Whither the workweek?

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When employment increases, a corresponding rise in hours worked can usually be expected. And indeed, from 1976 to 2000, changes in employment were fairly accurately reflected in hours worked. However, since 2000, this relationship has greatly diminished (Chart A). From 2000 to 2004, employment rose 8.1%, compared with only 4.3% for overall hours worked. Such a differential is unprecedented. The robust employment growth was surprising. Lower growth in hours seemed more consistent with reduced economic growth in Canada and the stagnation of employment in the United States. This contrast led some economists to question Canada's exceptional employment record in recent years (RBC 2004).

If employment is growing more rapidly than hours, then average hours per worker are declining. According to the Labour Force Survey (LFS), average weekly hours actually worked declined for three consecutive years—2001, 2002 and 2003—before rising slightly in 2004. The decline from 2000 to 2003 affected all provinces and population groups. According to the LFS, the decrease averaged 1.4 hours per week per worker (Table 1). In annual terms, this represents a drop of some two weeks of work.

Many factors can influence hours worked. Some are structural or cyclical, such as population aging, shifts in industrial structure, the business cycle, natural disasters, legislative changes, or simply personal preference. Others originate from the survey's conceptual framework, which should be re-examined periodically to see that it is still measuring what it is supposed to. This article looks at the contribution of these different factors in the decline in hours worked.

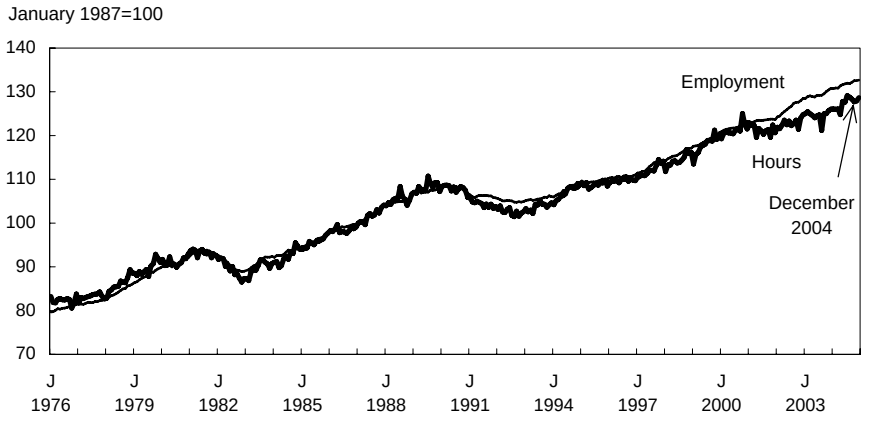
Decomposition of actual hours

The LFS collects information on both usual hours and actual hours of work. The drop in average hours appears in actual hours.

Usual hours of work are generally more stable since they reflect regular work schedules (Chart B). Changes in usual hours reflect fairly permanent changes in weekly work schedules.

On the other hand, hours actually worked can vary from week to week. By definition, actual hours are the sum of usual and overtime hours (paid or otherwise) minus hours of absence for any reason (for example,

Chart A The relationship between employment and annual hours worked has diminished.



Source: Labour Force Survey, 1976 to 2004

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Table 1 Components of actual hours worked per week by employees[1]

	2000	2001	2002	2003	2004	Change, 2000 to 2003	
						Total	Contribution
							%
Before adjustment							
Usual hours	35.7	35.7	35.5	35.5	35.5	-0.3	20.6
Overtime	1.7	1.7	1.8	1.7	1.7	0.0	-2.9
Hours lost	3.6	4.3	4.4	4.8	4.6	1.1	82.3
Actual hours[2]	33.8	33.1	33.0	32.4	32.6	-1.4	100.0
After adjustment							
Usual hours	35.7	35.7	35.5	35.5	35.5	-0.3	38.5
Overtime	1.7	1.7	1.8	1.7	1.7	0.0	-5.4
Adjusted lost hours	3.4	3.8	3.8	3.9	3.8	0.5	66.9
Adjusted actual hours	34.0	33.6	33.5	33.2	33.3	-0.7	100.0
LFS average actual hours[2]	33.7	33.0	32.9	32.3	32.5	-1.4	...

Source: Labour Force Survey

1 *Self-employed workers report only absences of one week or more. Absences in this table are for less than a week as well as for a week or more.*

2 *The average actual hours calculated in the identity are slightly different than the LFS average, with a tenth of a percentage point separating the two values. This is not significant at the 5% level and could be attributable to survey error.*

illness, vacation, personal or family responsibilities). (For a definition of these hours, see *Definitions and reference week*). This relationship is expressed in the following identity:

$$\overline{H_a} = \overline{H_u} + \overline{H_o} - \overline{H_l}$$

where

$\overline{H_a}$: Average actual hours

$\overline{H_u}$: Average usual hours

$\overline{H_o}$: Average overtime hours

$\overline{H_l}$: Average hours lost

This identity can be verified for employees only, since total hours lost are reported only for this category of workers.[4] An examination of the average values[5] of these components reveals that the drop in actual hours per employee happened gradually. From a peak in 2000, the rate dropped to a low in 2003 and then rallied somewhat in 2004. The 1.4 hour drop in average weekly hours between 2000 and 2003 is largely attributable to an increase in hours lost (Table 1, before adjustment). In fact, this accounted for more than 82% of the decrease in average hours.

