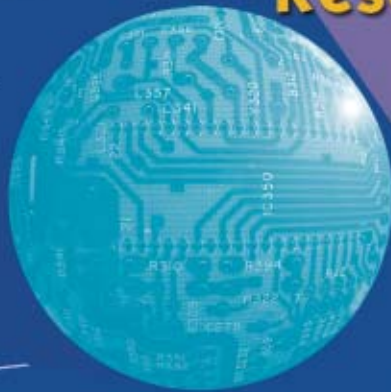


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# Employer and Employee Perspectives on Human Resource Practices

The Evolving Workplace Series



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*The Evolving Workplace Series*

## **Employer and Employee Perspectives on Human Resource Practices**

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Development Canada

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## FOREWORD

This document provides data from the new Workplace and Employee Survey (WES) conducted by Statistics Canada with the support of Human Resources Development Canada. The survey consists of two components: (1) a workplace survey on the adoption of technologies, organizational change, training and other human resource practices, business strategies, and labour turnover in workplaces; and (2) a survey of employees within these same workplaces covering wages, hours of work, job type, human capital, use of technologies and training. The result is a rich new source of linked information on workplaces and their employees.

### **Why have a linked workplace and employee survey?**

Advanced economies are constantly evolving. There is a general sense that the pace of change has accelerated in recent years, and that we are moving in new directions. This evolution is captured in phrases such as “the knowledge-based economy” or “the learning organization”. Central to these notions is the role of technology, particularly information technology. The implementation of these technologies is thought to have substantial impact on both firms and their workers. Likely related to these technological and environmental changes, many firms have undertaken significant organizational changes and have implemented new human resource practices. Globalization and increasing international competition also contribute to the sense of change.

In this environment, greater attention is being paid to the management and development of human resources within firms. Education and training are increasingly seen as an important investment for improved prosperity—both for firms and individual workers.

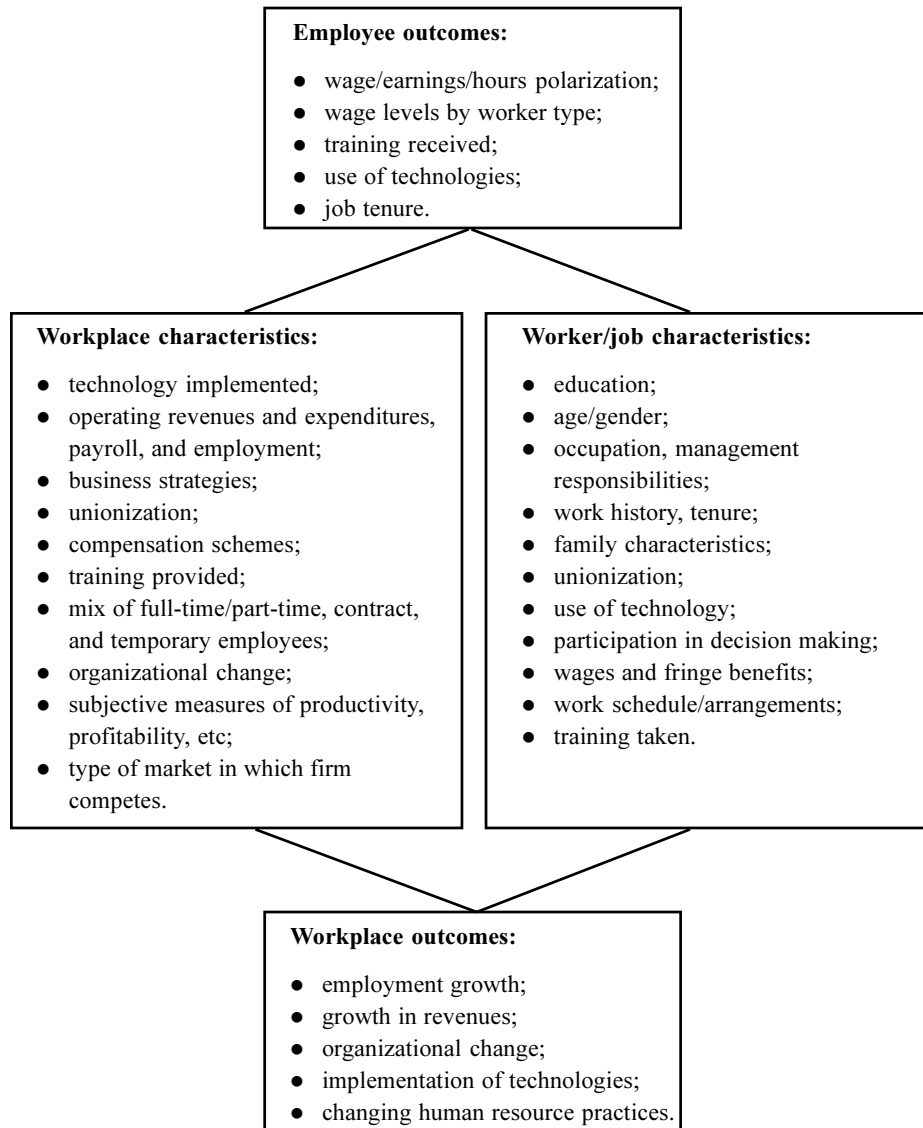
Thanks to earlier surveys, researchers have a good understanding of workers' outcomes regarding wages and wage inequality, job stability and layoffs, training, job creation, and unemployment. What is missing on the employees' side is the ability to link these changes to events taking place in firms. Such a connection is necessary if we hope to understand the association between labour market changes and pressures stemming from global competition, technological change, and the drive to improve human capital. Thus, one primary goal of WES is to establish a link between events occurring in workplaces and the outcomes for workers. The advantage of a linked survey is depicted in the figure which displays the main content blocks in the two surveys.

The second goal of the survey is to develop a better understanding of what is indeed occurring in companies in an era of substantial change. Just how many companies have implemented new information technologies? On what scale? What kind of training is associated with these events? What type of organizational change is occurring in firms? These are the kinds of issues addressed in the WES.

This report aims to give those interested in human resource practices some useful insights from the initial survey, as well as stimulating their interest in the possibilities provided by these new data.



**Link between the workplace survey content, employee survey content, and outcomes**



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# 1 INTRODUCTION

The workplace is the focal point for change on the economic, organizational and technological fronts. As Betcherman, Leckie, McMullen and Caron (1994) argue, using data from the 1993 Human Resource Practices Survey (HRPS), the nature of work is evolving as the result of globalization, increased competition, the development of new technologies and other changes in the business environment. In the face of these trends, businesses are adopting new technologies and ways of organizing work to attain efficiency and productivity gains (Leckie 1994; Neumark and Cappelli 1999; Black and Lynch 2000). These changes, though, have both positive and negative impacts on the working lives of Canadians. On the one hand, they are likely improving jobs for many, providing workers with new marketable skills, more control over their work, and higher incomes; on the other hand, these changes may be rendering some workers' skills obsolete, possibly contributing to the loss of their jobs (McMullen 1997; Osterman 2000).

To date, the discussion of change in the workplace and what it means to Canadian employers and their employees is lacking in one vital respect—comprehensive empirical evidence. Data are needed to test what works in the workplace. For this reason, Human Resources Development Canada (HRDC) and Statistics Canada jointly developed the Workplace and Employee Survey (WES) to cover both employers and their employees on a wide range of issues related to the changing workplace environment. WES may not be the first survey on workplace issues, but it is the

most comprehensive. It builds on earlier work, such as the HRPS and the Workplace Training Survey (WTS), in several ways:

- WES surveys firms in all industries, with the exception of agriculture, fishing, fur trapping and public administration; the HRPS covered four industry groups to represent the range of industries in the Canadian economy.
- WES covers all firms with employees; the HRPS selected firms with 40 or more employees.
- WES examines (like HRPS) a range of workplace issues such as training, technology use, work arrangements, and organizational change; the WTS collected training data only.
- WES links employees to their workplace (the 1999 WES linked 24,600 employees to nearly 6,400 work locations); while the WTS linked employees to their workplace, it covered only 18 firms and 400 employees.
- WES follows all sampled establishments for a minimum of four years and employees for two years; the 1995 WTS establishment survey followed up with only 40% of the sample that was contacted in 1993.

The WES dataset is the most extensive to date for researching workplace issues such as globalization, increased competition, the development of new technologies and other changes in the business environment.

Evidence from the 1999 round of WES shows that almost half of Canadian business locations introduced a product or process innovation, 29% adopted some form of new technology, and over 40% implemented an organizational change, primarily by re-engineering the work processes or by downsizing. Technological and organizational advances are

widespread, taking place in firms of all sizes and across a variety of industries—though to varying degrees. Larger businesses are the most likely to introduce these changes; those of fewer than 20 employees are much less likely to do so (Table 1.1). With respect to industry, the incidence of technological and organizational change is greatest in finance and insurance and lowest in the retail trade and consumer services, construction industries, real estate operations, and education, health care and social assistance services.

Human resource management policies—such as workplace training, variable pay and employee involvement—have an important role to play in facilitating change. New technology breeds new skill requirements; workplace training provides employees with the necessary skills. Firms need to be able to adapt to changing markets; job rotation, flexible job design and work teams give firms the necessary flexibility in their production process. Employees need incentives to participate in training and other employee involvement programs. Variable compensation methods (for example individual and group incentives, profit sharing, merit-or skill-based pay) provide this incentive by tying pay to performance. These practices aim to produce a skilled and motivated work force, who are able to adapt to and take advantage of organizational and technological change. Firms are using human resource management practices as a strategic tool to achieve business objectives such as cost reduction and product development (Schuler and Anthony 1987; Arthur 1992).

