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Guide to the Analysis of the Workplace and Employee Survey

2003

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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.

Table of contents

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 1999-2002 employer revision (June 2005)

Estimation – Since the release of the 2002 data a problem has been identified with the 2001 weights (more specifically in the way WES employment was calibrated to that of SEPH for reference year 2001.

Having established that a revision was necessary to correct the identified problem, we decided to take the opportunity to update all years to the new SEPH employment values associated with that survey's recent historical revision. In addition, we have decided to use this opportunity to push backwards certain methodological enhancements that have been introduced through the years. In general, the rebasing to SEPH affects every year whereas the methodological roll back affects years 1999 and 2000 the most. The result of these changes is a set of data that rests on the same methodological footing and that is consistent through time and with SEPH.

We have assessed the overall impact of these changes and have found that estimates are only slightly affected at higher levels of aggregation. On analytical work that has been redone internally, we have so far found that general conclusions remain the same although it is possible that conclusions from other work may yet change as a result of this revision. As one would expect, the impact of the revision is more pronounced at lower levels of aggregation such as regional levels, region by industries, and for various detailed cross-tabulations. In general, the higher the level of detail, (usually accompanied by a higher coefficient of variation), the higher the potential for large impact.

This applies to the four years of data (1999, 2000, 2001 and 2002).

What's new?

Workplace

New questions

Workforce Characteristics and Job Organization

Q1(a)(i) Of the total employment in March 2003 (as reported in Question 1 (a)), how many were male and how many were female?

Organization Change

Q23(a) As a result of the implementation of the most significant organizational change, have the skill requirements of employees…

1. increased?
2. remained the same?
3. decreased?

Workplace Performance

Q32(a) Thinking now about your entire organization, including all locations, approximately how long has it been in operation?

Modified questions
Work Organization
Q19: The category «Senior manager/Business owner» is available in its aggregated form or in separate categories «Senior manager», «Business owner».

Workplace Performance
Q28: This question is now asked for the organization instead of the location.

Deleted questions
none

Employee

New questions
Compensation
Q36(b)(ii), Q36(c)(ii), Q36(d)(ii), Q36(e)(ii)
Were these earnings included in the wage or salary reported in question 35(c)?

Modified questions
Compensation
Q36(c): The shift differentials are no longer asked.

Demographics
Q46(b): A code for the country of origin is now available.

Deleted questions
Compensation
Q36 In the past twelve months/since you started this job, did you earn any commissions, tips, bonuses, paid overtime or any other types of variable pay such as profit sharing, productivity bonuses (gain sharing) or piecework?

Q36(a) Were these commissions, tips, bonuses, paid overtime or any other types of variable pay included in the wage or salary you just reported?

1 – 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-GIE 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.

7. **Macro estimates- Control Totals**. Files with a prefix 'MA'.

All the files mentioned in 5-7 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.

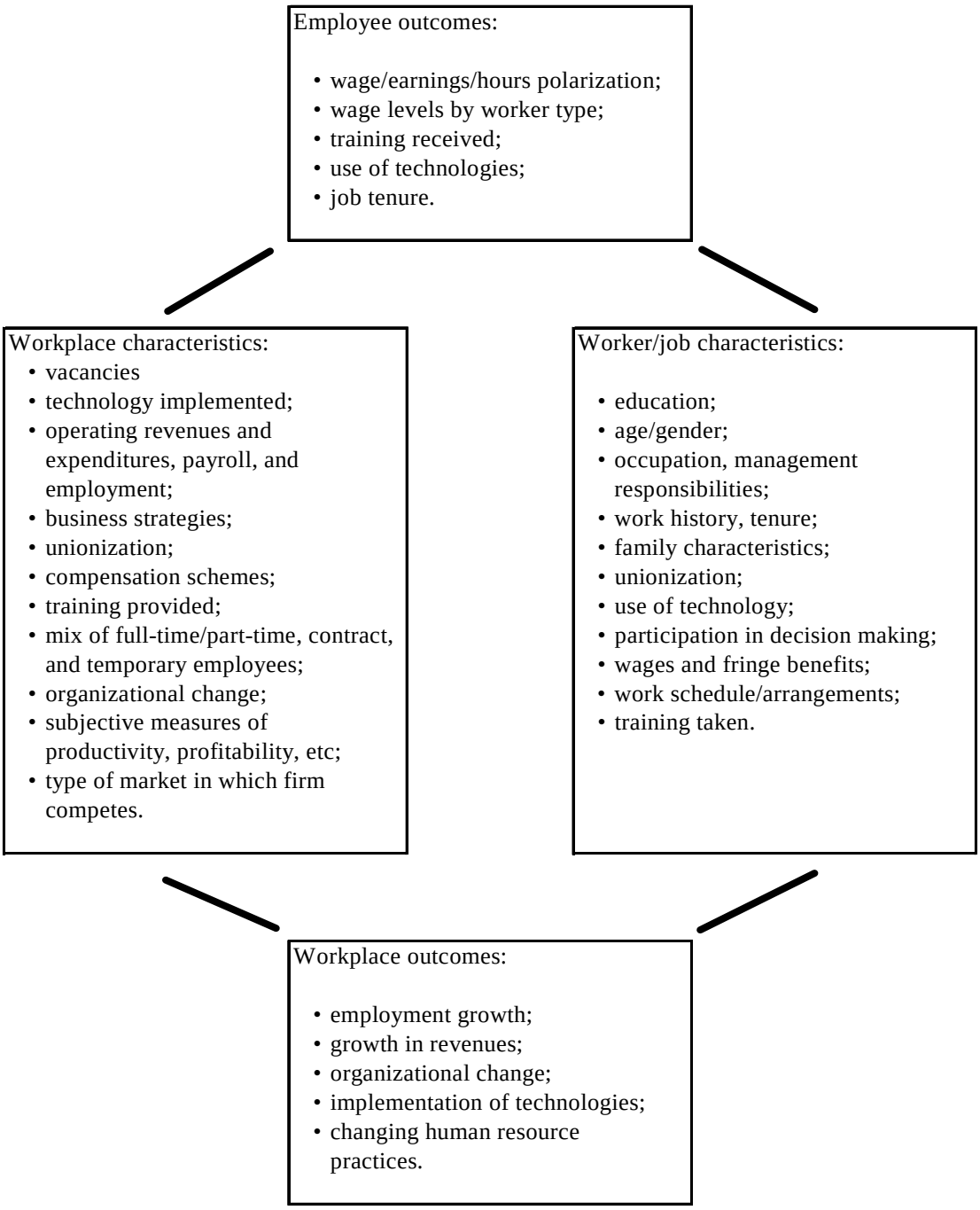
The workplace-worker link also contributes to improved measurement of a number of workplace–level variables. The characteristics of a workplace's workforce are often an important determinant of the behavior of a firm. However, data on workforce characteristics have been lacking or poorly measured in 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	Workplaces		Employee	
	Number of respondents	Estimated population	Number of respondents	Estimated population
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				
1-19 employees	2,789	645,238	5,607	3,441,317
20-99 employees	1,711	79,937	7,780	3,084,911
100-499 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

	Workplace response rate (%)	Employee response rate (%)
Overall	**95.2**	**82.8**

Table A2.3 Sample sizes and estimated populations 2000

Industry / Workplace size / Region	Workplaces		Employee	
	Number of respondents	Estimated population	Number of respondents	Estimated population
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				
1-19 employees	2,600	591,413	4,885	3,531,425
20-99 employees	1,684	81,840	6,604	3,128,181
100-499 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

	Workplace response rate (%)	Employee response rate (%)
Overall	**90.8**	**86.9**

Table A2.5 Sample sizes and estimated populations 2001

Industry / Workplace size / Region	Workplaces		Employee	
	Number of respondents	Estimated population	Number of respondents	Estimated population
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				
1-19 employees	2,709	633,971	4,766	3,586,232
20-99 employees	1,726	86,270	6,795	3,519,522
100-499 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

	Workplace response rate (%)	Employee response rate (%)
Overall	**85.9**	**86.9**

Table A2.7 Sample sizes and estimated populations 2002

Industry / Workplace size / Region	Workplaces		Employee	
	Number of respondents	Estimated population	Number of respondents	Estimated population
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				
1-19 employees	2,437	568,742	3,883	3,608,696
20-99 employees	1,654	86,351	5,542	3,582,765
100-499 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

	Workplace response rate (%)	Employee response rate (%)
Overall	**84.0**	**90.9**

Table A2.9 Sample sizes and estimated populations 2003

Industry / Workplace size / Region	Workplaces		Employee	
	Number of respondents	Estimated population	Number of respondents	Estimated population
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				
1-19 employees	2,814	617,404	4,665	3,641,990
20-99 employees	1,916	91,251	7,290	3,584,929
100-499 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

	Workplace response rate (%)	Employee response rate (%)
Overall	**83.1**	**82.7**

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, 2,334 locations were added for a total of 13,149 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 2,334 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 A2.11 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 / 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 1997)
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 / Trades

Composed of:

(a) Technical / 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 /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 / 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 / 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/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 A2.12 Concordance to the WES occupational classification

WES	Standard Occupational Classification (SOC) 1991
01 Managers	A011-A016; A111-A114; A121-A122; A131; A141; A211 A221-A222; A301-A303; A311-A312; A321-A324; A331-A334; A341-A343; A351-A353; A361; A371-A373; A381; A391-A392; E037
02 Professionals	B011-B014; B021-B022; B313; B315-B318; C011-C015; C021-C023; C031-C034; C041-C048; C051-C054; C061-C063; C111-C113; C121; C152; 162-C163; D011-D014; D021-D023; D031-D032; D041-D044; D111-D112; D211; D232; E011-E012; E021-E025; E031-E036; E038; E111-E112; E121; E130-E133; E211-E214; E216; F011-F013; F021-F025 F031-F034; F111; F121; F123; F143;
03 Technical/Trades	B111-B116; B212-B214; B311-B312; B314; B411-B415; B576; C122-C125; C131-C133; C141-C144; C151; C153-C155; C161; C164; C171-C175; D212-D219; D221-D223; D231; D233-D235; D311-D313; E215; F035-F036; F112; F122; F124-F127; F131-F132; F141-F142; F144-F145; F151-F154; G011-G016; G111; G121; G133-G134; G411-G412; G512; G611-G612; G621-G625; G631; G711-G712; G722; G812-G813; G911-G912; G921-G922; G933; G941-G942; G951; G981; H011-H019; H021-H022; H111-H113; H121-H122; H131-H134; H141-H145; H211-H217; H221-H222; H311-H312; H321-H325; H411-H418; H421-H422; H431-H435; H511-H514; H521-H523; H531-H535; H611-H612; H621-H623; H711-H714; H721-H722; H731; H736-H737; I011-I017; I021-I022; I111; I121-I122; I131-I132; I141-I142; I151; I161-I162; I171-I172 I182; J011-J016; J021-J027; J111-J114; J121-J125; J131-J134; J141-J146; J151-J154; J161-J162; J164; J171-J172; J174-J175; J181-J184; J191; J193-J197; J211; J213; J215-J216; J221-J223; J225; J227-J228;
04 Marketing/Sales	G131-G132; G211; G311; G511; G513; G713-G714; G973;
05 Clerical/Administrative	B211; B511-B514; B521-B524; B531-B535; B541-B543; B551-B554; B561-B563; B571-B575; G715; G721; G972;
06 Production Workers	G731-G732; G811; G814; G923-G924; G931-G932; G961-G962; G971; G982-G983; H732-H735; H811-H812; H821-H822; H831-H832; I181; I211-I216; J163; J173; J192; J212; J214; J217; J224: J226; J311-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 1999-2002.

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 1999/2000

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 1999/2000

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 1999/2000

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 1999/2001

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 2000/2001

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 2000/2001

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 2000/2001

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 1999/2002

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 2000/2002

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 2001/2002

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 2001/2002

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 2001/2002

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 2002 data using its corresponding weight however the results reflect the 1999 workplace universe and not the 2002 workplace universe. Births to the workplace universe were not included in the 2002 frame and are not reflected in the weights of that year. The same occurrence is true for all even years. In 2002 the workplace universe is 2001.

