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Guide to the Analysis of the Workplace and Employee Survey

2004

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Note of appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

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Appendices

Note to Research Data Centre (RDC) users: Several identification variables are not available in the RDCs in order to protect respondent confidentiality. Variables which are not available in the RDCs are shown with an (HO) for head office in the data dictionary.

Note on 2003 employee revision

This revision is the result of corrections made to the employer start date (STRTEMP) and the job start date (STRTJOB) for 186 employees (less than 1% of the sample). In these cases the start date for the job came before the start date with the employer. For these records, the corrections to dates had an impact on the following dependant variables: MTH_LAST, MTH_UNEM, NO_OTH, PRV_ACT, PRV_CPU, PRV_EARN, PRV_FREQ, PRV_HRS, PRV_OCP, PRV_PSN, PRV_TRN, RSN_LV, TTL_EMP, UNEMPL2, WK_LOOK, WRK_OTH, YRS_EXP.

Also while preparing this release, an error was discovered and corrected in the employer linked weights for 2002. This correction also affects the employee weights for the same year. Our analysis reveals that the effect of these changes is small at the industry-region level.

Revisions have also been made to the change indicator employee files for 1999, 2001 and 2003. These files reflect if any change occurred to a variable due to logic, manual change or imputation. Although seldom used, we decided none the less to include them as part of this revision.

As a precaution, we encourage users to redo their analysis in order to gauge the effect of these corrections on their work.

What's new?

Workplace
There are no new, modified or deleted questions.

Employee
There are no new, modified or deleted questions.

Quick start guide

This quick start guide is intended to give experienced microdata users the information they need to begin accessing Workplace and Employee Survey data. The following links provide the necessary information to get started. Please read the notes that follow the links to ensure proper use and interpretation of the data.

The electronic data dictionary 71-221-XWE and the questionnaires are available on www.statcan.ca.

1. **Use the survey weights in all analyses.** The employer survey is based on a stratified sample design that incorporates information on region, industry and employment size. Employees are selected randomly within each sampled business location. The sample is not "self representing" and failure to use the weights will result in estimates that do not relate to a known population. To those familiar with the term, we are strong advocates of "design based estimation".

2. **Use the appropriate survey weights.** There are three sets of survey weights available per year: employer weights, employee weights and employer-linked weights. The reasons for the first two sets of weights are obvious; studies can be carried out independently at both the employer and employee levels of the WES. However, there are a number of locations from which we receive employer responses, but no employee responses. These 'voids' are built into the employee weights, but necessitate a separate set of weights (the employer-linked weights) for employer-side analyses that incorporate employee characteristics. To determine the correct weight for your analysis, refer to *Appendix 5: Analysis and the Proper Weight.*

3. **Account for the survey design in variance calculations.** Even though the use of the appropriate survey weights will result in consistent estimates, most software packages will underestimate the variance of the estimates because they do not account for the design of the survey. Refer to *Appendix 8: Variance Calculation*, where we describe how to calculate correct variances (or reasonable approximations) in several different ways. Calculating an appropriate variance is the only way to determine the precision of the estimates and relationships that support your analyses.

4. **Choose an appropriate model for linked analyses**. Combining variables from both the employer and employee surveys will enhance many analyses and open new avenues of research; however such linked studies will require careful selection of the statistical model. Multi-level data will not conform to the assumptions of most simple statistical models. Refer to *Appendix 6: Linked Analysis* where some of the appropriate techniques are briefly discussed. A bibliography of more detailed applications of these techniques is also included.

5. **Micro data.** Files with a prefix 'IM' for data and 'EI' for change indicators such as edit and imputation levels.

6. **Dummy data**. Files with a prefix 'DM' for data and 'DE' for change indicators such as edit and imputation levels.

All the files mentioned in section 5 to 6 are available in SAS, SPSS and STATA.

Appendix 1

Introduction

Why have a linked workplace and employee survey?

Advanced economies are constantly evolving. The key stimuli for this evolution are new technologies (particularly information technologies), increasing international competition and the continued expansion of transnational enterprises. Firms respond in a number of ways: increasingly embracing new technologies; re-organizing or re-engineering their workforces; or resorting to downsizing or other elements of numerical flexibility. For firms, these trends create challenges in the management and development of human resources. For policy-makers, education and training are central policy prescriptions for increasing prosperity.

In this evolving environment, firms are thought to have undergone dramatic change in the areas of technology adoption, organizational change, training patterns, business strategies, levels of competition, and the manner in which they engage labour. Workers, on the other hand, experience this evolution through changes in job creation rates, job stability, wages and wage inequality, training, the use of advanced technologies, and the type of employment contracts available.

Due to a well-developed set of household (worker) surveys, we in Canada have a good understanding of workers' outcomes regarding wages and wage inequality, job stability and layoffs, training, job creation, and unemployment. What has been 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 demand-side pressures, which stem from global competition, technological change, and the drive to improve human capital, among other things. Thus, one primary goal of the 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 Figure 1. This chart displays the main content blocks in the two surveys. Note that there is reference to workplace and worker outcomes. Analysis of these events can be informed not only by the characteristics of the workplace -- as has been done in other firm surveys -- but also by the characteristics of the workers. Similarly, worker outcomes can be informed not only by data on the workers themselves, as has always been the case, but also by new workplace data.

For example, this link allows changes in the levels and distributions of wages of workers to be associated with events occurring in workplaces, such as the adoption of technology, or competing in international markets. Much of the earnings inequality literature suggest that technology and rising international trade are major contributors to inequality. Research on many other labour market issues are enhanced by the existence of such a link. Issues that have formerly been considered primarily from the supply side, often within the context of a human capital model, can be viewed increasingly from the demand side of the labour market. This might include issues such as job stability, the determinants of wages, the creation and destruction of different types of jobs, training levels among different types of workers, etc.

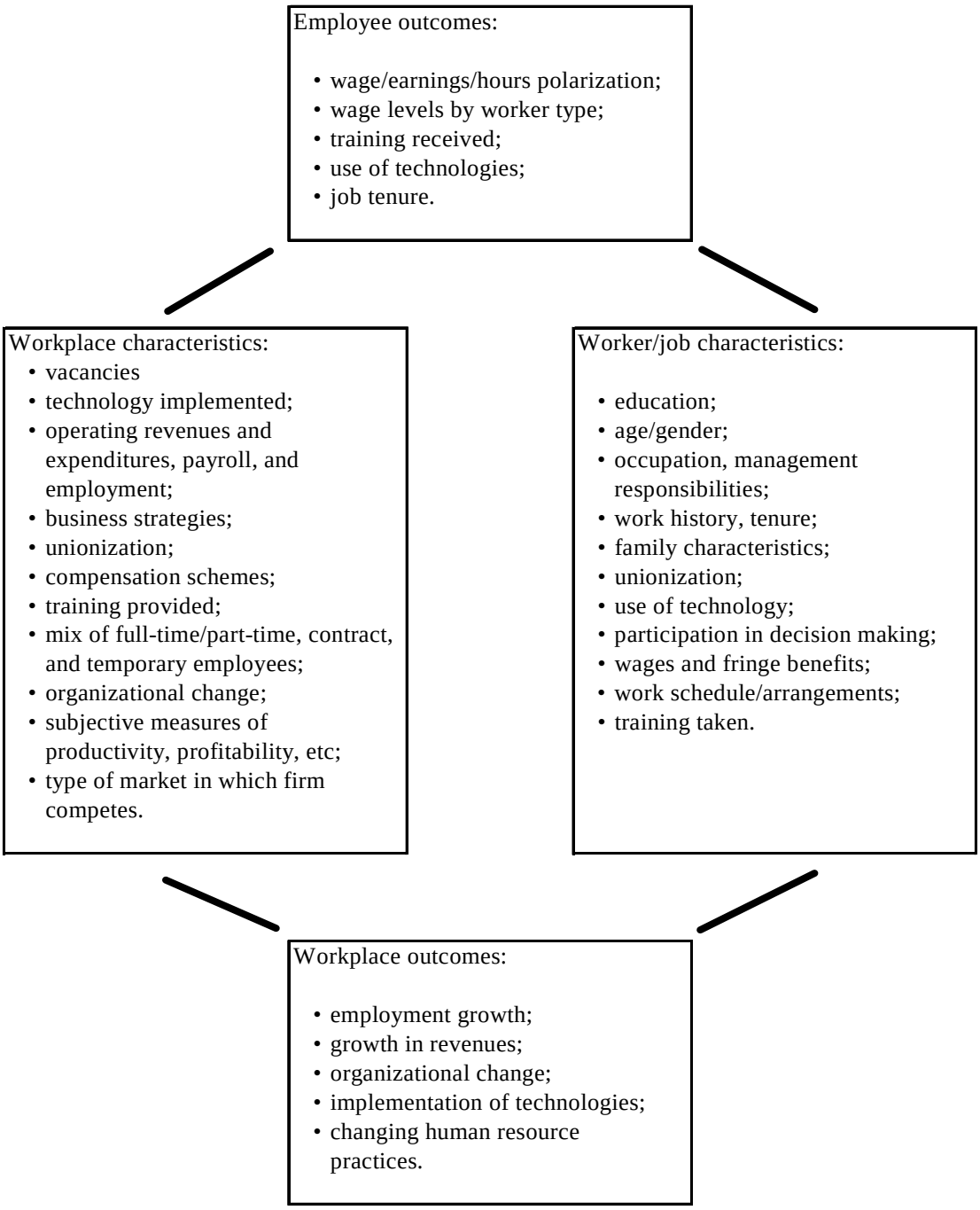
The workplace-worker link also contributes to improved measurement of a number of workplace–level variables. The characteristics of a workplace's workforce are often an important determinant of the behavior of a firm. However, data on workforce characteristics have been lacking or poorly measured in workplace surveys. The WES allows workplace variables -- such as training incidence and intensity, occupational and educational distribution of the workforce, use of technology by the workers, various workplace practices such as quality circles, fringe benefit levels, the distribution of wages, and a host of others -- to be better measured than in the past. Workers can provide more reliable and detailed data on these variables than can workplace level respondents.

The second goal of the survey is to develop a better understanding of what is indeed occurring in companies in an era of substantial evolution. Just how many companies have implemented new information technologies? On what scale? What kind of training is associated with this? What type of organizational change is occurring in firms? What types of business strategies are firms relying on to thrive during this period of change, and do they vary dramatically across firms? How important are human resource development activities and strategies, or are they largely ignored by most workplaces? Do firms that adopt one set of strategies in fact adopt many (e.g., adoption of technologies, innovation, human resource development, and organizational changes)? Is there a set of high-performance workplaces that tend to move on many fronts? These are the kinds of issues addressed in the WES.

While the available household surveys inform us about significant labour market changes, there has not been a corresponding set of workplace surveys that deal with new concerns. Some limited survey work has been done. The WES is an attempt to extend this in the context of a general worker–workplace survey.

Finally, the third objective is to extend surveying infrastructure. To a considerable extent WES is seen as the development of the infrastructure necessary to conduct integrated workplace-household surveys. Core content are repeated over successive waves of the survey, while content covering less frequent events are cycled out in alternative waves. Based on the assessment of response burden and data quality across several waves, new content is cycled in to meet changing information needs.

Figure 1: The workplace and employee survey conceptual framework



Appendix 2

Concepts and definitions

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). The employer sample is longitudinal – the sampled locations are followed over time, with the periodic addition of samples of new locations to maintain a representative cross section. Employees are 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 are drawn on every second survey occasion (i.e. first, third, fifth). This longitudinal aspect allows researchers to study both employer and employee outcomes over time in the evolving workplace.

Table A2.1 Sample sizes and estimated populations, 1999

Industry, workplace size, region	Workplace		Employee	
	Respondents	Estimated population	Respondents	Estimated population
	number			
Overall	**6,322**	**738,324**	**23,540**	**10,867,614**
Industry				
Forestry, mining, oil and gas extraction	292	13,825	1,100	186,729
Labour intensive tertiary manufacturing	408	22,806	1,556	535,632
Primary product manufacturing	320	7,493	1,392	395,379
Secondary product manufacturing	293	12,852	1,143	373,157
Capital intensive tertiary manufacturing	359	17,140	1,429	589,544
Construction	608	56,900	2,021	413,746
Transportation, warehousing and wholesale trade	711	89,405	2,782	1,109,613
Communication and other utilities	421	9,353	1,326	236,226
Retail trade and consumer services	524	234,731	1,764	2,572,687
Finance and insurance	506	38,474	1,841	525,016
Real estate, rental and leasing operations	364	31,863	1,098	195,257
Business services	468	83,418	1,728	1,009,564
Education and health services	704	103,780	2,986	2,382,418
Information and cultural industries	344	16,285	1,374	342,647
Workplace size				
1 to 19 employees	2,789	645,238	5,607	3,441,317
20 to 99 employees	1,711	79,937	7,780	3,084,911
100 to 499 employees	1,300	11,302	6,672	2,089,123
500 employees or more	522	1,846	3,481	2,252,263
Region				
Atlantic	774	63,077	2,892	711,809
Quebec	1,427	164,790	5,510	2,597,613
Ontario	1,577	263,231	5,781	4,332,383
Manitoba	420	27,042	1,556	407,144
Saskatchewan	342	29,954	1,221	332,480
Alberta	852	80,756	3,089	1,105,359
British Columbia	930	109,474	3,491	1,380,825

Table A2.2 Estimation response rates, 1999

	Response rates	
	Workplace	Employee
	%	
Overall	**95.2**	**82.8**

Table A2.3 Sample sizes and estimated populations, 2000

Industry, workplace size, region	Workplace		Employee	
	Respondents	Estimated population	Respondents	Estimated population
	number			
Overall	**6,068**	**686,680**	**20,167**	**10,867,614**
Industry				
Forestry, mining, oil and gas extraction	278	12,626	970	194,290
Labour intensive tertiary manufacturing	389	21,905	1,299	555,131
Primary product manufacturing	306	7,115	1,221	393,419
Secondary product manufacturing	275	12,420	961	380,104
Capital intensive tertiary manufacturing	344	16,505	1,225	556,640
Construction	576	49,035	1,681	405,579
Transportation, warehousing and wholesale trade	687	82,181	2,367	1,115,830
Communication and other utilities	394	8,701	1,142	235,661
Retail trade and consumer services	540	222,167	1,538	2,597,374
Finance and insurance	485	36,030	1,621	530,962
Real estate, rental and leasing operations	325	26,749	842	189,491
Business services	460	79,148	1,462	1,003,825
Education and health services	680	97,202	2,652	2,374,268
Information and cultural industries	329	14,896	1,186	335,040
Workplace size				
1 to 19 employees	2,600	591,413	4,885	3,531,425
20 to 99 employees	1,684	81,840	6,604	3,128,181
100 to 499 employees	1,280	11,566	5,724	2,079,137
500 employees or more	504	1,861	2,954	2,128,871
Region				
Atlantic	746	59,540	2,578	711,809
Quebec	1,365	150,825	4,525	2,597,613
Ontario	1,529	253,517	4,983	4,332,383
Manitoba	400	22,979	1,375	407,668
Saskatchewan	323	27,114	1,091	331,956
Alberta	821	75,974	2,602	1,105,359
British Columbia	884	96,730	3,013	1,380,825

Table A2.4 Estimation response rates, 2000

	Response rates	
	Workplace	Employee
	%	
Overall	**90.8**	**86.9**

Table A2.5 Sample sizes and estimated populations, 2001

Industry, workplace size, region	Workplace		Employee	
	Respondents	Estimated population	Respondents	Estimated population
	number			
Overall	**6,207**	**734,127**	**20,352**	**11,640,536**
Industry				
Forestry, mining, oil and gas extraction	256	11,480	878	197,007
Labour intensive tertiary manufacturing	380	23,534	1,203	575,600
Primary product manufacturing	303	8,874	1,177	416,559
Secondary product manufacturing	290	13,773	972	410,322
Capital intensive tertiary manufacturing	364	17,719	1,403	617,043
Construction	569	51,532	1,692	481,199
Transportation, warehousing and wholesale trade	685	79,635	2,271	1,203,365
Communication and other utilities	408	11,126	1,063	240,461
Retail trade and consumer services	568	222,753	1,651	2,762,570
Finance and insurance	462	37,756	1,686	544,068
Real estate, rental and leasing operations	336	32,828	852	206,186
Business services	523	105,777	1,500	1,180,291
Education and health services	701	99,330	2,796	2,433,941
Information and cultural industries	362	18,009	1,208	371,921
Workplace size				
1 to 19 employees	2,709	633,971	4,766	3,586,232
20 to 99 employees	1,726	86,270	6,795	3,519,522
100 to 499 employees	1,266	11,983	5,409	2,246,596
500 employees or more	506	1,903	3,382	2,288,186
Region				
Atlantic	754	61,894	2,245	761,445
Quebec	1,404	161,344	4,318	2,766,182
Ontario	1,521	274,308	5,888	4,615,319
Manitoba	395	25,202	1,239	446,720
Saskatchewan	334	27,703	1,028	341,653
Alberta	873	78,024	2,514	1,231,706
British Columbia	926	105,653	3,120	1,477,511

Table A2.6 Estimation response rates, 2001

	Response rates	
	Workplace	Employee
	%	
Overall	**85.9**	**86.9**

Table A2.7 Sample sizes and estimated populations, 2002

Industry, workplace size, region	Workplace		Employee	
	Respondents	Estimated population	Respondents	Estimated population
	number			
Overall	**5,818**	**668,876**	**16,813**	**11,640,536**
Industry				
Forestry, mining, oil and gas extraction	234	9,059	750	199,523
Labour intensive tertiary manufacturing	357	20,820	987	573,041
Primary product manufacturing	287	8,568	1,035	425,420
Secondary product manufacturing	266	12,784	785	404,159
Capital intensive tertiary manufacturing	335	16,778	1,145	625,883
Construction	548	48,474	1,327	530,086
Transportation, warehousing and wholesale trade	650	71,312	1,821	1,195,016
Communication and other utilities	367	9,895	878	239,355
Retail trade and consumer services	555	211,067	1,371	2,780,819
Finance and insurance	436	34,326	1,418	536,971
Real estate, rental and leasing operations	296	28,665	652	225,979
Business services	478	87,905	1,230	1,105,104
Education and health services	677	93,598	2,436	2,429,917
Information and cultural industries	332	15,625	978	369,263
Workplace size				
1 to 19 employees	2,437	568,742	3,883	3,608,696
20 to 99 employees	1,654	86,351	5,542	3,582,765
100 to 499 employees	1,229	11,890	4,477	2,182,646
500 employees or more	498	1,894	2,911	2,266,429
Region				
Atlantic	695	54,196	1,908	756,753
Quebec	1,333	149,289	3,595	2,769,148
Ontario	1,437	251,506	4,879	4,613,725
Manitoba	371	22,689	1,008	449,410
Saskatchewan	308	24,752	838	328,889
Alberta	809	71,987	2,066	1,240,121
British Columbia	865	94,458	2,519	1,482,491

Table A2.8 Estimation response rates, 2002

	Response rates	
	Workplace	Employee
	%	
Overall	**84.0**	**90.9**

Table A2.9 Sample sizes and estimated populations, 2003

Industry, workplace size, region	Workplace		Employee	
	Respondents	Estimated population	Respondents	Estimated population
	number			
Overall	**6,565**	**723,787**	**20,834**	**12,119,794**
Industry				
Forestry, mining, oil and gas extraction	246	7,739	844	184,886
Labour intensive tertiary manufacturing	380	21,845	1,110	606,796
Primary product manufacturing	318	7,912	1,188	390,890
Secondary product manufacturing	277	13,056	880	421,881
Capital intensive tertiary manufacturing	358	16,589	1,186	607,310
Construction	640	61,383	1,797	551,522
Transportation, warehousing and wholesale trade	756	79,246	2,421	1,222,166
Communication and other utilities	431	10,245	1,114	243,258
Retail trade and consumer services	655	233,733	1,853	2,916,450
Finance and insurance	478	35,586	1,647	565,604
Real estate, rental and leasing operations	349	32,771	916	218,211
Business services	571	89,969	1,776	1,245,004
Education and health services	740	96,708	2,888	2,550,635
Information and cultural industries	366	17,004	1,214	395,181
Workplace size				
1 to 19 employees	2,814	617,404	4,665	3,641,990
20 to 99 employees	1,916	91,251	7,290	3,584,929
100 to 499 employees	1,318	13,145	5,546	2,481,138
500 employees or more	517	1,986	3,333	2,411,737
Region				
Atlantic	774	57,660	2,376	800,705
Quebec	1,488	163,678	4,252	2,900,245
Ontario	1,707	263,766	6,084	4,753,936
Manitoba	416	25,583	1,331	449,645
Saskatchewan	335	28,098	1,078	377,779
Alberta	912	83,029	3,031	1,323,020
British Columbia	933	101,973	2,682	1,514,463

Table A2.10 Estimation response rates, 2003

	Response rates	
	Workplace	Employee
	%	
Overall	**83.1**	**82.7**

Table A2.11 Sample sizes and estimated populations, 2004

Industry, workplace size, region	Workplace		Employee	
	Respondents	Estimated population	Respondents	Estimated population
	number			
Overall	**6,159**	**660,951**	**16,804**	**12,119,794**
Industry				
Forestry, mining, oil and gas extraction	221	6,576	679	169,078
Labour intensive tertiary manufacturing	348	19,842	829	567,307
Primary product manufacturing	266	6,715	882	354,412
Secondary product manufacturing	286	13,774	765	531,462
Capital intensive tertiary manufacturing	330	15,706	971	605,227
Construction	609	55,944	1,416	562,669
Transportation, warehousing and wholesale trade	735	79,609	1,964	1,290,602
Communication and other utilities	390	8,809	894	242,197
Retail trade and consumer services	620	203,340	1,444	2,855,505
Finance and insurance	454	34,597	1,336	561,759
Real estate, rental and leasing operations	326	30,149	732	215,771
Business services	530	80,633	1,439	1,205,515
Education and health services	715	90,621	2,471	2,556,074
Information and cultural industries	329	14,635	982	402,215
Workplace size				
1 to 19 employees	2,528	552,047	3,753	3,597,585
20 to 99 employees	1,820	93,175	5,592	3,637,058
100 to 499 employees	1,294	13,764	4,545	2,465,703
500 employees or more	517	1,966	2,914	2,419,448
Region				
Atlantic	739	54,808	1,942	800,705
Quebec	1,390	150,140	3,418	2,900,245
Ontario	1,611	238,924	4,925	4,753,936
Manitoba	391	23,367	1,078	459,988
Saskatchewan	316	26,582	884	367,436
Alberta	845	76,989	2,474	1,323,020
British Columbia	867	90,141	2,083	1,514,463

Table A2.12 Estimation response rates, 2004

	Response rates	
	Workplace	Employee
	%	
Overall	**81.7**	**85.7**

Target population

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

- Employers in Yukon, Nunavut and Northwest Territories

- Employers operating in crop production and animal production; fishing, hunting and trapping; private households, religious organizations and public administration.

The target population for the employee component is all employees working or on paid leave in March 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 employer 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 operating in Canada, and is updated each month using data from various surveys, profiling of businesses and administrative sources.

Applicable population

Workplace
The applicable population follows the flow of the questionnaire and represents the estimated population of workplaces based on our sample.

Employee
The applicable population follows the flow of the questionnaire and represents the estimated population of employees based on our sample.

Reference period

There are two reference periods used for the WES. Questions concerning employment breakdown use the last pay period of March for the reference year while other questions refer to the last 12-month period ending in March of the reference year.

Sample design

The survey frame is a list of all locations 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 and classification information for the selected units.

Workplace survey

The survey frame of the Workplace component of WES is created from the information available on the Statistics Canada Business Register.

Prior to sample selection, the business locations on the frame are stratified into relatively homogeneous groups called *strata*, which are then used for sample allocation and selection. The WES frame is stratified by industry (14), region (6), and size (3), which is defined using estimated employment. The size stratum boundaries are typically different for each industry/region combination. The cut-off points defining a particular size stratum are computed using a model-based approach. The sample is selected using Neyman allocation. This process partitions the target population into 252 strata. In 1999, 9,043 business locations were selected. In 2001, 1,792 locations were added for a total of 10,815. In 2003, 2,332 locations were added for a total of 13,147 business locations.

All sampled units are 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 are 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 2003 WES survey collected data from 6,565 out of the 8,065 sampled employers. The remaining employers were 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.

The initial sample selected in 1999 is followed over time and is supplemented at two-year intervals with a sample of births selected from units added to the Business Register since the last survey occasion. Stratification of units remains constant over the life of the initial panel (set at 8 years). Whenever possible, the same sampling fractions are applied to all panels. Sometimes the sampling fractions are adjusted to offset stratum erosion, or to compensate for upswings or downswings in the economy. For 2001, they were revised slightly upward. This resulted in a birth panel of 1,792 workplaces. For 2003 this resulted in a birth panel of 2,332 workplaces.

Employee survey

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

Data collection

Data collection, data capture, preliminary editing and follow-up of non-respondents are all done in Statistics Canada Regional Offices. In 1999, workplace data were collected in person. Starting in 2000, computer assisted telephone interviews are conducted. For about 20% of the surveyed units (mostly large workplaces), more than one contact person is required. For the employee component, telephone interviews are conducted with persons who agree to participate in the survey by filling out and mailing in an employee participation form.

Statistical edit and imputation

Following collection, all data are analyzed extensively. Extreme values are 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 opt not to participate in the survey – *total non-response* – are removed and the weights of the remaining units are adjusted upward to preserve the representativity of the sample. For respondents who do not provide all required fields – *item non-response* – a statistical technique called *imputation* is used to fill in the missing values for both employers and employees.

The WES components are treated independently even though some questions on the employee questionnaire can be 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

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. This is true in every survey. The total survey error can be divided into two main components: the sampling error and the nonsampling errors. The sampling error is due to the fact that estimates are computed using only a sample of the whole population instead of a complete census while the nonsampling errors are due to all other causes such as an imperfect frame, measurement errors or nonresponse. For instance, measurement errors can arise from mistakes made by respondents or interviewers during the collection of data, from errors made in keying in the data, or from other sources. This type of error may lead to the imputation of consistent but not necessarily correct values.

In WES, the sampling error and part of the nonresponse and frame errors are dealt with by attaching an estimation weight, called the final weight, to each sampled unit (workplace or employee) for which we have data; be they imputed or not. The remaining of the nonresponse error is dealt with through the imputation of missing data. The editing stage of the survey attempts to minimize the effect of measurement errors. This stage involves outlier detection and different validation steps. The boundary between editing and data quality is fuzzy. The former is performed to improve the latter.

If there were no nonsampling error, the weighting strategy would ensure that the estimates are approximately design unbiased in the sense that the expectation over all possible samples of the survey

error would be approximately equal to zero. To evaluate the quality of an estimate and to obtain valid inferences, measures of precision, such as the estimated coefficient of variation, are usually computed. The estimated coefficient of variation is defined as the square root of the estimated design variance of an estimate over the estimate itself. The design variance is the hypothetical variability of the estimates taken over all possible samples that could have been drawn under the sampling design. Since only one sample is selected in practice, the design variance is unknown. However, it can be estimated using only one sample (in WES, the mean bootstrap technique is used), which allows the desired measures of precision to be obtained. Note that smaller coefficients of variation imply better quality of the estimates.

The WES sample was designed to be efficient for estimating totals at an industry by region by size level within the available budget. The projected coefficients of variation were around 5% for industry and 10% for industry by region for variables highly correlated with employment. When estimates are produced, they are compared to the projected precision. Approximately 60% of all estimates of totals exceeded expectation with another 25% being within the Statistics Canada publishable cut-off of 33%. The remaining 15% were not publishable by our standards. These were mostly estimates not highly correlated with employment. All estimates falling into the unpublishable category are validated.

To validate estimates of key financial variables such as revenues and expenditures, comparisons were made with the United Enterprise Survey, the Annual Retail and Wholesale Trade Survey, and the Census of Manufacturing. Other data sources such as LEAP were used to assess survey coverage and death rates. On the employee side comparisons were made with wage data collected by the Survey of Labour and Income Dynamics and the Labour Force Survey. Other variables were scrutinized as well. Most of these data verification activities took place during the revision of the 1999 wave. Since then, data are rigorously validated and edited each year of the survey to ensure sufficient data quality.

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 percentage 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 judgment. 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 publications is 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.

Table A2.13 Industry definitions

WES industry codes	Industry descriptions	North American Industry Classification System codes (NAICS 2002)
01	Forestry, mining, oil and gas extraction	113, 1153, 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, 236, 237, 238
07	Transportation, warehousing and 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 & 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, leasing operations	531, 532, 533
12	Business services	541, 551, 561
13	Education and health services	611, 621, 622, 623, 624, 8132, 8133, 8134, 8139
14	Information and cultural industries	511, 512, 513, 514, 711, 712

Industrial activities excluded from WES	North American Industry Classification System codes (NAICS 2002)
Crop production, animal production, support activities	111, 112, 1151, 1152
Fishing, hunting and trapping	114
Religious organizations	8131
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

Occupation definitions

A. Employee

Any person receiving pay for services rendered in Canada or for paid absence, and for whom you are required to complete a Canada Customs and Revenue Agency T-4 Form.

Employee:

A. Full-time employee: An employee working 30 or more hours per week.
B. Part-time employee: An employee working less than 30 hours per week.
C. Permanent employee: An employee who has no set termination date.
D. Non-permanent employee: An employee who has a set termination date or an agreement covering the period of employment (e.g. temporary or seasonal).

B. Independent contractor

A person providing products or services under contract with your location but for whom the completion of a Canada Customs and Revenue Agency T-4 Form is not required. This person may be an employee of another business or a home worker (e.g. computer consultant, piecework seamstresses, etc).

C. Management:

1. Managers

(a) Senior managers

Include the most senior manager in the workplace and other senior managers whose responsibilities would normally span more than one internal department. Most small workplaces would only have one senior manager. Examples: president of single location company; retail store manager; plant manager; senior partners in business services firms; production superintendent; senior administrator in public services enterprise; as well as vice-presidents, assistant directors, junior partners and assistant administrators whose responsibilities cover more than one specific domain.

(b) Specialist managers

Managers who generally report to senior management and are responsible for a single domain or department. This category would normally include assistant directors or the equivalent in small workplaces. Examples: department heads or managers (engineering, accounting, R&D, personnel, computing, marketing, sales, etc.); heads or managers of specific product lines; junior partners or assistant administrators with responsibilities for a specific domain; and assistant directors in small locations (without an internal department structure).

D. Non-management:

1. Professionals

Employees whose duties would normally require at least an undergraduate university degree or the equivalent. Examples: medical doctors, lawyers, accountants, architects, engineers, economists, science professionals, psychologists, sociologists, registered nurses, marketing and market research professionals, nurse-practitioners and teaching professionals. Include computing professionals whose duties would

normally require a minimum of an undergraduate degree in computer science. Include professional project managers and supervisors not included in senior managers (C.1 (a)) and specialist managers (C.1 (b)).

2. Technical or trades

Composed of:

(a) Technical or semi-professional workers

Employees whose duties would normally require a community college certificate /diploma or the equivalent and who are not primarily involved in the marketing /sales of a product or service. Examples: technologists, lab technicians, registered nursing assistants, audio-visual technicians; ECE-trained caregivers; technology trainers; legal secretaries and draftspersons. Include computer programmers and operators whose duties would normally require a community college certificate or diploma. Include semi-professional project managers and supervisors not included managers (C.1) and professionals (D.1).

(b) Trades or skilled production, operation and maintenance

Non-supervisory staff in positions requiring vocational /trades accreditation or the equivalent. Examples: construction trades, machinists, machine tenders, stationary engineers, mechanics, beauticians /barbers /hairdressers, butchers and repair occupations that do not normally require a post-secondary certificate or diploma.

3. Marketing or sales

Non-supervisory staff primarily engaged in the marketing / sales of products or services. Examples: retail sales clerks, waiters/waitresses, telemarketers, real estate agents, insurance agents and loans officers. Exclude employees whose duties require a university degree and professional accreditation (professionals (D.1)), those whose duties require a community college certificate /diploma (technical/trades (D.2)) and those whose duties are primarily supervisory (managers (C.1)).

4. Clerical or administrative

Non-supervisory staff providing clerical or administrative services for internal or external clients. Examples: secretaries, office equipment operators, filing clerks, account clerks, receptionists, desk clerks, mail and distribution clerks, bill collectors and claims adjusters. Duties do not normally require post-secondary education nor responsibility for marketing or sales.

5. Production workers with no trade or certification, operation and maintenance

Non-supervisory staff in production or maintenance positions that require no vocational /trades accreditation or the equivalent in on-the-job training. Examples: assemblers, packers, sorters, pilers, machine operators, transportation equipment operators (drivers), warehousemen, and cleaning staff. As a rough guideline, jobs in this category require no more than a one-month training for someone with no trade or vocational accreditation.