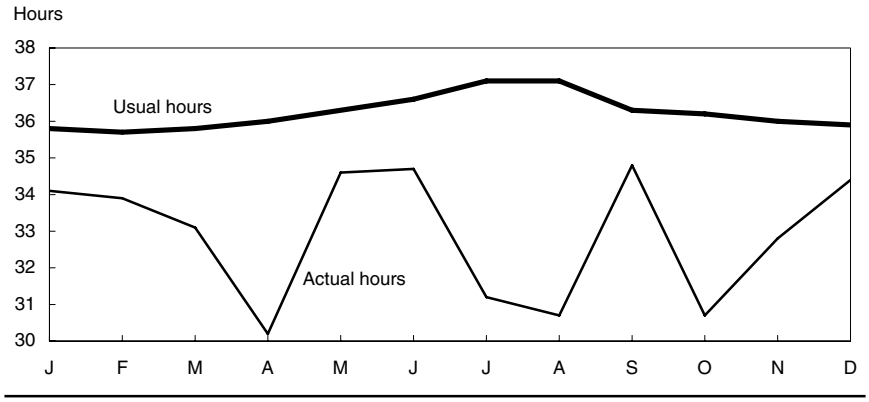
The rest of the decrease came from a decline in usual hours, where the average fell from 35.7 to 35.5 hours per week between 2001 and 2002 and then remained stable for the rest of the observation period. Overtime hours during the period fluctuated between an average of 1.7 and 1.8 hours per week, slightly tempering the decrease in actual hours worked.

Increase in hours lost for statutory holidays suspect

A breakdown serves to identify the source of the increase in hours lost. Absences were grouped according to six types: illness, vacation, statutory holidays, personal or family responsibilities, maternity leave, and other.[6]

Between 2000 and 2003, increases occurred for all types of absence, but particularly for statutory holidays (Table 2, unadjusted data). The average number of weekly hours not worked for this reason quadrupled from 0.2 hours in 2000 to 0.8 hours in 2003. On an annual basis, this amounts to 1.4 days in 2000 compared with 5.5 days in 2003.[7] Part of the rise occurred between 2000 and 2001, and again between 2002 and 2003. Between 2000 and 2003, statutory holidays explained almost 57% of the rise in total hours lost. However, the increase seems suspect, since the number of statutory holidays in each year was identical.

Chart B Usual hours of work are more stable than actual hours.



Source: Labour Force Survey, 2003

The decrease in hours: very real, but overestimated

Actual and usual hours of work are counted by the LFS every month, during a reference week that usually includes the 15th of the month.[8] Not all reference weeks are comparable. Among other things, some weeks include statutory holidays while others do not. These holidays have a greater or lesser effect, depending on whether they affect all Canadian workers or only some of them (for example, the Saint-Jean-Baptiste holiday in Quebec). Each year, the LFS captures only a portion of statutory holidays, and from one year to the next it captures different ones.

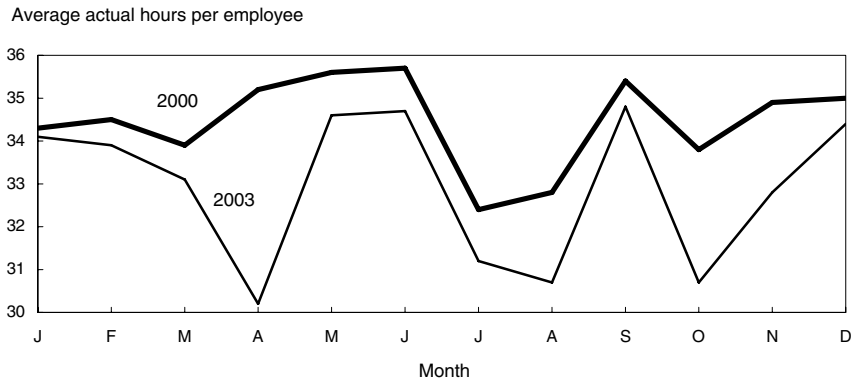
For example, in 2000, two statutory holidays often captured by the LFS were entirely or partially missed. Easter occurred during the week preceding the reference week and thus was not captured. Remembrance Day, which occurs on November 11 is a fixed holiday.[9] When it falls on a Saturday, as in 2000, it has almost no effect because it will be taken on the Monday following the reference week.[10] Also, the hours lost during the October 2000 reference week, which included Thanksgiving, were underestimated because of a technical problem related to the introduction of the new computer-assisted interview system.[11] In 2003, all these holidays were captured. A comparison between 2000 and 2003 of average actual hours per month shows the effect of the holidays not captured in 2000: hours for April, October and November 2000 appear much higher than in 2003 (Chart C). But in reality, their high value largely reflects the holidays missed by the survey. Hours in 2000 were thus overestimated because holidays were under-represented. This had a major impact on the reduction of actual hours between 2000 and 2003, since it more than doubled the decline in average actual hours.

However, even after adjusting to neutralize the estimation bias caused by the irregular presence of statutory holidays,[12] a decrease in average hours between 2000 and 2003 remains (Table 1). But it amounts to 0.7 hours on average per week per employee (just under one week annually) instead of 1.4 hours per week (two weeks annually). This decrease occurred gradually—from 34.0 in 2000 to 33.6 in 2001 to 33.5 in 2002 and then to 33.2 in 2003. What explains this decline?

Reasons for the decline

Using the adjusted data, the components of the identity were re-examined for the years 2000 and 2003. This exercise confirmed the importance of various reasons

Chart C Average actual hours vary from year to year primarily because of holidays in the survey reference week.