Longitudinal employer analysis:

Longitudinal employer analysis can be performed using any combination of the five available years (1999-2000, 1999-2001, 1999-2002, 1999-2003, 2000-2001, 2000-2002, 2000-2003, 2001-2002, 2001-2003) 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, otherwise 2002.)

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 2002 data using its corresponding weight however the results reflect the 2001 employee universe and not the 2002 employee universe. Births to the workplace universe were not included in the 2002 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 2002 the employee universe is 2001.

Longitudinal employee analysis:

Longitudinal employee analysis can be performed between 1999 and 2000 or 2001 and 2002 for common employees between the two years. The most current weight should be used. For example 2002 weight should be used for the 2001-2002 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 2002 data using its corresponding weight however the results reflect the 2001 workplace/employee universe and not the 2002 universe. Births to the workplace universe were not included in the 2002 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 2002 the results will reflect the 2001 workplace/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 and 2000 or 2001 and 2002 common workplaces and employees between the two years. The most current weight should be used. For example the 2002 weight should be used for the 2001-2002 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-wkp_bsw100 (workplace bootstrap weights), emp_bsw1-emp_bsw100 (employee bootstrap weights) or lnk_bsw1-lnk_bsw100 (linked bootstrap weights). SPSS users of older version will use wkp_b1-wkp_b100, emp_b1-emp_b100, lnk_b1_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.

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 Marie Drolet, Statistics Canada (613-951-5691 or marie.drolet@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: Name, address or telephone number provides an explicit link to a respondent. These three variables are stripped from all master files.

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

Sensitive variables: These 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 are 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

Question numbers by variables up to the 2003 questionnaires

Table A11.1 Workplace questionnaire

The HTML version of the data dictionary can be found in 71-221-GIE on www.statcan.ca.

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
	Primary key Workplace	Locno (HO) Docket (RDC)			
	Industry	Dom_Ind			
	Region	Dom_reg (HO)			
	Size	BLMA			
1a	1a	1a A	1a A	1a A	ttl_emp
-5	-5	1a B	-4	1a B	yr_emp
-5	-5	-5	-5	1ai A	ttl_male
-5	-5	-5	-5	1ai B	ttl_fem
1b A	1b A	1b A	1b A	1b A	now_full
-5	-5	1b B	1b B	1b B	now_part
4a D	4a D	1bC	1bC	1bC	prmanent
-5	-5	1b D	1b D	1b D	nperm_ft
4aA	4aA	1bA + 1bD	1bA + 1bD	1bA + 1bD	full_tim
-5	-5	1b E	1b E	1b E	nperm_pt
4aB	4aB	1bB + 1bE	1bB + 1bE	1bB + 1bE	part_tim
4a E	4a E	1bF	1bF	1bF	non_perm
-5	-5	1c	1c	1c	ttl_cba
4b A1	4b A1	1d A1	1d A1	1d A1	full_mn
-5	-5	1d A2	1d A2	1d A2	ncnm_ft
-5	-5	1d A3	1d A3	1d A3	cvnm_ft
4b A2	4b A2	1d B1	1d B1	1d B1	part_mn
-5	-5	1d B2	1d B2	1d B2	ncnm_pt
-5	-5	1d B3	1d B3	1d B3	cvnm_pt
-5	-5	1d C1	1d C1	1d C1	ttl_mgr
-5	-5	1d C2	1d C2	1d C2	ttl_ncnm
24a	24a	1d C3	1d C3	1d C3	ttl_cvnm
-5	-5	1e A1	1e A1	1e A1	ncft_pr
-5	-5	1e A2	1e A2	1e A2	ncpt_pr
-5	-5	1e B1	1e B1	1e B1	ncft_tc
-5	-5	1e B2	1e B2	1e B2	ncpt_tc
-5	-5	1e C1	1e C1	1e C1	ncft_sl
-5	-5	1e C2	1e C2	1e C2	ncpt_sl
-5	-5	1e D1	1e D1	1e D1	ncft_ad
-5	-5	1e D2	1e D2	1e D2	ncpt_ad
-5	-5	1e E1	1e E1	1e E1	ncft_un
-5	-5	1e E2	1e E2	1e E2	ncpt_un
-5	-5	1e F1	1e F1	1e F1	ncft_ot
-5	-5	1e F2	1e F2	1e F2	ncpt_ot
-5	-5	1f A1	1f A1	1f A1	cvft_pr
-5	-5	1f A2	1f A2	1f A2	cvpt_pr

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
24b A	24b A	1f A1+1f A2	1f A1+1f A2	1f A1+1f A2	cba_pr
-5	-5	1f B1	1f B1	1f B1	cvft_tc
-5	-5	1f B2	1f B2	1f B2	cvpt_tc
24b B	24b B	1f B1+1f B2	1f B1+1f B2	1f B1+1f B2	cba_tc
-5	-5	1f C1	1f C1	1f C1	cvft_sl
-5	-5	1f C2	1f C2	1f C2	cvpt_sl
24b C	24b C	1f C1+1f C2	1f C1+1f C2	1f C1+1f C2	cba_sl
-5	-5	1f D1	1f D1	1f D1	cvft_ad
-5	-5	1f D2	1f D2	1f D2	cvpt_ad
24b D	24b D	1f D1+1f D2	1f D1+1f D2	1f D1+1f D2	cba_ad
-5	-5	1f E1	1f E1	1f E1	cvft_un
-5	-5	1f E2	1f E2	1f E2	cvpt_un
24b E	24b E	1f E1+1f E2	1f E1+1f E2	1f E1+1f E2	cba_un
-5	-5	1f F1	1f F1	1f F1	cvft_ot
-5	-5	1f F2	1f F2	1f F2	cvpt_ot
24b F	24b F	1f F1+1f F2	1f F1+1f F2	1f F1+1f F2	cba_ot
4b B1	4b B1	1e A1+1f A1	1e A1+1f A1	1e A1+1f A1	full_pr
4b B2	4b B2	1e A2+1f A2	1e A2+1f A2	1e A2+1f A2	part_pr
4b C1	4b C1	1e B1+1f B1	1e B1+1f B1	1e B1+1f B1	full_tc
4b C2	4b C2	1e B2+1f B2	1e B2+1f B2	1e B2+1f B2	part_tc
4b D1	4b D1	1e C1+1f C1	1e C1+1f C1	1e C1+1f C1	full_sl
4b D2	4b D2	1e C2+1f C2	1e C2+1f C2	1e C2+1f C2	part_sl
4b E1	4b E1	1e D1+1f D1	1e D1+1f D1	1e D1+1f D1	full_ad
4b E2	4b E2	1e D2+1f D2	1e D2+1f D2	1e D2+1f D2	part_ad
4b F1	4b F1	1e E1+1f E1	1e E1+1f E1	1e E1+1f E1	full_un
4b F2	4b F2	1e E2+1f E2	1e E2+1f E2	1e E2+1f E2	part_un
4b G1	4b G1	1e F1+1f F1	1e F1+1f F1	1e F1+1f F1	full_ot
4b G2	4b G2	1e F2+1f F2	1e F2+1f F2	1e F2+1f F2	part_ot
-5	-5	1gA	1gA	1gA	ttl_site
4a G	4a G	1gB	1gB	1gB	off_othr
4a H	4a H	1gC	1gC	1gC	off_home
4a I	4a I	1hA	1hA	1hA	cntr_wkp
4a J	4a J	1hB	1hB	1hB	cntr_out
1c	1c	2	2	2	peak_yes
1e	1e	2a	2a	2a	peak_emp
1d 01	1d 01	2b 1	2b 1	2b 1	peak1
1d 02	1d 02	2b 2	2b 2	2b 2	peak2
1d 03	1d 03	2b 3	2b 3	2b 3	peak3
1d 04	1d 04	2b 4	2b 4	2b 4	peak4
1d 05	1d 05	2b 5	2b 5	2b 5	peak5
1d 06	1d 06	2b 6	2b 6	2b 6	peak6
1d 07	1d 07	2b 7	2b 7	2b 7	peak7
1d 08	1d 08	2b 8	2b 8	2b 8	peak8
1d 09	1d 09	2b 9	2b 9	2b 9	peak9
1d 10	1d 10	2b 10	2b 10	2b 10	peak10
1d 11	1d 11	2b 11	2b 11	2b 11	peak11
1d 12	1d 12	2b 12	2b 12	2b 12	peak12
2	2	3	3	3	new_hire

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
2a	2a	3a	3a	3a	ttl_nwhr
2b A	2b A	3b A	3b A	3b A	nwhr_mn
2b B	2b B	3b B	3b B	3b B	nwhr_pr
2b C	2b C	3b C	3b C	3b C	nwhr_tc
2b D	2b D	3b D	3b D	3b D	nwhr_sl
2b E	2b E	3b E	3b E	3b E	nwhr_ad
2b F	2b F	3b F	3b F	3b F	nwhr_un
2b G	2b G	3b G	3b G	3b G	nwhr_ot
3a A	3a A	4a B	4a B	4a B	staf_mn
3a B	3a B	4a C	4a C	4a C	staf_pr
3a C	3a C	4a D	4a D	4a D	staf_tc
3a D	3a D	4a E	4a E	4a E	staf_sl
3a E	3a E	4a F	4a F	4a F	staf_ad
3a F	3a F	4a G	4a G	4a G	staf_un
3a G	3a G	4a H	4a H	4a H	staf_ot
3b	3b	4b	4b	4b	unfi_vac
3c	3c	4c	4c	4c	ttl_unfi
3d A1	3d A1	4d A1	4d A1	4d A1	unfi_mn
3d A2 1	3d A2 1	4d A2 1	4d A2 1	4d A2 1	reas_mn1
3d A2 2	3d A2 2	4d A2 2	4d A2 2	4d A2 2	reas_mn2
3d A2 3	3d A2 3	4d A2 3	4d A2 3	4d A2 3	reas_mn3
3d A2 4	3d A2 4	4d A2 4	4d A2 4	4d A2 4	reas_mn4
3d B1	3d B1	4d B1	4d B1	4d B1	unfi_pr
3d B2 1	3d B2 1	4d B2 1	4d B2 1	4d B2 1	reas_pr1
3d B2 2	3d B2 2	4d B2 2	4d B2 2	4d B2 2	reas_pr2
3d B2 3	3d B2 3	4d B2 3	4d B2 3	4d B2 3	reas_pr3
3d B2 4	3d B2 4	4d B2 4	4d B2 4	4d B2 4	reas_pr4
3d C1	3d C1	4d C1	4d C1	4d C1	unfi_tc
3d C2 1	3d C2 1	4d C2 1	4d C2 1	4d C2 1	reas_tc1
3d C2 2	3d C2 2	4d C2 2	4d C2 2	4d C2 2	reas_tc2
3d C2 3	3d C2 3	4d C2 3	4d C2 3	4d C2 3	reas_tc3
3d C2 4	3d C2 4	4d C2 4	4d C2 4	4d C2 4	reas_tc4
3d D1	3d D1	4d D1	4d D1	4d D1	unfi_sl
3d D2 1	3d D2 1	4d D2 1	4d D2 1	4d D2 1	reas_sl1
3d D2 2	3d D2 2	4d D2 2	4d D2 2	4d D2 2	reas_sl2
3d D2 3	3d D2 3	4d D2 3	4d D2 3	4d D2 3	reas_sl3
3d D2 4	3d D2 4	4d D2 4	4d D2 4	4d D2 4	reas_sl4
3d E1	3d E1	4d E1	4d E1	4d E1	unfi_ad
3d E2 1	3d E2 1	4d E2 1	4d E2 1	4d E2 1	reas_ad1
3d E2 2	3d E2 2	4d E2 2	4d E2 2	4d E2 2	reas_ad2
3d E2 3	3d E2 3	4d E2 3	4d E2 3	4d E2 3	reas_ad3
3d E2 4	3d E2 4	4d E2 4	4d E2 4	4d E2 4	reas_ad4
3d F1	3d F1	4d F1	4d F1	4d F1	unfi_un
3d F2 1	3d F2 1	4d F2 1	4d F2 1	4d F2 1	reas_un1
3d F2 2	3d F2 2	4d F2 2	4d F2 2	4d F2 2	reas_un2
3d F2 3	3d F2 3	4d F2 3	4d F2 3	4d F2 3	reas_un3
3d F2 4	3d F2 4	4d F2 4	4d F2 4	4d F2 4	reas_un4
3d G1	3d G1	4d G1	4d G1	4d G1	unfi_ot

