

Considering the Structure of the Consumer Expenditure: Designing Computer Assisted Interviewing

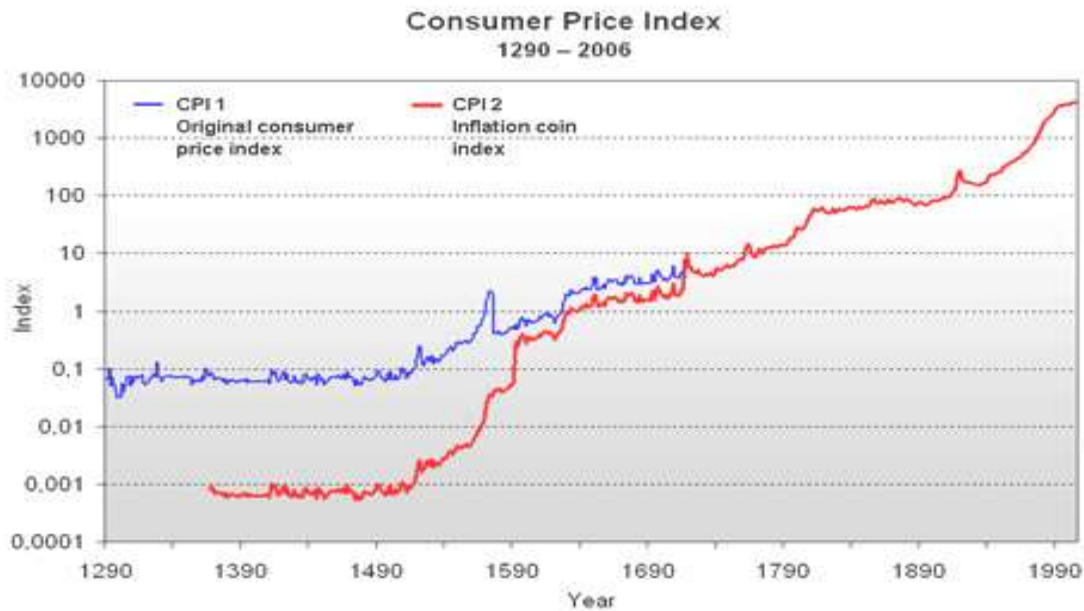
Frank P. Stafford, Department of Economics, University of Michigan

Introduction

There have been longstanding efforts to keep track of prices. The Bank of Sweden has constructed an historical series from 1290 to 2006. This has the purpose of understanding both the long evolution of prices and then working to understand the diverse influences which led to distinct periods of inflation or stable prices or deflation. Relative price changes would be important to now is assessing models of unbalanced economic growth.

How could such an index possibly be constructed? The answer is that the researchers focused on a small set of main commodities and the consumption basket was quite stable and very simple further back in time. The late Middle Ages were somewhat easy – with stable prices and not much change in what was consumed! It was not until the early 1800's that a line had to be added for potatoes, a new item derivative from the Columbian Exchange with the Americas. A CAPI application for Sweden in the 1300's would be quite brief and the respondents would likely welcome a visitor to their rural residence.

The main problem for Sweden now and the U.S. now is the extreme proliferation of different kinds and qualities of various consumption items. Combining that with the wide array of modes of purchase creates a true data collection challenge, perhaps more challenging than any other set of social measures one can think of. And, in addition, economic content is generally regarded as the least likely to engage a respondent's interest and is often seen as data overload by respondents, more anxiety producing than anything else.



Source: "The Evolution of Swedish Consumer Prices, 1290-2008," Rodney Edvinsson and Johan Söderberg, Bank of Sweden. The CPI2 allows for replacement of the coinage after periods of high inflation.

Figure 1 Swedish Prices, 1290-2006

If we go fast forward to 2010 for the U.S., we have the Google Price Index, constructed from on-line transactions. This highlights a growing complication in modern times – which is the wide range of purchasing modes and combined modes, such as both paying bills on-line and buying things on a sporadic basis. Such transactions may be missed without activating some recall of purchasing mode.

