Employer-provided training: results from a new survey

The 1993 BLS Survey of Employer Provided Training reveals that larger establishments are far more likely than smaller ones to provide formal training to their employees, as are establishments that offer various benefits or employ certain workplace practices

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In recent years, there has been a growing interest in the role that training—especially job skills training—plays in the economy. Concerns over the competitiveness of U.S. labor in the globalized economy, the weak performance of labor productivity since 1973, and the widening gap between the earnings of high school graduates and college-educated workers are among the reasons cited to support increasing the training provided the U.S. work force.

As researchers attempt to examine the potential impact of training on the economy, and as lawmakers wrestle with the question of the appropriate role of public policy, a growing need has arisen for more and better data on both the nature and the extent of private-sector training. To be sure, a rich array of data on the training received by *individuals* is provided by various household surveys, such as the Current Population Survey, the National Longitudinal Survey of Youth, the Survey of Income and Program Participation, and the Panel Study of Income Dynamics. In contrast to this information, however, data on the nature and extent of training opportunities provided by *private businesses* are scarce. Indeed, a comprehensive data base containing such information simply does not exist. Despite this gap, academic researchers have been innovative in their use of the limited data that do exist. Some researchers have adopted a case study approach, others have used the information on training that can be found in existing Federal surveys, and still others have conducted their own surveys. Still, given the concerns over the competitiveness and relative productivity of U.S. industries, it is important that improved information on the nature of employer-provided training be collected.

This article examines the results of a survey recently conducted by the Bureau of Labor Statistics and sponsored by the Employment and Training Administration of the U.S. Department of Labor. The Survey of Employer Provided Training was designed to collect information on the existence of various types of formal training programs that were provided or financed by private nonagricultural establishments during 1993. Although largely limited to formal training (training that has a structured format and a defined curriculum), the survey also gathered some information on the use of on-the-job training. It did not, however, measure the *intensity* of formal training programs, such as the number of participants in them, the number of hours of training offered, or the cost of training; hence, it is not a panacea for the lack of establishment data. Nonetheless, given the relative scarcity of data on even the existence of formal training programs, the survey takes an important first step in filling the information gap.

The first section of this article discusses the basic definitions of formal training used in the survey, the methods of gathering information, and the types of questions asked. The second section presents the basic findings of the survey, including patterns in the incidence of different

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types of formal training by establishment size and industry and patterns in the reasons why establishments chose to provide or not to provide different formal training programs. The third section draws upon economic theory to address the question of which characteristics of establishments make it more likely that they will offer formal training programs. A logistic regression is used to estimate the contribution of each of the measured characteristics. The final section presents some concluding remarks on the results of the study.

Background to the survey

The Survey on Employer Provided Training defines *formal* training as training that is planned in advance and that has a defined curriculum. The training can take place in a variety of settings, including, but not limited to, the classroom. Thus, a demonstration of a job skill on the shop floor could be considered formal training, as long as it was planned in advance and had a defined structure that was being followed in teaching the skill. In contrast, a spontaneous demonstration of a job skill to answer a question posed by an employee to a supervisor would be considered *informal* or *on-the-job* training.

The data from the survey give information on the following types of formal training:

- *Orientation training* that provides information on personnel and workplace practices and overall company policies.
- *Safety and health training* that provides information on safety and health hazards, procedures, and regulations.
- *Apprenticeship training* that is a structured process by which individuals become skilled workers through a combination of classroom instruction and on-the-job training.
- *Basic skills training* in reading and writing, arithmetic, and English language skills.
- *Workplace practices training* in policies and practices that affect employee relations or the work environment.
- *Job skills training* that upgrades employee skills, extends their skills, or qualifies workers for a job.

The survey was mailed to nearly 12,000 establishments. After accounting for establishments that were out of business or that were found to be otherwise ineligible to participate in the survey, the viable sample size was 11,068. A total of 8,467 establishments provided data to the Bureau, resulting in a usable response rate of 71.3 percent. The survey was conducted through the mail, with a follow-up telephone call in some cases. Because establishments have a wide range of recordkeeping practices, no attempt was made in the design of the survey to collect information on aspects of training programs that might require records, such as the number of participants, total hours spent in training, or costs of providing formal training. (The Bureau plans to conduct a second training survey in 1995 that will collect information on these measures of the intensity of formal training; see the box below for details.)

As an example of a typical question in the survey, each respondent was asked, "During 1993, did your establishment provide or finance formal training in basic reading, writing, arithmetic, or English language skills for any of its employees?"

The 1995 Survey of Employer Provided Training

The Bureau of Labor Statistics plans to conduct a second survey of employer-provided training in 1995. This survey will have three basic objectives. The first is to collect information from employers to construct esimates of the intensity of any formal training they offer, including the number of hours of formal training they provide, the number of participants in their formal training programs, and estimates of selected costs of the programs. The second objective is to collect information from *employees* that will permit the construction of estimates of the amount and proportion of time that is spent in formal and on-the-job, or informal, training activities. The third objective, which also requires the collection of information from employees, is to construct estimates of the wage and salary costs of time spent in training for both formal and informal training. Included will be a division of these costs by broad occupation groupings.

The 1995 survey is designed as a personal visit survey. Based on field research, the Bureau believes that a personal visit is necessary to collect accurate and complete information on intensity measures of training, both formal and informal. Experienced BLS field economists will provide survey respondents with the materials needed to keep track of training activities over a 2-week period.

As part of the second and third objectives, the Bureau will select two employees at random at each establishment and ask them to answer some basic background questions, as well as to fill out a training activity log for 1 week. The collection of information from employees at establishments is both innovative and experimental, and will provide a more complete picture of the nature of the training (both formal and informal) offered by establishments.

The answers to this question were used to estimate the proportion of all establishments that provided or financed training in basic reading, writing, arithmetic, or English language skills for any of their employees during 1993. In addition to this national estimate, the sample of establishments was selected in a way that estimates could also be made for establishments in nine major industry groups and five different employment size classes. The industry groups consisted of mining; construction; durable goods manufacturing; nondurable goods manufacturing; transportation and public utilities; wholesale trade; retail trade; finance, insurance, and real estate; and services. The employment size classes were: fewer than 50 employees; 50 to 99 employees; 100 to 249 employees; 250 to 499 employees; and 500 or more employees. We report results only for small (fewer than 50 employees), medium-sized (50 to 249 employees), and large (250 or more employees) establishments.

In addition to gathering information on the six major categories of formal training described earlier, the survey collected further detailed information on various types of formal job skills training. The box on page 7 presents a detailed list of the job skills categories developed for the survey.

The survey also collected information on several other aspects of the training programs provided or financed by establishments. Questions were asked as to why establishments did or did not provide basic skills training, why they did or did not provide job skills training, how they selected employees for job skills training, and how they judged the success of their programs.

