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Article abstract

Using monthly data from the Canadian Labour Force Survey, the author investigates changes in the complete duration of new job spells from 1981 through 1996. While the average complete length of new jobs did not increase or decrease over the period, investigation of the distribution of complete job lengths reveals two important changes. First, the probability that a new job would end within 6 months rose during the 1980s, but then reversed during the 1990s, meaning that there was important change over the period as a whole. Second, the conditional probability that a job that had lasted 6 months would continue on past 5 years rose through the whole period. This pattern of change was found among virtually all demographic subgroups examined, suggesting that an economy-wide (rather than a sectoral or demographic) explanation must be sought.

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Using monthly data from the Canadian Labour Force Survey, the author investigates changes in the complete duration of new job spells from 1981 through 1996. While the average complete length of new jobs did not increase or decrease over the period, investigation of the distribution of complete job lengths reveals two important changes. First, the probability that a new job would end within 6 months rose during the 1980s, but then reversed during the 1990s, meaning that there was little net change over the period as a whole. Second, the conditional probability that a job that had lasted 6 months would continue on past 5 years rose through the whole period. This pattern of change was found among virtually all demographic subgroups examined, suggesting that an economy-wide (rather than a sectoral or demographic) explanation must be sought.

It is widely thought that steady long-term employment is becoming less common. Considering other changes in the economy, such as the rise in non-standard work (Economic Council of Canada 1991, Christofides and McKenna 1995, and Shellenberg and Clark 1996), the rise in earnings inequality (Picot, Myles and Wannell 1990, and Morrissette, Myles and Picot 1993), and the increasing use by firms of a core of permanent employees supplemented by peripheral short-term workers (Osberg, Wein and Grude 1994), this perception may not be unfounded. Knowing the state of job durations (or job tenure) in Canada is important as it affects the welfare of workers. In a long-term job, a worker has more chance to build up job skills, attain a high wage and enjoy career advancement opportunities. Short-term

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- This is a revised version of a paper presented to the Canadian Economics Association meetings held at the UQAM in June 1995 (Heisz 1995). Earlier versions of this paper were published as Heisz (1996a, 1996b). The contents of the paper are the sole responsibility of the author, and in particular are not to be attributed to Statistics Canada.

jobs expose workers to more spells of unemployment, make it more difficult to accumulate a pension, and increase the need for mid-career retraining.

This paper addresses the question of changing job tenure in Canada by asking whether job instability is on the rise. Are short-term jobs becoming more common? Are long-term or "lifetime" jobs becoming less common, and if so, for whom? These questions are explored by estimating the average complete length of a new job over the period 1981 to 1996. To the extent that the average job created over the period has become longer or shorter, it may be said that we have more or less job stability. It is also possible that the frequency of short-term and long-term jobs could change, leaving the average length of jobs unchanged. Thus, we also examine the distribution of complete job lengths from 1981 to 1996.

Up to now, much of the literature has worked either with measures of job tenure that are inappropriate for the study of changes in job stability, or with changes in the stability of relatively long-term jobs of four or more years in length. This study contributes to the literature on job tenure in at least three ways. First, it introduces a complete job length statistic which can be used to provide insights into job stability in Canada and elsewhere. Second, it is the first study to examine changes in Canadian job tenure directly via changes in job survival functions. Third, the study is unique in its detailed characterization of the survival function, particularly for jobs of short tenure. This makes it possible to assess the importance of changes in short- and medium-term jobs in understanding job stability.

MEASURING JOB LENGTH AND STABILITY

Researchers have identified at least three fundamentally different ways to measure the length of job spells. These can be described with reference to Hasan and de Broucker (1985) (table 1). The first, which we call the *interrupted length of in-progress jobs,* describes the length of an ongoing job up to the date at which it was observed by a cross-sectional survey. Clearly, this measure does not give the complete length of a job, but only the amount of time the job has lasted up to the date of the survey. The spell is truncated, or right censored: a job sampled in such a way may last many more years, or may end the next day. This is the measure most commonly made available by statistical agencies, including Statistics Canada and the U.S. Bureau of Labor Statistics. Although it does not report the complete length of spells, this measure is useful for describing the tenure experience of the currently employed. Hasan and de Broucker reported this statistic as 7.4 years for 1980 using Canadian data.

