

AVAILABILITY OF EMPLOYEE HOURS DATA

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1. Introduction and Conclusions

The present paper describes a Response Analysis Survey conducted by the Bureau of Labor Statistics in 1982 to identify sources of nonsampling error in the Hours at Work Survey. The Hours at Work Survey, initiated the same year, is a mail survey of 4000 business establishments which asks for quarterly and annual figures on hours paid and hours at work. The ability of firms to provide this information depends on the records they keep and the ease with which these records can be retrieved and summarized. The Response Analysis Survey examined hours benefits and recordkeeping practices in order to evaluate ability to report. Responses were obtained by personal visit from 191 firms in manufacturing and retail trade in three cities.

Results were examined by industry and size of firm. Availability of data, in one sense, was a function of the computer revolution. Hours data typically formed part of the payroll system. In large firms, computer handling of these systems was well-established and refined. Medium-size firms were often in the process of implementing or upgrading computer systems; a moderate number employed external accounting services. Small, independent companies relied on manual systems and kept fewer records. Summarizing across size of firm, over 80% of employees belonged to firms with adequate records on the individual to determine hours paid and hours at work. About two-thirds in manufacturing and under one-half in retail trade were in firms with convenient existing data summaries. The limitations in data summaries appeared to be a principal source of response error or obstacle to response. The findings appeared to confirm the current survey definitions and the scope of employees for whom data are requested.

These results are explained in greater detail in Section 4 below. Section 2 provides a brief background on the need for the Hours at Work Survey in measuring productivity. Conduct of the Response Analysis Survey is described in Section 3.

2. Hours data in productivity measurement

The purpose of the Hours at Work Survey is to improve the measurement of productivity. Impetus for the survey came from the report (Rees, 1979) of a panel formed by the National Research Council. Viewing productivity measurement as "a tool for monitoring and promoting efficient production of goods and services," the Rees panel studied the major uses of productivity statistics and current methodology for these statistics. At the heart of the report were recommendations for improvements directed to BLS and other agencies.

Basically, productivity is defined as output of goods and services divided by the input required to produce them. Until recently, the denominator of this ratio has been measured by labor hours alone. (BLS (1983) released its first "multifactor productivity" statistics incorporating both labor and capital inputs into the denominator).

Up until now, labor hours have come mostly from the Current Employment Survey, which obtains employment, hours, and earnings monthly from payroll records of nearly 200,000 establishments. (Hours for farmers and farm laborers, proprietors, and unpaid family workers come from the Current Population Survey). Hours figures are hours paid for production workers in manufacturing and mining and nonsupervisory employees in other industries. Based on these figures, average weekly hours and average hourly earnings are also published with considerable industry detail.

The Rees panel (Rees, Chapter 6) recommended

- (1) collecting hours at work data, as well as hours paid, and
- (2) collecting actual hours data for supervisors and nonproduction workers.

The Hours at Work Survey, discussed here, implements the first recommendation, in agreement with a BLS task force report (1976). The second is being tested in two states in the All Employee Payroll Project (Ziegler, 1983).

For productivity, what is desired is the input in hours contributing to production, or hours worked. Denison (1979), among others, has derived hours worked figures from BLS data and employed them in analyzing economic growth and productivity. Hours for vacation, holidays, and sick leave are included inappropriately when hours paid are used. Additional time at work may be paid without directly contributing to production, such as coffee breaks or clean-up time. However, extracting hours worked from hours at work in an ongoing survey appeared unfeasible to the Rees panel.

These considerations led BLS to introduce the Hours at Work Survey in 1982. By mail, firms are being asked to provide annual data, with quarterly subtotals, on hours paid and hours at work. The aim is to provide national estimates of the ratio of hours at work to hours paid, and, by applying this ratio to results from the larger Current Employment Survey, to provide national estimates of the level of hours at work for a broad range of private industry.

3. Conduct of the Response Analysis Survey

Data quality in surveys is a function of sampling and nonsampling error. Over the past several years, Barbara Bailar and others have encouraged data producers to prepare "error profiles" as a step toward the ultimate goal of obtaining total survey error. In their error profile of the Current Population Survey, Brooks and Bailar (1978) included the following goals:

- (1) to compile---the sources of error and the information that is available about them.
- (2) to illustrate the need for controlled experiments to measure nonsampling errors.