Finally, the survey asked each respondent to give information on various characteristics of the establishment that were thought to be either positively or negatively correlated with the provision of formal training. In addition to obtaining information on the industry and the number of employees in each establishment, the survey asked the respondent to estimate the number of employees working part time, the number covered by a collective bargaining agreement, and the number employed at the establishment for less than 1 year. The respondent was also asked whether the establishment offered certain worker benefits or used particular work practices during 1993. (See the box on page 8 for a description of the work practices examined in the survey.)

Patterns in formal training

Table 1 presents estimates of the incidence of formal training programs for all establishments and for each of the three major employment size classes. Only 69 percent of small establishments provided training in 1993, compared with nearly all medium-sized and large establishments. Because most establishments are small, the overall proportion of all establishments offering training was only 71 percent. However, because a disproportionate share of U.S. workers is employed by large establishments, 9 in 10 employees worked in establishments that provided some kind of formal training during 1993.

Table 1. Percent and type of formal training in private nonfarm establishments, by size of establishment, 1993

Characteristic	Total	Fewer than 50 employees	50 to 249 employees	250 or more employees
All establishments (thousands)[1]	4,501	4,198	257	46
All establishments that provided any formal training:				
Number (thousands)	3,192	2,895	251	46
Percent[2]	70.9	68.9	97.9	99.3
Percent of all establishments with formal:[3]				
Orientation training	31.8	28.5	74.9	92.5
Safety and health training	32.4	29.5	70.2	88.3
Apprenticeship training	18.9	17.5	35.6	51.1
Basic skills training	2.2	1.7	7.2	19.3
Workplace-related training	36.1	33.0	77.3	89.6
Job skills training	48.6	45.8	85.8	95.9
Other	4.1	3.6	10.5	17.1

[1] The sampling frame does not include establishments that came into existence after selection of the sample. Therefore, the survey estimates of the total number of establishments will likely differ from the population values.

[2] Establishment counts shown are rounded to the nearest thousand; percents were calculated using unrounded data.

[3] Respondents could choose more than one category.

Some types of formal training were more prevalent than others. Nearly half of all establishments provided formal jobs skills training in 1993, while orientation, safety and health, and workplace-related training were each provided by about 1 in 3 establishments. Less than 3 percent of all establishments offered formal training in basic reading, writing, arithmetic, and English language skills. Larger establishments were more likely than smaller ones to provide formal training of all types. For example, 19 percent of all large establishments, but only 2 percent of small ones, offered basic skills training. Similarly, nearly all large establishments provided some type of formal job skills training during the year, compared with fewer than half of small establishments.

Industry differences. The provision of formal training varied somewhat across industries. Slightly less than 60 percent of all construction establishments offered such training in 1993, compared with roughly 3 out of 4 establishments in

each of the following industry groups: finance, insurance, and real estate; services; and transportation, communications, and public utilities. (See table 2.)

Basic skills training. Among establishments that provided formal basic reading, writing, arithmetic, or English language skills during 1993, the most frequent reasons for doing so were to reduce errors and waste (56 percent) and because basic skills were thought to be critical to technology or production methods (52 percent). The latter reason was the one cited most frequently by large establishments (68 percent). About one-quarter of all establishments reported that they offered basic skills training to meet safety and health requirements. Nearly 15 percent of all establishments cited an inability to hire employees with adequate skills as a reason for providing such training, although less than 7 percent of large establishments gave this as a reason. Finally, nearly 5 percent of all establishments reported that basic skills training was required as part of a collective bargaining agreement (See table 3.)

Among establishments that did not provide formal basic reading, writing, arithmetic, or English language skills during 1993, nearly 70 percent reported that their employees had adequate skills for the job. A slightly higher percentage of large establishments, 78 percent, gave this reason. Similarly, while only 2 percent of all establishments reported that the cost of basic skills training was too high, 6 percent of large establishments said the same.

Job skills training. The three types of job skills most commonly taught through formal training programs were sales and customer relations skills, management skills, and computer skills. While about 1 in 4 establishments provided training in these areas, 1 in 12 provided formal training in food, cleaning, protective, and personal service skills. Job skills training of all types increased with the size of the establishment. More than 80 percent of large establishments provided management skills training and computer skills training, and more than 71 percent offered training in sales and customer relations skills. (See table 4.) The types of training an establishment provides may reflect any number of factors, including the occupations of its workers, the types of job skills that are most easily taught formally rather than informally, and the types of skills that are most commonly taught in the workplace, rather than in schools.

The most frequently cited reason establishments of all sizes gave for offering formal job skills training in 1993 was that the training was necessary to provide skills specific to their organization (75 percent). Other important reasons for offering formal job skills training among establishments of

Table 2 Presence and type of formal training in private nonfarm establishments, by industry, 1993

Characteristic	Total	Mining	Construction	Manufacturing			Transportation, communications, and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
				Total	Durable goods	Nondurable goods					
All establishments (thousands)[1]	4,501	21	381	309	186	124	194	345	1,224	429	1,598
All establishments that provided any formal training:											
Number (thousands)	3,192	15	224	213	127	86	142	242	849	323	1,185
Percent[2]	70.9	69.0	58.8	68.9	68.7	69.2	73.2	70.0	69.3	75.3	74.1
Percent of all establishments with formal:[3]											
Orientation training	31.8	35.5	22.4	31.8	30.6	33.6	38.9	32.6	32.5	30.7	32.7
Safety and health training	32.4	51.6	32.9	42.8	44.9	39.6	43.6	31.2	31.4	19.5	33.2
Apprenticeship training	18.9	17.4	20.1	14.7	13.9	16.0	26.4	14.5	19.2	22.3	18.4
Basic skills training	2.2	4.7	.7	5.2	5.8	4.3	3.4	2.0	1.9	3.2	1.8
Workplace-related training	36.1	37.0	25.7	33.9	32.5	36.1	45.2	33.8	36.2	39.2	37.4
Job skills training	48.6	47.7	32.2	47.8	47.1	48.9	57.0	52.0	43.1	58.1	52.6
Other	4.1	5.3	2.3	5.6	6.6	4.3	10.6	4.7	3.2	4.4	4.0

[1] The sampling frame does not include establishments that came into existence after selection of the sample. Therefore, the survey estimates of the total number of establishments will likely differ from the population values.

[2] Establishment counts shown are rounded to the nearest thousand; percents were calculated using unrounded data.

[3] Respondents could choose more than one category.

Defining job skills training

The survey asked respondents whether they provided formal training in any of seven different categories during 1993. The types of job skills training are:

- *Management skills training*, which includes: Supervisory skills such as managing employees effectively; motivating employee performance; resolving conflicts; conveying goals; monitoring production; and promoting employee development.

  Employment practices such as hiring practices; completing employee performance evaluations; implementation of EEO regulations; collective bargaining provisions, and sexual harassment policies.

- *Professional and technical skills training*, which includes: Professional areas, such as art, biology, business, chemistry, engineering, health diagnoses, law, etc.

  Technical areas, such as drafting, electronics, medical technology, etc.