Source: Labour Force Survey

Definitions and reference week

Usual and actual hours
Usual hours are an employee's regular or contractual hours, excluding overtime.[1] The number of hours actually worked consists of the hours a respondent spent working during a reference week (including paid or unpaid overtime). By definition, the concept of hours actually worked excludes hours missed because of vacation, statutory holidays, illness or any other reason.[2]

The LFS reference week
Two types of absence are likely to bias the estimate of hours actually worked: statutory holidays and vacations in certain industries (such as the construction industry in Quebec) or those specific to particular periods of the year (such as the March school break). In Canada, 13 statutory holidays are recognized by federal or provincial administrations (see table below). Employers are required to grant these holidays or pay their employees a premium.

Several regularly fall outside the survey reference weeks: New Year's Day, Victoria Day (or la Journée nationale des patriotes in Quebec, which since November 2002 has replaced la fête de Dollard), Canada Day, Labour Day and Christmas. These holidays affect a sizeable portion of workers, and since they are statutory in most provinces, or at least the most populous ones, their impact is considerable. But since they are not captured by the survey, they are also not reflected in hours not worked. The actual hours of the reference week for the month in which these holidays occur are not affected by reference week biases. But these reference weeks are not representative of their month. In fact, the actual hours for these months will be overestimated.

Thanksgiving and Remembrance Day are usually captured by the LFS (see table next page). When they are, the hours in the reference week are lower. But since the reference week represents the month, the average for the month will be underestimated.

Easter is captured sporadically by the LFS. When it is captured, it does not always have the same effect. This holiday has a larger impact when the reference week includes Good Friday, which is a statutory holiday for most provinces. In Quebec, the employer can decide to grant Good Friday or Easter Monday as a holiday. Easter Monday is a holiday for a large proportion of public-sector employees. Thus, in 2003, 48% of employees reported hours lost because Good Friday fell within the reference week, compared with 27% in 2004, when the reference week included Easter Monday.

Statutory holidays with a fixed date, such as Christmas and New Year's Day, fall on a weekend in some years. In this case, these holidays must be carried over to the following Monday. Remembrance Day, however, is an exception. A large proportion of workers do not have the opportunity to take this holiday the following Monday when it falls on the weekend. This holiday therefore has a more limited impact in some years (David 1989), as was the case in 1989, 1990, 1995, 2000 and 2001.

Other holidays affect only certain localities, provinces or religious groups. Whether they are captured or not will therefore have a more limited impact on hours worked at the national level.

When the annual averages for hours actually worked are compared between years, they may appear to increase or decrease, often reflecting the presence or absence of statutory holidays during the 12 reference weeks.

Other major effects
In 2000, the LFS introduced a new computer-assisted interview system that allows an interviewer to electronically capture respondent information. In addition to facilitating the interviewer's task, it also reduces transcription errors. The system even reminds respondents of any statutory holiday during the reference week. This seems

Federal and provincial statutory holidays

		Federal	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
January 1	New Years Day	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
February	Family Day										✓	
March/April	Good Friday	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Easter Monday	✓					✓					
May	Victoria Day (patriotes)	✓					✓	✓	✓	✓	✓	✓
June 24	St-Jean-Baptiste						✓					
July 1	Canada Day	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
August	Civic Holiday		✓			✓		✓		✓		✓
September	Labour Day	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
October	Thanksgiving	✓					✓	✓	✓	✓	✓	✓
November	Remembrance Day	✓		✓	✓				✓	✓	✓	✓
December 25	Christmas Day	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
December 26	Boxing Day	✓						✓				

Definitions and reference week (concluded)

to be effective: since it was introduced, statutory holidays have been reported more systematically.[3] Since 2001, the proportion of workers reporting hours lost for Thanksgiving has consistently been higher than at the end of the 1990s. For example, from 1997 to 2000, 38% to 40% of employees reported this holiday, compared with 47% to 49% now. Much of this increase is likely related to the implementation of the new system, but the hypothesis that it is partly attributable to factors related to the business cycle cannot be entirely ruled out. In a period of strong growth, such as in 1999, some workers may not take the day off because of a heavier workload. In a period of slower growth, such as in 2003, more employees may do so.

Some fixed-date vacation leave also has a major impact. For example, employees in the Quebec construction industry take their vacation each year during the last two full weeks of July. This is picked up sporadically by the LFS. In particular, it was captured in 2003 but not in 2000. This, then, was another factor accounting for the lower hours in 2003. Also, the school spring break is captured systematically in some provinces, sporadically in some, and never in others.

Main holidays[1] captured in the LFS

	Easter	Vacation for construction workers in Quebec	Thanks-giving	Remem-brance Day
1987	Friday	✓	✓	✓
1988			✓	✓
1989				Saturday
1990	Monday	✓		Sunday
1991		✓	✓	✓
1992	Friday	✓	✓	✓
1993	Monday		✓	✓
1994			✓	✓
1995	Friday		✓	Saturday
1996		✓	✓	✓
1997		✓	✓	✓
1998	Monday	✓	✓	✓
1999			✓	✓
2000			✓[2]	Saturday
2001	Monday	✓	✓	Sunday
2002		✓	✓	✓
2003	Friday	✓	✓	✓
2004	Monday		✓	✓

1 Other holidays are Family Day in Alberta and school spring break, which is systematically captured in some provinces but never in others.

2 When the new computer-assisted interview system was introduced in 2000, respondents were not reminded that Thanksgiving and Remembrance Day fell in the reference week, causing hours lost for these holidays to be severely under-reported in the LFS.

