

Improvements in 2000 to the LFS

Introduction

Several important changes to Labour Force Survey (LFS) estimates are now being introduced. These changes affect all LFS data back to 1976.

The primary change involves adjusting all estimates to reflect population counts based on the 1996 Census. Until now, a 1991 Census base has been used. The LFS has a long established history of benchmarking estimates to the most recent Census data.

A major modification to the estimation methodology used by the LFS is now being implemented. This new method, composite estimation, reduces the sampling error associated with a sample based survey. The result is more efficient estimates of month to month change, while maintaining or modestly improving the quality of monthly level estimates particularly for industry and class of worker series at the province level.

Several minor modifications to some sub-provincial regions are also being introduced. These involve Economic Regions in the province of Alberta, and the CMAs of Winnipeg and St. Catharines-Niagara. These boundary changes have been incorporated back to January 1987.

In addition, new adjustments have been introduced that use 1996 Census based counts of the number of households by size and the number of Economic Families by size. The reason for this change is to harmonize LFS estimates to those produced by other household surveys.

Population “re-basing”

The Labour Force Survey uses estimates of the target population, which are derived independently from the survey, as benchmarks for producing survey estimates. These population estimates start with a Census base and are then updated using administrative data, to reflect the current population of Canada. Using these population counts reduces the sampling error and coverage bias of survey estimates. Proper population numbers are crucial in determining estimates from a sample survey like the LFS. In order to translate the results of the survey into representative data for the population as a whole, each individual in the sample is assigned a weight indicating the number of persons in the population that individual represents.

The Census base used for obtaining these estimates is updated several years after each new Census is conducted. Beginning with the release of the January 2000 survey, population estimates used by the Labour Force Survey will change from a 1991 Census base to a 1996 Census base.

These updated population counts will lead to better estimates than can be expected when using those with a 1991 Census base. As the population estimates move away from their original Census base in time, inadequacies in the administrative data used to update the numbers become more pronounced. For example, in December 1999, the 1991 based estimate of the target population is over 1.3% higher than the 1996 based estimate. This means the estimates of employment, unemployment and people not in the labour force were over estimated for that survey month. More detailed analysis of the impact of the re-basing on survey estimates is provided later in this section.

When the LFS re-based estimates to the 1991 census base (in 1995), the population counts included, for the first time, an adjustment for net Census undercoverage. Undercoverage refers to persons that, unintentionally, are not enumerated by the Census. An implication of this change was that the historical revision of estimates had to extend back beyond the 1986 Census date, all the way back to January 1976, the earliest point in the current LFS series. For this latest revision, LFS data series have been revised all the way back to 1976.

Household and economic family size adjustments

Many household surveys publish estimates for characteristics of families and/or households. For example, family income is an important study variable. Using Census based counts relating to family size reduces the sampling error of such estimates. Also, when looking at data over time, the series are more stable. If the controls were not used, then the sampling error associated with an estimate of family income would include an error component due to estimating family size itself. Including the control reduces this component of the sampling error.

The LFS has chosen to introduce these controls as it provides an element of harmonization between household surveys. By using the same auxiliary information at the estimation stage, it is easier to compare data from different survey sources.

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As part of the revision, estimates have been produced including household size controls beginning in 1976 and family size controls beginning in 1987. These dates were selected based on availability of the population counts.

Composite estimation

Composite estimation is a term that refers to any point estimator that is constructed by combining two or more other estimators. For surveys with a design like the LFS, it traditionally is used to refer to a weighted average of the present estimator and a “change based” estimator. The change based estimate updates last month's estimate with an estimate of change derived from the current and previous month's sample. A method of composite estimation has been developed that yields a single set of survey weights making the method operationally feasible for the LFS.

While the following paragraphs provide an overview of the method, a more thorough and technically precise description is available in the document *Composite Estimation for the Canadian Labour Force Survey*. To obtain this document, contact Marc Lévesque at (613) 951-2793.

The method of composite estimation uses the rotation pattern of the LFS to improve estimates. Households selected for the LFS remain in the sample for six consecutive months. In any given month, about one sixth of households are interviewed for the first time, one sixth for the second time, and so on. Each group of households is referred to as a rotation group or a panel. In any two consecutive months, five sixths of the households form a common sample. Part of the apparent change in month to month estimates may arise because an old rotation group is replaced by one that has quite different characteristics. This contributes noise (or more precisely sampling error) to estimates of change and makes short-term trends difficult to identify.

For a set of predetermined variables, composite estimation exploits the rotation design by putting more emphasis on the change that comes from the common sample. By improving the change estimate while maintaining the quality of the level estimate, data reliability is enhanced.

An important step in composite estimation is to select the predetermined, or key composite variables. As these are the variables which will exhibit the largest reduction in sampling error, and there is a limit to how many can be used, much thought was given at this stage. In terms of a strategy, two rationales were employed. The first was to

select a set of variables that are deemed highly important and to which many other published series are summed. To meet this criteria, at the province level, total employed, unemployed, and not in the labour force for adult men and women and for young men and women (and implicitly the province level totals), were chosen. The second rationale was to choose variables that were of high interest but which were more prone to sampling error. This led to the selection of province level industry groupings and class of worker. All remaining data series are referred to as non-composite data series.

The main benefit for the key composite variables is a reduction in sampling error. There are modest gains for level estimates and substantial gains for estimates of change. This reduced error improves LFS time series because seasonal patterns are more easily detected. Also, the reduced volatility in data series means that series that are published on a three month moving average basis (province level industry series), can now be published on a monthly basis. Little or no impact on non-composite data series has been observed.

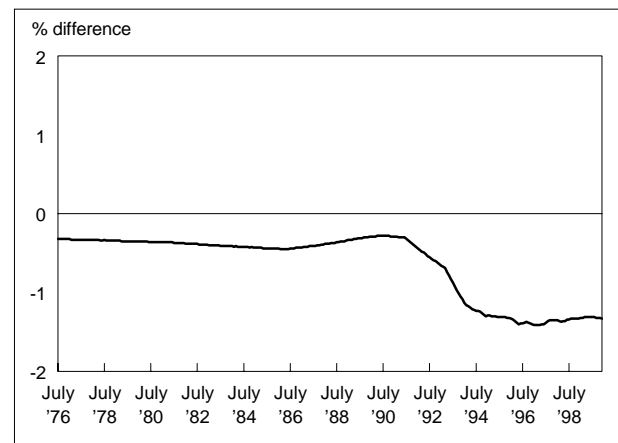
Impact on estimates

Changes in population counts

Estimates of the population have been revised from January 1976 to December 1999. In general, estimates have been revised downward and the magnitude of the downward revision increases over time.

Chart 1

Percent difference between 1991 and 1996 Census based population estimates.

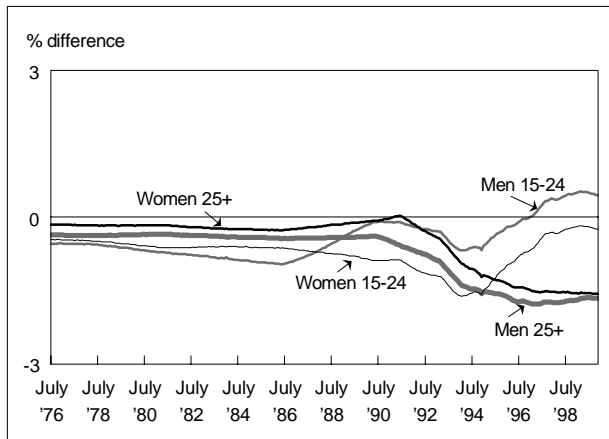


Source: Labour Force Survey

At the Canada level, for the population 15 years and older, the differences are small between January 1976 and June 1991. Over that period, the new population count is 0.35% less than the old population count. Beginning in July 1991, and continuing until June 1996, the difference becomes more pronounced and the gap widens. After June 1996, the revised population count is 1.35% less than the old population.

As a result of the revisions to the population estimates, the levels of employment, unemployment, and persons not in the labour force have decreased. When evaluating the data, however, it is important to keep in mind that different age and gender groups have been affected differently by the population revision. This is illustrated in Chart 2 below. Notably, youth are affected by the revision differently than adults. In fact, for recent years the new population count is higher for young men. Because these groups also have different labour market characteristics (for example, a higher proportion of men are employed than women) the relationship between the new and the old estimates can be complex.