- *Computer skills training*, which includes: General computer literacy; computer-related policies and procedures, including computer security; standard commercial word-processing software; other standard commercial software, such as desktop publishing, spreadsheet, graphics, computer-aided design, accounting, and statistical packages; software applications developed or tailored for the establishment; computer programming languages; and methods to develop software applications.

- *Sales and customer relations skills training*, which includes: Sales techniques; information about the firm's product line; and maintaining or improving customer relations.

- *Clerical and administrative support skills training*, which includes: Administrative recordkeeping, such as budget, payroll, or scheduling; business writing; typing and data entry; and other secretarial skills such as filing.

- *Food, cleaning, protective, or personal services training*, which includes: Food services, such as waiting tables and preparing food; cleaning services; protective services, such as security and detective work; and personal services, such as child care and tailoring.

- *Production-related skills training*, which includes: Operation of machinery or equipment; repair of machinery or equipment; and production processes, such as manufacturing, assembly, distribution, installation, and inspection.

all sizes were to keep up with changes in technology or production methods and to retain valuable employees; each of these reasons was cited by at least half of those providing formal job skills training. (See table 5.)

Establishments used a variety of methods for selecting employees for formal job skills training. During 1993, more than half of all establishments that provided formal job skills training made the training available to all of their employees. About a third of all establishments had supervisors choose employees who they believed required training to remedy deficiencies. About 1 in 4 establishments reported having employees volunteer for training, and a similar percentage chose those with promotion potential. The proportion of large establishments that chose employees who had deficiencies in various skills (63 percent) was nearly twice that of all establishments (34 percent). Large establishments were also more likely than all establishments to have employees volunteer for training (55 percent versus 27 percent). Training employees in order to comply with collective bargaining agreements was notable only in establishments with 250 or more employees—13 percent of such establishments cited that reason—as larger establishments are more likely to be unionized.[1] (See table 6.)

Table 3. Presence of formal basic skills training in private nonfarm establishments, by reason for training and size of establishment, 1993

Characteristic	Total	Fewer than 50 employees	50 to 249 employees	250 or more employees
All establishments that provided any formal basic skills training (thousands)	99	72	18	9
Percent, by reason:[1]				
To reduce errors and waste	56.0	58.3	46.7	55.9
To meet safety and/or health requirements	23.9	26.6	14.6	20.8
Basic skills are critical to technology and/or production methods	51.8	45.0	70.9	67.7
As a part of a collective bargaining agreement	4.9	5.3	1.9	7.7
Unable to hire employees with adequate skills	14.8	18.0	6.0	6.8
Other	31.2	30.0	31.9	39.5

[1] Respondents could choose more than one category.

Training and the organization of work

The survey asked establishments whether they employed any of eight alternative workplace practices. While the way in which work is organized in U.S. establishments is extremely complicated, this somewhat simple list of eight practices was culled from the literature in the hopes of describing general trends. In addition, the popular concept of a "high-performance" workplace resists a simple definition, and no attempt is made to estimate the proportion of such workplaces from the data in the survey. The eight workplace practices examined by the survey are:

- *Just-in-time inventories*, which are a method of inventory control and production where firms keep very small amounts of supplies on hand. Products are assembled from parts received "just in time" once orders for the products are also received. This method of production tends to reduce lot sizes and make deliveries much more frequent.

- *Worker teams*, which are small, intact groups of workers whose members have the authority to handle internal processes as they see fit in order to generate a specific group product, service, or decision.

- *Total quality management*, which is an organizational management approach in which the core ideas include doing things right the first time, striving for continuous improvement, and a devotion to understanding and meeting customer needs.

- *Quality circles*, which are generally voluntary groups of workers brought together for an hour or so a week to come up with solutions to problems concerning workers and productivity.

- *Peer review of employee performance*, which is a performance appraisal system in which employees' work performance is evaluated (at least in part) by coworkers.

- *Compensation increases based on a "pay for knowledge" system*, which is a pay system in which compensation is based on mastering new job-related skills. It is an alternative to pay systems where compensation is linked to a particular job.

- *Employee involvement in the firm's technology- and equipment-purchase decisions*, which is an organizational policy in which employees have a say in technology- and equipment-purchase decisions that affect them.

- *Job rotation*, which is a work design system that allows employees to rotate among different jobs.

The following tabulation lists the number of establishments employing each of these eight types of workplace practices. (Respondents could choose more than one category.) In addition, among establishments that employ each particular practice, the proportions that also provide any formal training are listed. As the tabulation indicates, compared with all establishments, an establishment with any of these particular workplace practices is, without exception, more likely to provide formal training.

	Total establishments (in thousands)	*Percent providing any formal training*
All establishments[1]	4,501	70.9
Establishments adopting:		
Just-in-time inventories	362	73.7
Worker teams	436	83.6
Total quality management	655	86.6
Quality circles	147	89.5
Peer review of employee performance	340	89.0
Increases in compensation based on "pay for knowledge" system	305	84.8
Employee involvement in technology- and equipment-purchasing decisions	491	84.5
Job rotation	387	84.6

[1] The sampling frame does not include establishments that came into existence after selection of the sample. Therefore, the survey estimates of the total number of establishments will likely differ from the population values.

Table 4. Presence and type of formal job skills training in private nonfarm establishments, by size of establishment, 1993

Characteristic	Total	Fewer than 50 employees	50 to 249 employees	250 or more employees
All establishments (thousands)[1]	4,501	4,198	257	46
All establishments that provided any formal job skills training:				
Number (thousands)	2,188	1,923	220	44
Percent[2]	48.6	45.8	85.8	95.9
Percent of all establishments by type of formal job skills training:[3]				
Management skills	24.4	21.1	66.7	85.6
Professional and technical skills	18.5	17.2	33.8	53.9
Computer skills	25.7	23.1	58.1	82.6
Sales and customer relations skills	28.1	25.8	57.7	71.1
Clerical and administrative support skills	16.9	15.1	38.9	61.1
Food, cleaning, protective, or personal service skills	8.4	7.2	25.2	27.6
Production-related activities	17.4	15.7	38.1	58.4
Other formal job skills	8.0	7.2	17.3	23.3

[1] The sampling frame does not include establishments that came into existence after selection of the sample. Therefore, the survey estimates of the total number of establishments will likely differ from the population values.

[2] Establishment counts shown are rounded to the nearest thousand; percents were calculated using unrounded data.

[3] Respondents could choose more than one category.

Subjective measures were most frequently used for measuring the success of formal job skills training. More than half of all establishments reported using supervisory evaluations of overall worker performance after training, and workers' own opinions of training were used by 4 in 10 establishments. Reflecting the relatively greater difficulty of finding objective measures of success, only 30 percent of establishments reported using specific measures such as fewer mistakes or increased output as methods of judging success. Similarly, only 22 percent used general effects on employee behavior, such as reduced absenteeism or lower turnover, and about 12 percent of establishments reported using written tests. (See table 7.)