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
3d G2 1	3d G2 1	4d G2 1	4d G2 1	4d G2 1	reas_ot1
3d G2 2	3d G2 2	4d G2 2	4d G2 2	4d G2 2	reas_ot2
3d G2 3	3d G2 3	4d G2 3	4d G2 3	4d G2 3	reas_ot3
3d G2 4	3d G2 4	4d G2 4	4d G2 4	4d G2 4	reas_ot4
5a A	5a A	5a A	5a A	5a A	ttl_quit
5a B	5a B	5a B	5a B	5a B	ttl_lyff
5a C	5a C	5a C	5a C	5a C	ttl_rdct
5a D	5a D	5a D	5a D	5a D	ttl_dsms
5a E	5a E	5a E	5a E	5a E	ttl_rtmt
-5	-5	5a F	5a F	5a F	ttl_othr
5b	5b	5b	5b	5b	tmp_lyff
5c	5c	5c	5c	5c	day_lyff
6a I	-4	6a A	-4	6a A	incen
6a ii	-4	6a B	-4	6a B	gains
6a iii	-4	6a C	-4	6a C	proft
6a iv	-4	6a D	-4	6a D	merit
-5	-5	6a E	-4	6a E	stck_pl
6b A1	-4	6b B1	-4	6b B1	incen_mn
6b A2	-4	6b B2	-4	6b B2	gains_mn
6b A3	-4	6b B3	-4	6b B3	proft_mn
6b A4	-4	6b B4	-4	6b B4	merit_mn
-5	-5	6b B5	-4	6b B5	stck_mn
6b B1	-4	6b C1	-4	6b C1	incen_pr
6b B2	-4	6b C2	-4	6b C2	gains_pr
6b B3	-4	6b C3	-4	6b C3	proft_pr
6b B4	-4	6b C4	-4	6b C4	merit_pr
-5	-5	6b C5	-4	6b C5	stck_pr
6b C1	-4	6b D1	-4	6b D1	incen_tc
6b C2	-4	6b D2	-4	6b D2	gains_tc
6b C3	-4	6b D3	-4	6b D3	proft_tc
6b C4	-4	6b D4	-4	6b D4	merit_tc
-5	-5	6b D5	-4	6b D5	stck_tc
6b D1	-4	6b E1	-4	6b E1	incen_sl
6b D2	-4	6b E2	-4	6b E2	gains_sl
6b D3	-4	6b E3	-4	6b E3	proft_sl
6b D4	-4	6b E4	-4	6b E4	merit_sl
-5	-5	6b E5	-4	6b E5	stck_sl
6b E1	-4	6b F1	-4	6b F1	incen_ad
6b E2	-4	6b F2	-4	6b F2	gains_ad
6b E3	-4	6b F3	-4	6b F3	proft_ad
6b E4	-4	6b F4	-4	6b F4	merit_ad
-5	-5	6b F5	-4	6b F5	stck_ad
6b F1	-4	6b G1	-4	6b G1	incen_un
6b F2	-4	6b G2	-4	6b G2	gains_un
6b F3	-4	6b G3	-4	6b G3	proft_un
6b F4	-4	6b G4	-4	6b G4	merit_un
-5	-5	6b G5	-4	6b G5	stck_un
6b G1	-4	6b H1	-4	6b H1	incen_ot

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
6b G2	-4	6b H2	-4	6b H2	gains_ot
6b G3	-4	6b H3	-4	6b H3	proft_ot
6b G4	-4	6b H4	-4	6b H4	merit_ot
-5	-5	6b H5	-4	6b H5	stck_ot
7	7	7	7	7	grspayrl
8A	-4	8A	-4	8A	earn80kp
8B	-4	8B	-4	8B	earn60kp
8C	-4	8C	-4	8C	earn40kp
8D	-4	8D	-4	8D	earn20kp
8E	-4	8E	-4	8E	earn20kl
10	10	9	9	9	bnfc_sw
10a A1	10a A1	10a A1	10a A1	10a A1	plan_na
10a A2	10a A2	10a A2	10a A2	10a A2	plan_all
10a A3	10a A3	10a A3	10a A3	10a A3	plan_av1
10a A4	10a A4	10a A4	10a A4	10a A4	plan_av2
10a A5	10a A5	10a A5	10a A5	10a A5	plan_av3
10a B1	10a B1	10a B1	10a B1	10a B1	life_na
10a B2	10a B2	10a B2	10a B2	10a B2	life_all
10a B3	10a B3	10a B3	10a B3	10a B3	life_av1
10a B4	10a B4	10a B4	10a B4	10a B4	life_av2
10a B5	10a B5	10a B5	10a B5	10a B5	life_av3
10a C1	10a C1	10a C1	10a C1	10a C1	mdcl_na
10a C2	10a C2	10a C2	10a C2	10a C2	mdcl_all
10a C3	10a C3	10a C3	10a C3	10a C3	mdcl_av1
10a C4	10a C4	10a C4	10a C4	10a C4	mdcl_av2
10a C5	10a C5	10a C5	10a C5	10a C5	mdcl_av3
10a D1	10a D1	10a D1	10a D1	10a D1	dntl_na
10a D2	10a D2	10a D2	10a D2	10a D2	dntl_all
10a D3	10a D3	10a D3	10a D3	10a D3	dntl_av1
10a D4	10a D4	10a D4	10a D4	10a D4	dntl_av2
10a D5	10a D5	10a D5	10a D5	10a D5	dntl_av3
10a E1	10a E1	10a E1	10a E1	10a E1	rrsp_na
10a E2	10a E2	10a E2	10a E2	10a E2	rrsp_all
10a E3	10a E3	10a E3	10a E3	10a E3	rrsp_av1
10a E4	10a E4	10a E4	10a E4	10a E4	rrsp_av2
10a E5	10a E5	10a E5	10a E5	10a E5	rrsp_av3
10a F1	10a F1	10a F1	10a F1	10a F1	stck_na
10a F2	10a F2	10a F2	10a F2	10a F2	stck_all
10a F3	10a F3	10a F3	10a F3	10a F3	stck_av1
10a F4	10a F4	10a F4	10a F4	10a F4	stck_av2
10a F5	10a F5	10a F5	10a F5	10a F5	stck_av3
10a G1	10a G1	10a G1	10a G1	10a G1	bnfc_na
10a G2	10a G2	10a G2	10a G2	10a G2	bnfc_all
10a G3	10a G3	10a G3	10a G3	10a G3	bnfc_av1
10a G4	10a G4	10a G4	10a G4	10a G4	bnfc_av2
10a G5	10a G5	10a G5	10a G5	10a G5	bnfc_av3
-5	-5	10a H1	10a H1	10a H1	work_na
-5	-5	10a H2	10a H2	10a H2	work_all

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
-5	-5	10a H3	10a H3	10a H3	work_av1
-5	-5	10a H4	10a H4	10a H4	work_av2
-5	-5	10a H5	10a H5	10a H5	work_av3
-5	-5	10a I1	10a I1	10a I1	allw_na
-5	-5	10a I2	10a I2	10a I2	allw_all
-5	-5	10a I3	10a I3	10a I3	allw_av1
-5	-5	10a I4	10a I4	10a I4	allw_av2
-5	-5	10a I5	10a I5	10a I5	allw_av3
-5	-5	10a J1	10a J1	10a J1	flbn_na
-5	-5	10a J2	10a J2	10a J2	flbn_all
-5	-5	10a J3	10a J3	10a J3	flbn_av1
-5	-5	10a J4	10a J4	10a J4	flbn_av2
-5	-5	10a J5	10a J5	10a J5	flbn_av3
-5	-5	10a ja1	10a ja1	10a ja1	anre_na
-5	-5	10a ja2	10a ja2	10a ja2	anre_all
-5	-5	10a ja3	10a ja3	10a ja3	anre_av1
-5	-5	10a ja4	10a ja4	10a ja4	anre_av2
-5	-5	10a ja5	10a ja5	10a ja5	anre_av3
10a H1	10a H1	10a K1	10a K1	10a K1	othr_na
10a H2	10a H2	10a K2	10a K2	10a K2	othr_all
10a H3	10a H3	10a K3	10a K3	10a K3	othr_av1
10a H4	10a H4	10a K4	10a K4	10a K4	othr_av2
10a H5	10a H5	10a K5	10a K5	10a K5	othr_av3
11 A	11 A	10b A	10b A	10b A	plan_fd
11 B	11 B	10b B	10b B	10b B	life_fd
11 C	11 C	10b C	10b C	10b C	mdcl_fd
11 D	11 D	10b D	10b D	10b D	dntl_fd
11 E	11 E	10b E	10b E	10b E	rrsp_fd
11 F	11 F	10b F	10b F	10b F	stck_fd
11 G	11 G	10b G	10b G	10b G	bnfc_fd
-5	-5	10b H	10b H	10b H	work_fd
-5	-5	10b I	10b I	10b I	allw_fd
-5	-5	10b J	10b J	10b J	flbn_fd
-5	-5	10b ja	10b ja	10b ja	anre_fd
11 H	11 H	10b K	10b K	10b K	othr_fd
10c A	10c A	10c A	10c A	10c A	plan_pt
10c B	10c B	10c B	10c B	10c B	life_pt
10c C	10c C	10c C	10c C	10c C	mdcl_pt
10c D	10c D	10c D	10c D	10c D	dntl_pt
10c E	10c E	10c E	10c E	10c E	rrsp_pt
10c F	10c F	10c F	10c F	10c F	stck_pt
10c G	10c G	10c G	10c G	10c G	bnfc_pt
-5	-5	10c H	10c H	10c H	work_pt
-5	-5	10c I	10c I	10c I	allw_pt
-5	-5	10c J	10c J	10c J	flbn_pt
-5	-5	10c ja	10c ja	10c ja	anre_pt
10c H	10c H	10c K	10c K	10c K	othr_pt
9	9	11	11	11	sal_expn

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
12 A	-4	12 B	12 B	12 B	hours_mn
12 B	-4	12 C	12 C	12 C	hours_pr
12 C	-4	12 D	12 D	12 D	hours_tc
12 D	-4	12 E	12 E	12 E	hours_sl
12 E	-4	12 F	12 F	12 F	hours_ad
12 F	-4	12 G	12 G	12 G	hours_un
12 G	-4	12 H	12 H	12 H	hours_ot
13 A1	-4	13 B1	-4	13 B1	over_mn1
13 A2	-4	13 B2	-4	13 B2	over_mn2
13 A3	-4	13 B3	-4	13 B3	over_mn3
13 A4	-4	13 B4	-4	13 B4	over_mn4
13 A5	-4	13 B5	-4	13 B5	over_mn5
13 B1	-4	13 C1	-4	13 C1	over_pr1
13 B2	-4	13 C2	-4	13 C2	over_pr2
13 B3	-4	13 C3	-4	13 C3	over_pr3
13 B4	-4	13 C4	-4	13 C4	over_pr4
13 B5	-4	13 C5	-4	13 C5	over_pr5
13 C1	-4	13 D1	-4	13 D1	over_tc1
13 C2	-4	13 D2	-4	13 D2	over_tc2
13 C3	-4	13 D3	-4	13 D3	over_tc3
13 C4	-4	13 D4	-4	13 D4	over_tc4
13 C5	-4	13 D5	-4	13 D5	over_tc5
13 D1	-4	13 E1	-4	13 E1	over_sl1
13 D2	-4	13 E2	-4	13 E2	over_sl2
13 D3	-4	13 E3	-4	13 E3	over_sl3
13 D4	-4	13 E4	-4	13 E4	over_sl4
13 D5	-4	13 E5	-4	13 E5	over_sl5
13 E1	-4	13 F1	-4	13 F1	over_ad1
13 E2	-4	13 F2	-4	13 F2	over_ad2
13 E3	-4	13 F3	-4	13 F3	over_ad3
13 E4	-4	13 F4	-4	13 F4	over_ad4
13 E5	-4	13 F5	-4	13 F5	over_ad5
13 F1	-4	13 G1	-4	13 G1	over_un1
13 F2	-4	13 G2	-4	13 G2	over_un2
13 F3	-4	13 G3	-4	13 G3	over_un3
13 F4	-4	13 G4	-4	13 G4	over_un4
13 F5	-4	13 G5	-4	13 G5	over_un5
13 G1	-4	13 H1	-4	13 H1	over_ot1
13 G2	-4	13 H2	-4	13 H2	over_ot2
13 G3	-4	13 H3	-4	13 H3	over_ot3
13 G4	-4	13 H4	-4	13 H4	over_ot4
13 G5	-4	13 H5	-4	13 H5	over_ot5
14a1	14a1	14a1	14a1	14a1	trng1_1
14a2	14a2	14a2	14a2	14a2	trng1_2
14a3	14a3	14a3	14a3	14a3	trng1_3
14a4	14a4	14a4	14a4	14a4	trng1_4
14a5	14a5	14a5	14a5	14a5	trng1_5
14a6	14a6	14a6	14a6	14a6	trng1_6