Chart 2
Percent difference between 1991 and 1996 Census based population estimates by sex and age.



Source: Labour Force Survey

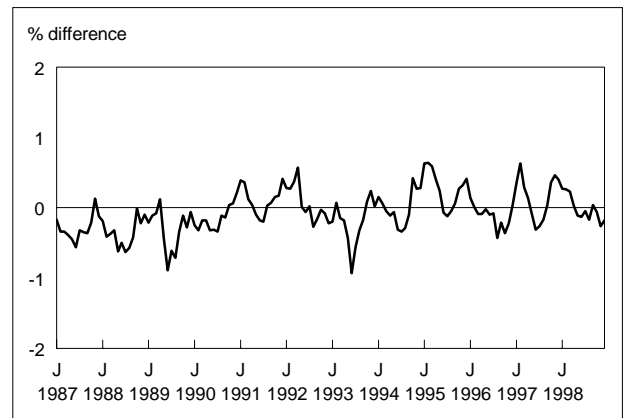
Changes from composite estimation

As described earlier, the LFS uses a sample design with six rotation groups. In theory, each rotation group is an independent sample, and can be used to produce estimates in their own right. However, it has been observed that the rotation group consisting of households selected for their first survey occasion (called the birth rotation) tends to have higher non-response than the other rotation groups. The patterns of non-response are also different, with more non-contacts in the birth rotation. The result of this is that the birth rotation can have different rates of employment than the other rotation groups. Because composite estimation weights rotation groups differently, it is anticipated that there will be some consistent differences in employment, brought about by the composite estimation.

In order to evaluate the impact of composite estimation, it is necessary to filter out the impact of the population re-basing. The LFS produced a set of estimates using the new population counts, but with the old method of estimation.

Chart 3 below shows the percent difference in unadjusted employment using the composite estimates and the old method (general regression estimates-GREG) for the period 1987 to 1999 (both using 1996 population counts). Note that at the Canada level, there appears to be no consistent difference between the two series.

Chart 3
Percent difference in unadjusted Canada level of employment between composite and GREG estimators (both using 1996 Census counts).



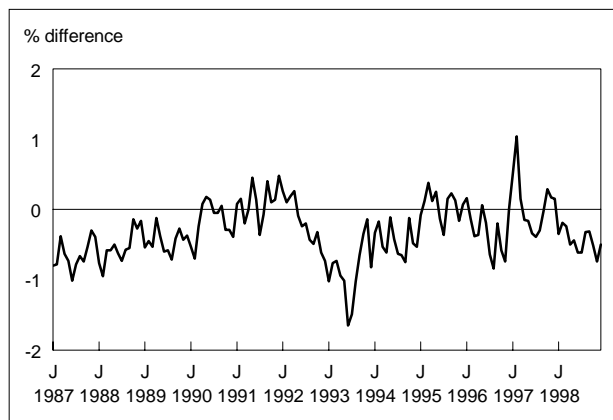
Source: Labour Force Survey

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At the province level, some differences do exist. For example, Chart 4 displays the same information for the province of Ontario. Here the difference is more pronounced, particularly in earlier years. This is not unexpected because rotation group differences tend to be somewhat larger at the province level.

Chart 4

Percent difference in unadjusted Ontario level of employment between composite and GREG estimators (both using 1996 Census counts).



Source: Labour Force Survey

The overall impact of the revision on labour market estimates

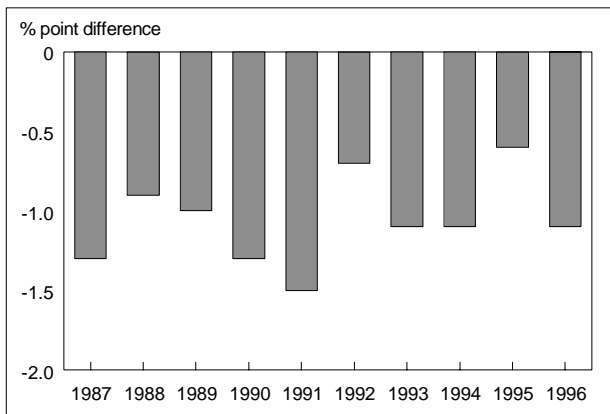
Tables 1 and 2 present differences in annual overall estimates of labour force characteristics at the Canada level. As expected, employment, unemployment, and the number of people not in the labour force are revised slightly downwards when using the revised estimates (mostly due to the new population counts). As shown in Chart 6, for most years, estimates of the employment and unemployment rates are little changed at the national level.

However, by age and sex, there are some consistent differences in employment and unemployment rates over time. For example, the employment rate for 15 to 24 year-olds is consistently higher with composite estimation. Why is this? One must understand that error in the data can arise from non-response to the survey if those not responding have different characteristics than those who answer. Non-response among youths in the first month of the survey is higher than in other months and higher than other groups. Chart 5 below presents the percent difference between the youth employment rate for the birth rotation and for the common sample.

Tables 3 and 4 present differences in annual average estimates for each province. With the exception of British Columbia, the new population counts are smaller than the old. In British Columbia, by 1996, the new population counts are consistently higher than the old, pushing up employment and unemployment in that province.

Chart 5

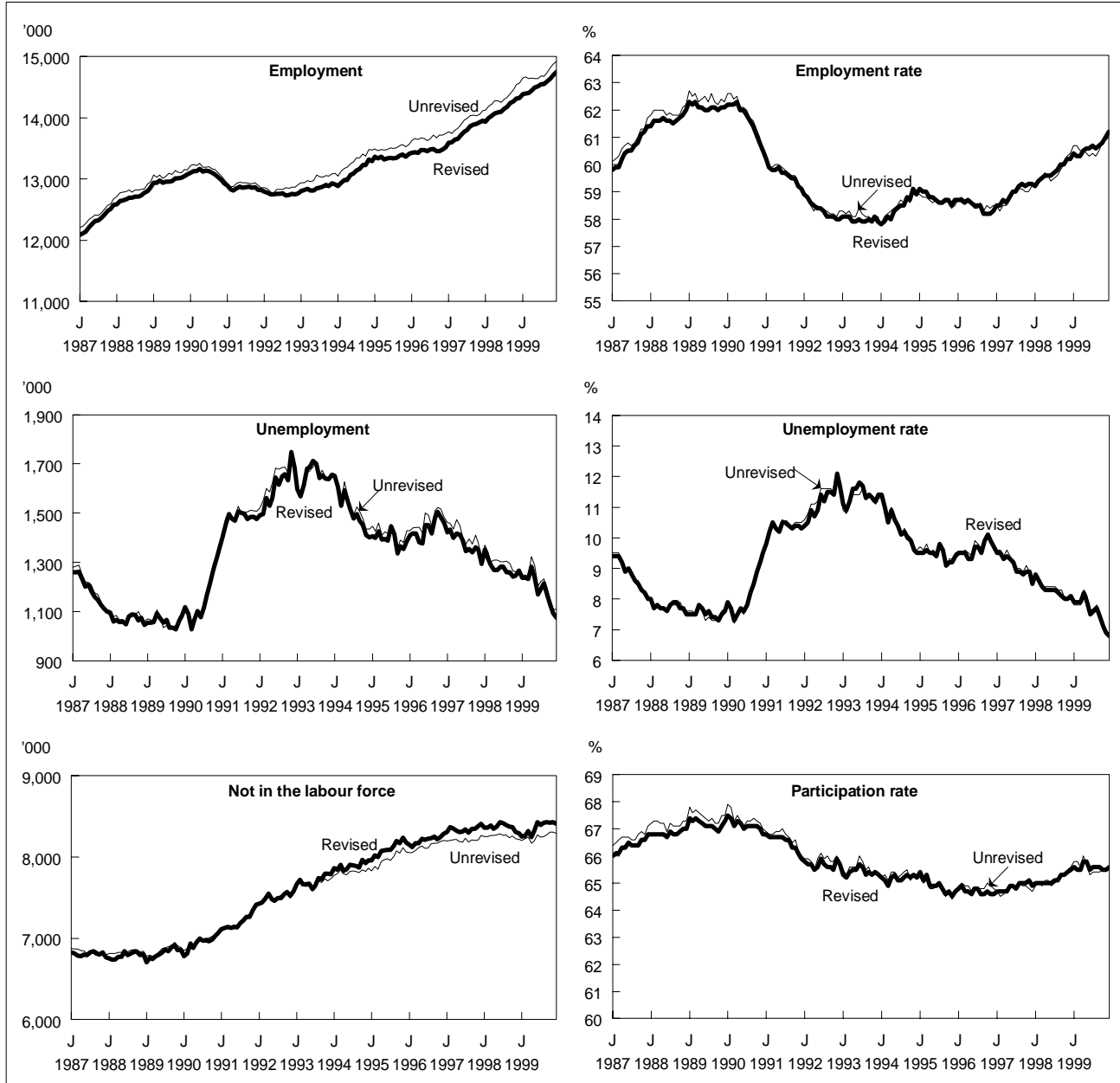
Percentage point difference between birth rotation employment rate and the common sample employment rate for youths, annual averages.



