of their *Total income* which is similar to what we saw in the lowest quintile. The 65 and older group has average *Total income* and *Wages and salaries* that are more than four time greater than the lowest quintile. The CUs in the *65 and older column* are spread out among the different quintiles. If one is interested, we have two-year tables with Age cross tabulated by income. We use two years of data to produce these tables to get a sufficient sample. Even with the larger sample the data are subject to large variances and fluctuations. These tables are on the web under the section Cross-tabulated tables. They are not produced in the larger prepublication version because of the sample size, and they only contain mean values. The methodology for producing and providing variances for these tables is being researched.

--Average number of Earners in consumer unit

One may want to consider this characteristic of a CU when looking at the *Wages and salaries* subcomponent *of Money income before taxes.* In the published version of the 2016 Quintile table we can see that the lowest quintile has on average one half an earner per CU while the highest quintile has on average two earners per CU. In addition, we see that for the first quintile, *Wages and salaries* ($3,472) make up 30 percent of their total income. In the highest quintile the Wages and salary ($159,681) make up 80 percent of their income. If one is interested in a CU's earnings they can use our Number of Earners in the consumer unit table where they can easily compare a one earner to a two earner CU. Coincidentally, in 2016, they each have an average of 3.0 people in CU's of two or more people.

--Average number of Vehicles in consumer unit

This row includes both owned and leased vehicles and is another useful characteristic that is often used when comparing transportation expenditures. It would be a factor to consider when looking at expenditures for items such as *Vehicle insurance*, *Gasoline and motor oil*, and *Other vehicle expenses*.

--Housing tenure: Percent Homeowner or Renter

We often receive queries from customers that look at the *All Consumer units* column asking how the published average rent could be so low. In 2016 the *Rented dwellings* row under the Housing section has an average annual expenditure of $4,035; dividing this by 12 months would yield just $336 a month --- no wonder this average rent would be questioned. If one looks at the characteristics however, you see that only 38 percent of Consumer units are *Renter*. One should divide the dollar average for all consumer units by .38. This equals an average rent for renters being about $885 a month, a much more reasonable figure. A better alternative to this extra calculation would be to use the CE Housing tenure and type area table and look at just the subset of renters in the *Renters* column. Here the average annual for *Rented dwellings* is $10,557 or $880 a month. You could take this one step further and use the Interview table along with an associated explanation page and calculate reported rent by renters in a given quarter and discover that only about 93 percent of renters actually report out of pocket *Rented dwelling* expenditures making the average by those who spend $946. Similar calculations can be made for Homeowners, such as for *Homeowner insurance*. When looking at mortgage payments and *Mortgage interest and charges*, there is a further breakdown of *Homeowner* in the characteristics for those *With mortgage* and those *Without mortgage*. Keep in mind that the principal portion of a mortgage payment is collected as a reduction to liabilities and is **not** considered an expenditure.

Integrated table construction

All published tables are **Integrated**, meaning they use data from the two different CE surveys: the weekly (Diary Survey) and quarterly (Interview Survey). The data are annualized for use in the published tables. Each year a new stub is produced

containing any modifications, additions, deletions, or survey source changes. When changes occur they are noted in the appropriate row in the *Item* column as explained below.

--Interview Survey expenditures are collected for a quarter through a recall method asking about the previous three months before the interview takes place, and are multiplied by four to get an annual amount. Tables cover an expenditure 12 month time period, and not the collection year. For example in the 2014 annual table there are expenditures that were collected in January, February, and March of 2015. January interviews are all mapped to the previous year. February Interviews would be divided by month with the January expenditure reported for that year and November and December expenditures would go to the previous year's table. New and ending rows for expenditures from the Interview survey generally begin in April collection, therefor those rows will not have a complete year of data in them. The row title would be annotated with a "from" or "thru" quarter remark such as *Residential telephone/pay phones* (thru Q20131) which would only have the remaining $1/12^{th}$ of a year of data for a 2013 table or, *Assets taken from farm or business* (from Q20131) which would contain $11/12^{ths}$ of a year of data.

--Diary Survey data are collected for a week of expenditures and multiplied by 52 for use in the annual tables. The new rows begin in January and will have a full year of data while the ending rows have data through December and do not appear in the next year's annual tables. For processing of two-year data the ending row may be kept depending on the type of change.

Percent reporting cannot be annualized

The percent of consumer units making an expenditure can only be reported covering the time period for which the data were collected. For example, the percent reporting for vehicle insurance is per quarter, and all CUs do not pay car insurance premiums every 3 months. The percent reporting will be either weekly or quarterly depending on the survey used as the source of that expenditure item. Aggregated rows that have data from both surveys do not have a percent reporting calculation. To see the percent reporting numbers for disaggregated rows one should request the Interview or Diary survey prepublication data table. With these tables one can answer such questions as: -- What was the average expenditure per week on *Rice* for consumer units actually purchasing rice? or -- What was the average quarterly expenditure on *Cellular phone service* of those in the middle quintile who actually reported such an expenditure?

Aggregate expenditure share tables

Aggregate shares are produced for a separate set of published annual calendar year tables. These tables will show an aggregate dollar amount (in millions) in the *All consumer units* column and a percentage share for that row for the rest of the columns. An example would be: *Apparel and services* expenditures in the 2016 aggregate Decile table where the first decile accounts for less than 5 percent of the 233 billion dollar aggregate expenditure while the highest decile accounts for 25 percent. These tables are not available in a prepublication format.