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
14a7	14a7	14a7	14a7	14a7	trng1_7
14a8	14a8	14a8	14a8	14a8	trng1_8
14a9	14a9	14a9	14a9	14a9	trng1_9
14a10	14a10	14a10	14a10	14a10	trng1_10
14a11	14a11	14a11	14a11	14a11	trng1_11
14a12	14a12	14a12	14a12	14a12	trng1_12
14a13	14a13	14a13	14a13	14a13	trng1_13
14a14	14a14	14a14	14a14	14a14	trng1_14
14b	14b	14b	14b	14b	trn_emp1
14c1	14c1	14c1	14c1	14c1	trnfnd1
14c2	14c2	14c2	14c2	14c2	trnfnd2
14c3	14c3	14c3	14c3	14c3	trnfnd3
14c4	14c4	14c4	14c4	14c4	trnfnd4
14c5	14c5	14c5	14c5	14c5	trnfnd5
14c6	14c6	14c6	14c6	14c6	trnfnd6
14c7	14c7	14c7	14c7	14c7	trnfnd7
14c8	14c8	14c8	14c8	14c8	trnfnd8
14c9	14c9	14c9	14c9	14c9	trnfnd9
14c0	14c0	14c0	14c0	14c0	trnfnd10
15a	15a	15a	15a	15a	trng_exp
15b1	15b1	15b1	15b1	15b1	expcmp1
15b2	15b2	15b2	15b2	15b2	expcmp2
15b3	15b3	15b3	15b3	15b3	expcmp3
15b4	15b4	15b4	15b4	15b4	expcmp4
15b5	15b5	15b5	15b5	15b5	expcmp5
15b6	15b6	15b6	15b6	15b6	expcmp6
15b7	15b7	15b7	15b7	15b7	expcmp7
15b8	15b8	15b8	15b8	15b8	expcmp8
15b9	15b9	15b9	15b9	15b9	expcmp9
15c	15c	15c	15c	15c	trn_tim
16a	16a	16a	16a	16a	sbsd_tng
16b	16b	16b	16b	16b	sbsd_emp
16c1	16c1	16c1	16c1	16c1	trng2_1
16c2	16c2	16c2	16c2	16c2	trng2_2
16c3	16c3	16c3	16c3	16c3	trng2_3
16c4	16c4	16c4	16c4	16c4	trng2_4
16c5	16c5	16c5	16c5	16c5	trng2_5
16c6	16c6	16c6	16c6	16c6	trng2_6
16c7	16c7	16c7	16c7	16c7	trng2_7
16c8	16c8	16c8	16c8	16c8	trng2_8
16c9	16c9	16c9	16c9	16c9	trng2_9
16c10	16c10	16c10	16c10	16c10	trng2_10
16c11	16c11	16c11	16c11	16c11	trng2_11
16c12	16c12	16c12	16c12	16c12	trng2_12
16c13	16c13	16c13	16c13	16c13	trng2_13
16c14	16c14	16c14	16c14	16c14	trng2_14
16d	16d	16d	16d	16d	trn_emp2
17	-4	17	-4	17	hr_resp

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
18 A1	-4	18 A1	-4	18 A1	wrk_org1
18A2	-4	18A2	-4	18A2	Q18year1
18B1	-4	18B1	-4	18B1	wrk_org2
18B2	-4	18B2	-4	18B2	Q18year2
18C1	-4	18C1	-4	18C1	wrk_org3
18C2	-4	18C2	-4	18C2	Q18year3
18D1	-4	18D1	-4	18D1	wrk_org4
18D2	-4	18D2	-4	18D2	Q18year4
18E1	-4	18E1	-4	18E1	wrk_org5
18E2	-4	18E2	-4	18E2	Q18year5
18F1	-4	18F1	-4	18F1	wrk_org6
18F2	-4	18F2	-4	18F2	Q18year6
19 A1	-4	19 A1	-4	19 A1	worn1_1 / worg1_1
19 A2	-4	19 A2	-4	19 A2	worn1_2 / worg1_2
19 A3	-4	19 A3	-4	19 A3	worn1_3 / worg1_3
19 A4	-4	19 A4	-4	19 A4	worg1_4 (worn1_4/6)
-5	-5	-5	-5	19 A4	worn1_4
19 A5	-4	19 A5	-4	19 A5	worn1_5 / worg1_5
-5	-5	-5	-5	19 A6	worn1_6
19 B1	-4	19 B1	-4	19 B1	worn2_1 / worg2_1
19 B2	-4	19 B2	-4	19 B2	worn2_2 / worg2_2
19 B3	-4	19 B3	-4	19 B3	worn2_3 / worg2_3
19 B4	-4	19 B4	-4	19 B4	worg2_4 (worn2_4/6)
-5	-5	-5	-5	19 B4	Worn2_4
19 B5	-4	19 B5	-4	19 B5	Worn2_5 / worg2_5
-5	-5	-5	-5	19 B6	Worn2_6
19 C1	-4	19 C1	-4	19 C1	worn3_1 / worg3_1
19 C2	-4	19 C2	-4	19 C2	worn3_2 / worg3_2
19 C3	-4	19 C3	-4	19 C3	worn3_3 / worg3_3
19 C4	-4	19 C4	-4	19 C4	worg3_4 (worn3_4/6)
-5	-5	-5	-5	19 C4	Worn3_4
19 C5	-4	19 C5	-4	19 C5	Worn3_5 / worg3_5
-5	-5	-5	-5	19 C6	Worn3_6
19 D1	-4	19 D1	-4	19 D1	worn4_1 / worg4_1
19 D2	-4	19 D2	-4	19 D2	worn4_2 / worg4_2
19 D3	-4	19 D3	-4	19 D3	worn4_3 / worg4_3
19 D4	-4	19 D4	-4	19 D4	worg4_4 (worn4_4/6)
-5	-5	-5	-5	19 D4	Worn4_4
19 D5	-4	19 D5	-4	19 D5	Worn4_5 / worg4_5
-5	-5	-5	-5	19 D6	Worn4_6
19 E1	-4	19 E1	-4	19 E1	worn5_1 / worg5_1
19 E2	-4	19 E2	-4	19 E2	worn5_2 / worg5_2
19 E3	-4	19 E3	-4	19 E3	worn5_3 / worg5_3
19 E4	-4	19 E4	-4	19 E4	worg5_4 (worn5_4/6)
-5	-5	-5	-5	19 E4	Worn5_4
19 E5	-4	19 E5	-4	19 E5	Worn5_5 / worg5_5
-5	-5	-5	-5	19 E6	Worn5_6
19 F1	-4	19 F1	-4	19 F1	worn6_1 / worg6_1

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
19 F2	-4	19 F2	-4	19 F2	worn6_2 / worg6_2
19 F3	-4	19 F3	-4	19 F3	worn6_3 / worg6_3
19 F4	-4	19 F4	-4	19 F4	worg6_4 (worn6_4/6)
-5	-5	-5	-5	19 F4	Worn6_4
19 F5	-4	19 F5	-4	19 F5	Worn6_5 / worg6_5
-5	-5	-5	-5	19 F6	Worn6_6
19 G1	-4	19 G1	-4	19 G1	worn7_1 / worg7_1
19 G2	-4	19 G2	-4	19 G2	worn7_2 / worg7_2
19 G3	-4	19 G3	-4	19 G3	worn7_3 / worg7_3
19 G4	-4	19 G4	-4	19 G4	worg7_4 (worn7_4/6)
-5	-5	-5	-5	19 G4	Worn7_4
19 G5	-4	19 G5	-4	19 G5	Worn7_5 / worg7_5
-5	-5	-5	-5	19 G6	Worn7_6
19 H1	-4	19 H1	-4	19 H1	worn8_1 / worg8_1
19 H2	-4	19 H2	-4	19 H2	worn8_2 / worg8_2
19 H3	-4	19 H3	-4	19 H3	worn8_3 / worg8_3
19 H4	-4	19 H4	-4	19 H4	worg8_4 (worn8_4/6)
-5	-5	-5	-5	19 H4	Worn8_4
19 H5	-4	19 H5	-4	19 H5	Worn8_5 / worg8_5
-5	-5	-5	-5	19 H6	Worn8_6
19 I1	-4	19 I1	-4	19 I1	worn9_1 / worg9_1
19 I2	-4	19 I2	-4	19 I2	worn9_2 / worg9_2
19 I3	-4	19 I3	-4	19 I3	worn9_3 / worg9_3
19 I4	-4	19 I4	-4	19 I4	worg9_4 (worn9_4/6)
-5	-5	-5	-5	19 I4	Worn9_4
19 I5	-4	19 I5	-4	19 I5	Worn9_5 / worg9_5
-5	-5	-5	-5	19 I6	Worn9_6
19 J1	-4	19 J1	-4	19 J1	worn10_1 / worg10_1
19 J2	-4	19 J2	-4	19 J2	worn10_2 / worg10_2
19 J3	-4	19 J3	-4	19 J3	worn10_3 / worg10_3
19 J4	-4	19 J4	-4	19 J4	worg10_4 (worn10_4/6)
-5	-5	-5	-5	19 J4	Worn10_4
19 J5	-4	19 J5	-4	19 J5	Worn10_5 / worg10_5
-5	-5	-5	-5	19 J6	Worn10_6
19 K1	-4	19 K1	-4	19 K1	worn11_1 / worg11_1
19 K2	-4	19 K2	-4	19 K2	worn11_2 / worg11_2
19 K3	-4	19 K3	-4	19 K3	worn11_3 / worg11_3
19 K4	-4	19 K4	-4	19 K4	worg11_4 (worn11_4/6)
-5	-5	-5	-5	19 K4	Worn11_4
19 K5	-4	19 K5	-4	19 K5	Worn11_5 / worg11_5
-5	-5	-5	-5	19 K6	Worn11_6
19 L1	-4	19 L1	-4	19 L1	worn12_1 / worg12_1
19 L2	-4	19 L2	-4	19 L2	worn12_2 / worg12_2
19 L3	-4	19 L3	-4	19 L3	worn12_3 / worg12_3
19 L4	-4	19 L4	-4	19 L4	worg12_4 (worn12_4/6)
-5	-5	-5	-5	19 L4	Worn12_4
19 L5	-4	19 L5	-4	19 L5	Worn12_5 / worg12_5
-5	-5	-5	-5	19 L6	Worn12_6