TABLE 1

Alternate Measures of the Length of Job Spells

		Average Job Length (years)
Interrupted length of in-progress jobs[a]		7.4
Complete length of in-progress jobs[b]	– Doubling approach	14.8
	– Retention rate approach	13.6[c]
Complete length of a new job[a]		2.0

Source: Hasan and de Broucker (1985) a: 1980 b: 1981 c: Computed by the author from data supplied in Hasan and de Broucker (1985: table 6–7).

A second measure of job tenure we call the *complete length of in-progress jobs*. An early example of the estimation of this statistic is was Akerlof and Main (1981) who noted that, in a steady state, the complete length of a job spell sampled in-progress is simply twice its interrupted length. Hasan and de Brouker (1985) reported this spell length to be 14.8 years for all individuals currently employed in 1980. A more recent example of the computation of complete job lengths using this method is Christofides and McKenna (1993, 1995), who used longitudinal data from the 1986–87 and 1988–90 panels of the Canadian Labour Market Activity Survey (LMAS). The estimated complete length of jobs sampled in-progress fell between the two panels from 14.5 years to 14.0 years.

An alternate way of estimating the complete length of in-progress jobs was developed by Hall (1982) with extensions by Ureta (1992). These studies applied methods developed for the study of unemployment spell lengths to the study of job spells. The central concept of this methodology is the *retention rate*, which is the conditional probability that a job will continue for some specified period of time, given that it has reached a certain tenure. Denoting the amount of tenure the worker has already experienced as t, the time as c and the retention rate $R_{t,c}$, the retention rate can be derived using two consecutive surveys as

$$R_{t,c} = N_{t,c}/N_{t-1,c-1}. \tag{1}$$

This is simply the number of respondents reporting tenure of t in the present survey divided by the number of respondents reporting tenure of

t–1 in the previous survey.[1] $R_{t,c}$ is one minus the hazard rate, and a full set of retention rates defines a survival function. The computation of the retention rate is an application of the *synthetic cohort* approach, so named because representative individuals from the same cohort (rather than the same specific individuals) are sampled for the numerator and denominator. Using retention rates, Hall was able to add an estimate of remaining tenure to the distribution of interrupted spells available from Current Population Survey (CPS) supplements, and thereby generate a distribution of complete job lengths. Hall's methodology was applied by Hasan and de Broucker (1985) using Canadian data from the Labour Force Survey (LFS) for 1981. This approach has the advantage over the simpler "doubling" method used by Akerlof and Main since it allows for the computation of the full distribution of complete job spells, although the average is similar at 13.6 years. These statistics rightly prompted the conclusion that the majority of time spent employed is in long-term jobs.

Although useful, the distribution of in-progress spells, either in its interrupted or complete form, is inappropriate for examining changes in job tenure over time. To illustrate this point, consider the following formula for the average interrupted job length:

$$\textit{Average Interrupted Job Length}_c = \frac{\sum_{t=1}^{n} N_{1,\,c-t}\; S_{t,\,c-t} \cdot t}{\sum_{t=1}^{n} N_{1,\,c-t}\; S_{t,c-t}} \qquad (2)$$

$N_{1,c-t}$ is the number of workers starting jobs in period $c-t$ and $S_{t,c-t}$ is the survival rate, or the probability that a job which begins at time $c-t$ will last at least t periods. The average interrupted job length in period c, is affected by the level of inflows in all previous periods in which someone currently with a job became employed, and all the respective survival rates in those periods. In a similar manner, the average complete job length of the currently employed is also affected by changes in past inflows and survival rates. This causes difficulties in interpreting changes over time in either of these statistics.