WES results show that close to three-quarters of Canadian businesses report human resource management as an important aspect of their overall business strategy (Table 1.2). It is common to see businesses focussing on human resources in combination with business strategies aimed at product development and cost reduction. In 1999, 86% of businesses working

**Table 1.1**

**The changing workplace environment: Establishments introducing different types of change, by size and industry, 1998-1999**

Establishment characteristics	Type of change		
	Product or process innovation introduced	Organizational change <sup>1</sup> implemented	Technology adopted
	% of establishments		
<b>Total</b>	48.1	42.2	28.8
<b>Size (no. of employees)</b>			
Fewer than 20	45.2	38.6	26.1
20 to 99	67.1	63.7	44.9
100 to 499	67.0	77.4	55.1
500 or more	76.1	87.9	54.8
<b>Industry sector</b>			
Forestry, mining, oil and gas extraction	31.9	40.1	26.9
Manufacturing: labour intensive tertiary	60.9	56.7	30.7
Manufacturing: primary product	54.8	54.1	34.3
Manufacturing: secondary product	55.4	48.1	31.6
Manufacturing: capital intensive tertiary	71.9	56.8	44.0
Construction	38.8	31.6	22.3
Transportation, warehousing, wholesale trade	48.8	38.3	37.2
Communication and other utilities	43.5	44.0	29.8
Retail trade and consumer services	51.9	42.2	21.4
Finance and insurance	62.2	57.6	48.0
Real estate, rental and leasing operations	30.3	36.9	23.4
Business services	45.4	47.6	40.2
Education and health services	38.6	35.3	23.7
Information and cultural industries	60.4	48.1	39.5

Source: Workplace component of WES, 1999.

<sup>1</sup> Organizational change includes the following: integrating different functional areas; modifying the degree of centralization; downsizing; relying more on temporary and/or part-time workers; re-engineering; increasing overtime hours; adopting flexible working hours; reducing the number of managerial levels; relying more on job rotation and/or multi-skilling; implementing Total Quality Management; outsourcing; collaborating more on interfirm R&D, production or marketing.

**Table 1.2**  
**The importance of various business strategies, 1998-1999**

Business strategy	Focus	Also focussing on human resources
% of establishments		
Improving human resources management	72.3	n.a.
Improving quality	60.0	86.0
Reducing cost	56.8	80.4
Developing product	40.3	73.0

*Source:* Workplace component of WES, 1999.

to improve existing products and/or to develop new ones also rated human resource management strategies as integral to their business plan. Similarly, 80% of those pursuing cost-reduction strategies saw human resource management strategies as an important part of their plan.

Some of the preceding material sets out ideas on organizing the workplace. With WES, researchers have an excellent opportunity to test these and other hypotheses regarding the workplace. This report, a first look at the WES data, focusses on workplace training, variable pay and employee involvement. The next three chapters contain a discussion of WES results on these practices, their association with change, where we see them implemented, and whom they impact. A final chapter draws conclusions and suggests further research questions.

It is important to note that the purpose of this report, a descriptive analysis of one year's data, is to provide an overview of partial results from WES. Practices are associated with measures of change and outcomes to suggest possible effects of these practices—however outcomes over time have not been observed, nor have we controlled for the influence of other factors. Only with the benefit of longitudinal data and multivariate methods will we be able to make more conclusive statements about the incremental impacts of human resource practices.

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## 2 TRAINING PRACTICES

The decision to train arises for a number of reasons. Based on evidence from the WTS and a series of case studies, Betcherman, Leckie and McMullen (1997) conclude that much of the workplace training occurring in Canada is of an event-triggered or episodic nature. Factors such as organizational and technological change increase the demand for high-skilled workers (McMullen 1997; Bresnahan, Brynjolfsson and Hitt 1999); this in turn increases the need for workplace training. As the demand for skills rises, the supply of workers must react accordingly.

The skills and abilities of working Canadians are increasing. During the 1990s, there was a 47% increase in the employment of university graduates, compared with a mere 2% increase for those with only a high school education (Statistics Canada 2000). Though formal education provides the foundation for human capital, workers must also continuously keep those skills current in the face of pervasive technological and organizational change and product innovation. When introducing change, employers must also provide for the upgrading of their workers' skills to facilitate adjustment to the new environment. The focus of the current chapter is the means by which both workers and employers are meeting these skill demands.

This chapter presents empirical evidence from WES on the skill adjustment process as measured by classroom and on-the-job workplace

training.<sup>1</sup> First, results are shown for employer-sponsored workplace training according to the establishment's need for training. Then, data on employee participation in workplace training according to establishment, employee and job characteristics are examined to observe how receipt of training varies according to the implied needs of the employer and the employee's level of human capital. Finally, we present indirect evidence from Betcherman and Leckie (1998) and Lynch and Black (1995) to corroborate the benefits of training for both employees and employers.

### **Why train?**

Training is a significant workplace activity—57% of Canadian establishments reported sponsoring classroom and/or on-the-job training for their employees in 1998-1999, and over half of workers reported taking training over that period (Table 2.1).

Earlier surveys indicated that firms used training to help employees adjust to new skill requirements that arose when the firm reacted to competitive forces. WES offers evidence that firms support employee training when there is change in the workplace (Table 2.1). Overall, there is a minimum 20 percentage point difference in the employer sponsorship rate between firms implementing change and those that do not. However, a different picture emerges when the data is split by firm size. Small firms making changes in their operations are about 50% more likely to provide training to their workers than like-sized firms not making changes. Larger firms, however, show a much smaller increase in employer-supported training under the specified circumstances since most are already providing

---

<sup>1</sup> Questions on the two components were asked in somewhat different ways. The major difference concerns 'on-the-job' training. On the employee questionnaire, it appears that on-the-job training includes postsecondary courses, whereas the employer questionnaire excludes these courses.

**Table 2.1**

**Rates of training sponsorship and employee participation, by establishment size, 1998-1999**

	Employer sponsorship rate			Employee participation rate		
	All establishments	Fewer than 20 employees	20 or more employees	All establishments	Fewer than 20 employees	20 or more employees
	%					
<b>Overall</b>	<b>56.5</b>	<b>51.1</b>	<b>92.5</b>	<b>54.6</b>	<b>44.5</b>	<b>59.4</b>
<b>Job rotation/ Multi-skilling organizational change</b>						
Not implemented	52.2	47.2	90.8	53.3	43.1	58.9
Implemented	80.3	75.6	97.7	58.2	50.5	60.4
<b>Organizational change</b>						
None introduced	42.3	38.5	87.0	45.3	37.5	53.2
At least one introduced	76.0	71.0	95.3	59.3	52.2	61.4
<b>Technological change</b>						
None introduced	50.6	46.5	88.6	51.4	42.1	57.9
Computer-based or other technology introduced	71.0	64.1	97.0	58.4	50.0	60.7
<b>Innovation</b>						
None introduced	44.6	40.7	87.4	49.0	39.2	56.0
Goods/services or processes introduced/improved	69.3	63.6	95.0	57.7	49.1	60.9
<b>Human resources management business strategy (level of importance)</b>						
No/slight importance	22.4	20.7	79.3	36.9	32.2*	43.9
Low importance	50.0	46.1	85.0	47.9	40.2	54.4
Medium importance	68.5	63.6	94.0	55.8	48.3	59.0
High importance	77.2	71.5	97.2	60.8	49.8	63.7

Source: Workplace and employee components of WES, 1999.

\* Indicates that the Coefficient of Variation (CV), a measure of data reliability, is greater than 16% and less than 35%. The reliability of the estimate declines as the CV increases.

training to their employees on an ongoing basis. And while virtually all large firms support workplace change with training, about one-quarter of small firms do not sponsor training when they implement workplace change. Either the change implemented in small firms does not require training, or the firm adjusts its skill mix by hiring new workers with the necessary skills.

In addition to showing that firms provide training in response to need, the WTS also noted that firms train for reasons that are not so apparent. Training can be an ongoing activity that employers use to promote employee movement within the firm, to improve firm performance through upgrading employees' existing skills, or to instill a 'learning culture' within the organization. WES results point to the same conclusion as a large share of firms provides training to employees when there is no change.

When employers introduce change, they tend to increase the amount of training offered in their firm. Thus, it is only natural to expect that employees are more likely to participate in training when the firm makes organizational and/or technological changes or introduces product/process innovations. Under these circumstances, how many employees benefit from training? The results show that not everyone does: employee participation increases because of the firm's actions, but only moderately. This is expected when the change is restricted to specific areas of the firm and so does not necessitate all employees receiving training. It is also not unexpected to observe significant employee participation rates for firms where change did not take place, given the earlier result that employers sponsor training for more reasons than coping with change. About 40% of employees report taking professional and/or computer software training. This training may help the employees deal with change in the firm; alternatively, it may serve to improve their performance.

As we have noted, the training gap between large and small firms narrows when comparing employer sponsorship and training participation by firm size. When change is present in the workplace, a minimum 20-point difference exists in the employer training sponsorship rate between small and large firms. However, this difference is cut in half when comparing the employee participation rates. Relatively more employees may be affected by and need help to adjust to change in small firms than in large ones.

### **Where training is taking place**

Employer and employee training rates by selected characteristics of establishments are shown in Table 2.2. Not surprisingly, training incidence rises with establishment size, as larger establishments typically have more resources to undertake such activities than do smaller enterprises. The smaller firms do not support classroom training to the same extent as the larger firms; however, small firms are equal to large firms in supporting on-the-job training. Although employee participation in the smaller firms is evenly split between on-the-job training and classroom training, only 5% of employees of the smallest firms take both classroom and on-the-job training. Small firms may be using on-the-job training as a substitute for expensive classroom training. Alternatively, small firms may be hiring those workers with the required classroom training and supplementing it with on-the-job training as needed. The greater resources of larger firms are evident in their preference for classroom training. Nevertheless, a significant proportion of their employees takes both forms of training—15% of employees in the largest firms take classroom and on-the-job training. This points to the complementary nature of on-the-job training and classroom training. For example, computer software training may initially

**Table 2.2**

**Establishments sponsoring training and employee participation rate, by size and industry, 1998-1999**

Establishment characteristics	Employer sponsorship rate— Workplace reported	Employee participation rate— employee reported		
		Class-room	On-the-job	All training <sup>1</sup>
		%		
<b>Overall</b>	<b>56.5</b>	<b>36.6</b>	<b>30.3</b>	<b>54.6</b>
<b>Size (no. of employees)</b>				
Fewer than 20	51.1	25.7	25.3	44.5
20 to 99	91.7	33.2	32.2	53.3
100 to 499	97.7	45.5	30.9	61.6
500 or more	99.8	51.6	34.8	66.7
<b>Industry sector</b>				
Forestry, mining, oil and gas extraction	52.3	42.5	29.2	59.8
Manufacturing: labour intensive tertiary	60.5	23.8	23.5	39.4
Manufacturing: primary product	67.9	35.3	29.0	51.5
Manufacturing: secondary product	56.5	36.1	32.4	54.4
Manufacturing: capital intensive tertiary	65.3	42.4	36.7	61.7
Construction	44.6	29.4	27.7	46.4
Transportation, warehousing, wholesale trade	57.8	40.9	27.6	55.7
Communication and other utilities	65.4	51.9	30.9	65.0
Retail trade and consumer services	54.6	21.6	29.6	45.7
Finance and insurance	82.1	56.5	43.7	71.7
Real estate, rental and leasing operations	42.0	33.9	19.8	47.5
Business services	54.8	42.6	27.9	58.0
Education and health services	57.8	44.6	31.0	60.7
Information & cultural industries	64.4	40.6	32.5	58.7

Source: Workplace and employee components of WES, 1999.