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
20A	20A	20A	20A	20A	orgchg1
20B	20B	20B	20B	20B	orgchg2
20C	20C	20C	20C	20C	orgchg3
20D	20D	20D	20D	20D	orgchg4
20E	20E	20E	20E	20E	orgchg5
20F	20F	20F	20F	20F	orgchg6
20G	20G	20G	20G	20G	orgchg7
20H	20H	20H	20H	20H	orgchg8
20I	20I	20I	20I	20I	orgchg9
20J	20J	20J	20J	20J	orgchg10
20K	20K	20K	20K	20K	orgchg11
20L	20L	20L	20L	20L	orgchg12
20M	20M	20M	20M	20M	orgchg13
20N	20N	20N	20N	20N	orgchg14
20O	20O	20O	20O	20O	orgchg15
21a	21a	21a	21a	21a	s_chg
21b	21b	21b	21b	21b	downsize
22 01	22 01	22 01	22 01	22 01	objchg1
22 02	22 02	22 02	22 02	22 02	objchg2
22 03	22 03	22 03	22 03	22 03	objchg3
22 04	22 04	22 04	22 04	22 04	objchg4
22 05	22 05	22 05	22 05	22 05	objchg5
22 06	22 06	22 06	22 06	22 06	objchg6
22 07	22 07	22 07	22 07	22 07	objchg7
22 08	22 08	22 08	22 08	22 08	objchg8
22 09	22 09	22 09	22 09	22 09	objchg9
22 10	22 10	22 10	22 10	22 10	objchg10
22 11	22 11	22 11	22 11	22 11	objchg11
23 A	23 A	23 A	23 A	23 A	impact1
23 B	23 B	23 B	23 B	23 B	impact2
23 C	23 C	23 C	23 C	23 C	impact3
23 D	23 D	23 D	23 D	23 D	impact4
23 E	23 E	23 E	23 E	23 E	impact5
23 F	23 F	23 F	23 F	23 F	impact6
23 G	23 G	23 G	23 G	23 G	impact7
23 H	23 H	23 H	23 H	23 H	impact8
23 I	23 I	23 I	23 I	23 I	impact9
23 J	23 J	23 J	23 J	23 J	impact10
23 K	23 K	23 K	23 K	23 K	impact11
23 L	23 L	23 L	23 L	23 L	impact12
23 M	23 M	23 M	23 M	23 M	impact13
23 N	23 N	23 N	23 N	23 N	impact14
-5	-5	-5	-5	23a	orgchgsk
25 A1	-4	24 A1	-4	24 A1	cbag1_1
25 A2	-4	24 A2	-4	24 A2	cbag1_2
25 A3	-4	24 A3	-4	24 A3	cbag1_3
25 A4	-4	24 A4	-4	24 A4	cbag1_4
25 B1	-4	24 B1	-4	24 B1	cbag2_1

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
25 B2	-4	24 B2	-4	24 B2	cbag2_2
25 B3	-4	24 B3	-4	24 B3	cbag2_3
25 B4	-4	24 B4	-4	24 B4	cbag2_4
25 C1	-4	24 C1	-4	24 C1	cbag3_1
25 C2	-4	24 C2	-4	24 C2	cbag3_2
25 C3	-4	24 C3	-4	24 C3	cbag3_3
25 C4	-4	24 C4	-4	24 C4	cbag3_4
25 D1	-4	24 D1	-4	24 D1	cbag4_1
25 D2	-4	24 D2	-4	24 D2	cbag4_2
25 D3	-4	24 D3	-4	24 D3	cbag4_3
25 D4	-4	24 D4	-4	24 D4	cbag4_4
25 E1	-4	24 E1	-4	24 E1	cbag5_1
25 E2	-4	24 E2	-4	24 E2	cbag5_2
25 E3	-4	24 E3	-4	24 E3	cbag5_3
25 E4	-4	24 E4	-4	24 E4	cbag5_4
25 F1	-4	24 F1	-4	24 F1	cbag6_1
25 F2	-4	24 F2	-4	24 F2	cbag6_2
25 F3	-4	24 F3	-4	24 F3	cbag6_3
25 F4	-4	24 F4	-4	24 F4	cbag6_4
25 G1	-4	24 G1	-4	24 G1	cbag7_1
25 G2	-4	24 G2	-4	24 G2	cbag7_2
25 G3	-4	24 G3	-4	24 G3	cbag7_3
25 G4	-4	24 G4	-4	24 G4	cbag7_4
25 H1	-4	24 H1	-4	24 H1	cbag8_1
25 H2	-4	24 H2	-4	24 H2	cbag8_2
25 H3	-4	24 H3	-4	24 H3	cbag8_3
25 H4	-4	24 H4	-4	24 H4	cbag8_4
25 I1	-4	24 I1	-4	24 I1	cbag9_1
25 I2	-4	24 I2	-4	24 I2	cbag9_2
25 I3	-4	24 I3	-4	24 I3	cbag9_3
25 I4	-4	24 I4	-4	24 I4	cbag9_4
25 J1	-4	24 J1	-4	24 J1	cbag10_1
25 J2	-4	24 J2	-4	24 J2	cbag10_2
25 J3	-4	24 J3	-4	24 J3	cbag10_3
25 J4	-4	24 J4	-4	24 J4	cbag10_4
26 A1	26 A1	25 A1	25 A1	25 A1	rule
26 A2	26 A2	25 A2	25 A2	25 A2	rule_day
26 B1	26 B1	25 B1	25 B1	25 B1	slow
26 B2	26 B2	25 B2	25 B2	25 B2	slow_day
26 C1	26 C1	25 C1	25 C1	25 C1	strk
26 C2	26 C2	25 C2	25 C2	25 C2	strk_day
26 D1	26 D1	25 D1	25 D1	25 D1	lockouts
26 D2	26 D2	25 D2	25 D2	25 D2	lock_day
26 E1	26 E1	25 E1	25 E1	25 E1	actn
26 E2	26 E2	25 E2	25 E2	25 E2	actn_day
27a	-4	26a	-4	26a	frmlgrv
27b	-4	26b	-4	26b	authgrv
27c	27c	27a	27a	27a	numb_grv

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
27d	27d	27b	27b	27b	rat_rln
28	**28**	**28**	**28**	**28**	**non_prft**
28a	-4	28a	-4	28a	fiscal12
28b	-4	28b	-4	28b	end_date
29a	29a	29a	29a	29a	revenue
29b	29b	29b	29b	29b	rev_wkp
29c	-4	29c	-4	29c	rev_chng
30a	30a	30a	30a	30a	expndtr
30b	30b	30b	30b	30b	expn_wkp
31	31	31	31	31	f_assets
32	32	32	32	32	same_adr
-5	-5	-5	-5	32a	yr_exist
33B	33B	33aA	33aA	33aA	prf33_b
33C	33C	33aB	33aB	33aB	prf33_c
33D	33D	33aC	33aC	33aC	prf33_d
33E	33E	33aD	33aD	33aD	prf33_e
33F	33F	33aE	33aE	33aE	prf33_f
33A	33A	33b	33b	33b	prf33_a
34A	-4	34A	-4	34A	strtgy1
34B	-4	34B	-4	34B	strtgy2
34C	-4	34C	-4	34C	strtgy3
34D	-4	34D	-4	34D	strtgy4
34E	-4	34E	-4	34E	strtgy5
34F	-4	34F	-4	34F	strtgy6
34G	-4	34G	-4	34G	strtgy7
34H	-4	34H	-4	34H	strtgy8
34I	-4	34I	-4	34I	strtgy9
34J	-4	34J	-4	34J	strtgy10
34K	-4	34K	-4	34K	strtgy11
34L	-4	34L	-4	34L	strtgy12
34M	-4	34M	-4	34M	strtgy13
34N	-4	34N	-4	34N	strtgy14
34O	-4	34O	-4	34O	strtgy15
35A	35A	35A	35A	35A	mrkt_loc
35B	35B	35B	35B	35B	mrkt_can
35C	35C	35C	35C	35C	mrkt_usa
35D	35D	35D	35D	35D	mrkt_wld
36 1	-4	36 1	-4	36 1	cmp_loc
36 2	-4	36 2	-4	36 2	cmp_can
36 3	-4	36 3	-4	36 3	cmp_usa
36 4	-4	36 4	-4	36 4	cmp_oth
36 5	-4	36 5	-4	36 5	cmp_none
36a A	-4	36a A	-4	36a A	lev_loc
36a B	-4	36a B	-4	36a B	lev_can
36a C	-4	36a C	-4	36a C	lev_usa
36a D	-4	36a D	-4	36a D	lev_oth
37	-4	37	-4	37	cmp_frm
38	-4	38	-4	38	prc_lev

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
39A	39A	39A	39A	39A	prf39_a
39B	39B	39B	39B	39B	prf39_b
39C	39C	39C	39C	39C	prf39_c
40 A	40 A	40 A	40 A	40 A	new_prd
40 B	40 B	40 B	40 B	40 B	impv_prd
40 C	40 C	40 C	40 C	40 C	new_prc
40 D	40 D	40 D	40 D	40 D	impv_prc
42	42	42	42	42	innov
43	43	43	43	43	cpu_user
44a	44a	44a	44a	44a	new_soft
44b A 1	44b A 1	44b A 1	44b A 1	44b A 1	date44b1
44b A 2	44b A 2	44b A 2	44b A 2	44b A 2	date44b2
44b B 1	44b B 1	44b B 1	44b B 1	44b B 1	sft_use1
44b B 2	44b B 2	44b B 2	44b B 2	44b B 2	sft_use2
44b C 1	44b C 1	44b C 1	44b C 1	44b C 1	sft_cst1
44b C 2	44b C 2	44b C 2	44b C 2	44b C 2	sft_cst2
44b D 1	44b D 1	44b D 1	44b D 1	44b D 1	sft_trn1
44b D 2	44b D 2	44b D 2	44b D 2	44b D 2	sft_trn2
44b E 1	44b E 1	44b E 1	44b E 1	44b E 1	sft_dur1
44b E 2	44b E 2	44b E 2	44b E 2	44b E 2	sft_dur2
44b F1 1	44b F1 1	44b F1 1	44b F1 1	44b F1 1	sft_mn1
44b F1 2	44b F1 2	44b F1 2	44b F1 2	44b F1 2	sft_mn2
44b F2 1	44b F2 1	44b F2 1	44b F2 1	44b F2 1	sft_pr1
44b F2 2	44b F2 2	44b F2 2	44b F2 2	44b F2 2	sft_pr2
44b F3 1	44b F3 1	44b F3 1	44b F3 1	44b F3 1	sft_tc1
44b F3 2	44b F3 2	44b F3 2	44b F3 2	44b F3 2	sft_tc2
44b F4 1	44b F4 1	44b F4 1	44b F4 1	44b F4 1	sft_sl1
44b F4 2	44b F4 2	44b F4 2	44b F4 2	44b F4 2	sft_sl2
44b F5 1	44b F5 1	44b F5 1	44b F5 1	44b F5 1	sft_ad1
44b F5 2	44b F5 2	44b F5 2	44b F5 2	44b F5 2	sft_ad2
44b F6 1	44b F6 1	44b F6 1	44b F6 1	44b F6 1	sft_un1
44b F6 2	44b F6 2	44b F6 2	44b F6 2	44b F6 2	sft_un2
44b F7 1	44b F7 1	44b F7 1	44b F7 1	44b F7 1	sft_ot1
44b F7 2	44b F7 2	44b F7 2	44b F7 2	44b F7 2	sft_ot2
45a	45a	45a	45a	45a	cpu_ctrl
45b A 1	45b A 1	45b A 1	45b A 1	45b A 1	date45b1
45b A 2	45b A 2	45b A 2	45b A 2	45b A 2	date45b2
45b B 1	45b B 1	45b B 1	45b B 1	45b B 1	ctl_use1
45b B 2	45b B 2	45b B 2	45b B 2	45b B 2	ctl_use2
45b C 1	45b C 1	45b C 1	45b C 1	45b C 1	ctl_cst1
45b C 2	45b C 2	45b C 2	45b C 2	45b C 2	ctl_cst2
45b D 1	45b D 1	45b D 1	45b D 1	45b D 1	ctl_trn1
45b D 2	45b D 2	45b D 2	45b D 2	45b D 2	ctl_trn2
45b E 1	45b E 1	45b E 1	45b E 1	45b E 1	ctl_dur1
45b E 2	45b E 2	45b E 2	45b E 2	45b E 2	ctl_dur2
45b F1 1	45b F1 1	45b F1 1	45b F1 1	45b F1 1	ctl_mn1
45b F1 2	45b F1 2	45b F1 2	45b F1 2	45b F1 2	ctl_mn2
45b F2 1	45b F2 1	45b F2 1	45b F2 1	45b F2 1	ctl_pr1