(other than statutory holidays, which are excluded from the adjusted data) in the decrease in average actual hours.

Increase in hours lost a major factor

Hours lost explained two-thirds of the drop in hours (Table 1, after adjustment) instead of the 82% before adjustment. Usual hours explained the remaining third. On the other hand, overtime, which remained steady at 1.7 hours per week, slowed the decrease in hours.

Since the distribution of employees between full- and part-time has a major impact on hours worked, the identity was done separately for full- and part-time workers (Table 3). The decrease in adjusted average actual hours between 2000 and 2003 was much greater for full-time workers—0.7 hours on average per week after adjustment, compared with a marginal 0.1 for part-time workers.

A decomposition of the drop into the components of the identity for full-time and part-time employees confirms the importance of hours lost in the drop in average actual hours (Table 3, after adjustment), accounting for 85% and 153% respectively.

Employees seeking a better balance between work and personal life

When statutory holidays are excluded, the influence of other reasons for absence between 2000 and 2003[13] can be seen (Table 2, after adjustment). Among full-time employees, maternity leave accounted for the largest share of the increase in hours of absence—nearly one-third. This coincided with changes to Employment Insurance which, as of December 31, 2000, increased maternity, parental or adoption benefits from 30 to 50 weeks. (For further details, see Marshall 2003.) Hours of absence per female employee because of maternity leave rose from 0.6 hours per week[14] in 2000 to 0.9 hours in 2003.

Table 2 Increase in hours lost by reason and full- or part-time status

						Change, 2000 to 2003		
							Contribution	
	2000	2001	2002	2003	2004	Total	Before adjustment	After adjustment[1]
				Weekly hours			%	
Both sexes								
Hours lost	3.6	4.3	4.4	4.8	4.6	1.1	100.0	...
Adjusted hours lost	3.4	3.8	3.8	3.9	3.8	0.5	...	100.0
Illness	0.9	1.0	1.0	1.0	1.0	0.1	8.9	20.4
Personal or family responsibilities	0.2	0.2	0.3	0.2	0.3	0.1	4.7	10.8
Maternity leave	0.3	0.3	0.4	0.4	0.5	0.1	12.8	29.5
Vacation	1.7	2.0	1.9	1.9	1.8	0.1	9.0	20.7
Other	0.3	0.3	0.3	0.4	0.3	0.1	8.1	18.6
Statutory holidays	0.2	0.5	0.5	0.8	0.7	0.6	56.6	...
Full-time employees								
Hours lost	4.1	4.8	4.9	5.4	5.1	1.3	100.0	...
Adjusted hours lost	3.8	4.2	4.3	4.4	4.3	0.6	...	100.0
Illness	1.1	1.1	1.1	1.2	1.1	0.1	8.4	19.2
Personal or family responsibilities	0.2	0.2	0.3	0.3	0.3	0.1	4.6	10.5
Maternity leave	0.3	0.3	0.4	0.5	0.5	0.2	13.0	29.9
Vacation	2.0	2.2	2.1	2.1	2.0	0.1	10.2	23.4
Other	0.3	0.3	0.3	0.4	0.4	0.1	7.4	17.0
Statutory holidays	0.2	0.6	0.6	1.0	0.8	0.7	56.4	...
Part-time employees								
Hours lost	1.6	1.9	1.9	2.0	2.1	0.4	100.0	...
Adjusted hours lost	1.6	1.7	1.8	1.8	1.8	0.2	...	100.0
Illness	0.4	0.4	0.5	0.5	0.5	0.1	21.1	39.3
Personal or family responsibilities	0.2	0.1	0.2	0.2	0.2	0.0	6.0	11.2
Maternity leave	0.1	0.2	0.2	0.2	0.2	0.0	8.0	14.9
Vacation	0.7	0.8	0.7	0.7	0.7	0.0	1.2	2.2
Other	0.2	0.2	0.3	0.3	0.3	0.1	17.4	32.3
Statutory holidays	0.0	0.1	0.1	0.2	0.2	0.2	46.2	...

Source: Labour Force Survey
1 The adjustment consists essentially of removing statutory holidays.

Again in the case of full-time employees, the second-ranking factor in the increase in hours of absence was vacation leave, which accounted for 23% of the increase. This is probably partly related to an aging workforce, as older workers are generally entitled to more leave; in fact, 70% of the increase in vacation leave was attributable to workers aged 45 and over.

By the same token, with inflation remaining at relatively low levels over the past several years, union demands have focused less on wages than on job protection (Fortin 2003) and on improvements to fringe benefits. Indeed, some employers use both wages and employment conditions to attract the best workers (Akyeampong 2002).[15] The increase in vacation leave is probably also partly attributable to these new union demands, which are oriented more toward a better balance between work and personal life. The increase in leave for personal or family responsibilities—which, while more modest, nevertheless explained just over one-tenth of the overall increase in hours lost—is likely also part of this trend.