II. Design Themes

The main themes to be kept in mind when redesigning a modern consumer expenditure survey is the ways in which the information reporting burden of the respondent can be controlled yet at the same time valid answers to quite detailed information – of the sort not on the minds of the respondent in that form – can be captured. A major theme is flexibility in reporting yet maintaining an overall standardization. This is possible with modern, high quality data collection software. One of several areas where we have used a flexible interviewing structure in the Panel Study of Income Dynamics is the use of Event History Calendars over the phone. In this situation the respondent cannot see the actual screen calendar, but the calendar design allows flexibility and a more conversational approach for the respondent. The interviewer also gets benefits from this flexibility and has the advantage of seeing the screen entries. The software can be designed to have on-the -fly calculations and checks for answers that don't add up – this can lead to soft or hard checks.

Hard checks may arise when the respondent reports a time gap between jobs with no labor force status for the intervening period. A check is also created to see if the adding up of subcomponents exceeds some benchmark – such as being more than 52 weeks per year. Here the flag is a 'soft check' where the internal processing within CAI produces an unlikely match or mismatch, but may be the result of rounding the duration of some labor market spells. These checks can trigger an interviewer inquiry, but unlike a hard check, where reconciliation is mandatory, the soft check allows the interview to continue.

Figure 2 Employment Even History Calendar

INCORRECT REPORTING OF TIME AWAY – “VACATION SPELL”

The screenshot displays the 'Employment Event History Calendar' interface. On the left, a sidebar contains tabs for various employment domains: Residence, Job, Wellcome Trust, Not Just Windows, Fast Track, Time Away, Someone else's, Own sick, Vacation, On Strike, Temporary Layoff, Not Working, 2007 Looking, 2007 Not looking, 2008 Looking, and 2008 Not looking. The main area shows a calendar grid for 2007 and 2008, with colored bars representing different domains. A 'Warning' dialog box is open, asking 'Time Away cells you just entered do not correspond with an employment period, do you want to continue?' with 'Yes' and 'No' buttons. Below the dialog, there is a form for 'Starting Time' and 'Ending Time' with dropdowns for Year, Month, and Day, and a 'Reason for Time Away' dropdown set to 'Vacation'.

Above is a screen capture from the employment Event History Calendar used in the 2009 and 2011 PSID. Two points of interest are the tabs on the left which are different possible employment domains as defined in the CPS. Since there are clear rules as to what the domains are and that they are mutually exclusive, the data can be collected in order but can also allow the interviewer to backtrack and edit prior reports as new information occurs to the respondent. And as information is filled in various checks can be run, such as the one above, where the respondent reported a vacation when it should have been a period of being out of the labor force.

Several methods checks have been carried out for such data and a recent one was to see the potential for alignment of the start of spells of unemployment from the reported months of receipt in 2008 with the onset of a spell of unemployment. This matchup is shown in Figure 3. There are most of the spells

followed by UI receipt soon after. The few separated from the start could be either errors or delayed and or disputed receipt of benefits.