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
45b F2 2	45b F2 2	45b F2 2	45b F2 2	45b F2 2	ctl_pr2
45b F3 1	45b F3 1	45b F3 1	45b F3 1	45b F3 1	ctl_tc1
45b F3 2	45b F3 2	45b F3 2	45b F3 2	45b F3 2	ctl_tc2
45b F4 1	45b F4 1	45b F4 1	45b F4 1	45b F4 1	ctl_sl1
45b F4 2	45b F4 2	45b F4 2	45b F4 2	45b F4 2	ctl_sl2
45b F5 1	45b F5 1	45b F5 1	45b F5 1	45b F5 1	ctl_ad1
45b F5 2	45b F5 2	45b F5 2	45b F5 2	45b F5 2	ctl_ad2
45b F6 1	45b F6 1	45b F6 1	45b F6 1	45b F6 1	ctl_un1
45b F6 2	45b F6 2	45b F6 2	45b F6 2	45b F6 2	ctl_un2
45b F7 1	45b F7 1	45b F7 1	45b F7 1	45b F7 1	ctl_ot1
45b F7 2	45b F7 2	45b F7 2	45b F7 2	45b F7 2	ctl_ot2
46a	46a	46a	46a	46a	oth_tech
46b A 1	46b A 1	46b A 1	46b A 1	46b A 1	date46b1
46b A 2	46b A 2	46b A 2	46b A 2	46b A 2	date46b2
46b B 1	46b B 1	46b B 1	46b B 1	46b B 1	tec_use1
46b B 2	46b B 2	46b B 2	46b B 2	46b B 2	tec_use2
46b C 1	46b C 1	46b C 1	46b C 1	46b C 1	tec_cst1
46b C 2	46b C 2	46b C 2	46b C 2	46b C 2	tec_cst2
46b D 1	46b D 1	46b D 1	46b D 1	46b D 1	tec_trn1
46b D 2	46b D 2	46b D 2	46b D 2	46b D 2	tec_trn2
46b E 1	46b E 1	46b E 1	46b E 1	46b E 1	tec_dur1
46b E 2	46b E 2	46b E 2	46b E 2	46b E 2	tec_dur2
46b F1 1	46b F1 1	46b F1 1	46b F1 1	46b F1 1	tec_mn1
46b F1 2	46b F1 2	46b F1 2	46b F1 2	46b F1 2	tec_mn2
46b F2 1	46b F2 1	46b F2 1	46b F2 1	46b F2 1	tec_pr1
46b F2 2	46b F2 2	46b F2 2	46b F2 2	46b F2 2	tec_pr2
46b F3 1	46b F3 1	46b F3 1	46b F3 1	46b F3 1	tec_tc1
46b F3 2	46b F3 2	46b F3 2	46b F3 2	46b F3 2	tec_tc2
46b F4 1	46b F4 1	46b F4 1	46b F4 1	46b F4 1	tec_sl1
46b F4 2	46b F4 2	46b F4 2	46b F4 2	46b F4 2	tec_sl2
46b F5 1	46b F5 1	46b F5 1	46b F5 1	46b F5 1	tec_ad1
46b F5 2	46b F5 2	46b F5 2	46b F5 2	46b F5 2	tec_ad2
46b F6 1	46b F6 1	46b F6 1	46b F6 1	46b F6 1	tec_un1
46b F6 2	46b F6 2	46b F6 2	46b F6 2	46b F6 2	tec_un2
46b F7 1	46b F7 1	46b F7 1	46b F7 1	46b F7 1	tec_ot1
46b F7 2	46b F7 2	46b F7 2	46b F7 2	46b F7 2	tec_ot2
47 A	47 A	47 A	47 A	47 A	effect1
47 B	47 B	47 B	47 B	47 B	effect2
47 C	47 C	47 C	47 C	47 C	effect3
47 D	47 D	47 D	47 D	47 D	effect4
47 E	47 E	47 E	47 E	47 E	effect5
47 F	47 F	47 F	47 F	47 F	effect6
47 G	47 G	47 G	47 G	47 G	effect7
47 H	47 H	47 H	47 H	47 H	effect8
47 I	47 I	47 I	47 I	47 I	effect9
47 J	47 J	47 J	47 J	47 J	effect10
47 K	47 K	47 K	47 K	47 K	effect11
47 L	47 L	47 L	47 L	47 L	effect12

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
47 M	47 M	47 M	47 M	47 M	effect13
47 N	47 N	47 N	47 N	47 N	effect14
47 O	47 O	47 O	47 O	47 O	effect15
47 P	47 P	47 P	47 P	47 P	effect16
47 Q	47 Q	47 Q	47 Q	47 Q	effect17
47 R	47 R	47 R	47 R	47 R	effect18
47 S	47 S	47 S	47 S	47 S	effect19
47 T	47 T	47 T	47 T	47 T	effect20
47 U	47 U	47 U	47 U	47 U	effect21
48a	48a	48a	48a	48a	rslt_nm
48b	48b	48b	48b	48b	rslt_mn
49	49	49	49	49	rslt_sk
50 01	50 01	50 01	50 01	50 01	factor1
50 02	50 02	50 02	50 02	50 02	factor2
50 03	50 03	50 03	50 03	50 03	factor3
50 04	50 04	50 04	50 04	50 04	factor4
50 05	50 05	50 05	50 05	50 05	factor5
50 06	50 06	50 06	50 06	50 06	factor6
50 07	50 07	50 07	50 07	50 07	factor7
50 08	50 08	50 08	50 08	50 08	factor8
50 09	50 09	50 09	50 09	50 09	factor9
50 10	50 10	50 10	50 10	50 10	factor10
50 11	50 11	50 11	50 11	50 11	factor11
51 A	-4	-6	-6	-6	Q51_a1
51 B	-4	-6	-6	-6	Q51_b1
51 C	-4	-6	-6	-6	Q51_c1
51 D	-4	-6	-6	-6	Q51_d1
51 E	-4	-6	-6	-6	Q51_e1
51 F	-4	-6	-6	-6	Q51_f1
51 G	-4	-6	-6	-6	Q51_g1
51 H	-4	-6	-6	-6	Q51_h1
51 I	-4	-6	-6	-6	Q51_i1
51 J	-4	-6	-6	-6	Q51_j1
51 K	-4	-6	-6	-6	Q51_k1
51 L	-4	-6	-6	-6	Q51_l1
51 M	-4	-6	-6	-6	Q51_m1
51 N	-4	-6	-6	-6	Q51_n1
51 O	-4	-6	-6	-6	Q51_o1
51 P	-4	-6	-6	-6	Q51_p1
51 Q	-4	-6	-6	-6	Q51_q1
51 R	-4	-6	-6	-6	Q51_r1
51 S	-4	-6	-6	-6	Q51_s1
51 T	-4	-6	-6	-6	Q51_t1
4a C	4a C	-6	-6	-6	ttl4a_ab
4a F	4a F	-6	-6	-6	ttl4a_de
1bA2	-4	-6	-6	-6	yr_full
1b B	1b B	-6	-6	-6	now_othr
1bB1	-4	-6	-6	-6	yr_othr

Table A11.2 Employee questionnaire

The HTML version of the data dictionary can be found in 71-221-GIE on www.statcan.ca.

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
	Primary key Workplace	Locno (HO) Docket (RDC)			
	Primary key Employee	Seq_no			
	Industry	Dom_Ind			
	Region	Dom_reg (HO)			
	Size	BLMA			
-5	A	A	A	A	sam_empl
-5	B	B	B	B	sam_locn
-5	C	C	C	C	sam_job
-5	D	D	D	D	sam_act
-5	ABCD	ABCD	ABCD	ABCD	Flowtype
-5	x1_1	x1_1	x1_1	x1_1	xleftjob
-5	x1_2	x1_2	x1_2	x1_2	xresleav
-5	x1_3	x1_3	x1_3	x1_3	xresend
-5	x1_4	x1_4	x1_4	x1_4	xrc_pay
-5	x1_5	x1_5	x1_5	x1_5	xamt_rc
-5	x2_1	x2_1	x2_1	x2_1	xjob_end
-5	x2_2	x2_2	x2_2	x2_2	xempstat
-5	x3_1	x3_1	x3_1	x3_1	xnewstat
-5	x3_2	x3_2	x3_2	x3_2	xstrtjob
-5	x4_1a	x4_1a	x4_1a	x4_1a	xsamstrt
-5	x4_1b	x4_1b	x4_1b	x4_1b	xstrtemp
-5	x4_3	x4_3	x4_3	x4_3	xsimind
-5	x5_1	x5_1	x5_1	x5_1	xmainact
4	carry over	1	carry over	1	strtemp
4a	2	2	2	2	prevwork
5a	2a	3	3	3	premonth
6_1	4a_1	4a_1	4a_1	4a_1	learn_1
6_2	4a_2	4a_2	4a_2	4a_2	learn_2
6_3	4a_3	4a_3	4a_3	4a_3	learn_3
6_4	4a_4	4a_4	4a_4	4a_4	learn_4
6_5	4a_5	4a_5	4a_5	4a_5	learn_5
6_6	4a_6	4a_6	4a_6	4a_6	learn_6
6_7	4a_7	4a_7	4a_7	4a_7	learn_7
6_8	4a_8	4a_8	4a_8	4a_8	learn_8
6_9	4a_9	4a_9	4a_9	4a_9	learn_9
6_10	4a_10	4a_10	4a_10	4a_10	learn_10
6_11	4a_11	4a_11	4a_11	4a_11	learn_11
6_12	4a_12	4a_12	4a_12	4a_12	learn_12
7_1	4b_1	4b_1	4b_1	4b_1	hire_1
7_2	4b_2	4b_2	4b_2	4b_2	hire_2
7_3	4b_3	4b_3	4b_3	4b_3	hire_3
7_4	4b_4	4b_4	4b_4	4b_4	hire_4
7_5	4b_5	4b_5	4b_5	4b_5	hire_5
7_6	4b_6	4b_6	4b_6	4b_6	hire_6

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
7_7	4b_7	4b_7	4b_7	4b_7	hire_7
7_8	4b_8	4b_8	4b_8	4b_8	hire_8
7_9	4b_9	4b_9	4b_9	4b_9	hire_9
7_10	4b_10	4b_10	4b_10	4b_10	hire_10
7_11	4b_11	4b_11	4b_11	4b_11	hire_11
1-2	5-6	5-6	5-6	5-6	soc
derived	derived	derived	derived	derived	ocp_grp
3	7	7	7	7	strtjob
8	8	8	8	8	mineduc
9	9	9	9	9	supervis
9a	9a	9a	9a	9a	sup_peop
10	10	10	10	10	samphrwk
10a	10a	10a	10a	10a	hrs_wk
10b	10b	10b	10b	10b	hrs_max
10c	10c	10c	10c	10c	hrs_min
10d	10d	10d	10d	10d	hrs_usl
10e	10e	10e	10e	10e	pover_wk
10f	10f	10f	10f	10f	uover_wk
10g	10g	10g	10g	10g	over_sch
11a	11a	11a	11a	11a	wk_year
11b	11b	11b	11b	11b	mth_year
12	12	12	12	12	prf_hrs
12a	12a	12a	12a	12a	red_hrs
12b_1	12b_1	12b_1	12b_1	12b_1	redc_1
12b_2	12b_2	12b_2	12b_2	12b_2	redc_2
12b_3	12b_3	12b_3	12b_3	12b_3	redc_3
12b_4	12b_4	12b_4	12b_4	12b_4	redc_4
12b_5	12b_5	12b_5	12b_5	12b_5	redc_5
12c	12c	12c	12c	12c	add_hrs
12d_1	12d_1	12d_1	12d_1	12d_1	add_1
12d_2	12d_2	12d_2	12d_2	12d_2	add_2
12d_3	12d_3	12d_3	12d_3	12d_3	add_3
12d_4	12d_4	12d_4	12d_4	12d_4	add_4
12d_5	12d_5	12d_5	12d_5	12d_5	add_5
12d_6	12d_6	12d_6	12d_6	12d_6	add_6
12d_7	12d_7	12d_7	12d_7	12d_7	add_7
12d_8	12d_8	12d_8	12d_8	12d_8	add_8
12d_9	12d_9	12d_9	12d_9	12d_9	add_9
13	derived	derived	derived	derived	wrk_ftim
-5	13a_i	13a_i	13a_i	13a_i	mon2fri
-5	13a_ii	13a_ii	13a_ii	13a_ii	min6hrs
-5	13a_iii	13a_iii	13a_iii	13a_iii	bet6to6
13g	13g	13b	13b	13b	redc_wk
13h	13h	13c	13c	13c	redc_arr
13i	13i	13d	13d	13d	cmprs_wk
13a	13b	13e	13e	13e	wrk_sch
13c	13c	13f	13f	13f	sam_hrs
13d	13d	13g	13g	13g	sam_days