The increase in absences for 'other' reasons explained 17% of the increase in hours lost for full-time employees and reflects numerous disruptive events that

Table 3 Components of actual hours worked for full- and part-time employees

						Change, 2000 to 2003		
							Contribution	
	2000	2001	2002	2003	2004	Total	Before adjustment	After adjustment
							%	
Full-time								
Usual hours	39.7	39.7	39.6	39.5	39.5	-0.2	11.2	23.6
Overtime	1.9	1.9	2.1	2.0	1.9	0.1	-4.3	-9.0
Hours lost	4.1	4.8	4.9	5.4	5.1	1.3	93.1	...
Adjusted hours lost	3.8	4.2	4.3	4.4	4.3	0.6	...	85.4
Actual hours	37.5	36.8	36.8	36.1	36.3	-1.4	100.0	...
Adjusted actual hours	37.7	37.4	37.4	37.1	37.1	-0.7	...	100.0
Part-time								
Usual hours	17.3	17.4	17.4	17.4	17.5	0.1	-22.0	-50.9
Overtime	0.5	0.5	0.5	0.5	0.5	0.0	-0.8	-1.8
Hours lost	1.6	1.9	1.9	2.0	2.1	0.4	122.8	...
Adjusted hours lost	1.6	1.7	1.8	1.8	1.8	0.2	...	152.7
Actual hours	16.2	16.1	16.0	15.9	15.9	-0.3	100.0	...
Adjusted actual hours[1]	16.2	16.2	16.1	16.1	16.1	-0.1	...	100.0

Source: Labour Force Survey
1 Actual hours in this table are calculated using adjusted hours lost and do not correspond with those in Table 4.

occurred in 2003. Ontario was especially hard hit by the power blackout in August as well as the appearance of a number of SARS cases. For its part, British Columbia found itself in the grip of numerous forest fires and several floods, while Canadian businesses were forced to adjust to strong appreciation in the Canadian dollar.

The increase in time lost because of illness was also substantial, explaining 19% of the total increase in hours lost between the two years. Aging did not appear to be the only cause of the rise, at least for men, since only 36% of the increase in time lost because of illness was attributable to male workers aged 45 and over. For women, the figure was 70%.

For part-time employees, the increase in absences because of illness and for other reasons accounted for the lion's share of the increase in hours lost (72%). Not surprisingly, maternity leave, personal or family responsibilities, and vacations explained only 28% of the increase, since part-time employees are not widely covered for these types of leave.[16]

In summary, the increase in hours lost for full-time workers seems largely attributable to the increased presence of older workers, who have more fringe benefits. Also, workers in general appear to be assigning more value to employment conditions that favour a better balance between work and personal life, since the combined increase in maternity leave and leave for personal or family responsibilities accounts for more than 40% of the overall increase in hours lost. A major proportion of part-time employees have already by definition struck this balance, since for most of them, working part time is a matter of choice.[17]

Other factors

A regression model was used to examine factors such as the increased proportion of employees working part time, aging, region of residence (province and urban/rural area), the temporary nature of the job, student status, and occupation and industry in order to test their effects on the decrease in average actual hours worked.

Table 4 Proportion of part-time employees and average actual hours

	Part-time workers			Average hours					
				Full-time			Part-time		
	Both sexes	Men	Women	Both sexes	Men	Women	Both sexes	Men	Women
	%			Hours					
1987	15.7	7.9	25.6	37.2	38.9	34.5	15.5	14.8	15.7
1988	15.9	8.1	25.7	37.9	39.7	35.1	15.6	15.1	15.8
1989	15.8	8.1	25.3	38.4	40.2	35.5	15.8	15.0	16.2
1990	16.2	8.6	25.5	37.8	39.6	35.1	15.7	14.9	16.0
1991	17.4	9.5	26.7	37.4	39.2	34.7	15.4	14.9	15.6
1992	17.6	9.8	26.8	36.8	38.8	34.0	15.3	14.9	15.5
1993	18.2	10.4	27.4	37.6	39.6	34.5	15.5	15.1	15.7
1994	18.0	10.1	27.4	38.0	40.2	34.8	15.7	15.2	15.9
1995	17.8	10.0	27.0	37.7	39.8	34.6	15.7	15.1	16.0
1996	18.1	10.0	27.5	38.0	40.2	34.9	15.9	15.3	16.1
1997	18.0	9.7	27.6	38.0	40.2	34.7	16.2	15.8	16.4
1998	17.6	9.6	26.9	37.5	39.7	34.4	16.4	16.0	16.5
1999	17.3	9.5	26.3	37.8	40.0	34.6	16.5	15.9	16.7
2000	17.2	9.6	25.9	38.0	40.2	35.0	16.5	16.0	16.8
2001	17.3	9.9	25.8	37.2	39.3	34.2	16.5	16.0	16.7
2002	17.8	10.2	26.3	37.1	39.3	34.1	16.3	16.1	16.4
2003	18.0	10.3	26.5	36.5	38.7	33.5	16.2	16.0	16.4
2004	17.7	10.2	26.0	36.8	39.2	33.6	16.2	16.0	16.3

Source: Labour Force Survey

Between 2000 and 2003, the proportion of employees working part time went from 17.2% to 18.0%. However, the proportion dipped to 17.7% in 2004. The increase in part-time work was greater for men, with their proportion rising from 9.6% to 10.3% in 2003 and 10.2% in 2004. For women, it rose from 25.9% in 2000 to 26.5% in 2003, then declined to 26.0% in 2004 (Table 4).

This increased propensity for part-time work accounted for 20%[18] of the drop in average hours, a sizeable share. Once again, it would be tempting to say that aging is a factor. For women, the increased propensity was more pronounced for the older age groups. For men, however, it was distributed among most age groups. The explanation could therefore be a lack of full-time jobs, since a larger share of young men take part-time work by necessity. It could also be that some of these young men are students, making it impossible to rule out the hypothesis of an increased preference for a better balance between work and personal life.

Variables such as occupation and industry do little to explain the decline in hours. However, what little these variables add would seem to show that a small part of the decline in hours is attributable to some transfer of jobs from occupations and industries with relatively high hours to ones requiring fewer hours.