Source: Labour Force Survey, unrevised data

Chart 6

Comparison of revised and unrevised labour force levels and rates, seasonally adjusted from January 1987 to December 1999.

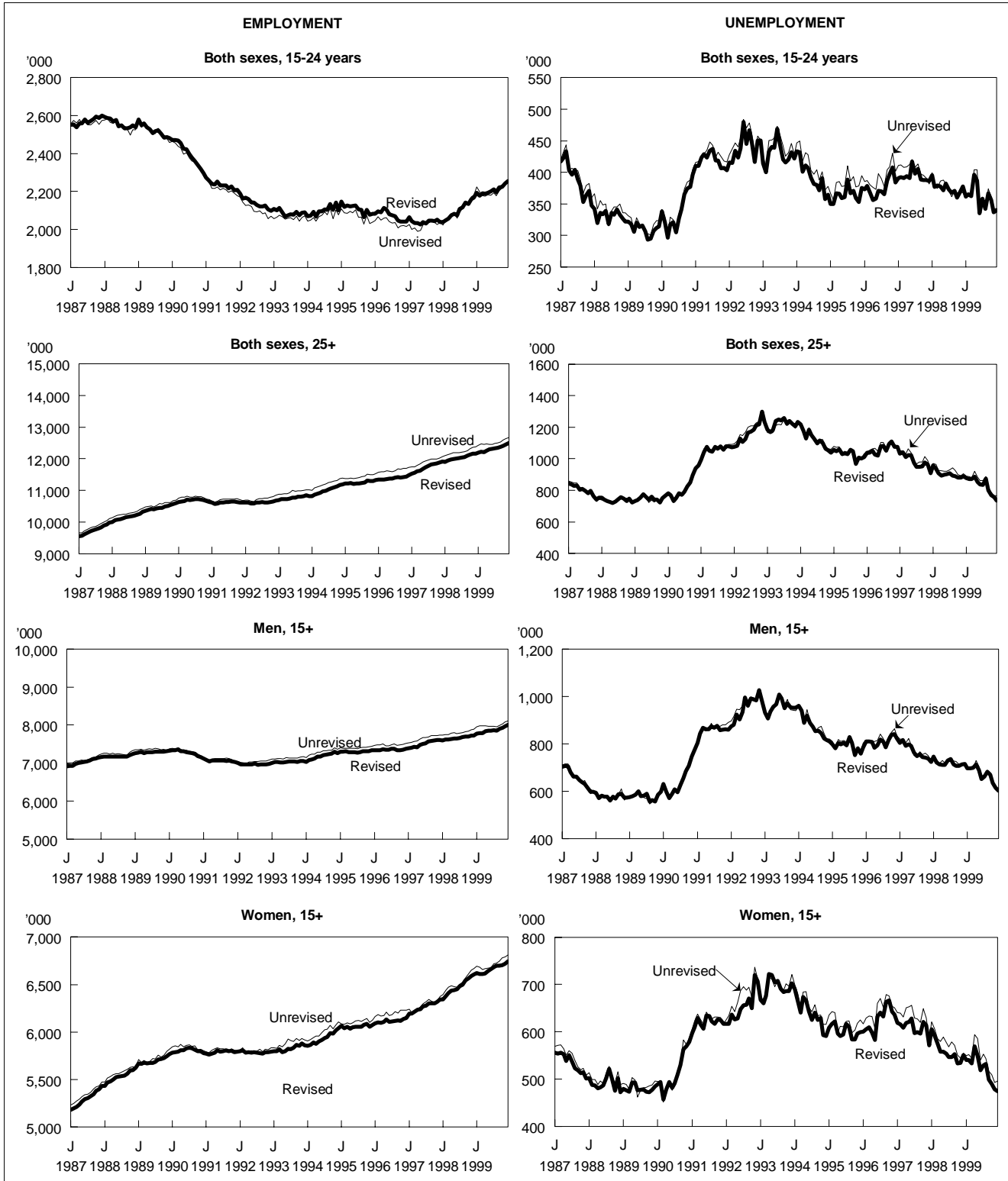


Source: Labour Force Survey

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Chart 7

Comparison of revised and unrevised employment and unemployment levels by age and sex, seasonally adjusted from January 1987 to December 1999.



Source: Labour Force Survey

View of the labour market

When conducting an historical revision of survey estimates, concern centers on whether the view of labour market conditions has been altered. Consider Chart 6. The revised estimates of employment are lower overall due to the lower population estimates. However, turning points indicating the impact of the recession are little changed. The post recession growth in employment is slightly slower for the revised numbers. Between 1992 and 1999, the average level of employment increased by 14.6% based on the unrevised estimates and 13.7% based on the revised estimates. However most of this decline in growth can be accounted for by slower growth in new population estimates. Over the same period the 1991 based population estimates grew at 10.5% while the 1996 based estimates show growth of 9.6%.

Table 5 presents, for the revised and unrevised numbers, the growth between 1989 and 1999 in employment by age, sex, class of worker based on annual averages for those years. The growth for academic attainment uses growth between 1990 and 1999 due to a break in this series between 1989 and 1990. Unemployment is included for age and sex. Table 6 presents the distribution of employment for 1999 across various categories of age, sex, class of worker, and level of education based on the revised and unrevised numbers.

While the overall growth in employment is dampened, the major areas of growth such as self-employed and those with higher levels of education, remain the same. The distribution of employment by age, sex, class of worker and level of education is similar to that prior to the revision. The distribution of unemployed by age and sex is also little changed. The labour market as portrayed by the revised estimates is essentially unchanged.

Industry

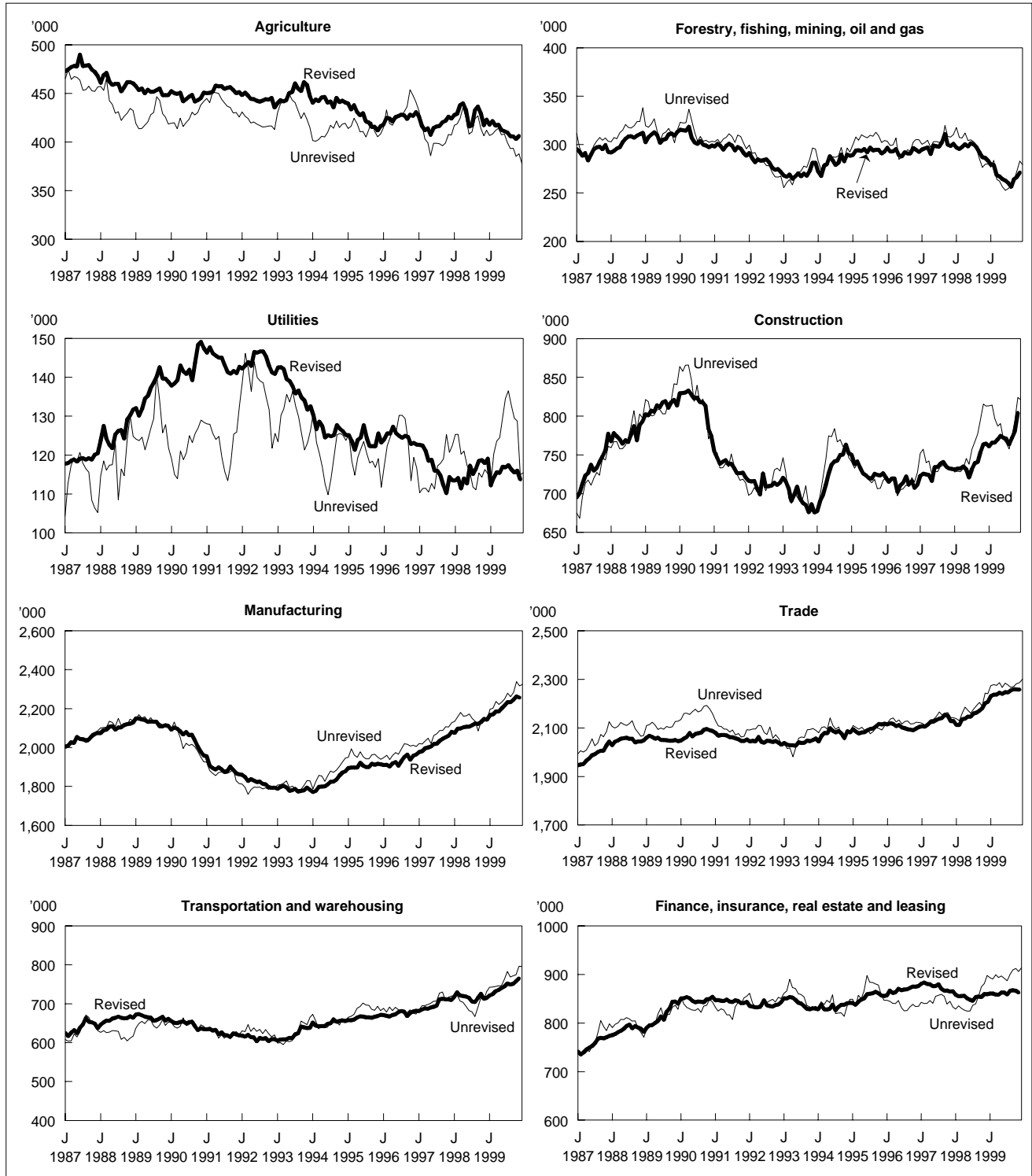
Chart 8 presents graphs giving seasonally adjusted employment by industry series at the Canada level. It is evident that the revised series display less volatility than the old series. While differences in level are due primarily to the different population estimates, the stability in estimates is a property of the new composite estimator. This increased stability in employment by industry series is also evident at the provincial level. The new composite estimator removes many false movements in data series that are associated with rotation group differences.