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
13e	13e	13h	13h	13h	rot_shft
13f	13f	13i	13i	13i	shifts
13j	13j	13j	13j	13j	days_wk
13k	13k	13k	13k	13k	sat_sun
14	14	14	14	14	flex_hrs
15	15	15	15	15	term_emp
15a	15a	15a	15a	15a	term_end
16	16	16	16	16	duty_loc
17	17	17	17	17	duty_hom
17a	17a	17a	17a	17a	sch_hom
17b	17b	17b	17b	17b	hrs_hom
17c	17c	17c	17c	17c	main_hom
17d	17d	17d	17d	17d	equipaid
17e_1	17e_1	17e_1	17e_1	17e_1	equip_1
17e_2	17e_2	17e_2	17e_2	17e_2	equip_2
17e_3	17e_3	17e_3	17e_3	17e_3	equip_3
17e_4	17e_4	17e_4	17e_4	17e_4	equip_4
17e_5	17e_5	17e_5	17e_5	17e_5	equip_5
17e_7	17e_7	17e_6	17e_6	17e_6	equip_6
18a	18a	18a	18a	18a	pd_vac
18b	18b	18b	18b	18b	pd_skc
-5	18c_i	18c_i	18c_i	18c_i	tkn_edc
-5	18cii	18c_ii	18c_ii	18c_ii	pd_edc
-5	18c_iii	18c_iii	18c_iii	18c_iii	supp_edc
18d	18d	18d	18d	18d	pd_oth
18e	18e	18e	18e	18e	upd_leav
18f	18f	18f	18f	18f	upd_days
-5	18g	18g	18g	18g	vac_alow
19	19	19	19	19	off_wrk
-5	19a	19a	19a	19a	off_lay
19a	19a_i	19a_i	19a_i	19a_i	days_lay
-5	19b	19b	19b	19b	off_str
19b	19b_i	19b_i	19b_i	19b_i	days_str
-5	19c	19c	19c	19c	off_lck
19c	19c_i	19c_i	19c_i	19c_i	days_lck
20	20	20	20	20	prmtd
20a	20a	20a	20a	20a	no_prmtd
20b	20b	20b	20b	20b	prmtdate
20c_1	20c_1	20c_1	20c_1	20c_1	prmtd_1
20c_2	20c_2	20c_2	20c_2	20c_2	prmtd_2
20c_3	20c_3	20c_3	20c_3	20c_3	prmtd_3
20c_4	20c_4	20c_4	20c_4	20c_4	prmtd_4
20c_5	20c_5	20c_5	20c_5	20c_5	prmtd_5
20c_6	20c_6	20c_6	20c_6	20c_6	prmtd_6
21	21	21	21	21	perf_apr
21a	21a	21a	21a	21a	impc_ben
22	22	22	22	22	use_cpu
22a	22a	22a	22a	22a	tim_cpu

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
22b	22b	22b	22b	22b	init_cpu
22c_1	22c_1	22c_1	22c_1	22c_1	tyapp_1
22c_2	22c_2	22c_2	22c_2	22c_2	tyapp_2
22c_3	22c_3	22c_3	22c_3	22c_3	tyapp_3
22c_4	22c_4	22c_4	22c_4	22c_4	tyapp_4
22c_5	22c_5	22c_5	22c_5	22c_5	tyapp_5
22c_6	22c_6	22c_6	22c_6	22c_6	tyapp_6
22c_7	22c_7	22c_7	22c_7	22c_7	tyapp_7
22c_8	22c_8	22c_8	22c_8	22c_8	tyapp_8
22c_9	22c_9	22c_9	22c_9	22c_9	tyapp_9
22c_10	22c_10	22c_10	22c_10	22c_10	tyapp_10
22c_11	22c_11	22c_11	22c_11	22c_11	tyapp_11
22c_12	22c_12	22c_12	22c_12	22c_12	tyapp_12
22c_13	22c_13	22c_13	22c_13	22c_13	tyapp_13
22c_14	22c_14	22c_14	22c_14	22c_14	tyapp_14
22d	22d	22d	22d	22d	app1
22e	22e	22e	22e	22e	app1_tim
22f_1	22f_1	22f_1	22f_1	22f_1	ap1lrn_1
22f_2	22f_2	22f_2	22f_2	22f_2	ap1lrn_2
22f_3	22f_3	22f_3	22f_3	22f_3	ap1lrn_3
22f_4	22f_4	22f_4	22f_4	22f_4	ap1lrn_4
22f_5	22f_5	22f_5	22f_5	22f_5	ap1lrn_5
22f_6	22f_6	22f_6	22f_6	22f_6	ap1lrn_6
22g	22g	22g	22g	22g	ap1_most
22h	22h	22h	22h	22h	ap1_more
22i	22i	22i	22i	22i	app2
22j	22j	22j	22j	22j	app2_tim
22k	22k	22k	22k	22k	app3
22l	22l	22l	22l	22l	app3_tim
22m	22m	22m	22m	22m	no_cpu
23	23	23	23	23	use_tech
23a_i	23a_i	23a_i	23a_i	23a_i	tim_tech
23b	23b	23b	23b	23b	lrn_tech
23c	23c	23c	23c	23c	upg_tech
23d	23d	23d	23d	23d	trn_tech
23e	23e	23e	23e	23e	day_tech
23f	23f	23f	23f	23f	use_dev
23g_i	23g_i	23g_i	23g_i	23g_i	tim_dev1
23g_ii	23g_ii	23g_ii	23g_ii	23g_ii	tim_dev2
23g_iii	23g_iii	23g_iii	23g_iii	23g_iii	tim_dev3
23h	23h	23h	23h	23h	lrn_dev
23i	23i	23i	23i	23i	upg_dev
23j	23j	23j	23j	23j	trn_dev
23k	23k	23k	23k	23k	day_dev
24	24	24	24	24	tech_com
25	25	25	25	25	classtr
25a	25a	25a	25a	25a	courses
25bi	25bi	25bi	25bi	25bi	sub_crs1

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
25bii	25bii	25bii	25bii	25bii	len_crs1
25biii	25biii	25biii	25biii	25biii	loc_crs1
25biv	25biv	25biv	25biv	25biv	tim_crs1
25bv_1	25bv_1	25bv_1	25bv_1	25bv_1	pvcrs1_1
25bv_2	25bv_2	25bv_2	25bv_2	25bv_2	pvcrs1_2
25bv_3	25bv_3	25bv_3	25bv_3	25bv_3	pvcrs1_3
25bv_4	25bv_4	25bv_4	25bv_4	25bv_4	pvcrs1_4
25bv_5	25bv_5	25bv_5	25bv_5	25bv_5	pvcrs1_5
25bv_6	25bv_6	25bv_6	25bv_6	25bv_6	pvcrs1_6
-5	-5	-5	25b) (vi)	25b) (vi)	use_crs1
25ci	25ci	25ci_1	25ci	25ci	sub_crs2
25cii	25cii	25cii	25cii	25cii	len_crs2
25ciii	25ciii	25ciii	25ciii	25ciii	loc_crs2
25civ	25civ	25civ	25civ	25civ	tim_crs2
25cv_1	25cv_1	25cv_1	25cv_1	25cv_1	pvcrs2_1
25cv_2	25cv_2	25cv_2	25cv_2	25cv_2	pvcrs2_2
25cv_3	25cv_3	25cv_3	25cv_3	25cv_3	pvcrs2_3
25cv_4	25cv_4	25cv_4	25cv_4	25cv_4	pvcrs2_4
25cv_5	25cv_5	25cv_5	25cv_5	25cv_5	pvcrs2_5
25cv_6	25cv_6	25cv_6	25cv_6	25cv_6	pvcrs2_6
-5	-5	-5	25c) (vi)	25c) (vi)	use_crs2
25d	25d	25d	25d	25d	jobtr
25di_1	25di_1	25di_1	25di_1	25di_1	sub_1
25di_2	25di_2	25di_2	25di_2	25di_2	sub_2
25di_3	25di_3	25di_3	25di_3	25di_3	sub_3
25di_4	25di_4	25di_4	25di_4	25di_4	sub_4
25di_5	25di_5	25di_5	25di_5	25di_5	sub_5
25di_6	25di_6	25di_6	25di_6	25di_6	sub_6
25di_7	25di_7	25di_7	25di_7	25di_7	sub_7
25di_8	25di_8	25di_8	25di_8	25di_8	sub_8
25di_9	25di_9	25di_9	25di_9	25di_9	sub_9
25di_10	25di_10	25di_10	25di_10	25di_10	sub_10
25di_11	25di_11	25di_11	25di_11	25di_11	sub_11
25di_12	25di_12	25di_12	25di_12	25di_12	sub_12
25di_13	25di_13	25di_13	25di_13	25di_13	sub_13
25dii	25dii	25dii	25dii	25dii	jobtrtim
25div1	25diii1	25diii1	25diii1	25diii1	jobtrp_1
25div2	25diii2	25diii2	25diii2	25diii2	jobtrp_2
25div3	25diii3	25diii3	25diii3	25diii3	jobtrp_3
25div4	25diii4	25diii4	25diii4	25diii4	jobtrp_4
25div5	25diii5	25diii5	25diii5	25diii5	jobtrp_5
25div6	25diii6	25diii6	25diii6	25diii6	jobtrp_6
25div7	25diii7	25diii7	25diii7	25diii7	jobtrp_7
-5	-5	-5	25d) (iv)	25d) (iv)	use_jobt
26	26	26	26	26	train_no
26a	26a_1	26a	26a	26a	rsncrs
26b	26b	26b	26b	26b	emp_hlp
26c	26c	26c	26c	26c	no_crsem

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
26d_1	26d_1	26d_1	26d_1	26d_1	goalmc_1
26d_2	26d_2	26d_2	26d_2	26d_2	goalmc_2
26d_3	26d_3	26d_3	26d_3	26d_3	goalmc_3
26d_4	26d_4	26d_4	26d_4	26d_4	goalmc_4
26d_5	26d_5	26d_5	26d_5	26d_5	goalmc_5
26e_1	26e_1	26e_1	26e_1	26e_1	paidmc_1
26e_2	26e_2	26e_2	26e_2	26e_2	paidmc_2
26e_3	26e_3	26e_3	26e_3	26e_3	paidmc_3
27	27	27	27	27	npaidcrs
27a	27a	27a	27a	27a	no_npcrs
27bi	27bi	27bi	27bi	27bi	su_1npd
27bii	27bii	27bii	27bii	27bii	day_1npd
27ci	27ci	27ci	27ci	27ci	su_2npd
27cii	27cii	27cii	27cii	27cii	day_2npd
28	28	28	28	28	skill
29	29	29	29	29	avtrain
30	30	30	30	30	amtrain
-5	-5	-5	30a) A	30a) A	read_let
-5	-5	-5	30a) B	30a) B	read_rep
-5	-5	-5	30a) C	30a) C	read_man
-5	-5	-5	30a) D	30a) D	read_dia
-5	-5	-5	30a) E	30a) E	read_dir
-5	-5	-5	30a) F	30a) F	read_bil
-5	-5	-5	30b)	30b)	read_imp
-5	-5	-5	30c) A	30c) A	writ_let
-5	-5	-5	30c) B	30c) B	writ_rep
-5	-5	-5	30c) C	30c) C	writ_man
-5	-5	-5	30c) D	30c) D	writ_dia
-5	-5	-5	30c) E	30c) E	writ_dir
-5	-5	-5	30c) F	30c) F	writ_bil
-5	-5	-5	30d) A	30d) A	mat_msur
-5	-5	-5	30d) B	30d) B	mat_calc
-5	-5	-5	30d) C	30d) C	mat_coun
-5	-5	-5	30d) D	30d) D	mat_mngt
-5	-5	-5	30d) E	30d) E	mat_dir
-5	-5	-5	30d) F	30d) F	mat_stat
31a	31a	31a	31a	31a	feed
31b	31b	31b	31b	31b	sugg
31c	31c	31c	31c	31c	jrot
31d	31d	31d	31d	31d	wrkperf
31e	31e	31e	31e	31e	tasktea
31f	31f	31f	31f	31f	circle
31g	31g	31g	31g	31g	seldir
32	32	32	32	32	suppfam
32a	32a	32a	32a	32a	childca
32ai	32ai	32ai	32ai	32ai	use_chld
32b	32b	32b	32b	32b	assis
32bi	32bi	32bi	32bi	32bi	use_ass