Did the reference week bias have an effect in the past?

Since the degree of representation of statutory holidays in the reference week has a major impact on the trend in hours between 2000 and 2003, it is legitimate to ask whether such a bias occurred in the past. Hours actually worked were adjusted starting in 1987 (Chart D).

A comparison of adjusted and unadjusted hours shows that similar patterns occurred in the past. One of the most important took place in the early 1990s. In 1989 and 1990, few statutory holidays were captured by the LFS (see the second table in *Definitions and the reference week*).[19] The adjustment of hours actually worked therefore

Labour force surveys in other countries

The United States Current Population Survey (CPS), like the LFS, collects monthly employment data for a reference week. Reference-week biases are therefore also unavoidable. However, CPS reference weeks are chosen to avoid most statutory holidays except Easter. As a result, annual hours worked are considerably overestimated. As part of a research project to compare productivity changes, Statistics Canada made similar statutory holiday adjustments to the American data. Because of the greater overestimation in the United States, the changes in their figures were larger.

Average annual hours in Canada and the U.S.

	Unadjusted hours		Adjusted hours		Gap	
	Canada	United States	Canada	United States	Canada	United States
					%	
1994	1,814.8	1,945.1	1,768.4	1,856.4	2.6	4.6
1995	1,799.2	1,952.3	1,766.5	1,850.9	1.8	5.2
1996	1,814.8	1,950.6	1,778.9	1,865.8	2.0	4.3
1997	1,814.8	1,965.9	1,774.8	1,870.0	2.2	4.9
1998	1,799.2	1,956.8	1,774.0	1,873.4	1.4	4.3
1999	1,814.8	1,975.8	1,777.1	1,878.0	2.1	4.9
2000	1,825.2	1,954.3	1,773.5	1,889.2	2.8	3.3
2001	1,788.8	1,928.0	1,762.1	1,876.3	1.5	2.7
2002	1,778.4	1,957.8	1,745.0	1,867.3	1.9	4.6

Ideally, a weekly labour force survey would provide better estimates, with no reference-week bias. New surveys in the European Union use such an approach. The surveys use reduced samples that cover each week. Monthly estimates are then produced. This approach obviously entails major changes in methodology and operations, as well as presentation of the data. (For more information, see *The European Union labour force survey*, published June 2005 by Eurostat and available on their Web site.)

had little effect during these years. Starting in 1990, the economic slowdown was apparent; hours (adjusted or otherwise) decreased substantially. In 1992, several statutory holidays were captured by the LFS (Good Friday, Thanksgiving and Remembrance Day).[20] The adjustment of actual hours therefore had more of an effect in 1992, significantly raising the number of hours worked. Unadjusted actual hours between 1990 and 1992 indicate a much larger drop than the adjusted hours.

Subsequently, from 1994 to 1999, adjusted and non-adjusted hours increased substantially and at the same pace. Starting in 2000, growth was slower, for both adjusted and non-adjusted hours. (For a description of the methodology used by the United States and the European Union, see *Labour force surveys in other countries*.)

Impact of hours on productivity

The reference week bias in hours actually worked affects not only the reading of labour market indicators but also labour productivity, since the latter reflects production per hour actually worked. Unless LFS hours are adjusted for various captured and non-captured holidays, the productivity measure would indicate spurious changes and would give an erroneous measure of economic efficiency. For this reason, before productivity is calculated, several adjustments are made to hours actually worked (see *Adjustments made by the Canadian Productivity Accounts* and Maynard 2004).

The adjusted hours are usually lower than non-adjusted hours (Table 5). The difference may amount to as much as 12.4 days annually (1989). Adjusted annual hours also fluctuate much less. For example, between 1987 and 2004, they ranged between -1.1% and 0.8% compared with -2.0% to 1.5% for unadjusted hours.

The effect of using unadjusted hours in calculating productivity was also measured. Taking unadjusted hours as the denominator, labour productivity in 2001 would be overestimated by 1.5%. This overestimation would amount to an average of 0.9% per year between 2000 and 2003 and 0.6% between 1989 and 1993. However, over the long term (1987 to 2004), the effect is marginal (0.1%).

Conclusion

Between 2000 and 2003, the LFS estimate of annual average hours of work gradually declined by 70 hours, or the equivalent of two weeks of work. This decline was surprising, since employment continued to be uncommonly strong despite slower economic growth than in the late 1990s. This strength contrasted with the stagnation of employment in the United States. Some analysts therefore questioned the strength of the labour market during these years.

Adjustments made by the Canadian Productivity Accounts

The Canadian productivity accounts adjusts hours aggregated by industry and class of worker, using more steps than in this article.

In the LFS, the annualization of hours consists primarily of summing the hours for the 12 reference weeks. In the productivity accounts, hours are adjusted in four steps. A first adjustment neutralizes the effect of the holidays on reference weeks by adding hours of absence to actual hours. Next, a linear interpolation of the 'standardized' hours of reference weeks is done to produce estimates for all the weeks of the year. Then estimates are produced of the hours of absence related to statutory holidays and some vacations during weeks other than survey reference weeks for all employed persons, for all their jobs. These hours of absence are then subtracted from the 'standardized' actual hours. These adjustments give a better estimate of hours actually lost because of statutory holidays, since they add back the hours that should not have been subtracted and deduct hours actually lost annually for all the statutory holidays in each province.