Three selected provincial level series are included to illustrate the benefits of composite estimation at the province level.

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Chart 8A

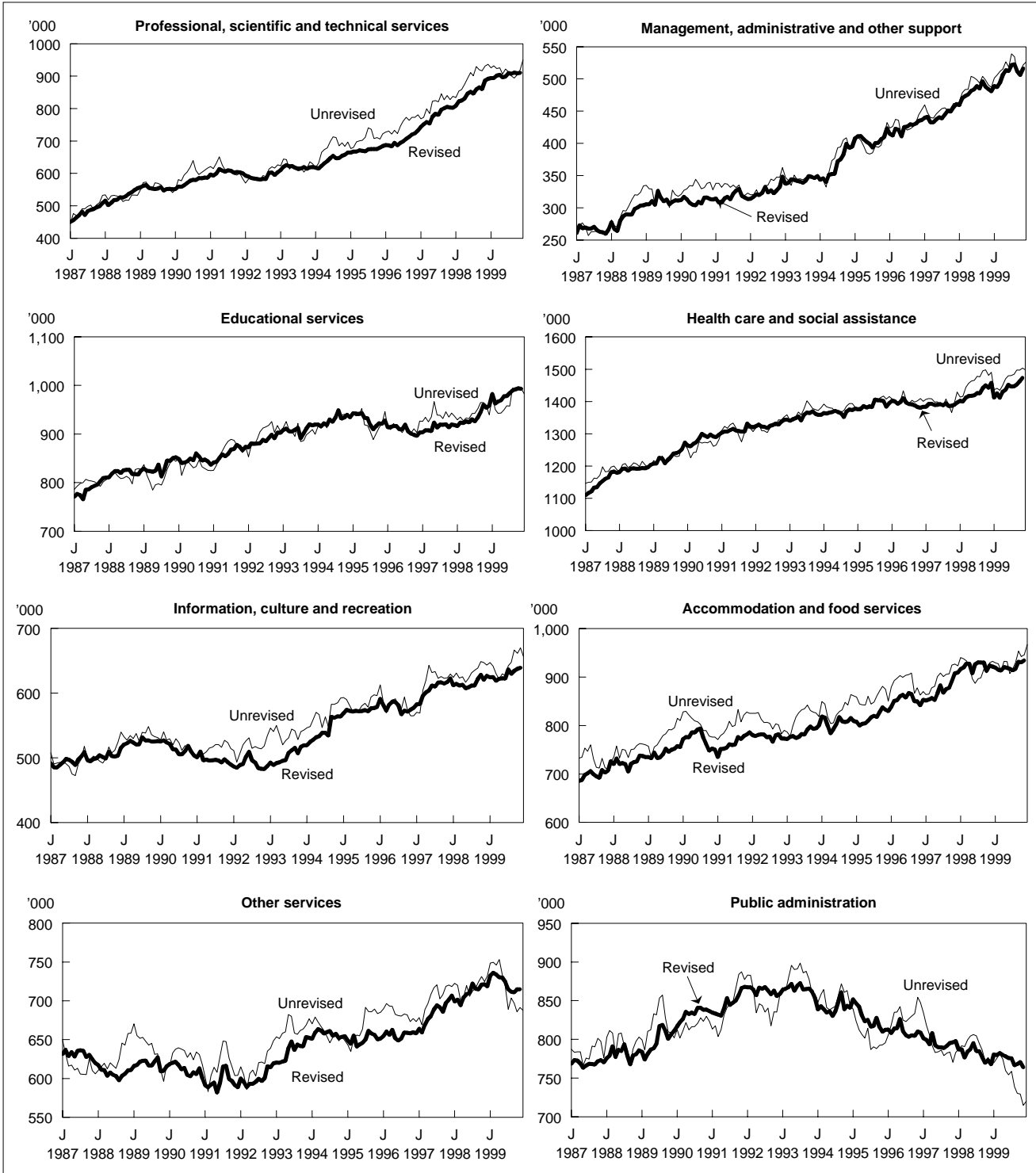
Comparison of revised and unrevised employment levels by industry, seasonally adjusted from January 1987 to December 1999.



Source: Labour Force Survey

Chart 8B

Comparison of revised and unrevised employment levels by industry, seasonally adjusted from January 1987 to December 1999.