Nearly two-thirds of establishments that did not provide formal job skills training in 1993 reported that on-the-job training satisfied their needs. An even greater proportion (83 percent) of medium-sized and large establishments combined cited this reason.[2] Less than 10 percent of all establishments reported that the cost of formal training was too high or that they were unwilling to provide formal training due to a fear of losing trained employees to other employers. (See table 8.)

Likelihood of providing formal training

The preceding section reported the incidence of formal training by size and industry. One limitation of the analysis in that section is that the effects of size and industry are examined separately and in isolation from other characteristics of establishments. Thus, what may appear to be an important connection between, for example, industry affiliation and the provision of training may in reality be masking the fact that a disproportionate share of establishments in the industry are small—and therefore less likely to provide training. As a case in point, it was found that nearly all of the largest firms provided training. At the same time, only 59 percent of establishments in the construction industry offered formal training. Construction establishments tend to be smaller than average; the mean size of all establishments surveyed was 78 employees, but in construction the mean was 12 employees. To what extent, then, is the relatively low propor-

Table 5. Presence of formal job skills training in private nonfarm establishments, by reason for training and size of establishment, 1993

Characteristic	Total	Fewer than 50 employees	50 to 249 employees	250 or more employees
All establishments that provided any formal job skills training (thousands)	2,188	1,923	220	44
Percent, by reason:[1]				
To provide skills specific to establishment	75.0	73.4	86.8	87.2
To help retain valuable employees	52.6	50.1	69.8	75.8
To upgrade employee skills in response to changes in technology, production methods, or both	53.4	51.7	63.5	78.3
Inability to hire employees with adequate skills	13.0	12.9	12.4	18.7
Requirement of law or regulation	24.6	22.7	37.5	43.6
Requirement by collective bargaining agreement	1.4	1.1	3.0	9.6
Other reasons	6.5	6.7	4.5	6.5

[1] Respondents could choose more than one category.

tion of establishments in the construction industry that offer formal training influenced by the relative sizes of establishments in the industry? Or, more generally, to what extent do an establishment's characteristics influence the likelihood of it providing training? To measure the independent contribution of different characteristics of an establishment—such as size, industry affiliation, and the existence of alternative workplace practices—it is necessary to separate those characteristics. The technique employed in this section, *logistic regression*, enables us to estimate the probability that an establishment with any given set of characteristics provides training, as well as to measure the impact that a change in any given characteristic (such as the size of the establishment) has on this probability after controlling for the values of all other characteristics.

The characteristics this article uses to describe an establishment in the logistic regression are the proportion of employees with less than 1 year of tenure, the number and types of benefits offered by the establishment, the number and types of alternative workplace practices used by the establishment, the size of the establishment, the proportion of employees who work part time, and the proportion of workers covered by a union or collective bargaining agreement. Before turning to the results of the regression, let us consider how these variables might affect the provision of training according to economic and management theory.

Table 6. **Presence of formal job skills training in private nonfarm establishments, by method of choosing employee trainees and size of establishment, 1993**

Characteristic	Total	Fewer than 50 employees	50 to 249 employees	250 or more employees
All establishments that provided any formal job skills training (thousands)	2,188	1,923	220	44
Percent, by method of choosing employee trainees:[1]				
Training made available to all employees	55.6	55.6	56.0	51.1
Employees volunteer	26.5	24.6	37.4	54.8
Supervisors choose employees who they believe require training to remedy deficiencies	33.8	31.0	52.4	62.6
Supervisors choose employees with promotion potential	24.7	22.2	42.5	48.2
Collective bargaining agreement dictates which employees are trained	1.6	1.2	3.6	12.5
Senior employees are generally trained first	6.5	6.3	9.3	5.0
Other methods	10.8	10.6	10.4	19.6

[1] Respondents could choose more than one category.

Tenure of workers. The relationship between the provision of formal training and workers' expected tenure with an employer is straightforward to predict. Training presumably increases an employee's productivity. The longer employees stay with an establishment after receiving training, the more profitable the investment in training has been to the employer. Therefore, employers would be likely to concentrate their training efforts on those they expect to stay with the firm.

In addition, the provision of training may increase worker's expected tenure by reducing turnover. Economists distinguish between two types of skills developed through training: general skills, which can be used at various firms, and specific skills, which can be used only at the current firm. To the extent that training is specific, it may raise a worker's productivity at his or her firm relative to other firms. It is rational, then, for the firm that offers the training to pay the trained worker more than other firms would. Such premium wages may encourage employees to stay with the employer.

In considering the relationship between employees' tenure and the provision of training, however, it is important to distinguish between workers' *expected* tenure and their *current* tenure. The relationship between the provision of training and workers' current tenure is not as clear as that between the provision of training and their expected tenure. It can be argued that employers train workers with short tenure in order to bring them "up to speed" and that the employers expect to enjoy the returns to the investment in training over a longer period than if they delayed training. On the other hand, firms may hold off training until it is clear that an employee is unlikely to leave. The former strategy would increase the association between training and short average tenure, while the latter would imply a correlation between training and long tenure. In the following analysis, we test whether establishments with a high proportion of short-tenured employees (less than 1 year of tenure) are more or less likely to provide training than those with fewer short-tenured workers.

The training survey contained a question on the proportion of workers with less than 1 year of tenure. While the survey did not contain a measure of the expected tenure of employees, many of the other variables can be anticipated to correlate with expected tenure. Several characteristics of the firm may reflect a commitment to the development of a long-term relationship with the employee. These are discussed in the sections that follow.

Table 7. Presence and criteria for judging success of formal job skills training in private nonfarm establishments, by size of establishment, 1993

Characteristic	Total	Fewer than 50 employees	50 to 249 employees	250 or more employees
All establishments that provided any formal job skills training (thousands)	2,188	1,923	220	44
Percent, by method of judging success of training:[1]				
No evaluations are performed	18.5	19.5	11.2	8.8
Workers' opinions of training	40.9	39.1	51.5	64.8
Supervisory evaluation of overall worker performance after training	55.2	53.2	70.3	67.7
Supervisory evaluation using specific measures such as fewer mistakes or increased output	29.6	28.2	39.2	44.5
General effects on employee behavior, such as reduced absenteeism or lower turnover	22.1	20.1	36.1	40.7
Written tests	12.1	10.5	22.7	28.8
Other methods	5.0	4.8	6.2	10.2

[1] Respondents could choose more than one category.

Benefits. One would expect that, to the extent that the provision of both benefits and training reflects employers' commitments to retaining their employees, training may be correlated with the provision of certain types of benefits. For example, pensions can be thought of as a deferred wage payment, and the deferral of the payment can be expected to discourage turnover. Similarly, the provision of family leave or employer-financed child care might retain workers with children. Hence, any decrease in turnover that arises through reducing the incentive to quit may be correlated with the provision of training. Finally, a high level of benefits of any type may reflect a generally high level of compensation, similarly reducing the incentive to quit.