It is also important to note that the distribution of completed in-progress spells is an upwardly biased distribution of spell lengths. In a point-in-time survey, the probability of sampling a spell is proportionate to its length,

1. Hall (1982), computed retention rates using a single cross section of data. Ureta (1992) demonstrates that retention rates calculated from a single survey are biased. To illustrate this, consider a retention rate $R'_{t,c}$ computed from a single cross-sectional survey:

$$R'_{t,c} = N_{t,c}/N_{t-1,c},$$

Assuming a stable survivor function, $R'_{t,c}$ will be biased if $N_{t-1,c} \neq N_{t-1,c-1}$ which will occur if inflows to new jobs are changing.

making the distribution of in-progress jobs heavily weighted by long spells. As a result, Akerlof and Main (1981) refer to these measures as "experience weighted" since each job spell is weighted by its length. Akerlof and Main (1981), Hall (1982), and Hasan and de Broucker (1985) argue that this is the appropriate distribution to study since it reflects the average experience of the employed. A discussion of how measuring spells in this way under-represents the importance of short spells in the context of measuring unemployment durations is provided by Carlson and Horrigan (1983).

In this paper we focus on a third measure of job spells, which we call the *complete length of a new job*. Using a simple steady state approach and the restrictive assumption that retention rates are identical for all interrupted tenures, Hasan and de Broucker (1985) found that the average new spell in 1980 lasted just 2.0 years, illustrating the well-known fact that while most time spent employed may be in long spells, the majority of job spells are quite short. An alternate method to derive this statistic, one which we employ in this paper, follows from Sider (1985), Baker (1992), and Corak and Heisz (1996) who applied it to the study of unemployment spells. This approach has the advantage that it does not rely on the restrictive steady state assumption. Again, the central concept underlying this methodology is the *retention rate*. Given a full set of retention rates, the expected average complete job length for a group of individuals who begin their jobs at the same time is defined to be:

$$AvgLength_c = \sum_{i=1}^{n} \prod_{t=1}^{n} R_{i,c} \cdot \qquad (3)$$

This equation is the discrete time version of the result that in continuous time the average duration of new job spells equals the integral of the survivor function.[2] It measures the average length of time a group of workers who just begin their jobs will remain employed, assuming that they face the same economic conditions as currently prevail for the remainder of their jobs.[3]

2. See Baker and Trivedi (1985) for more details.

3. The first element of equation (3) is one and n=420. In practice, sample size limitations dictate that tenure intervals longer than one month be used for retention rates. For the longest part of the distribution of interrupted job lengths there are sufficiently few responses to require interval widths of up to 5 years. Specifically, 16 retention rates are calculated over the period 1976 to 1996. The retention rates are derived based upon the following ratios:

$R_{1,c}$	=	3–4	months tenure in month c	to	1–2	months tenure in month c–2
$R_{2,c}$	=	5–6	months tenure in month c	to	3–4	months tenure in month c–2
$R_{3,c}$	=	7–8	months tenure in month c	to	5–6	months tenure in month c–2
$R_{4,c}$	=	13–18	months tenure in month c	to	7–12	months tenure in month c–6
$R_{5,c}$	=	25–36	months tenure in month c	to	13–24	months tenure in month c–12

In a similar manner we can use retention rates to compute the distribution of complete job lengths for the newly employed. Let $E_{t,c}$ be the proportion of jobs which end in the interval *(t-1,t)* at time *c*. This can be estimated by subtracting the proportion of new jobs that survived longer than t from the proportion of new jobs which survived longer than *t-1*. Since the proportion of new jobs which survive longer than t is $\prod_{i=1}^{t} R_{i,c}$ then:

$$E_{t,c} = \prod_{i=1}^{t-1} R_{i,c} - \prod_{i=1}^{t} R_{i,c} \cdot \qquad (4)$$

This requires the same assumptions to be made as for the average complete length of a new job statistic. $E_{t,c}$ represents the proportion of jobs which end in the interval *(t-1,t)* given that the present economic conditions remain unchanged through the life of the spells.