Hours are also adjusted for vacations, since in some provinces, reference weeks coincide with vacations in particular industries, such as the construction industry in Quebec. A final adjustment is made to account for the day of the week that a calendar year starts.

This yields the hours actually worked for each of the 52 weeks of the year for all employed persons at all their jobs. These adjusted totals are published in *The Canadian Productivity Accounts* of Statistics Canada. Thus, data are available on the hours of self-employed workers and employees by province or territory for a detailed industry level. For more information, see Maynard 2004 and Statistics Canada 2005.

More than half of the decrease was in fact due to survey methodology. The under-representation of some statutory holidays led to an overestimate of annual average hours worked in 2000 and thus, by comparison, an exaggerated drop in hours in the next three years. Similar patterns have occurred previously, notably between 1989 and 1992.

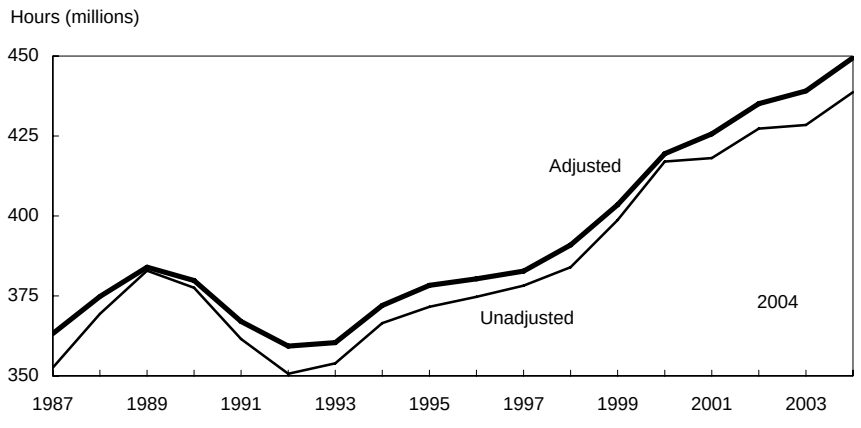
Once adjusted to eliminate the statutory holiday bias, the decline amounted to an average of one week annually per employee instead of two. Two-thirds of the decrease in adjusted hours came from an increase in hours lost for other than statutory holidays. This increase in hours lost was attributable to the aging of the workforce, since a major portion of the increase was seen among workers aged 45 and over.

However, aging was not the only factor. Increases in time off for vacation and for personal or family responsibilities, as well as changes to EI that resulted in more weeks of maternity, parental and adoption benefits as of December 31, 2000, also contributed, reflecting the greater value assigned to a better balance between work and personal life. The increased propensity to work part time, which was more pronounced among men in all age groups, could also be seen as reinforcing this trend.

In addition, 2003 was disrupted by several unfortunate events: the August power blackout in Ontario, concerns about a possible SARS epidemic, and forest fires and floods in British Columbia. Combined with the substantial appreciation of the Canadian dollar, these events led to an increase in work absences for other reasons, which accounted for nearly one-fifth of the total increase in hours lost.

Thus the decrease in adjusted hours did not seem to reflect a lack of economic vitality, but rather the aging of the workforce and the greater value assigned to a better balance between work and personal life.

Chart D Removing the statutory holiday bias reduces the fluctuation in annual work hours.



Source: Labour Force Survey, 1987 to 2004

Table 5 Average annual hours per employee, before and after adjustment, and effect of adjustment on labour productivity[1]

	Hours		Difference in		Actual hours growth		
	Unadjusted	Adjusted	Annual Hours	Days	Unadjusted	Adjusted	Effect on labour productivity[3]
					%		
1987	1,804.4	1,767.9	36.5	4.9	...	...	...
1988	1,830.4	1,771.4	59.0	7.9	1.4	0.2	-1.2
1989	1,856.4	1,763.6	92.8	12.4	1.4	-0.4	-1.9
1990	1,830.4	1,753.3	77.1	10.3	-1.4	-0.6	0.8
1991	1,794.0	1,733.7	60.3	8.0	-2.0	-1.1	0.9
1992	1,768.0	1,735.3	32.7	4.4	-1.4	0.1	1.5
1993	1,788.8	1,738.3	50.5	6.7	1.2	0.2	-1.0
1994	1,814.8	1,745.3	69.5	9.3	1.5	0.4	-1.1
1995	1,799.2	1,746.0	53.2	7.1	-0.9	0.0	0.9
1996	1,814.8	1,759.5	55.3	7.4	0.9	0.8	-0.1
1997	1,814.8	1,754.2	60.6	8.1	0.0	-0.3	-0.3
1998	1,799.2	1,753.7	45.5	6.1	-0.9	0.0	0.8
1999	1,814.8	1,759.2	55.6	7.4	0.9	0.3	-0.6
2000	1,825.2	1,754.3	70.9	9.5	0.6	-0.3	-0.9
2001	1,788.8	1,745.0	43.8	5.8	-2.0	-0.5	1.5
2002	1,778.4	1,732.1	46.3	6.2	-0.6	-0.7	-0.2
2003	1,747.2	1,725.5	21.7	2.9	-1.8	-0.4	1.4
2004	1,762.8	1,742.0	20.8	2.8	0.9	1.0	0.1
1989 to 1993[2]	1,808.0	1,745.0	63.0	8.4	-0.9	-0.4	0.6
2000 to 2003[2]	1,784.2	1,738.9	45.3	6.0	-1.5	-0.6	0.9
1987 to 2004[2]	1,800.8	1,748.5	52.3	7.0	-0.1	-0.1	0.1

Sources: Labour Force Survey; Micro-economic Studies and Analysis Division

1 The adjustments are for various provincial holidays and for the vacation of construction workers in Quebec.

2 Geometric mean of the average annual growth rate of adjusted and unadjusted hours in 2000 and 2003.

3 This column looks at the overestimation or underestimation of labour productivity if actual hours are not adjusted. For example, between 2000 and 2001, productivity growth would have been overestimated by 1.5% if unadjusted hours had been used instead of adjusted ones.