<sup>1</sup> The All training category counts employees once even though they may have taken classroom training and on-the-job training.

take place in the classroom, but training for subsequent software upgrades is done on-the-job.

Table 2.2 indicates that training tends to be more common in sectors considered to be high-tech, a concept associated with skill upgrading. Establishments in finance and insurance, which are undergoing considerable technological change, exhibit the highest workplace training sponsorship rate (82%). At the same time, less than 50% of establishments in real estate, rental and leasing operations and construction, where technological change has not been extensive, sponsor workplace training (about 42% and 45%, respectively). The patterns by industry for employee training participation rates are similar to those observed for employer sponsorship rates. Again, the size effect discussed in the preceding paragraph appears in the employee participation rates by industry. More than one-quarter of employees in the finance and insurance industries receive both classroom and on-the-job training, whereas in the retail trade and consumer services industries only 2% of employees receive both forms of training.

Some other patterns of interest include the following:

- **Turnover:** The results show a very low training rate (31%) among establishments with zero turnover over the last year, a very high training rate (77% ) among employers with low to medium turnover, and a somewhat lower training rate (68%) for establishments with a relatively high turnover rate.
- **Hiring practices:** WES results indicate that, generally, the training rate of establishments that recruited from outside the workplace to fill vacancies differed little from that of establishments that recruit from within. The only exception is vacancies in professional positions, for which the training rate is much higher for

**Table 2.3****Employee participation rate in employer-sponsored training, by employee characteristics, 1998-1999**

Employee characteristics	Employee participation rate	Classroom training rate	On-the-job training rate
		%	
<b>All employees</b>	<b>54.6</b>	<b>36.6</b>	<b>30.3</b>
<b>Sex</b>			
Male	53.1	36.3	31.6
Female	56.0	36.8	28.8
<b>Age (years)</b>			
15 to 24	54.8	22.7	40.5
25 to 34	57.5	39.3	31.4
35 to 44	57.3	40.1	31.7
45 to 54	53.6	37.9	28.1
55 and over	40.6	30.6	16.8
<b>Education level (highest attained)</b>			
Not completed high school	39.7	20.3	23.7
High school diploma (including some PSE)	47.0	27.8	29.1
Trade/vocational diploma	49.5	34.3	24.4
College diploma	58.3	38.3	32.3
University degree	64.2	48.6	33.9
<b>Occupation</b>			
Manager	61.0	44.0	30.3
Professional	68.3	54.2	35.6
Technical/Trades	50.9	34.1	27.2
Marketing/Sales	44.3	20.8	28.3
Clerical/Administrative	53.9	32.2	33.8
Production workers with no trade/certification	43.9	22.6	30.4
<b>Terms of employment</b>			
Non-permanent	42.1	23.6	26.2
Permanent	56.0	38.0	30.7
<b>Weekly working hours</b>			
Part-time (fewer than 30 hours)	46.2	25.6	29.7
Full-time (30 hours or more)	56.3	38.8	30.4
<b>Use computer</b>			
Do not use computer on the job	42.4	25.2	24.1
Use one on the job	63.8	45.2	35.0
<b>Technological complexity of job</b>			
Stable	46.8	28.5	27.1
Increased	62.3	44.4	33.5

Source: Employee component of WES, 1999.



establishments that fill the vacancies from within the workplace or firm.

- **Unions:** Establishments with at least one employee covered by a collective agreement sponsor workplace training at a high level (74%) compared with establishments where employees are not covered (55%).

### **Who receives training and who does not?**

WES data point to a strong relationship between the employee's human capital and the amount of training received. For example, workers with a university degree were much more likely than those without a high school certificate to take part in employer-sponsored training (Table 2.3). This relationship is not surprising since the rationale is that university graduates have the greatest ability to succeed in training and thereby reduce the employer's training investment risk. These employees benefit from training by improving their wage and career advancement possibilities. The flip side is that employees with low skills and abilities are not getting as much training. The least skilled workers post the lowest participation rates in all training categories. These people risk not keeping pace with increasing skill demands and thereby losing out on wage growth and career advancement.

Half of workers reported that the technological complexity of their job was increasing, so it is not surprising to see computer software training as the most common training work done (Tables 2.4 a and b). By occupation, computer software training is number one for managers, professionals and clerks.

Canada's movement into the "knowledge economy" is reflected by the importance of professional training. Technicians, tradespeople and

**Table 2.4a**

**Employees participating in classroom training, by occupational category and subject area, 1998-1999**

Training course area	Manager	Profes- sional	Tech- nical/ Trades	Sales and market- ing	Clerical, Admin.	Pro- duction with no certificate	Total
	%						
Orientation for new employees	**	0.3*	0.7*	**	0.8*	**	0.9*
Managerial and supervisory	14.9	3.6	4.4	**	1.4*	**	5.6
Professional training	12.4*	22.1	15.6	21.0	8.9	16.5*	16.1
Apprenticeship training	**	**	1.2*	0	**	**	0.6*
Sales and marketing	5.7	**	1.8	14.7*	3.8*	4.0	3.3
Computer hardware	2.8*	2.2*	**	**	3.1	**	2.1*
Computer software	19.4	22.7	15.3	11.0*	45.8	**	20.9
Other office or non-office equipment	**	0.5*	2.0	**	1.6*	1.7*	1.3
Group decision-making or problem-solving	0.7	1.0*	0.4*	**	0.2*	**	0.6*
Team building, leadership communications	3.0	2.7	1.7	**	2.9*	2.9*	2.3
Occupational health and safety, environmental protection	4.7*	6.3	15.7	**	3.4	24.0	9.8
Literacy or numeracy	**	**	**	**	0.2*	0.2*	**
Other	34.5	36.5	39.0	34.7	27.0	45.5	36.2
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Employee component of WES, 1999.

Note: Total may not add to 100 due to rounding.

\* Indicates that the Coefficient of Variation (CV), a measure of data reliability, is greater than 16% and less than 35%. The reliability of the estimate declines as the CV increases.

\*\* Estimates are not shown due to high sampling variability.

**Table 2.4b**

**Employees participating in on-the-job training, by occupational category and subject area, 1998-1999**

Training course area	Manager	Profes- sional	Tech- nical/ Trades	Sales and market- ing	Clerical, Admin.	Pro- duction with no certificate	Total
	%						
Orientation for new employees	**	3.4*	7.4	22.7	11.4	17.3	8.9
Managerial and supervisory	11.9	2.7*	3.1	1.1*	4.1*	**	4.4
Professional training	12.0*	18.7	15.4	8.1*	8.7	13.5*	13.7
Apprenticeship training	0*	**	1.8	0.9*	**	1.2*	1.1
Sales and marketing	7.5*	1.1*	3.4*	15.1*	1.6	3.6*	4.2
Computer hardware	1.4*	4.0*	2.0*	2.1*	4.1*	**	2.5
Computer software	26.6	25.3	18.6	15.3	39.9	3.3*	23.2
Other office or non-office equipment	4.7*	2.9*	5.7	6.4	4.0*	6.7*	4.9
Group decision-making or problem-solving	1.4*	1.8*	0.5*	0.8*	**	0.9*	0.9*
Team building, leadership communications	4.8*	2.8*	1.9*	0.6*	**	0.9*	2.3
Occupational health and safety, environmental protection	3.1*	5.8	8.4	1.3*	3.7	10.4*	5.9
Literacy or numeracy	0	0	0	0	0	0	0
Other	20.9*	30.5	31.8	25.4	20.2	38.3	28.0
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Employee component of WES, 1999.

Note: Total may not add to 100 due to rounding.

\* Indicates that the Coefficient of Variation (CV), a measure of data reliability, is greater than 16% and less than 35%. The reliability of the estimate declines as the CV increases.

\*\* Estimates are not shown due to high sampling variability.

professionals report this area as their second most popular subject matter for training.

At the bottom of the scale is literacy and numeracy training. Low-skilled workers generally do not receive literacy and numeracy training. Presumably their present skills in these areas meet the needs of the job. Are their skills sufficiently developed, though, to ensure success in training? If they are considered too high risk to train, these workers may find themselves trapped in low-skilled jobs and in a training deficit cycle: without literacy skills, they are not given the training they need to advance, but without training they will not develop the necessary literacy skills.

### **The benefits of workplace training**

The quintessential question when looking at the relation between workplace practices, productivity and job satisfaction is “Which is the cause and which is the effect?” Does training improve productivity or is it that productive firms can afford to pay for training? Research to date shows an association between training and productivity but cannot establish a cause-effect relationship (Bartel 1995; and Black and Lynch 1997). A definitive answer is elusive for these researchers because their data were cross-sectional. Thus, researchers could not determine which came first—the practice or the growth in productivity and job satisfaction. WES’s longitudinal data will help deal with this causality issue. However, because the current report is based on data from WES’s first year, it shares the same problem as earlier research and it also cannot answer these questions.

We have provided data on productivity and job satisfaction in this section primarily to make users aware of the data; we caution readers that these data cannot be construed as direct evidence of the impact training

has on productivity and job satisfaction. Moreover, our analysis is strictly descriptive and does not control for the influence of such worker characteristics as wages, benefits and working conditions, nor for such workplace attributes as technological change and business strategies. Keeping this in mind, readers are invited to review the highlights on job satisfaction and training reported by employees (Table 2.5) and employers (Table 2.6).