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
32c	32c	32c	32c	32c	elder
32ci	32ci	32ci	32ci	32ci	use_eldr
32d	32d	32d	32d	32d	fitness
32di	32di	32di	32di	32di	use_fit
32e	32e	32e	32e	32e	othsup
32eii	32eii	32eii	32eii	32eii	use_oth
33	33	33	33	33	cba
34	34	34	34	34	griev
34a	34a	34a	34a	34a	fil_grie
34b_1	34b_1	34b_1	34b_1	34b_1	mecgri_1
34b_2	34b_2	34b_2	34b_2	34b_2	mecgri_2
34b_3	34b_3	34b_3	34b_3	34b_3	mecgri_3
34b_4	34b_4	34b_4	34b_4	34b_4	mecgri_4
34b_5	34b_5	34b_5	34b_5	34b_5	mecgri_5
34c	34c	34c	34c	34c	imp_grie
35_1	35_1	35_1	35_1	35_1	emp_sal
35_2	35_2	35_2	35_2	35_2	sal_freq
-5	35 Wage (no extra earnings)	35 Wage (no extra earnings)	35 Wage (no extra earnings)	35 Wage (no extra earnings)	hr_wageb
35 Wage	35 Wage	35 Wage	35 Wage	35 Wage	hr_waget
36	36	36	36	36	xtra
36a	36a	36a	36a	36a	rep_xtra
-5	36b	36b	36b	36b	rc_ovpay
-5	36b_i	36b_i	36b_i	36b_i	over_pay
-5	-5	-5	-5	q36b_ii	inc_over
-5	36c	36c	36c	36c	rc_shft
-5	36c_i	36c_i	36c_i	36c_i	shft_pay
-5	-5	-5	-5	q36c_ii	inc_shft
-5	36d	36d	36d	36d	rc_bonus
-5	36d_i	36d_i	36d_i	36d_i	bon_pay
-5	-5	-5	-5	q36d_ii	inc_bon
-5	36e_1	36e_1	36e_1	36e_1	rc_oth
-5	36e_i	36e_i	36e_i	36e_i	oth_pay
-5	-5	-5	-5	q36e_ii	inc_oth
37	37	37	37	37	non_wage
37a	37a	37a	37a	37a	pensn
37h_i	37a_i	37a_i	37a_i	37a_i	par_psn
37b	37b	37b	37b	37b	rrsp
37b_i	37b_i	37b_i	37b_i	37b_i	emprrsp
37h_ii	37b_ii	37b_ii	37b_ii	37b_ii	par_rrs
37c	37c	37c	37c	37c	life
37h_iii	37c_i	37c_i	37c_i	37c_i	par_lif
37d	37d	37d	37d	37d	medic
37h_iv	37d_i	37d_i	37d_i	37d_i	par_mdc
37e	37e	37e	37e	37e	dental
37h_v	37e_i	37e_i	37e_i	37e_i	par_dnt
37f	37f	37f	37f	37f	uispl
37g	37g	37g	37g	37g	stock

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
37g_i	37g_i	37g_i	37g_i	37g_i	empstck
38	38	38	38	38	satisjob
39	39	39	39	39	satismon
-5	x40a	x40a	x40a	x40a	xjobsat
-5	x41aa	x41aa	x41aa	x41aa	xwkcon_a
-5	x41ab	x41ab	x41ab	x41ab	xwkcon_b
-5	x41ac	x41ac	x41ac	x41ac	xwkcon_c
-5	x41ad	x41ad	x41ad	x41ad	xwkcon_d
-5	x41ae	x41ae	x41ae	x41ae	xwkcon_e
-5	x41ca	x41ca	x41ca	x41ca	xjobop_a
-5	x41cb	x41cb	x41cb	x41cb	xjobop_b
-5	x41cc	x41cc	x41cc	x41cc	xjobop_c
-5	x41cd	x41cd	x41cd	x41cd	xjobop_d
-5	x41ce	x41ce	x41ce	x41ce	xjobop_e
-5	x41cf	x41cf	x41cf	x41cf	xjobop_f
-5	x41cg	x41cg	x41cg	x41cg	xjobop_g
-5	x41ch	x41ch	x41ch	x41ch	xjobop_h
-5	x41ci	x41ci	x41ci	x41ci	xjobop_i
40	carry over	40	carry over	40	yrs_exp
40a	-4	40a	-4	40a	wrk_oth
40b	-4	40b	-4	40b	no_oth
40c	carry over	40c	-4	40c	unempl2
40d	-4	40d	-4	40d	mth_unem
40e	40e	40e	-4	40e	rsn_lv
40f-g	40f-g	40f-g	40f-g	40f-g	prv_ocp
40h	-4	40h	-4	40h	mth_last
40i	-4	40i	-4	40i	prv_hrs
40j_1	-4	40j_1	-4	40j_1	prv_earn
40j_2	-4	40j_2	-4	40j_2	prv_freq
40k	-4	40k	-4	40k	prv_psn
40l	-4	40l	-4	40l	prv_cpu
40m	-4	40m	-4	40m	prv_trn
41	-4	41	-4	41	prv_act
41a	carry over	41a	-4	41a	wk_look
42	42	42	42	42	oth_paid
42a_1	42a_1	42a_1	42a_1	42a_1	hrs_job1
42a_2	42a_2	42a_2	42a_2	42a_2	hrs_job2
42b_1	42b_1	42b_1	42b_1	42b_1	earn1
42b_2	42b_2	42b_2	42b_2	42b_2	earn2
43	carry over	43	carry over	43	birthdat
44	carry over	44	carry over	44	gender
45a	45a	45a	45a	45a	lang_wrk
45b	45b	45b	45b	45b	lang_hom
46	carry over	46	carry over	46	born_cnd
46a	carry over	46a	carry over	46a	imgr_yr
-5	-5	-5	-5	q46b	cntry_cd
47	-4	47	-4	47	hig_grad
48	carry over	48	carry over	48	grad_hs

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
49	Derived	49	Derived	49	oth_educ
-5	49	-4	49	-4	oth_12m
50_1	carry over	50_1	carry over	50_1	edc_1
50_2	carry over	50_2	carry over	50_2	edc_2
50_3	carry over	50_3	carry over	50_3	edc_3
50_4	carry over	50_4	carry over	50_4	edc_4
50_5	carry over	50_5	carry over	50_5	edc_5
50_6	carry over	50_6	carry over	50_6	edc_6
50_7	carry over	50_7	carry over	50_7	edc_7
50_8	carry over	50_8	carry over	50_8	edc_8
50_9	carry over	50_9	carry over	50_9	edc_9
50_10	carry over	50_10	carry over	50_10	edc_10
50_11	carry over	50_11	carry over	50_11	edc_11
50_12	carry over	50_12	carry over	50_12	edc_12
50_13	carry over	50_13	carry over	50_13	edc_13
-5	50_1		50_1		edc12_1
-5	50_2		50_2		edc12_2
-5	50_3		50_3		edc12_3
-5	50_4		50_4		edc12_4
-5	50_5		50_5		edc12_5
-5	50_6		50_6		edc12_6
-5	50_7		50_7		edc12_7
-5	50_8		50_8		edc12_8
-5	50_9		50_9		edc12_9
-5	50_10		50_10		edc12_10
-5	50_11		50_11		edc12_11
-5	50_12		50_12		edc12_12
-5	50_13		50_13		edc12_13
-5	-5	-5	50_14		edc12_14
-5	-5	50a	50a	50a	mfs
51	51	51	51	51	marital
52	52	52	52	52	comn_law
53	53	53	53	53	dpnd_kid
53a_1	53a_1	53a_1	53a_1	53a_1	kid_1
53a_2	53a_2	53a_2	53a_2	53a_2	kid_2
53a_3	53a_3	53a_3	53a_3	53a_3	kid_3
53a_4	53a_4	53a_4	53a_4	53a_4	kid_4
53a_5	53a_5	53a_5	53a_5	53a_5	kid_5
53a_6	53a_6	53a_6	53a_6	53a_6	kid_6
53a_7	53a_7	53a_7	53a_7	53a_7	kid_7
53a_8	53a_8	53a_8	53a_8	53a_8	kid_8
53b	53b	53b	53b	53b	kid_care
54a	54a	54a	54a	54a	fam_incm
54b	54b	54b	54b	54b	oth_incm
55_1	carry over	55_1	carry over	55_1	eth_1
55_2	carry over	55_2	carry over	55_2	eth_2
55_3	carry over	55_3	carry over	55_3	eth_3
55_4	carry over	55_4	carry over	55_4	eth_4

1999	2000	2001	2002	2003	Variable
Note: -3 Not applicable; -4 Not asked; - 5 Variable did not exist; -6 Removed permanently					
55_5	carry over	55_5	carry over	55_5	eth_5
55_6	carry over	55_6	carry over	55_6	eth_6
55_7	carry over	55_7	carry over	55_7	eth_7
55_8	carry over	55_8	carry over	55_8	eth_8
55_9	carry over	55_9	carry over	55_9	eth_9
55_10	carry over	55_10	carry over	55_10	eth_10
55_11	carry over	55_11	carry over	55_11	eth_11
55_12	carry over	55_12	carry over	55_12	eth_12
55_13	carry over	55_13	carry over	55_13	eth_13
55_14	carry over	55_14	carry over	55_14	eth_14
55_15	carry over	55_15	carry over	55_15	eth_15
55_16	carry over	55_16	carry over	55_16	eth_16
55_17	carry over	55_17	carry over	55_17	eth_17
55_18	carry over	55_18	carry over	55_18	eth_18
55_19	carry over	55_19	carry over	55_19	eth_19
56a	56a	56a	56a	56a	mnr_recr
56b	56b	56b	56b	56b	prt_mpgm
-5	-5	57	57	57	diff_any
-5	-5	57a	57a	57a	redc_hme
-5	-5	57b	57b	57b	redc_wrk
-5	-5	57c	57c	57c	redc_oth
59	59	58	58	58	disablty
59a	59a	58a	58a	58a	prt_dis
59b	59b	58b	58b	58b	aids_dis
59c	59c	58c	58c	58c	emp_dis
37h_vi	37fi	-6	-6	-6	par_ui
57a	57a	-6	-6	-6	hme_act
57b	57b	-6	-6	-6	wrk_act
37h	-6	-6	-6	-6	benpart
25d)(iii)	-6	-6	-6	-6	jobtrhel
57	-6	-6	-6	-6	lim_act
58	-6	-6	-6	-6	lng_dis
57c	-6	-6	-6	-6	lsr_act
13b	-6	-6	-6	-6	out_6t6
18	-6	-6	-6	-6	pd_leav
36c 1	-6	-6	-6	-6	typay_1
36c 2	-6	-6	-6	-6	typay_2
36c 3	-6	-6	-6	-6	typay_3
36c 4	-6	-6	-6	-6	typay_4
36c 5	-6	-6	-6	-6	typay_5
36c 6	-6	-6	-6	-6	typay_6
36c 7	-6	-6	-6	-6	typay_7
36c 8	-6	-6	-6	-6	typay_8
36c 9	-6	-6	-6	-6	typay_9
36b	-6	-6	-6	-6	xtraearn