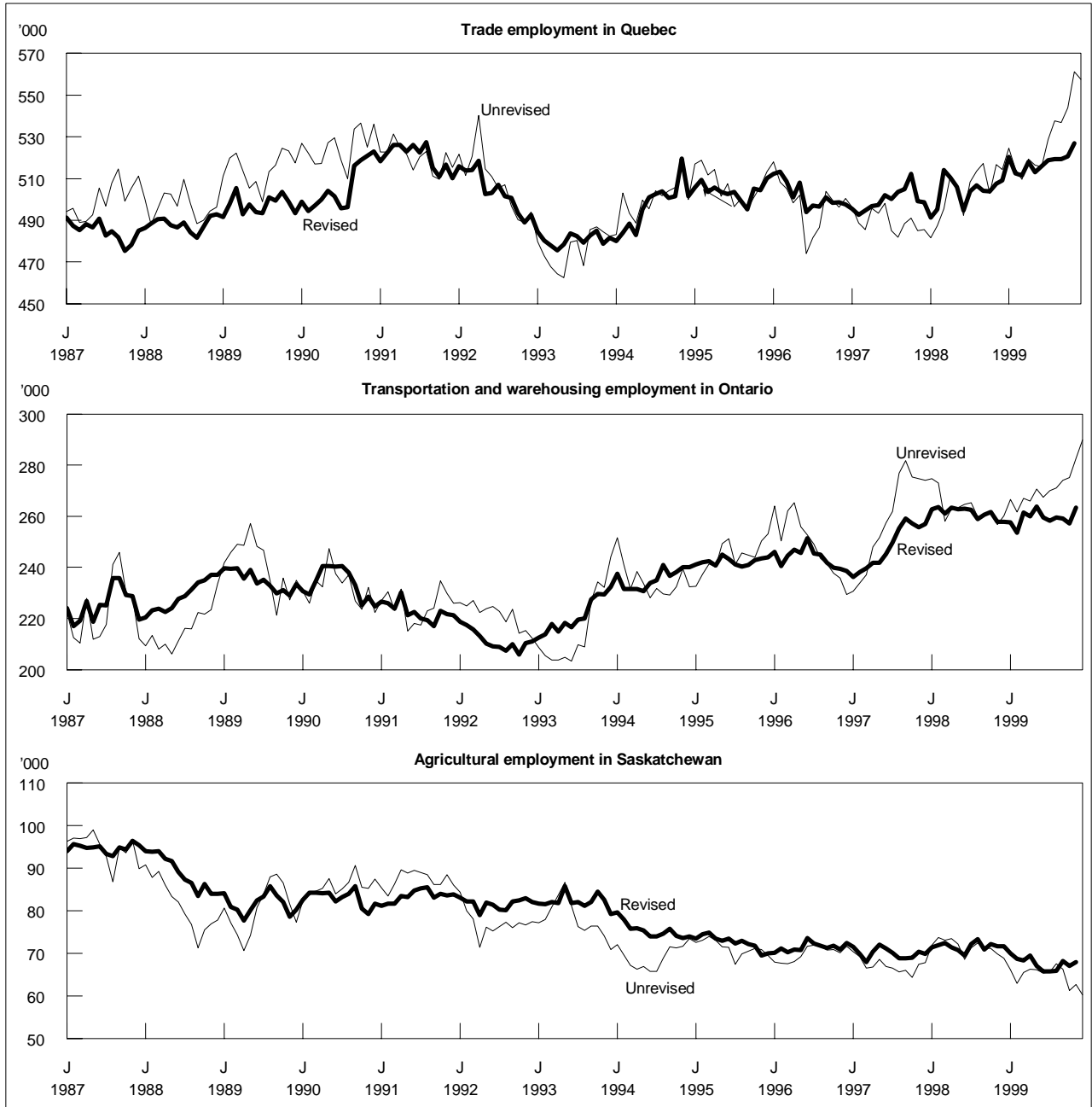


Source: Labour Force Survey

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Chart 9

Comparison of revised and unrevised employment levels for selected industries and provinces, seasonally adjusted from January 1987 to December 1999.



Source: Labour Force Survey

Table 1
Labour force characteristics of revised minus unrevised estimates by age and sex, annual averages for selected years

	Population 15 years and over	Labour force	Employ- ment	Full-time employ- ment	Part-time employ- ment	Unem- plov- ment	Not in the labour force	Unem- plovment rate	Partici- pation rate	Employ- ment rate
	'000						% point difference			
Both sexes, 15+										
1976	-27.7	-15.6	0.1	-10.1	10.1	-15.7	-12.1	-0.2	--	0.1
1981	-69.1	-109.6	-101.2	-91.2	-10.2	-8.4	40.5	--	-0.3	-0.4
1986	-89.3	-120.6	-115.5	-107.2	-8.3	-5.0	31.3	0.0	-0.3	-0.3
1991	-72.1	-77.7	-65.4	-68.7	3.3	-12.2	5.6	-0.1	-0.2	-0.1
1996	-321.1	-245.9	-213.6	-204.2	-9.4	-32.3	-75.4	-0.1	-0.2	-0.1
1999	-319.4	-204.0	-179.6	-175.7	-4.0	-24.4	-115.4	--	--	--
Both sexes, 15 - 24										
1976	-11.5	21.4	29.6	18.7	10.8	-8.2	-32.9	-0.4	0.6	0.8
1981	-32.5	5.4	16.3	5.3	11.1	-10.9	-37.9	-0.4	0.6	0.7
1986	-34.7	-15.2	-6.6	-13.0	6.4	-8.7	-19.4	-0.2	0.2	0.3
1991	-20.1	12.4	20.3	3.6	16.7	-7.8	-32.6	-0.4	0.6	0.8
1996	-18.6	18.3	34.0	10.2	23.8	-15.7	-36.9	-0.8	0.8	1.1
1999	6.1	0.7	5.4	-7.6	13.0	-4.6	5.4	-0.2	-0.1	--
Both sexes, 25 +										
1976	-16.1	-36.9	-29.5	-28.9	-0.7	-7.3	20.7	-0.1	-0.3	-0.1
1981	-36.7	-115.0	-117.7	-96.5	-21.2	2.5	78.4	0.1	-0.6	-0.7
1986	-54.6	-105.3	-109.0	-94.4	-14.7	3.7	50.7	0.1	-0.5	-0.5
1991	-52.0	-90.1	-85.8	-72.2	-13.5	-4.4	38.2	0.1	-0.3	-0.3
1996	-302.6	-264.1	-247.6	-214.4	-33.2	-16.5	-38.5	--	-0.3	-0.4
1999	-325.5	-204.7	-184.9	-167.9	-16.9	-19.8	-120.8	-0.1	--	--
Men, 15+										
1976	-17.3	-24.0	-20.5	-22.6	2.1	-3.5	6.6	--	-0.2	-0.1
1981	-41.9	-53.3	-53.3	-52.4	-0.9	0.0	11.5	--	-0.3	-0.3
1986	-54.4	-74.1	-72.7	-66.1	-6.6	-1.4	19.7	0.1	-0.3	-0.3
1991	-52.5	-50.6	-44.1	-46.2	2.1	-6.5	-2.0	--	-0.1	-0.1
1996	-163.0	-144.0	-132.9	-127.3	-5.6	-11.1	-19.1	--	-0.2	-0.2
1999	-153.8	-133.9	-127.2	-121.3	-5.9	-6.7	-20.0	--	-0.2	-0.2
Men, 15-24										
1976	-6.2	7.0	9.0	4.5	4.5	-2.0	-13.2	-0.2	0.5	0.6
1981	-17.7	1.9	5.9	0.3	5.6	-3.9	-19.6	-0.2	0.6	0.7
1986	-20.9	-12.3	-7.1	-8.7	1.5	-5.2	-8.6	-0.2	0.1	0.2
1991	-2.5	11.6	13.6	4.8	8.8	-1.9	-14.2	-0.3	0.7	0.8
1996	-2.3	9.1	15.4	5.7	9.7	-6.3	-11.4	-0.6	0.5	0.8
1999	10.1	4.5	4.6	-1.6	6.2	-0.1	5.5	--	-0.1	--
Men, 25+										
1976	-11.2	-31.0	-29.5	-27.2	-2.4	-1.5	19.9	--	-0.4	-0.4
1981	-24.2	-55.3	-59.3	-52.8	-6.5	3.9	31.1	0.1	-0.5	-0.5
1986	-33.4	-61.8	-65.6	-57.4	-8.2	3.7	28.4	0.2	-0.4	-0.5
1991	-50.1	-62.3	-57.6	-51.0	-6.7	-4.6	12.2	--	-0.3	-0.3
1996	-160.7	-153.1	-148.3	-133.0	-15.4	-4.7	-7.7	0.2	-0.4	-0.5
1999	-163.9	-138.4	-131.8	-119.7	-12.1	-6.7	-25.5	--	-0.2	-0.2
Women, 15+										
1976	-10.4	8.4	20.5	12.5	8.0	-12.1	-18.8	-0.3	0.1	0.3
1981	-27.2	-56.3	-47.9	-38.6	-9.3	-8.4	29.0	-0.1	-0.4	-0.4
1986	-34.8	-46.5	-42.8	-41.1	-1.7	-3.7	11.6	--	-0.3	-0.2
1991	-19.5	-27.1	-21.4	-22.5	1.2	-5.7	7.6	--	-0.1	-0.1
1996	-158.2	-101.9	-80.7	-76.9	-3.7	-21.2	-56.3	-0.1	-0.1	--
1999	-165.5	-70.1	-52.5	-54.3	1.9	-17.7	-95.4	-0.1	0.2	0.3
Women, 15-24										
1976	-5.3	14.4	20.6	14.2	6.4	-6.2	-19.6	-0.6	0.7	1.0
1981	-14.8	3.5	10.5	5.1	5.5	-7.0	-18.3	-0.5	0.5	0.8
1986	-13.8	-3.0	0.6	-4.2	4.8	-3.6	-10.8	-0.2	0.3	0.4
1991	-17.7	0.8	6.7	-1.3	8.0	-5.9	-18.4	-0.5	0.7	0.9
1996	-16.2	9.2	18.6	4.5	14.1	-9.4	-25.5	-0.9	1.0	1.4
1999	-4.0	-3.9	0.8	-6.0	6.8	-4.5	-0.2	-0.3	--	0.2
Women, 25+										
1976	-5.0	-5.8	-0.1	-1.7	1.7	-5.9	0.9	-0.2	--	--
1981	-12.5	-59.8	-58.4	-43.7	-14.7	-1.4	47.3	0.1	-0.7	-0.7
1986	-21.1	-43.4	-43.5	-36.9	-6.5	-0.1	22.4	--	-0.4	-0.4
1991	-1.9	-27.9	-28.1	-21.3	-6.8	0.2	26.0	0.1	-0.3	-0.3
1996	-141.9	-111.0	-99.3	-81.4	-17.9	-11.8	-30.8	--	-0.3	-0.3
1999	-161.5	-66.3	-53.1	-48.2	-4.9	-13.1	-95.2	-0.1	0.3	0.4