From the employees' reports on job satisfaction and training, we found that:

- the percentage of employees who were very satisfied in their jobs was greater among those who participated in employer-sponsored workplace training than those who did not;
- employees who reported that the training they received was about right for the demands of their job were more likely to be very satisfied than those who said the training was too little or too much for the demands of their jobs; and
- employees in establishments where the amount of training made available to them (as reported by employers) had increased over the last year were more likely to be very satisfied than those in establishments where training had decreased or remained stable.

From the employers' reports on productivity and training, we found that:

- 46% of establishments that sponsored training also reported increases in productivity in 1998-1999.

**Table 2.5**

**Training and job satisfaction: by level of job satisfaction and training, 1998-1999**

	Not satisfied	Satisfied	Very satisfied	Total
	% of employees			
<b>Overall</b>	<b>10.7</b>	<b>54.6</b>	<b>34.8</b>	<b>100.0</b>
<b>Employer-sponsored workplace training</b>				
Were trained	9.4	52.7	37.9	100.0
Were not trained	12.2	56.9	30.9	100.0
<b>Amount of training taken compared to demands of job</b>				
Too little	19.7	58.6	21.7	100.0
About right	6.6	53.1	40.3	100.0
Too much	24.8	48.8	26.5	100.0
<b>Amount of training made available by establishment</b>				
Increased	11.4	53.7	35.0	100.0
Remained stable	10.3	56.7	33.1	100.0
Decreased	12.5*	56.9	30.6	100.0

Source: Workplace and employee components of WES, 1999.

Note: Total may not add to 100 due to rounding.

\* Indicates that the Coefficient of Variation (CV), a measure of data reliability, is greater than 16% and less than 35%. The reliability of the estimate declines as the CV increases.

**Table 2.6**

**Training and productivity growth: by change in productivity and training sponsorship, 1998-1999**

Productivity Change	Sponsored training	Did not sponsor training	Total
	% of establishments		
Decreased	7.2*	**	7.9
No change	46.3	63.8*	53.9
Increased	46.4	**	38.1
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Workplace component of WES, 1999.

Note: Total may not add to 100 due to rounding.

\* Indicates that the Coefficient of Variation (CV), a measure of data reliability, is greater than 16% and less than 35%. The reliability of the estimate declines as the CV increases.

\*\* Estimates are not shown due to high sampling variability.

### 3 VARIABLE PAY

Variable pay refers to a set of practices whereby employee compensation is tied to job performance. As with training, variable pay can benefit both the employer and the employee. Freeman *et al.*, (2000) and Black and Lynch (1997 and 2000) have shown that variable pay, in association with other human resource management (HRM) practices, can lead to higher productivity. Employers can use variable pay to provide incentives to employees to participate in workplace change. When employees can share in the gains from change, the expectation is that they will train and make the effort to adapt to the new workplace. When this increased effort leads to the strong performance of the organization, employees benefit through increased personal earnings. In linking pay with performance, employers may further benefit by attracting highly productive workers to the company.

This chapter presents the results on variable pay (or alternative compensation schemes) from the workplace component of WES.<sup>1</sup> Employers were asked if their compensation systems include one or more of the following four types of incentives for non-managerial employees:

- **Individual incentive systems** are systems that reward individuals on the basis of individual output or performance; this includes

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<sup>1</sup> As variable pay questions on the employee component of the survey differed greatly from those on the employer component, we present results here from only the latter; a companion report focussing on the employee will include results on variable pay based on the employee component.

**Table 3.1**

**Establishments providing variable pay for non-managerial employees, by type of pay, 1998-1999**

Type of pay	%
<b>All establishments (at least one type)</b>	<b>38.2</b>
Individual incentive systems	29.3
Productivity gain-sharing and other group incentives	7.5
Profit-sharing plans	7.6
Merit- skill-based pay	16.4

Source: Workplace component of WES, 1999.

bonuses (for individual performance); piece-rate; commissions; and stock options/purchase plans;

- **Productivity gain-sharing and other group incentives.** Productivity gain-sharing is defined as benefits to employees for gains realized by increased productivity. Group incentives refer to systems that reward individuals on the basis of group output or performance including bonuses for group performance, small-team rewards, employee stock ownership plans, and stock options;
- **Profit-sharing plans** includes any plan by which employees receive a share of profits from the workplace; and
- **Merit-pay and skill-based pay** include incentives defined as a reward or honour given for superior qualities, great abilities or expertise that comes from training, practice, and so on.

We begin this chapter by examining the use of variable pay by various establishment characteristics. We then look at the association between the use of variable pay and workplace practices. Because variable pay works as an incentive for employees to accept change, we would expect



to see higher use of variable compensation methods by employers adopting new technologies and introducing organizational change than by those who do not. We conclude this chapter with a look at WES data on the possible benefits associated with variable pay.

### **Which types of establishments introduce variable pay?**

Overall, almost two in five employers have at least one variable pay incentive as part of their compensation system (Table 3.1). Individual incentives are the most popular (29%) followed by merit-skill-based pay (16%). Only 8% of establishments have gain-sharing or profit-sharing plans in place.

Differences by establishment size and industry in workplace use of variable pay are presented in Table 3.2. Variable pay usage tends to increase with establishment size, though it drops off for very large establishments—that is, those with 500 or more employees. The findings from the HRPS and the Working with Technology Survey (WWTS)<sup>2</sup> also show a positive association between firm size and variable pay, but the researchers noted that union presence has a negative effect on variable pay. This union effect may help explain the drop-off in training reported by the largest firms. By industry, use tends to be high in capital intensive tertiary manufacturing, finance and insurance, primary product manufacturing, and transportation, warehousing, wholesale trade. Businesses in these industries typically face rapid technological change and stiff competition and therefore may look to variable pay to boost their employees' performance. The lowest provision rate is observed in education and health services, where there is little competition. The proportion of employers

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<sup>2</sup> This survey was designed and conducted by the Economic Council of Canada in 1985 and 1991.

**Table 3.2****Establishments having variable pay<sup>a</sup>, by size and industry, 1998-1999**

Establishment characteristics	%
<b>All establishments (at least one type)</b>	<b>38.2</b>
<b>Size (no. of employees)</b>	
Fewer than 20	34.9
20 to 99	59.4
100 to 499	66.9
500 or more	55.0
<b>Industry sector</b>	
Forestry, mining, oil and gas extraction	35.0
Manufacturing: labour intensive tertiary	40.4
Manufacturing: primary product	56.0
Manufacturing: secondary product	44.6
Manufacturing: capital intensive tertiary	57.7
Construction	30.5
Transportation, warehousing, wholesale trade	52.0
Communications and other utilities	30.0
Retail trade and consumer services	34.5
Finance and insurance	58.0
Real estate, rental and leasing operations	36.2
Business services	43.2
Education and health services	24.8
Information and cultural industries	44.6

Source: Workplace component of WES, 1999.

<sup>a</sup> One or more of individual incentives, gain-sharing or other group incentives, profit-sharing, and merit- and skill-based pay.

using variable pay in for-profit establishments was almost twice the proportion doing so in non-profit establishments (40% vs. 23%).

After they identified the variable pay incentives that exist in their workplace on the employer survey, employers were asked to identify the occupations covered by the different incentive plans.

Not surprisingly, establishments providing individual incentives are most likely to provide them for marketing and sales workers, who tend to work on an individual basis and among whom employers may want to create a competitive atmosphere.

Group incentives go mostly to managers and production workers, who typically work in teams. Managers also benefit from profit-sharing.

Clerical and administrative workers are by far the least likely to be included in group incentives, while uncertified production workers are by far the least likely to be included in individual incentives and profit-sharing plans.

Merit- and skill-based pay are provided mostly to technical/trades, professional and uncertified production workers, among whom employers may want to encourage skill development.

### **Why do employers introduce variable pay?**

One rationale for tying compensation to job performance may be to attract scarce skilled workers in a highly competitive economy. Another reason may be to increase productivity in the face of organizational change and innovation. Since there are no direct questions on reasons for introducing variable pay, we instead examine the use of variable pay according to whether or not establishments have introduced organizational change and innovation, face foreign competition or have a human-resource focussed business strategy, all of which suggest need and intent.

The results indicate that establishments that innovate, introduce technological or organizational change and compete in international markets are more likely to have at least one type of variable pay as part of their compensation system than those not participating in such practices

**Table 3.3**

**Establishments having variable pay as part of compensation system, by selected characteristics, 1998-1999**

	% providing variable pay		
	Overall	Fewer than 20 employees	20 or more employees
<b>All establishments (at least one practice)</b>	<b>38.2</b>	<b>34.9</b>	<b>60.2</b>
<b>Organizational change</b>			
Did not introduce any	26.7	24.9*	48.1*
Introduced at least one	53.9	50.7	66.4
<b>Technology</b>			
Did not adopt	33.8	31.2	56.7
Adopted at least one	49.0	45.1*	64.1
<b>Innovation</b>			
Did not introduce/improve goods/services/processes	27.0	25.0*	49.2
Introduced/improved goods/services/processes	50.2	46.8	65.5
<b>Market areas</b>			
Mainly local	38.0	35.0	61.9
Mainly national	52.0	48.7*	64.7
Mainly international	59.6	**	77.5
<b>Human resources management (HRM) business strategy: level of importance</b>			
None/slight	20.3	**	**
Low	31.8	29.6*	52.2*
Medium	45.4	42.3*	62.1
High	51.5	47.2*	66.7
<b>Cost-reduction business strategy: level of importance</b>			
None/slight	25.7	24.6*	43.8*
Low	44.1	40.5*	65.2
Medium	42.0	37.6*	63.8
High	53.3	53.4*	52.9*

Source: Workplace component of WES, 1999.

\* Indicates that the Coefficient of Variation (CV), a measure of data reliability, is greater than 16% and less than 35%. The reliability of the estimate declines as the CV increases.

\*\* Estimates are not shown due to high sampling variability.

(Table 3.3). Similar findings were reported from WWTS and the HRPS. However, the association does vary by firm size: larger firms are more likely to offer variable pay regardless of the circumstances, while smaller firms show a proportionately larger uptake of variable pay when introducing change.

