

## SURVEY RESPONSE MEASUREMENT AT THE BUREAU OF LABOR STATISTICS

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### Introduction

Historically, each survey at the Bureau of Labor Statistics, BLS, has computed and analyzed its own response rates, but there was no systematic comparison of the rates across surveys. In the 1980's, a framework was developed for computing similar response rates across all surveys. Over the last several years, each of the Bureau's surveys has revised their response rate definitions and formulas to conform to the Bureau-wide framework. Using the response rates computed using these definitions and formulas, we have begun analyzing response rates across similar surveys. This paper will present the agency-wide framework and definitions, describe the current status of the agency-wide analysis, and discuss planned enhancements to this effort.

### Overview of BLS Survey Organization

Like most large survey organizations, for administrative and operational reasons BLS has organized its survey operations into several offices. Each office is thus responsible for the surveys within their domain. Three BLS offices are responsible for various establishment surveys: 1) Office of Prices and Living Conditions (OPLC); 2) Office of Employment and Unemployment Statistics (OEUS); and 3) Office of Compensation and Working Conditions (OCWC).

Within these three offices, there are ten major establishment-based surveys. BLS also conducts several household surveys, most notably the Current Population Survey, the National Longitudinal Survey, and others. However, in most instances an outside survey organization conducts the actual survey operations rather than having BLS staff directly collect the data. In other cases, BLS employees in our regional offices collect the data. Nevertheless, response rates for household surveys are not directly comparable to those for establishment surveys due to the different nature of the respondents. Therefore, we have excluded all of the Bureau's household surveys from consideration in this paper.

Table 1 provides a summary of the major BLS establishment-based surveys in terms of Office, purpose, scope, sample, and collection methods. As can be seen, these surveys vary greatly across these variables. For example, the JOLTS survey has a sample of about 15,000 establishment and collects very limited data elements from respondents to produce estimates of job vacancies and layoffs; the ARS survey contacts all business establishments every 3 years to update the industry classification of all 8 million businesses; and the CPI survey collects data from 27,000 outlets to collect over 78,000 price quotes.

The Bureau's surveys also use a varied set of collection methods, ranging from mail/fax to personal visit, to CATI, to automated self-response methods such as touchtone data entry. Given the separation of survey operation between the offices, the scope/size of the survey, and modes of collection, it's not surprising that each office has historically worked independently; that is, developing their own internal procedures for survey operations without a lot of direct contact with their counterparts from the other program offices. This philosophy also extended to calculation of response rates.

### Historical Response Rate Computations within Each Program

In addition to the nature of BLS survey operations, there are a number of pragmatic reasons for development of separate and perhaps distinct response measures for each program/survey.

As noted in Table 1, some BLS surveys request updated information on an annual basis, while others request data updates monthly. In addition, while most of the Bureau's surveys have a separate "field" component for initiation, relying on other methods for ongoing collection, two surveys contact the establishments in their surveys only once. As a result, for the update surveys, and in particular for the OPLC and OCWC surveys that incorporate separate field initiation, each program broke down operations

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by “stage” of processing (i.e. initiation vs. ongoing collection). This often involved establishment of separate databases for field tracking and update collection. Once these separate databases were in place, each survey could calculate response rates for each “stage;” however, it was more difficult to calculate response rates across the entire survey.

Once periodic update survey operation was ongoing, it became more efficient to track the “update” or “repricing” rate for each survey. From an operational standpoint, tracking this rate provided managers with an accurate and consistent measure of how the monthly or quarterly collection was going. Most monthly surveys have a tight deadline to collect and process data so that tracking returns from the “active sample” was the primary operational consideration in that the program knew that X percent of their sample should be collected within the 10-15 day collection cycle established for their survey. This could be closely monitored separate from the initial sample that was drawn.

For many of the price programs there are other complexities that dictated separate stage of processing response computation. These primarily relate to the difference between the number of establishments in the survey versus the number “quotes” obtained from each. For example, the CPI samples 27,000 outlets but obtains price quotes for over 78,000 commodities. Thus, the initiation rate measures what percent of the 27,000 outlets agree to provide price quotes. However, we may not receive complete price information for all desired commodities. Should the response rate look only at what percent of the 27,000 outlets provide all quotes? What if we ask for ten quotes but only receive data for five of them? Once in the monthly repricing cycle, it is more important to track collection at the quote level rather than at the outlet level since the quotes are the actual inputs into the index calculation.