Nonetheless, unless adjusted, the LFS estimate of hours actually worked often introduces a bias that can distort interpretation of labour market conditions. A comprehensive adjustment is produced regularly at Statistics Canada in the Canadian Productivity Accounts program. The Current Population Survey, the American counterpart of Canada's LFS, uses virtually identical procedures, so their estimates also contain a reference-week bias. On the other hand, new labour force surveys by nations in the European Union gather their data weekly from reduced samples, nullifying this bias.

Notes

1 This is the definition of usual hours used since January 1997. Prior to that, usual hours included any overtime hours usually worked by the survey respondent during a normal workweek, regardless of whether those hours were remunerated. Usual hours are used to calculate hourly wage rates.

2 Actual hours are used to calculate productivity and the hourly cost of labour.

3 In 2000, the system was new, and messages reminding respondents of the Thanksgiving and Remembrance Day holidays did not function. As a result, the LFS greatly underestimated the hours lost that year because of these holidays.

4 Self-employed workers report only absences of one week or more. Employees additionally report absences for part of a week. In this article, total hours lost cover both types of absence. Therefore, self-employed workers are excluded.

5 It is important to distinguish between average hours per employee and total hours. Total hours continued to grow between 2000 and 2003, since employment increased. However, they grew less rapidly, and hence the decrease in average hours.

6 Other reasons include time lost because of weather, strikes, lockouts, temporary layoffs, job starting or ending during the week, lack of material, or maintenance and repair of work premises.

7 Hours lost are annualized by multiplying weekly hours by 52 and by dividing the result by 7.5 hours per day.

8 From January to October, the LFS reference week includes the 15th day of the month. In December, the reference week is moved ahead to avoid having interviews take place during the weeks prior to Christmas. The same is usually done for November so that at least three weeks will separate the November and December interviews (David 1989).

9 Some holidays occur on a fixed date (Christmas, New Years Day, Remembrance Day) while others are variable (Civic Holiday, Good Friday). Some workers are penalized when fixed-date holidays fall on a weekend.

10 Not all workers are given this holiday, but most provincial and federal employees are. (See second table in *Definitions and reference week*.)

11 For further details, see *Definitions and reference week*.

12 The adjustment consisted of adding hours lost for statutory holidays to actual hours of work. An additional adjustment was made for 2000, when the LFS reference week did not take place during the vacation of construction employees in Quebec, whereas in 2003, those vacation weeks were captured. In this case, the hours lost to vacation are estimated on the basis of usual hours. The average actual hours thus adjusted are slightly overestimated, since hours lost to statutory holidays are considered as having been worked, whereas in realty, this is not the case. However, this adjustment eliminates the bias caused by the reference week, and the numbers of hours may therefore be compared without risk of error.

13 The years 2000 and 2003 represent the peak and trough respectively of average actual hours. The rest of the article examines differences between these two years to explain the decline in hours.

14 Only women can report hours of absence owing to maternity leave. Men can take parental leave, which is captured in leave for personal or family responsibilities.

15 Some laws have reinforced this effect, such as the Quebec legislation that gradually lowered the standard workweek from 44 hours in 1998 to 40 hours in 2002. A similar regulation in Ontario established a ceiling of 48 hours, including overtime.

16 An Oaxaca decomposition model was used to see whether the increase in hours lost was more concentrated in specific industries and occupations or the result of a transfer of employment from some industries and occupations with low levels of hours lost toward industries and occupations with high levels. However, the model showed that the increase was broadly based. The decomposition was done by estimating a linear regression model with the average number of hours of absence per week as the dependent variable and the following independent variables: age group, sex, temporary employee status, student status, province of residence, rural/urban area, occupation and industry.

17 The proportion of employees working part time by choice was more than 70% in 2000 and in 2003.

18 This estimate of 20% was obtained through a series of ordinary least squares regressions in which the dependent variable was an average of the number of adjusted actual hours for the years 2000 and 2003 combined. In the first regression, a single dependent variable was used, namely a dichotomous variable taking the value 1 in the case of data for 2003 and 0 otherwise. In a second regression, the proportion of part-time employees was added. The coefficient of the dichotomous variable then declined by 20%, meaning that the growing proportion of part-time employees explains 20% of the decrease in hours. The third regression included the variables in the second regression as well as province and the rural/urban nature of the area of residence. A fourth regression included all variables in the third regression as well as occupation and industry, the temporary or non-temporary nature of the job, and student status. The coefficient for Model 5 was -0.54, or 31% less than that of the first model, which shows that adding all the variables in models 3, 4 and 5 managed to add only about 10 percentage points more than Model 2 to explaining the drop in hours.

19 In 1989 and 1990, the only holiday captured was Remembrance Day. Also, this holiday fell on the weekend in both these years. When Remembrance Day falls on the weekend, it often has less impact on hours lost, since eligible employees would carry the holiday over to the following Monday.

20 In 1992, Remembrance Day fell on a weekday. Also, the July reference week took place during the vacation period for Quebec construction workers, reducing actual hours for that month.

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