

Calling Effort and Nonresponse for Telephone Panel Surveys

Roberta L. Sangster, September 2005

The Consumer Price Index (CPI) is one of the major measures of inflation in the United States. Overall, a large aggregate referred to as “Housing” represents about 41 percent of the CPI. About 26 percent of this aggregate data comes from the Housing Survey owner’s equivalence of the primary rent (20 percent) and rental of primary residence (6 percent).

The Housing Survey sample listing was initiated starting in the second half of 1998 through the second half of 1999 (n=35,650).¹ The BLS field staff listed over 1,000,000 addresses of which over 250,000 were sampled for screening. High owner areas were over sampled to represent rental housing units similar to owner occupied housing units (10 to 30 percent renter density areas) in order to estimate the cost of rent for owner occupied dwellings (owner equivalency, see attached document for a fuller understanding). Once screened, the units stay in sample for ten years for a twice yearly interview (sample is broken into six monthly interview rotations within panel). The sample does get augmented quarterly and new construction units were added starting in 2000 (see Table 1 and Table 2 at the end of the document). The response rate has declined over the past six years from the initial response rate of 82 percent to the current response rate of 73 percent.

In the past, the BLS has renewed the sample every ten years. However, Congress has denied the request to renew the sample and the BLS is now faced with the challenge of re-using an old sample with weary respondents, and possibly re-contacting sample units that have declined in the past. The task for this project is to examine the deterioration of the sample over the past ten years.

News Flash Update!

The good news is that the BLS now believes that we will receive funding to renew the Housing Survey sample! Research conducted on the current attrition rate and the projected attrition rates by 2015 helped to attain this outcome.

Housing Survey Attrition Rates

The attrition rate was calculated based on the remaining sample size after initiation for every six months in panel (6 months to 72 months) over 1-SUM of the original sample size.

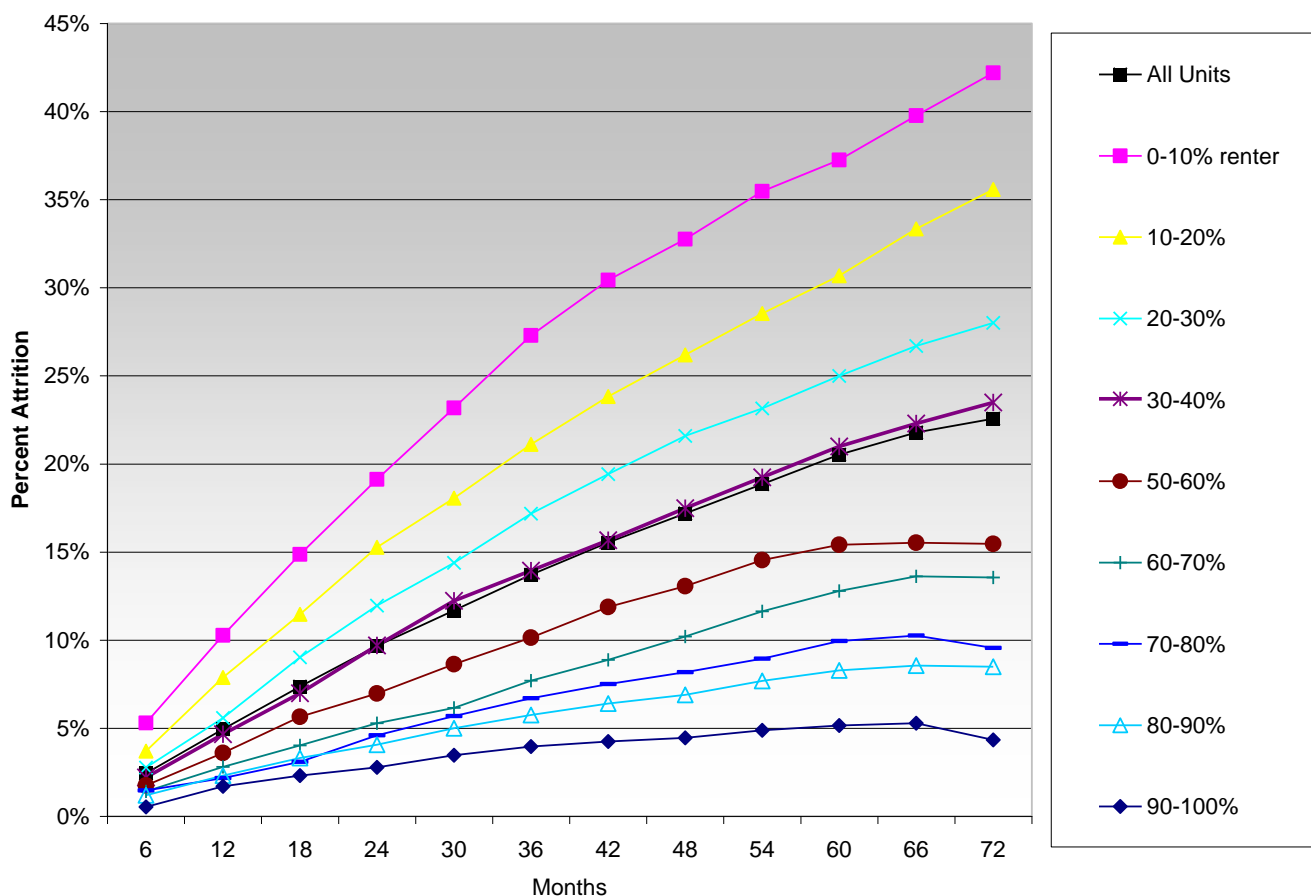
- The first concern is the loss of rental units to owner occupied housing or other ineligible statuses (e.g., demolished, uninhabitable, conversion to commercial use) and loss of sample due to refusals to participate.
- The second concern is losing sample in the low density renter areas(10-30% rentals)
 - The lower density rental areas are used for the “owner equivalency” the BLS uses to estimate the cost of living for home owners (since owners are not included in the sample).
 - Lower density rental areas are over sampled to better represent rental units more similar to owner occupied units.