The Response Analysis Survey pursued these goals in a qualitative way for one part of nonsampling error,

response or measurement error. Response error may be defined as the difference between the true value for a respondent, in this setting an establishment, and an actual value recorded on a survey schedule. A 13-page questionnaire examined hours concepts and recordkeeping as practiced in the firm. It was considered premature to conduct a reinterview for data (e.g., Hansen et al, 1964) during the first year of the survey, so the qualitative approach was adopted. A qualitative experiment of this type complements and gives preparation for a quantitative experiment, such as a reinterview for data.

An evaluation survey is expensive per response due to personal visit collection and to complexities in questionnaire design, processing, and editing. Due to resource limitations, the scope of the Response Analysis Survey was narrowed to firms in manufacturing and retail trade in three cities. Manufacturing was chosen as the area where most productivity analysis has occurred. Retail trade was selected because of its different character and a low initial response on the Hours at Work Survey. The cities, selected to provide geographic diversity, belong to three of the four standard Census regions, Northeast,

North Central, and West. These three cities had local BLS offices, offering facilities and assistance for the data collectors from the national office. Ability and willingness to report are often a function of size, so three size classes were formed and sampled equally. The allocation in Table 1 was used in manufacturing and repeated in retail trade.

Drawing conclusions from the Response Analysis Survey is limited by the small sample sizes, geographic coverage, and nonresponse. Units within size-industry-city cells were selected with equal probability. Size-industry percentages discussed in the next section were calculated as simple averages of the city percentages. This gave equal weight to the three cities. Table 2 shows the response rates by cell. Response rates were held down more by lack of interviewing resources than by lack of cooperation. Firms were usually receptive to the goals of evaluating and improving survey concepts and methods. Due to severe budget limitations in fiscal year 82, only 12 interviewer-weeks were available for the personal visits. Each interviewer had one week for contacting a panel of 24 units.

Table 1. Sample Allocation

Manufacturing	Chicago	Denver	Philadelphia	TOTAL
Small (0-49)	16	16	16	48
Medium (50-249)	16	16	16	48
Large (250+)	16	16	16	48
TOTAL	48	48	48	144

Table 2. Response Rates for the Response Analysis Survey

	Designated Sample	In Scope Units	Usable Response	Response Rate
Manufacturing				
Small	48	43	27	63%
Medium	48	47	33	70%
Large	48	48	34	71%
TOTAL	144	138	94	68%
Retail Trade				
Small	47	43	24	56%
Medium	49	48	37	77%
Large	50	48	36	75%
TOTAL	146	139	97	70%

4. Results on data availability

The two variables being collected in the Hours at Work Survey are hours paid and hours at work. The differences between the two reduce to paid leave, which may be grouped into the following four categories: vacation or annual leave, holidays, sick leave, and unscheduled personal or administrative leave. The last category may include time off for personal business, funeral leave, or jury duty. These data are requested for production workers in manufacturing and mining and nonsupervisory employees in other industries. The reference period is the previous year, with both quarterly and annual totals requested. Results are analyzed by industry and size class. Table 3 shows the distribution of employment, by size class. Employment is concentrated in large firms in manufacturing and in small firms in retail trade.

Table 3. Distribution of National Employment by Size

	Manufacturing	Retail Trade
Small	16%	52%
Medium	27	27
Large	<u>57</u>	<u>21</u>
	100%	100%
Total Industry Employment (millions)	19.2	14.8

The Response Analysis Survey investigated the following questions:

- (1) Do survey definitions fit company practices and recordkeeping?
- (2) Just what hours benefits are offered to employees?
- (3) Are sufficient data available on the individual to determine both hours paid and hours at work?
- (4) Are data summarized across employees and across time periods?
- (5) Are records kept long enough to be available during data collection 3-6 months after the reference year?
- (6) How do practices vary for broad employee types, such as production workers and nonproduction workers?

Only the key questions will be discussed in this paper. Starting with the last question, nearly all firms had data systems covering production workers (manufacturing) or nonsupervisory employees (retail trade) either through a separate payroll, an hourly payroll, or an all-employee payroll. Subtotals for the appropriate group of employees were usually available,

except that about one-fifth of medium-size manufacturing firms lacked production worker subtotals. A third or more of firms in each size industry cell lacked any systematic hours records for supervisors. These findings suggest that the Hours at Work Survey continue to restrict the scope of hours data to production workers or nonsupervisory employees. All subsequent results apply to these employee groups.