6. Other

If you have a large number of employees who do not correspond to any of the above categories, please write in their occupation(s) in the space provided below.

Table A2.14 Concordance to the WES occupational classification

WES	Standard Occupational Classification (SOC) 1991
01 Managers	A011 to A016; A111 to A114; A121 to A122; A131; A141; A211 A221 to A222; A301 to A303; A311 to A312; A321 to A324; A331 to A334; A341 to A343; A351 to A353; A361; A371 to A373; A381; A391 to A392; E037;
02 Professionals	B011 to B014; B021, B022; B313; B315 to B318; C011 to C015; C021 to C023; C031 to C034; C041 to C048; C051 to C054; C061 to C063; C111 to C113; C121; C152; 162, C163; D011 to D014; D021 to D023; D031, D032; D041 to D044; D111, D112; D211; D232; E011, E012; E021 to E025; E031 to E036; E038; E111, E112; E121; E130 to E133; E211 to E214; E216; F011 to F013; F021 to F025; F031 to F034; F111; F121; F123; F143;
03 Technical or trades	B111 to B116; B212 to B214; B311, B312; B314; B411 to B415; B576; C122 to C125; C131 to C133; C141 to C144; C151; C153 to C155; C161; C164; C171 to C175; D212 to D219; D221 to D223; D231; D233 to D235; D311 to D313; E215; F035, F036; F112; F122; F124 to F127; F131, F132; F141, F142; F144, F145; F151 to F154; G011 to G016; G111; G121; G133, G134; G411, G412; G512; G611, G612; G621 to G625; G631; G711, G712; G722; G812, G813; G911, G912; G921, G922; G933; G941, G942; G951; G981; H011 to H019; H021, H022; H111 to H113; H121, H122; H131 to H134; H141, H145; H211 to H217; H221, H222; H311, H312; H321 to H325; H411 to H418; H421, H422; H431 to H435; H511, H514; H521 to H523; H531 to H535; H611, H612; H621 to H623; H711 to H714; H721, H722; H731; H736, H737; I011 to I017; I021, I022; I111; I121, I122; I131, I132; I141, I142; I151; I161, I162; I171, I172 I182; J011 to J016; J021 to J027; J111 to J114; J121 to J125; J131 to J134; J141 to J146; J151 to J154; J161, J162; J164; J171, J172; J174, J175; J181 to J184; J191; J193 to J197; J211; J213; J215, J216; J221, J223; J225; J227, J228;
04 Marketing or sales	G131, G132; G211; G311; G511; G513; G713, G714; G973;
05 Clerical or administrative	B211; B511, B514; B521 to B524; B531 to B535; B541 to B543; B551 to B554; B561 to B563; B571 to B575; G715; G721; G972;
06 Production workers	G731, G732; G811; G814; G923, G924; G931, G932; G961, G962; G971; G982, G983; H732 to H735; H811, H812; H821, H822; H831, H832; I181; I211 to I216; J163; J173; J192; J212; J214; J217; J224: J226; J311 to J319;

Appendix 3

Editing, outlier detection, and imputation

To maximize the usability of the collected information, one engages in three principal activities, *editing, outlier detection, and imputation*, to ensure that the final data are of the highest quality. Editing is an interactive process whereby the respondent is asked to confirm information that either appears suspect or does not follow some pre-specified general rules governing the data to be collected. This process takes place in the field during data collection.

The detection of outliers is a statistical technique used to identify anomalous responses that either evaded edits, or that did not conform to the correlation structure of the majority of the data (did not follow known relationships). An outlying observation may be classified into two categories, *representative* and *non-representative*. The former has to be left intact as it represents other units in the population that exhibit the same characteristics. The latter, however, should be treated to prevent it from having a significantly positive or negative impact on the estimates. Both types of outliers should be flagged for possible exclusion from imputation.

Imputation is a statistical technique used to fill in information that the respondent fails to provide. It can be applied to records with either partially (certain items have not been collected) or fully (no items have been collected) missing data. This process takes place in the head office after all data have been received and have gone through outlier detection and treatment.

Editing of data

The workplace questionnaire contains nine distinct blocks. Each block focuses on a different theme. In most cases a single respondent will be able to answer all the questions. If the primary respondent is unable to provide the requested information in its entirety, then he or she will be asked to identify the person privy to this information.

The employer CATI (Computer Assisted Telephone Interviewing) capture vehicle performs validity, range, and inter-field edits. These are the types of edits that are performed during the collection of the first wave data. For subsequent waves a suitable set of historical edits has been developed. The majority of inter-field edits are confined to a single content block. If an edit failure occurs between blocks, then the primary respondent is asked to confirm the information.

An example of a validity edit is that total annual expenditures be positive. The corresponding range edit requires that expenditures not exceed an upper bound. A related inter-field edit for total annual expenditures ensures that the sum of annual gross payroll and non-wage expenditures does not exceed total annual expenditures.

The employee CATI application performs validity, range, inter-field and historical edits. Any edit failures are resolved during the telephone interview.

Outlier detection

The use of CATI for data collection greatly reduces the number of response and typographical errors. The system incorporates basic data validation and verification of known relationships such as full time and part time employment not exceeding total employment. To detect errors that have eluded the CATI

application, both micro and macro level analysis of questionable responses is performed to protect the coherence of the data.

At the macro level, the top ten contributors to their respective estimates are investigated along with the records comprising an estimate that has undergone a relatively large change from year to year. This change may be positive or negative. The two techniques are related as an unusually large contributor to an estimate may also be the cause for its large change. To make the analysis more efficient, an expected contribution of a unit to an estimate is computed using the reported employment. This is then compared to the corresponding observed contribution. A test is conducted to determine if the difference between the expected and observed contributions is significant. The approach works well for variables well correlated with employment, and is still a good indicator of potential problems even for variables whose correlation with employment is weaker.

When large year-to-year changes are detected in the estimates, all corresponding records are investigated. In many cases the change may be real if a particular sector experiences a period of strong growth or decline. No one record contributes a significant amount to the estimate but the cumulative effect of small changes causes the numbers to change dramatically. The macro analysis is univariate and as such may not detect problems between variables.

At the micro data level, a univariate outlier detection routine is applied to all complete and partial respondents prior to imputation. The outlier detection is performed on individual variables or ratios of variables, cross-sectionally and longitudinally. The method used for outlier detection standardizes the variable(s) of interest by subtracting a location measure and dividing by a scale measure. In WES, the location measure used in the median and the scale measure is the inter quartile range (IQR). This type of outlier detection is performed for workplaces at the micro data level. The sensitivity of the process can be adjusted to suit the survey's needs.

To be able to perform outlier detection successfully with business survey data, one has to satisfy two criteria: (a) data homogeneity, and (b) data symmetry. Achieving data homogeneity obviates the need to use design weights when pooling neighbouring strata to increase the resolution of the outlier routine. Data homogeneity reduces the effect of the design and the complex problem of identifying aberrant observations in a sample drawn from a finite population reduces to a much simpler problem of dealing with outliers in the context of an infinite population. Homogeneity can be achieved by applying an appropriate transformation to one or more variables. The transformed data are then tested for approximate symmetry.

Imputation

There are three types of nonresponse in WES: unit nonresponse, item nonresponse and wave nonresponse. Unit nonresponse occurs if it is not possible to obtain the survey information for all variables of a selected unit (workplace or employee) due to a refusal or the impossibility to make a contact. Item nonresponse occurs if we are able to obtain only partial information from a selected unit. This could be due to a refusal or the impossibility to respond to some questions or inconsistencies in the data collected. Finally, wave nonresponse occurs when we have at least partial information at a previous wave for a selected unit but no information at the current wave. In the current nonresponse treatment strategy, a weight adjustment for the respondents is computed to deal with unit nonresponse while item and wave nonresponse are treated using different imputation methods. Cross-sectional versions of these methods are used for units appearing at the current wave for the first time. Otherwise, if historical data are available, longitudinal versions are used.

In the case of item nonresponse, some processing and editing is done before proceeding to imputation in order to remove inconsistencies in the data collected. Editing is based on a set of rules that must or should likely be satisfied. This process leads to either creating additional missing values or imputing by deduction the values that should have been reported. This type of imputation is used when a single missing field can be deduced uniquely from the given information. For example, if one component of a sum is missing and the remaining components including the sum are present, then the missing component can be determined uniquely.

Once this process is completed, the remaining missing values are imputed using one of the four methods described below. To avoid producing inconsistencies in the imputed data, most interrelated fields are imputed as a block. Since there are a number of questions falling into this category, a post-imputation system has been developed to preserve all inter-field relationships.

There are four main imputation methods being used both for the employer and employee portions of WES: carry-over, distributional, weighted hot deck and nearest-neighbour. Carry-over imputation is used when historical data is available. It consists simply of transferring the value from the previous wave to the current wave. For continuous variables, the value may be adjusted by a trend from an auxiliary variable. Obviously, there is no cross-sectional version of carry-over imputation.

Distributional imputation is used for questions where the respondent is asked to provide a total and its breakdown into multiple categories when either two or more of the categories are missing. The distribution of the categories is computed at a macro level and applied at the micro level. To illustrate this approach, let us assume that the respondent gave us total employment but was unable to provide a breakdown by occupational group. We would apply the distribution of the occupational groups computed at the industry/size level to the total employment figure to impute the missing fields. This method can only be applied cross-sectionnally.

For weighted hot deck, a missing field is imputed using the response of a randomly-selected donor within an imputation class; either the value of the donor for the missing variable is imputed directly or the ratio from the donor between the missing variable and an auxiliary variable. In the latter, the ratio is then multiplied by the auxiliary value from the recipient. The method is longitudinal if the auxiliary variable or the imputation classes are determined using previous wave information, otherwise it is cross-sectional. The donor is selected randomly with a probability of selection equal to the ratio of its sampling weight over the sum of the sampling weights of all units in the corresponding imputation class. The weighted hot deck approach was adopted for the following two main reasons: i) the method is easy to implement and ii) it leads to approximately unbiased point estimates provided that all units within each imputation class can be assumed to have the same propensity to respond (Rao, 1996).

Finally, nearest-neighbour imputation is used to preserve relationships between certain variables. It is a donor imputation method like weighted hot-deck. This method replaces the missing values of a given recipient by the corresponding values from the donor which is the closest to the recipient with respect to a few matching variables. Similarly to weighted hot-deck, a ratio from the donor can be imputed to the recipient, which is then multiplied by an auxiliary value from the recipient. Again, the method is longitudinal if the auxiliary variable, the imputation classes or the matching variables are determined using previous wave information, otherwise it is cross-sectional. It is very similar to weighted hot-deck imputation. It differs only in the way donors are selected. With weighted hot-deck imputation, donors are randomly selected while they are deterministically selected according to some matching variables with nearest-neighbour imputation.

Appendix 4

Overview of WES population estimates

The purpose of this document is to explain in detail the different populations of interest in the Workplace and Employee Survey (WES). This is done to ensure that users of the data are not only aware of the populations which they study, but also, that they are able to relay this message to readers of articles they may produce or estimates they may release. Cautionary notes are given when applicable.

Note: Workplace and location are synonymous in this document. All estimates provided are real estimates from the WES survey. The workplace target population refers to the list of workplaces for which information is desired. The workplace analysis portion refers to the list of workplaces that were sampled and for which data has been made readily available. The employee target population refers to the list of employees for which information is desired. The employee analysis portion refers to the list of employees that were sampled and for which data has been made readily available.

The following examples represent reference years 1999 to 2002.

Workplace 1999

Workplace target population

The target population for the workplace component is defined as all business locations operating in Canada in March 1999 that have at least one paid employee in March 1999 who receives a Canada Customs and Revenue Agency T-4 Supplementary form, with the following exceptions:

- Workplaces in Yukon, Nunavut and Northwest Territories
- Workplaces operating in crop production and animal production; fishing, hunting and trapping; private households, religious organizations, and public administration.

Workplace analysis portion (HO: 6,322 locations, RDC: 6,271 (51 unique observations removed))

The analysis portion is the set of all sampled workplaces that have responded to the 1999 workplace questionnaire, are part of the 1999 workplace target population, and have at least one paid employee in March 1999 who receives a Canada Customs and Revenue Agency T-4 Supplementary form. The analysis portion used in conjunction with the weights reflects the 1999 workplace target population.

Note: The process of re-weighting has been used to account for non-respondent locations, and as a result, the final workplace weights should be used in all analyses. Locations that were sampled but discovered to be out-of-business, out-of-scope, have zero employees, or in receivership in March 1999 are not included in the analysis portion as they are not part of the target population.

Below are a number of examples that use the 1999 workplace analysis portion.

Example 1: Total number of locations in the 1999 workplace target population.

$$\hat{N} = \sum_i w_i = 738{,}324$$

w_i - Final location weight

Example 2: Total number of employees for locations in the 1999 workplace target population.

$$\hat{X} = \sum_i w_i x_i = 10{,}867{,}614$$

w_i - Final location weight
x_i - Employment

Example 3: Average gross payroll per employee in the 1999 workplace target population.

$$\hat{R} = \frac{\sum_i w_i z_i}{\sum_i w_i x_i} = \$31{,}019$$

w_i - Final location weight
x_i - Employment
z_i - Gross payroll

Example 4: Average gross payroll per employee of workplaces that offer non-wage benefits in the 1999 workplace target population.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_i}{\sum_i w_i x_i \delta_i} = \$33{,}635$$

w_i - Final location weight
x_i - Employment
z_i - Gross payroll
δ_i - Non-wage benefit indicator (equals 1 if location offers non-wage benefits; 0 otherwise)

Employee 1999

Employee target population

The target population for the employee component is all employees working or on paid leave in March 1999 who receive a Canada Customs and Revenue Agency T-4 Supplementary form. The aforementioned employee must also belong to a workplace from the 1999 workplace target population.

Employee analysis portion (23,540 employees)

The analysis portion is the set of all sampled employees that have responded to the 1999 employee questionnaire, and are part of the 1999 employee target population. The analysis portion used in conjunction with the weights reflects the 1999 employee target population.

Note: The process of re-weighting has been used to account for non-respondent employees, and as a result, the final employee weights should be used in all analyses. Employees that were sampled but discovered to be dead or out-of-scope (not working for the sampled location in March 1999) are not included.

Below are a number of examples that use the 1999 employee analysis portion.

Example 1: Total number of employees in the 1999 employee target population.

$$\hat{N} = \sum_i w_i = 10{,}867{,}614$$

w_i - Final employee weight

Example 2: Average hourly wage per employee in the 1999 employee target population.

$$\hat{\bar{X}} = \frac{\sum_i w_i x_i}{\sum_i w_i} = \$18.49$$

w_i - Final employee weight
x_i - Hourly wage

Example 3: Average hourly wage per employee that is in a union or covered by a collective bargaining agreement (CBA) in the 1999 employee target population.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_i}{\sum_i w_i \delta_i} = \$20.41$$

w_i - Final employee weight
x_i - Hourly wage
δ_i - Union status indicator (equals 1 if employee is in a union or covered by a CBA; 0 otherwise)

Linked workplace/employee 1999

Linked target population
The 1999 linked target population is the set of locations from the 1999 workplace target population and employees from the 1999 employee target population.

Linked analysis portion (HO: 5,733 locations; 23,540 employees; RDC: 5,685 locations; 23,209 employees)
The linked analysis portion consists of workplaces from the 1999 workplace analysis portion with at least one responding employee and employees from the 1999 employee analysis portion. The analysis portion may be used in conjunction with the weights to reflect the 1999 linked target population.

Note: When performing employee analysis, linking to workplace characteristics, one should use the employee final weights, in association with the complete employee file. When performing workplace analysis, linking to employee characteristics, the workplace linked weight should be used considering only workplaces with at least one responding employee. Re-weighting is performed to adjust for workplaces with no-responding employees.

Example 1: Average hourly wage per employee working for a non-profit workplace in the 1999 linked target population.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_i}{\sum_i w_i \delta_i} = \$21.44$$

w_i - Final employee weight
x_i - Hourly wage
δ_i - Non-profit indicator (from location file; equals 1 if location is a non-profit workplace; 0 otherwise)

Example 2: Average hourly wage per employee that is in a union or covered by a collective bargaining agreement and working for a non-profit workplace in the 1999 linked target population.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_{1i} \delta_{2i}}{\sum_i w_i \delta_{1i} \delta_{2i}} = \$21.95$$

w_i - Final employee weight
x_i - Hourly wage
δ_{1i} - Union status indicator (equals 1 if employee is in a union or covered by a CBA; 0 otherwise)
δ_{2i} - Non-profit indicator (from location file; equals 1 if location is a non-profit workplace; 0 otherwise)

Example 3: Average gross payroll per employee for workplaces with at least one employee that does some work at home in the 1999 linked target population.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_i}{\sum_i w_i x_i \delta_i} = \$34{,}720$$

w_i - Linked location weight
x_i - Employment
z_i - Gross Payroll
δ_i – Work at home (from employee file; equals 1 if location has at least one employee who does work at home; 0 otherwise)

Example 4: Average gross payroll per employee of locations that offer non-wage benefits in the 1999 linked target population with at least one employee who does some work at home.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_{1i} \delta_{2i}}{\sum_i w_i x_i \delta_{1i} \delta_{2i}} = \$36{,}163$$

w_i - Linked location weight
x_i - Employment
z_i - Gross Payroll
δ_{1i} - Non-wage benefit indicator (equals 1 if location offers non-wage benefits; 0 otherwise)
δ_{2i} – Work at home indicator (from employee file; equals 1 if location has at least one employee who does some work at home; 0 otherwise)

Workplace 2000

Workplace target population

The WES is a longitudinal survey with its workplace component being refreshed every second year (2001, 2003, etc.). For this reason, the 2000 workplace target population remains unchanged from 1999.

Workplace analysis portion (HO: 6,068 locations; RDC: 6,018 (50 unique observations removed))

The 2000 analysis portion is the subset of workplaces from the 1999 workplace analysis portion, having at least one paid employee in March 2000 who receives a Canada Customs and Revenue Agency T-4 Supplementary form. Excluded (considered out-of-scope) from the 2000 workplace analysis portion are workplaces that in March 2000:

- Are located in the Yukon, Nunavut or Northwest Territories
- Are operating in crop production and animal production; fishing, hunting and trapping; private households, religious organizations, and public administration.

Note: The final workplace weights should be used in the analyses as re-weighting has been performed to account for non-respondents from 1999. Analyses performed on the 2000 workplace analysis portion do not represent the cross-sectional picture of all workplaces in March 2000. This stems from the fact that workplaces which came into existence after the creation of the 1999 frame have a zero probability of being included in the sample and no re-weighting has been done to account for them. Thus, all analyses from the 2000 workplace analysis portion should refer to continuing (still in-business and in-scope) units from the 1999 population only.

Below are a number of examples that use the 2000 workplace analysis portion.

Example 1: Total number of continuing locations in the 2000 workplace target population.

$$\hat{N} = \sum_i w_i = 686{,}680$$

w_i - Final location weight

Example 2: Total number of employees in continuing locations in the 2000 WES workplace target population.

$$\hat{X} = \sum_i w_i x_i = 10{,}932{,}350$$

w_i - Final location weight
x_i - Employment

Example 3: Average gross payroll per employee of continuing locations in the 2000 workplace target population.

$$\hat{R} = \frac{\sum_i w_i z_i}{\sum_i w_i x_i} = \$32{,}159$$

w_i - Final location weight
x_i - Employment
z_i - Gross payroll

Example 4: Average gross payroll per employee of continuing locations that offer non-wage benefits in the 2000 workplace target population.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_i}{\sum_i w_i x_i \delta_i} = \$34{,}976$$

w_i - Final location weight
x_i - Employment
z_i - Gross payroll
δ_i - Non-wage benefit indicator (equals 1 if location offers non-wage benefits; 0 otherwise)

Employee 2000

Employee target population

The WES is a longitudinal survey with its employee component being refreshed every second year (2001, 2003, etc.). For this reason, the 2000 employee target population remains unchanged from 1999.

Employee analysis portion (20,167 employees)

The 2000 analysis portion is the subset of employees from the 1999 employee analysis portion whose employer of March 1999 is part of the 2000 workplace analysis portion. This set of employees is split between continuers (working for same employer in March 1999 and March 2000) and exiters (no longer working for the same employer as March 1999). The set of exiters either works for a new employer that may or may not be part of the 2000 workplace target population or is no longer in the workforce.

Excluded from the 2000 employee analysis portion are employees that belong to locations that are excluded from the 2000 workplace analysis portion.

Note: The final employee weights should be used in the analyses as re-weighting has been performed to account for 1999 and 2000 non-respondents. Analyses performed on the 2000 employee analysis portion do not correspond to all employees as of March 2000. This stems from the fact that employees belonging to workplaces which came into existence after the creation of the 1999 frame have a zero probability of being included in the sample and no re-weighting has been done to account for them. Thus, all analyses from the 2000 employee analysis portion should refer to continuing or exiting units from the 1999 population only.

Below are a number of examples that use the 2000 employee analysis portion.

Example 1: Total number of continuing or exiting employees in March 2000 working in March 1999 for a continuing workplace. (ie. Employee belonged in March 1999 to a workplace that is part of the 2000 analysis portion)

$$\hat{N} = \sum_i w_i = 10{,}867{,}614$$

w_i - Final employee weight

Example 2: Total number of continuing employees in March 2000 working in March 1999 and March 2000 for the same continuing workplace.

$$\hat{N}_d = \sum_i w_i \delta_i = 9{,}166{,}010$$

w_i - Final employee weight
δ_i - Continuer status indicator (equals 1 if employee is working for the same employer in March 2000 as in March 1999; 0 otherwise)

Example 3: Total number of exiting employees between April 1999 and March 2000 working in March 1999 for a continuing workplace.

$$\hat{N}_d = \sum_i w_i \delta_i = 1{,}701{,}604$$

w_i - Final employee weight
δ_i - Exiter status indicator (equals 1 if employee is, in March 2000, no longer working for the same employer as in March 1999; 0 otherwise)

Example 4: Average hourly wage per working employee in March 2000 working in March 1999 for a continuing workplace.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_i}{\sum_i w_i \delta_i} = \$19.42$$

w_i - Final employee weight
x_i - Hourly wage
δ_i - Working status indicator (equals 1 if employee is working)

Linked analysis of workplace and employee 2000

Linked target population

The 2000 linked target population is the set of locations from the 2000 workplace target population and employees from the 2000 employee target population.

Linked analysis portion (HO: 5,453 locations; 20,167 employees; RDC: 5,406 locations; 19,888 employees)

The linked analysis portion consists of workplaces from the 2000 workplace analysis portion with at least one responding employee and employees from the 2000 employee analysis portion. The analysis portion may be used in conjunction with the weights to reflect the 2000 linked target population.

Note: When performing employee analysis, linking to workplace characteristics, one should use the employee final weights, in association with the complete employee file. When performing workplace analysis, linking to employee characteristics, the workplace linked weight should be used, considering only workplaces with at least one responding employee. Re-weighting is performed to adjust for workplaces with no-responding employees. Analyses performed on the 2000 linked analysis portion do not represent the cross-sectional picture of all linked workplace/employees in March 2000. This stems from the fact that workplaces and employees belonging to workplaces which came into existence after the creation of the 1999 frame have a zero probability of being included in the sample and no re-weighting has been done to account for them. Thus, all analyses from the 2000 linked analysis portion should refer to continuing or exiting employees from continuing locations.

Below are a number of examples that use the 2000 linked analysis portion.

Example 1: Average hourly wage per employee who in March 1999 were working in a continuing workplace that during the 2000 collection, was a non-profit workplace. The employee may or may not still work for the same employer as in March 1999.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_i}{\sum_i w_i \delta_i} = \$22.71$$

w_i - Final employee weight
x_i - Hourly wage
δ_i - Non-profit indicator (from location file; equals 1 if location is a non-profit workplace; 0 otherwise)

Example 2: Average hourly wage per employee who is working for a non-profit workplace in the 2000 linked target population and was working for the same location as March 1999.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_{1i} \delta_{2i}}{\sum_i w_i \delta_{1i} \delta_{2i}} = \$22.86$$

w_i - Final employee weight
x_i - Hourly wage
δ_{1i} - Continuer status indicator (equals 1 if employee is working in for the same employer in March 2000 as in March 1999; 0 otherwise)
δ_{2i} - Non-profit indicator (from location file; equals 1 if location is a non-profit workplace; 0 otherwise)

Example 3: Average gross payroll per employee for continuing workplaces with at least one continuing employee that does some work at home in March 2000.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_i}{\sum_i w_i x_i \delta_i} = \$37{,}486$$

w_i - Linked location weight
x_i - Employment
z_i - Gross Payroll
δ_i – work at home indicator (from employee file; equals 1 if location has at least one continuing employee that does some work at home; 0 otherwise)

Example 4: Average gross payroll per employee of locations that offer non-wage benefits in the 2000 linked target population with at least one employee who does some work at home.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_{1i} \delta_{2i}}{\sum_i w_i x_i \delta_{1i} \delta_{2i}} = \$38{,}617$$

w_i - Linked location weight
x_i - Employment
z_i - Gross Payroll
δ_{1i} - Non-wage benefit indicator (equals 1 if location offers non-wage benefits; 0 otherwise)
δ_{2i} – Work at home indicator (from employee file; equals 1 if location has at least one employee who does some work at home; 0 otherwise)

Workplace 2001

Workplace target population

The target population for the workplace component is defined as all business locations operating in Canada in March 2001 that have at least one paid employee in March 2001 who receives a Canada Customs and Revenue Agency T-4 Supplementary form, with the following exceptions:

- Workplaces in Yukon, Nunavut and Northwest Territories
- Workplaces operating in crop production and animal production; fishing, hunting and trapping; private households, religious organizations, and public administration.

Workplace analysis portion (HO: 6,207 locations, RDC: 6,094 (113 unique observations removed)

The analysis portion is the set of all sampled workplaces that have responded to the 2001 workplace questionnaire, are part of the 2001 workplace target population, and have at least one paid employee in March 2001 who receives a Canada Customs and Revenue Agency T-4 Supplementary form. The analysis portion used in conjunction with the weights reflects the 2001 workplace target population.

Note: The process of re-weighting has been used to account for non-respondent locations, and as a result, the final workplace weights should be used in all analyses. Locations that were sampled but discovered to be out-of-business, out-of-scope, have zero employees, or in receivership in March 2001 are not included in the analysis portion as they are not part of the target population.

Below are a number of examples that use the 2001 workplace analysis portion.

Example 1: Total number of locations in the 2001 workplace target population.

$$\hat{N} = \sum_i w_i = 734{,}127$$

w_i - Final location weight

Example 2: Total number of employees for locations in the 2001 workplace target population.

$$\hat{X} = \sum_i w_i x_i = 11{,}640{,}536$$

w_i - Final location weight
x_i - Employment

Example 3: Average gross payroll per employee in the 2001 workplace target population.

$$\hat{R} = \frac{\sum_i w_i z_i}{\sum_i w_i x_i} = \$33{,}514$$

w_i - Final location weight
x_i - Employment
z_i - Gross payroll

Example 4: Average gross payroll per employee of workplaces that offer non-wage benefits in the 2001 workplace target population.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_i}{\sum_i w_i x_i \delta_i} = \$36{,}770$$

w_i - Final location weight
x_i - Employment
z_i - Gross payroll
δ_i - Non-wage benefit indicator (equals 1 if location offers non-wage benefits; 0 otherwise)

Employee 2001

Employee target population
The target population for the employee component is all employees working or on paid leave in March 2001 who receive a Canada Customs and Revenue Agency T-4 Supplementary form. The aforementioned employee must also belong to a workplace from the 2001 workplace target population.

Employee analysis portion (20,352 employees)
The analysis portion is the set of all sampled employees that have responded to the 2001 employee questionnaire, and are part of the 2001 employee target population. The analysis portion used in conjunction with the weights reflects the 2001 employee target population.

Note: The process of re-weighting has been used to account for non-respondent employees, and as a result, the final employee weights should be used in all analyses. Employees that were sampled but discovered to be dead or out-of-scope (not working for the sampled location in March 2001) are not included.

Below are a number of examples that use the 2001 employee analysis portion.

Example 1: Total number of employees in the 2001 employee target population.

$$\hat{N} = \sum_i w_i = 11{,}640{,}636$$

w_i - Final employee weight

Example 2: Average hourly wage per employee in the 2001 employee target population.

$$\hat{\bar{X}} = \frac{\sum_i w_i x_i}{\sum_i w_i} = \$19.46$$

w_i - Final employee weight
x_i - Hourly wage

Example 3: Average hourly wage per employee that is in a union or covered by a collective bargaining agreement (CBA) in the 2001 employee target population.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_i}{\sum_i w_i \delta_i} = \$20.97$$

w_i - Final employee weight
x_i - Hourly wage
δ_i - Union status indicator (equals 1 if employee is in a union or covered by a CBA; 0 otherwise)

Linked workplace/employee 2001

Linked target population
The 2001 linked target population is the set of locations from the 2001 workplace target population and employees from the 2001 employee target population.

Linked analysis portion (HO: 5,274 locations; 20,352 employees, RDC: 5,185 locations; 19,450 employees)
The linked analysis portion consists of workplaces from the 2001 workplace analysis portion with at least one responding employee and employees from the 2001 employee analysis portion. The analysis portion may be used in conjunction with the weights to reflect the 2001 linked target population.

Note: When performing employee analysis, linking to workplace characteristics, one should use the employee final weights, in association with the complete employee file. When performing workplace analysis, linking to employee characteristics, the workplace linked weight should be used considering only workplaces with at least one responding employee. Re-weighting is performed to adjust for workplaces with no-responding employees.

Example 1: Average hourly wage per employee working for a non-profit workplace in the 2001 linked target population.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_i}{\sum_i w_i \delta_i} = \$21.64$$

w_i - Final employee weight
x_i - Hourly wage
δ_i - Non-profit indicator (from location file; equals 1 if location is a non-profit workplace; 0 otherwise)

Example 2: Average hourly wage per employee that is in a union or covered by a collective bargaining agreement and working for a non-profit workplace in the 2001 linked target population.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_{1i} \delta_{2i}}{\sum_i w_i \delta_{1i} \delta_{2i}} = \$22.76$$

w_i - Final employee weight
x_i - Hourly wage
δ_{1i} - Union status indicator (equals 1 if employee is in a union or covered by a CBA; 0 otherwise)
δ_{2i} - Non-profit indicator (from location file; equals 1 if location is a non-profit workplace; 0 otherwise)

Example 3: Average gross payroll per employee for workplaces with at least one employee who does some work at home in the 2001 linked target population.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_i}{\sum_i w_i x_i \delta_i} = \$38{,}820$$

w_i - Linked location weight
x_i - Employment
z_i - Gross Payroll
δ_i – Work at home indicator (from employee file; equals 1 if location has at least one employee who does some work at home; 0 otherwise)

Example 4: Average gross payroll per employee of locations that offer non-wage benefits in the 2001 linked target population with at least one employee who does some work at home.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_{1i} \delta_{2i}}{\sum_i w_i x_i \delta_{1i} \delta_{2i}} = \$41{,}383$$

w_i - Linked location weight
x_i - Employment
z_i - Gross Payroll
δ_{1i} - Non-wage benefit indicator (equals 1 if location offers non-wage benefits; 0 otherwise)
δ_{2i} – Work at home indicator (from employee file; equals 1 if location has at least one employee who does some work at home; 0 otherwise)

Workplace 2002

Workplace target population

The WES is a longitudinal survey with its workplace component being refreshed every second year (2001, 2003, etc.). For this reason, the 2002 workplace target population remains unchanged from 2001.

Workplace analysis portion (HO: 5,818 locations; RDC: 5,713 (105 unique observations removed))

The 2002 analysis portion is the subset of workplaces from the 2001 workplace analysis portion, having at least one paid employee in March 2002 who receives a Canada Customs and Revenue Agency T-4 Supplementary form. Excluded (considered out-of-scope) from the 2002 workplace analysis portion are workplaces that in March 2002:

- Are located in the Yukon, Nunavut or Northwest Territories
- Are operating in crop production and animal production; fishing, hunting and trapping; private households, religious organizations, and public administration.

Note: The final workplace weights should be used in the analyses as re-weighting has been performed to account for non-respondents from 2001. Analyses performed on the 2002 workplace analysis portion do not represent the cross-sectional picture of all workplaces in March 2002. This stems from the fact that workplaces which came into existence after the creation of the 2001 frame have a zero probability of being included in the sample and no re-weighting has been done to account for them. Thus, all analyses from the 2002 workplace analysis portion should refer to continuing (still in-business and in-scope) units from the 2001 population only.

Below are a number of examples that use the 2002 workplace analysis portion.