Workplace practices. In recent years, many employers have adopted a number of alternative workplace practices with the primary goal of increasing productivity. The survey asked establishments whether they used each of the following practices: just-in-time inventories, worker teams, total quality management, quality circles, peer review of employee performance, increases in compensation based on a "pay for knowledge" system, employee involvement in the establishment's decisions to purchase technology and equipment, and job rotation.

The relationship between the adoption of such alternative practices and the provision of training is not necessarily clear. Theoretically, firms that adopt new practices must, by definition, train their workers in the skills required to carry out those practices. For example, a quality circle is a structure through which employees examine and develop solutions to problems traditionally dealt with by management. It would seem that the successful operation of a quality circle would require training in quality theory and group processes, at a minimum. There is evidence, however, that many firms employ a number of these practices without formally providing their workers with additional skills.[3]

Further evidence suggests that firms which successfully adopt such practices are likely to have an above-average proportion of workers with long tenure. Some propose that long-tenured employees are more likely to be willing to forgo short-term individual goals in favor of longer term establishment goals.[4] Thus, the adoption of new practices may be most successful in those establishments in which there is already a high degree of employer-employee commitment. If this commitment is linked to training, then establishments adopting such practices would also have a high likelihood of providing training.

Size of establishment. The limited empirical evidence on the relationship between training and the size of the establishment indicates that employees of large firms are more likely to receive job training than are employees of small

Table 8. Absence of formal job skills training in private nonfarm establishments, by reason and size of establishment, 1993

Characteristic	Total	Fewer than 50 employees	50 or more employees
All establishments that did not provide formal job skills training (thousands)	2,313	2,275	38
Percent, by reason:[1]			
On-the-job training satisfies needs	65.2	64.9	82.8
Only workers with necessary job skills are hired	28.2	28.1	34.7
Cost of formal training is too high	7.8	7.8	9.2
May train employees and then lose them to other firms	3.1	3.1	1.6
Other reasons	21.9	22.0	11.3

[1] Respondents could choose more than one category.

firms.[5] One theory holds that large firms are more likely to train workers than are small firms because of economies of scale. That is, the average per-employee costs of developing and conducting formal training would decline as more employees participate in the training. Such costs, which often include the costs of hiring a trainer, developing a curriculum, and acquiring training space, can be spread over many employees in a large firm. By comparison, small firms would be more likely to use informal, on-the-job training methods as a means of teaching their employees how to perform their jobs.

Another theory maintains that large employers are generally more likely to take risks than are small employers and are thus more willing to train many employees—including those that are more likely than others to quit. Proponents of this theory argue that large firms can afford to take more risks because they do more initial job screening.[6]

Probability of providing training in representative small and otherwise identical establishments, except for specified characteristic

Characteristic	Any training	Job skills training	Basic skills training
Representative small establishment[1]	67.0	51.5	0.2
Otherwise identical establishment, except for:[2]			
50 percent part time	[66.0]	[50.3]	[.2]
33 percent less than 1 year	69.3	54.4	[.2]
Offers four benefits	74.0	60.9	.3
Uses one workplace practice	77.4	68.1	.4
Union[3]	78.6	[64.4]	[.2]
Industry:[4]			
Mining	52.2	31.6	.9
Construction	52.0	27.6	[.5]
Durable goods manufacturing	42.3	22.3	.9
Nondurable goods manufacturing	42.4	27.9	[.3]
Transportation, communication, and utilities	[58.9]	[45.7]	1.0
Wholesale trade	43.6	30.7	[.4]
Retail trade	54.6	35.4	.7
Finance, insurance, and real estate	[67.6]	[56.2]	1.4

[1] A representative small establishment is in the service industry and has five employees; 12 percent work part time, and 13 percent have less than 1 year of tenure; it has no union, offers three benefits, and uses no alternative work practices. Characteristics of a representative establishment represent medians for each characteristic among establishments in the size class.

[2] Characteristics for comparison represent those of establishments at the 75th percentile for each characteristic.

[3] Less than 25 percent of small and medium-sized establishments have unionized employees. The measurement here represents movement from 0 (no union) to 1 (100 percent unionized).

[4] The service industry is used as the representative industry, as it accounts for the largest proportion of establishments in the sample.

NOTE: Brackets indicate that the stated probability of training is not significantly different (at the 5-percent level) from that of a representative establishment.

The positive relationship between the size of an establishment and the training it offers has also been linked to the fact that large firms tend to have more physical capital, and tend to upgrade their physical capital more often, than small firms do. As a result, large firms may have a greater incentive to train and retrain their workers on how to use their equipment and machinery. This theory relies on the notion that human and physical capital are complementary and that the efficiency of physical capital is enhanced by investment in human capital.

Some sociologists have suggested that large firms train their workers because they have more problems creating cohesive work environments than do smaller firms. The large firms may use formal training to promote uniform activity and "organizational citizenship."[7] Yet another theory supposes that large firms offer more training because they enjoy lower required rates of return on their investments in training because of better access to capital markets.[8]

Proportion of part-time workers. The proportion of workers in an establishment who work part time may have some relationship to the provision of worker training. The payoff to training is less with workers who would use the skills for fewer hours per week. Thus, it is reasonable to expect that, the larger the proportion of employees who work part time, the less likely the employer is to provide training.

Union concentration. There are conflicting theories on the relationship between union concentration and the availability of training in a firm, although most of the theories suggest that firms with unions would be more likely to offer training than would others. Because union jobs pay higher wages than nonunion jobs do, there may be less turnover among union workers. In addition, collective bargaining agreements may require that employers provide training. If firms can rely on lower turnover, they may be more likely to offer training to union workers. Alternatively, because unionized firms generally pay higher wages, they may hire only workers who are already trained, thus lowering their need to provide training.

Unions sometimes conduct their own training, especially in the construction trades, where traditional apprenticeships continue. Employers contribute financial support, but in return expect to hire qualified craftspersons, who may neither require nor receive any additional training. This would reduce the employers' need to train employees.

Results of the logistic regression. Logistic regression, also called *logit analysis*, estimates the probability of a given

event (the dependent variable) as a nonlinear function of a set of independent variables.[9] In the case of training, for any given set of establishment characteristics, logistic regression enables the analyst to assign a probability that the establishment provided formal training.

To determine which variables affect the probability of training, the following establishment characteristics were examined: the size of the establishment,[10] the number of benefits offered (from the list in the survey), the number of high-performance workplace practices adopted (from the list in the survey), the percentage of workers employed at the establishment for less than 1 year, the percentage of employees working part time, the percentage covered by a union, and the establishment's industry group.[11] The analysis examined the effects of these variables on the probability of providing (1) any formal training,[12] (2) formal job skills training, and (3) training in basic skills.[13]

Results of the logistic regressions are shown in tables 9, 10, 11, and 12. Because the effects of the variables differ by size of establishment, results are presented for establishments of different sizes. For ease of presentation, in each size class and for each characteristic, the likelihood of a representative establishment's providing training is compared with that of an establishment that is identical, except for the specified characteristic. A representative establishment is defined as that establishment with the median characteristics of each variable for its size class.[14] For example, if half of small establishments offer more than three benefits and half offer fewer, the representative small establishment would offer exactly three benefits. Note that the representative establishment is assigned to the service industry, as this industry is the largest in each size class.