The Response Analysis Survey found survey definitions to be consistent with company practices. With respect to major hours benefits, the only problem encountered was that a few companies included holiday hours along with hours at work in a "regular hours" figure. One of these, a large manufacturing firm, had thorough hours records for the individual, but in summary reports placed only vacation and unscheduled leave in an exception hours category. Overall, as anticipated, obtaining productive time within hours at work was not possible. The hours at work concept could be defined as regular plus overtime hours or as hours paid minus leave hours.

The fundamental question for the evaluation was whether or not companies keep sufficient records on the individual to determine hours paid and hours at work. As seen in the first column of Table 4, roughly 90% of the large firms in both manufacturing and retail trade had the necessary basic records, and almost all large firms had some computerized hours data. In medium size establishments, about the same portion had sufficient records in retail trade and a somewhat lower portion, roughly 80%, in manufacturing. Again, most systems were computerized. Typically, employees in large and medium firms in both industries punch time clocks and are paid weekly. Supervisors or their assistants go over the time cards and note exception hours. The cards then go to a central location and the data are entered into the computer. Manual records predominated in the small firms, with the percentage having adequate records dropping by about 10% from the percentages for medium firms.

Supplying annual data with quarterly subtotals is likely to be burdensome unless summaries already exist or can be conveniently derived from an existing system. The second column in Table 4 shows the percentage of units with hours paid and hours at work data summarized for the unit and for time periods of at least a month.

In manufacturing, the availability of existing summaries increases with size of firm. However, for small firms, estimation with limited records may be fairly effective, since many small firms do not offer sick leave or other unscheduled leave. Summaries were less frequently available in retail trade, and the size effect was less pronounced. Many of the small units were part of large corporations, such as outlets of fast-food chains. Often, national chain stores had payroll or records centers, which would be the best contacts for survey purposes.

Table 4. Availability of Hours Data

	Firms with Sufficient Hours Records for the Individual (% of total units)	Firms with Sufficient Existing Hours Summaries (% of total units)	TOTAL UNITS
Manufacturing			
Small	68%	34%	27
Medium	78	65	33
Large	90	77	34
Retail Trade			
Small	78%	35%	24
Medium	87	57	37
Large	87	54	36

Table 5.

Response Rates for the 1983 Hours at Work Survey (Preliminary)

Manufacturing	Response Rate
Small	79
Medium	81
Large	77
TOTAL	78
Retail Trade	
Small	84
Medium	74
Large	55
TOTAL	74

Overall, from Table 4, it appears that most employees belong to firms with enough information on the individual to report hours data in accord with survey definitions. Summarizing across size, weighting by the distribution in Table 3, the figures exceed 80% in both manufacturing and retail trade. About two-thirds of employees in manufacturing and less than one-half in retail trade are covered by convenient, existing data summaries.

The limitations in data summaries raise the most uncertainty about the reporting of data. For instance, will the one-third of large firms in retail trade (87%-54%) with sufficient basic data but insufficient summaries be willing to modify their summaries for the purposes of a voluntary survey? Alternately, will they simply estimate the data or not report at all?

Table 5 contains preliminary response rates for the second year of the survey. For small and medium firms, these rates exceed the Response Analysis Survey figures for existing hours summaries in Table 4; for large firms, the figures are virtually the same. For small firms, the response rates exceed the Table 4 figures for individual hours records. Small and medium firms were often willing either to estimate data or to do additional summarization from records in order to respond to the survey. In proceeding to a reinterview survey to measure response error, it is important to identify how often data for one or more hours components are based on estimates.

From a broader perspective, the numbers in Table 4 illustrate the problem of response for many establishment surveys. For the Hours at Work Survey, a relatively straightforward survey requesting only one type of data, perhaps 10-20% either lack the basic data or fail to match the survey definitions; for additional firms, extra work is required to provide the data as requested. In such cases, it appears difficult to obtain the extremely high response rates achieved by some household surveys, such as the Current Population Survey, where acceptable responses may require no referral to records.

The summary findings in this paper are subject to review following a more detailed analysis of the data now underway. Some of the same issues are dealt with in Utter and Rosen (1983) and the forthcoming All-Employee Payroll Project (Ziegler, 1983).

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