¹ The respondent can be the occupant (renter), landlord of the rental unit, or a company that manages the rental unit.

Results

Based on the first six years of data the results indicate that the low density rental areas have the highest attrition rate (see the Figure 1). The trend is symmetrical with the highest attrition in the low density rental areas to the least attrition in the high rental areas. The center black line is the attrition rate over time for the all sample units. The top pink line with is the 0-10 percent rental areas followed by the areas of most concern, the 10 percent to 30 percent renter areas (28 percent to 36 percent sample loss). This indicates that sample loss would be highest for the areas over-sampled to produce the owner equivalency index. This could be problematic since these data represent about 20 percent of data used to create the Housing Index portion of the CPI.

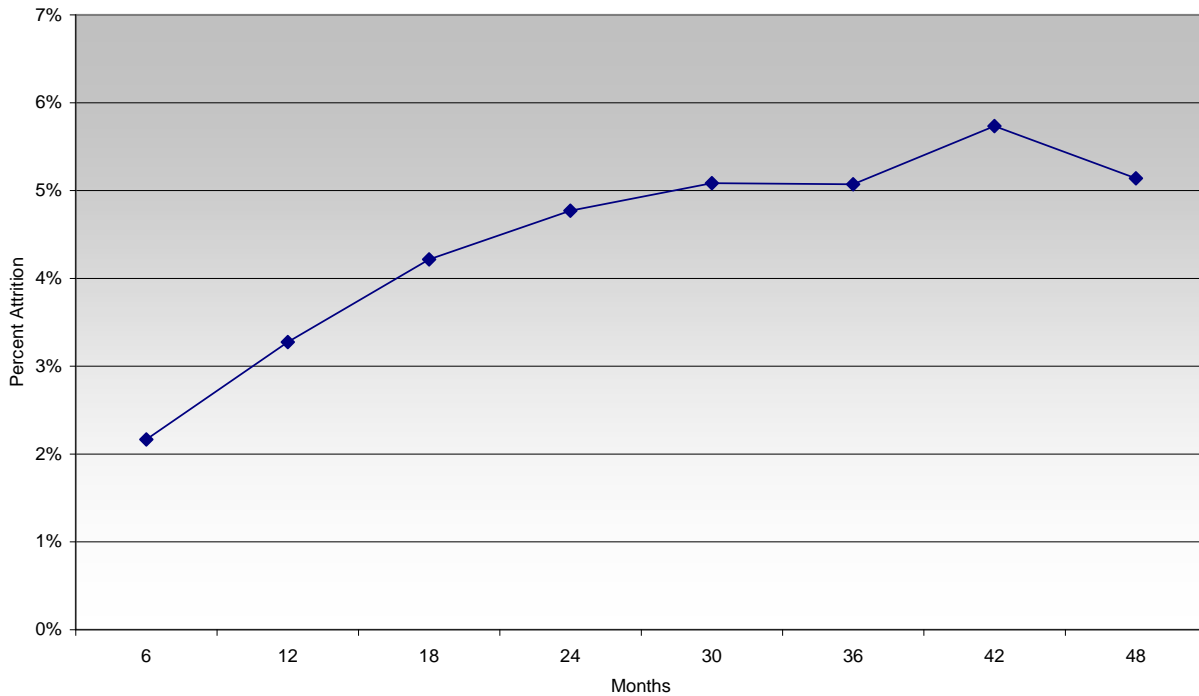
Figure 1: CPI Housing Survey
Sample Attrition Rates 1998 to 2004