The *complete length of a new job* statistic is useful for measuring the length of job spells because it is not biased in favour of longer jobs. Also, in contrast to job length estimates derived directly from the distribution of in-progress spells, the complete length of a new job spell, as defined in equation (3) and (4), relies upon retention rates generated from the current and most recent periods and avoids problems in interpretation caused by

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$R_{6,c}$ = 37–48 months tenure in month c to 25–36 months tenure in month c–12
$R_{7,c}$ = 49–60 months tenure in month c to 37–48 months tenure in month c–12
$R_{8,c}$ = 61–72 months tenure in month c to 49–60 months tenure in month c–12
$R_{9,c}$ = 85–108 months tenure in month c to 61–84 months tenure in month c–24
$R_{10,c}$ = 109–132 months tenure in month c to 85–108 months tenure in month c–24
$R_{11,c}$ = 133–156 months tenure in month c to 109–132 months tenure in month c–24
$R_{12,c}$ = 157–180 months tenure in month c to 133–156 months tenure in month c–24
$R_{13,c}$ = 181–204 months tenure in month c to 157–180 months tenure in month c–24
$R_{14,c}$ = 241–300 months tenure in month c to 181–240 months tenure in month c–60
$R_{15,c}$ = 301–360 months tenure in month c to 241–300 months tenure in month c–60
$R_{16,c}$ = 361–420 months tenure in month c to 301–360 months tenure in month c–60

For the purpose of computing average tenure of new jobs, these retention rates are converted to monthly equivalents by raising them to the inverse of their respective interval width. This assumes that monthly retention rates are constant within the interval.

These retention rates can in turn be converted to broader widths by multiplying them together. For example, the probability of a job lasting to beyond 6 months at time c given as $R_{1,c} \times R_{2,c} \times R_{3,c}$. Similarly the conditional probability of a job lasting to beyond 5 years given that it lasts to 6 months is $R_{4,c} \times R_{5,c} \times R_{6,c} \times R_{7,c} \times R_{8,c}$.

Because few respondents report more than 360 months of tenure, retention rates beyond 360 months are not computed. This is done for methodological convenience, but since this represents a small tail of the tenure distribution this is not expected to affect results. Corak and Heisz (1996) have shown that it is important when using this method to have narrow intervals for the densest part of the distribution, which in this case is at the shorter tenures.

changes in past inflows and survival functions.[4] As a result, it is also more appropriate than alternate measures of job lengths for investigating changes in job tenure over time.[5] Except when explicitly stated, the remainder of the paper will deal with the complete length of new jobs.

Most recent studies have sidestepped the issue of estimating average job lengths and followed one of three approaches. Farber (1995) and Green and Riddell (1995) look at changes in the distribution of interrupted job tenures in the U.S. and Canada respectively, even though, as noted above, changes in this distribution are hard to interpret. Examining Canadian data from 1979 to 1991, Green and Riddell (1995) observe a tendency towards shorter job spells, particularly for the younger and less educated, as well as declines in the proportions of in-progress jobs lasting 6 to 10 years and increases in the proportion of workers in 11- to 20-year-old jobs. Picot and Lin (1997) examine the probability a Canadian worker will experience a permanent layoff over the period 1978 to 1993 and find that this probability has not changed substantially. Diebold, Neumark and Polsky (1994) and Swinnerton and Wial (1995) focus directly upon changes in retention rates, but each research group, using similar data from the U.S. Current Population Survey (CPS) reaches a different conclusion. Diebold, Neumark and Polsky (1994) find that four-year retention rates are quite stable while Swinnerton and Wial (1995) find a significant drop in 4-year rates over the 1980s. A subsequent communication by Diebold, Neumark and Polsky (1996) found the latter results to be in error because of sample selection problems and small differences in methodology. They found that four-year retention rates overall were 0.52 in 1983 and 0.51 in 1987 implying no overall decline in job stability. This conclusion is maintained when workers are stratified by current tenure. As we show later, most job spells last less than 4 years so this statistic may be missing potentially important changes in job stability.

In this study we compute the average complete length of a new job and the distribution of new job lengths for the period 1981 through 1996. The tenure t is obtained from the Canadian Labour Force Survey (LFS) as

4. As noted in footnote 3, because we use intervals longer than one month, our estimate will be influenced by changes in past retention rates and inflows. However, the estimate for new job lengths is less susceptible to these biases than that of current job length. There are two reasons for this. First, most retention rates defined in footnote 3 require two or fewer years lag. Second, the effects of longer lags for retention rates at 15 years of tenure and longer are mitigated by the fact that very few new jobs reach tenures of this length. Nevertheless, the effects of wider intervals at long tenures should be sufficient to cause changes in this statistic to lag changes in the economy.