The association between business strategy and variable pay incidence is interesting. The more a firm focusses on human resources management (HRM), the more likely it is to introduce variable pay. This relationship holds regardless of firm size. However, this is not the case for cost-reduction business strategies. In larger firms, the incidence of variable pay actually declines as the commitment to a cost-reduction strategy increases. This decline may be a reflection of union resistance to the introduction of variable compensation practices since unions may view these as a means for employers to transfer risk onto the employees.

### **Do employers benefit from the provision of variable pay?**

The same caveats concerning the relationship among workplace practices and productivity and job satisfaction that were emphasized in Chapter 2 apply here: nothing can be said about cause and effect with only one year's data and the analysis does not control for other influences. The reader should not draw any definitive conclusions about the impacts of variable pay from the cross-tabulations presented here.

As we discussed, establishments that provide variable pay to their work force would expect to increase worker productivity and reduce turnover, and thereby reduce their costs. Table 3.4 presents WES employer survey results, according to the existence of variable pay, for three establishment performance measures: change in productivity, change in unit costs, and turnover.

**Table 3.4**  
**Variable pay and establishment performance, 1998-1999**

Performance measure	Establishments provided variable pay	Establishments did <i>not</i> provide variable pay	All establishments
	%		
<b>Change in productivity</b>			
Decreased	7.8*	8.0*	7.9
No change	39.8	62.7	53.9
Increased	52.4	29.4*	38.1
Total	100.0	100.0	100.0
<b>Change in unit costs</b>			
Decreased	10.3*	9.3*	9.7
No change	52.3	56.4	54.8
Increased	37.4	34.4	35.5
Total	100.0	100.0	100.0
<b>Turnover</b>			
Zero (0%)	21.0*	40.7	33.2
Low (1-20%)	12.8*	7.0*	9.2
High (>20%)	66.2	52.3	57.6
Total	100.0	100.0	100.0

*Source:* Workplace component of WES, 1999.

*Note:* Total may not add to 100 due to rounding.

\* Indicates that the Coefficient of Variation (CV), a measure of data reliability, is greater than 16% and less than 35%. The reliability of the estimate declines as the CV increases.

The results indicate, first, that establishments providing variable pay to non-managerial employees were more likely to report an increase in productivity in 1998-1999 than those which did not provide variable pay (52% vs. 29%). Second, however, there does not appear to be a link between variable pay and a reduction in unit costs. (Rising labour or intermediate input costs will affect unit costs but not productivity measures.)

Third, establishments offering some form of variable pay have higher turnover rates than those that do not use variable pay as a part of their compensation methods. There is no obvious explanation for this result. These last two outcomes may simply reinforce the earlier mentioned caveats i.e., the true outcomes of using variable pay methods may only be seen through a more exhaustive analysis.

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## **4 FLEXIBLE JOB DESIGN AND EMPLOYEE INVOLVEMENT**

The key benefit of workplace flexibility is that it allows the firm to use human resources where and when they are needed. Practices such as job rotation, multi-tasking and teamwork benefit employers because the more workers know about the entire work process, the more easily they can be moved to make up for absenteeism or shifts in demand. As well, the firm can use workers' wide knowledge of the production process in trouble-shooting. These practices also benefit workers, preventing them from being locked into one job and affording them a measure of mobility. To varying degrees, such practices also provide employees with increased responsibility and control in the workplace. Workers thus benefit through greater participation in decision-making in the operation of the firm and thereby a greater sense of making a difference at work, although at the possible cost of increased pressure embodied in heightened responsibility. The provision of such practices can in turn reinforce productivity gains for the employer and serve to attract skilled workers to the establishment.

There is ample evidence in the literature on the benefits of flexible job design and employee involvement to employers (Bélanger 2000). Ichniowski (1992) describes a case study where a firm made dramatic productivity improvements through increasing employee involvement and flexibility in combination with variable (incentive) pay. Similarly, MacDuffie and Krafcik (1992) argue that workplace practices that encourage worker flexibility and problem solving support the objectives of implementing new technology that promotes plant flexibility.

There is also evidence that employee involvement can benefit employees. Neumark and Cappelli (1999) show that practices that transfer power to employees contribute to increased compensation for employees, with weak impacts on productivity and no harmful impacts on efficiency. Similarly, Freeman *et al.*, (2000) find that employee involvement, which is typically accompanied by profit-sharing, has a weak effect on labour productivity but has a strong and positive effect on employee well-being.

This chapter presents the WES results on the extent to which employers implement, and employees participate in, practices that concern the design of the job and the involvement or participation of employees in the operation and decision-making of the business. These practices will be collectively referred to as employee involvement practices (EIPs).

WES asked employers and employees about sets of EIPs that vary somewhat between the two questionnaires. On the workplace questionnaire, employers are asked about work organization practices that exist on a formal basis in their workplaces for non-managerial employees. These practices comprise the following:

- **flexible job design** including job rotation, job enrichment/enlargement, and job redesign (where jobs are broadened, or where skill requirements or autonomy are increased);
- **problem-solving teams** concerned with quality or work flow issues (with moderate authority);
- **task teams or joint labour-management committees**, concerned with a broad set of issues (with mainly consultative power only);
- **self-directed work groups** or semi-autonomous or mini-enterprise work groups (with real decision-making authority);

- **employee suggestion programs** including employee feedback surveys; and
- **information sharing** with employees (on such matters as firm performance, wages and technology).

These practices fall along a continuum of employee involvement, from information sharing (low) to self-directed work groups (high). In this chapter, the emphasis will be on the first four of the listed practices—that is, on flexible job design, problem-solving teams, task teams or joint labour-management committees, and self-directed work groups.

On the employee survey, WES asked questions about a similar group of EIPs enabling employees to participate in decisions regarding their workplace. The practices are much the same as those asked about in the employer survey; however, some small differences exist. Employees were asked about the frequency (never, occasionally, frequently/always) with which they participated in the following practices:

- **job rotation or cross-training** (which is not as broad a practice as its counterpart on the employer survey, flexible job design);
- **quality circles or groups** concerned with work flow or quality issues (equivalent to problem-solving teams in the employer's WES);
- **task teams or labour-management committees** (concerned with a broad range of issues);
- **self-directed work groups** or semi-autonomous or mini-enterprise work groups (with a high level of responsibility for a specific product or service and real autonomy in organizing themselves).
- **employee feedback surveys;**

- **employee suggestion programs** or regular meetings in which employees can offer superiors suggestions for improvement of work (note that this practice is combined with employee feedback surveys in the employer WES); and
- **information sharing**, through meetings or written word (for example, newsletters) about workplace performance and changes.

Once again, these practices can generally be viewed along a continuum of employee involvement and the emphasis in this report will be on the first four practices, namely job rotation or cross-training, quality circles; task teams or labour-management committees, and self-directed work groups. The intensity of employee participation (whether occasionally, frequently or always) is not taken into consideration in this report.

This chapter begins with overall measures of EIP incidence and continues to address a number of issues, including reconciling employers' and employees' responses to employee involvement practices; the extent to which training in communications and problem-solving skills support employee involvement practices; examining the characteristics of the establishments and their reasons for introducing these practices relating to changes in the workplace; and the apparent benefits of EIP for employers and employees.

Note that the analysis in this chapter was restricted to establishments with 10 or more employees and employees working for such establishments. Moreover, employer responses apply to their non-managerial employees while managers are not excluded from the employee responses.

**Table 4.1****Establishments reporting EIPs for non-managerial employees, 1998-1999**

Employee Involvement Practice (EIP)	Employer incidence (%)
Flexible job design (job rotation, enrichment, redesign)	28.5
Problem-solving teams (for quality or work flow)	23.0
Task teams or joint labour-management committees (concerned with broad set of issues)	17.9
Self-directed work groups (semi-autonomous or mini-enterprise work groups)	9.2
Employee suggestion programs; employee survey	27.8
Information sharing	44.3

Source: Workplace component of WES, 1999.

**Overall incidence of EIP**

The overall employer results for all formal EIP for non-managerial employees are presented in Table 4.1. With the exception of flexible job design, the incidence of these practices is inversely related to the degree of employee involvement associated with the EIP, ranging from 44% for information sharing, to under 10% for self-directed workgroups.

The results for employees (Table 4.2) are much the same as for employers, with the popularity of the practice generally varying inversely with the degree of involvement it is supposed to provide. Outside of job rotation we observe that 40% to 75% of employees participate in low-involvement information sharing practices such as newsletters and employee feedback, while employee participation in the high-involvement practices of quality circles and task teams is 38% and 28% respectively. Because the relatively high participation rate in self-directed work groups (47%) is counter to the pattern observed above for employers (9%), we can assume that this practice is most prevalent among large firms. Job rotation also differs as 29% of employers report it as opposed to 19% of employees participating in job rotation.

**Table 4.2****Employees reporting participation in EIPs, 1998-1999**

Employee Involvement Practice (EIP)	Employee incidence (%)
Job rotation or cross-training	19.1
Quality circles: teams or circles concerned with quality or work flow issues	38.2
Task teams or labour-management committees	27.6
Self-directed work groups (semi-autonomous or mini-enterprise work groups)	46.6
Employee feedback surveys	40.2
Employee suggestion programs	59.1
Information sharing, via meetings and written word (newsletters, etc.)	74.4

Source: Employee component of WES, 1999.

**Which employers use EIPs**

In Table 4.3, incidence results are presented for four major EIPs according to establishment characteristics. The results indicate a similar pattern of incidence of the practices within different groups. Within the two smaller size groups, the percentage of establishments reporting the different practices declines with the degree of employee involvement implied in the practice. The results also indicate that the larger the establishment, the more likely the practice is reported.