Example 1: Total number of continuing locations in the 2002 workplace target population.

$$\hat{N} = \sum_i w_i = 668{,}876$$

w_i - Final location weight

Example 2: Total number of employees in continuing locations in the 2002 WES workplace target population.

$$\hat{X} = \sum_i w_i x_i = 11{,}318{,}732$$

w_i - Final location weight
x_i - Employment

Example 3: Average gross payroll per employee of continuing locations in the 2002 workplace target population.

$$\hat{R} = \frac{\sum_i w_i z_i}{\sum_i w_i x_i} = \$34{,}500$$

w_i - Final location weight
x_i - Employment
z_i - Gross payroll

Example 4: Average gross payroll per employee of continuing locations that offer non-wage benefits in the 2002 workplace target population.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_i}{\sum_i w_i x_i \delta_i} = \$37{,}373$$

w_i - Final location weight
x_i - Employment
z_i - Gross payroll
δ_i - Non-wage benefit indicator (equals 1 if location offers non-wage benefits; 0 otherwise)

Employee 2002

Employee target population

The WES is a longitudinal survey with its employee component being refreshed every second year (2001, 2003, etc.). For this reason, the 2002 employee target population remains unchanged from 2001.

Employee analysis portion (16,813 employees)

The 2002 analysis portion is the subset of employees from the 2001 employee analysis portion whose employer of March 2001 is part of the 2002 workplace analysis portion. This set of employees is split between continuers (working for same employer in March 2001 and March 2002) and exiters (no longer working for the same employer as March 2001). The set of exiters either works for a new employer that may or may not be part of the 2002 workplace target population or is no longer in the workforce.

Excluded from the 2002 employee analysis portion are employees that belong to locations that are excluded from the 2002 workplace analysis portion.

Note: The final employee weights should be used in the analyses as re-weighting has been performed to account for 2001 and 2002 non-respondents. Analyses performed on the 2002 employee analysis portion do not correspond to all employees as of March 2002. This stems from the fact that employees belonging to workplaces which came into existence after the creation of the 2001 frame have a zero probability of being included in the sample and no re-weighting has been done to account for them. Thus, all analyses from the 2002 employee analysis portion should refer to continuing or exiting units from the 2001 population only.

Below are a number of examples that use the 2002 employee analysis portion.

Example 1: Total number of continuing or exiting employees in March 2002 working in March 2001 for a continuing workplace. (ie. Employee belonged in March 2001 to a workplace that is part of the 2002 analysis portion)

$$\hat{N} = \sum_i w_i = 11{,}640{,}536$$

w_i - Final employee weight

Example 2: Total number of continuing employees in March 2002 working in March 2001 and March 2002 for the same continuing workplace.

$$\hat{N}_d = \sum_i w_i \delta_i = 9{,}563{,}853$$

w_i - Final employee weight
δ_i - Continuer status indicator (equals 1 if employee is working for the same employer in March 2002 as in March 2001; 0 otherwise)

Example 3: Total number of exiting employees between April 2001 and March 2002 working in March 2001 for a continuing workplace.

$$\hat{N}_d = \sum_i w_i \delta_i = 2{,}076{,}683$$

w_i - Final employee weight
δ_i - Exiter status indicator (equals 1 if employee is, in March 2002, no longer working for the same employer as in March 2001; 0 otherwise)

Example 4: Average hourly wage per working employee in March 2002 working in March 2001 for a continuing workplace.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_i}{\sum_i w_i \delta_i} = \$20.66$$

w_i - Final employee weight
x_i - Hourly wage
δ_i - Working status indicator (equals 1 if employee is working)

Linked analysis of workplace and employee 2002

Linked target population

The 2002 linked target population is the set of locations from the 2002 workplace target population and employees from the 2002 employee target population.

Linked analysis portion (HO: 4,834 locations; 16,813 employees; RDC: 4,745 locations; 16,026 employees)

The linked analysis portion consists of workplaces from the 2002 workplace analysis portion with at least one responding employee and employees from the 2002 employee analysis portion. The analysis portion may be used in conjunction with the weights to reflect the 2002 linked target population.

Note: When performing employee analysis, linking to workplace characteristics, one should use the employee final weights, in association with the complete employee file. When performing workplace analysis, linking to employee characteristics, the workplace linked weight should be used, considering only workplaces with at least one responding employee. Re-weighting is performed to adjust for workplaces with no-responding employees. Analyses performed on the 2002 linked analysis portion do not represent the cross-sectional picture of all linked workplace/employees in March 2002. This stems from the fact that workplaces and employees belonging to workplaces which came into existence after the creation of the 2001 frame have a zero probability of being included in the sample and no re-weighting has been done to account for them. Thus, all analyses from the 2002 linked analysis portion should refer to continuing or exiting employees from continuing locations.

Below are a number of examples that use the 2002 linked analysis portion.

Example 1: Average hourly wage per employee who in March 2001 were working in a continuing workplace that during the 2002 collection, was a non-profit workplace. The employee may or may not still work for the same employer as in March 2001.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_i}{\sum_i w_i \delta_i} = \$22.87$$

w_i - Final employee weight
x_i - Hourly wage
δ_i - Non-profit indicator (from location file; equals 1 if location is a non-profit workplace; 0 otherwise)

Example 2: Average hourly wage per employee who is working for a non-profit workplace in the 2002 linked target population and was working for the same location as March 2001.

$$\hat{\bar{X}}_d = \frac{\sum_i w_i x_i \delta_{1i} \delta_{2i}}{\sum_i w_i \delta_{1i} \delta_{2i}} = \$23.76$$

w_i - Final employee weight
x_i - Hourly wage
δ_{1i} - Continuer status indicator (equals 1 if employee is working in for the same employer in March 2002 as in March 2001; 0 otherwise)
δ_{2i} - Non-profit indicator (from location file; equals 1 if location is a non-profit workplace; 0 otherwise)

Example 3: Average gross payroll per employee for continuing workplaces with at least one continuing or exiting employee that does some work at home in March 2002.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_i}{\sum_i w_i x_i \delta_i} = \$40{,}253$$

w_i - Linked location weight
x_i - Employment
z_i - Gross Payroll
δ_i – Work at home indicator (from employee file; equals 1 if location has at least one employee that does some work at home; 0 otherwise)

Example 4: Average gross payroll per employee of locations that offer non-wage benefits in the 2002 linked target population with at least one employee who does some work at home.

$$\hat{R}_d = \frac{\sum_i w_i z_i \delta_{1i} \delta_{2i}}{\sum_i w_i x_i \delta_{1i} \delta_{2i}} = \$42{,}599$$

w_i - Linked location weight
x_i - Employment
z_i - Gross Payroll
δ_{1i} - Non-wage benefit indicator (equals 1 if location offers non-wage benefits; 0 otherwise)
δ_{2i} – Work at home indicator (from employee file; equals 1 if location has at least one employee who does some work at home; 0 otherwise)

Longitudinal workplace 1999 to 2000

Longitudinal workplace target population
The longitudinal workplace target population is the same as the 1999 workplace target population.

Longitudinal workplace analysis portion (HO:6,068 locations; RDC: 6,018)
The longitudinal workplace analysis portion is the same as the 2000 workplace analysis portion including data from both 1999 and 2000.

Note: Longitudinal estimates calculated from 1999 in the following examples are done so using only continuing locations.

Below are a number of examples that use the longitudinal workplace analysis portion.

Example 1: Percentage change in total revenue from 1999 to 2000 for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2000} - \sum_i w_i x_{i1999}}{\sum_i w_i x_{i1999}} \times 100 = 7.35\%$$

w_i - Final 1999 location weight
x_{i2000} - 2000 Revenue
x_{i1999} - 1999 Revenue

Example 2: Percentage change in average gross payroll per employee from 1999 to 2000 for continuing locations.

$$\hat{P} = \frac{\frac{\sum_i w_i z_{i2000}}{\sum_i w_i x_{i2000}} - \frac{\sum_i w_i z_{i1999}}{\sum_i w_i x_{i1999}}}{\frac{\sum_i w_i z_{i1999}}{\sum_i w_i x_{i1999}}} \times 100 = 2.97\%$$

w_i - Final 1999 location weight
x_{i2000} - 2000 Employment
x_{i1999} - 1999 Employment
z_{i2000} - 2000 Gross Payroll
z_{i1999} - 1999 Gross Payroll

Example 3: Percentage change in total revenue for locations offering non-wage benefits in both years for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2000} \delta_i - \sum_i w_i x_{i1999} \delta_i}{\sum_i w_i x_{i1999} \delta_i} \times 100 = 6.72\%$$

w_i - Final 1999 location weight
x_{i2000} - 2000 Revenue
x_{i1999} - 1999 Revenue
δ_i - Non-wage benefit indicator (equals 1 if location offers non-wage benefits in both survey years, 1999 and 2000; 0 otherwise)

Longitudinal employee 1999 to 2000

Longitudinal employee target population
The longitudinal employee target population is the same as the 1999 employee target population.

Longitudinal employee analysis portion (20,167 employees)
The longitudinal employee analysis portion is the same as the 2000 employee analysis portion including data from both 1999 and 2000.

Note: For longitudinal analyses the 2000 employee final weights should be used. Longitudinal estimates calculated from 1999 in the following examples are done so using only employees who in March 1999 were part of continuing locations.

Below are a number of examples that use the longitudinal employee analysis portion.

Example 1: Percentage change in average hourly wage per employee between 1999 and 2000 working in March 1999 for a continuing location. (Employee may be working for the same location as in March 1999, working for a new location, or not working at all.)

$$\hat{P} = \frac{\frac{\sum_i w_i x_{i2000}}{\sum_i w_i} - \frac{\sum_i w_i x_{i1999}}{\sum_i w_i}}{\frac{\sum_i w_i x_{i1999}}{\sum_i w_i}} \times 100 = -2.58\%$$

w_i - Final 2000 employee weight
x_{i2000} - 2000 Hourly Wage
x_{i1999} - 1999 Hourly Wage

Example 2: Percentage change in average hourly wage per continuing employee between 1999 and 2000 working in March 1999 for a continuing location.

$$\hat{P} = \frac{\frac{\sum_i w_i x_{i2000}\delta_i}{\sum_i w_i \delta_i} - \frac{\sum_i w_i x_{i1999}\delta_i}{\sum_i w_i \delta_i}}{\frac{\sum_i w_i x_{i1999}\delta_i}{\sum_i w_i \delta_i}} \times 100 = 3.20\%$$

w_i - Final 2000 employee weight
x_{i2000} - 2000 Hourly Wage
x_{i1999} - 1999 Hourly Wage
δ_i - Continuer status indicator (equals 1 if employee is working in for the same employer in March 2000 as in March 1999; 0 otherwise)

Example 3: Percentage change in average hourly wage per exiting employee between 1999 and 2000 working in March 1999 for a continuing location and working in March 2000 for a new employer.

$$\hat{P} = \frac{\frac{\sum_i w_i x_{i2000} \delta_i}{\sum_i w_i \delta_i} - \frac{\sum_i w_i x_{i1999} \delta_i}{\sum_i w_i \delta_i}}{\frac{\sum_i w_i x_{i1999} \delta_i}{\sum_i w_i \delta_i}} \times 100 = 7.15\%$$

w_i - Final 2000 employee weight
x_{i2000} - 2000 Hourly Wage
x_{i1999} - 1999 Hourly Wage
δ_i - Exiter status indicator (equals 1 if employee is, in March 2000, no longer working for the same employer as in March 1999; 0 otherwise)

Longitudinal linked workplace/employee 1999 to 2000

Longitudinal linked target population
The longitudinal linked target population is the same as the 1999 linked target population.

Longitudinal linked analysis portion (HO: 5,453 locations; 20,167 employees; RDC: 5,406 locations; 19,888 employees)
The longitudinal linked analysis portion is the same as the 2000 linked analysis portion including data from both 1999 and 2000.

Note: When performing longitudinal employee analysis, linking to workplace characteristics, one should use the 2000 employee final weights, in association with the complete employee file. When performing longitudinal workplace analysis, linking to employee characteristics, the 2000 workplace linked weight should be used, considering only workplaces with at least one responding employee. Re-weighting is performed to adjust for workplaces with no responding employees. Longitudinal estimates calculated from 1999 in the following examples are done so using only employees who in March 1999 were part of continuing locations, regardless of where they work (or don't work) in March 2000.

Below are a number of examples that use the longitudinal linked analysis portion.

Example 1: Percentage change in average hourly wage per employee who in March 1999 was working for a non-profit continuing workplace. (Employee may be working for the same location as in March 1999, working for a new location, or not working at all.)

$$\hat{P} = \frac{\frac{\sum_i w_i x_{i2000} \delta_i}{\sum_i w_i \delta_i} - \frac{\sum_i w_i x_{i1999} \delta_i}{\sum_i w_i \delta_i}}{\frac{\sum_i w_i x_{i1999} \delta_i}{\sum_i w_i \delta_i}} \times 100 = -1.55\%$$

w_i - Final 2000 employee weight
x_{i2000} - 2000 Hourly Wage
x_{i1999} - 1999 Hourly Wage
δ_i - Non-profit indicator (from location file; equals 1 if location was a non-profit workplace in 1999; 0 otherwise)

Example 2: Percentage change in average hourly wage per continuing employee who in March 1999 was working for a continuing location. The location was non-profit in 1999 and 2000.

$$\hat{P} = \frac{\frac{\sum_i w_i x_{i2000} \delta_{1i} \delta_{2i}}{\sum_i w_i \delta_{1i} \delta_{2i}} - \frac{\sum_i w_i x_{i1999} \delta_{1i} \delta_{2i}}{\sum_i w_i \delta_{1i} \delta_{2i}}}{\frac{\sum_i w_i x_{i1999} \delta_{1i} \delta_{2i}}{\sum_i w_i \delta_{1i} \delta_{2i}}} \times 100 = 4.90\%$$

w_i - Final 2000 employee weight
x_{i2000} - 2000 Hourly Wage
x_{i1999} - 1999 Hourly Wage
δ_{1i} - Continuer status indicator (equals 1 if employee is working in for the same employer in March 2000 as in March 1999; 0 otherwise)
δ_{2i} - Non-profit indicator (from location file; equals 1 if location is a non-profit workplace in 1999 and 2000; 0 otherwise)

Example 3: Percentage change in total revenue from 1999 to 2000 for continuing workplaces with at least one continuing or exiting employee that does some work at home in March 1999 and March 2000 in the longitudinal linked target population.

$$\hat{P} = \frac{\sum_i w_i x_{i2000} \delta_i - \sum_i w_i x_{i1999} \delta_i}{\sum_i w_i x_{i1999} \delta_i} \times 100 = 8.12\%$$

w_i - Final 2000 linked location weight
x_{i2000} - 2000 Revenue
x_{i1999} - 1999 Revenue
δ_i – Work at home indicator (equals 1 if employee does some work at home in 1999 and 2000; 0 otherwise)

Longitudinal workplace 1999 to 2001

Longitudinal workplace target population

The longitudinal workplace target population is the same as the 1999 workplace target population.

Longitudinal workplace analysis portion (HO:5,291 locations; RDC: 5,189 locations)

The 2001 longitudinal workplace analysis portion is the subset of workplaces from the 1999 workplace analysis portion, having at least one paid employee in March 2001 who receives a Canada Customs and Revenue Agency T-4 Supplementary form. Excluded (considered out-of-scope) from the 2001 longitudinal workplace analysis portion are workplaces that in March 2001:

- Are located in the Yukon, Nunavut or Northwest Territories
- Are operating in crop production and animal production; fishing, hunting and trapping; private households, religious organizations, and public administration.

Note: The final workplace weights should be used in the analyses as re-weighting has been performed to account for non-respondents from 1999. Longitudinal estimates calculated from 1999 in the following examples are done so using only continuing locations.

Below are a number of examples that use the longitudinal workplace analysis portion.

Example 1: Percentage change in total revenue from 1999 to 2001 for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2001} - \sum_i w_i x_{i1999}}{\sum_i w_i x_{i1999}} \times 100 = 10.7\%$$

w_i - Final 1999 location weight
x_{i2001} - 2001 Revenue
x_{i1999} - 1999 Revenue

Example 2: Percentage change in average gross payroll per employee from 1999 to 2001 for continuing locations.

$$\hat{P} = \frac{\frac{\sum_i w_i z_{i2001}}{\sum_i w_i x_{i2001}} - \frac{\sum_i w_i z_{i1999}}{\sum_i w_i x_{i1999}}}{\frac{\sum_i w_i z_{i1999}}{\sum_i w_i x_{i1999}}} \times 100 = 7.49\%$$

w_i - Final 1999 location weight
x_{i2001} - 2001 Employment
x_{i1999} - 1999 Employment
z_{i2001} - 2001 Gross Payroll
z_{i1999} - 1999 Gross Payroll

Example 3: Percentage change in total revenue for locations offering non-wage benefits in both years for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2001}\delta_i - \sum_i w_i x_{i1999}\delta_i}{\sum_i w_i x_{i1999}\delta_i} \times 100 = 9.89\%$$

w_i - Final 1999 location weight
x_{i2001} - 2001 Revenue
x_{i1999} - 1999 Revenue
δ_i - Non-wage benefit indicator (equals 1 if location offers non-wage benefits in both survey years, 1999 and 2001; 0 otherwise)

Longitudinal workplace 2000 to 2001

Longitudinal workplace target population

The longitudinal workplace target population is the same as the 1999 workplace target population.

Longitudinal workplace analysis portion (HO:5,318 locations; RDC: 5,170 locations)

The 2001 longitudinal workplace analysis portion is the subset of workplaces from the 2000 workplace analysis portion, having at least one paid employee in March 2001 who receives a Canada Customs and Revenue Agency T-4 Supplementary form. Excluded (considered out-of-scope) from the 2001 longitudinal workplace analysis portion are workplaces that in March 2001:

- Are located in the Yukon, Nunavut or Northwest Territories
- Are operating in crop production and animal production; fishing, hunting and trapping; private households, religious organizations, and public administration.

Note: The final workplace weights should be used in the analyses as re-weighting has been performed to account for non-respondents from 1999. Longitudinal estimates calculated from 2000 in the following examples are done so using only continuing locations.

Below are a number of examples that use the longitudinal workplace analysis portion.

Example 1: Percentage change in total revenue from 2000 to 2001 for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2001} - \sum_i w_i x_{i2000}}{\sum_i w_i x_{i2000}} \times 100 = 2.29\%$$

w_i - Final 1999 location weight
x_{i2001} - 2001 Revenue
x_{i2000} - 2000 Revenue

Example 2: Percentage change in average gross payroll per employee from 2000 to 2001 for continuing locations.

$$\hat{P} = \frac{\frac{\sum_i w_i z_{i2001}}{\sum_i w_i x_{i2001}} - \frac{\sum_i w_i z_{i2000}}{\sum_i w_i x_{i2000}}}{\frac{\sum_i w_i z_{i2000}}{\sum_i w_i x_{i2000}}} \times 100 = 4.16\%$$

w_i - Final 1999 location weight
x_{i2001} - 2001 Employment
x_{i2000} - 2000 Employment
z_{i2001} - 2001 Gross Payroll
z_{i2000} - 2000 Gross Payroll

Example 3: Percentage change in total revenue for locations offering non-wage benefits in both years for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2001} \delta_i - \sum_i w_i x_{i2000} \delta_i}{\sum_i w_i x_{i2000} \delta_i} \times 100 = 1.28\%$$

w_i - Final 1999 location weight
x_{i2001} - 2001 Revenue
x_{i2000} - 2000 Revenue
δ_i - Non-wage benefit indicator (equals 1 if location offers non-wage benefits in both survey years, 2000 and 2001; 0 otherwise)

Longitudinal employee 2000 to 2001

Employees are selected to be in sample for a period of two years. In 2001, the employee sample has been refreshed leaving a small overlap between the 2000 and 2001 employee samples. For this reason analysis is not recommended for employees between 2000 and 2001.

Longitudinal linked workplace/employee 2000 to 2001

Employees are selected to be in sample for a period of two years. In 2001, the employee sample has been refreshed leaving a small overlap between the 2000 and 2001 employee samples. For this reason analysis is not recommended for linked workplaces and employees between 2000 and 2001**.**

Longitudinal workplace 1999 to 2002

Longitudinal workplace target population
The longitudinal workplace target population is the same as the 1999 workplace target population.

Longitudinal workplace analysis portion (HO: 5,073 locations; RDC: 4,949)
The longitudinal workplace analysis portion is the same as the 2002 workplace analysis portion including data from both 1999 and 2002.

Note: Longitudinal estimates calculated from 1999 in the following examples are done so using only continuing locations.

Below are a number of examples that use the longitudinal workplace analysis portion.

Example 1: Percentage change in total revenue from 1999 to 2002 for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2002} - \sum_i w_i x_{i1999}}{\sum_i w_i x_{i1999}} \times 100 = 10.32\%$$

w_i - Final 1999 location weight
x_{i2002} - 2002 Revenue
x_{i1999} - 1999 Revenue

Example 2: Percentage change in average gross payroll per employee from 1999 to 2002 for continuing locations.

$$\hat{P} = \frac{\frac{\sum_i w_i z_{i2002}}{\sum_i w_i x_{i2002}} - \frac{\sum_i w_i z_{i1999}}{\sum_i w_i x_{i1999}}}{\frac{\sum_i w_i z_{i1999}}{\sum_i w_i x_{i1999}}} \times 100 = 10.64\%$$

w_i - Final 1999 location weight
x_{i2002} - 2002 Employment
x_{i1999} - 1999 Employment
z_{i2002} - 2002 Gross Payroll
z_{i1999} - 1999 Gross Payroll

Example 3: Percentage change in total revenue for locations offering non-wage benefits in both years for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2002} \delta_i - \sum_i w_i x_{i1999} \delta_i}{\sum_i w_i x_{i1999} \delta_i} \times 100 = 9.97\%$$

w_i - Final 1999 location weight
x_{i2002} - 2002 Revenue
x_{i1999} - 1999 Revenue
δ_i - Non-wage benefit indicator (equals 1 if location offers non-wage benefits in both survey years, 1999 and 2002; 0 otherwise)

Longitudinal workplace 2000 to 2002

Longitudinal workplace target population

The longitudinal workplace target population is the same as the 1999 workplace target population.

Longitudinal workplace analysis portion (HO: 5,073 locations; RDC: 4,937)

The longitudinal workplace analysis portion is the same as the 2002 workplace analysis portion including data from both 2000 and 2002.

Note: Longitudinal estimates calculated from 2000 in the following examples are done so using only continuing locations.

Below are a number of examples that use the longitudinal workplace analysis portion.

Example 1: Percentage change in total revenue from 2000 to 2002 for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2002} - \sum_i w_i x_{i2000}}{\sum_i w_i x_{i2000}} \times 100 = 2.55\%$$

w_i - Final 1999 location weight
x_{i2002} - 2002 Revenue
x_{i2000} - 2000 Revenue

Example 2: Percentage change in average gross payroll per employee from 2000 to 2002 for continuing locations.

$$\hat{P} = \frac{\frac{\sum_i w_i z_{i2002}}{\sum_i w_i x_{i2002}} - \frac{\sum_i w_i z_{i2000}}{\sum_i w_i x_{i2000}}}{\frac{\sum_i w_i z_{i2000}}{\sum_i w_i x_{i2000}}} \times 100 = 7.25\%$$

w_i - Final 1999 location weight
x_{i2002} - 2002 Employment
x_{i2000} - 2000 Employment
z_{i2002} - 2002 Gross Payroll
z_{i2000} - 2000 Gross Payroll

Example 3: Percentage change in total revenue for locations offering non-wage benefits in both years for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2002} \delta_i - \sum_i w_i x_{i2000} \delta_i}{\sum_i w_i x_{i2000} \delta_i} \times 100 = 1.59\%$$

w_i - Final 1999 location weight
x_{i2002} - 2002 Revenue
x_{i2000} - 2000 Revenue
δ_i - Non-wage benefit indicator (equals 1 if location offers non-wage benefits in both survey years, 2000 and 2002; 0 otherwise)

Longitudinal workplace 2001 to 2002

Longitudinal workplace target population

The longitudinal workplace target population is the same as the 1999 workplace target population.

Longitudinal workplace analysis portion (HO: 5,818 locations; RDC: 5,713)

The longitudinal workplace analysis portion is the same as the 2002 workplace analysis portion including data from both 2001 and 2002.

Note: Longitudinal estimates calculated from 2000 in the following examples are done so using only continuing locations.

Below are a number of examples that use the longitudinal workplace analysis portion.

Example 1: Percentage change in total revenue from 2001 to 2002 for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2002} - \sum_i w_i x_{i2001}}{\sum_i w_i x_{i2001}} \times 100 = .23\%$$

w_i - Final 1999 location weight
x_{i2002} - 2002 Revenue
x_{i2001} - 2001 Revenue

Example 2: Percentage change in average gross payroll per employee from 2001 to 2002 for continuing locations.

$$\hat{P} = \frac{\frac{\sum_i w_i z_{i2002}}{\sum_i w_i x_{i2002}} - \frac{\sum_i w_i z_{i2001}}{\sum_i w_i x_{i2001}}}{\frac{\sum_i w_i z_{i2001}}{\sum_i w_i x_{i2001}}} \times 100 = 2.71\%$$

w_i - Final 1999 location weight
x_{i2002} - 2002 Employment
x_{i2001} - 2001 Employment
z_{i2002} - 2002 Gross Payroll
z_{i2001} - 2001 Gross Payroll

Example 3: Percentage change in total revenue for locations offering non-wage benefits in both years for continuing locations.

$$\hat{P} = \frac{\sum_i w_i x_{i2002} \delta_i - \sum_i w_i x_{i2001} \delta_i}{\sum_i w_i x_{i2001} \delta_i} \times 100 = .03\%$$

w_i - Final 1999 location weight
x_{i2002} - 2002 Revenue
x_{i2001} - 2001 Revenue
δ_i - Non-wage benefit indicator (equals 1 if location offers non-wage benefits in both survey years, 2001 and 2002; 0 otherwise)

Longitudinal employee 2001 to 2002

Longitudinal employee target population
The longitudinal employee target population is the same as the 2001 employee target population.

Longitudinal employee analysis portion (16,813 employees)
The longitudinal employee analysis portion is the same as the 2002 employee analysis portion including data from both 2001 and 2002.

Note: For longitudinal analyses the 2002 employee final weights should be used. Longitudinal estimates calculated from 2001 in the following examples are done so using only employees who in March 2001 were part of continuing locations.

Below are a number of examples that use the longitudinal employee analysis portion.

Example 1: Percentage change in average hourly wage per employee between 2001 and 2002 working in March 2001 for a continuing location. (Employee may be working for the same location as in March 2001, working for a new location, or not working at all.)

$$\hat{P} = \frac{\frac{\sum_i w_i x_{i2002}}{\sum_i w_i} - \frac{\sum_i w_i x_{i2001}}{\sum_i w_i}}{\frac{\sum_i w_i x_{i2001}}{\sum_i w_i}} \times 100 = -3.50\%$$

w_i - Final 2002 employee weight
x_{i2002} - 2002 Hourly Wage
x_{i2001} - 2001 Hourly Wage

Example 2: Percentage change in average hourly wage per continuing employee between 2001 and 2002 working in March 2001 for a continuing location.

$$\hat{P} = \frac{\frac{\sum_i w_i x_{i2002}\delta_i}{\sum_i w_i \delta_i} - \frac{\sum_i w_i x_{i2001}\delta_i}{\sum_i w_i \delta_i}}{\frac{\sum_i w_i x_{i2001}\delta_i}{\sum_i w_i \delta_i}} \times 100 = 3.65\%$$

w_i - Final 2002 employee weight
x_{i2002} - 2002 Hourly Wage
x_{i2001} - 2001 Hourly Wage
δ_i - Continuer status indicator (equals 1 if employee is working in for the same employer in March 2002 as in March 2001; 0 otherwise)

Example 3: Percentage change in average hourly wage per exiting employee between 2001 and 2002 working in March 2001 for a continuing location and working in March 2002 for a new employer.

$$\hat{P} = \frac{\frac{\sum_i w_i x_{i2002} \delta_i}{\sum_i w_i \delta_i} - \frac{\sum_i w_i x_{i2001} \delta_i}{\sum_i w_i \delta_i}}{\frac{\sum_i w_i x_{i2001} \delta_i}{\sum_i w_i \delta_i}} \times 100 = 8.33\%$$

w_i - Final 2002 employee weight
x_{i2002} - 2002 Hourly Wage
x_{i2001} - 2001 Hourly Wage
δ_i - Exiter status indicator (equals 1 if employee is, in March 2002, no longer working for the same employer as in March 2001; 0 otherwise)

Longitudinal linked workplace/employee 2001 to 2002

Longitudinal linked target population
The longitudinal linked target population is the same as the 2001 linked target population.

Longitudinal linked analysis portion (HO: 5,818 locations; 16,813 employees; RDC: 5,713 locations; 16,026 employees)
The longitudinal linked analysis portion is the same as the 2002 linked analysis portion including data from both 2001 and 2002.

Note: When performing longitudinal employee analysis, linking to workplace characteristics, one should use the 2002 employee final weights, in association with the complete employee file. When performing longitudinal workplace analysis, linking to employee characteristics, the 2002 workplace linked weight should be used, considering only workplaces with at least one responding employee. Re-weighting is performed to adjust for workplaces with no responding employees. Longitudinal estimates calculated from 2001 in the following examples are done so using only employees who in March 2001 were part of continuing locations, regardless of where they work (or don't work) in March 2002. Also included in the examples are the continuing locations.

Below are a number of examples that use the longitudinal linked analysis portion.

Example 1: Percentage change in average hourly wage per employee who in March 2001 was working for a non-profit continuing workplace. (Employee may be working for the same location as in March 2001, working for a new location, or not working at all.)

$$\hat{P} = \frac{\frac{\sum_i w_i x_{i2002} \delta_i}{\sum_i w_i \delta_i} - \frac{\sum_i w_i x_{i2001} \delta_i}{\sum_i w_i \delta_i}}{\frac{\sum_i w_i x_{i2001} \delta_i}{\sum_i w_i \delta_i}} \times 100 = -3.47\%$$

w_i - Final 2002 employee weight
x_{i2002} - 2002 Hourly Wage
x_{i2001} - 2001 Hourly Wage
δ_i - Non-profit indicator (from location file; equals 1 if location was a non-profit workplace in 2001; 0 otherwise)

Example 2: Percentage change in average hourly wage per continuing employee who in March 2001 was working for a continuing location. The location was non-profit in 2001 and 2002.

$$\hat{P} = \frac{\frac{\sum_i w_i x_{i2002} \delta_{1i} \delta_{2i}}{\sum_i w_i \delta_{1i} \delta_{2i}} - \frac{\sum_i w_i x_{i2001} \delta_{1i} \delta_{2i}}{\sum_i w_i \delta_{1i} \delta_{2i}}}{\frac{\sum_i w_i x_{i2001} \delta_{1i} \delta_{2i}}{\sum_i w_i \delta_{1i} \delta_{2i}}} \times 100 = 3.57\%$$

w_i - Final 2002 employee weight
x_{i2002} - 2002 Hourly Wage
x_{i2001} - 2001 Hourly Wage
δ_{1i} - Continuer status indicator (equals 1 if employee is working in for the same employer in March 2002 as in March 2001; 0 otherwise)
δ_{2i} - Non-profit indicator (from location file; equals 1 if location is a non-profit workplace in 2001 and 2002; 0 otherwise)

Example 3: Percentage change in total revenue from 2001 to 2002 for continuing workplaces with at least one continuing or exiting employee that does some work at home in March 2001 and March 2002 in the longitudinal linked target population.

$$\hat{P} = \frac{\sum_i w_i x_{i2002} \delta_i - \sum_i w_i x_{i2001} \delta_i}{\sum_i w_i x_{i2001} \delta_i} \times 100 = -1.5\%$$

w_i - Final 2002 linked location weight
x_{i2002} - 2002 Revenue
x_{i2001} - 2001 Revenue
δ_i – Work at home indicator (equals 1 if employee does some work at home in 2001 and 2002; 0 otherwise)

Appendix 5

Analysis and the proper weight

Cross-sectional employer analysis

Cross-sectional employer analysis performed for 1999, 2001 and 2003 should use the corresponding weight of that year. Cross-sectional analysis may be performed on the 2000 data using its corresponding weight however the results reflect the 1999 workplace universe and not the 2000 workplace universe. Births to the workplace universe were not included in the 2000 frame and are not reflected in the weights of that year. The same occurrence is true for all even years. In 2004 the workplace universe is 2003.

Longitudinal employer analysis

Longitudinal employer analysis can be performed using any combination of the six available years (1999 to 2000, 1999 to 2001, 1999 to 2002, 1999 to 2003, 1999 to 2004, 2000 to 2001, 2000 to 2002, 2000 to 2003, 2000 to 2004 etc.) for common units. The weight to be used for longitudinal employer analysis is the weight from the earliest year in the analysis. (i.e. 1999 if 1999 is part of the analysis)

Cross-sectional employee analysis

Cross-sectional employee analysis performed for 1999, 2001 and 2003 should use the corresponding weight of that year. Cross-sectional analysis may be performed on the 2000 data using its corresponding weight however the results reflect the 1999 employee universe and not the 2000 employee universe. Births to the workplace universe were not included in the 2000 workplace frame and therefore their corresponding employees are not part of the employee frame and as such are not reflected in the weight. The same occurrence is true for all even years. In 2004 the employee universe is 2003.