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Table 2
Percentage difference in labour force characteristics between revised and unrevised estimates by age and sex, annual averages for selected years

	Population 15 years and over	Labour force	Employ- ment	Full-time employ- ment	Part-time employ- ment	Unemploy- ment	Not in the labour force
	% difference						
Both sexes, 15+							
1976	-0.2	-0.1	--	-0.1	0.8	-2.1	-0.2
1981	-0.4	-0.9	-0.9	-0.9	-0.6	-0.9	0.6
1986	-0.4	-0.9	-1.0	-1.1	-0.4	-0.4	0.5
1991	-0.3	-0.5	-0.5	-0.6	0.1	-0.8	0.1
1996	-1.4	-1.6	-1.6	-1.8	-0.4	-2.2	-0.9
1999	-1.3	-1.3	-1.2	-1.5	-0.1	-2.0	-1.4
Both sexes, 15 - 24							
1976	-0.3	0.7	1.2	0.9	2.0	-2.3	-1.9
1981	-0.7	0.2	0.6	0.2	1.6	-2.5	-2.5
1986	-0.8	-0.5	-0.3	-0.8	0.8	-1.9	-1.4
1991	-0.5	0.5	0.9	0.3	1.9	-1.8	-2.5
1996	-0.5	0.8	1.7	0.9	2.6	-4.0	-2.4
1999	0.2	--	0.2	-0.6	1.3	-1.3	0.4
Both sexes, 25 +							
1976	-0.1	-0.5	-0.4	-0.4	-0.1	-1.9	0.4
1981	-0.3	-1.3	-1.4	-1.3	-2.1	0.5	1.6
1986	-0.3	-1.0	-1.1	-1.1	-1.2	0.4	0.9
1991	-0.3	-0.8	-0.8	-0.8	-0.9	-0.4	0.6
1996	-1.6	-2.1	-2.1	-2.1	-2.0	-1.5	-0.6
1999	-1.6	-1.5	-1.5	-1.6	-1.0	-2.3	-1.8
Men, 15+							
1976	-0.2	-0.4	-0.3	-0.4	0.6	-0.8	0.4
1981	-0.5	-0.7	-0.8	-0.8	-0.2	0.0	0.6
1986	-0.5	-1.0	-1.0	-1.0	-1.1	-0.2	0.9
1991	-0.5	-0.6	-0.6	-0.7	0.3	-0.8	-0.1
1996	-1.4	-1.7	-1.8	-1.9	-0.7	-1.3	-0.6
1999	-1.3	-1.5	-1.6	-1.7	-0.7	-1.0	-0.6
Men, 15-24							
1976	-0.3	0.4	0.7	0.4	1.8	-1.0	-1.8
1981	-0.7	0.1	0.4	0.0	1.7	-1.6	-3.0
1986	-0.9	-0.8	-0.5	-0.9	0.4	-2.0	-1.4
1991	-0.1	0.8	1.2	0.7	2.2	-0.7	-2.3
1996	-0.1	0.7	1.5	0.9	2.4	-2.8	-1.6
1999	0.5	0.3	0.4	-0.2	1.5	--	0.8
Men, 25+							
1976	-0.2	-0.6	-0.6	-0.6	-2.0	-0.7	1.7
1981	-0.4	-1.0	-1.1	-1.0	-3.8	1.4	2.3
1986	-0.4	-1.0	-1.2	-1.1	-3.4	0.8	1.7
1991	-0.6	-0.9	-1.0	-0.9	-2.2	-0.8	0.6
1996	-1.7	-2.2	-2.3	-2.2	-3.9	-0.8	-0.3
1999	-1.7	-1.9	-1.9	-1.9	-3.0	-1.4	-1.0
Women, 15+							
1976	-0.1	0.2	0.6	0.5	0.9	-3.6	-0.4
1981	-0.3	-1.1	-1.0	-1.1	-0.8	-2.0	0.6
1986	-0.3	-0.8	-0.8	-1.1	-0.1	-0.7	0.3
1991	-0.2	-0.4	-0.4	-0.5	0.1	-0.9	0.2
1996	-1.3	-1.5	-1.3	-1.7	-0.2	-3.3	-1.1
1999	-1.3	-1.0	-0.8	-1.1	0.1	-3.3	-1.9
Women, 15-24							
1976	-0.2	1.1	1.8	1.6	2.2	-4.0	-2.0
1981	-0.6	0.2	0.8	0.5	1.4	-3.8	-2.1
1986	-0.6	-0.2	--	-0.5	1.0	-1.9	-1.5
1991	-0.9	0.1	0.6	-0.2	1.6	-3.5	-2.8
1996	-0.8	0.8	1.9	1.0	2.7	-5.6	-3.2
1999	-0.2	-0.3	0.1	-1.2	1.2	-2.8	--
Women, 25+							
1976	-0.1	-0.2	--	-0.1	0.3	-3.4	--
1981	-0.2	-1.7	-1.8	-1.8	-1.8	-0.6	1.3
1986	-0.3	-1.0	-1.1	-1.2	-0.7	--	0.6
1991	--	-0.5	-0.6	-0.6	-0.6	--	0.7
1996	-1.4	-2.0	-1.9	-2.1	-1.4	-2.5	-0.7
1999	-1.6	-1.1	-0.9	-1.1	-0.4	-3.4	-2.2

Table 3
Labour force characteristics of revised minus unrevised estimates by province, annual averages for selected years