It should be noted that the zero to five percent low renter areas started out problematic from the very beginning and never yielded sufficient renter data to be of use; the data really starts at five percent.

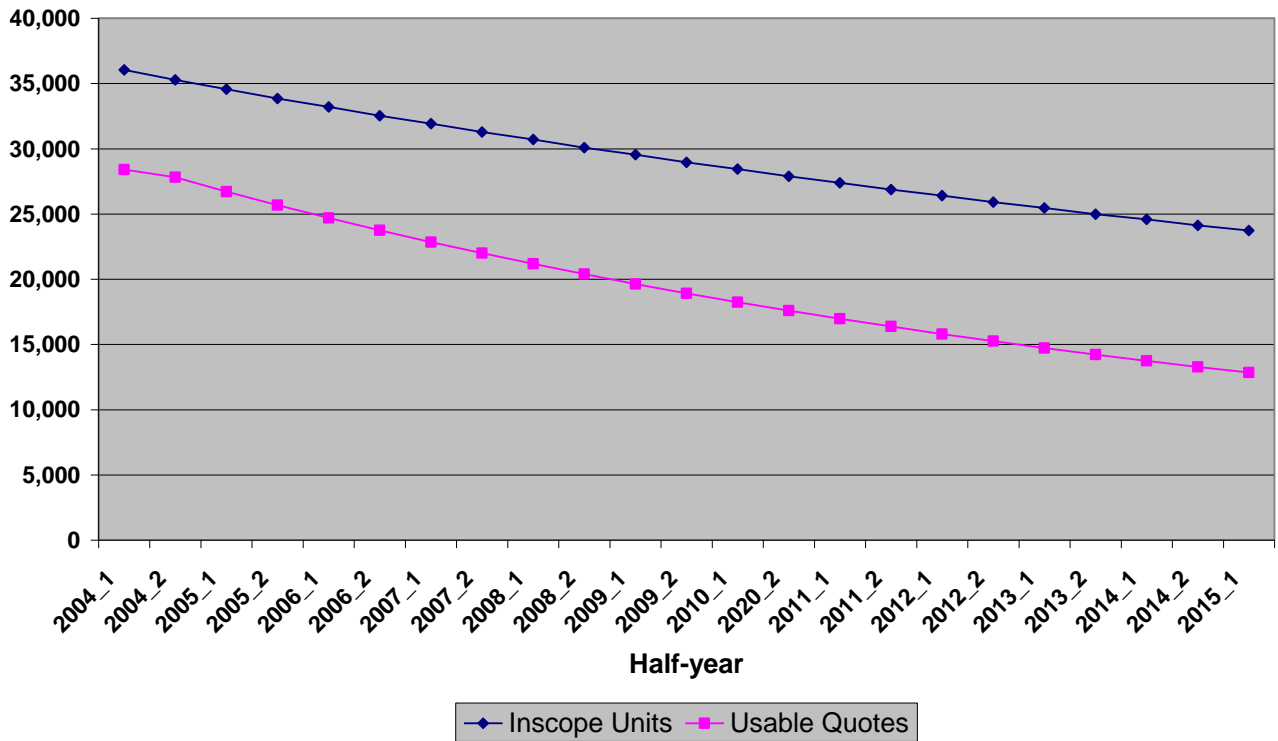
The BLS began adding in new construction units starting in the spring of 2000. The attrition rate for the sample augmentation with new construction unit's for the second quarter of 2004 (0.052) was not as steep as that found for the sample over all (0.172) after four years.