Longitudinal employee analysis

Longitudinal employee analysis can be performed between 1999 to 2000 or 2001 to 2002 or 2003 to 2004 for common employees between the two years. The most current weight should be used. For example 2000 weight should be used for the 1999 to 2000 analysis. No weights were computed to perform longitudinal analysis using common employees between 2000 and 2001 or 2002 and 2003 as the overlap between the years is minimal and the variances produced from any analyses would show the analyses to be unreliable.

Cross-sectional linked employer-employee analysis

Cross-sectional linked employer-employee analysis performed for 1999, 2001 and 2003 should use the corresponding weight of that year. Cross-sectional analysis may be performed on the 2000 data using its corresponding weight however the results reflect the 1999 workplace/employee universe and not the 2000 universe. Births to the workplace universe were not included in the 2000 workplace frame and therefore their corresponding employees are not part of the employee frame. As such neither the birthed workplaces nor employees are reflected in the weight. The same occurrence is true for all even years. In 2004 the results will reflect the 2003 workplace and employee universe.

When performing employee analysis, linking to workplace characteristics, one should use the employee final weights, in association with the complete employee file. When performing workplace analysis, linking to employee characteristics, the workplace linked weight should be used considering only workplaces with at least one responding employee. Re-weighting is performed to adjust for workplaces with no-responding employees.

Longitudinal linked employer-employee analysis

Longitudinal linked employer-employee analysis can only be performed at this point between 1999 to 2000 or 2001 to 2002 or 2003 to 2004 common workplaces and employees between the two years. The most current weight should be used. For example the 2000 weight should be used for the 1999 to 2000 analysis. No weights were computed to perform longitudinal analysis between 2000 and 2001 or 2002 and 2003 as the overlap of employees between the years is minimal and the variances produced from any analyses would show the analyses to be unreliable.

When performing employee analysis, linking to workplace characteristics, one should use the employee final weights, in association with the complete employee file. When performing workplace analysis, linking to employee characteristics, the workplace linked weight should be used considering only workplaces with at least one responding employee. Re-weighting is performed to adjust for workplaces with no-responding employees.

Appendix 6

Linked analysis

Why linked models must be treated differently

With linked employer and employee data such as Statistics Canada's Workplace and Employee Survey (WES), researchers are provided an opportunity to investigate business and labour market outcomes that depend critically on the interactions between employers and employees. At the same time, they will also have to face some statistical and econometric problems in their modelling of the business and labour market activities.

Since the late 1990s, economists have proposed a variety of empirical models that can be estimated with linked (matched) employer-employee data.[1] Although the models employed by these studies are basically the familiar linear regression function, there are a number of new elements embedded in these models warranting a treatment different from the classical linear regression analysis. Consider a linear model specified for some employee-level outcome Y_{ij} in which employee i is characterised by X_{ij} and workplace j is characterised by Z_j:

$$Y_{ij} = \alpha_j + \beta_j X_{ij} + \varepsilon_{ij},$$
$$\alpha_j = \alpha_0 + \alpha_1 Z_j + u_j,$$
$$\beta_j = \beta_0 + \beta_1 Z_j + v_j,$$

where ε_{ij}, u_j, and v_j are classical disturbances, ε_{ij} is independent of X_{ij}, u_j and v_j are independent from each other and they are independent of Z_j. A linear model can be derived from these specifications:

$$Y_{ij} = \alpha_0 + \alpha_1 Z_j + \beta_0 X_{ij} + \beta_1 X_{ij} Z_j + u_j + v_j X_{ij} + \varepsilon_{ij}.$$

Models like the above, often referred to as *mixed models* (*varying parameter models*), contains stochastic elements (u_j and v_j) that are not observable to the analyst. Classical linear regression analysis applies to the above model only if $u_j = v_j = 0$. When $v_j = 0$, it becomes an example of the *error component models*, and when $u_j = 0$, we obtain an example of the *random coefficients models*.

The mixed model becomes more complex if we attempt to analyse outcomes of the interactions between employers and employees over time. Even in the absence of error components and random coefficients, some of the standard assumptions of the classical regression analysis are quite likely to be violated in a mixed model. In particular, intra-firm correlation, inter-firm heteroscedasticity, measurement error brought by aggregation can all cause serious consequences if these problems are not carefully addressed. Furthermore, the full model, capable of capturing the effects of employer and employee characteristics and the effects of decisions (choices) made by employers and employees, is not necessarily hierarchical or balanced[2]. Hence, not all the treatments established by the multilevel modelling literature[3] are applicable in such a specification.

1. See Abowd and Kramarz (1999) for a review. Haltiwanger et al. (1999) eds. contain selected articles presented at the 1998 international Symposium of Linked Employer-Employee Data.
2. The basic linear model employed by Abowd and Kramarz (1999) for their review is such an example.
3. See Goldstein (1995) for an introduction to multilevel analysis.

Using employer variables in employee analyses

When one attempts to analyze employee level outcomes using variables at the employer level, a disaggregation of the employer variables is initiated. Employees drawn from the same firm or workplace would have identical employer variables such as technology investment, training expenditure and industry, and these employer variables may not be independent across workers within the same workplace. But parameter estimation necessarily treats the value of an employer variable associated with each employee within the same workplace as independent information. As a result, some estimates may be spuriously different from 0. In order to avoid this, one shall need to correct the downward bias in the estimated standard errors. The correction procedure is discussed in Moulton (1985) and Troske (1996).

One may follow the classical regression analysis to assume homogeneous employees within a firm, but it is likely that employees between firms are heterogeneous. Wrong inference can be made if grouped data drawn from a heterogeneous population are treated as if they are drawn from a homogeneous one. The group-wise heteroscedasticity problem, however, is not a new issue. Treatments are discussed in many standard econometric textbooks[4]. A random coefficients model specification, due to Hildreth and Houck (1968), might be a convenient way out of the problem.

Using summarized employee data in employer analyses

Information collected from employees could be of particular interest for researchers modelling employer outcomes. But many variables defined at the employee level might be problematic when being used at the employer level, particularly those based on the subjective assessments made by the surveyed employees. Hence, in linked analyses, the *error in variables* problem brought by aggregation becomes a norm rather than an exception.

The solution to measurement error is to replace the variable in question by an instrumental variable (IV), a variable that is highly correlated with the true value of the underlying variable but not with the measurement error[5]. The IV estimators are asymptotically consistent, efficient, and normal under certain general conditions. Fuller (1987) is an excellent reference on the IV method. A suitable instrument is not easy to find in many situations, but linked data makes it easier for analysts to find good instruments. However, correcting problems induced by measurement error is not the only usefulness of the IV method. More importantly, the IV method is employed by many empirical studies to solve the possible endogeneity problem: an explanatory variable in a model depends also on the dependent variable. In the classical regression context, this is the case where the explanatory variable is correlated with the error term. The endogeneity problem makes the IV method (in stead of the multilevel model) more popular in linked employer-employee analysis.

4. See for example, chapters 16 and 17 of Judge et al (1982).

5 The measurement error can be non-classical in the sense that it is not independent of the true values of the variable in question. See Barron, Berger and Black (1999).

Software

The mixed model estimation, the IV method and estimations of fixed effects, random effects can be handled by many statistical/econometric programs. SAS and STATA are two powerful packages. In SAS, the GLM and the MIXED PROCs can be used for estimation of the multilevel model, taking weights into the procedures. STATA can offer capacities to estimate many models researchers may specify and provide a number of procedures that account for complex sample design effects (with the “svy” prefix).

However, users should be aware that STATA is not able to correctly incorporate the dead units. If the domain of interest is used, the point estimates will be correct but not their variances. By far, the use of bootstrap weights in SAS regression procedures is the most general and practical way to generating design-based estimates and variances.

The WES project team is testing a number of other software packages appropriate to mixed models

Appendix 7

Weighting and estimation

The Workplace and Employee Survey is a sample of Canadian business locations from which a certain number of employees is selected depending on the size of the location measured by total employment.

Estimation

Estimation is the survey step that consists of approximating unknown parameters using only a part of the population, called the sample, and of making inferences about these unknown parameters; that is, drawing conclusions about the population from only a sample of that population. Examples of usual population parameters of interest include population totals, means and ratios. There may also be an interest in the estimation of model parameters such as linear or logistic regression model coefficients.

Estimates are obtained by attaching a final weight to each unit (workplace or employee) in the sample. The basic weighting principle is to weight each unit by the inverse of its probability of inclusion in the sample. This leads to the initial design weight, which is often interpreted as the number of times that each sampled unit should be duplicated to represent the whole population. Because of many reasons, such as refusals or the impossibility to contact some of the sampled units, the observed sample is of smaller size than the original sample selected. To compensate for nonresponse, imputation and nonresponse weight adjustment are used. Nonresponse weight adjustment consists of adjusting the design weight of each responding unit by a nonresponse adjustment factor. Then, another weight adjustment is performed to deal with the problem of stratum jumpers (large workplaces believed to be small at the time of the survey design and vice-versa), which leads to an adjusted design weight. Finally, calibration is used to obtain final weights. The basic idea of calibration is to find final weights as close as possible to the adjusted design weights and such that constraints are satisfied. The goal of these constraints is: i) to ensure consistency with total employment by industry/region obtained from the Survey of Employment, Payroll and Hours (SEPH); and ii) to improve the efficiency of the estimates.

The initial sample selection determines the design weight of each unit. During the survey process the initial design weights may undergo several adjustments, which strive to maintain the representativity of the sample. For WES two adjustments are made, one to compensate for complete non-response and one to diminish the influence of stratum jumpers on estimates. To adjust for non-response one multiplies the initial design weights of responding units by a ratio of all sampled units to all responding units within each stratum. This process is predicated on the assumption that respondents and non-respondents behave alike. Since nonresponse exists mainly amongst the smaller units, this assumption is not unreasonable.

Adjusting for stratum jumpers is more complex as there are at least three methods for dealing with this problem in general. One can either decrease the design weight of the stratum jumper and distribute the difference over the remaining units within the stratum, or one can reduce its values, or one can remove the unit entirely and treat it as non-response. We selected the first option where we targeted approximately 30 employers for a design weight adjustment.

The use of the design weights, whether initial or adjusted, results in unbiased yet sometimes inefficient estimates. To improve the efficiency of the estimation process, one can benchmark, or calibrate, the sample to a set of known or efficiently estimated population totals. In WES this is done using total employment estimated by SEPH at the industry by region level, at which the WES estimates are forced to agree with the SEPH estimates. The resulting adjustment factors are applied to the adjusted design

weights. Benchmarking is of the most benefit in situations where the calibration variable (in WES, it is employment) is highly correlated with the variables of interest.

The product of the adjusted design weight and the calibration factor is the final workplace weight. The final linked weight is obtained by adjusting the workplace weight for live employers with no responding employees before applying the calibration factor. The final employee weight accounts for selection of employees and additional nonresponse of employees. These final weights are used for computing statistics such as totals, means, regression coefficients, etc. To estimate the variance of these statistics, one has to use software packages that allow the user to specify the survey design. If one uses products such as SAS without suitably transforming the survey weights, the resulting underestimation of the variance may be quite severe.

Variance estimation

There are many avenues open to the analysts wishing to produce appropriate variance estimates. One is to use the Statistics Canada Generalized Estimations System (GES) that will handle the estimation of totals, means, and ratios for a variety of designs. The use of GES by external researchers may be financially prohibitive given its licensing costs.

A second option is by far the most general and the easiest to put into practice. It involves the use of bootstrap weights. Bootstrap is a statistical technique whereby one uses a re-sampling technique to generate a number of sets of weights that, if used correctly, capture the variability of a wide variety of statistics. The idea is to compute a large number of "bootstrap" estimates and then calculate their variance.

Once the bootstrap weights are computed, they can be specified in the weight statement in any SAS procedure that has one. To estimate the variance of a statistic, one has to produce an estimate based on each set of bootstrap weights. Then one uses the variability among these bootstrap estimates to produce an appropriate variance estimate of the desired statistic.

Appendix 8

Variance calculation

The use of bootstrap weights for computing design consistent variances

When one computes the variances for estimates based on samples coming from finite populations, one has to account for the sampling design. This is not easily done in most statistical analysis software packages. Although most of them do allow the use of weights, they do not use them in the proper manner thus often resulting in the underestimation of the variance. This could have dire consequences for hypothesis testing and for constructing confidence intervals.

Over the years statistical agencies have developed systems to deal with finite populations but most of them lack the flexibility needed to do data analysis. This is where BOOTSTRAP comes in. It is a technique based on re-sampling. One uses the original sample, from which one selects a simple random sample with replacement of as many units as one has at the outset. This procedure is repeated many times to guarantee convergence. This leads to several set of bootstrap weights. In WES, the mean bootstrap methodology is used, where each set of bootstrap weights is in fact obtained as an average of many (in WES, it is 50) sets of bootstrap weights.

Once the bootstrap weights are computed, they can be specified in the weight statement in any SAS procedure that has one. To estimate the variance for a desired statistic, one has to produce an estimate based on each set of bootstrap weights. Then one computes the variability among these bootstrap estimates to produce an appropriate variance estimate of the desired statistic. Below are two examples of how this can be achieved for totals and for correlation coefficients

Depending on your analysis you would use either the wkp_bsw1 to wkp_bsw100 (workplace bootstrap weights), emp_bsw1 to emp_bsw100 (employee bootstrap weights) or lnk_bsw1 to lnk_bsw100 (linked bootstrap weights). SPSS users of older version will use wkp_b1 to wkp_b100, emp_b1 to emp_b100, lnk_b1 to lnk_b100. The following example looks at workplace information.

```
PROC SUMMARY DATA = WES NWAY;
        CLASS DOM_IND;
        VAR WKP_FINAL_WT WKP_BSW1-WKP_BSW100;
        WEIGHT TTL_EMP;
        OUTPUT OUT = ESTIM (DROP = _FREQ_ _TYPE_)
                SUM = EMPL WKP_BSW1-WKP_BSW100;
RUN;

PROC TRANSPOSE DATA = ESTIM
                OUT = T_ESTIM (DROP = _NAME_ RENAME = (COL1 = ESTIM));
        VAR WKP_BSW1-WKP_BSW100;
                BY DOM_IND;
RUN;

PROC SUMMARY DATA = T_ESTIM NWAY;
        CLASS DOM_IND;
        VAR ESTIM;
        OUTPUT OUT = VAR (DROP = _FREQ_ _TYPE_)
                CSS = VAR;
RUN;

DATA ESTIM;
        MERGE ESTIM (KEEP = DOM_IND EMPL)
                VAR;
                BY DOM_IND;
        CV = ROUND (SQRT(50 / 100 * VAR) / EMPL, 0.01); RUN:
```

The first SUMMARY procedure uses a trick that allows one to compute all necessary estimates in one simple step. This can only be done when one is producing estimates for a single variable. The trick is to specify the bootstrap weights as the analysis variables and to use the analysis variable as the weight. The estimates are computed at the domain industry level specified by the class statement.

After estimates have been computed, transposed and renamed, another SUMMARY procedure is used to compute their variance (actually, their corrected sum of squares, or CSS in SAS). And finally, multiplying the CSS by 50 / 100 produces the correct design variance. The denominator (100) is the normal adjustment *n* that yields the classical variance. The numerator (50) reflects the fact that each set of bootstrap weights has been averaged over 50 iterations, resulting in an average bootstrap weight. Therefore, the adjustment injects back the variability that has been lost by using the average.

The next example illustrates the use of bootstrap weights for computing correlation coefficients. Here, one has to use a macro to compute individual coefficients, as one cannot easily use the above trick.

```
%MACRO COR_COEF;
        %DO I = 1 %TO 100;
                PROC CORR DATA = BOOT OUTP = CORRS NOPRINT;
                        VAR TTL_EMP CBA_EMP;
                                BY DOM_IND;
                        WEIGHT WKP_BSW&I;
                RUN;

                DATA CORRS (KEEP = DOM_IND CBA_EMP RENAME = (CBA_EMP = CORR));
                        SET CORRS (WHERE = (_TYPE_ = 'CORR' & _NAME_ = 'TTL_EMP'));
                RUN;

                PROC DATASETS FORCE NOLIST;
                        APPEND BASE = ESTIM DATA = CORRS;
                        QUIT;
                RUN;
        %END;
%MEND;

%COR_COEF;

PROC SUMMARY DATA = ESTIM NWAY;
        CLASS DOM_IND;
        VAR CORR;
        OUTPUT OUT = VAR (DROP = _FREQ_ _TYPE_)
                CSS = VAR;
RUN;

PROC CORR DATA = BOOT OUTP = CORRS NOPRINT;
        VAR TTL_EMP CBA_EMP;
                BY DOM_IND;
        WEIGHT WKP_FINAL_WT;
RUN;

DATA CORRS (KEEP = DOM_IND CBA_EMP RENAME = (CBA_EMP = EST_CORR));
        SET CORRS (WHERE = (_TYPE_ = 'CORR' & _NAME_ = 'TTL_EMP'));
RUN;

DATA ESTIM;
        MERGE VAR CORRS;
                BY DOM_IND;
        CV = ROUND(SQRT(50 / 100 * VAR) / EST_CORR * 100, 0.01);
RUN;
```

The macro COR_COEF computes correlation coefficients based on each set of bootstrap weights. The example here treats two continuous variables but may be easily extended to multiple variables both

continuous and categorical. After estimates have been computed, the corrected sum of squares is produced along with a correlation coefficient that is based on the final weights.

The two files are then merged, the corrected sum of squares is adjusted and a CV is computed. Similar steps should be followed for computing variances of regression estimates, principal components, and other statistic. With the exception of totals of a single variable the computations cannot be done in one step. To reduce computing time per iteration it is recommended that the initial data set be reduced to the analysis variables.

Additional codes written in STATA and SAS showing how to use the WES bootstrap weights to perform a wide array of statistical analyses are included in \CODE. This set of codes is anchored in prior work by François Brisebois (SPSS and SAS macros for NPHS), Pierre Felx (SAS macros for WES), Tony Fang (STATA macro for WES) and Dominic Grenier (STATA and SAS macros for LSIC). The focus of these macros is not estimation of means, totals or ratios; these programs are rather primarily prepared with a view at illustrating the use of the WES bootstrap weights in statistical modelling. The codes allow the following types of analyses:

- linear regression
- T-test
- analysis of variance
- analysis of covariance
- logistic regression
- probit models
- multinomial logistic regression
- ordinal logit models
- ordinal probit models
- generalized estimating equation (GEE)
- generalized linear models (the entire family)
- goodness-of-fit, homogeneity and association tests using both the first- and second-order Rao-Scott corrections

The programs are flexible, easy to reproduce, easy to use and generalizable to any survey for which bootstrap weights are available.

Flexibility
The programs are not provided as STATA ado files or as SAS macros to be saved in a macro library. The experienced users as well as those with less experience with STATA or SAS can, with minor work, adapt these codes to the particular problem at hand. They can easily expand or contract them. The less experienced users may want to use them as is, in their current formulation.

Ease of reproduction
The same programming structure is repeated in every program. This pattern can be easily extended to or reproduced with other statistical models for which no explicit bootstrap codes are provided.

Ease of use
First of all, the users prepare a data set with the relevant variables required by the models they want to fit. This dataset must be augmented with the bootstrap weights; depending on the type of analysis, the employee, linked or employer survey final weight are also included.

Then, on the Stata model command line, users have to specify the name of their own variables and the final weight they are going to use, as in the examples provided. These programs use the stub of the

bootstrap weight variable, emp_bsw for the employee portion; for an analysis using the workplace portion, the stub would be wkp_bsw, for example.

In the SAS macros, at the beginning of the programs, users need to specify the survey final weight, the number of bootstrap weights, the number of iterations, the dataset they intend to use and the stub for the bootstrap weights.

To be specified at the beginning

```
%let bsw = emp_bsw;/* in the employee file use emp_bsw, in the employer replace that variable by wkp_bsw */
%let fwgt = emp_final_wt; /*Use the variable name for the final weight, e.g. emp_final_wt for the employee file,
                                wkp_final_wt for the employer file*/
%let dsn=boot_data;/* this data set has the subset of relevant variables for the analysis and the bootstrap weights*/
%let b=100;/* the number of bootstrap weights available in the file*/

%let iter=50;
```

To be specified at the end

%***linregress***(boot_data,hr_waget,age) /* the number of items in this line depend on the models an other macro parameters needed. This line does a regression analysis, stating that hourly wage as a function of employee age based on the dataset boot_data.

Finally, the results are saved in a directory provided by the users, by replacing the path "c:\Documents and Settings\decayve\bootstrap_yves\res.dta" with their own path.

Generalizability

These program files can be used with any survey that provides bootstrap weights. The unique aspect that makes it particular to WES is that in the computation of the variance, the fact that each bootstrap weight represents an average of 50 iterations was taken into account. In the STATA program, this was translated with the instruction “local iter = 50. With other surveys, users have only to replace 50 by 1 in that line. Also, if a particular survey provides 1000 bootstrap weights, just replace 100 by 1000 in the command “local bs = 100”. That is only what is needed.

The same can be accomplished with the SAS macros by replacing

"%let iter= 50" with "%let iter = 1".

When 1000 bootstrap weights are provided, replace

"%let b =100" with "%let b =1000".

Commercial packages such as SUDAAN and WesVar can be used to perform bootstrap variance estimation if the variance estimation approach is specified as BRR, and if the bootstrap weight variables are specified as BRR weights (D. Binder and G. Roberts, 2004, in "Statistical inference in survey data analysis: Where does the sample design fit in?"). With WES bootstrap weights, the results provided by these packages would have to be adjusted to account for the fact that each set of bootstrap weights has been averaged over 50 iterations, resulting in an average bootstrap weight. The codes provided herein take the iterations into account, rendering them therefore specific to WES. However, by setting the number of iterations equal to one, the generalizability to all surveys providing bootstrap weights to their users is achieved.

Appendix 9

Deemed employee[6] access to workplace and employee survey microdata

Researchers under agreement with Statistics Canada

A9.1 Steps to follow for entry of Statistics Canada:

1. Researchers are to submit proposals to Statistics Canada (STC). Be sure to include in your proposal a justification for using STC microdata. Guidelines and forms can be obtained from your STC analyst.

2. Statistics Canada will carry out a review of the proposal and will notify the primary researcher of the final decision made by the review committee. Ideally this will happen within two months of the date of submission. At that time, Statistics Canada will conduct a security check on all researchers who will be accessing the data. Note that all proposal decisions can be appealed through Statistics Canada.
    - Researchers should contact the STC analyst to indicate their intent before they would like to access the data. Upon that contact, the primary researcher will:
        - sign a memorandum of understanding between the project team members and Statistics Canada.
        - undergo an Enhanced Reliability Check as defined by Treasury Board Security Policy;
        - attend an orientation session (approximately three hours) conducted by the STC analyst.
        - sign the oath/affirmation of secrecy required by the *Statistics Act*;
        - acknowledge in writing that they have read and understood:
            - sections 17(1), 30 and 34 of the *Statistics Act* and
            - documentation related to specified Statistics Canada policies and practices
        - acknowledge in writing having received and read documentation on the *Conflict of Interest and Post-Employment Code*
            - and declare they will comply with the Code.
    - Researchers who have signed the oath of office will then receive their own pass to access the STC area.
3. Researchers are asked to sign up for a workstation on the days they would like to access data.

4. Data access begins.

6. Deemed employees are persons who have had research projects approved, either through the Social Sciences and Humanities Research Council (SSHRC) review process for research projects to be undertaken in a Research Data Centre (RDC), or through an equivalent peer review process approved by Policy Committee (see A9.2) for research projects where the work is undertaken either at Headquarters or in a Regional Office;

A9.2 Peer review approval processes for research conducted by deemed employees at Statistics Canada headquarters or regional offices (approved by Policy committee, July 3, 2002, revised October 9, 2002)

This document outlines the peer review approval processes to be used for research projects that have not been reviewed through the Social Sciences and Humanities Research Council (SSHRC) review process for research projects to be undertaken in a Research Data Centre (RDC). This includes projects using social statistics and conducted at headquarters (or in regional offices given appropriate security arrangements), and all projects conducted by deemed employees using business microdata. In the latter case, all of this research must be conducted at headquarters.

The approval process for research projects carried out by deemed employees in the RDCs is operated largely by SSHRC, and described on the SSHRC www.sshrc.ca/web/apply/application/rdc_application_e.asp and Statistics Canada RDC web sites www.statcan.ca/english/rdc/index.htm.

1. *Social Statistics:* Approval Processes for Deemed Employee Research Projects Using Household/Social Microdata (only the employee portion of the WES data should fall into this category)

a. Researcher initiated, no funding provided, microdata research contract

All research projects should follow the SSHRC process that is currently in place for the RDCs. This includes research projects conducted by deemed employees that sign a Microdata Research Contract, and conduct the work at headquarters or the regional offices (as well as those done at the RDCs). Deemed employee research projects can only be conducted in regional offices if there are security arrangements in place that are equivalent to those in the Research Data Centres. This process in essence extends the existing RDC approval process to projects conducted outside the RDCs. Researchers submit the project through the SSHRC web site, and it is reviewed by peer reviewers selected by SSHRC, as well as by Statistics Canada.

The peer review approval processes of other granting councils or competitions may be used only where SSHRC agrees they are equivalent or is involved in the process.

b. Statistics Canada initiated, with full funding provided through a service contract

No review process is required beyond that regularly used to let contracts.

c. Joint research projects with outside researchers as deemed employees, Statistics Canada initiated, but no money changing hands

Periodically there are research projects that involve partnerships between Statistics Canada employees and outside researchers. A Statistics Canada division may decide to conduct a particular project, and involve a research partner in a federal government agency, university, or elsewhere. No money changes hands, since it is in the interest of both groups to conduct the work. In these cases, the proposal must go to Policy Committee for approval.

2. *Business statistics*: proposed approval process for deemed employee research projects using business microdata

   RDC approval process does not apply to the confidential business microdata (including employer portion of the WES or the employer-employee linked WES data) housed in the Statistics Canada headquarter or one of its regional offices. The approval process for the access to this type of data is the following:

a. Researcher initiated (no funding provided)

Research projects can be proposed by researchers from other federal agencies, universities, think tanks, etc. There is a two-step approval process:

i. The first step is to ensure that the project falls within Statistics Canada's mandate, that it is a project that Statistics Canada itself would conduct if it had the available resources, and that it is "doable" given the data available. The researcher submits a proposal to the Business Research Co-ordinating Committee through John Baldwin, the Director of Micro Economic Analysis Division. If the Director is not involved, then the Committee will assign one. The Director is responsible for the security arrangements, vetting the output for confidentiality, administering the oath, and other aspects as described in the *Guidelines On the Use of Deemed Employees*.

ii. If passed, as a second step, the project is then sent to two outside reviewers selected by the Business Research Co-ordinating Committee to assess the quality of the project (methodology, objectives given currently existing knowledge, etc.). Based on the reports of the reviewers, the Committee decides whether the project should proceed.

If the project had already received funding from a legitimate granting agency with a peer review process (notably SSHRC), then the second stage of the review process would not be required.

It is the responsibility of the Business Research Co-ordinating Committee to ensure that the research projects proposed and the outcomes of the review process are registered on the data base maintained by the manager of the Research Data Centres, so that all research projects using deemed employee are maintained in one place. The Committee must also establish a mechanism for keeping such information up-to-date.

b. Statistics Canada initiated, with full funding through a service contract

No review process is required beyond that regularly required to let contracts.

c. Joint research projects with outside researchers as deemed employees, Statistics Canada initiated, but no money changing hands

The approval process is similar to that described in 1 (c), above. However, these projects must first go to the Business Research Co-ordinating Committee to ensure that all projects are listed in one place, but ultimately to Policy Committee for approval. Again the Business Research Co-ordinating Committee would have the responsibility of ensuring that the projects are listed on the database of projects maintained by the manager of the RDCs, and that the information is kept up-to-date.

A9.3 Steps to follow for submission of output for disclosure analysis

Note: We encourage you to request of STC only the output that is essential to your report . The more requests on which the STC analysts have to perform disclosure analysis, the more difficult it becomes to address all researchers' needs in a timely fashion.

Please follow these steps if you would like to remove output from the STC:

1. Create a subdirectory under your assigned directory containing the files you would like to remove and accompanying analysis that may be necessary for disclosure analysis.
2. Schedule time with the STC analyst to discuss the disclosure analysis. Depending on the level of difficulty of the analysis and the volume of output, the STC analyst may request your presence during the disclosure analysis.
3. Revise your output based on the recommendations of the STC analyst and rename your files under the same subdirectories. Note that additional sessions may be required until all issues are addressed.
4. Advise the STC analyst that the revisions have been made and provide a diskette to transfer the output or indicate that you would like a printed copy.
5. Pick up your copy/diskette from the STC analyst.

Note to users: No survey data should be removed from Statistics Canada or the Research Data Centres!

A9.4 Steps to follow to gain access to a database not requested in the original proposal

Normally Statistics Canada will not allow researchers access to a new database if it was not requested in the original proposal. However, this need may arise from time to time. Talk with your STC analyst to determine whether your request can be fulfilled.

1. Researchers must submit a short written request to the STC analyst outlining the rationale for gaining access to a new database in order to achieve the goals of the original proposal.
2. The STC analyst will review your request with Statistics Canada staff, who may ask you for details.
3. If Statistics Canada approves the request, the STC analyst will arrange access to this database.

Note: Unsuccessful applicants are encouraged to submit a new proposal to gain access to additional databases.

A9.5 Steps to follow to add/remove a new researcher to/from a project after acceptance of a proposal by Statistics Canada

Note: Primary researchers are required to include the names of all researchers who are associated with the proposal, particularly any research assistants who will be accessing data in the STC area. However, an occasion may arise when a research assistant may be substituted or added.

Adding a researcher to a project:

1. Primary researchers should indicate to the STC analyst, in writing, the names of researchers who are to be added to the data access for a particular project.
2. The STC analyst will send the primary researcher the appropriate forms to be completed for the security check.
3. The STC analyst will inform the primary researcher of the results of the security check.
4. If the results are acceptable, then the new researcher can contact the STC analyst to arrange a time to attend an orientation session, take the oath of office and receive a security key and password.

Removing a researcher from a project:

1. Primary researchers should indicate to the STC analyst, in writing, the names of any researchers who will no longer be accessing data under this project. The primary researcher should also indicate if the computer files of this researcher should be retained, purged, or reassigned.
2. These researchers will be asked to return their security passes to the STC analyst and sign the amendment.

Note: The oath of office remains in effect for these researchers.

A9.6 Steps to follow to exit the STC upon completion of a project:

1. Researchers are to submit a draft of the Statistics Canada product to the STC analyst under the conditions of the memorandum of understanding.
2. Statistics Canada will carry out a review of the product and will notify the primary researcher of the acceptance or rejection of the product, including any revisions that may be necessary. Ideally this will happen within two months of the date of submission.
3. Researchers should complete revisions to the product and submit a final draft to René Morissette, Statistics Canada (613-951-3608 or rene.morissette@statcan.ca).
4. Researchers should notify the STC analyst that the project is complete and a final product has been submitted to Statistics Canada. At that time, the researchers must return their security pass/password/identification.
5. Researchers may also choose to save any programming/syntax or output to a CD. This can be done through a request to the STC analyst. Note that these files will be retained for six months following the completion of a Statistics Canada contract and then purged.
6. Researchers are free to publish subsequent reports stemming from their work in the STC.

Note: Your oath of office remains in effect even after you have completed the contract for Statistics Canada.

A9.7 Steps to follow for re-entry of STC user on a new agreement with Statistics Canada:

1. Researchers are to submit proposals to STC as they did the first time they wanted access to data. Be sure to include in your proposal a justification for using Statistics Canada microdata. You don't need to re-submit a Curriculum vita if you had done so before.
2. Statistics Canada will carry out a review of the proposal and will notify the primary researcher of the final decision made by the review committee. Ideally this will happen within two months of the date of submission. At that time, Statistics Canada will conduct a security check on all researchers (whom never were subject to security check) and who will be accessing the data in the STC for the first time.
3. Researchers should contact the STC analyst before they would like to access the data and indicate their intent. Upon that contact, four things will happen:
    - The primary researcher will sign a memorandum of understanding between the project team members and Statistics Canada.
    - The researchers will review the orientation material with the STC analyst.
    - The researchers will be asked to reaffirm their oath of office.

    The researchers will then receive their own key/password to access the STC area.
4. Researchers are asked to sign up for a workstation on the days that they would like to access data.
5. Data access begins.