A similar situation exists for the NCS surveys where subject-matter analysts must obtain and review a lot of “qualitative” information on employee benefits and wage rates. Again, what is the unit of measurement for response, the establishment, or the data elements (i.e. quotes) provided?

For mail-based surveys such as OES, CES, and OSH, differentiating between nonresponse and other out of business out of scope status can affect response calculations. Since most collection is via mail, a non-returned survey may indicate the unit is out of business rather than a refusal. Lack of precise information in this area may bias any response

calculation. Until 2003, each State completed CES sample initiation independently with little BLS involvement and the sample design allowed for direct replacement of nonrespondents. Thus calculating a true response rate was not possible.

### **BLS’ Past Efforts to develop a corporate strategy for Calculating Response Rates**

In the mid 1980’s, the BLS Commissioner became concerned about the effect increased telephone collection had on data quality. The Division of Statistical Research and Evaluation (DSRE) set out to develop tests that might be performed to investigate the effects of alternative modes of data collection. The Commissioner wanted suggestions for areas for program improvement.

DSRE compiled tables that summarized for each major BLS survey the use of personal visit, mail or telephone contact with respondents for initial data collection, ongoing data collection and edit or nonresponse follow-up. DSRE found that surveys did not fully document the modes used in their data collection methodology making evaluations of mode effect on quality almost impossible to pursue.

DSRE recommended that BLS embark on an effort to document and standardize the data collection process at BLS. With this standardization in place, the Bureau could develop a framework for evaluating and testing its data collection modes to determine the trade-offs with respect to cost, time and quality.

In March 1985, the Bureau formed a task force to develop a system for compilation of standardized information on data collection across Bureau programs. The task force recommended a framework of accountability codes that:

1. At any level, the classes should be mutually exclusive and exhaustive subsets of the next higher level;
2. The framework should be flexible enough to be applicable to any BLS establishment or housing unit survey;
3. The framework should reflect the longitudinal nature of most BLS surveys;
4. The framework should allow for the differentiation of two basic survey operations: data collection and estimation;
5. The framework should be consistent with the standard definition of a response rate;
6. The framework should allow for the computation of field collection completion rates; and

7. The framework should provide the capability of mapping all current BLS classification schemes into it.

The task force developed the following data collection and estimation phase classification schemes:

<b>Data Collection/Accountability Status Codes</b>	
Eligible	
10	Responding
20*	Refusal
21	Refusal—Data Absent-Unable to Cooperate
22	Refusal-unwilling to cooperate
Eligibility not determined	
23	Eligibility not determined
Ineligible	
30*	Ineligible
31	Existent – Out of Scope
32	Nonexistent
* Use these codes only if data are not available for subclasses.	

<b>Data Collection/Estimation Accountability Codes</b>	
Eligible for estimation	
10	Eligible for estimation
Included in Estimation	
11*	Included in Estimation
Scheduled for inclusion in a previous period	
12*	Scheduled for inclusion in a previous period
13	Included in a previous estimation period
14	Excluded from previous estimation period
Not scheduled for inclusion in previous estimation period	
15	Not scheduled for inclusion in previous estimation period
Exclusion for estimation	
19*	Exclusion for estimation
20	Not responding at data collection
23	Eligibility not determined at data collection
25	Failed to meet prescribed criteria
Ineligible for estimation	
30	Ineligible for estimation
* Use these codes only if data are not available for subclasses.	

This proposed framework supports the following definition of an unweighted response rate:

$$\frac{\text{Number of responding units}}{\text{Number of eligible units} + \text{Number of sample units with eligibility not determined}}$$

Each survey can also use this strategy to compute weighted response rates by summing the appropriate weight across all units in the category. For a weighted response rate, the numerator would be the sum of the weights for all responding units while the denominator would include the sum of the weights for all eligible or eligibility not determined units. Depending on the survey, the weight may be the inverse of the probability of selection while it may be the current employment or volume of trade for other surveys.