5. Application of (3) is not limited to predicting the job lengths of the newly employed. Since the statistic is composed of information from job holders drawn from the entire cohort of currently employed, changes in job stability for jobs of any length will be reflected in this statistic, as weighted by the probability that a new job will reach that length.

the number of consecutive months of interrupted work for the current employer.[6] This is available monthly for a representative sample of about 60,000 Canadians from 1976 to the present. The sample used for this study includes all full- and part-time paid workers, excluding the self employed, full-time students[7] and unpaid family workers. Although most comparable work in this subject has used U.S. data, Canadian data is better suited to the study of tenure for at least three reasons. First, Canadian tenure data is available monthly, compared to that in the U.S. which is available only in intervals of at least two years. This allows the computation of retention rates at narrower intervals than is possible with U.S. data and permits us to evaluate changes in job stability for shorter jobs. Second, the questions asked of Canadians have been consistent throughout the time frame, whereas in the U.S. the data series is broken by a change in the question between the 1981 and 1983 tenure supplements.[8] Third, in Canada the tenure questions are asked as part of the regular LFS, while in the U.S. they are asked in a supplement to the CPS, resulting in substantial non-response which does not occur in Canada.

CHANGES IN JOB STABILITY

Figure 1 portrays the average length of a new job from 1981 to 1994 for all workers in our sample. Over this period, new jobs lasted an average of 44.4 months (3.7 years).[9] Although the average length of jobs followed a cyclical pattern, varying from lows of 41.7 months in 1982 and 34.8 months

6. For multiple job holders, tenure is measured for the primary job. An absence of work due to vacation, illness, temporary layoff or other reason is not considered a break in employment unless the person leaves the job in the course of the absence. See Statistics Canada (1992).

7. Students include those full-time in the month of the survey, and, for the months of May to September, returning students. Returning students were full-time in March of the current calendar year and intended to return to school in the fall.

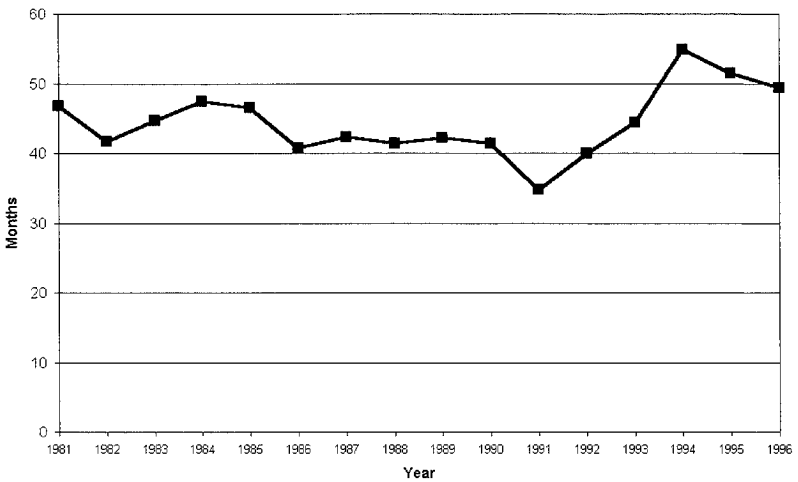
8. The question in Canada is more similar to the initial question asked in the U.S. In Canada, LFS respondents are asked: "When did ... start working for the current employer". This is shown by Diebold, Neumark and Polsky (1994) to supply less response bias than an alternate question, asked of U.S. respondents after 1983: "How long has ... been working for his present employer (or as self employed)". This latter question has been shown to produce a "heaping" of responses around regular intervals, such as 5 years. We find little sign of heaping in our data.

9. The average length of new jobs is much shorter than either the interrupted or complete measures of jobs sampled in-progress. The average interrupted job length over the period 1981–1996 was 7.5 years while the average complete job length was estimated to be 17.6 years. This illustrates the fact that, although new jobs tend to be short, most time spent employed is in long jobs.

in 1991 to peaks of 47.5 months in 1984 and 54.9 months in 1994, it showed no significant trend. In fact, average job duration rose slightly between recovery periods. The average new job lasted 44.9 months between 1983 and 1986 and 50.1 months between 1993 and 1996.