Appendix 10

Disclosure avoidance guidelines for using workplace and employee survey microdata at RDCs

Statistics Canada takes great care to respect the trust of their respondents and to safeguard the privacy and confidentiality of the information that they provide. It is this trust that makes it possible for Statistics Canada to continue to collect accurate and meaningful data. Most household Surveys carried out by Statistics Canada do not require households and business mandatory participation - respondents to volunteer give their time and information freely. The information contained in these and other Statistics Canada surveys benefits the research community, and Statistics Canada goes to great lengths to protect the confidentiality of its respondents' information.

The goal of disclosure avoidance is to protect the information provided by respondents while presenting the least possible hindrance to research. The Statistics Canada staff and researchers will work together to find solutions to confidentiality problems.

Types of data disclosure

Identity disclosure occurs when a specific individual or workplace can be identified from the released data. This type of disclosure is rare but can happen. It ranges from specifically stating whom the respondent is to providing enough information to reveal a respondent's identity. For example, a researcher investigating innovative human resource practices could disaggregate the data to the extent that perhaps only one or two workplaces are contained in a cell (e.g. small unionised workplace in a particular industry with certain human resource practices). Someone who may know most of the characteristics of a given company, particularly if the location of the workplace is revealed, could then easily identify the firm and learn more about it based on the additional information contained in the table.

Attribute disclosure occurs when confidential information is revealed and can be attributed to an individual. For example, if we release the salary range of a particular occupation (e.g. doctors) in a small locality, then there is disclosure if the range gives a better idea of the doctors' salary than would be generally known. Note that in this case we have not identified a particular doctor but, since residents of that locality may know who the people are, identification would occur nonetheless and this amounts to identity disclosure. Note also that we have not given a particular salary figure, but if the range is too narrow, then the salary is assumed to have been revealed. What constitutes 'too narrow a range' may however, be subject to interpretation.

Inferential disclosure occurs when information about an individual can be inferred with a high level of confidence. For example, the results of a regression model may provide a confidence interval for doctors' salaries. In general, statistical agencies do not guard against this type of disclosure because one of the main purposes of statistical data is to enable inferences to be made, and because inferences are not very accurate predictors of individual behaviour.

Residual disclosure occurs when information about a respondent can be detected from the current information and previous information released. This is a particular problem with longitudinal data (e.g., WES) when information is released from subsequent cycles. Alternatively, residual disclosure could occur when information is released from two independent surveys. Residual disclosure may also occur when information in a suppressed cell can be deduced from other information provided. Another type of residual disclosure can occur through sample restrictions for analytical purposes. For example, sample restrictions may exclude some respondents that may be identifiable if compared to all respondents.

Regardless of the process, different types of disclosure are possible but once an individual or firm is identified, identity disclosure has occurred.

All variables on a database can be categorized according to their importance to data confidentiality:

Direct identifiers such as name, address or telephone number provide an explicit link to a respondent. These three variables are stripped from all master files.

Indirect identifiers such as age, sex, marital status, area of residence or occupation, type of business, etc. can be used to identify an individual.

Sensitive variables are characteristics relating to respondents' private lives, or business, and are not usually known by the general public.

These variables could work together to reveal information about individuals. Consider the case were indirect identifiers (such as age, sex, marital status and occupation) are presented for a small region along with a sensitive variable such as family income. It may be possible to deduce the family income of certain individuals with a rare combination of these characteristics.

Data confidentiality priorities

Data confidentiality is primarily a problem for frequency data, tables of magnitude and individual statistics. It tends not to be a problem for causal analysis results such as regression parameters.

The following general rules apply at ALL times:

- Outputs have to be checked for confidentiality before they can be taken out of Statistics Canada Offices or the Research Data Centres (RDCs).

- Cross tabulations and charts are discouraged. Cross-tabulations must be vetted for confidentiality prior to leaving the RDC premises and prior to publication. The same applies to charts as they are a graphical representation of cross tabulations.

- No minimum and maximum values can be provided. As well, for highly skewed populations such as earnings, it may be inappropriate to report the 5th and 95^{th} percentile.

- Pay attention to residual disclosure. Residual disclosure may occur when information in a suppressed cell can be deduced from other information provided or when sample restrictions used in the analysis can identify respondents if compared to all respondents.

- Only weighted data can be used for publication. Users are required to provide both unweighted and weighted programs for disclosure analysis. However, only weighted outputs will be released.

- Do not report statistics based on a small number of respondents, which is defined as fewer than 5 cases for the employee data file and fewer than 10 cases for the employer data file. In addition, if the contribution of a few observations is found to dominate the estimates of a particular cell then the entire cell is suppressed. For reasons of confidentiality the actual rules to do this cannot be disclosed.

- Be aware of certain empty cells and full cells. For example, confidentiality may be broken if the sampled firms in a particular industry and region all reported the same characteristics.

- Anecdotal information should never be given about specific respondents.

- Analytical outputs do not normally present a disclosure problem. However, variables in the model should adhere to the disclosure rules for descriptive statistics and appropriate weights should always be applied.

- Do not report ANOVAs and regression equations when the model involving categorical covariates is saturated or nearly saturated (has many coefficients— intercept, main effects and interaction terms—or nearly as many as there are possible combinations of the covariate values).

The following examples are designed as guidelines for dealing with various data types:

Table A10.1 Tabular output: frequency data or tables of magnitude

Data result	Disclosure problem	Solution
Reporting a table of frequencies or magnitudes	Sampling design must be corrected for.	Use weighted data.
Reporting a sample size that represents the sample, not the population	Unweighted sample sizes usually do not pose a confidentiality risk if sample size is greater than 30.	No need to weight data in this case.
Reporting a frequency table or cross-tabulation where a category or cell contains only a few respondents (low frequency cells) Reporting an estimate from a table of magnitude that has a low frequency cell	Reporting small category or cell sizes is a data confidentiality problem and must not be done. Consult the documentation for your survey to determine the definition of a 'small cell size.' Usually it is five.	Collapse categories or exclude categories from analysis.
Reporting a frequency table or cross-tabulation where a category or cell is equal to zero Reporting an estimate from a table of magnitude where a category or cell is equal to zero	There are two kinds of zero cells: 1) structured zero cells, which cannot possibly contain a respondent (e.g., a cell for 'married' and 'under 12 years old'); and 2) non-structural zero cells, which could potentially contain a respondent but do not for a particular analysis.	Structured zero cells are not a data confidentiality problem. Non-structured zero cells should only be published if they account for less than 15% of the non-marginal cells of a table and if they cause no potential disclosure risk; otherwise, collapse categories or exclude categories from the analysis. For a categorical income variable, the zero cells may present a potential disclosure risk if the non-zero cells represent a narrow range of possible values: the highest possible value should not be less than twice the lowest possible value.
Reporting frequency or cross-tabulation tables where a category or cell contains 100% of the sample (full cell) Reporting an estimate from a table of magnitude that has a full cell	The data confidentiality risk depends on the type of information in the table. There is little risk in publishing full cells when they reveal the sex of respondents. However, it is more problematic when the full cell reveals sensitive information about individuals that would not otherwise be known (i.e., accounting irregularity for all sampled small firms in a particular industry and region).	STC staff can provide guidance in deciding when a full cell proposes a data confidentiality problem. If it has been deemed to be a problem, then collapse categories, exclude categories from analysis, or do an alternative analysis.

Table A10.2 Individual statistics

Data result	Disclosure problem	Solution
Reporting an individual statistic, such as a total, mean, ratio, median or percentile	Sampling design must be corrected for.	Use weighted data.
Reporting a ratio	Ratios should not be published if either component cannot be published.	The ratio should be calculated in another way.
Reporting a total, mean or average based on fewer than three respondents	Reporting statistics from extremely small samples is a data confidentiality problem and must not be done. Consult the documentation for your survey to determine the definition of a 'small sample.' Usually it is three.	Select a bigger sample on which to calculate the statistic.
Reporting order statistics such as medians and percentiles where there are fewer than five respondents above and fewer than five respondents below the order statistic	The 'tails' should contain at least five respondents. If the survey contains multiple respondents from one household, business or organization, then the five respondents should be from at least three different households, businesses, or organizations.	Calculate other order statistics, such as larger percentiles or averages instead of medians.

Table A10.3 Analytical outputs

Data result	Disclosure problem	Solution
Reporting ANOVAs and regression equations	These analytical outputs do not normally present a disclosure problem. Be sure that variables in the model adhere to disclosure rules for descriptive statistics.	Should always be calculated on weighted data.
Reporting ANOVAs and regression equations when the model involving categorical covariates is saturated or nearly saturated (has many coefficients— intercept, main effects and interaction terms—or nearly as many as there are possible combinations of the covariate values)	Saturated or nearly saturated models can pose a data confidentiality problem.	Do not calculate saturated or nearly saturated models. Or proceed as when publishing the table whose classification variables are these same covariates, and apply the appropriate rules for tabular outputs.
Reporting scatterplots, plots of residuals or box plots	They may present a disclosure risk when they display values for individual respondents, particularly income data with extreme outliers.	Graphical outputs should respect all the rules specified elsewhere in this document.

Table A10.4 Geography and indirect identifiers

Data result	Disclosure problem	Solution
Reporting the location of a sample cluster on a map, list or otherwise	This poses a data confidentiality problem.	Do not do this.
Reporting tabular outputs on variables such as race or ethnicity below the national level	This poses a data confidentiality problem, particularly when there is a great deal of detail for a particularly small geographical area. Exceptions may be granted if the case can be made that revealing more detail is essential to the study report, and does not constitute poor quality data, and does not present a disclosure risk.	Use broad categories such as 'White/Other,' 'English/French/Other,' or 'Canadian/Immigrant.'
Reporting tabular output for, or by, subprovincial areas smaller than 250,000 people Reporting tables that include classification variables that identify very small and/or visible sub-populations Reporting tables that include more than three indirect identifiers as classification variables (in addition to the geographical information)	This can pose a data confidentiality problem.	Apply rules for tabular output
Reporting tables with geographical classification variables (e.g., Health Region, Census Division) or the same geographical classification for two different time periods	This can pose a data confidentiality problem if the table includes more than one geographical classification variable (unless one is an urban/rural code).	Use only one geographical identifier.

Table A10.5 Information about individual respondents

Data result	Disclosure problem	Solution
Reporting maximum or minimum values for sensitive variables such as income, age and household size	This poses a confidentiality problem only when the maximum or minimum value indicates the presence of an atypical respondent.	Report standard deviations or other statistics that can be used to describe the range of values without reporting an actual maximum or minimum.
Reporting anecdotal information about a particular respondent	This is the ultimate confidentiality problem.	Do not do this.

Table A10.6 Related outputs

Data result	Disclosure problem	Solution
Reporting similar information from previous studies or cycles of a survey or from other surveys	This is the most difficult kind of disclosure to control, but every effort should be made to prevent the disclosure of confidential information from related survey data.	Results involving similar sets of classifications (e.g., two types of geographical classification systems, two different 'breakdowns' of occupational codes) should be examined closely. Also, if Public-Use Microdata Files (PUMFs) are released for the same survey, then the published results should not disclose sensitive information that was suppressed from the PUMF about individual respondents.

Appendix 11

Table A11.1 Workplace questionnaire variables

Variable	1999	2000	2001	2002	2003	2004	2005	2006
ttl_emp	1a	1a	1a A	1a A	1a A	1a A	1a A	1a A
yr_emp	-5	-5	1a B	-4	1a B	-4	1a B	-4
ttl_male	-5	-5	-5	-5	1ai A	-5	1ai A	-5
ttl_fem	-5	-5	-5	-5	1ai B	-5	1ai B	-5
now_full	1b A	1b A	1b A	1b A	1b A	1b A	1b A	1b A
now_part	-5	-5	1b B	1b B	1b B	1b B	1b B	1b B
prmanent	4a D	4a D	1bC	1bC	1bC	1bC	1bC	1bC
nperm_ft	-5	-5	1b D	1b D	1b D	1b D	1b D	1b D
full_tim	4aA	4aA	1bA + 1bD	1bA + 1bD	1bA + 1bD	1bA + 1bD	1bA + 1bD	1bA + 1bD
nperm_pt	-5	-5	1b E	1b E	1b E	1b E	1b E	1b E
part_tim	4aB	4aB	1bB + 1bE	1bB + 1bE	1bB + 1bE	1bB + 1bE	1bB + 1bE	1bB + 1bE
non_perm	4a E	4a E	1bF	1bF	1bF	1bF	1bF	1bF
ttl_cba	-5	-5	1c	1c	1c	1c	1c	1c
full_mn	4b A1	4b A1	1d A1	1d A1	1d A1	1d A1	1d A1	1d A1
ncnm_ft	-5	-5	1d A2	1d A2	1d A2	1d A2	1d A2	1d A2
cvnm_ft	-5	-5	1d A3	1d A3	1d A3	1d A3	1d A3	1d A3
part_mn	4b A2	4b A2	1d B1	1d B1	1d B1	1d B1	1d B1	1d B1
ncnm_pt	-5	-5	1d B2	1d B2	1d B2	1d B2	1d B2	1d B2
cvnm_pt	-5	-5	1d B3	1d B3	1d B3	1d B3	1d B3	1d B3
ttl_mgr	-5	-5	1d C1	1d C1	1d C1	1d C1	1d C1	1d C1
ttl_ncnm	-5	-5	1d C2	1d C2	1d C2	1d C2	1d C2	1d C2
ttl_cvnm	24a	24a	1d C3	1d C3	1d C3	1d C3	1d C3	1d C3
ncft_pr	-5	-5	1e A1	1e A1	1e A1	1e A1	1e A1	1e A1
ncpt_pr	-5	-5	1e A2	1e A2	1e A2	1e A2	1e A2	1e A2
ncft_tc	-5	-5	1e B1	1e B1	1e B1	1e B1	1e B1	1e B1
ncpt_tc	-5	-5	1e B2	1e B2	1e B2	1e B2	1e B2	1e B2
ncft_sl	-5	-5	1e C1	1e C1	1e C1	1e C1	1e C1	1e C1
ncpt_sl	-5	-5	1e C2	1e C2	1e C2	1e C2	1e C2	1e C2
ncft_ad	-5	-5	1e D1	1e D1	1e D1	1e D1	1e D1	1e D1
ncpt_ad	-5	-5	1e D2	1e D2	1e D2	1e D2	1e D2	1e D2
ncft_un	-5	-5	1e E1	1e E1	1e E1	1e E1	1e E1	1e E1
ncpt_un	-5	-5	1e E2	1e E2	1e E2	1e E2	1e E2	1e E2
ncft_ot	-5	-5	1e F1	1e F1	1e F1	1e F1	1e F1	1e F1
ncpt_ot	-5	-5	1e F2	1e F2	1e F2	1e F2	1e F2	1e F2
cvft_pr	-5	-5	1f A1	1f A1	1f A1	1f A1	1f A1	1f A1
cvpt_pr	-5	-5	1f A2	1f A2	1f A2	1f A2	1f A2	1f A2
cba_pr	24b A	24b A	1f A1+1f A2	1f A1+1f A2	1f A1+1f A2	1f A1+1f A2	1f A1+1f A2	1f A1+1f A2
cvft_tc	-5	-5	1f B1	1f B1	1f B1	1f B1	1f B1	1f B1
cvpt_tc	-5	-5	1f B2	1f B2	1f B2	1f B2	1f B2	1f B2
cba_tc	24b B	24b B	1f B1+1f B2	1f B1+1f B2	1f B1+1f B2	1f B1+1f B2	1f B1+1f B2	1f B1+1f B2
cvft_sl	-5	-5	1f C1	1f C1	1f C1	1f C1	1f C1	1f C1
cvpt_sl	-5	-5	1f C2	1f C2	1f C2	1f C2	1f C2	1f C2

Table A11.1 Workplace questionnaire variables - continued

cba_sl	24b C	24b C	1f C1+1f C2	1f C1+1f C2	1f C1+1f C2	1f C1+1f C2	1f C1+1f C2	1f C1+1f C2
cvft_ad	-5	-5	1f D1	1f D1	1f D1	1f D1	1f D1	1f D1
cvpt_ad	-5	-5	1f D2	1f D2	1f D2	1f D2	1f D2	1f D2
cba_ad	24b D	24b D	1f D1+1f D2	1f D1+1f D2	1f D1+1f D2	1f D1+1f D2	1f D1+1f D2	1f D1+1f D2
cvft_un	-5	-5	1f E1	1f E1	1f E1	1f E1	1f E1	1f E1
cvpt_un	-5	-5	1f E2	1f E2	1f E2	1f E2	1f E2	1f E2
cba_un	24b E	24b E	1f E1+1f E2	1f E1+1f E2	1f E1+1f E2	1f E1+1f E2	1f E1+1f E2	1f E1+1f E2
cvft_ot	-5	-5	1f F1	1f F1	1f F1	1f F1	1f F1	1f F1
cvpt_ot	-5	-5	1f F2	1f F2	1f F2	1f F2	1f F2	1f F2
cba_ot	24b F	24b F	1f F1+1f F2	1f F1+1f F2	1f F1+1f F2	1f F1+1f F2	1f F1+1f F2	1f F1+1f F2
full_pr	4b B1	4b B1	1e A1+1f A1	1e A1+1f A1	1e A1+1f A1	1e A1+1f A1	1e A1+1f A1	1e A1+1f A1
part_pr	4b B2	4b B2	1e A2+1f A2	1e A2+1f A2	1e A2+1f A2	1e A2+1f A2	1e A2+1f A2	1e A2+1f A2
full_tc	4b C1	4b C1	1e B1+1f B1	1e B1+1f B1	1e B1+1f B1	1e B1+1f B1	1e B1+1f B1	1e B1+1f B1
part_tc	4b C2	4b C2	1e B2+1f B2	1e B2+1f B2	1e B2+1f B2	1e B2+1f B2	1e B2+1f B2	1e B2+1f B2
full_sl	4b D1	4b D1	1e C1+1f C1	1e C1+1f C1	1e C1+1f C1	1e C1+1f C1	1e C1+1f C1	1e C1+1f C1
part_sl	4b D2	4b D2	1e C2+1f C2	1e C2+1f C2	1e C2+1f C2	1e C2+1f C2	1e C2+1f C2	1e C2+1f C2
full_ad	4b E1	4b E1	1e D1+1f D1	1e D1+1f D1	1e D1+1f D1	1e D1+1f D1	1e D1+1f D1	1e D1+1f D1
part_ad	4b E2	4b E2	1e D2+1f D2	1e D2+1f D2	1e D2+1f D2	1e D2+1f D2	1e D2+1f D2	1e D2+1f D2
full_un	4b F1	4b F1	1e E1+1f E1	1e E1+1f E1	1e E1+1f E1	1e E1+1f E1	1e E1+1f E1	1e E1+1f E1
part_un	4b F2	4b F2	1e E2+1f E2	1e E2+1f E2	1e E2+1f E2	1e E2+1f E2	1e E2+1f E2	1e E2+1f E2
full_ot	4b G1	4b G1	1e F1+1f F1	1e F1+1f F1	1e F1+1f F1	1e F1+1f F1	1e F1+1f F1	1e F1+1f F1
part_ot	4b G2	4b G2	1e F2+1f F2	1e F2+1f F2	1e F2+1f F2	1e F2+1f F2	1e F2+1f F2	1e F2+1f F2
ttl_site	-5	-5	1gA	1gA	1gA	1gA	1gA	1gA
off_othr	4a G	4a G	1gB	1gB	1gB	1gB	1gB	1gB
off_home	4a H	4a H	1gC	1gC	1gC	1gC	1gC	1gC
cntr_wkp	4a I	4a I	1hA	1hA	1hA	1hA	1hA	1hA
cntr_out	4a J	4a J	1hB	1hB	1hB	1hB	1hB	1hB
peak_yes	1c	1c	2	2	2	2	2	2
peak_emp	1e	1e	2a	2a	2a	2a	2a	2a
peak1	1d 01	1d 01	2b 1	2b 1	2b 1	2b 1	2b 1	2b 1
peak2	1d 02	1d 02	2b 2	2b 2	2b 2	2b 2	2b 2	2b 2
peak3	1d 03	1d 03	2b 3	2b 3	2b 3	2b 3	2b 3	2b 3
peak4	1d 04	1d 04	2b 4	2b 4	2b 4	2b 4	2b 4	2b 4
peak5	1d 05	1d 05	2b 5	2b 5	2b 5	2b 5	2b 5	2b 5
peak6	1d 06	1d 06	2b 6	2b 6	2b 6	2b 6	2b 6	2b 6
peak7	1d 07	1d 07	2b 7	2b 7	2b 7	2b 7	2b 7	2b 7
peak8	1d 08	1d 08	2b 8	2b 8	2b 8	2b 8	2b 8	2b 8
peak9	1d 09	1d 09	2b 9	2b 9	2b 9	2b 9	2b 9	2b 9
peak10	1d 10	1d 10	2b 10	2b 10	2b 10	2b 10	2b 10	2b 10
peak11	1d 11	1d 11	2b 11	2b 11	2b 11	2b 11	2b 11	2b 11
peak12	1d 12	1d 12	2b 12	2b 12	2b 12	2b 12	2b 12	2b 12
new_hire	2	2	3	3	3	3	3	3
ttl_nwhr	2a	2a	3a	3a	3a	3a	3a	3a
nwhr_mn	2b A	2b A	3b A	3b A	3b A	3b A	3b A	3b A
nwhr_pr	2b B	2b B	3b B	3b B	3b B	3b B	3b B	3b B
nwhr_tc	2b C	2b C	3b C	3b C	3b C	3b C	3b C	3b C
nwhr_sl	2b D	2b D	3b D	3b D	3b D	3b D	3b D	3b D
nwhr_ad	2b E	2b E	3b E	3b E	3b E	3b E	3b E	3b E

Table A11.1 Workplace questionnaire variables - continued

nwhr_un	2b F	2b F	3b F	3b F	3b F	3b F	3b F	3b F
nwhr_ot	2b G	2b G	3b G	3b G	3b G	3b G	3b G	3b G
staf_mn	3a A	3a A	4a B	4a B	4a B	4a B	4a B	4a B
staf_pr	3a B	3a B	4a C	4a C	4a C	4a C	4a C	4a C
staf_tc	3a C	3a C	4a D	4a D	4a D	4a D	4a D	4a D
staf_sl	3a D	3a D	4a E	4a E	4a E	4a E	4a E	4a E
staf_ad	3a E	3a E	4a F	4a F	4a F	4a F	4a F	4a F
staf_un	3a F	3a F	4a G	4a G	4a G	4a G	4a G	4a G
staf_ot	3a G	3a G	4a H	4a H	4a H	4a H	4a H	4a H
unfi_vac	3b	3b	4b	4b	4b	4b	4b	4b
ttl_unfi	3c	3c	4c	4c	4c	4c	4c	4c
unfi_mn	3d A1	3d A1	4d A1	4d A1	4d A1	4d A1	4d A1	4d A1
reas_mn1	3d A2 1	3d A2 1	4d A2 1	4d A2 1	4d A2 1	4d A2 1	4d A2 1	4d A2 1
reas_mn2	3d A2 2	3d A2 2	4d A2 2	4d A2 2	4d A2 2	4d A2 2	4d A2 2	4d A2 2
reas_mn3	3d A2 3	3d A2 3	4d A2 3	4d A2 3	4d A2 3	4d A2 3	4d A2 3	4d A2 3
reas_mn4	3d A2 4	3d A2 4	4d A2 4	4d A2 4	4d A2 4	4d A2 4	4d A2 4	4d A2 4
unfi_pr	3d B1	3d B1	4d B1	4d B1	4d B1	4d B1	4d B1	4d B1
reas_pr1	3d B2 1	3d B2 1	4d B2 1	4d B2 1	4d B2 1	4d B2 1	4d B2 1	4d B2 1
reas_pr2	3d B2 2	3d B2 2	4d B2 2	4d B2 2	4d B2 2	4d B2 2	4d B2 2	4d B2 2
reas_pr3	3d B2 3	3d B2 3	4d B2 3	4d B2 3	4d B2 3	4d B2 3	4d B2 3	4d B2 3
reas_pr4	3d B2 4	3d B2 4	4d B2 4	4d B2 4	4d B2 4	4d B2 4	4d B2 4	4d B2 4
unfi_tc	3d C1	3d C1	4d C1	4d C1	4d C1	4d C1	4d C1	4d C1
reas_tc1	3d C2 1	3d C2 1	4d C2 1	4d C2 1	4d C2 1	4d C2 1	4d C2 1	4d C2 1
reas_tc2	3d C2 2	3d C2 2	4d C2 2	4d C2 2	4d C2 2	4d C2 2	4d C2 2	4d C2 2
reas_tc3	3d C2 3	3d C2 3	4d C2 3	4d C2 3	4d C2 3	4d C2 3	4d C2 3	4d C2 3
reas_tc4	3d C2 4	3d C2 4	4d C2 4	4d C2 4	4d C2 4	4d C2 4	4d C2 4	4d C2 4
unfi_sl	3d D1	3d D1	4d D1	4d D1	4d D1	4d D1	4d D1	4d D1
reas_sl1	3d D2 1	3d D2 1	4d D2 1	4d D2 1	4d D2 1	4d D2 1	4d D2 1	4d D2 1
reas_sl2	3d D2 2	3d D2 2	4d D2 2	4d D2 2	4d D2 2	4d D2 2	4d D2 2	4d D2 2
reas_sl3	3d D2 3	3d D2 3	4d D2 3	4d D2 3	4d D2 3	4d D2 3	4d D2 3	4d D2 3
reas_sl4	3d D2 4	3d D2 4	4d D2 4	4d D2 4	4d D2 4	4d D2 4	4d D2 4	4d D2 4
unfi_ad	3d E1	3d E1	4d E1	4d E1	4d E1	4d E1	4d E1	4d E1
reas_ad1	3d E2 1	3d E2 1	4d E2 1	4d E2 1	4d E2 1	4d E2 1	4d E2 1	4d E2 1
reas_ad2	3d E2 2	3d E2 2	4d E2 2	4d E2 2	4d E2 2	4d E2 2	4d E2 2	4d E2 2
reas_ad3	3d E2 3	3d E2 3	4d E2 3	4d E2 3	4d E2 3	4d E2 3	4d E2 3	4d E2 3
reas_ad4	3d E2 4	3d E2 4	4d E2 4	4d E2 4	4d E2 4	4d E2 4	4d E2 4	4d E2 4
unfi_un	3d F1	3d F1	4d F1	4d F1	4d F1	4d F1	4d F1	4d F1
reas_un1	3d F2 1	3d F2 1	4d F2 1	4d F2 1	4d F2 1	4d F2 1	4d F2 1	4d F2 1
reas_un2	3d F2 2	3d F2 2	4d F2 2	4d F2 2	4d F2 2	4d F2 2	4d F2 2	4d F2 2
reas_un3	3d F2 3	3d F2 3	4d F2 3	4d F2 3	4d F2 3	4d F2 3	4d F2 3	4d F2 3
reas_un4	3d F2 4	3d F2 4	4d F2 4	4d F2 4	4d F2 4	4d F2 4	4d F2 4	4d F2 4
unfi_ot	3d G1	3d G1	4d G1	4d G1	4d G1	4d G1	4d G1	4d G1
reas_ot1	3d G2 1	3d G2 1	4d G2 1	4d G2 1	4d G2 1	4d G2 1	4d G2 1	4d G2 1
reas_ot2	3d G2 2	3d G2 2	4d G2 2	4d G2 2	4d G2 2	4d G2 2	4d G2 2	4d G2 2
reas_ot3	3d G2 3	3d G2 3	4d G2 3	4d G2 3	4d G2 3	4d G2 3	4d G2 3	4d G2 3
reas_ot4	3d G2 4	3d G2 4	4d G2 4	4d G2 4	4d G2 4	4d G2 4	4d G2 4	4d G2 4
ttl_quit	5a A	5a A	5a A	5a A	5a A	5a A	5a A	5a A
ttl_lyff	5a B	5a B	5a B	5a B	5a B	5a B	5a B	5a B
ttl_rdct	5a C	5a C	5a C	5a C	5a C	5a C	5a C	5a C

Table A11.1 Workplace questionnaire variables - continued

ttl_dsms	5a D	5a D	5a D	5a D	5a D	5a D	5a D	5a D
ttl_rtmt	5a E	5a E	5a E	5a E	5a E	5a E	5a E	5a E
ttl_othr	-5	-5	5a F	5a F	5a F	5a F	5a F	5a F
tmp_lyff	5b	5b	5b	5b	5b	5b	5b	5b
day_lyff	5c	5c	5c	5c	5c	5c	5c	5c
incen	6a I	-4	6a A	-4	6a A	-4	6a A	-4
gains	6a ii	-4	6a B	-4	6a B	-4	6a B	-4
proft	6a iii	-4	6a C	-4	6a C	-4	6a C	-4
merit	6a iv	-4	6a D	-4	6a D	-4	6a D	-4
stck_pl	-5	-5	6a E	-4	6a E	-4	6a E	-4
incen_mn	6b A1	-4	6b B1	-4	6b B1	-4	6b B1	-4
gains_mn	6b A2	-4	6b B2	-4	6b B2	-4	6b B2	-4
proft_mn	6b A3	-4	6b B3	-4	6b B3	-4	6b B3	-4
merit_mn	6b A4	-4	6b B4	-4	6b B4	-4	6b B4	-4
stck_mn	-5	-5	6b B5	-4	6b B5	-4	6b B5	-4
incen_pr	6b B1	-4	6b C1	-4	6b C1	-4	6b C1	-4
gains_pr	6b B2	-4	6b C2	-4	6b C2	-4	6b C2	-4
proft_pr	6b B3	-4	6b C3	-4	6b C3	-4	6b C3	-4
merit_pr	6b B4	-4	6b C4	-4	6b C4	-4	6b C4	-4
stck_pr	-5	-5	6b C5	-4	6b C5	-4	6b C5	-4
incen_tc	6b C1	-4	6b D1	-4	6b D1	-4	6b D1	-4
gains_tc	6b C2	-4	6b D2	-4	6b D2	-4	6b D2	-4
proft_tc	6b C3	-4	6b D3	-4	6b D3	-4	6b D3	-4
merit_tc	6b C4	-4	6b D4	-4	6b D4	-4	6b D4	-4
stck_tc	-5	-5	6b D5	-4	6b D5	-4	6b D5	-4
incen_sl	6b D1	-4	6b E1	-4	6b E1	-4	6b E1	-4
gains_sl	6b D2	-4	6b E2	-4	6b E2	-4	6b E2	-4
proft_sl	6b D3	-4	6b E3	-4	6b E3	-4	6b E3	-4
merit_sl	6b D4	-4	6b E4	-4	6b E4	-4	6b E4	-4
stck_sl	-5	-5	6b E5	-4	6b E5	-4	6b E5	-4
incen_ad	6b E1	-4	6b F1	-4	6b F1	-4	6b F1	-4
gains_ad	6b E2	-4	6b F2	-4	6b F2	-4	6b F2	-4
proft_ad	6b E3	-4	6b F3	-4	6b F3	-4	6b F3	-4
merit_ad	6b E4	-4	6b F4	-4	6b F4	-4	6b F4	-4
stck_ad	-5	-5	6b F5	-4	6b F5	-4	6b F5	-4
incen_un	6b F1	-4	6b G1	-4	6b G1	-4	6b G1	-4
gains_un	6b F2	-4	6b G2	-4	6b G2	-4	6b G2	-4
proft_un	6b F3	-4	6b G3	-4	6b G3	-4	6b G3	-4
merit_un	6b F4	-4	6b G4	-4	6b G4	-4	6b G4	-4
stck_un	-5	-5	6b G5	-4	6b G5	-4	6b G5	-4
incen_ot	6b G1	-4	6b H1	-4	6b H1	-4	6b H1	-4
gains_ot	6b G2	-4	6b H2	-4	6b H2	-4	6b H2	-4
proft_ot	6b G3	-4	6b H3	-4	6b H3	-4	6b H3	-4
merit_ot	6b G4	-4	6b H4	-4	6b H4	-4	6b H4	-4
stck_ot	-5	-5	6b H5	-4	6b H5	-4	6b H5	-4
grspayrl	7	7	7	7	7	7	7	7
earn80kp	8A	-4	8A	-4	8A	-4	8A	-4
earn60kp	8B	-4	8B	-4	8B	-4	8B	-4
earn40kp	8C	-4	8C	-4	8C	-4	8C	-4