The incidence of problem-solving teams, task teams or joint labour-management committees and self-directed work groups rises with firm size. These practices improve employee communications and flatten the hierarchy within the firm. Employees in small establishments probably already have frequent contact and no hierarchy to flatten. Small establishments already enjoy flexibility by virtue of their small size and so do not need to implement these practices. The exception is flexible job design:

**Table 4.3****Establishments reporting selected EIPs, by establishment characteristics, 1998-1999**

Establishment characteristics	Flexible job design	Problem solving teams	Task teams or labour- management committees	Self- directed work groups
	%			
<b>Establishments with 10 employees or more</b>	<b>28.5</b>	<b>23.0</b>	<b>17.9</b>	<b>9.2</b>
<b>Size (no. of employees)</b>				
10 to 19	29.7	18.0*	9.2*	6.4*
20 to 99	28.1	27.3	23.9	11.4*
100 to 499	20.8	32.3	44.6	15.7
500 or more	28.6	53.3	71.8	27.8
<b>Industry sector</b>				
Forestry, mining, oil and gas extraction	**	**	**	**
Manufacturing: labour intensive tertiary	22.9*	15.2*	17.1*	**
Manufacturing: primary product	24.1*	30.6	35.9	12.9*
Manufacturing: secondary product	19.1*	26.2*	21.6*	6.6*
Manufacturing: capital intensive tertiary	26.4*	35.3	21.8*	10.9*
Construction	**	**	**	**
Transportation, warehousing, wholesale trade	30.4*	21.2*	19.1*	**
Communications and other utilities	18.6*	19.5*	27.5*	**
Retail trade and consumer services	34.9*	**	**	**
Finance and insurance	36.5*	23.2*	24.3*	17.8*
Real estate, rental and leasing operations	**	**	**	**
Business services	24.5*	21.7*	**	**
Education and health services	24.4*	33.3*	24.3*	15.3*
Information and cultural industries	21.5*	25.1*	28.2*	**
<b>Collective agreement coverage</b>				
No employees covered	29.4	21.3	11.8	9.1*
At least one employee covered	24.4*	30.6*	45.4	9.5*

Source: Workplace component of WES, 1999.

\* Indicates that the Coefficient of Variation (CV), a measure of data reliability, is greater than 16% and less than 35%. The reliability of the estimate declines as the CV increases.

\*\* Estimates are not shown due to high sampling variability.

establishments of all sizes show a similar need for employees with the flexibility to perform various tasks in the production process.

Incidence levels ranging from 19% to 37% were observed across all industries for flexible job design. Establishments in finance and insurance are more likely to have this practice in place than those in other industries. The existence of problem-solving teams is most prevalent in manufacturing industries producing capital intensive tertiary products, e.g. automobiles and petroleum products. Task teams and labour-management committees are most often found in primary product manufacturing industries, e.g. paper and steel. Self-directed work groups are frequently observed in the finance and insurance industries. Establishments in finance and insurance are more likely to use employee suggestion systems and information sharing than establishments in other industries.

The incidence of EIPs is shown according to the presence of a collective agreement in the reporting establishment. The relationship between EIPs and collective agreements is not, a priori, certain. Regardless of union status, some workers are likely to accept these practices because they afford them a way to improve their jobs through increased involvement. Employees also will support the practices as a means to improve the establishment's competitiveness and thereby possibly protect their jobs. Conversely, others may see these practices as contravening established union-management contracts. The results indicate that flexible job design is somewhat lower in a unionized environment, perhaps indicative of the fact that collective agreements often strictly control job descriptions and duties. However, the incidence of problem-solving teams and, particularly, task teams or labour-management committees was higher in establishments with a collective agreement than in those where there was no



agreement. This may be attributed to the fact that collective agreements typically contain provisions for such arrangements.

### **Who participates in EIPs and who does not?**

The discussion now turns to the variation in *employee* participation rates in EIPs according to the characteristics of the job and the employee.

Our review of job characteristics shows:

- first, that EIP participation rates tend to be higher in management and professional occupations;<sup>1</sup>
- second, that there is little variation in quality circles and self-directed work groups according to job tenure. However, the other practices show different patterns; and
- third, the presence of a collective agreement shows mixed results—as is the case with the employer reported responses (Table 4.4).

Table 4.5 presents results of analysis for employee characteristics. Women participate less in quality circles, task teams or labour-management committees and self-directed work groups when compared with men; similarly, youth (aged 15 to 24) participate less than older age groups. This probably reflects the occupational distributions for women and for youth. Many women and youth work in occupations where EIPs are not offered—that is, fewer women than men, and fewer youth than older workers, work in managerial, professional or technical occupations. The results also indicate little variation by education level, apart from university

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<sup>1</sup>The exception is job rotation—a practice that does not lend itself well to managerial functions.

**Table 4.4**

**Employees participating in EIPs, by job characteristics, 1998-1999**

Job characteristics	Job rotation or cross-training	Quality circles	Task teams or labour-management committees	Self-directed work groups
	%			
<b>Employees in establishments with 10 employees or more</b>	<b>19.1</b>	<b>38.2</b>	<b>27.6</b>	<b>46.6</b>
<b>Occupation</b>				
Manager	15.0	56.6	48.1	63.1
Professional	14.0	48.2	29.5	57.6
Technical/Trades	20.9	35.9	25.6	45.1
Marketing and sales	14.3	21.6	14.1	29.4
Clerical/Administrative	24.9	29.8	18.9	35.9
Production workers with no trade/certification	24.8	19.7	19.9	30.3
<b>Job tenure (years)</b>				
Fewer than one	22.2	36.3	24.6	45.7
1 to 4	19.9	38.0	26.9	47.4
5 to 9	17.6	40.7	29.7	45.6
10 to 19	17.8	38.9	30.0	47.3
20 or more	15.1	34.0	26.6	43.4
<b>Collective agreement coverage</b>				
Not covered	19.0	40.4	27.1	49.3
Covered	19.3	33.2	28.5	40.6
<b>Hourly wage</b>				
Fewer than \$9.00	20.7	24.9	19.6	34.5
\$9.00 to 11.99	16.2	29.6	20.9	35.4
\$12.00 to 15.99	20.4	37.1	26.6	42.3
\$16.00 to 20.99	20.7	40.3	27.2	49.0
\$21.00 and over	17.9	47.0	34.7	58.0

Source: Employee component of WES, 1999.

**Table 4.5****Employees participating in selected EIPs, by employee characteristics, 1998-1999**

Employee characteristics	Job rotation or cross-training	Quality circles	Task teams or labour-management committees	Self-directed work groups
			%	
<b>Employees in establishments with 10 employees or more</b>	<b>19.1</b>	<b>38.2</b>	<b>27.6</b>	<b>46.6</b>
<b>Gender</b>				
Male	19.1	40.4	30.2	49.7
Female	19.2	35.9	25.0	43.5
<b>Age (years)</b>				
15 to 24	18.9	24.9	16.9	37.8
25 to 34	21.4	37.3	25.1	47.3
35 to 44	19.3	41.3	29.1	49.5
45 to 54	18.8	40.9	31.7	47.1
55 and over	13.8	36.5	29.1	42.4
<b>Education level (highest attained)</b>				
Not completed high school	20.5	31.4	24.6	35.6
High school diploma (including some PSE)	22.0	35.9	24.3	38.7
Trade/vocational diploma	18.7	34.3	24.9	44.6
College diploma	20.0	36.1	26.4	48.6
University degree	16.1	45.5	32.8	54.5

Source: Employee component of WES, 1999.

degree holders' somewhat higher participation rates in quality circles, task teams and self-directed work groups.

### Reconciling employer and employee responses

Does an employer need to formally enact EIPs for the practices to exist in the firm? The answer is no (Table 4.6). Nearly 40% of employees take part in self-directed work groups even though their employer stated that it is not part of the firm's workplace practices. This does not mean that the employer does not know what is going on in the firm. In fact, 33%

of managers report working in self-directed work groups even though the practice is not official policy in the firm. This suggests an informality about the implementation of EIPs. Its degree, however, appears to be related to occupation—informal participation in problem-solving circles and self-directed work groups tends to fall with the apparent skill level of the occupation. Informal participation is more likely among managers and professionals than it is among clerical and lower skilled production workers. Is this informality more likely to appear in small firms given that small firms are less structured than large ones? Apparently this is not the case, as this result is generally consistent across firm size.

Do employers extend EIPs to all employees? Again, the answer is no (last column, Table 4.6). There are barriers to employee participation in EIPs. Nearly half of managers do not take part in their firms' job rotation programs presumably because of their skills and the nature of their jobs. In comparison, about one-fifth of uncertified production workers are not included in the job rotation program. This result reverses itself when looking at problem-solving circles—14% of managers do not participate as opposed to 30% of uncertified production workers. In addition to varying by occupation, the probability of not being included increases with firm size. About half of employees in firms employing more than 500 workers do not join in the firm's job rotation program. In firms with fewer than 20 employees and offering job rotation, this figure drops to one-third. Firms implement EIPs where there is a benefit to the firm doing so. And, of course, not all employees may be included in the programme.

### **EIPs and training**

An establishment that requires employees to work in groups and exercise autonomy in problem solving and decision making may support

**Table 4.6**  
**Measures of awareness/inclusion, employee participation in selected EIPs,**  
**1998-1999**

Practice	Employee "Yes" – Employer "No" <sup>a</sup> –	Employee "No" – Employer "Yes" <sup>b</sup> –	Employee "Yes" – Employer "Yes" –	Employee "No" – Employer "No" –
	%			
Job rotation or cross-training	13.8	21.4	5.3	59.4
Teams or circles concerned with quality or work flow issues	23.1	19.8	15.1	42.0
Self-directed work groups (semi-autonomous or mini-enterprises)	37.9	7.1	8.7	46.3

Source: Workplace and employee components of WES, 1999.

<sup>a</sup> Employees participating in an EIP who are in establishments where the practice is *not* reported, taken as a percentage of all employees.

<sup>b</sup> Employees *not* participating in an EIP who are in establishments where the practice is reported, taken as a percentage of all employees

the skill development of its employees in these areas. Results from analysis of WES reveal that the proportion of establishments providing training in "EIP-type" skills among establishments with EIPs was more than twice the proportion among establishments without EIPs. For example, the proportion of workplaces sponsoring classroom training in group decision-making and problem-solving skills was 30% in establishments with EIPs compared to 15% among non-EIP establishments; similarly, the proportion of establishments sponsoring team-building, leadership and communication skills training in EIP and non-EIP establishments was 43% and 21%, respectively. However, note that, for all classroom training subjects, the sponsorship rate tended to be higher for establishments with EIPs than for those without, although the gaps were greatest for group decision-making and team-building and leadership skills.