For each variable, the probability of providing training by the representative establishment was compared with the probability of providing training by an otherwise identical establishment with a value of the variable at the 75th percentile in its size class.[15] For example, the representative small establishment, which uses no alternative workplace practices ("work practices" hereafter), is compared with an otherwise identical establishment with exactly one work practice—the value at the 75th percentile among small establishments. This exercise shows the separate effect of each variable on the provision of training. After the exercise is performed for establishments in each size class, the effect of size on the likelihood of providing training is examined. This is done by comparing the representative medium-sized establishment, with 85 employees, with otherwise identical establishments with 5 and 450 employees, the median numbers in small and large establishments, respectively. The results of these comparisons are shown in table 12.

Number of benefits and work practices. As shown in tables 9 through 11, both the number of benefits and the number of work practices are strong predictors of training. For the provision of any training and job skills training, the effects of benefits and practices are clearest for small establishments, as the representative medium-sized and large establishments are already virtually certain to provide training in both of these categories. For example, a representative small establishment offers three benefits and has a probability of providing any formal training of 67 percent; the probability increases to 74 percent for an establishment with identical characteristics that offers four benefits. (See table 9.) Similarly, if the establishment provides just one workplace prac-

Table 12. Probability of providing training in representative medium-sized and otherwise identical establishments, except for specified characteristic

Characteristic	Any training	Job skills training	Basic skills training
Representative medium-sized establishment[1]	98.7	95.9	4.6
Otherwise identical establishment, except for:[2]			
42 percent part time	[98.7]	[95.6]	[4.0]
35 percent less than 1 year	98.8	[96.0]	[4.5]
Offers six benefits	99.2	97.2	5.7
Uses three workplace practices	99.0	97.1	5.8
Union[3]	99.3	[96.3]	[4.9]
Industry:[4]			
Mining	97.7	[94.9]	9.7
Construction	97.7	[94.0]	[6.6]
Durable goods manufacturing	96.6	[93.4]	11.9
Nondurable goods manufacturing	96.6	92.8	[7.3]
Transportation, communication, and utilities	[98.2]	[97.4]	8.2
Wholesale trade	96.8	[94.0]	[6.5]
Retail trade	97.9	[95.7]	[6.0]
Finance, insurance, and real estate	[98.8]	[97.7]	15.4

[1] A representative medium-sized establishment is in the service industry and has 85 employees; 10 percent work part time, and 20 percent have less than 1 year of tenure; it has no union, offers five benefits, and uses two alternative work practices. Characteristics of a representative establishment represent medians for each characteristic among establishments in the size class.

[2] Characteristics for comparison represent those of establishments at the 75th percentile for each characteristic.

[3] Less than 25 percent of small and medium-sized establishments have unionized employees. The measurement here represents movement from 0 (no union) to 1 (100 percent unionized).

[4] The service industry is used as the representative industry, as it accounts for the largest proportion of establishments in the sample.

NOTE: Brackets indicate that the stated probability of training is not significantly different (at the 5-percent level) from that of a representative establishment.

tice, instead of the median zero, the probability of providing job skills training jumps from 52 percent to 68 percent.

For basic skills training, on the other hand, the effect is clearest for medium-sized and large establishments, as the representative small establishment is virtually certain not to offer such training. (See tables 10 and 11.) The likelihood of providing basic skills training for a representative large establishment is 15 percent; the probability increases to 22 percent if the establishment uses four work practices rather than the median two.

The strong association between work practices and the provision of formal training supports the idea that "high-performance" workplaces—those that use many of the practices listed in the survey—are more likely to provide training.[16] And the strong association between the provision of benefits and that of training supports the idea that the establishment of a long-term commitment between the firm and the employee, as manifested in the benefits, increases employers' incentives to train workers.

Table 11. Probability of providing training in representative large and otherwise identical establishments, except for specified characteristic

Characteristic	Any training	Job skills training	Basic skills training
Representative large establishment[1]	99.7	98.6	15.2
Otherwise identical establishment, except for:[2]			
22 percent part time	[99.7]	[98.5]	13.5
39 percent less than 1 year	99.8	[98.7]	[13.9]
Offers seven benefits	99.8	99.2	17.4
Uses four workplace practices	99.8	99.3	22.0
Union[3]	99.9	[98.4]	[15.3]
Industry:[4]			
Mining	99.5	[98.8]	[20.4]
Construction	99.5	[98.6]	[16.0]
Durable goods manufacturing	99.3	[98.6]	26.8
Nondurable goods manufacturing	99.3	[98.1]	22.9
Transportation, communication, and utilities	[99.6]	99.4	[15.3]
Wholesale trade	99.3	[98.5]	[16.5]
Retail trade	99.6	[99.0]	[11.2]
Finance, insurance, and real estate	[99.8]	[99.4]	31.7

[1] A representative large establishment is in the service industry and has 450 employees; 3 percent work part time, and 13 percent have less than 1 year of tenure; it has no union, offers six benefits, and uses two alternative work practices. Characteristics of a representative establishment represent medians for each characteristic among establishments in the size class.

[2] Characteristics for comparison represent those of establishments at the 75th percentile for each characteristic.

[3] Less than 25 percent of small and medium-sized establishments have unionized employees. The measurement here represents movement from 0 (no union) to 1 (100 percent unionized).

[4] The service industry is used as the representative industry, as it accounts for the largest proportion of establishments in the sample.

NOTE: Brackets indicate that the stated probability of training is not significantly different (at the 5-percent level) from that of a representative establishment.

Establishment size. Establishment size by itself also has a large effect on the provision of training. As shown in table 12, among establishments with the characteristics of the representative medium-sized establishment (except size), an establishment with 450 employees is virtually certain to provide some formal training (99.6 percent), while an establishment with 5 employees is less likely to do so (91.5 percent). Essentially the same pattern holds for formal job skills training. The probability of providing basic skills training also increases with size; an establishment with 5 employees has a negligible probability of providing basic skills training (0.9 percent), while an establishment with 450 employees has close to a 1 in 8 likelihood of doing so.

A comparison of table 12 with table 1 shows that the effect of size by itself on the probability of offering any formal training, or of offering job skills training, is substantially smaller than a cross-tabulation of establishment size with the provision of formal training (and job skills training) would suggest. Larger establishments are likely to provide more benefits and adopt more work practices than are smaller establishments, as is shown in the composition of the representative establishments in tables 9 through 11. Thus, much of the difference between large and small establishments in the provision of training is accounted for by differences in the provision of benefits and the adoption of work practices.

