

# NEW APPROACHES TO CONTROLLING RESPONSE ERROR IN ESTABLISHMENT UNIVERSE AND SAMPLE DATA

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**KEY WORDS:** Collection, software quality, processing error

## I. Introduction

The decade of the 1980's created a wide range of new payroll processing services which were offered to employers, along with sophisticated commercial payroll software purchased by employers. This widespread shift by employers to standardized software packages created a dramatic concentration of payroll data being generated by a relatively small number of standardized software systems. This concentration provides an important opportunity to measure and control response error in business establishment-based surveys.

During 1992, the Bureau of Labor Statistics (BLS) conducted a pilot Response Analysis Survey (RAS) of major payroll processing and payroll software firms as a first step toward studying these issues. The initial impetus for BLS to conduct the RAS developed from an unusually and unexpectedly large adjustment to its establishment survey employment estimates, published by the Current Employment Statistics (CES) program. The CES employment estimates are derived from a monthly sample of 380,000 business establishments and are benchmarked annually to independently developed population counts from the administrative records of the State Unemployment Insurance (UI) system. Research into the causes for the unusual divergence between the sample and universe employment counts led BLS to explore response differences between the two surveys; payroll processing software was found to constitute an important source for the differences.

## II. Background

On June 5, 1992, BLS released March 1991-based benchmark revisions to its highly visible CES survey employment estimates. This release of revised employment series was both preceded and followed by considerable media coverage and concern among major users. The

magnitude of the revision at -640,000 (0.6%) was substantially larger than users had come to expect from the survey, which had averaged revisions of  $\pm 200,000$  (0.2%) over the previous decade. Because the time period covered by the revisions centered on March 1991, a recession time period, much of the concern focused on the apparent failure of the survey to reflect the true depths of the recession.

However, the CES and UI employment counts had indicated similar trends until January 1991 when the UI showed a sudden, sharp drop in employment which was not evident in the CES employment estimates, nor in other employment related series. The January 1991 drop in universe employment counts coincided with the introduction of improved reporting forms and procedures for universe employment data collection, thus leading BLS to suspect that some of the drop was non-economic. It appeared nearly impossible to gauge how many individual firms might have improved reporting in first quarter 1991, and what impact these changes had on the aggregate employment counts, until BLS began to recognize the impact of the payroll processing industry on UI reporting.

With the voluntary cooperation of firms in the payroll processing industry, BLS was able to confirm that certain historical overcount problems in the UI had, in fact, been corrected in the first quarter of 1991, contributing significantly to the sudden, sharp drop in universe employment counts for that month.

Upon completion of further research, BLS concluded that approximately 540,000 of the 640,000 downward benchmark revision for March 1991 was attributable to implementation of improved employment reporting methods by payroll processors, effective with first quarter 1991 UI tax filings. These findings were confirmed by an independent review conducted by an expert panel of the American Statistical Association.

This experience made clear to BLS the importance of the payroll processing industry in the collection and tabulation of employment

statistics, and resulted in BLS' launching the payroll processing firm (PPF) RAS.

### III. Goals and Objectives

There were three goals for the PPF RAS pilot test. The first was to identify changes in reporting procedures which had occurred in the first quarter of 1991 and may have affected the 1991 CES benchmark. In order to fulfill this specific objective in a timely manner, the largest payroll processors, in terms of both numbers of clients and employment coverage, were chosen for inclusion in the pilot test. A series of questions were asked that specifically dealt with changes made during that time period.

The second goal of the RAS was to prevent future occurrences of the type which had caused the 1991 benchmark problem. The RAS educated PPF respondents on the importance and uses of the employment counts reported on the Quarterly Contributions Report, and the effect that a sudden, unannounced correction could have on a critical economic indicator. It was essential to stress that BLS must be able to differentiate between reporting improvements and genuine economic movements.

The third goal was to identify and document current response errors. By developing and conducting the RAS, BLS would become cognizant of further necessary corrections to universe data, could influence the timing of such corrections, and could provide mechanisms to measure their effects, prior to implementation.

### IV. RAS Procedures and Results

For the pilot test, BLS chose firms known to be large from previous communications. Initial selections were verified through screening calls. Thirty-one firms were originally identified as in scope for the first phase of the RAS. After refinement, the firms targeted for personal visits totaled 24. Twenty-one interviews were completed using a structured questionnaire; there were three refusals.

The central focus of the questionnaire was on adherence to the CES/UI definition of employment: "the number of employees, who worked during or received pay for the pay period including the 12th day of the calendar month."

### Profile of the Payroll Processing Industry

The RAS indicated that the industry has three distinct components: Payroll Processing Firms (PPFs), Payroll Software Firms (PSWFs), and Tax Filing Services.

Payroll Processing Firms handle payroll, generate paychecks and reports, and sometimes file payroll taxes. The Payroll Software Providers design, produce, and maintain software which individual businesses and PPFs use to process payrolls. These two components are not totally separate; some PPFs sell software, and some PSWFs also process payrolls.

A third component of the industry, Tax Filing Services, file UI and other taxes for clients, using input generated by PPFs, payroll software products, or in-house data generated by individual businesses. Thus, the employment figures reported by these firms are whatever the client provides. These firms were covered in the pilot test, but generated little useful information for BLS purposes.

The 19 Payroll Processing Firms and Payroll Software Providers firms visited during the pilot test cover about 473,000 businesses and an estimated 37 million employees or about one-third of U.S. employment.