## **Rationale for introducing EIPs**

Based on evidence from the employer survey, businesses undergoing organizational change, technological change or innovations implement EIPs to facilitate the introduction of the changes and to gain a competitive advantage (Table 4.7). A common theme in the literature is the need for EIPs to maximize the benefits from technological change and re-engineering initiatives, such as just-in-time inventory practices. Furthermore, workplace practices that impose a rigid structure upon the workplace defeat the purpose of introducing flexibility into the production process.

When implementing change, 46% of firms accompany it with at least one EIP. However, this does not tell the whole story. When looking at EIPs by firm size, there are two different patterns. Small firms do not make a great deal of use of EIPs.<sup>2</sup> Even when introducing change, nearly 90% of small firms do not use EIPs. Small firms may not need these practices as they already consider themselves to be flexible by virtue of their size. It may also be that the nature of the change is such that EIPs are not warranted.

## **The benefits of employee involvement**

Finally, we turn to the issue of whether or not participation in employee involvement practices benefit employees and employers.<sup>3</sup>

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<sup>2</sup> Results for small firms are not shown due to data reliability guidelines (high sampling variability of the estimates).

<sup>3</sup> Note once more that the analysis is merely descriptive and only suggestive of how employees and employers benefit from the practices in question. The analysis does not control for the influence of other practices besides EIPs on the outcomes measured.

**Table 4.7**

**Establishments introducing at least one EIP, according to motive/rationale indicators, 1998-1999**

Indicator	10 or more employees	20 or more employees
		%
<b>Overall</b>	<b>45.5</b>	<b>53.5</b>
<b>Organizational change</b>		
Introduced none	25.8*	40.1
Introduced at least one	59.3	60.5
<b>Technological change</b>		
Introduced none	40.8	49.1
Introduced computer-based or other technology	52.4	58.6
<b>Innovation</b>		
Introduced none	34.6*	39.0
Introduced/improved goods/services or processes	51.9	60.6
<b>Human resources in business strategy (level of importance)</b>		
Not/slightly	**	43.6*
Low	30.6*	38.6
Medium	46.1	52.2
High	62.2	67.4

Source: Workplace component of WES, 1999.

\* Indicates that the Coefficient of Variation (CV), a measure of data reliability, is greater than 16% and less than 35%. The reliability of the estimate declines as the CV increases.

\*\* Estimates are not shown due to high sampling variability.

Workers who participate in at least one EIP are more likely to be satisfied in their jobs (Table 4.8). The results also indicate that this pattern holds for all individual EIPs with the differential between participants and non-participants who are very satisfied being particularly great for task teams or labour-management committees and quality circles. There is little support for employee involvement placing greater pressures on workers leading to dissatisfaction on the job.

**Table 4.8**

**EIPs and job satisfaction: distribution of employees by level of job satisfaction, according to EIP participation, 1998-1999**

	Not satisfied	Satisfied	Very satisfied	Total
	%			
<b>Employees in establishments with 10 employees or more</b>	<b>11.2</b>	<b>55.1</b>	<b>33.7</b>	<b>100.0</b>
<b>At least one EIP</b>				
Participated in at least one	10.2	53.8	35.9	100.0
Did not	13.3	57.9	28.9	100.0
<b>Job rotation or cross-training</b>				
Participated	9.9	53.1	37.0	100.0
Did not	11.5	55.6	32.9	100.0
<b>Quality circles</b>				
Participated	7.5	51.8	40.6	100.0
Did not	13.4	57.1	29.4	100.0
<b>Task teams or labour-management committees</b>				
Participated	8.0	50.6	41.4	100.0
Did not	12.4	56.8	30.8	100.0
<b>Self-directed work groups</b>				
Participated	9.7	53.1	37.1	100.0
Did not	12.4	56.8	30.7	100.0

Source: Employee component of WES, 1999.

Note: Total may not add to 100 due to rounding.

Regarding benefits for employers implementing EIPs, there is only weak evidence suggesting that employers who put EIPs into their workplace experience greater productivity increases than establishments not employing these practices.<sup>4</sup> This gap in productivity growth appears to be greatest between establishments that use and those that do not use problem-solving teams and flexible job design—practices that provide a greater

<sup>4</sup> The data supporting this point is not shown since it has high sampling variability and must be interpreted with caution.



degree of involvement to employees. There was less of a difference for the lower involvement EIPs (for example, information sharing).

There is little difference in cost reduction between establishments that have and have not introduced the various EIPs. Indeed, the data suggest that establishments applying the practices are more likely to experience cost *increases*. Note that this result does not necessarily contradict the positive labour productivity outcome, as declines in labour costs can be offset by increases in the other components of unit costs.

We observed that there is very little difference in outcomes between employers introducing and not introducing the various practices with respect to labour turnover. This suggests a low degree of association between EIPs and turnover rates.

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## 5 CONCLUSIONS

Data from the 1999 Workplace and Employee Survey (WES) were analysed to provide evidence on the use of several human resource management (HRM) practices among Canadian employers. Three practices were examined: training, variable pay, and employee involvement. The analysis was intended to be descriptive and the results were only suggestive of the explanations for workplace decisions about, and the outcomes of the various practices described. We suggested reasons for introducing the individual practices, particularly those arising from the changing external and internal environment of the firm. Similarly, we are able at this point only to suggest that the implementation of these workplace practices leads to benefits for both employers and employees.

Multivariate analysis is required to more precisely identify factors contributing to decisions to implement practices and the outcomes of those practices. Such analysis permits the analyst to better identify factors leading to the decision to implement training, variable pay and employee involvement, and then to disentangle the impact of these practices on job satisfaction and strong establishment performance from other factors that may have contributed to the outcomes. This analysis will benefit from the release of longitudinal data when they become available. Longitudinal data will help in identifying the causality relations between the workplace practices examined here and productivity and job satisfaction.

The analysis in this report points to a number of research themes that reflect government, business and worker priorities and that utilize unique

features of WES, such as the employer-employee connection. Among the questions meriting further exploration, we have selected the following:

- Do firms meet new skill demands through training current staff or by hiring the skill from outside the organization? What characteristics predispose firms to favour training or hiring?
- Do innovation and the use of technology increase the demand for high-skill labour at the expense of demand for low-skill labour (confirming the skill-biased technological change hypothesis)?
- Are any groups—for example, older workers, less-skilled workers or part-time workers—denied training opportunities?
- What are the roles of competition, government policy and regulation, workplace practices and employee characteristics in innovation?
- Are there barriers to performance-enhancing workplace practices within the firms themselves?
- How do small firms use technology and how do their employees adapt to new technologies?
- What is the optimal bundle of workplace practices? Are there additional workplace practices that should be added to such a bundle? Does it vary with firm characteristics?

WES presents an important opportunity for researchers who want to learn more about the nature of workplaces and the impact of that nature on the organization and on its workers. WES is designed to provide information on a broad range of issues relating to employers and their employees. Thus it will continue to probe and present information from both the supply and demand side of the labour market—and it will be available to enrich studies focussed on either side of that market.

## **APPENDIX A: CONCEPTS AND METHODS**

### **Objectives**

The Workplace and Employee Survey (WES) is designed to explore a broad range of issues relating to employers and their employees. The survey aims to shed light on the relationships among competitiveness, innovation, technology use and human resource management on the employer side and technology use, training, job stability and earnings on the employee side.

The survey is unique in that employers and employees are linked at the micro data level; employees are selected from within sampled workplaces. Thus, information from both the supply and demand sides of the labour market is available to enrich studies on either side of the market.

### **Sample sizes and response rates**

WES was conducted for the first time during the summer (employer survey part) and fall of 1999 (employee survey part). Just over 6,350 workplaces and about 24,600 employees responded to the survey, representing response rates of 94% and 83%, respectively. The employer sample is longitudinal—the sampled locations will be followed over time, with the periodic addition of samples of new locations to maintain a representative cross section. Employees will be followed for two years only, due to the difficulty of integrating new employers into the location sample as workers change companies. As such, fresh samples of employees will be drawn on every second survey occasion (i.e. first, third, fifth). This longitudinal aspect will allow researchers to study both employer and employee outcomes over time in the evolving workplace.

**Appendix A–Table 1. Sample sizes and estimated populations**

Industry/Workplace size/Region	Workplaces		Employment	
	Number of respondents	Estimated population	Number of respondents	Estimated population
<b>Overall</b>	<b>6,351</b>	<b>735,911</b>	<b>24,597</b>	<b>10,777,543</b>
<b>Industry</b>				
Forestry, mining, oil and gas extraction	313	13,359	1,193	190,453
Labour intensive tertiary manufacturing	406	20,584	1,620	497,409
Primary product manufacturing	318	7,648	1,434	392,872
Secondary product manufacturing	292	11,762	1,191	371,888
Capital intensive tertiary manufacturing	359	17,059	1,469	585,253
Construction	607	54,659	2,095	419,373
Transportation, warehousing, wholesale trade	706	84,820	2,877	1,114,182
Communication and other utilities	413	9,712	1,376	243,601
Retail trade and consumer services	515	249,409	1,864	2,596,439
Finance and insurance	498	34,153	1,893	512,159
Real estate, rental and leasing operations	364	24,429	1,143	189,303
Business services	467	83,245	1,830	1,006,460
Education and health services	751	109,404	3,193	2,340,519
Information and cultural industries	342	15,669	1,419	317,632
<b>Workplace size</b>				
1-19 employees	2,872	640,077	6,154	3,471,168
20-99 employees	1,743	83,412	8,356	3,260,557
100-499 employees	1,249	10,735	6,810	1,960,109
500 employees or more	487	1,687	3,277	2,085,708
<b>Region</b>				
Atlantic	777	63,152	3,003	709,303
Quebec	1,432	153,277	5,745	2,560,682
Ontario	1,626	276,920	6,187	4,352,265
Manitoba	423	27,888	1,641	402,138
Saskatchewan	329	29,333	1,217	322,333
Alberta	839	80,063	3,183	1,076,019
British Columbia	925	105,279	3,621	1,354,803

Source: Workplace and Employee Survey, 1999.