Over the nineties, Bureau staff initiated efforts to ensure that all surveys were collecting response codes that could support this framework. There was no funding to move all programs over to this taxonomy. Managers supported the taxonomy by ensuring that revisions to the processing systems and collection protocols would be consistent as surveys modernized

and updated their methodologies and computer systems.

**Current Efforts**

Over the late nineties, most survey managers reported that maintaining good response rates was becoming more problematical with response rates in general declining. However, program managers routinely only monitor response of active sample members, generating survey specific stage of processing response rates. Even though individual programs can aggregate their response codes into a compatible taxonomy, the response codes differ from program to program because of different internal monitoring requirements. Thus, the Bureau cannot use the individual response codes monitored by each survey to identify systematic problems across surveys.

In early 2000, a team was formed to compile response rates based upon the Data Collection Task Force methodology rather than look at rates based upon actual production samples to develop a cross Bureau strategy for improvement initiatives.

This team generated its first report in October 2000, including response rates from 14 surveys, including household and business surveys. The team updates the report every three months to include as much data as possible from as many surveys as possible. Some surveys provide stage of processing rates as well as overall survey response rates while other surveys provide only an overall rate or only one or more stage of processing rates.

Table 2 shows a recent summary of the unweighted response rates that appear in this quarterly report. Note that some surveys are computing weighted response rates that are included in the quarterly report even though the weighted rates are not in Table 2. The table, as described below, contains five columns to include space for reporting the individual stage of processing rates and the overall survey response rate.

- **Survey:** This is the name of the BLS establishment survey. See Table 1 for a description of the surveys.
- **Initial Data Collection Response Rate:** This is the response rate based on the initial contact with the establishment for the individual survey. For most surveys, this rate is computed based on sampled establishments where an establishment is considered a cooperative establishment if the company agreed to provide any of the requested data – whether or not the company provided all requested data.
- **Update Collection Response Rate:** Where applicable, this is the response rate for the most recent update period for the survey. The update collection response rates show the ratio of establishments (or quotes) for which the survey collected any data during the update period, whether the data was usable for estimation purposes or not. Some surveys compute the update collection rate using establishment counts while other surveys compute this rate for quotes, or the specific items for which the Bureau asks the company to provide information. This rate only applies to surveys that perform an initiation process to gain initial cooperation and then gather updated data on a regular basis for several years.
- **Update Estimation Response Rate:** This rate includes only establishments/quotes for

which the company provided enough data for survey to include the establishment/quote in the actual survey estimates. Both the Update Collection and Update Estimation response rates are stage of processing rates where the denominator includes only those items that were cooperative at the initiation contact with the establishment. This rate only applies to surveys that perform an initiation process to gain initial cooperation and then gather updated data on a regular basis for several years.

- **Total Survey Response Rate:** The last column for each survey shows the overall survey response rate for the survey, when available. For this rate, the numerator includes all data used in the estimation process while the denominator includes all in-scope sampled units. This rate applies to all BLS surveys.

Note that the OSH survey is mandatory for all respondents in all states and the ARS survey is mandatory for all respondents in approximately one-half of the states. The mandatory nature of these surveys explains the very high response rates achieved by these programs.

In its quarterly report, the Bureau compares rates across “like” surveys – establishment surveys, index surveys, non-index surveys, and at comparable stages of processing. Surveys are continuing to update their processes to conform to the agreed upon standards for definitions and formulas so values presented for previous periods may not have been computed the same way as data for more recent periods. Additionally, surveys are continuing to update their processes so that they can compute both the overall survey response rates as well as the stage of processing rates.

#### Future Plans

In order to develop a corporate strategy to improve response rates, the Bureau has adopted a proposal for disaggregating response rates by variables that we believe will enable us to compare similar respondents and nonrespondents to identify Bureau-wide response problem areas. Where appropriate, we hope to begin computing response rates by variables related to collection area/region, size of sample unit, industry classification, and survey mode (i.e. mail, fax, telephone, internet, etc.). Some surveys have already begun collecting the data necessary to compute these disaggregated rates and plan to begin computing

them in the near future while other surveys are just starting to determine how to collect the variables necessary for these rates.