Other variables. The other variables discussed at the beginning of this section all have less consistent effects on the probability of providing formal training. Unionized establishments were more likely to offer some formal training than were nonunionized establishments. Results not shown in this article indicate that the presence of a union has a substantial effect on apprenticeship training: while the representative small, medium-sized, and large firms have probabilities of offering apprenticeship training of 14 percent, 40 percent, and 41 percent, respectively, otherwise identical unionized establishments have probabilities of 33 percent, 58 percent, and 54 percent. Small unionized establishments also appear more likely to offer job skills training than does the representative small establishment, which is not unionized. The probability of training increases from 52 percent to 64 percent if the work force is completely unionized; however, the difference is not statistically significant at the 5-

Table 12. **Probability of providing training in establishments with characteristics of a representative medium-sized establishment, except for number of employees**

Number of employees	Any training	Job skills training	Basic skills training
5	91.5	88.6	0.9
85	98.7	95.9	4.6
450	99.6	97.9	11.9

NOTE: A representative medium-sized establishment is in the service industry and has 85 employees; 10 percent work part time, and 20 percent have less than 1 year of tenure; it has no union, offers five benefits, and uses two alternative work practices. Characteristics of a representative establishment represent medians for each characteristic among establishments in the size class.

percent level. Unionization does not have a statistically significant impact on the provision of job skills training in medium-sized and large firms.

The effect of the percentage of employees who work part time is small and statistically insignificant in almost all cases. The effect of the percentage of employees who have worked at the establishment less than 1 year is also small, possibly reflecting the opposite effects of the need to train those with short current tenure and the disincentive to train those with short expected tenure.

In addition to the variables suggested by theory, the effect of industry on the provision of formal training was examined. Even holding other characteristics constant, formal training varies substantially by industry. One of the few patterns that hold across types of training is that the finance, insurance, and real estate industry is the industry most likely to provide both job skills training and basic skills training to employees.

Otherwise, the pattern varies by type of training provided and by size of establishment. For example, the representative small establishment in the service industry is more likely than otherwise identical establishments in most other industries to provide job skills training, but less likely to provide basic skills training. Similarly, among nondurable goods manufacturers, those with the characteristics of the representative small establishment are among the least likely to provide basic skills training, while the larger nondurable goods manufacturers are among the most likely.

A focus on benefits and work practices. To obtain the preceding results, the effects of benefits and work practices were analyzed by estimating the effect of the number of benefits and of the number of work practices on the probability of formal training. This logistic regression specification assumed that the effect of each benefit (or each work practice) was the same, regardless of the type of benefit (or practice); that is, only the number of benefits (or practices) mattered.

The rest of this section takes another point of view: logit models are estimated with variables indicating the presence or absence of *each specific benefit or practice*. As before, representative establishments are constructed in each size class. If a benefit or practice is used in more than half of the establishments in a size class, it is assigned to the representative establishment; otherwise it is not assigned to the representative establishment.[17] The effect of adding the omitted benefit or practice to the probability of formal training is then calculated. Results are shown in table 13.

To see whether there are any differences among the effects of different benefits (or practices) on the probability of training, the hypothesis that all benefits (or practices) have the same effect on training was tested. Different tests were conducted for small, medium-sized, and large establishments for job skills training and basic skills training. A single test was conducted for all size classes for "any training."[18]

The tests show that there are differences in the effects of different benefits on the probability of providing training. Tests of the hypothesis that all benefits have the same effect on the probability of offering training were rejected at the 5-percent level in all cases, except for basic skills training provided by large establishments. As shown in table 13, the benefits that appear to have the largest effect are employee assistance plans and employee wellness plans—that is, benefits that are closely related to a long-term, implicit contract between the worker and the firm. The existence of an employee assistance program would appear to imply that the establishment seeks to retain employees and assist them with difficulties, rather than replace them with new employees; employee wellness programs would seem to imply an interest in the health of the employee, again with an eye toward a long-term commitment. For small establishments, the presence of pensions also was a strong predictor of the provision of training. (Small establishments were the only size class of establishments in which pensions were not offered by the majority of establishments.) Flexible work schedules would appear to have little relation to a long-term commitment and have a small impact on training. On the other hand, the provision of child care, contrary to the earlier argument that it might help to reduce turnover, is estimated in many cases to have a small or even negative effect on the probability of offering formal training.

The situation is less clear for alternative work practices. Table 13 does not indicate that any particular alternative work practice has a larger effect than other work practices on the likelihood of providing different types of formal training. The hypothesis that all work practices have the same effect on training is rejected only for job skills training provided by small establishments. The apparently homogenous

Table 13. Probability of providing training in representative small, medium-sized, large, and otherwise identical establishments, except that they provide specified benefits or practices

Characteristic	Representative small establishment			Representative medium-sized establishment			Representative large establishment		
	Any training	Job skills training	Basic skills training	Any training	Job skills training	Basic skills training	Any training	Job skills training	Basic skills training
Representative establishment[1]	64.2	48.1	0.2	95.9	85.2	1.9	99.9	99.2	19.8
Establishments that offer the same benefits[2] as representative establishments, but also provide:									
Paid vacation	—	—	—	—	—	—	—	—	—
Flexible work schedules	[67.0]	53.5	.3	[96.4]	[85.7]	2.7	[99.9]	[99.1]	[22.0]
Paid sick leave	[67.3]	[54.0]	[.2]	—	—	—	—	—	—
Employer-financed child care	[63.3]	[58.8]	[.1]	[95.8]	[84.8]	[1.6]	[99.9]	[98.9]	[20.4]
Paid parental or family leave	[71.2]	[49.0]	[.2]	[97.0]	[89.6]	[2.3]	[99.9]	[99.6]	[23.1]
Health care benefits	—	—	—	—	—	—	—	—	—
Employee assistance programs	82.6	77.0	.5	98.4	94.4	3.0	—	—	—
Pension plans	74.5	60.6	[.2]	—	—	—	—	—	—
Employee wellness programs	82.1	66.7	[.3]	98.4	91.2	3.0	—	—	—
Profit sharing	71.2	[53.9]	.1	97.0	89.2	[1.4]	99.9	[99.5]	[18.9]
Establishments that use the same practices[2] as representative establishments, but also use:									
Just-in-time inventories	[61.9]	[49.3]	[.2]	[95.5]	[86.5]	[2.2]	[99.9]	[99.3]	[23.2]
Worker teams	[69.4]	56.5	.4	[96.7]	89.6	3.5	—	—	—
Total quality management	73.8	62.6	[.2]	97.4	91.2	[2.1]	—	—	—
Quality circles	[69.1]	32.4	[.1]	[96.7]	[91.0]	[1.7]	[99.9]	99.8	[21.4]
Peer review of employee performance	[71.5]	62.6	[.2]	[97.0]	[87.3]	[2.3]	[99.9]	[99.1]	[23.8]
"Pay for knowledge" system	77.0	62.2	[.2]	97.8	[90.0]	[2.1]	99.9	[99.4]	[21.9]
Employee involvement in technology- and equipment-purchasing decisions	74.0	63.9	[.2]	97.4	92.7	[1.9]	99.9	99.7	[21.4]
Job rotation	74.0	[52.6]	[.2]	97.4	91.8	[2.4]	99.9	99.7	27.1

[1] Representative establishments are those with medians for each characteristic among establishments in each size class.