### Client Distribution by Size, Industry and Geography;

The target markets of these firms vary to some extent, but for a majority of providers are not specifically defined by size, industry, or geography. Most PPFs reported clients in all industries and usually in most or all states. A few reported concentrations, in metropolitan areas, especially in New York, New England and California.

### Response Error Profile

There are three separate dimensions to the employee count. If the reported employment count is to meet BLS definitions for the ES-202 and BLS-790 programs, all three dimensions must be handled correctly: method, timing and scope.

- o The *method* by which the counts of employees are derived can vary widely. The method used is determined by the content of the payroll systems' standard outputs. For example, if a count

or counts are displayed on a payroll summary, the employer may use such figures without delving into their conformity with the detailed definitions on the survey forms.

Employers may use counts of "active employees", "paid employees", "employees who received checks", or "counts of checks issued". The count most consistent with the BLS definitions is an unduplicated count of individuals receiving a check or other form of payment. Most of the incorrect reporting methods tend to overstate employment.

- o The *reference period* for which employment is reported is the second dimension. Most incorrect reporting results in an over-count, because typical errors include reporting an unduplicated count of paychecks for the entire month, or reporting the total quarterly employment each month. Under-counting could occur if the figure

only included the number of employees on the payroll on the twelfth day of the month.

- o The *scope* is another type of potential response error (i.e., who is counted). This could occur if the concept of covered workers is misunderstood. This type of error would also tend to produce over-counts, because it is more likely to include employees who are not covered than to exclude covered employees.

Table 1 profiles response errors related to the method and the reference period. The most significant finding, is that nearly two-thirds of the employment covered by these firms appears to be reported correctly. About 14 percent include at least a small level of misreporting, and for about 20 percent the RAS was not able to determine if the employment data are correct. This is due mainly to client's use of commercial software which leaves many decisions and calculations up to the client.

**Table 1. Response Errors: Method and Reference Period**

Reference Period	Number of PPFs	Estimated Employment as percent of RAS-Establishments Total Employment
Correct Reporting	11	65.5%
Incorrect Reporting	5	14.2%
• day of 12th	1	0.3%
• cumulative for month	1	0.1%
• "active" employees	2	13.5%
• number of checks	1	0.3%
Unable to Determine	2	20.2%
<b>Total</b>	<b>19</b>	<b>100%</b>

Table 2 profiles response errors relating to the employee scope issue. Again, the most important finding was that the majority of the reporting is correct. Among the problem cases,

the most common errors were failure to exclude certain groups such as workers receiving pay advances, those on unpaid leave, strike, or layoff.

**Table 2. Response Error: Employee Scope**

Employment Scope	Number of PPFs			Percent of RAS Employment in PPFs with Correct Report <sup>1</sup>
	Yes	No	Unable to Determine	
<b>Correctly Included:</b>				
• part-time	17	0	2	99.6%
• paid leave	16	1	2	90.6%
• trainees	17	0	2	99.6%
• executives, corporate officials	17	0	2	99.6%
• terminated during pay period of 12th	15	1	3	75.7%
<b>Correctly Excluded:</b>				
• pay advances	4	7	8	4.5%
• terminated during earlier pay period	13	3	3	75.7%
• unpaid leave	12	5	2	59.1%
• retirees	11	3	5	97.9%
• contractors	14	2	3	98.9%
• strikers	10	4	5	51.1%
• on layoff	11	5	3	58.1%
• available, but not working	12	5	2	59.1%

<sup>1</sup> does not include those for which a determination was not possible

## V. Conclusions

The scope of the payroll processing industry coverage is massive and apparently highly concentrated among a relatively small number of firms. According to the rough estimates on employment coverage received from companies during the pilot test, approximately one-third of all universe employment data is reported by this handful of companies alone. This provides significant opportunity to measure and control response error in employment data reporting.

BLS has the basis for identifying current reporting errors in the UI and working with payroll processors to correct them. There is the potential for BLS to decide how best to phase-in corrections

while maintaining the viability of its official employment series.

For payroll processing firms which directly compute employment counts and file quarterly UI contributions reports for clients, the task is relatively straightforward. BLS can ask for simulations of impact and can pinpoint exactly the timing of the introduction of corrections. However, for establishments which use payroll processing software to generate and file their own UI taxes, it will be much more difficult to measure impact. A software firm can not directly control the timing of software enhancement implementation with each customer, nor precisely quantify its impact in the aggregate. Methods for measuring and controlling change for this group need to be further explored and developed.

## VI. Further Work

BLS is continuing research into response error measurement and control through the following activities.

### PPF RAS - Phase 2

This will complete the work begun by the pilot test described above. There are approximately 250 known PPF firms that BLS will include in this phase. A scaled down version of the full questionnaire is being used, and the data collection is by telephone interview in BLS' Atlanta, Georgia Data Collection Center (DCC). The telephone collection allows completion of the RAS in a much more resource efficient manner than personal visits.

### PPF RAS - Phase 3

#### Develop Methodology for Validating the All Employee Figures

Previous reporting error improvement projects, like the CES RAS surveys done in the 1980's, involved working directly with individual firms to identify and improve reporting where possible. By working directly with PPFs, BLS can dramatically improve the cost-effectiveness of its efforts. This phase envisions development of procedures to validate the all employee counts produced by PPF systems and PSWF software through use of either a "test deck" approach or partial system review.

This phase then goes beyond the simple question and answer approach of the RAS and will attempt to actually validate PPF software used in producing employment counts, diagnose problems, and work with PPFs to improve their software.