Table A11.1 Workplace questionnaire variables - continued

earn20kp	8D	-4	8D	-4	8D	-4	8D	-4
earn20kl	8E	-4	8E	-4	8E	-4	8E	-4
bnfc_sw	10	10	9	9	9	9	9	9
plan_na	10a A1	10a A1	10a A1	10a A1	10a A1	10a A1	10a A1	10a A1
plan_all	10a A2	10a A2	10a A2	10a A2	10a A2	10a A2	10a A2	10a A2
plan_av1	10a A3	10a A3	10a A3	10a A3	10a A3	10a A3	10a A3	10a A3
plan_av2	10a A4	10a A4	10a A4	10a A4	10a A4	10a A4	10a A4	10a A4
plan_av3	10a A5	10a A5	10a A5	10a A5	10a A5	10a A5	10a A5	10a A5
life_na	10a B1	10a B1	10a B1	10a B1	10a B1	10a B1	10a B1	10a B1
life_all	10a B2	10a B2	10a B2	10a B2	10a B2	10a B2	10a B2	10a B2
life_av1	10a B3	10a B3	10a B3	10a B3	10a B3	10a B3	10a B3	10a B3
life_av2	10a B4	10a B4	10a B4	10a B4	10a B4	10a B4	10a B4	10a B4
life_av3	10a B5	10a B5	10a B5	10a B5	10a B5	10a B5	10a B5	10a B5
mdcl_na	10a C1	10a C1	10a C1	10a C1	10a C1	10a C1	10a C1	10a C1
mdcl_all	10a C2	10a C2	10a C2	10a C2	10a C2	10a C2	10a C2	10a C2
mdcl_av1	10a C3	10a C3	10a C3	10a C3	10a C3	10a C3	10a C3	10a C3
mdcl_av2	10a C4	10a C4	10a C4	10a C4	10a C4	10a C4	10a C4	10a C4
mdcl_av3	10a C5	10a C5	10a C5	10a C5	10a C5	10a C5	10a C5	10a C5
dntl_na	10a D1	10a D1	10a D1	10a D1	10a D1	10a D1	10a D1	10a D1
dntl_all	10a D2	10a D2	10a D2	10a D2	10a D2	10a D2	10a D2	10a D2
dntl_av1	10a D3	10a D3	10a D3	10a D3	10a D3	10a D3	10a D3	10a D3
dntl_av2	10a D4	10a D4	10a D4	10a D4	10a D4	10a D4	10a D4	10a D4
dntl_av3	10a D5	10a D5	10a D5	10a D5	10a D5	10a D5	10a D5	10a D5
rrsp_na	10a E1	10a E1	10a E1	10a E1	10a E1	10a E1	10a E1	10a E1
rrsp_all	10a E2	10a E2	10a E2	10a E2	10a E2	10a E2	10a E2	10a E2
rrsp_av1	10a E3	10a E3	10a E3	10a E3	10a E3	10a E3	10a E3	10a E3
rrsp_av2	10a E4	10a E4	10a E4	10a E4	10a E4	10a E4	10a E4	10a E4
rrsp_av3	10a E5	10a E5	10a E5	10a E5	10a E5	10a E5	10a E5	10a E5
stck_na	10a F1	10a F1	10a F1	10a F1	10a F1	10a F1	10a F1	10a F1
stck_all	10a F2	10a F2	10a F2	10a F2	10a F2	10a F2	10a F2	10a F2
stck_av1	10a F3	10a F3	10a F3	10a F3	10a F3	10a F3	10a F3	10a F3
stck_av2	10a F4	10a F4	10a F4	10a F4	10a F4	10a F4	10a F4	10a F4
stck_av3	10a F5	10a F5	10a F5	10a F5	10a F5	10a F5	10a F5	10a F5
bnfc_na	10a G1	10a G1	10a G1	10a G1	10a G1	10a G1	10a G1	10a G1
bnfc_all	10a G2	10a G2	10a G2	10a G2	10a G2	10a G2	10a G2	10a G2
bnfc_av1	10a G3	10a G3	10a G3	10a G3	10a G3	10a G3	10a G3	10a G3
bnfc_av2	10a G4	10a G4	10a G4	10a G4	10a G4	10a G4	10a G4	10a G4
bnfc_av3	10a G5	10a G5	10a G5	10a G5	10a G5	10a G5	10a G5	10a G5
work_na	-5	-5	10a H1	10a H1	10a H1	10a H1	10a H1	10a H1
work_all	-5	-5	10a H2	10a H2	10a H2	10a H2	10a H2	10a H2
work_av1	-5	-5	10a H3	10a H3	10a H3	10a H3	10a H3	10a H3
work_av2	-5	-5	10a H4	10a H4	10a H4	10a H4	10a H4	10a H4
work_av3	-5	-5	10a H5	10a H5	10a H5	10a H5	10a H5	10a H5
allw_na	-5	-5	10a I1	10a I1	10a I1	10a I1	10a I1	10a I1
allw_all	-5	-5	10a I2	10a I2	10a I2	10a I2	10a I2	10a I2
allw_av1	-5	-5	10a I3	10a I3	10a I3	10a I3	10a I3	10a I3
allw_av2	-5	-5	10a I4	10a I4	10a I4	10a I4	10a I4	10a I4
allw_av3	-5	-5	10a I5	10a I5	10a I5	10a I5	10a I5	10a I5
flbn_na	-5	-5	10a J1	10a J1	10a J1	10a J1	10a J1	10a J1

Table A11.1 Workplace questionnaire variables - continued

flbn_all	-5	-5	10a J2	10a J2	10a J2	10a J2	10a J2	10a J2
flbn_av1	-5	-5	10a J3	10a J3	10a J3	10a J3	10a J3	10a J3
flbn_av2	-5	-5	10a J4	10a J4	10a J4	10a J4	10a J4	10a J4
flbn_av3	-5	-5	10a J5	10a J5	10a J5	10a J5	10a J5	10a J5
anre_na	-5	-5	10a ja1	10a ja1	10a ja1	10a ja1	10a ja1	10a ja1
anre_all	-5	-5	10a ja2	10a ja2	10a ja2	10a ja2	10a ja2	10a ja2
anre_av1	-5	-5	10a ja3	10a ja3	10a ja3	10a ja3	10a ja3	10a ja3
anre_av2	-5	-5	10a ja4	10a ja4	10a ja4	10a ja4	10a ja4	10a ja4
anre_av3	-5	-5	10a ja5	10a ja5	10a ja5	10a ja5	10a ja5	10a ja5
othr_na	10a H1	10a H1	10a K1	10a K1	10a K1	10a K1	10a K1	10a K1
othr_all	10a H2	10a H2	10a K2	10a K2	10a K2	10a K2	10a K2	10a K2
othr_av1	10a H3	10a H3	10a K3	10a K3	10a K3	10a K3	10a K3	10a K3
othr_av2	10a H4	10a H4	10a K4	10a K4	10a K4	10a K4	10a K4	10a K4
othr_av3	10a H5	10a H5	10a K5	10a K5	10a K5	10a K5	10a K5	10a K5
plan_fd	-5	-5	10b A	10b A	10b A	10b A	10b A	10b A
life_fd	11 B	11 B	10b B	10b B	10b B	10b B	10b B	10b B
mdcl_fd	11 C	11 C	10b C	10b C	10b C	10b C	10b C	10b C
dntl_fd	11 D	11 D	10b D	10b D	10b D	10b D	10b D	10b D
rrsp_fd	11 E	11 E	10b E	10b E	10b E	10b E	10b E	10b E
stck_fd	11 F	11 F	10b F	10b F	10b F	10b F	10b F	10b F
bnfc_fd	11 G	11 G	10b G	10b G	10b G	10b G	10b G	10b G
work_fd	-5	-5	10b H	10b H	10b H	10b H	10b H	10b H
allw_fd	-5	-5	10b I	10b I	10b I	10b I	10b I	10b I
flbn_fd	-5	-5	10b J	10b J	10b J	10b J	10b J	10b J
anre_fd	-5	-5	10b ja	10b ja	10b ja	10b ja	10b ja	10b ja
othr_fd	11 H	11 H	10b K	10b K	10b K	10b K	10b K	10b K
plan_pt	10c A	10c A	10c A	10c A	10c A	10c A	10c A	10c A
life_pt	10c B	10c B	10c B	10c B	10c B	10c B	10c B	10c B
mdcl_pt	10c C	10c C	10c C	10c C	10c C	10c C	10c C	10c C
dntl_pt	10c D	10c D	10c D	10c D	10c D	10c D	10c D	10c D
rrsp_pt	10c E	10c E	10c E	10c E	10c E	10c E	10c E	10c E
stck_pt	10c F	10c F	10c F	10c F	10c F	10c F	10c F	10c F
bnfc_pt	10c G	10c G	10c G	10c G	10c G	10c G	10c G	10c G
work_pt	-5	-5	10c H	10c H	10c H	10c H	10c H	10c H
allw_pt	-5	-5	10c I	10c I	10c I	10c I	10c I	10c I
flbn_pt	-5	-5	10c J	10c J	10c J	10c J	10c J	10c J
anre_pt	-5	-5	10c ja	10c ja	10c ja	10c ja	10c ja	10c ja
othr_pt	10c H	10c H	10c K	10c K	10c K	10c K	10c K	10c K
sal_expn	9	9	11	11	11	11	11	11
hours_mn	-5	-4	12 B	12 B	12 B	12 B	12 B	12 B
hours_pr	12 B	-4	12 C	12 C	12 C	12 C	12 C	12 C
hours_tc	12 C	-4	12 D	12 D	12 D	12 D	12 D	12 D
hours_sl	12 D	-4	12 E	12 E	12 E	12 E	12 E	12 E
hours_ad	12 E	-4	12 F	12 F	12 F	12 F	12 F	12 F
hours_un	12 F	-4	12 G	12 G	12 G	12 G	12 G	12 G
hours_ot	12 G	-4	12 H	12 H	12 H	12 H	12 H	12 H
over_mn1	13 A1	-4	13 B1	-4	13 B1	-4	13 B1	-4
over_mn2	13 A2	-4	13 B2	-4	13 B2	-4	13 B2	-4
over_mn3	13 A3	-4	13 B3	-4	13 B3	-4	13 B3	-4

Table A11.1 Workplace questionnaire variables - continued

over_mn4	13 A4	-4	13 B4	-4	13 B4	-4	13 B4	-4
over_mn5	13 A5	-4	13 B5	-4	13 B5	-4	13 B5	-4
over_pr1	13 B1	-4	13 C1	-4	13 C1	-4	13 C1	-4
over_pr2	13 B2	-4	13 C2	-4	13 C2	-4	13 C2	-4
over_pr3	13 B3	-4	13 C3	-4	13 C3	-4	13 C3	-4
over_pr4	13 B4	-4	13 C4	-4	13 C4	-4	13 C4	-4
over_pr5	13 B5	-4	13 C5	-4	13 C5	-4	13 C5	-4
over_tc1	13 C1	-4	13 D1	-4	13 D1	-4	13 D1	-4
over_tc2	13 C2	-4	13 D2	-4	13 D2	-4	13 D2	-4
over_tc3	13 C3	-4	13 D3	-4	13 D3	-4	13 D3	-4
over_tc4	13 C4	-4	13 D4	-4	13 D4	-4	13 D4	-4
over_tc5	13 C5	-4	13 D5	-4	13 D5	-4	13 D5	-4
over_sl1	13 D1	-4	13 E1	-4	13 E1	-4	13 E1	-4
over_sl2	13 D2	-4	13 E2	-4	13 E2	-4	13 E2	-4
over_sl3	13 D3	-4	13 E3	-4	13 E3	-4	13 E3	-4
over_sl4	13 D4	-4	13 E4	-4	13 E4	-4	13 E4	-4
over_sl5	13 D5	-4	13 E5	-4	13 E5	-4	13 E5	-4
over_ad1	13 E1	-4	13 F1	-4	13 F1	-4	13 F1	-4
over_ad2	13 E2	-4	13 F2	-4	13 F2	-4	13 F2	-4
over_ad3	13 E3	-4	13 F3	-4	13 F3	-4	13 F3	-4
over_ad4	13 E4	-4	13 F4	-4	13 F4	-4	13 F4	-4
over_ad5	13 E5	-4	13 F5	-4	13 F5	-4	13 F5	-4
over_un1	13 F1	-4	13 G1	-4	13 G1	-4	13 G1	-4
over_un2	13 F2	-4	13 G2	-4	13 G2	-4	13 G2	-4
over_un3	13 F3	-4	13 G3	-4	13 G3	-4	13 G3	-4
over_un4	13 F4	-4	13 G4	-4	13 G4	-4	13 G4	-4
over_un5	13 F5	-4	13 G5	-4	13 G5	-4	13 G5	-4
over_ot1	13 G1	-4	13 H1	-4	13 H1	-4	13 H1	-4
over_ot2	13 G2	-4	13 H2	-4	13 H2	-4	13 H2	-4
over_ot3	13 G3	-4	13 H3	-4	13 H3	-4	13 H3	-4
over_ot4	13 G4	-4	13 H4	-4	13 H4	-4	13 H4	-4
over_ot5	13 G5	-4	13 H5	-4	13 H5	-4	13 H5	-4
trng1_1	14a1	14a1	14a1	14a1	14a1	14a1	14a1	14a1
trng1_2	14a2	14a2	14a2	14a2	14a2	14a2	14a2	14a2
trng1_3	14a3	14a3	14a3	14a3	14a3	14a3	14a3	14a3
trng1_4	14a4	14a4	14a4	14a4	14a4	14a4	14a4	14a4
trng1_5	14a5	14a5	14a5	14a5	14a5	14a5	14a5	14a5
trng1_6	14a6	14a6	14a6	14a6	14a6	14a6	14a6	14a6
trng1_7	14a7	14a7	14a7	14a7	14a7	14a7	14a7	14a7
trng1_8	14a8	14a8	14a8	14a8	14a8	14a8	14a8	14a8
trng1_9	14a9	14a9	14a9	14a9	14a9	14a9	14a9	14a9
trng1_10	14a10	14a10	14a10	14a10	14a10	14a10	14a10	14a10
trng1_11	14a11	14a11	14a11	14a11	14a11	14a11	14a11	14a11
trng1_12	14a12	14a12	14a12	14a12	14a12	14a12	14a12	14a12
trng1_13	14a13	14a13	14a13	14a13	14a13	14a13	14a13	14a13
trng1_14	14a14	14a14	14a14	14a14	14a14	14a14	14a14	14a14
trn_emp1	14b	14b	14b	14b	14b	14b	14b	14b
trnfnd1	14c1	14c1	14c1	14c1	14c1	14c1	14c1	14c1
trnfnd2	14c2	14c2	14c2	14c2	14c2	14c2	14c2	14c2

Table A11.1 Workplace questionnaire variables - continued

trnfnd3	14c3	14c3	14c3	14c3	14c3	14c3	14c3	14c3
trnfnd4	14c4	14c4	14c4	14c4	14c4	14c4	14c4	14c4
trnfnd5	14c5	14c5	14c5	14c5	14c5	14c5	14c5	14c5
trnfnd6	14c6	14c6	14c6	14c6	14c6	14c6	14c6	14c6
trnfnd7	14c7	14c7	14c7	14c7	14c7	14c7	14c7	14c7
trnfnd8	14c8	14c8	14c8	14c8	14c8	14c8	14c8	14c8
trnfnd9	14c9	14c9	14c9	14c9	14c9	14c9	14c9	14c9
trnfnd10	14c0	14c0	14c0	14c0	14c0	14c0	14c0	14c0
trng_exp	15a	15a	15a	15a	15a	15a	15a	15a
expcmp1	15b1	15b1	15b1	15b1	15b1	15b1	15b1	15b1
expcmp2	15b2	15b2	15b2	15b2	15b2	15b2	15b2	15b2
expcmp3	15b3	15b3	15b3	15b3	15b3	15b3	15b3	15b3
expcmp4	15b4	15b4	15b4	15b4	15b4	15b4	15b4	15b4
expcmp5	15b5	15b5	15b5	15b5	15b5	15b5	15b5	15b5
expcmp6	15b6	15b6	15b6	15b6	15b6	15b6	15b6	15b6
expcmp7	15b7	15b7	15b7	15b7	15b7	15b7	15b7	15b7
expcmp8	15b8	15b8	15b8	15b8	15b8	15b8	15b8	15b8
expcmp9	15b9	15b9	15b9	15b9	15b9	15b9	15b9	15b9
trn_tim	15c	15c	15c	15c	15c	15c	15c	15c
sbsd_tng	16a	16a	16a	16a	16a	16a	16a	16a
sbsd_emp	16b	16b	16b	16b	16b	16b	16b	16b
trng2_1	16c1	16c1	16c1	16c1	16c1	16c1	16c1	16c1
trng2_2	16c2	16c2	16c2	16c2	16c2	16c2	16c2	16c2
trng2_3	16c3	16c3	16c3	16c3	16c3	16c3	16c3	16c3
trng2_4	16c4	16c4	16c4	16c4	16c4	16c4	16c4	16c4
trng2_5	16c5	16c5	16c5	16c5	16c5	16c5	16c5	16c5
trng2_6	16c6	16c6	16c6	16c6	16c6	16c6	16c6	16c6
trng2_7	16c7	16c7	16c7	16c7	16c7	16c7	16c7	16c7
trng2_8	16c8	16c8	16c8	16c8	16c8	16c8	16c8	16c8
trng2_9	16c9	16c9	16c9	16c9	16c9	16c9	16c9	16c9
trng2_10	16c10	16c10	16c10	16c10	16c10	16c10	16c10	16c10
trng2_11	16c11	16c11	16c11	16c11	16c11	16c11	16c11	16c11
trng2_12	16c12	16c12	16c12	16c12	16c12	16c12	16c12	16c12
trng2_13	16c13	16c13	16c13	16c13	16c13	16c13	16c13	16c13
trng2_14	16c14	16c14	16c14	16c14	16c14	16c14	16c14	16c14
trn_emp2	16d	16d	16d	16d	16d	16d	16d	16d
hr_resp	17	-4	17	-4	17	-4	17	-4
wrk_org1	18 A1	-4	18 A1	-4	18 A1	-4	18 A1	-4
Q18year1	18 A2	-4	18 A2	-4	18 A2	-4	18 A2	-4
wrk_org2	18 B1	-4	18 B1	-4	18 B1	-4	18 B1	-4
Q18year2	18 B2	-4	18 B2	-4	18 B2	-4	18 B2	-4
wrk_org3	18 C1	-4	18 C1	-4	18 C1	-4	18 C1	-4
Q18year3	18 C2	-4	18 C2	-4	18 C2	-4	18 C2	-4
wrk_org4	18 D1	-4	18 D1	-4	18 D1	-4	18 D1	-4
Q18year4	18 D2	-4	18 D2	-4	18 D2	-4	18 D2	-4
wrk_org5	18 E2	-4	18 E2	-4	18 E2	-4	18 E2	-4
Q18year5	18 E3	-4	18 E3	-4	18 E3	-4	18 E3	-4
wrk_org6	18 F1	-4	18 F1	-4	18 F1	-4	18 F1	-4
Q18year6	18 F2	-4	18 F2	-4	18 F2	-4	18 F2	-4

Table A11.1 Workplace questionnaire variables - continued

worn1_1 / worg1_1	19 A1	-4	19 A1	-4	19 A1	-4	19 A1	-4
worn1_2 / worg1_2	19 A2	-4	19 A2	-4	19 A2	-4	19 A2	-4
worn1_3 / worg1_3	19 A3	-4	19 A3	-4	19 A3	-4	19 A3	-4
worg1_4 (worn1_4/6)	19 A4	-4	19 A4	-4	19 A4	-4	19 A4	-4
worn1_4	-5	-5	-5	-5	19 A4	-5	19 A4	-5
worn1_5 / worg1_5	19 A5	-4	19 A5	-4	19 A5	-4	19 A5	-4
worn1_6	-5	-5	-5	-5	19 A6	-4	19 A6	-4
worn2_1 / worg2_1	19 B1	-4	19 B1	-4	19 B1	-4	19 B1	-4
worn2_2 / worg2_2	19 B2	-4	19 B2	-4	19 B2	-4	19 B2	-4
worn2_3 / worg2_3	19 B3	-4	19 B3	-4	19 B3	-4	19 B3	-4
worg2_4 (worn2_4/6)	19 B4	-4	19 B4	-4	19 B4	-4	19 B4	-4
Worn2_4	-5	-5	-5	-5	19 B4	-4	19 B4	-4
Worn2_5 / worg2_5	19 B5	-4	19 B5	-4	19 B5	-4	19 B5	-4
Worn2_6	-5	-5	-5	-5	19 B6	-4	19 B6	-4
worn3_1 / worg3_1	19 C1	-4	19 C1	-4	19 C1	-4	19 C1	-4
worn3_2 / worg3_2	19 C2	-4	19 C2	-4	19 C2	-4	19 C2	-4
worn3_3 / worg3_3	19 C3	-4	19 C3	-4	19 C3	-4	19 C3	-4
worg3_4 (worn3_4/6)	19 C4	-4	19 C4	-4	19 C4	-4	19 C4	-4
Worn3_4	-5	-5	-5	-5	19 C4	-4	19 C4	-4
Worn3_5 / worg3_5	19 C5	-4	19 C5	-4	19 C5	-4	19 C5	-4
Worn3_6	-5	-5	-5	-5	19 C6	-4	19 C6	-4
worn4_1 / worg4_1	19 D1	-4	19 D1	-4	19 D1	-4	19 D1	-4
worn4_2 / worg4_2	19 D2	-4	19 D2	-4	19 D2	-4	19 D2	-4
worn4_3 / worg4_3	19 D3	-4	19 D3	-4	19 D3	-4	19 D3	-4
worg4_4 (worn4_4/6)	19 D4	-4	19 D4	-4	19 D4	-4	19 D4	-4
Worn4_4	-5	-5	-5	-5	19 D4	-4	19 D4	-4
Worn4_5 / worg4_5	19 D5	-4	19 D5	-4	19 D5	-4	19 D5	-4
Worn4_6	-5	-5	-5	-5	19 D6	-4	19 D6	-4
worn5_1 / worg5_1	19 E1	-4	19 E1	-4	19 E1	-4	19 E1	-4
worn5_2 / worg5_2	19 E2	-4	19 E2	-4	19 E2	-4	19 E2	-4
worn5_3 / worg5_3	19 E3	-4	19 E3	-4	19 E3	-4	19 E3	-4
worg5_4 (worn5_4/6)	19 E4	-4	19 E4	-4	19 E4	-4	19 E4	-4
Worn5_4	-5	-5	-5	-5	19 E4	-4	19 E4	-4
Worn5_5 / worg5_5	19 E5	-4	19 E5	-4	19 E5	-4	19 E5	-4
Worn5_6	-5	-5	-5	-5	19 E6	-4	19 E6	-4
worn6_1 / worg6_1	19 F1	-4	19 F1	-4	19 F1	-4	19 F1	-4
worn6_2 / worg6_2	19 F2	-4	19 F2	-4	19 F2	-4	19 F2	-4
worn6_3 / worg6_3	19 F3	-4	19 F3	-4	19 F3	-4	19 F3	-4
worg6_4 (worn6_4/6)	19 F4	-4	19 F4	-4	19 F4	-4	19 F4	-4

Table A11.1 Workplace questionnaire variables - continued

Worn6_4	-5	-5	-5	-5	19 F4	-4	19 F4	-4
Worn6_5 / worg6_5	19 F5	-4	19 F5	-4	19 F5	-4	19 F5	-4
Worn6_6	-5	-5	-5	-5	19 F6	-4	19 F6	-4
worn7_1 / worg7_1	19 G1	-4	19 G1	-4	19 G1	-4	19 G1	-4
worn7_2 / worg7_2	19 G2	-4	19 G2	-4	19 G2	-4	19 G2	-4
worn7_3 / worg7_3	19 G3	-4	19 G3	-4	19 G3	-4	19 G3	-4
worg7_4 (worn7_4/6)	19 G4	-4	19 G4	-4	19 G4	-4	19 G4	-4
Worn7_4	-5	-5	-5	-5	19 G4	-4	19 G4	-4
Worn7_5 / worg7_5	19 G5	-4	19 G5	-4	19 G5	-4	19 G5	-4
Worn7_6	-5	-5	-5	-5	19 G6	-4	19 G6	-4
worn8_1 / worg8_1	19 H1	-4	19 H1	-4	19 H1	-4	19 H1	-4
worn8_2 / worg8_2	19 H2	-4	19 H2	-4	19 H2	-4	19 H2	-4
worn8_3 / worg8_3	19 H3	-4	19 H3	-4	19 H3	-4	19 H3	-4
worg8_4 (worn8_4/6)	19 H4	-4	19 H4	-4	19 H4	-4	19 H4	-4
Worn8_4	-5	-5	-5	-5	19 H4	-4	19 H4	-4
Worn8_5 / worg8_5	19 H5	-4	19 H5	-4	19 H5	-4	19 H5	-4
Worn8_6	-5	-5	-5	-5	19 H6	-4	19 H6	-4
worn9_1 / worg9_1	19 I1	-4	19 I1	-4	19 I1	-4	19 I1	-4
worn9_2 / worg9_2	19 I2	-4	19 I2	-4	19 I2	-4	19 I2	-4
worn9_3 / worg9_3	19 I3	-4	19 I3	-4	19 I3	-4	19 I3	-4
worg9_4 (worn9_4/6)	19 I4	-4	19 I4	-4	19 I4	-4	19 I4	-4
Worn9_4	-5	-5	-5	-5	19 I4	-4	19 I4	-4
Worn9_5 / worg9_5	19 I5	-4	19 I5	-4	19 I5	-4	19 I5	-4
Worn9_6	-5	-5	-5	-5	19 I6	-4	19 I6	-4
worn10_1 / worg10_1	19 J1	-4	19 J1	-4	19 J1	-4	19 J1	-4
worn10_2 / worg10_2	19 J2	-4	19 J2	-4	19 J2	-4	19 J2	-4
worn10_3 / worg10_3	19 J3	-4	19 J3	-4	19 J3	-4	19 J3	-4
worg10_4 (worn10_4/6)	19 J4	-4	19 J4	-4	19 J4	-4	19 J4	-4
Worn10_4	-5	-5	-5	-5	19 J4	-4	19 J4	-4
Worn10_5 / worg10_5	19 J5	-4	19 J5	-4	19 J5	-4	19 J5	-4
Worn10_6	-5	-5	-5	-5	19 J6	-4	19 J6	-4
worn11_1 / worg11_1	19 K1	-4	19 K1	-4	19 K1	-4	19 K1	-4
worn11_2 / worg11_2	19 K2	-4	19 K2	-4	19 K2	-4	19 K2	-4
worn11_3 / worg11_3	19 K3	-4	19 K3	-4	19 K3	-4	19 K3	-4
worg11_4 (worn11_4/6)	19 K4	-4	19 K4	-4	19 K4	-4	19 K4	-4
Worn11_4	-5	-5	-5	-5	19 K4	-4	19 K4	v
Worn11_5 / worg11_5	19 K5	-4	19 K5	-4	19 K5	-4	19 K5	-4
Worn11_6	-5	-5	-5	-5	19 K6	-4	19 K6	-4
worn12_1 / worg12_1	19 L1	-4	19 L1	-4	19 L1	-4	19 L1	-4
worn12_2 /	19 L2	-4	19 L2	-4	19 L2	-4	19 L2	-4

Table A11.1 Workplace questionnaire variables - continued

worg12_2								
worn12_3 / worg12_3	19 L3	-4	19 L3	-4	19 L3	-4	19 L3	-4
worg12_4 (worn12_4/6)	19 L4	-4	19 L4	-4	19 L4	-4	19 L4	-4
Worn12_4	-5	-5	-5	-5	19 L4	-4	19 L4	-4
Worn12_5 / worg12_5	19 L5	-4	19 L5	-4	19 L5	-4	19 L5	-4
Worn12_6	-5	-5	-5	-5	19 L6	-4	19 L6	-4
orgchg1	20A	20A	20A	20A	20A	20A	20A	20A
orgchg2	20B	20B	20B	20B	20B	20B	20B	20B
orgchg3	20C	20C	20C	20C	20C	20C	20C	20C
orgchg4	20D	20D	20D	20D	20D	20D	20D	20D
orgchg5	20E	20E	20E	20E	20E	20E	20E	20E
orgchg6	20F	20F	20F	20F	20F	20F	20F	20F
orgchg7	20G	20G	20G	20G	20G	20G	20G	20G
orgchg8	20H	20H	20H	20H	20H	20H	20H	20H
orgchg9	20I	20I	20I	20I	20I	20I	20I	20I
orgchg10	20J	20J	20J	20J	20J	20J	20J	20J
orgchg11	20K	20K	20K	20K	20K	20K	20K	20K
orgchg12	20L	20L	20L	20L	20L	20L	20L	20L
orgchg13	20M	20M	20M	20M	20M	20M	20M	20M
orgchg14	20N	20N	20N	20N	20N	20N	20N	20N
orgchg15	20O	20O	20O	20O	20O	20O	20O	20O
s_chg	21a	21a	21a	21a	21a	21a	21a	21a
downsize	21b	21b	21b	21b	21b	21b	21b	21b
objchg1	22 01	22 01	22 01	22 01	22 01	22 01	22 01	22 01
objchg2	22 02	22 02	22 02	22 02	22 02	22 02	22 02	22 02
objchg3	22 03	22 03	22 03	22 03	22 03	22 03	22 03	22 03
objchg4	22 04	22 04	22 04	22 04	22 04	22 04	22 04	22 04
objchg5	22 05	22 05	22 05	22 05	22 05	22 05	22 05	22 05
objchg6	22 06	22 06	22 06	22 06	22 06	22 06	22 06	22 06
objchg7	22 07	22 07	22 07	22 07	22 07	22 07	22 07	22 07
objchg8	22 08	22 08	22 08	22 08	22 08	22 08	22 08	22 08
objchg9	22 09	22 09	22 09	22 09	22 09	22 09	22 09	22 09
objchg10	22 10	22 10	22 10	22 10	22 10	22 10	22 10	22 10
objchg11	22 11	22 11	22 11	22 11	22 11	22 11	22 11	22 11
impact1	23 A	23 A	23 A	23 A	23 A	23 A	23 A	23 A
impact2	23 B	23 B	23 B	23 B	23 B	23 B	23 B	23 B
impact3	23 C	23 C	23 C	23 C	23 C	23 C	23 C	23 C
impact4	23 D	23 D	23 D	23 D	23 D	23 D	23 D	23 D
impact5	23 E	23 E	23 E	23 E	23 E	23 E	23 E	23 E
impact6	23 F	23 F	23 F	23 F	23 F	23 F	23 F	23 F
impact7	23 G	23 G	23 G	23 G	23 G	23 G	23 G	23 G
impact8	23 H	23 H	23 H	23 H	23 H	23 H	23 H	23 H
impact9	23 I	23 I	23 I	23 I	23 I	23 I	23 I	23 I
impact10	23 J	23 J	23 J	23 J	23 J	23 J	23 J	23 J
impact11	23 K	23 K	23 K	23 K	23 K	23 K	23 K	23 K
impact12	23 L	23 L	23 L	23 L	23 L	23 L	23 L	23 L
impact13	23 M	23 M	23 M	23 M	23 M	23 M	23 M	23 M
impact14	23 N	23 N	23 N	23 N	23 N	23 N	23 N	23 N