[2] Benefits and practices excluded from each analysis are those provided by more than half of establishments in the size class.

NOTE: Dashes indicate benefits and work practices adopted by the representative establishment. Brackets indicate that the stated probability of training is not significantly different (at the 5-percent level) from that of a representative establishment.

impact of alternative work practices is consistent with the viewpoint that any of these practices requires a commitment to training for its successful adoption. In addition, the literature on so-called high-performance workplaces tends to favor the view that the successful transformation of a workplace is less a matter of which practices are adopted and more a matter of employing a significant number of practices at the same time.

Conclusion

The 1993 Survey of Employer Provided Training helps to close part of the gap that exists in our knowledge of the formal training that establishments provide employees. While measures of the intensity of formal training were not captured by this survey, nationally representative estimates of the proportion of establishments that offer formal training are a significant advance in our base of information.

One conclusion that may be drawn from the results of the survey is that establishments rely heavily on both formal and informal methods of providing training to their employees. The finding that the provision of formal training increases significantly with the size of the establishment does not necessarily mean that the smaller employers are not providing training. Rather, they may be relying on more informal, on-the-job methods of teaching employees job skills or offering other types of training. Indeed, a reliance upon on-the-job training was one of the principal reasons cited by establishments that did not provide formal job skills training. Firms that provide formal training (of any kind) may also rely upon on-the-job methods. Thus, one of the challenges of the 1995 Survey of Employer Provided Training is to estimate both

the total amount of time and the proportions of time devoted to formal and on-the-job training of employees.

A telling result of the survey is that larger firms are much more likely to provide formal training of any type than are smaller firms. This result shows up quite clearly in many of the cross tabulations and is also confirmed by the results of the logistic regressions, which control for the influence of variables other than size.

Another significant finding is that the provision of employer benefits increases a firm's likelihood of offering formal training of all types. Not all benefits have the same impact: some, such as the provision of child care, have a small effect, while others, such as employee assistance plans and employee wellness plans, have a much greater impact. These findings are broadly consistent with the view that establishments which try to promote long-term relationships with their employees and to reduce the rate of worker turnover are also more likely to provide formal training.

In addition to offering benefits, establishments that employ various workplace practices are more likely to provide formal training of all types. This finding is quite reasonable, given the fact that the workplace practices examined in the survey tend to require a commitment on the part of establishments to train the workers in each particular practice. Finally, because larger establishments also have more benefits and more work practices, on average, than do smaller establishments, the considerable difference in the probability of providing formal training between large and small establishments is partially accounted for by differences in their benefits and work practices. □

Footnotes

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[1] Data from the survey indicate that 19 percent of large establishments had 50 percent or more of their employees covered by a collective bargaining agreement, compared with 3 percent of small and 12 percent of medium-sized establishments. (The percentages refer to population-weighted data.)

[2] Because of the small number of medium-sized and large establishments that did not provide formal job skills training, these two categories were combined for the construction of estimates relating to this type of training.

[3] Edward Lawler, "Adoption of Employee Involvement Practices," chapter 1 in Edward Lawler, Gerald Ledford, and Susan Mohrman, *Employee Involvement and Total Quality Management: Practice and Results in Fortune 1000 Companies* (San Francisco, Jossey-Bass, 1992).

[4] Lawler, "Employee Involvement Practices."

[5] John M. Barron, Dan A. Black, and Mark A. Lowenstein, "Employer Size: The Implications for Search, Training, Capital Investment, Starting Wages and Wage Growth, " *Journal of Labor Economics*, vol. 5, no. 1, pp. 76–89.

[6] Alphonse G. Holtmann and Todd L. Idson, "Employer Size and On-the-Job Training Decisions," *Southern Economic Journal*, Oct. 1991, pp. 33–55.

[7] W. Richard Scott and John W. Meyer, "The Risk of Training Programs in Firms and Agencies: An Institutional Perspective," *Research in Organizational Behavior*, vol. 13, pp. 297–326.

[8] Barron, Black, and Lowenstein, "Employer Size."

[9] For an introduction to logit analysis, see Damodar N. Gujarati, *Basic Econometrics* (New York, McGraw-Hill, 1988), pp. 481–91.

[10] We use ln (number of employees + 1) as our measure of size. By using the logarithm of the size of the establishment, we measure the effect on the probability of training of a 1-percent change in the size of the establishment. The logarithm specification fits the data better than the untransformed size of the establishment does. We add 1 to the number of employees before taking the logarithm in order to incorporate establishments that report zero employees. The sample includes a few establishments that reported zero employees at the time of the survey in 1994, compared with a nonzero employment in 1993, the reference period for determining whether training was provided.

[11] To allow for the effects of benefits or practices to increase or decrease as additional benefits or practices are provided, variables equal to the square of the number of benefits and practices at the establishment were also included.

[12] We also examined the provision of any "nonorientation" training, where orientation training and training classified as "other" training by the respondent were excluded. The results were similar to those obtained for the provision of any formal training.

[13] The effect of any of the variables examined may differ as a function of the size of the establishment. To test this possibility, the fits of two different specifications were compared, one including a set of interaction variables constructed by multiplying the logarithm of the size of the establishment by the other variables and the other not including these interactions. Then, a goodness-of-fit test was used. (This test is described in David W. Hosmer, Jr., and Stanley Lemeshow, *Applied Logistic Regression* (New York, Wiley, 1989).) The test involved dividing the sample into 10 equal-sized groups on the basis of the predicted probability of training and then comparing proportions of the sample with predictions from the model. The p-values for the goodness-of-fit test of the hypothesis that the model without interactions is the correct specification were 0.45 for any training, 0.08 for job skills training, and 0.01 for basic skills training. With the interactions, the p-values were 0.65 for any training, 0.24 for job skills training, and 0.14 for basic skills training. Accordingly, no interactions were included in the regression specification for "any formal training" because the fit without the interactions was already quite good. On the other hand, interactions with the logarithm of the establishment size were used in estimating the probability of job skills training and basic skills training.

[14] Weighted data are used in calculating the medians and other percentiles, so the latter represent estimated population percentiles rather than sample percentiles.

[15] The variable "percentage covered by a union" is an exception. Less than 25 percent of small and medium sized establishments have unionized employees. In establishments that have unionized employees, typically, nearly all are covered by a union. Accordingly, in all size classes, the representative establishment with no union is compared with an otherwise identical establishment that is 100 percent unionized.

[16] For a discussion of "high-performance" workplaces, see Jeffrey Kling, "High performance work systems and firm performance," this issue.

[17] The benefit "flexible work schedule" is omitted from the representative medium-sized establishment for consistency with the small and large establishments, even though the survey estimates that 50.6 percent of medium-sized establishments have flexible work schedules.

[18] The specification for "any training" does not allow for the identification of the effects of benefits or practices by establishment size. (See footnote 13.)