

Using ACNielsen Homescan Panel Data To Track Weekly Beef Purchases

This report uses data from the ACNielsen Homescan panel, a nationwide panel of households that use a scanning device to scan the universal product codes (UPCs) on purchased products. Participants scan their food purchases from all retail outlets at home after they finish shopping. The purchase data is uploaded to ACNielsen's computer. Data include detailed product characteristics, date purchased, quantity, and expenditures for each food item purchased by each household. Households scan both fixed-weight products (products with a UPC) and random-weight products (e.g., fresh meat and poultry, fresh fruit and vegetables). The problem associated with products without UPCs is solved by creating a codebook containing product descriptions and a unique code that is scanned.

Homescan Panel Data Is Rich and Detailed

The sample of households in the ACNielsen Homescan panel was selected so that calculations made from the dataset will closely track U.S. food markets. The dataset is a geographically stratified random sample of households. The sample was selected based on both demographic and geographic targets. ACNielsen constructed weights for each household so that the weighted sample would match the U.S. Census along seven variables: household size, income, race, ethnicity (Hispanic or not), female household head's age and education, male household head's education, and the household head's occupation type. That is, the weighted proportion of households in the sample matches the proportions of households in the Census. The weights that make the proportions from the sample equal to proportions from the Census were used in estimation and analysis. Each year, ACNielsen recalculates household weights and adjusts the sample to match annual updates to the Census.

Panel size has varied from 7,124 households in 1999 to a high of 8,833 households in 2003. All purchases in our dataset came from households that participated in the panel for at least 10 out of the 12 months in each year, 1998-2004. This collection procedure leads to millions of purchase records each year.

For our purposes, the data are rich and before-and-after patterns are relatively strong. We examine retail purchase data from the ACNielsen Homescan panel for evidence of changes attributable to the BSE announcements.² The dataset is unique because it comes from a nationally representative sample of households, finely differentiates food products and associated expenditures and quantities purchased, and includes exact days when each household purchase was made. Thus, we were able to construct high-frequency purchase data suitable for testing for the presence of even short-lived impacts.

We constructed weekly time series (1998-2004, 364 observations) of fresh beef purchases (i.e., purchases from grocery store meat counters), purchases of frozen beef products, and purchases of frankfurters. To construct each series, we summed the weighted quantities purchased each week. The dataset also includes expenditures for each purchase. To calculate a weekly

²The main limitation to using food purchase data to estimate impacts of BSE announcements is that nearly half of what typical consumers spend on food is spent at restaurants (U.S. Department of Agriculture, Economic Research Service). It is possible that consumers made different decisions about beef purchases for meal preparation at home and for restaurant meals.

price, we summed the weighted expenditures and divided the result by the weekly quantity purchased.

Each of the three products may satisfy a different demand. Including all three allows for the possibility that these varying demands might display different responses to the announcements. Our analysis decomposes each time series of purchases into the sum of trend, seasonality, price, and BSE announcement effects.

Income in the United States has been rising and food expenditures as a share of disposable personal income has been declining over many years (U.S. Department of Agriculture, Economic Research Service).³ It is reasonable to expect that household expenditures for any specific food will be a small fraction of disposable income. When quantities demanded represent small expenditures, demands are likely to be relatively unresponsive to prices. Instead, habit⁴ and tradition are likely to be major factors influencing food purchase patterns: for example, demand for some foods will increase before a particular holiday or season. Thus, when we examine purchases of particular foods, we expect to find regularity and patterns across time. Having accounted for observed regularity and patterns means that changes brought about by consumers becoming fearful at particular times should be obvious.

Why Construct Weekly Purchase Data?

We used the purchase record data to estimate quantities of beef products U.S. consumers purchase each week. Evidence indicates that most households make decisions about food purchases on a weekly basis. Also, summarizing data on a weekly basis means each point represents activity over 7 days, thus avoiding trading-day variation that would occur were the data summarized on a monthly basis.

Researchers have examined the shopping frequency question from a variety of perspectives and mostly concluded that weekly grocery shopping is typical. Using a large-scale, nationally representative survey of households, Blaylock (1989) reported that approximately 71 percent of the households in the sample reported that major grocery shopping occurred once a week or more often and 29 percent shopped less than once a week. Bawa and Ghosh (1999) treated the frequency of shopping as an indicator of how households minimize costs—the sum of travel and inventory costs—while meeting food requirements. Their scanner data panel over a 1-year period revealed the number of shopping trips made by households ranged from 23 to 529, with a median of 95 trips. Chiang et al. (2001) found that promotions have little effect in accelerating purchase timing. They concluded that 7-day cycles for shopping are the solution consumers adopt for their time allocation problem. Between 1998 and 2003, the Food Institute (2003) reported that typical shoppers report making 2.2 visits to a supermarket each week, including 1.7 visits to a primary supermarket. Weekly grocery shopping was the primary reason consumers gave for entering a supermarket.

Shopping less than once a week may be related to the timing of income and the costs of reaching a supermarket. Wilde and Ranney (2000), also using nationally representative data, reported that 42 percent of all food stamp

³Between 1929 and 2004, expenditures on food as a share of disposable personal income fell from 23.4 percent to 9.5 percent. The trend fell faster for food purchased for consumption at home. In 1929, these expenditures represented 20.3 percent of disposable personal income. By 2004, the share had fallen to 5.4 percent.

⁴ Economists often use the term “habit” when describing situations in which consumers take time to fully adjust to changed conditions. Here, we use the term in a conventional way, assuming that consumers adjust quickly, but have preferences that vary over time.

households conduct major grocery shopping trips only once per month (households receive Food Stamps once a month). They found that cash welfare participation, female head of household, urban residence, and increased distance to a “major” grocery store each significantly reduced the probability of shopping frequently among food stamp households. But, the majority of food stamp households shop more frequently than monthly.

Both BSE announcements were made on Tuesdays. We constructed weekly purchase data so that weeks would run from Wednesday through Tuesday, and a week would begin immediately after each announcement. The first week in our dataset begins Wednesday December 31, 1997.