	Population 15 years and over	Labour force	Employ- ment	Full-time employ- ment	Part-time employ- ment	Unem- p- loy- ment	Not in the labour force	Unem- p- loy- ment rate	Partici- pation rate	Employ- ment rate
Newfoundland				'000					% point difference	
1976	-0.5	-0.5	-0.7	-0.8	0.1	0.2	--	0.2	-0.1	-0.2
1981	-1.5	1.4	2.2	1.9	0.3	-0.9	-2.9	-0.6	0.5	0.8
1986	-1.4	1.7	2.2	1.6	0.6	-0.4	-3.2	-0.3	0.6	0.7
1991	-1.4	1.4	2.0	1.7	0.3	-0.5	-2.8	-0.3	0.5	0.5
1996	-7.8	-3.8	-2.7	-3.5	0.7	-1.0	-4.0	-0.1	--	0.2
1999	-5.5	-3.3	-3.4	-3.8	0.4	--	-2.2	0.2	--	-0.2
Prince Edward Island										
1976	--	0.6	0.9	0.7	0.2	-0.2	-0.7	-0.5	0.8	1.1
1981	-0.2	-0.6	-0.5	-0.5	--	--	0.4	0.1	-0.5	-0.5
1986	-0.4	-0.2	0.1	-0.2	0.2	-0.2	-0.2	-0.3	0.1	0.4
1991	-0.4	-0.3	-0.1	-0.2	0.1	-0.2	-0.2	-0.3	--	0.2
1996	-1.6	-1.2	-1.2	-1.1	-0.1	--	-0.3	0.2	-0.2	-0.3
1999	-0.1	-0.5	-0.6	-0.6	0.1	0.1	0.4	0.3	-0.4	-0.5
Nova Scotia										
1976	-0.6	0.6	1.4	0.7	0.8	-0.8	-1.2	-0.3	0.1	0.3
1981	-1.5	-1.4	-0.6	-0.8	0.2	-0.8	-0.1	-0.2	-0.1	--
1986	-2.5	-3.2	-4.2	-4.2	-0.1	1.0	0.9	0.3	-0.3	-0.4
1991	-2.2	-0.5	-0.8	-1.4	0.6	0.3	-1.7	0.1	0.1	0.1
1996	-10.8	-9.5	-6.9	-6.2	-0.7	-2.6	-1.2	-0.3	-0.4	-0.1
1999	-10.1	-6.8	-5.6	-5.4	-0.3	-1.3	-3.3	-0.1	-0.1	--
New Brunswick										
1976	-0.8	-2.4	-1.9	-1.7	-0.2	-0.5	1.6	-0.1	-0.4	-0.3
1981	-1.8	-3.1	-2.8	-2.6	-0.3	-0.4	1.3	--	-0.4	-0.4
1986	-2.4	-2.8	-2.8	-2.4	-0.4	0.1	0.5	0.2	-0.3	-0.3
1991	-2.2	-3.0	-2.5	-2.4	-0.1	-0.4	0.7	--	-0.3	-0.3
1996	-9.2	-7.7	-6.6	-6.0	-0.7	-1.1	-1.4	-0.1	-0.4	-0.3
1999	-8.7	-8.2	-7.7	-7.5	-0.2	-0.5	-0.5	0.1	-0.5	-0.5
Québec										
1976	-9.7	-6.8	-4.3	-4.7	0.4	-2.5	-2.9	--	--	--
1981	-17.9	-12.7	-13.1	-10.8	-2.2	0.4	-5.2	0.1	-0.1	-0.1
1986	-22.6	-19.7	-16.9	-16.0	-0.9	-2.7	-3.1	--	-0.1	-0.1
1991	-18.1	-14.4	-17.2	-19.1	1.9	2.8	-3.7	0.1	-0.1	-0.2
1996	-105.2	-73.3	-66.7	-61.4	-5.3	-6.6	-31.9	0.1	-0.2	-0.1
1999	-122.3	-60.0	-50.0	-46.1	-3.9	-10.0	-62.3	-0.1	0.3	0.4
Ontario										
1976	-7.6	2.0	7.5	0.5	7.1	-5.5	-9.6	-0.1	0.1	0.2
1981	-23.1	-52.6	-48.4	-43.9	-4.5	-4.1	29.5	-0.1	-0.6	-0.5
1986	-33.3	-54.2	-49.7	-43.3	-6.3	-4.6	21.0	--	-0.5	-0.4
1991	-31.4	-38.1	-27.9	-23.5	-4.4	-10.3	6.7	-0.1	-0.2	-0.1
1996	-166.5	-143.9	-129.9	-118.0	-11.9	-13.9	-22.7	-0.1	-0.4	-0.3
1999	-149.1	-110.4	-98.1	-91.0	-7.0	-12.3	-38.6	-0.1	-0.2	-0.1
Manitoba										
1976	-0.8	-0.4	-0.1	-0.1	-0.1	-0.2	-0.4	--	--	0.1
1981	-1.7	-2.9	-2.5	-3.1	0.7	-0.4	1.1	--	-0.2	-0.2
1986	-2.3	-4.9	-4.8	-4.5	-0.3	-0.2	2.6	0.1	-0.4	-0.4
1991	-2.5	-0.3	1.2	0.5	0.7	-1.6	-2.2	-0.3	0.1	0.3
1996	-14.6	-9.3	-6.9	-6.0	-0.9	-2.4	-5.3	-0.3	--	0.2
1999	-15.8	-14.7	-14.1	-12.2	-2.0	-0.5	-1.2	0.1	-0.4	-0.5
Saskatchewan										
1976	-0.9	-1.8	-1.2	-1.3	0.1	-0.5	0.8	-0.1	-0.2	-0.1
1981	-2.1	-3.1	-2.1	-2.4	0.3	-0.9	1.1	-0.1	-0.2	-0.1
1986	-3.1	-5.2	-5.1	-5.2	0.1	--	2.1	0.1	-0.4	-0.5
1991	-3.0	-5.1	-5.0	-5.0	-0.1	--	2.2	0.1	-0.4	-0.4
1996	-3.5	-3.9	-3.7	-3.8	0.2	-0.3	0.4	--	-0.2	-0.3
1999	-4.8	-1.1	-0.7	-2.4	1.7	-0.2	-3.8	--	0.3	0.3
Alberta										
1976	-2.1	1.1	2.1	1.2	0.9	-1.0	-3.3	-0.1	0.2	0.2
1981	-8.3	-12.1	-11.9	-11.4	-0.6	-0.2	3.8	--	-0.4	-0.4
1986	-7.1	-8.0	-9.1	-10.4	1.3	1.0	0.9	0.1	-0.2	-0.3
1991	-7.4	-5.3	-2.5	-6.5	3.9	-2.8	-2.1	-0.2	0.0	0.1
1996	-13.2	-6.2	-4.3	-7.7	3.4	-2.0	-6.9	-0.1	0.2	0.2
1999	-14.4	-4.3	-3.5	-5.6	2.0	-0.7	-10.2	-0.1	0.3	0.3
British Columbia										
1976	-4.6	-8.0	-3.6	-4.5	1.0	-4.5	3.3	-0.3	-0.3	--
1981	-11.0	-22.6	-21.7	-17.5	-4.2	-0.9	11.5	0.1	-0.7	-0.7
1986	-14.1	-23.9	-25.2	-22.6	-2.5	1.2	9.9	0.3	-0.6	-0.7
1991	-3.4	-12.2	-12.5	-12.9	0.4	0.4	8.8	0.1	-0.4	-0.4
1996	11.1	13.0	15.4	9.6	5.9	-2.3	-2.0	-0.2	0.2	0.3
1999	11.4	5.2	4.2	-1.2	5.3	1.1	6.2	0.0	-0.1	-0.1

Improvements in 2000 to the LFS

Table 4
Percentage difference in labour force characteristics between revised and unrevised estimates by province, annual averages for selected years