We have begun to develop a response database that will enable us to produce these disaggregated response rates to analyze response problems in depth. This project will take at least two years to complete. The project involves verifying a crosswalk of variables we have defined for the database with the survey databases, developing a mechanism to transfer appropriate files between each of the 14 surveys' databases to the response database, building the database and building appropriate access tools. Any authorized employee in the National Office and field will have access to the database. Variables included on the database will include survey characteristics, industry codes, size of sample unit, and collection region.

#### **Conclusions**

The Bureau of Labor Statistics has developed a corporate approach to measuring survey response that relies on standard definitions and formulas ensuring

that rates can be compared across the various establishment surveys. The Bureau has also begun to implement this approach and is now computing some type of survey response rates for each survey on a regular basis. However, ensuring that all rates are in complete conformance with the corporate approach and are available at all levels of desired detail will take several more years to complete. The process of changing our disparate survey processing systems to collect all the needed data is complex and time consuming. However, we are optimistic that development of a Bureau-wide response database will help us compute and compare response rates across surveys in the not too distant future so that we can look for any trends in the rates across surveys.

#### **References/Bibliography**

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"Response Rate Status Report - An Update", *BLS Internal Report*, April 2003

Table 1 -- Summary of BLS Establishment Surveys

Office	Survey	Survey Size E - Estab. Q - Quotes	Initial Data Collection Mode	Periodic Updates		Mandatory?
				Frequency	Primary Collection Modes	
OPLC	CPI C&S	27,000 E 78,000 Q	PV	Monthly/ Bi-monthly	PV	N
OPLC	PPI	38,000 E 100,000 Q	PV	Monthly	Mail, FAX	N
OPLC	IPP Exports	3,000 E 11,500 Q	PV	Monthly/ Quarterly	Mail, Phone, FAX	N
OPLC	IPP	3,400 E 14,300 Q	PV	Monthly/ Quarterly	Mail, Phone, FAX	N
OEUS	OES	1,200,000 E	Mail, Phone			N
OEUS	CES	400,000 E	CATI	Monthly	TDE, CATI, Electronic, FAX	Yes in 5 states
OEUS	ARS	> 8,000,000 E	Mail, TDE	Tri-annually	Mail, TDE	Yes in half the states
OEUS	JOLTS	15,000 E	CATI	Monthly	CATI, TDE, FAX	N
OCWC	NCS	42,000 E	PV	Quarterly/ Annually	PV, Mail, Phone	N
OCWC	OSH	250,000 E	Mail, Internet			Yes

**Key:**

OPLC - Office of Prices and Living Conditions  
 OEUS - Office of Employment and  
 Unemployment Statistics  
 OCWC - Office of Compensation and Working  
 Conditions  
 CPI C&P - Consumer Price Index -  
 Commodities and Services  
 PPI - Producer Price Index  
 IPP - International Price Program  
 OES - Occupational Employment Statistics

CES - Current Employment Statistics  
 ARS - Annual Refiling Survey  
 JOLTS - Job Opening and Labor Turnover  
 Survey  
 NCS - National Compensation Survey  
 OSH - Occupational Safety and Health  
 E - Establishments  
 Q - Quotes  
 PV - Personal Visit  
 CATI - Computer Assisted Telephone Interview  
 TDE - Touchtone Data Entry

Table 2 – Sample BLS Unweighted Response Rates

<i>Survey</i>	<i>Initial Data Collection Response Rate</i>	<i>Update Collection Response Rate</i>	<i>Update Estimation Response Rate</i>	<i>Total Survey Response Rate</i>
CPI C&S		97% E 85% Q	94% E 83% Q	
PPI	81% E	85% Q		
IPP Exports	77% E 62% Q	92% Q	73% Q	48% Q
IPP Imports	79% E 60% Q	91% Q	71% Q	47% Q
OES				78% E
CES	77% E	74% E		61% E
ARS				84% E
JOLTS				70% E
NCS				68% E
OSH	92% E			92% E

NOTES:

- E --> Establishment unweighted response rate
- Q --> Quote unweighted response rate
- Data is for the most recent survey panel completed on or before the March 2003 update cycle and for which response data was available.
- Gray cells indicate that the response rate is not applicable to this survey.
- White cells indicate that the response rate is not available for this survey at this time.