**Appendix A–Table 2. Response rates**

Category	Employer response rate (%)	Employee response rate (%)
<b>Overall</b>	<b>94.0</b>	<b>83.1</b>
<b>Industry</b>		
Forestry, mining, oil and gas extraction	97.0	87.1
Labour intensive tertiary manufacturing	91.0	81.3
Primary product manufacturing	95.3	85.7
Secondary product manufacturing	94.7	85.7
Capital intensive tertiary manufacturing	94.5	84.4
Construction	94.3	83.8
Transportation, warehousing, wholesale trade	92.6	84.5
Communication and other utilities	98.0	82.9
Retail trade and consumer services	93.3	82.2
Finance and insurance	96.5	87.5
Real estate, rental and leasing operations	97.3	87.8
Business services	94.2	85.7
Education and health services	96.8	86.5
Information and cultural industries	98.1	87.9
<b>Workplace size</b>		
1-19 employees	96.9	85.0
20-99 employees	95.1	86.8
100-499 employees	92.4	85.0
500 employees or more	93.4	81.6
<b>Region</b>		
Atlantic	96.3	88.8
Quebec	92.4	82.5
Ontario	95.6	84.2
Manitoba	96.4	87.7
Saskatchewan	96.7	86.3
Alberta	94.9	85.0
British Columbia	96.2	85.1

Source: Workplace and Employee Survey, 1999.

## **Target population**

The target population for the employer component is defined as all business locations operating in Canada that have paid employees, with the following exceptions:

- a) Employers in Yukon, Northwest Territories and Nunavut
- b) Employers operating in crop production and animal production; fishing, hunting and trapping; private households and public administration.

The target population for the employee component is all employees working in the selected workplaces who receive a Customs Canada and Revenue Agency T-4 Supplementary form. If a person receives a T-4 slip from two different workplaces, then the person will be counted as two employees on the WES frame.

## **Survey population**

The survey population is the collection of all units for which the survey can realistically provide information. The survey population may differ from the target population due to operational difficulties in identifying all the units that belong to the target population.

WES draws its sample from the Business Register (BR) maintained by the Business Register Division of Statistics Canada, and from lists of employees provided by the surveyed employers.

The Business Register is a list of all businesses in Canada, and is updated each month using data from various surveys, profiling of businesses and administrative sources.



## Reference period

The reference period for WES is mainly the 12-month period ending March 1999. Some questions in the workplace portion covered the last pay period ending before March 1999.

## Sample design

The survey frame is a list of all units that carries contact and classification (e.g., industrial classification) information on the units. This list is used for sample design and selection; ultimately, it provides contact information for the selected units.

### i) Workplace survey

The survey frame for the workplace component of WES was created from the information available on the Statistics Canada Business Register.

Prior to sample selection, the business locations on the frame were stratified into relatively homogeneous groups called *strata*, which were then used for sample allocation and selection. The WES frame was stratified by industry (14), region (6), and size (3), which was defined using estimated employment. The size stratum boundaries were typically different for each industry/region combination. The cut-off points defining a particular size stratum were computed using a model-based approach. The sample was selected using Neyman allocation. This process generated 252 strata with 9,144 sampled business locations.

All sampled units were assigned a sampling weight (a raising factor attached to each sampled unit to obtain estimates for the population from a sample). For example, if two units were selected at random and with equal probability out of a population of ten units, then each selected unit

would represent five units in the population, and it would have a sampling weight of five.

The inaugural WES survey collected data from 6,351 out of the 9,144 sampled employers. The remaining employers were a combination of workplaces determined to be either out-of-business, seasonally inactive, holding companies, or out-of-scope. The majority of non-respondents were owner-operators with no paid help and in possession of a payroll deduction account.

## **ii) Employee survey**

The frame for the employee component of WES was based on lists of employees made available to interviewers by the selected workplaces. A maximum of twelve employees was sampled using a probability mechanism. In workplaces with fewer than four employees, all employees were selected.

## **Data collection**

Data collection, data capture, preliminary editing and follow-up of non-respondents were all done in Statistics Canada Regional Offices. Interviewers in person collected the workplace survey data. The workplace questionnaire covered a wide range of topics. For about 20% of the surveyed units (mostly large workplaces), more than one respondent was required to complete the questionnaire. For the employee component, telephone interviews were conducted with persons who had agreed to participate in the survey by filling out and mailing in an employee participation form.

## Statistical edit and imputation

Following collection, all data were analyzed extensively. Extreme values were listed for manual inspection in order of priority determined by the size of the deviation from average behaviour and the size of their contribution to the overall estimate.

Respondents who opted not to participate in the survey—*total non-response*—were removed and the weights of the remaining units were adjusted upward to preserve the representativity of the sample. For respondents who did not provide all required fields—*item non-response*—a statistical technique called *imputation* was used to fill in the missing values for both employers and employees. The particular method that was selected for this purpose, *weighted hot-deck*, is based on first identifying respondents at a certain level called *imputation class*, and then from within the imputation class a donor is selected using a probability mechanism. The donor's value is then transferred to the missing field of the non-respondent.

The WES components were treated independently even if some questions on the employee questionnaire could have been imputed from the related workplace questionnaire.

## Estimation

The reported (or imputed) values for each workplace and employee in the sample are multiplied by the weight for that workplace or employee; these weighted values are summed up to produce estimates. An initial weight equal to the inverse of the original probability of selection is assigned to each unit. To calculate variance estimates, the initial survey weights are adjusted to force the estimated totals in each industry/region group to agree with the known population totals. These adjusted weights

are then used in forming estimates of means or totals of variables collected by the survey.

Variables for which population totals are known are called auxiliary variables. They are used to calibrate survey estimates to increase their precision. Each business location is calibrated to known population totals at the industry/region level. The auxiliary variable used for WES is total employment obtained from the Survey of Employment, Payrolls and Hours.

Estimates are computed for many domains of interest such as industry and region.

### **Data quality**

Any survey is subject to errors. While considerable effort is made to ensure a high standard throughout all survey operations, the resulting estimates are inevitably subject to a certain degree of error. Errors can arise due to the use of a sample instead of a complete census, from mistakes made by respondents or interviewers during the collection of data, from errors made in keying in the data, from imputation of a consistent but not necessarily correct value, or from other sources.

### **Sampling errors**

The true sampling error is unknown; however, it can be estimated from the sample itself by using a statistical measure called the *standard error*. When the standard error is expressed as a percent of the estimate, it is known as the relative standard error or *coefficient of variation*.

### **Non-sampling errors**

Some non-sampling errors will cancel out over many observations, but systematically occurring errors (i.e. those that do not tend to cancel) will contribute to a bias in the estimates. For example, if respondents consistently tend to underestimate their sales, then the resulting estimate of the total sales will be below the true population total. Such a bias is not reflected in the estimates of standard error. As the sample size increases, the sampling error decreases. However, this is not necessarily true for the non-sampling error.

### **Coverage errors**

Coverage errors arise when the survey frame does not adequately cover the target population. As a result, certain units belonging to the target population are either excluded (under-coverage), or counted more than once (over-coverage). In addition, out-of-scope units may be present on the survey frame (over-coverage).

### **Response errors**

Response errors occur when a respondent provides incorrect information due to misinterpretation of the survey questions or lack of correct information, gives wrong information by mistake, or is reluctant to disclose the correct information. Gross response errors are likely to be caught during editing, but others may simply go through undetected.

### **Non-response errors**

Non-response errors can occur when a respondent does not respond at all (total non-response) or responds only to some questions (partial non-response). These errors can have a serious impact on estimates if the

non-respondents are systematically different from the respondents in survey characteristics and/or the non-response rate is high.

### **Processing errors**

Errors that occur during the processing of data represent another component of the non-sampling error. Processing errors can arise during data capture, coding, editing, imputation, outlier treatment and other types of data handling. A coding error occurs when a field is coded erroneously because of misinterpretation of coding procedures or bad judgement. A data capture error occurs when data are misinterpreted or keyed in incorrectly.

### **Joint interpretation of measures of error**

The measure of non-response error and the coefficient of variation must be considered jointly to assess the quality of the estimates. The lower the coefficient of variation and the higher the response fraction, the better will be the published estimate.

### **Confidentiality**

The information presented in this publication has been reviewed to ensure that the confidentiality of individual responses is respected. Any estimate that could reveal the identity of a specific respondent is declared confidential, and consequently not published.

### **Response/non-response**

- a) **Response rate:** includes all units, which responded by providing “usable information” during the collection phase.
- b) **Refusal rate:** includes those units, which were contacted but refused to participate in the survey.

## APPENDIX B: INDUSTRY DEFINITIONS

<b>WES industry codes</b>	<b>Industry descriptions</b>	<b>3-digit North American industry classification system (NAICS)</b>
01	Forestry, mining, oil and gas extraction	113, 115, 211, 212, 213
02	Labour intensive tertiary manufacturing	311, 312, 313, 314, 315, 316, 337, 339
03	Primary product manufacturing	321, 322, 324, 327, 331
04	Secondary product manufacturing	325, 326, 332
05	Capital intensive tertiary manufacturing	323, 333, 334, 335, 336
06	Construction	231, 232
07	Transportation, storage, warehousing, wholesale trade	411, 412, 413, 414, 415, 416, 417, 418, 419, 481, 482, 483, 484, 485, 486, 487, 488, 493
08	Communication and other utilities	221, 491, 492, 562
09	Retail trade and consumer services	441, 442, 443, 444, 445, 446, 447, 448, 451, 452, 453, 454, 713, 721, 722, 811, 812
10	Finance and insurance	521, 522, 523, 524, 526
11	Real estate, rental and leasing operations	531, 532
12	Business services	533, 541, 551, 561
13	Education and health services	611, 621, 622, 623, 624, 813
14	Information and cultural industries	511, 512, 513, 514, 711, 712
<b>Industrial activities excluded from WES</b>		<b>3-digit North American industry classification system (NAICS)</b>
Crop production/animal production		111, 112
Fishing, hunting and trapping		114
Private households		814
Federal government public administration		911
Provincial and territorial public administration		912
Local, municipal and regional public administration		913
Aboriginal public administration		914
International and other extra-territorial public administration		919

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