	Population 15 years and over	Labour force	Employ- ment	Full-time employ- ment	Part-time employ- ment	Unemploy- ment	Not in the labour force
Newfoundland				% difference			
1976	-0.1	-0.3	-0.4	-0.5	0.8	0.8	--
1981	-0.4	0.7	1.2	1.1	1.9	-3.0	-1.5
1986	-0.3	0.7	1.2	1.0	2.8	-0.9	-1.6
1991	-0.3	0.6	1.0	1.0	1.1	-1.1	-1.4
1996	-1.7	-1.6	-1.4	-2.2	2.3	-2.2	-1.8
1999	-1.2	-1.3	-1.6	-2.1	1.3	0.0	-1.1
Prince Edward Island							
1976	--	1.3	2.1	1.9	3.4	-4.4	-2.0
1981	-0.2	-1.1	-1.1	-1.3	--	--	1.1
1986	-0.4	-0.3	0.2	-0.5	2.3	-2.5	-0.6
1991	-0.4	-0.5	-0.2	-0.5	1.1	-1.8	-0.6
1996	-1.5	-1.7	-2.0	-2.2	-0.9	--	-0.8
1999	-0.1	-0.7	-1.0	-1.2	1.0	1.0	1.1
Nova Scotia							
1976	-0.1	0.2	0.5	0.3	2.2	-2.6	-0.5
1981	-0.2	-0.4	-0.2	-0.3	0.4	-2.2	--
1986	-0.4	-0.8	-1.2	-1.4	-0.2	1.9	0.3
1991	-0.3	-0.1	-0.2	-0.4	0.9	0.6	-0.6
1996	-1.5	-2.2	-1.8	-2.0	-0.9	-4.7	-0.4
1999	-1.3	-1.5	-1.4	-1.6	-0.4	-2.9	-1.1
New Brunswick							
1976	-0.2	-0.9	-0.8	-0.8	-0.8	-1.7	0.7
1981	-0.3	-1.1	-1.1	-1.2	-0.8	-1.2	0.6
1986	-0.4	-0.9	-1.0	-1.1	-0.9	0.2	0.2
1991	-0.4	-0.9	-0.8	-1.0	-0.2	-0.9	0.3
1996	-1.5	-2.2	-2.1	-2.3	-1.3	-2.7	-0.6
1999	-1.4	-2.2	-2.3	-2.7	-0.4	-1.3	-0.2
Québec							
1976	-0.2	-0.2	-0.2	-0.2	0.2	-1.0	-0.1
1981	-0.4	-0.4	-0.5	-0.4	-0.6	0.1	-0.3
1986	-0.4	-0.6	-0.6	-0.6	-0.2	-0.7	-0.2
1991	-0.3	-0.4	-0.6	-0.7	0.4	0.7	-0.2
1996	-1.8	-2.0	-2.1	-2.3	-0.9	-1.5	-1.4
1999	-2.0	-1.6	-1.5	-1.6	-0.7	-2.8	-2.8
Ontario							
1976	-0.1	0.1	0.2	--	1.4	-2.2	-0.4
1981	-0.3	-1.1	-1.1	-1.2	-0.7	-1.3	1.4
1986	-0.4	-1.1	-1.0	-1.1	-0.8	-1.3	0.9
1991	-0.4	-0.7	-0.6	-0.6	-0.5	-1.9	0.3
1996	-1.9	-2.5	-2.4	-2.7	-1.2	-2.6	-0.8
1999	-1.6	-1.8	-1.7	-1.9	-0.7	-3.1	-1.3
Manitoba							
1976	-0.1	-0.1	--	--	-0.2	-0.9	-0.1
1981	-0.2	-0.6	-0.5	-0.8	0.9	-1.3	0.4
1986	-0.3	-0.9	-1.0	-1.1	-0.3	-0.5	1.0
1991	-0.3	-0.1	0.2	0.1	0.6	-3.2	-0.8
1996	-1.7	-1.6	-1.3	-1.4	-0.8	-5.6	-1.8
1999	-1.8	-2.5	-2.5	-2.7	-1.8	-1.5	-0.4
Saskatchewan							
1976	-0.1	-0.4	-0.3	-0.4	0.2	-3.2	0.3
1981	-0.3	-0.7	-0.5	-0.7	0.4	-4.3	0.4
1986	-0.4	-1.0	-1.1	-1.4	0.1	--	0.8
1991	-0.4	-1.0	-1.1	-1.4	-0.1	--	0.9
1996	-0.5	-0.8	-0.8	-1.0	0.2	-0.9	0.2
1999	-0.6	-0.2	-0.1	-0.6	1.8	-0.6	-1.5
Alberta							
1976	-0.2	0.1	0.2	0.2	0.7	-2.8	-0.8
1981	-0.5	-1.0	-1.0	-1.1	-0.4	-0.4	0.8
1986	-0.4	-0.6	-0.8	-1.1	0.6	0.8	0.2
1991	-0.4	-0.4	-0.2	-0.6	1.7	-2.4	-0.4
1996	-0.6	-0.4	-0.3	-0.7	1.3	-1.9	-1.2
1999	-0.6	-0.3	-0.2	-0.4	0.7	-0.7	-1.6
British Columbia							
1976	-0.2	-0.7	-0.3	-0.5	0.6	-4.4	0.5
1981	-0.5	-1.6	-1.6	-1.6	-1.9	-0.9	1.6
1986	-0.6	-1.5	-1.9	-2.1	-0.9	0.6	1.2
1991	-0.1	-0.7	-0.8	-1.0	0.1	0.2	1.0
1996	0.4	0.7	0.9	0.7	1.6	-1.3	-0.2
1999	0.4	0.3	0.2	-0.1	1.3	0.6	0.6

Table 5
Percent growth in employment and unemployment by age and sex between 1989 and 1999, and for employment by class of worker and level of education for both sexes

	Men		Women	
	Revised	Unrevised	Revised	Unrevised
	% growth		% growth	
Employment				
15 +	7.9	8.7	17.0	17.2
15 - 24	-12.8	-13.2	-12.2	-11.8
25 +	12.5	13.4	24.8	25.0
25 - 44	3.7	4.6	11.8	12.7
45 +	29.4	30.4	56.1	54.5
25 - 54	13.1	14.2	24.4	25.0
55 +	8.3	8.6	28.8	25.0
15 - 19	-16.3	-15.6	-13.1	-12.4
20 - 24	-10.5	-11.8	-11.6	-11.5
25 - 29	-18.8	-19.0	-12.5	-12.0
30 - 34	-7.4	-5.9	1.2	3.2
35 - 44	23.5	24.8	32.2	33.0
45 - 54	43.9	45.8	70.2	69.8
55 - 59	11.0	11.7	38.7	35.1
60 - 64	-1.4	-2.1	20.3	15.2
65 +	19.8	20.1	5.4	3.4
65 - 69	18.8	18.6	2.8	-2.7
70 +	21.3	22.7	9.8	14.5
Unemployment				
15 +	15.1	16.8	8.8	10.7
15 - 24	12.8	12.3	19.9	18.3
25 +	16.2	18.9	4.7	7.8
25 - 44	6.4	9.0	-7.3	-4.5
45 +	41.1	43.6	45.7	49.4
25 - 54	17.3	20.4	4.0	7.2
55 +	8.4	8.5	14.9	16.3
15 - 19	23.0	22.4	42.2	39.8
20 - 24	4.2	3.5	1.6	0.8
25 - 29	-25.1	-23.8	-30.8	-28.0
30 - 34	1.8	4.3	-23.4	-20.8
35 - 44	37.7	41.5	23.0	25.9
45 - 54	68.7	73.2	60.9	65.6
55 - 59	21.3	23.0	20.5	24.1
60 - 64	-19.4	-20.3	--	-2.4
65 +	80.0	76.9	--	--
65 - 69	31.6	30.0	--	--
70 +	--	--	--	--
Employment by:				
	Revised	Unrevised		
Class of worker between 1989 and 1990			% growth	
Total	11.9	12.4		
Employees	7.9	7.6		
Self-employed and unpaid family workers	36.6	42.1		
Level of education between 1990 and 1999				
Both sexes				
Total	11.1	11.7		
0 - 8 years	-39.5	-39.3		
Some high school	-22.1	-21.8		
High school graduate	1.8	2.0		
Some post-secondary	6.7	6.9		
Post-secondary certificate or diploma	39.5	40.8		
Bachelor's degree	47.1	47.3		
Graduate degree	48.9	50.7		

Improvements in 2000 to the LFS

Table 6

Distribution in employment and unemployment by age and sex, and for employment by class of worker and level of education for both sexes for 1999

	Men		Women	
	Revised	Unrevised	Revised	Unrevised
	%		%	
Employment				
15 +	100.0	100.0	100.0	100.0
15 - 24	14.5	14.2	16.0	15.8
25 +	85.5	85.8	84.0	84.2
25 - 44	52.0	52.3	53.1	53.6
45 +	33.5	33.5	30.9	30.6
25 - 54	74.0	74.3	75.4	75.6
55 +	11.4	11.5	8.7	8.5
15 - 19	5.4	5.3	6.1	6.1
20 - 24	9.1	8.9	9.9	9.8
25 - 29	11.0	11.0	11.5	11.6
30 - 34	12.5	12.6	12.5	12.8
35 - 44	28.5	28.6	29.2	29.2
45 - 54	22.0	22.0	22.2	22.1
55 - 59	6.3	6.3	5.4	5.3
60 - 64	3.3	3.3	2.3	2.2
65 +	1.9	1.9	1.0	1.0
65 - 69	1.1	1.1	0.6	0.6
70 +	0.7	0.8	0.4	0.4
Unemployment				
15 +	100.0	100.0	100.0	100.0
15 - 24	30.8	30.5	29.4	29.3
25 +	69.2	69.5	70.6	70.7
25 - 44	45.5	45.6	48.2	48.3
45 +	23.7	23.9	22.4	22.4
25 - 54	60.9	61.2	64.8	65.0
55 +	8.3	8.3	5.8	5.7
15 - 19	15.4	15.3	15.8	15.6
20 - 24	15.4	15.2	13.7	13.7
25 - 29	11.0	10.9	11.3	11.4
30 - 34	11.7	11.8	11.5	11.5
35 - 44	22.7	22.8	25.4	25.4
45 - 54	15.4	15.6	16.6	16.7
55 - 59	5.2	5.2	3.9	3.9
60 - 64	2.4	2.4	1.6	1.5
65 +	0.7	0.7	--	0.3
65 - 69	0.4	0.4	--	--
70 +	0.3	--	--	--
Employment by:				
	Revised	Unrevised		
Class of worker			%	
Total	100.0	100.0		
Employees	83.1	82.5		
Self-employed and unpaid family workers	16.9	17.5		
Level of education				
Both sexes	100.0	100.0		
0 - 8 years	4.1	4.0		
Some high school	13.6	13.5		
High school graduate	20.9	20.8		
Some post-secondary	9.4	9.3		
Post-secondary certificate or diploma	33.0	33.1		
Bachelor's degree	13.0	13.0		
Graduate degree	6.1	6.2		