Table A11.1 Workplace questionnaire variables - continued

orgchgsk	-5	-5	-5	-5	23a	-4	23a	-4
cbag1_1	25 A1	-4	24 A1	-4	24 A1	-4	24 A1	-4
cbag1_2	25 A2	-4	24 A2	-4	24 A2	-4	24 A2	-4
cbag1_3	25 A3	-4	24 A3	-4	24 A3	-4	24 A3	-4
cbag1_4	25 A4	-4	24 A4	-4	24 A4	-4	24 A4	-4
cbag2_1	25 B1	-4	24 B1	-4	24 B1	-4	24 B1	-4
cbag2_2	25 B2	-4	24 B2	-4	24 B2	-4	24 B2	-4
cbag2_3	25 B3	-4	24 B3	-4	24 B3	-4	24 B3	-4
cbag2_4	25 B4	-4	24 B4	-4	24 B4	-4	24 B4	-4
cbag3_1	25 C1	-4	24 C1	-4	24 C1	-4	24 C1	-4
cbag3_2	25 C2	-4	24 C2	-4	24 C2	-4	24 C2	-4
cbag3_3	25 C3	-4	24 C3	-4	24 C3	-4	24 C3	-4
cbag3_4	25 C4	-4	24 C4	-4	24 C4	-4	24 C4	-4
cbag4_1	25 D1	-4	24 D1	-4	24 D1	-4	24 D1	-4
cbag4_2	25 D2	-4	24 D2	-4	24 D2	-4	24 D2	-4
cbag4_3	25 D3	-4	24 D3	-4	24 D3	-4	24 D3	-4
cbag4_4	25 D4	-4	24 D4	-4	24 D4	-4	24 D4	-4
cbag5_1	25 E1	-4	24 E1	-4	24 E1	-4	24 E1	-4
cbag5_2	25 E2	-4	24 E2	-4	24 E2	-4	24 E2	-4
cbag5_3	25 E3	-4	24 E3	-4	24 E3	-4	24 E3	-4
cbag5_4	25 E4	-4	24 E4	-4	24 E4	-4	24 E4	-4
cbag6_1	25 F1	-4	24 F1	-4	24 F1	-4	24 F1	-4
cbag6_2	25 F2	-4	24 F2	-4	24 F2	-4	24 F2	-4
cbag6_3	25 F3	-4	24 F3	-4	24 F3	-4	24 F3	-4
cbag6_4	25 F4	-4	24 F4	-4	24 F4	-4	24 F4	-4
cbag7_1	25 G1	-4	24 G1	-4	24 G1	-4	24 G1	-4
cbag7_2	25 G2	-4	24 G2	-4	24 G2	-4	24 G2	-4
cbag7_3	25 G3	-4	24 G3	-4	24 G3	-4	24 G3	-4
cbag7_4	25 G4	-4	24 G4	-4	24 G4	-4	24 G4	-4
cbag8_1	25 H1	-4	24 H1	-4	24 H1	-4	24 H1	-4
cbag8_2	25 H2	-4	24 H2	-4	24 H2	-4	24 H2	-4
cbag8_3	25 H3	-4	24 H3	-4	24 H3	-4	24 H3	-4
cbag8_4	25 H4	-4	24 H4	-4	24 H4	-4	24 H4	-4
cbag9_1	25 I1	-4	24 I1	-4	24 I1	-4	24 I1	-4
cbag9_2	25 I2	-4	24 I2	-4	24 I2	-4	24 I2	-4
cbag9_3	25 I3	-4	24 I3	-4	24 I3	-4	24 I3	-4
cbag9_4	25 I4	-4	24 I4	-4	24 I4	-4	24 I4	-4
cbag10_1	25 J1	-4	24 J1	-4	24 J1	-4	24 J1	-4
cbag10_2	25 J2	-4	24 J2	-4	24 J2	-4	24 J2	-4
cbag10_3	25 J3	-4	24 J3	-4	24 J3	-4	24 J3	-4
cbag10_4	25 J4	-4	24 J4	-4	24 J4	-4	24 J4	-4
rule	26 A1	26 A1	25 A1	25 A1	25 A1	25 A1	25 A1	25 A1
rule_day	26 A2	26 A2	25 A2	25 A2	25 A2	25 A2	25 A2	25 A2
slow	26 B1	26 B1	25 B1	25 B1	25 B1	25 B1	25 B1	25 B1
slow_day	26 B2	26 B2	25 B2	25 B2	25 B2	25 B2	25 B2	25 B2
strk	26 C1	26 C1	25 C1	25 C1	25 C1	25 C1	25 C1	25 C1
strk_day	26 C2	26 C2	25 C2	25 C2	25 C2	25 C2	25 C2	25 C2
lockouts	26 D1	26 D1	25 D1	25 D1	25 D1	25 D1	25 D1	25 D1
lock_day	26 D2	26 D2	25 D2	25 D2	25 D2	25 D2	25 D2	25 D2

Table A11.1 Workplace questionnaire variables - continued

actn	26 E1	26 E1	25 E1	25 E1	25 E1	25 E1	25 E1	25 E1
actn_day	26 E2	26 E2	25 E2	25 E2	25 E2	25 E2	25 E2	25 E2
frmlgrv	27a	-4	26a	-4	26a	-4	26a	-4
authgrv	27b	-4	26b	-4	26b	-4	26b	-4
numb_grv	27c	27c	27a	27a	27a	27a	27a	27a
rat_rln	27d	27d	27b	27b	27b	27b	27b	27b
non_prft	28	28	28	28	28	28	28	28
fiscal12	28a	-4	28a	-4	28a	-4	28a	-4
end_date	28b	-4	28b	-4	28b	-4	28b	-4
revenue	29a	29a	29a	29a	29a	29a	29a	29a
rev_wkp	29b	29b	29b	29b	29b	29b	29b	29b
rev_chng	29c	-4	29c	-4	29c	-4	29c	-4
expndtr	30a	30a	30a	30a	30a	30a	30a	30a
expn_wkp	30b	30b	30b	30b	30b	30b	30b	30b
f_assets	31	31	31	31	31	31	31	31
same_adr	32	32	32	32	32	32	32	32
yr_exist	-5	-5	-5	-5	32a	-4	32a	-4
prf33_b	33B	33B	33aA	33aA	33aA	33aA	33aA	33aA
prf33_c	33C	33C	33aB	33aB	33aB	33aB	33aB	33aB
prf33_d	33D	33D	33aC	33aC	33aC	33aC	33aC	33aC
prf33_e	33E	33E	33aD	33aD	33aD	33aD	33aD	33aD
prf33_f	33F	33F	33aE	33aE	33aE	33aE	33aE	33aE
prf33_a	33A	33A	33b	33b	33b	33b	33b	33b
strtgy1	34A	-4	34A	-4	34A	-4	34A	-4
strtgy2	34B	-4	34B	-4	34B	-4	34B	-4
strtgy3	34C	-4	34C	-4	34C	-4	34C	-4
strtgy4	34D	-4	34D	-4	34D	-4	34D	-4
strtgy5	34E	-4	34E	-4	34E	-4	34E	-4
strtgy6	34F	-4	34F	-4	34F	-4	34F	-4
strtgy7	34G	-4	34G	-4	34G	-4	34G	-4
strtgy8	34H	-4	34H	-4	34H	-4	34H	-4
strtgy9	34I	-4	34I	-4	34I	-4	34I	-4
strtgy10	34J	-4	34J	-4	34J	-4	34J	-4
strtgy11	34K	-4	34K	-4	34K	-4	34K	-4
strtgy12	34L	-4	34L	-4	34L	-4	34L	-4
strtgy13	34M	-4	34M	-4	34M	-4	34M	-4
strtgy14	34N	-4	34N	-4	34N	-4	34N	-4
strtgy15	34O	-4	34O	-4	34O	-4	34O	-4
mrkt_loc	35A	35A	35A	35A	35A	35A	35A	35A
mrkt_can	35B	35B	35B	35B	35B	35B	35B	35B
mrkt_usa	35C	35C	35C	35C	35C	35C	35C	35C
mrkt_wld	35D	35D	35D	35D	35D	35D	35D	35D
cmp_loc	36 1	-4	36 1	-4	36 1	-4	36 1	-4
cmp_can	36 2	-4	36 2	-4	36 2	-4	36 2	-4
cmp_usa	36 3	-4	36 3	-4	36 3	-4	36 3	-4
cmp_oth	36 4	-4	36 4	-4	36 4	-4	36 4	-4
cmp_none	36 5	-4	36 5	-4	36 5	-4	36 5	-4
lev_loc	36a A	-4	36a A	-4	36a A	-4	36a A	-4
lev_can	36a B	-4	36a B	-4	36a B	-4	36a B	-4

Table A11.1 Workplace questionnaire variables - continued

lev_usa	36a C	-4	36a C	-4	36a C	-4	36a C	-4
lev_oth	36a D	-4	36a D	-4	36a D	-4	36a D	-4
cmp_frm	37	-4	37	-4	37	-4	37	-4
prc_lev	38	-4	38	-4	38	-4	38	-4
prf39_a	39A	39A	39A	39A	39A	39A	39A	39A
prf39_b	39B	39B	39B	39B	39B	39B	39B	39B
prf39_c	39C	39C	39C	39C	39C	39C	39C	39C
new_prd	40 A	40 A	40 A	40 A	40 A	40 A	40 A	40 A
impv_prd	40 B	40 B	40 B	40 B	40 B	40 B	40 B	40 B
new_prc	40 C	40 C	40 C	40 C	40 C	40 C	40 C	40 C
impv_prc	40 D	40 D	40 D	40 D	40 D	40 D	40 D	40 D
innov	42	42	42	42	42	42	42	42
cpu_user	43	43	43	43	43	43	43	43
new_soft	44a	44a	44a	44a	44a	44a	44a	44a
date44b1	44b A 1	44b A 1	44b A 1	44b A 1	44b A 1	44b A 1	44b A 1	44b A 1
date44b2	44b A 2	44b A 2	44b A 2	44b A 2	44b A 2	44b A 2	44b A 2	44b A 2
sft_use1	44b B 1	44b B 1	44b B 1	44b B 1	44b B 1	44b B 1	44b B 1	44b B 1
sft_use2	44b B 2	44b B 2	44b B 2	44b B 2	44b B 2	44b B 2	44b B 2	44b B 2
sft_cst1	44b C 1	44b C 1	44b C 1	44b C 1	44b C 1	44b C 1	44b C 1	44b C 1
sft_cst2	44b C 2	44b C 2	44b C 2	44b C 2	44b C 2	44b C 2	44b C 2	44b C 2
sft_trn1	44b D 1	44b D 1	44b D 1	44b D 1	44b D 1	44b D 1	44b D 1	44b D 1
sft_trn2	44b D 2	44b D 2	44b D 2	44b D 2	44b D 2	44b D 2	44b D 2	44b D 2
sft_dur1	44b E 1	44b E 1	44b E 1	44b E 1	44b E 1	44b E 1	44b E 1	44b E 1
sft_dur2	44b E 2	44b E 2	44b E 2	44b E 2	44b E 2	44b E 2	44b E 2	44b E 2
sft_mn1	44b F1 1	44b F1 1	44b F1 1	44b F1 1	44b F1 1	44b F1 1	44b F1 1	44b F1 1
sft_mn2	44b F1 2	44b F1 2	44b F1 2	44b F1 2	44b F1 2	44b F1 2	44b F1 2	44b F1 2
sft_pr1	44b F2 1	44b F2 1	44b F2 1	44b F2 1	44b F2 1	44b F2 1	44b F2 1	44b F2 1
sft_pr2	44b F2 2	44b F2 2	44b F2 2	44b F2 2	44b F2 2	44b F2 2	44b F2 2	44b F2 2
sft_tc1	44b F3 1	44b F3 1	44b F3 1	44b F3 1	44b F3 1	44b F3 1	44b F3 1	44b F3 1
sft_tc2	44b F3 2	44b F3 2	44b F3 2	44b F3 2	44b F3 2	44b F3 2	44b F3 2	44b F3 2
sft_sl1	44b F4 1	44b F4 1	44b F4 1	44b F4 1	44b F4 1	44b F4 1	44b F4 1	44b F4 1
sft_sl2	44b F4 2	44b F4 2	44b F4 2	44b F4 2	44b F4 2	44b F4 2	44b F4 2	44b F4 2
sft_ad1	44b F5 1	44b F5 1	44b F5 1	44b F5 1	44b F5 1	44b F5 1	44b F5 1	44b F5 1
sft_ad2	44b F5 2	44b F5 2	44b F5 2	44b F5 2	44b F5 2	44b F5 2	44b F5 2	44b F5 2
sft_un1	44b F6 1	44b F6 1	44b F6 1	44b F6 1	44b F6 1	44b F6 1	44b F6 1	44b F6 1
sft_un2	44b F6 2	44b F6 2	44b F6 2	44b F6 2	44b F6 2	44b F6 2	44b F6 2	44b F6 2
sft_ot1	44b F7 1	44b F7 1	44b F7 1	44b F7 1	44b F7 1	44b F7 1	44b F7 1	44b F7 1
sft_ot2	44b F7 2	44b F7 2	44b F7 2	44b F7 2	44b F7 2	44b F7 2	44b F7 2	44b F7 2
cpu_ctrl	45a	45a	45a	45a	45a	45a	45a	45a
date45b1	45b A 1	45b A 1	45b A 1	45b A 1	45b A 1	45b A 1	45b A 1	45b A 1
date45b2	45b A 2	45b A 2	45b A 2	45b A 2	45b A 2	45b A 2	45b A 2	45b A 2
ctl_use1	45b B 1	45b B 1	45b B 1	45b B 1	45b B 1	45b B 1	45b B 1	45b B 1
ctl_use2	45b B 2	45b B 2	45b B 2	45b B 2	45b B 2	45b B 2	45b B 2	45b B 2
ctl_cst1	45b C 1	45b C 1	45b C 1	45b C 1	45b C 1	45b C 1	45b C 1	45b C 1
ctl_cst2	45b C 2	45b C 2	45b C 2	45b C 2	45b C 2	45b C 2	45b C 2	45b C 2
ctl_trn1	45b D 1	45b D 1	45b D 1	45b D 1	45b D 1	45b D 1	45b D 1	45b D 1
ctl_trn2	45b D 2	45b D 2	45b D 2	45b D 2	45b D 2	45b D 2	45b D 2	45b D 2
ctl_dur1	45b E 1	45b E 1	45b E 1	45b E 1	45b E 1	45b E 1	45b E 1	45b E 1
ctl_dur2	45b E 2	45b E 2	45b E 2	45b E 2	45b E 2	45b E 2	45b E 2	45b E 2

Table A11.1 Workplace questionnaire variables - continued

ctl_mn1	45b F1 1	45b F1 1	45b F1 1	45b F1 1	45b F1 1	45b F1 1	45b F1 1	45b F1 1
ctl_mn2	45b F1 2	45b F1 2	45b F1 2	45b F1 2	45b F1 2	45b F1 2	45b F1 2	45b F1 2
ctl_pr1	45b F2 1	45b F2 1	45b F2 1	45b F2 1	45b F2 1	45b F2 1	45b F2 1	45b F2 1
ctl_pr2	45b F2 2	45b F2 2	45b F2 2	45b F2 2	45b F2 2	45b F2 2	45b F2 2	45b F2 2
ctl_tc1	45b F3 1	45b F3 1	45b F3 1	45b F3 1	45b F3 1	45b F3 1	45b F3 1	45b F3 1
ctl_tc2	45b F3 2	45b F3 2	45b F3 2	45b F3 2	45b F3 2	45b F3 2	45b F3 2	45b F3 2
ctl_sl1	45b F4 1	45b F4 1	45b F4 1	45b F4 1	45b F4 1	45b F4 1	45b F4 1	45b F4 1
ctl_sl2	45b F4 2	45b F4 2	45b F4 2	45b F4 2	45b F4 2	45b F4 2	45b F4 2	45b F4 2
ctl_ad1	45b F5 1	45b F5 1	45b F5 1	45b F5 1	45b F5 1	45b F5 1	45b F5 1	45b F5 1
ctl_ad2	45b F5 2	45b F5 2	45b F5 2	45b F5 2	45b F5 2	45b F5 2	45b F5 2	45b F5 2
ctl_un1	45b F6 1	45b F6 1	45b F6 1	45b F6 1	45b F6 1	45b F6 1	45b F6 1	45b F6 1
ctl_un2	45b F6 2	45b F6 2	45b F6 2	45b F6 2	45b F6 2	45b F6 2	45b F6 2	45b F6 2
ctl_ot1	45b F7 1	45b F7 1	45b F7 1	45b F7 1	45b F7 1	45b F7 1	45b F7 1	45b F7 1
ctl_ot2	45b F7 2	45b F7 2	45b F7 2	45b F7 2	45b F7 2	45b F7 2	45b F7 2	45b F7 2
oth_tech	46a	46a	46a	46a	46a	46a	46a	46a
date46b1	46b A 1	46b A 1	46b A 1	46b A 1	46b A 1	46b A 1	46b A 1	46b A 1
date46b2	46b A 2	46b A 2	46b A 2	46b A 2	46b A 2	46b A 2	46b A 2	46b A 2
tec_use1	46b B 1	46b B 1	46b B 1	46b B 1	46b B 1	46b B 1	46b B 1	46b B 1
tec_use2	46b B 2	46b B 2	46b B 2	46b B 2	46b B 2	46b B 2	46b B 2	46b B 2
tec_cst1	46b C 1	46b C 1	46b C 1	46b C 1	46b C 1	46b C 1	46b C 1	46b C 1
tec_cst2	46b C 2	46b C 2	46b C 2	46b C 2	46b C 2	46b C 2	46b C 2	46b C 2
tec_trn1	46b D 1	46b D 1	46b D 1	46b D 1	46b D 1	46b D 1	46b D 1	46b D 1
tec_trn2	46b D 2	46b D 2	46b D 2	46b D 2	46b D 2	46b D 2	46b D 2	46b D 2
tec_dur1	46b E 1	46b E 1	46b E 1	46b E 1	46b E 1	46b E 1	46b E 1	46b E 1
tec_dur2	46b E 2	46b E 2	46b E 2	46b E 2	46b E 2	46b E 2	46b E 2	46b E 2
tec_mn1	46b F1 1	46b F1 1	46b F1 1	46b F1 1	46b F1 1	46b F1 1	46b F1 1	46b F1 1
tec_mn2	46b F1 2	46b F1 2	46b F1 2	46b F1 2	46b F1 2	46b F1 2	46b F1 2	46b F1 2
tec_pr1	46b F2 1	46b F2 1	46b F2 1	46b F2 1	46b F2 1	46b F2 1	46b F2 1	46b F2 1
tec_pr2	46b F2 2	46b F2 2	46b F2 2	46b F2 2	46b F2 2	46b F2 2	46b F2 2	46b F2 2
tec_tc1	46b F3 1	46b F3 1	46b F3 1	46b F3 1	46b F3 1	46b F3 1	46b F3 1	46b F3 1
tec_tc2	46b F3 2	46b F3 2	46b F3 2	46b F3 2	46b F3 2	46b F3 2	46b F3 2	46b F3 2
tec_sl1	46b F4 1	46b F4 1	46b F4 1	46b F4 1	46b F4 1	46b F4 1	46b F4 1	46b F4 1
tec_sl2	46b F4 2	46b F4 2	46b F4 2	46b F4 2	46b F4 2	46b F4 2	46b F4 2	46b F4 2
tec_ad1	46b F5 1	46b F5 1	46b F5 1	46b F5 1	46b F5 1	46b F5 1	46b F5 1	46b F5 1
tec_ad2	46b F5 2	46b F5 2	46b F5 2	46b F5 2	46b F5 2	46b F5 2	46b F5 2	46b F5 2
tec_un1	46b F6 1	46b F6 1	46b F6 1	46b F6 1	46b F6 1	46b F6 1	46b F6 1	46b F6 1
tec_un2	46b F6 2	46b F6 2	46b F6 2	46b F6 2	46b F6 2	46b F6 2	46b F6 2	46b F6 2
tec_ot1	46b F7 1	46b F7 1	46b F7 1	46b F7 1	46b F7 1	46b F7 1	46b F7 1	46b F7 1
tec_ot2	46b F7 2	46b F7 2	46b F7 2	46b F7 2	46b F7 2	46b F7 2	46b F7 2	46b F7 2
effect1	47 A	47 A	47 A	47 A	47 A	47 A	47 A	47 A
effect2	47 B	47 B	47 B	47 B	47 B	47 B	47 B	47 B
effect3	47 C	47 C	47 C	47 C	47 C	47 C	47 C	47 C
effect4	47 D	47 D	47 D	47 D	47 D	47 D	47 D	47 D
effect5	47 E	47 E	47 E	47 E	47 E	47 E	47 E	47 E
effect6	47 F	47 F	47 F	47 F	47 F	47 F	47 F	47 F
effect7	47 G	47 G	47 G	47 G	47 G	47 G	47 G	47 G
effect8	47 H	47 H	47 H	47 H	47 H	47 H	47 H	47 H
effect9	47 I	47 I	47 I	47 I	47 I	47 I	47 I	47 I
effect10	47 J	47 J	47 J	47 J	47 J	47 J	47 J	47 J

Table A11.1 Workplace questionnaire variables - continued

effect11	47 K	47 K	47 K	47 K	47 K	47 K	47 K	47 K
effect12	47 L	47 L	47 L	47 L	47 L	47 L	47 L	47 L
effect13	47 M	47 M	47 M	47 M	47 M	47 M	47 M	47 M
effect14	47 N	47 N	47 N	47 N	47 N	47 N	47 N	47 N
effect15	47 O	47 O	47 O	47 O	47 O	47 O	47 O	47 O
effect16	47 P	47 P	47 P	47 P	47 P	47 P	47 P	47 P
effect17	47 Q	47 Q	47 Q	47 Q	47 Q	47 Q	47 Q	47 Q
effect18	47 R	47 R	47 R	47 R	47 R	47 R	47 R	47 R
effect19	47 S	47 S	47 S	47 S	47 S	47 S	47 S	47 S
effect20	47 T	47 T	47 T	47 T	47 T	47 T	47 T	47 T
effect21	47 U	47 U	47 U	47 U	47 U	47 U	47 U	47 U
rslt_nm	48a	48a	48a	48a	48a	48a	48a	48a
rslt_mn	48b	48b	48b	48b	48b	48b	48b	48b
rslt_sk	49	49	49	49	49	49	49	49
factor1	50 01	50 01	50 01	50 01	50 01	50 01	50 01	50 01
factor2	50 02	50 02	50 02	50 02	50 02	50 02	50 02	50 02
factor3	50 03	50 03	50 03	50 03	50 03	50 03	50 03	50 03
factor4	50 04	50 04	50 04	50 04	50 04	50 04	50 04	50 04
factor5	50 05	50 05	50 05	50 05	50 05	50 05	50 05	50 05
factor6	50 06	50 06	50 06	50 06	50 06	50 06	50 06	50 06
factor7	50 07	50 07	50 07	50 07	50 07	50 07	50 07	50 07
factor8	50 08	50 08	50 08	50 08	50 08	50 08	50 08	50 08
factor9	50 09	50 09	50 09	50 09	50 09	50 09	50 09	50 09
factor10	50 10	50 10	50 10	50 10	50 10	50 10	50 10	50 10
factor11	50 11	50 11	50 11	50 11	50 11	50 11	50 11	50 11
Q51_a1	51 A	-4	-6	-6	-6	-6	-6	-6
Q51_b1	51 B	-4	-6	-6	-6	-6	-6	-6
Q51_c1	51 C	-4	-6	-6	-6	-6	-6	-6
Q51_d1	51 D	-4	-6	-6	-6	-6	-6	-6
Q51_e1	51 E	-4	-6	-6	-6	-6	-6	-6
Q51_f1	51 F	-4	-6	-6	-6	-6	-6	-6
Q51_g1	51 G	-4	-6	-6	-6	-6	-6	-6
Q51_h1	51 H	-4	-6	-6	-6	-6	-6	-6
Q51_i1	51 I	-4	-6	-6	-6	-6	-6	-6
Q51_j1	51 J	-4	-6	-6	-6	-6	-6	-6
Q51_k1	51 K	-4	-6	-6	-6	-6	-6	-6
Q51_l1	51 L	-4	-6	-6	-6	-6	-6	-6
Q51_m1	51 M	-4	-6	-6	-6	-6	-6	-6
Q51_n1	51 N	-4	-6	-6	-6	-6	-6	-6
Q51_o1	51 O	-4	-6	-6	-6	-6	-6	-6
Q51_p1	51 P	-4	-6	-6	-6	-6	-6	-6
Q51_q1	51 Q	-4	-6	-6	-6	-6	-6	-6
Q51_r1	51 R	-4	-6	-6	-6	-6	-6	-6
Q51_s1	51 S	-4	-6	-6	-6	-6	-6	-6
Q51_t1	51 T	-4	-6	-6	-6	-6	-6	-6
ttl4a_ab	4a C	4a C	-6	-6	-6	-6	-6	-6
ttl4a_de	4a F	4a F	-6	-6	-6	-6	-6	-6
yr_full	1bA2	-4	-6	-6	-6	-6	-6	-6
now_othr	1b B	1b B	-6	-6	-6	-6	-6	-6

Table A11.1 Workplace questionnaire variables - continued

yr_othr	1bB1	-4	-6	-6	-6	-6	-6	-6

Note to users

Primary key: LOCNO (HO) Docket (RDC)
Stratum variables: Industry: DOM_IND; Size: BLMA; Region: DOM_REG (HO)
HTML version of this data dictionary: 71-221-XWIE.
Variable Codeset: -3: not applicable; -4: not asked; -5: did not exist; -6: removed permanently

Table A11.2 Employee questionnaire variables

Variable	1999	2000	2001	2002	2003	2004	2005	2006
sam_empl	-5	A	A	A	A	A	A	-4
sam_locn	-5	B	B	B	B	B	B	-4
sam_job	-5	C	C	C	C	C	C	-4
sam_act	-5	D	D	D	D	D	D	-4
Flowtype	-5	ABCD	ABCD	ABCD	ABCD	ABCD	ABCD	-4
xleftjob	-5	x1_1	x1_1	x1_1	x1_1	x1_1	x1_1	-4
xresleav	-5	x1_2	x1_2	x1_2	x1_2	x1_2	x1_2	-4
xresend	-5	x1_3	x1_3	x1_3	x1_3	x1_3	x1_3	-4
xrc_pay	-5	x1_4	x1_4	x1_4	x1_4	x1_4	x1_4	-4
xamt_rc	-5	x1_5	x1_5	x1_5	x1_5	x1_5	x1_5	-4
xjob_end	-5	x2_1	x2_1	x2_1	x2_1	x2_1	x2_1	-4
xempstat	-5	x2_2	x2_2	x2_2	x2_2	x2_2	x2_2	-4
xnewstat	-5	x3_1	x3_1	x3_1	x3_1	x3_1	x3_1	-4
xstrtjob	-5	x3_2	x3_2	x3_2	x3_2	x3_2	x3_2	-4
xsamstrt	-5	x4_1a	x4_1a	x4_1a	x4_1a	x4_1a	x4_1a	-4
xstrtemp	-5	x4_1b	x4_1b	x4_1b	x4_1b	x4_1b	x4_1b	-4
xsimind	-5	x4_3	x4_3	x4_3	x4_3	x4_3	x4_3	-4
xmainact	-5	x5_1	x5_1	x5_1	x5_1	x5_1	x5_1	-4
strtemp	4	carry over	1	carry over	1	carry over	1	-4
prevwork	4a	2	2	2	2	2	2	-4
premonth	5a	2a	3	3	3	3	3	-4
learn_1	6_1	4a_1	4a_1	4a_1	4a_1	4a_1	4a_1	-4
learn_2	6_2	4a_2	4a_2	4a_2	4a_2	4a_2	4a_2	-4
learn_3	6_3	4a_3	4a_3	4a_3	4a_3	4a_3	4a_3	-4
learn_4	6_4	4a_4	4a_4	4a_4	4a_4	4a_4	4a_4	-4
learn_5	6_5	4a_5	4a_5	4a_5	4a_5	4a_5	4a_5	-4
learn_6	6_6	4a_6	4a_6	4a_6	4a_6	4a_6	4a_6	-4
learn_7	6_7	4a_7	4a_7	4a_7	4a_7	4a_7	4a_7	-4
learn_8	6_8	4a_8	4a_8	4a_8	4a_8	4a_8	4a_8	-4
learn_9	6_9	4a_9	4a_9	4a_9	4a_9	4a_9	4a_9	-4
learn_10	6_10	4a_10	4a_10	4a_10	4a_10	4a_10	4a_10	-4
learn_11	6_11	4a_11	4a_11	4a_11	4a_11	4a_11	4a_11	-4
learn_12	6_12	4a_12	4a_12	4a_12	4a_12	4a_12	4a_12	-4
hire_1	7_1	4b_1	4b_1	4b_1	4b_1	4b_1	4b_1	-4
hire_2	7_2	4b_2	4b_2	4b_2	4b_2	4b_2	4b_2	-4
hire_3	7_3	4b_3	4b_3	4b_3	4b_3	4b_3	4b_3	-4
hire_4	7_4	4b_4	4b_4	4b_4	4b_4	4b_4	4b_4	-4
hire_5	7_5	4b_5	4b_5	4b_5	4b_5	4b_5	4b_5	-4
hire_6	7_6	4b_6	4b_6	4b_6	4b_6	4b_6	4b_6	-4
hire_7	7_7	4b_7	4b_7	4b_7	4b_7	4b_7	4b_7	-4
hire_8	7_8	4b_8	4b_8	4b_8	4b_8	4b_8	4b_8	-4
hire_9	7_9	4b_9	4b_9	4b_9	4b_9	4b_9	4b_9	-4
hire_10	7_10	4b_10	4b_10	4b_10	4b_10	4b_10	4b_10	-4
hire_11	7_11	4b_11	4b_11	4b_11	4b_11	4b_11	4b_11	-4

Table A11.2 Employee questionnaire variables - continued

soc	coded	coded	coded	coded	coded	coded	coded	-4
ocp_grp	derived	derived	derived	derived	derived	derived	derived	-4
strtjob	3	7	7	7	7	7	7	-4
mineduc	8	8	8	8	8	8	8	-4
supervis	9	9	9	9	9	9	9	-4
sup_peop	9a	9a	9a	9a	9a	9a	9a	-4
samphrwk	10	10	10	10	10	10	10	-4
hrs_wk	10a	10a	10a	10a	10a	10a	10a	-4
hrs_max	10b	10b	10b	10b	10b	10b	10b	-4
hrs_min	10c	10c	10c	10c	10c	10c	10c	-4
hrs_usl	10d	10d	10d	10d	10d	10d	10d	-4
pover_wk	10e	10e	10e	10e	10e	10e	10e	-4
uover_wk	10f	10f	10f	10f	10f	10f	10f	-4
over_sch	10g	10g	10g	10g	10g	10g	10g	-4
wk_year	11a	11a	11a	11a	11a	11a	11a	-4
mth_year	11b	11b	11b	11b	11b	11b	11b	-4
prf_hrs	12	12	12	12	12	12	12	-4
red_hrs	12a	12a	12a	12a	12a	12a	12a	-4
redc_1	12b_1	12b_1	12b_1	12b_1	12b_1	12b_1	12b_1	-4
redc_2	12b_2	12b_2	12b_2	12b_2	12b_2	12b_2	12b_2	-4
redc_3	12b_3	12b_3	12b_3	12b_3	12b_3	12b_3	12b_3	-4
redc_4	12b_4	12b_4	12b_4	12b_4	12b_4	12b_4	12b_4	-4
redc_5	12b_5	12b_5	12b_5	12b_5	12b_5	12b_5	12b_5	-4
add_hrs	12c	12c	12c	12c	12c	12c	12c	-4
add_1	12d_1	12d_1	12d_1	12d_1	12d_1	12d_1	12d_1	-4
add_2	12d_2	12d_2	12d_2	12d_2	12d_2	12d_2	12d_2	-4
add_3	12d_3	12d_3	12d_3	12d_3	12d_3	12d_3	12d_3	-4
add_4	12d_4	12d_4	12d_4	12d_4	12d_4	12d_4	12d_4	-4
add_5	12d_5	12d_5	12d_5	12d_5	12d_5	12d_5	12d_5	-4
add_6	12d_6	12d_6	12d_6	12d_6	12d_6	12d_6	12d_6	-4
add_7	12d_7	12d_7	12d_7	12d_7	12d_7	12d_7	12d_7	-4
add_8	12d_8	12d_8	12d_8	12d_8	12d_8	12d_8	12d_8	-4
add_9	12d_9	12d_9	12d_9	12d_9	12d_9	12d_9	12d_9	-4
wrk_ftim	13	derived	derived	derived	derived	derived	derived	-4
mon2fri	-5	13a_i	13a_i	13a_i	13a_i	13a_i	13a_i	-4
min6hrs	-5	13a_ii	13a_ii	13a_ii	13a_ii	13a_ii	13a_ii	-4
bet6to6	-5	13a_iii	13a_iii	13a_iii	13a_iii	13a_iii	13a_iii	-4
redc_wk	13g	13g	13b	13b	13b	13b	13b	-4
redc_arr	13h	13h	13c	13c	13c	13c	13c	-4
cmprs_wk	13i	13i	13d	13d	13d	13d	13d	-4
wrk_sch	13a	13b	13e	13e	13e	13e	13e	-4
sam_hrs	13c	13c	13f	13f	13f	13f	13f	-4
sam_days	13d	13d	13g	13g	13g	13g	13g	-4
rot_shft	13e	13e	13h	13h	13h	13h	13h	-4
shifts	13f	13f	13i	13i	13i	13i	13i	-4
days_wk	13j	13j	13j	13j	13j	13j	13j	-4
sat_sun	13k	13k	13k	13k	13k	13k	13k	-4