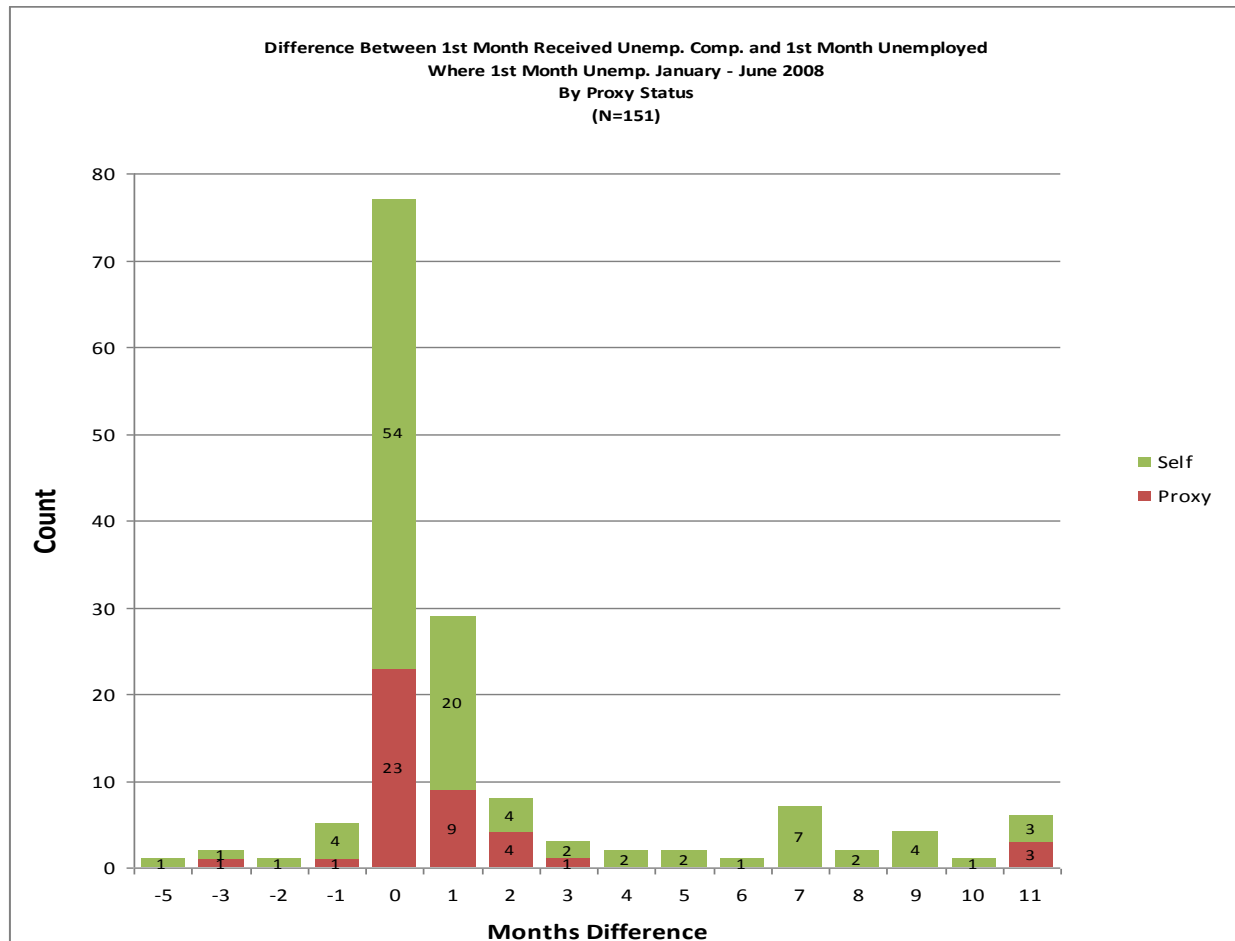


Figure 3 Alignment of UI Receipt and Start of Spell from the EHC

The concept of flexibility and interaction has been applied in the effort to gain consumption measures in the American Life Panel (ALP). Another element is asking the respondent to report quite wide aggregate subtotals of consumption. Both ALP and PSID rely on quite global measures. In the case of the PSID consumption is not in a given section of the CATI application but is scattered throughout the

application. Possibly this helps avoid the feeling of a long section with a list of spending categories. For broad total expenditures the PSID and CE align quite well.

Table 1. Ratio of average consumption expenditures in PSID to Consumer Expenditures Survey			
	1999	2001	2003
Total	0.96	1.02	1.01
Food	1.03	1.08	1.1
Housing	0.94	1	0.97
Transportation	0.86	0.95	0.94
Education	1.16	1.31	1.13
Childcare	1.21	1.25	1.26
Health care	1.04	1.1	1.14
Source: Li, Schoeni, Danziger, Charles (2010), table 3.			

A similar structure of fewer, more aggregate items has also been employed in the American Life Panel (ALP). (See Table 2.) The strategy there and in the PSID is to carefully select the recall periodicities to match the expenditure category. So, spending that occurs only occasionally such as a home repair or renovation can be referenced in terms of the prior year (or calendar year) while food at home can be reported weekly or monthly. Also giving the respondent flexibility in the choice of time interval can be considered, and in the case of PSID this is referred to as the 'pers' – per week, per month,... A similar design issue has been addressed in the recall periodicities for ALP. Mode of purchase can be added to the classification system – at least as a way to encourage better recall.

Table 2.

A classification of spending categories by regularity and frequency of expense

Regularity	Frequency	Examples
Somewhat regular	High (weekly)	Food, gasoline
Regular	Medium (monthly)	Rent, utilities, prescription drugs (for some people)

Regular	Low (annual/semiannual) Property taxes, auto license
Irregular	Varies across households Clothing, health care copays
Big ticket items	Usually less than once/year Automobiles, home improvements

Source: “Methodological Innovations in Collecting Spending Data: The HRS Consumption and Activities Mail Survey,” Michael Hurd and Susann Rohwedder.