Figure 2: CPI Housing Survey
New Construction Sample Augmentation
Attrition Rates 2000 to 2004



William Larson (2005) at the BLS reported on projected sample loss at the recent Joint Statistical Meetings this month. His research shows the projected attrition rates based on the first six years of the Housing Survey data. In short, he projects that the current sample would be reduced by about one-half by 2015. He broke the data by in-scope units, which are all sample units, eligible to produce a price quote (cost of rent) whether or not a quote was produced and “useable quotes” or eligible sample units that produce a quote. The chart shows a steady decline in useable quotes, with an actual count of 28,400 units in 2004 to an estimated 12,600 units by 2015. The loss of useable quotes would produce greater variance in the price relatives (the change in the cost of rent) and possibly become more volatile than desirable.

Chart 1. Number of Inscope Units and Units with Usable Quotes 2004 (Actual) through 2015 (Projected) Averaged over 20 Simulations



From Larson, W. 2005: *The Effect of Attrition on Variance and Sample Size in the Housing Component of the Consumer Price Index*.

Conclusion

Overall, it can be concluded that continuing to use the Housing sample into 2015 would not produce optimal data. Fortunately the decision was recently made to renew the sample in an ongoing rotation plan starting sometime after 2007. We will use a different sampling methodology this time. The plan is to use two commercial address frames for the sample (. Thus far, the plan is to use a mail survey to screen the sample for renters, followed by telephone, and field visits for those we could not contact using the prior methods.

Table I: CPI Housing Survey Sample Size and Attrition Rates Overtime

All Units Panels by Quarters	Months										
	Initiation	6	12	18	24	30	36	42	48	54	60
1998_2*	24771	24193	23597	23053	22460	21916	21405	20976	20606	20257	19882
1999_1	6335	6174	5979	5789	5632	5499	5375	5252	5142	5018	4906
1999_2	4544	4420	4304	4160	4062	3967	3870	3785	3712	3609	3546
2000_1	3152	3081	2994	2913	2853	2805	2758	2708	2645	2603	
2000_2	1953	1909	1856	1816	1775	1749	1709	1672	1645		
2001_1	1223	1194	1167	1146	1119	1107	1079	1059			
2001_2	720	708	696	684	673	663	650				
2002_1	539	521	510	498	486	481					
2002_2	454	434	420	410	404						
2003_1	388	375	374	364							
2003_2	316	311	301								
2004_1	386	370									
2004_2	155										
Attrition		0.024	0.049	0.074	0.097	0.117	0.137	0.155	0.172	0.189	0.205

*Highlight indicates the initial sample (n=35,650)

Table 2: CPI Housing Survey New Construction Sample Size and Attrition Rates Overtime

All Units Panels by Quarters	Months									
	Initiation	6	12	18	24	30	36	42	48	54
2000_1	1026	1007	994	980	975	968	964	956	949	942
2000_2	648	634	622	615	608	601	596	592	591	
2001_1	489	485	474	470	460	459	456	449		
2001_2	282	277	276	274	274	272	269			
2002_1	231	221	220	215	212	210				
2002_2	176	167	164	163	163					
2003_1	184	175	175	173						
2003_2	141	141	136							
2004_1	239	229								
2004_2	102									
	0	6	12	18	24	30	36	42	48	54
Attrition		0.022	0.033	0.042	0.048	0.051	0.051	0.057	0.052	0.029