Table A11.2 Employee questionnaire variables - continued

flex_hrs	14	14	14	14	14	14	14	-4
term_emp	15	15	15	15	15	15	15	-4
term_end	15a	15a	15a	15a	15a	15a	15a	-4
duty_loc	16	16	16	16	16	16	16	-4
duty_hom	17	17	17	17	17	17	17	-4
sch_hom	17a	17a	17a	17a	17a	17a	17a	-4
hrs_hom	17b	17b	17b	17b	17b	17b	17b	-4
main_hom	17c	17c	17c	17c	17c	17c	17c	-4
equipaid	17d	17d	17d	17d	17d	17d	17d	-4
equip_1	17e_1	17e_1	17e_1	17e_1	17e_1	17e_1	17e_1	-4
equip_2	17e_2	17e_2	17e_2	17e_2	17e_2	17e_2	17e_2	-4
equip_3	17e_3	17e_3	17e_3	17e_3	17e_3	17e_3	17e_3	-4
equip_4	17e_4	17e_4	17e_4	17e_4	17e_4	17e_4	17e_4	-4
equip_5	17e_5	17e_5	17e_5	17e_5	17e_5	17e_5	17e_5	-4
equip_6	17e_7	17e_7	17e_6	17e_6	17e_6	17e_6	17e_6	-4
pd_vac	18a	18a	18a	18a	18a	18a	18a	-4
pd_skc	18b	18b	18b	18b	18b	18b	18b	-4
tkn_edc	-5	18c_i	18c_i	18c_i	18c_i	18c_i	18c_i	-4
pd_edc	-5	18cii	18c_ii	18c_ii	18c_ii	18c_ii	18c_ii	-4
supp_edc	-5	18c_iii	18c_iii	18c_iii	18c_iii	18c_iii	18c_iii	-4
pd_oth	18d	18d	18d	18d	18d	18d	18d	-4
upd_leav	18e	18e	18e	18e	18e	18e	18e	-4
upd_days	18f	18f	18f	18f	18f	18f	18f	-4
vac_alow	-5	18g	18g	18g	18g	18g	18g	-4
off_wrk	19	19	19	19	19	19	19	-4
off_lay	-5	19a	19a	19a	19a	19a	19a	-4
days_lay	19a	19a_i	19a_i	19a_i	19a_i	19a_i	19a_i	-4
off_str	-5	19b	19b	19b	19b	19b	19b	-4
days_str	19b	19b_i	19b_i	19b_i	19b_i	19b_i	19b_i	-4
off_lck	-5	19c	19c	19c	19c	19c	19c	-4
days_lck	19c	19c_i	19c_i	19c_i	19c_i	19c_i	19c_i	-4
prmtd	20	20	20	20	20	20	20	-4
no_prmtd	20a	20a	20a	20a	20a	20a	20a	-4
prmtdate	20b	20b	20b	20b	20b	20b	20b	-4
prmtd_1	20c_1	20c_1	20c_1	20c_1	20c_1	20c_1	20c_1	-4
prmtd_2	20c_2	20c_2	20c_2	20c_2	20c_2	20c_2	20c_2	-4
prmtd_3	20c_3	20c_3	20c_3	20c_3	20c_3	20c_3	20c_3	-4
prmtd_4	20c_4	20c_4	20c_4	20c_4	20c_4	20c_4	20c_4	-4
prmtd_5	20c_5	20c_5	20c_5	20c_5	20c_5	20c_5	20c_5	-4
prmtd_6	20c_6	20c_6	20c_6	20c_6	20c_6	20c_6	20c_6	-4
perf_apr	21	21	21	21	21	21	21	-4
impc_ben	21a	21a	21a	21a	21a	21a	21a	-4
use_cpu	22	22	22	22	22	22	22	-4
tim_cpu	22a	22a	22a	22a	22a	22a	22a	-4
init_cpu	22b	22b	22b	22b	22b	22b	22b	-4
tyapp_1	22c_1	22c_1	22c_1	22c_1	22c_1	22c_1	22c_1	-4
tyapp_2	22c_2	22c_2	22c_2	22c_2	22c_2	22c_2	22c_2	-4
tyapp_3	22c_3	22c_3	22c_3	22c_3	22c_3	22c_3	22c_3	-4

Table A11.2 Employee questionnaire variables - continued

tyapp_4	22c_4	22c_4	22c_4	22c_4	22c_4	22c_4	22c_4	-4
tyapp_5	22c_5	22c_5	22c_5	22c_5	22c_5	22c_5	22c_5	-4
tyapp_6	22c_6	22c_6	22c_6	22c_6	22c_6	22c_6	22c_6	-4
tyapp_7	22c_7	22c_7	22c_7	22c_7	22c_7	22c_7	22c_7	-4
tyapp_8	22c_8	22c_8	22c_8	22c_8	22c_8	22c_8	22c_8	-4
tyapp_9	22c_9	22c_9	22c_9	22c_9	22c_9	22c_9	22c_9	-4
tyapp_10	22c_10	22c_10	22c_10	22c_10	22c_10	22c_10	22c_10	-4
tyapp_11	22c_11	22c_11	22c_11	22c_11	22c_11	22c_11	22c_11	-4
tyapp_12	22c_12	22c_12	22c_12	22c_12	22c_12	22c_12	22c_12	-4
tyapp_13	22c_13	22c_13	22c_13	22c_13	22c_13	22c_13	22c_13	-4
tyapp_14	22c_14	22c_14	22c_14	22c_14	22c_14	22c_14	22c_14	-4
app1	22d	22d	22d	22d	22d	22d	22d	-4
app1_tim	22e	22e	22e	22e	22e	22e	22e	-4
ap1lrn_1	22f_1	22f_1	22f_1	22f_1	22f_1	22f_1	22f_1	-4
ap1lrn_2	22f_2	22f_2	22f_2	22f_2	22f_2	22f_2	22f_2	-4
ap1lrn_3	22f_3	22f_3	22f_3	22f_3	22f_3	22f_3	22f_3	-4
ap1lrn_4	22f_4	22f_4	22f_4	22f_4	22f_4	22f_4	22f_4	-4
ap1lrn_5	22f_5	22f_5	22f_5	22f_5	22f_5	22f_5	22f_5	-4
ap1lrn_6	22f_6	22f_6	22f_6	22f_6	22f_6	22f_6	22f_6	-4
ap1_most	22g	22g	22g	22g	22g	22g	22g	-4
ap1_more	22h	22h	22h	22h	22h	22h	22h	-4
app2	22i	22i	22i	22i	22i	22i	22i	-4
app2_tim	22j	22j	22j	22j	22j	22j	22j	-4
app3	22k	22k	22k	22k	22k	22k	22k	-4
app3_tim	22l	22l	22l	22l	22l	22l	22l	-4
no_cpu	22m	22m	22m	22m	22m	Carry over	22m	-4
use_tech	23	23	23	23	23	23	23	-4
tim_tech	23a_i	23a_i	23a_i	23a_i	23a_i	23a_i	23a_i	-4
lrn_tech	23b	23b	23b	23b	23b	23b	23b	-4
upg_tech	23c	23c	23c	23c	23c	23c	23c	-4
trn_tech	23d	23d	23d	23d	23d	23d	23d	-4
day_tech	23e	23e	23e	23e	23e	23e	23e	-4
use_dev	23f	23f	23f	23f	23f	23f	23f	-4
tim_dev1	23g_i	23g_i	23g_i	23g_i	23g_i	23g_i	23g_i	-4
tim_dev2	23g_ii	23g_ii	23g_ii	23g_ii	23g_ii	23g_ii	23g_ii	-4
tim_dev3	23g_iii	23g_iii	23g_iii	23g_iii	23g_iii	23g_iii	23g_iii	-4
lrn_dev	23h	23h	23h	23h	23h	23h	23h	-4
upg_dev	23i	23i	23i	23i	23i	23i	23i	-4
trn_dev	23j	23j	23j	23j	23j	23j	23j	-4
day_dev	23k	23k	23k	23k	23k	23k	23k	-4
tech_com	24	24	24	24	24	24	24	-4
classtr	25	25	25	25	25	25	25	-4
courses	25a	25a	25a	25a	25a	25a	25a	-4
sub_crs1	25bi	25bi	25bi	25bi	25bi	25bi	25bi	-4
len_crs1	25bii	25bii	25bii	25bii	25bii	25bii	25bii	-4
loc_crs1	25biii	25biii	25biii	25biii	25biii	25biii	25biii	-4
tim_crs1	25biv	25biv	25biv	25biv	25biv	25biv	25biv	-4
pvcrs1_1	25bv_1	25bv_1	25bv_1	25bv_1	25bv_1	25bv_1	25bv_1	-4

Table A11.2 Employee questionnaire variables - continued

pvcrs1_2	25bv_2	25bv_2	25bv_2	25bv_2	25bv_2	25bv_2	25bv_2	-4
pvcrs1_3	25bv_3	25bv_3	25bv_3	25bv_3	25bv_3	25bv_3	25bv_3	-4
pvcrs1_4	25bv_4	25bv_4	25bv_4	25bv_4	25bv_4	25bv_4	25bv_4	-4
pvcrs1_5	25bv_5	25bv_5	25bv_5	25bv_5	25bv_5	25bv_5	25bv_5	-4
pvcrs1_6	25bv_6	25bv_6	25bv_6	25bv_6	25bv_6	25bv_6	25bv_6	-4
use_crs1	-5	-5	-5	25b) (vi)	25b) (vi)	25b) (vi)	25b) (vi)	-4
sub_crs2	25ci	25ci	25ci_1	25ci	25ci	25ci	25ci	-4
len_crs2	25cii	25cii	25cii	25cii	25cii	25cii	25cii	-4
loc_crs2	25ciii	25ciii	25ciii	25ciii	25ciii	25ciii	25ciii	-4
tim_crs2	25civ	25civ	25civ	25civ	25civ	25civ	25civ	-4
pvcrs2_1	25cv_1	25cv_1	25cv_1	25cv_1	25cv_1	25cv_1	25cv_1	-4
pvcrs2_2	25cv_2	25cv_2	25cv_2	25cv_2	25cv_2	25cv_2	25cv_2	-4
pvcrs2_3	25cv_3	25cv_3	25cv_3	25cv_3	25cv_3	25cv_3	25cv_3	-4
pvcrs2_4	25cv_4	25cv_4	25cv_4	25cv_4	25cv_4	25cv_4	25cv_4	-4
pvcrs2_5	25cv_5	25cv_5	25cv_5	25cv_5	25cv_5	25cv_5	25cv_5	-4
pvcrs2_6	25cv_6	25cv_6	25cv_6	25cv_6	25cv_6	25cv_6	25cv_6	-4
use_crs2	-5	-5	-5	25c) (vi)	25c) (vi)	25c) (vi)	25c) (vi)	-4
jobtr	25d	25d	25d	25d	25d	25d	25d	-4
sub_1	25di_1	25di_1	25di_1	25di_1	25di_1	25di_1	25di_1	-4
sub_2	25di_2	25di_2	25di_2	25di_2	25di_2	25di_2	25di_2	-4
sub_3	25di_3	25di_3	25di_3	25di_3	25di_3	25di_3	25di_3	-4
sub_4	25di_4	25di_4	25di_4	25di_4	25di_4	25di_4	25di_4	-4
sub_5	25di_5	25di_5	25di_5	25di_5	25di_5	25di_5	25di_5	-4
sub_6	25di_6	25di_6	25di_6	25di_6	25di_6	25di_6	25di_6	-4
sub_7	25di_7	25di_7	25di_7	25di_7	25di_7	25di_7	25di_7	-4
sub_8	25di_8	25di_8	25di_8	25di_8	25di_8	25di_8	25di_8	-4
sub_9	25di_9	25di_9	25di_9	25di_9	25di_9	25di_9	25di_9	-4
sub_10	25di_10	25di_10	25di_10	25di_10	25di_10	25di_10	25di_10	-4
sub_11	25di_11	25di_11	25di_11	25di_11	25di_11	25di_11	25di_11	-4
sub_12	25di_12	25di_12	25di_12	25di_12	25di_12	25di_12	25di_12	-4
sub_13	25di_13	25di_13	25di_13	25di_13	25di_13	25di_13	25di_13	-4
jobtrtim	25dii	25dii	25dii	25dii	25dii	25dii	25dii	-4
jobtrp_1	25div1	25diii1	25diii1	25diii1	25diii1	25diii1	25diii1	-4
jobtrp_2	25div2	25diii2	25diii2	25diii2	25diii2	25diii2	25diii2	-4
jobtrp_3	25div3	25diii3	25diii3	25diii3	25diii3	25diii3	25diii3	-4
jobtrp_4	25div4	25diii4	25diii4	25diii4	25diii4	25diii4	25diii4	-4
jobtrp_5	25div5	25diii5	25diii5	25diii5	25diii5	25diii5	25diii5	-4
jobtrp_6	25div6	25diii6	25diii6	25diii6	25diii6	25diii6	25diii6	-4
jobtrp_7	25div7	25diii7	25diii7	25diii7	25diii7	25diii7	25diii7	-4
use_jobt	-5	-5	-5	25d) (iv)	25d) (iv)	25d) (iv)	25d) (iv)	-4
train_no	26	26	26	26	26	26	26	-4
rsncrs	26a	26a_1	26a	26a	26a	26a	26a	-4
emp_hlp	26b	26b	26b	26b	26b	26b	26b	-4
no_crsem	26c	26c	26c	26c	26c	26c	26c	-4
goalmc_1	26d_1	26d_1	26d_1	26d_1	26d_1	26d_1	26d_1	-4
goalmc_2	26d_2	26d_2	26d_2	26d_2	26d_2	26d_2	26d_2	-4
goalmc_3	26d_3	26d_3	26d_3	26d_3	26d_3	26d_3	26d_3	-4
goalmc_4	26d_4	26d_4	26d_4	26d_4	26d_4	26d_4	26d_4	-4

Table A11.2 Employee questionnaire variables - continued

goalmc_5	26d_5	26d_5	26d_5	26d_5	26d_5	26d_5	26d_5	-4
paidmc_1	26e_1	26e_1	26e_1	26e_1	26e_1	26e_1	26e_1	-4
paidmc_2	26e_2	26e_2	26e_2	26e_2	26e_2	26e_2	26e_2	-4
paidmc_3	26e_3	26e_3	26e_3	26e_3	26e_3	26e_3	26e_3	-4
npaidcrs	27	27	27	27	27	27	27	-4
no_npcrs	27a	27a	27a	27a	27a	27a	27a	-4
su_1npd	27bi	27bi	27bi	27bi	27bi	27bi	27bi	-4
day_1npd	27bii	27bii	27bii	27bii	27bii	27bii	27bii	-4
su_2npd	27ci	27ci	27ci	27ci	27ci	27ci	27ci	-4
day_2npd	27cii	27cii	27cii	27cii	27cii	27cii	27cii	-4
skill	28	28	28	28	28	28	28	-4
avtrain	29	29	29	29	29	29	29	-4
amtrain	30	30	30	30	30	30	30	-4
read_let	-5	-5	-5	30a) A	30a) A	30a) A	30a) A	-4
read_rep	-5	-5	-5	30a) B	30a) B	30a) B	30a) B	-4
read_man	-5	-5	-5	30a) C	30a) C	30a) C	30a) C	-4
read_dia	-5	-5	-5	30a) D	30a) D	30a) D	30a) D	-4
read_dir	-5	-5	-5	30a) E	30a) E	30a) E	30a) E	-4
read_bil	-5	-5	-5	30a) F	30a) F	30a) F	30a) F	-4
read_imp	-5	-5	-5	30b)	30b)	30b)	30b)	-4
writ_let	-5	-5	-5	30c) A	30c) A	30c) A	30c) A	-4
writ_rep	-5	-5	-5	30c) B	30c) B	30c) B	30c) B	-4
writ_man	-5	-5	-5	30c) C	30c) C	30c) C	30c) C	-4
writ_dia	-5	-5	-5	30c) D	30c) D	30c) D	30c) D	-4
writ_dir	-5	-5	-5	30c) E	30c) E	30c) E	30c) E	-4
writ_bil	-5	-5	-5	30c) F	30c) F	30c) F	30c) F	-4
mat_msur	-5	-5	-5	30d) A	30d) A	30d) A	30d) A	-4
mat_calc	-5	-5	-5	30d) B	30d) B	30d) B	30d) B	-4
mat_coun	-5	-5	-5	30d) C	30d) C	30d) C	30d) C	-4
mat_mngt	-5	-5	-5	30d) D	30d) D	30d) D	30d) D	-4
mat_dir	-5	-5	-5	30d) E	30d) E	30d) E	30d) E	-4
mat_stat	-5	-5	-5	30d) F	30d) F	30d) F	30d) F	-4
feed	31a	31a	31a	31a	31a	31a	31a	-4
sugg	31b	31b	31b	31b	31b	31b	31b	-4
jrot	31c	31c	31c	31c	31c	31c	31c	-4
wrkperf	31d	31d	31d	31d	31d	31d	31d	-4
tasktea	31e	31e	31e	31e	31e	31e	31e	-4
circle	31f	31f	31f	31f	31f	31f	31f	-4
seldir	31g	31g	31g	31g	31g	31g	31g	-4
suppfam	32	32	32	32	32	32	32	-4
childca	32a	32a	32a	32a	32a	32a	32a	-4
use_chld	32ai	32ai	32ai	32ai	32ai	32ai	32ai	-4
assis	32b	32b	32b	32b	32b	32b	32b	-4
use_ass	32bi	32bi	32bi	32bi	32bi	32bi	32bi	-4
elder	32c	32c	32c	32c	32c	32c	32c	-4
use_eldr	32ci	32ci	32ci	32ci	32ci	32ci	32ci	-4
fitness	32d	32d	32d	32d	32d	32d	32d	-4
use_fit	32di	32di	32di	32di	32di	32di	32di	-4

Table A11.2 Employee questionnaire variables - continued

othsup	32e	32e	32e	32e	32e	32e	32e	-4
use_oth	32eii	32eii	32eii	32eii	32eii	32eii	32eii	-4
cba	33	33	33	33	33	33	33	-4
griev	34	34	34	34	34	34	34	-4
fil_grie	34a	34a	34a	34a	34a	34a	34a	-4
mecgri_1	34b_1	34b_1	34b_1	34b_1	34b_1	34b_1	34b_1	-4
mecgri_2	34b_2	34b_2	34b_2	34b_2	34b_2	34b_2	34b_2	-4
mecgri_3	34b_3	34b_3	34b_3	34b_3	34b_3	34b_3	34b_3	-4
mecgri_4	34b_4	34b_4	34b_4	34b_4	34b_4	34b_4	34b_4	-4
mecgri_5	34b_5	34b_5	34b_5	34b_5	34b_5	34b_5	34b_5	-4
imp_grie	34c	34c	34c	34c	34c	34c	34c	-4
emp_sal	35_1	35_1	35_1	35_1	35_1	35_1	35_1	-4
sal_freq	35_2	35_2	35_2	35_2	35_2	35_2	35_2	-4
hr_wageb	-5	35 Wage (no extra earnings)	35 Wage (no extra earnings)	35 Wage (no extra earnings)	35 Wage (no extra earnings)	35 Wage (no extra earnings)	35 Wage (no extra earnings)	-4
hr_waget	35 Wage	35 Wage	35 Wage	35 Wage	35 Wage	35 Wage	35 Wage	-4
xtra	36	36	36	36	-6	-6	-6	-4
rep_xtra	36a	36a	36a	36a	-6	-6	-6	-4
rc_ovpay	-5	36b	36b	36b	36b	36b	36b	-4
over_pay	-5	36b_i	36b_i	36b_i	36b_i	36b_i	36b_i	-4
inc_over	-5	-5	-5	-5	q36b_ii	q36b_ii	q36b_ii	-4
rc_shft	-5	36c	36c	36c	36c	36c	36c	-4
shft_pay	-5	36c_i	36c_i	36c_i	36c_i	36c_i	36c_i	-4
inc_shft	-5	-5	-5	-5	q36c_ii	q36c_ii	q36c_ii	-4
rc_bonus	-5	36d	36d	36d	36d	36d	36d	-4
bon_pay	-5	36d_i	36d_i	36d_i	36d_i	36d_i	36d_i	-4
inc_bon	-5	-5	-5	-5	q36d_ii	q36d_ii	q36d_ii	-4
rc_oth	-5	36e_1	36e_1	36e_1	36e_1	36e_1	36e_1	-4
oth_pay	-5	36e_i	36e_i	36e_i	36e_i	36e_i	36e_i	-4
inc_oth	-5	-5	-5	-5	q36e_ii	q36e_ii	q36e_ii	-4
non_wage	37	37	37	37	37	37	37	-4
pensn	37a	37a	37a	37a	37a	37a	37a	-4
par_psn	37h_i	37a_i	37a_i	37a_i	37a_i	37a_i	37a_i	-4
rrsp	37b	37b	37b	37b	37b	37b	37b	-4
emprrsp	37b_i	37b_i	37b_i	37b_i	37b_i	37b_i	37b_i	-4
par_rrs	37h_ii	37b_ii	37b_ii	37b_ii	37b_ii	37b_ii	37b_ii	-4
life	37c	37c	37c	37c	37c	37c	37c	-4
par_lif	37h_iii	37c_i	37c_i	37c_i	37c_i	37c_i	37c_i	-4
medic	37d	37d	37d	37d	37d	37d	37d	-4
par_mdc	37h_iv	37d_i	37d_i	37d_i	37d_i	37d_i	37d_i	-4
dental	37e	37e	37e	37e	37e	37e	37e	-4
par_dnt	37h_v	37e_i	37e_i	37e_i	37e_i	37e_i	37e_i	-4
uispl	37f	37f	37f	37f	37f	37f	37f	-4
stock	37g	37g	37g	37g	37g	37g	37g	-4
empstck	37g_i	37g_i	37g_i	37g_i	37g_i	37g_i	37g_i	-4
satisjob	38	38	38	38	38	38	38	-4
satismon	39	39	39	39	39	39	39	-4
xjobsat	-5	x40a	x40a	x40a	x40a	x40a	x40a	-4

Table A11.2 Employee questionnaire variables - continued

xwkcon_a	-5	x41aa	x41aa	x41aa	x41aa	x41aa	x41aa	-4
xwkcon_b	-5	x41ab	x41ab	x41ab	x41ab	x41ab	x41ab	-4
xwkcon_c	-5	x41ac	x41ac	x41ac	x41ac	x41ac	x41ac	-4
xwkcon_d	-5	x41ad	x41ad	x41ad	x41ad	x41ad	x41ad	-4
xwkcon_e	-5	x41ae	x41ae	x41ae	x41ae	x41ae	x41ae	-4
xjobop_a	-5	x41ca	x41ca	x41ca	x41ca	x41ca	x41ca	-4
xjobop_b	-5	x41cb	x41cb	x41cb	x41cb	x41cb	x41cb	-4
xjobop_c	-5	x41cc	x41cc	x41cc	x41cc	x41cc	x41cc	-4
xjobop_d	-5	x41cd	x41cd	x41cd	x41cd	x41cd	x41cd	-4
xjobop_e	-5	x41ce	x41ce	x41ce	x41ce	x41ce	x41ce	-4
xjobop_f	-5	x41cf	x41cf	x41cf	x41cf	x41cf	x41cf	-4
xjobop_g	-5	x41cg	x41cg	x41cg	x41cg	x41cg	x41cg	-4
xjobop_h	-5	x41ch	x41ch	x41ch	x41ch	x41ch	x41ch	-4
xjobop_i	-5	x41ci	x41ci	x41ci	x41ci	x41ci	x41ci	-4
yrs_exp	40	carry over	40	carry over	40	carry over	40	-4
wrk_oth	40a	-4	40a	-4	40a	-4	40a	-4
no_oth	40b	-4	40b	-4	40b	-4	40b	-4
unempl2	40c	carry over	40c	-4	40c	-4	40c	-4
mth_unem	40d	-4	40d	-4	40d	-4	40d	-4
rsn_lv	40e	40e	40e	-4	40e	-4	40e	-4
prv_ocp	40f-g	40f-g	40f-g	40f-g	40f-g	40f-g	40f-g	-4
mth_last	40h	-4	40h	-4	40h	-4	40h	-4
prv_hrs	40i	-4	40i	-4	40i	-4	40i	-4
prv_earn	40j_1	-4	40j_1	-4	40j_1	-4	40j_1	-4
prv_freq	40j_2	-4	40j_2	-4	40j_2	-4	40j_2	-4
prv_psn	40k	-4	40k	-4	40k	-4	40k	-4
prv_cpu	40l	-4	40l	-4	40l	-4	40l	-4
prv_trn	40m	-4	40m	-4	40m	-4	40m	-4
prv_act	41	-4	41	-4	41	-4	41	-4
wk_look	41a	carry over	41a	-4	41a	-4	41a	-4
oth_paid	42	42	42	42	42	42	42	-4
hrs_job1	42a_1	42a_1	42a_1	42a_1	42a_1	42a_1	42a_1	-4
hrs_job2	42a_2	42a_2	42a_2	42a_2	42a_2	42a_2	42a_2	-4
earn1	42b_1	42b_1	42b_1	42b_1	42b_1	42b_1	42b_1	-4
earn2	42b_2	42b_2	42b_2	42b_2	42b_2	42b_2	42b_2	-4
birthdat	43	carry over	43	carry over	43	carry over	43	-4
gender	44	carry over	44	carry over	44	carry over	44	-4
lang_wrk	45a	45a	45a	45a	45a	45a	45a	-4
lang_hom	45b	45b	45b	45b	45b	45b	45b	-4
born_cnd	46	carry over	46	carry over	46	carry over	46	-4
imgr_yr	46a	carry over	46a	carry over	46a	carry over	46a	-4
cntry_cd	-5	-5	-5	-5	q46b	carry over	q46b	-4
hig_grad	47	-4	47	-4	47	-4	47	-4
grad_hs	48	carry over	48	carry over	48	carry over	48	-4
oth_educ	49	Derived	49	Derived	49	Derived	49	-4
oth_12m	-5	49	-4	49	-4	49	-4	-4
edc_1	50_1	carry over	50_1	carry over	50_1	carry over	50_1	-4
edc_2	50_2	carry over	50_2	carry over	50_2	carry over	50_2	-4

Table A11.2 Employee questionnaire variables - continued

edc_3	50_3	carry over	50_3	carry over	50_3	carry over	50_3	-4
edc_4	50_4	carry over	50_4	carry over	50_4	carry over	50_4	-4
edc_5	50_5	carry over	50_5	carry over	50_5	carry over	50_5	-4
edc_6	50_6	carry over	50_6	carry over	50_6	carry over	50_6	-4
edc_7	50_7	carry over	50_7	carry over	50_7	carry over	50_7	-4
edc_8	50_8	carry over	50_8	carry over	50_8	carry over	50_8	-4
edc_9	50_9	carry over	50_9	carry over	50_9	carry over	50_9	-4
edc_10	50_10	carry over	50_10	carry over	50_10	carry over	50_10	-4
edc_11	50_11	carry over	50_11	carry over	50_11	carry over	50_11	-4
edc_12	50_12	carry over	50_12	carry over	50_12	carry over	50_12	-4
edc_13	50_13	carry over	50_13	carry over	50_13	carry over	50_13	-4
edc12_1	-5	…	50_1	…	50_1	…	50_1	-4
edc12_2	-5	…	50_2	…	50_2	…	50_2	-4
edc12_3	-5	…	50_3	…	50_3	…	50_3	-4
edc12_4	-5	…	50_4	…	50_4	…	50_4	-4
edc12_5	-5	…	50_5	…	50_5	…	50_5	-4
edc12_6	-5	…	50_6	…	50_6	…	50_6	-4
edc12_7	-5	…	50_7	…	50_7	…	50_7	-4
edc12_8	-5	…	50_8	…	50_8	…	50_8	-4
edc12_9	-5	…	50_9	…	50_9	…	50_9	-4
edc12_10	-5	…	50_10	…	50_10	…	50_10	-4
edc12_11	-5	…	50_11	…	50_11	…	50_11	-4
edc12_12	-5	…	50_12	…	50_12	…	50_12	-4
edc12_13	-5	…	50_13	…	50_13	…	50_13	-4
edc12_14	-5	…	-5	…	50_14	…	50_14	-4
mfs	-5	-5	50a	50a	50a	50a	50a	-4
marital	51	51	51	51	51	51	51	-4
comn_law	52	52	52	52	52	52	52	-4
dpnd_kid	53	53	53	53	53	53	53	-4
kid_1	53a_1	53a_1	53a_1	53a_1	53a_1	53a_1	53a_1	-4
kid_2	53a_2	53a_2	53a_2	53a_2	53a_2	53a_2	53a_2	-4
kid_3	53a_3	53a_3	53a_3	53a_3	53a_3	53a_3	53a_3	-4
kid_4	53a_4	53a_4	53a_4	53a_4	53a_4	53a_4	53a_4	-4
kid_5	53a_5	53a_5	53a_5	53a_5	53a_5	53a_5	53a_5	-4
kid_6	53a_6	53a_6	53a_6	53a_6	53a_6	53a_6	53a_6	-4
kid_7	53a_7	53a_7	53a_7	53a_7	53a_7	53a_7	53a_7	-4
kid_8	53a_8	53a_8	53a_8	53a_8	53a_8	53a_8	53a_8	-4
kid_care	53b	53b	53b	53b	53b	53b	53b	-4
fam_incm	54a	54a	54a	54a	54a	54a	54a	-4
oth_incm	54b	54b	54b	54b	54b	54b	54b	-4
eth_1	55_1	carry over	55_1	carry over	55_1	carry over	55_1	-4
eth_2	55_2	carry over	55_2	carry over	55_2	carry over	55_2	-4
eth_3	55_3	carry over	55_3	carry over	55_3	carry over	55_3	-4
eth_4	55_4	carry over	55_4	carry over	55_4	carry over	55_4	-4
eth_5	55_5	carry over	55_5	carry over	55_5	carry over	55_5	-4

… not applicable

Table A11.2 Employee questionnaire variables - continued

eth_6	55_6	carry over	55_6	carry over	55_6	carry over	55_6	-4
eth_7	55_7	carry over	55_7	carry over	55_7	carry over	55_7	-4
eth_8	55_8	carry over	55_8	carry over	55_8	carry over	55_8	-4
eth_9	55_9	carry over	55_9	carry over	55_9	carry over	55_9	-4
eth_10	55_10	carry over	55_10	carry over	55_10	carry over	55_10	-4
eth_11	55_11	carry over	55_11	carry over	55_11	carry over	55_11	-4
eth_12	55_12	carry over	55_12	carry over	55_12	carry over	55_12	-4
eth_13	55_13	carry over	55_13	carry over	55_13	carry over	55_13	-4
eth_14	55_14	carry over	55_14	carry over	55_14	carry over	55_14	-4
eth_15	55_15	carry over	55_15	carry over	55_15	carry over	55_15	-4
eth_16	55_16	carry over	55_16	carry over	55_16	carry over	55_16	-4
eth_17	55_17	carry over	55_17	carry over	55_17	carry over	55_17	-4
eth_18	55_18	carry over	55_18	carry over	55_18	carry over	55_18	-4
eth_19	55_19	carry over	55_19	carry over	55_19	carry over	55_19	-4
eth_20	-5	-5	-5	-5	55_20	carry over	55_20	-4
mnr_recr	56a	56a	56a	56a	56a	56a	56a	-4
prt_mpgm	56b	56b	56b	56b	56b	56b	56b	-4
diff_any	-5	-5	57	57	57	57	57	-4
redc_hme	-5	-5	57a	57a	57a	57a	57a	-4
redc_wrk	-5	-5	57b	57b	57b	57b	57b	-4
redc_oth	-5	-5	57c	57c	57c	57c	57c	-4
disablty	59	59	58	58	58	58	58	-4
prt_dis	59a	59a	58a	58a	58a	58a	58a	-4
aids_dis	59b	59b	58b	58b	58b	58b	58b	-4
emp_dis	59c	59c	58c	58c	58c	58c	58c	-4
par_ui	37h_vi	37fi	-6	-6	-6	-6	-6	-4
hme_act	57a	57a	-6	-6	-6	-6	-6	-4
wrk_act	57b	57b	-6	-6	-6	-6	-6	-4
benpart	37h	-6	-6	-6	-6	-6	-6	-4
jobtrhel	25d)(iii)	-6	-6	-6	-6	-6	-6	-4
lim_act	57	-6	-6	-6	-6	-6	-6	-4
lng_dis	58	-6	-6	-6	-6	-6	-6	-4
lsr_act	57c	-6	-6	-6	-6	-6	-6	-4
out_6t6	13b	-6	-6	-6	-6	-6	-6	-4
pd_leav	18	-6	-6	-6	-6	-6	-6	-4
typay_1	36c 1	-6	-6	-6	-6	-6	-6	-4
typay_2	36c 2	-6	-6	-6	-6	-6	-6	-4
typay_3	36c 3	-6	-6	-6	-6	-6	-6	-4
typay_4	36c 4	-6	-6	-6	-6	-6	-6	-4
typay_5	36c 5	-6	-6	-6	-6	-6	-6	-4
typay_6	36c 6	-6	-6	-6	-6	-6	-6	-4
typay_7	36c 7	-6	-6	-6	-6	-6	-6	-4
typay_8	36c 8	-6	-6	-6	-6	-6	-6	-4

Table A11.2 Employee questionnaire variables - continued

typay_9	36c 9	-6	-6	-6	-6	-6	-6	-4
xtraearn	36b	-6	-6	-6	-6	-6	-6	-4

Note to users

Primary key: LOCNO SEQ_NO (HO) Docket (RDC)
Stratum variables: Industry: DOM_IND; Size: BLMA; Region: DOM_REG (HO)
HTML version of this data dictionary: 71-221-XWIE.
Variable Codeset: -3: not applicable; -4: not asked; -5: did not exist; -6: removed permanently