An essential part of the process is an interactive reconciliation. This is true of the EHC approach and the expenditure approach in Alp. A partial screen capture is set out in Figure 4.

In table 3 are presented the consumption totals from ALP May 2009 through April 2010 for 25 categories plus July, October 2009 and January, April 2020 for 11 additional items. As can be seen there are some general alignment and also some differences, notably for the age 65 and older group.

Table 3.

Spending Over a Year ALP and CEX

Total one-year spending

ALP April 2009 – March 2010

CEX 2009

	All	45 or older	65 or older
ALP	41,723	43,814	40,582
CEX	43,596	44,147	35,706

Source: Michael Hurd and Susann Rohwedder, “ Effects of the Economic Crisis on American Households,” Working Paper, RAND, 2010. Note: CAMS also has higher totals than CEX in oldest age group.

II. A Proposed Structure.

The CAI structure that could be considered in the redesign of the Consumer Expenditure Survey has the following components.

1. First obtain the labor force status of the family members age 15 and older as of the survey data and the prior calendar year. Then a summary measure of labor income from the prior calendar year period. In the PSID we have attempted to get income from a year prior to the last calendar year ($t-2$). Over the period, 1997 – 2007 we implemented various forms of this and have concluded that only major components such as labor income of the respondent and spouse and total family income can be meaningfully obtained.¹ Possibly more detail could be obtained from shorter versions of income from the prior calendar year. As a summary add any other main component and then implement a CAI-based, preliminary total income for the family for year t .
2. To this one might add questions on any unusual sources of income such as an inheritance or a pension (cashed in). Or major reductions in debt or transfers to others outside the family. This could be used to define an ‘annual cash flow available for consumption’ or ACFC.
3. Next go through a set of rather global expenditure categories, using recall periodicities to match the expenditure category. The level of aggregation should be quite high. These aggregates should be design to match the existing CE categories but in less specific detail.
4. After going through the broad categories there should be a reconciliation phase in which the components are added to a total. The respondent can then be questioned along the lines of “I get a total of about \$MM? Does that seem about right to you? Here one could implement soft

¹ Yeung, W.J., Stafford, F., and Andreski, P. 2008. Assessing the Quality of Income Data Collected on A Two-Year Periodicity: Experience from the Panel Study of Income Dynamics. *Survey Research: Method and Application*, 23: 34-80.

checks in the difference between total income and of ACFC. Then an interactive process of some, but not of excessive reconciliation, could be used.

5. After going to this point the next step would be to select at random a single consumption domain for added detail, Here the starting point could be the categories set out in Appendix B of CPI Requirements of CE². For example, a given family may be assigned at random to AA (Men's Apparel), AB (Boys' Apparel), AC (Women's Apparel), AD (Girls' Apparel). These detailed categories seem to be quite challenging and the CAI for the design of each should be quite different and should recognize both the range of potential items and also work on mode of payment . Were the items in AC0380311 (women's sport coats, tailored jackets) bought at a store, via a catalog, via a website,...)
6. Mode of Purchase. For the specific domain of spending the respondent should be encourage to recall all the ways in which purchase may be carried out – including stores and maybe kinds of stores, catalogues, open markets, internet transactions,....

Spillover across categories. The categories seem quite distinct – but if one is in focus there may be a tendency for 'nearby' items to get picked up, and across the set of families randomly assigned to separate categories there could be an upward bias from an accounting perspective.

7. Gifts of goods. Gifts of services are going to be outside of the normal CEX realm. What of gifts of goods – especially from non-residential family members. To take an example, what if grandparents are paying for a non-residential grandchild's schooling? The grandparent did not expend in the sense of being in their consuming household. One way is to have this as a gift component that connects to ACFC. And for the receiving family it would be recorded as a boost in their ACFC in the form of an external gift that has a market transaction value. In any event

² CPI Requirements of CE, William Casey, mimeographed, June 17, 2010.

there are quite substantial intra-family transfers and these need to be accounted for in an overall fashion – avoiding either undercounting or double counting across the families.