FIGURE 1

Average Complete Job Length, 1981 to 1996



Masked by the stability in the average lengths of jobs are important changes in the distribution of completed job lengths. This distribution is shown in figure 2, averaged across several points in the period. We observe two major changes in the distribution of new job lengths. The first is a shift towards more short-term jobs. From the 1980s through the 1990–92 recession, the proportion of jobs lasting 6 months or less increased from 44 percent in 1981–82 to 50 percent in 1983–89 and further to 54 percent in 1990–92. Following the recession of the early 1990s, this trend towards more short-term jobs reversed, and the probability that a new job would end within 6 months returned to 1983–89 levels.

The second important shift displayed in figure 2 is a trend away from medium-term jobs. The proportion of jobs which lasted between 6 months and 5 years dropped from 38 percent in 1981–82 to 32 percent in 1983–89 and to 29 percent in 1990–92, and 1993–96. Across this same period, the proportion of jobs estimated to last between 5 and 20 years and more than 20 years remained relatively unchanged. Between 1981 and 1992, 12 percent of jobs lasted between 5 and 20 years and 6 percent lasted longer

than 20 years. There were also small increases in the proportion of jobs that are long term in the 1993–96 period.

FIGURE 2

Distribution of Complete Job Lengths

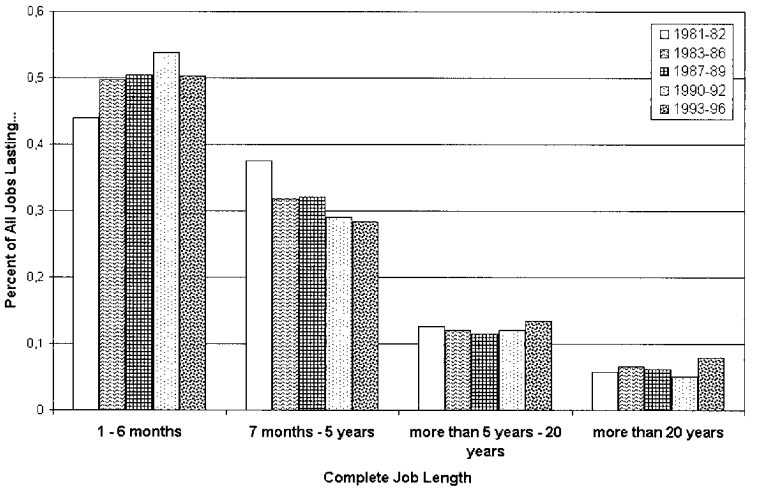


Figure 2 raises two questions: (1) focusing on the 1981–92 period, how is it that the proportion of long-term jobs remained stable even though the proportion of short-term jobs increased? and (2) what drove the increase in long-term jobs following the 1990–92 recession?

The answer to the first question is that once a job passed the 6-month milestone it had a better chance of becoming a long-term job at the end of the period than it did at the beginning. This is shown in figure 3 which shows the proportion of new jobs which go on to last beyond 6 months and the proportion of 6-month old jobs which go on to last more than 5 years. While the proportion of new jobs which lasted beyond 6 months declined up to 1993, the proportion of 6-month old jobs which lasted longer than 5 years increased from 33 percent during the 1980s recession, to 37 percent in the 1990s recession. These changes meant workers with more than six months of job seniority were enjoying increasing stability while at the same time the ranks of stable job holders were becoming more difficult to join.

To answer the second question: following the 1990–92 recession, the proportion of new jobs lasting beyond 6 months recovered substantially, peaking at 53 percent in 1995 (its highest point since 1981). At the same

time, the fraction of 6-month old jobs which lasted longer than 5 years continued to rise to higher levels, averaging 43 percent in 1993–96. These two factors combined to raise the probability that a new job would become a long-term job in the most recent period.

FIGURE 3

Changes in the Distribution of Complete Job Lengths, 1981–1996

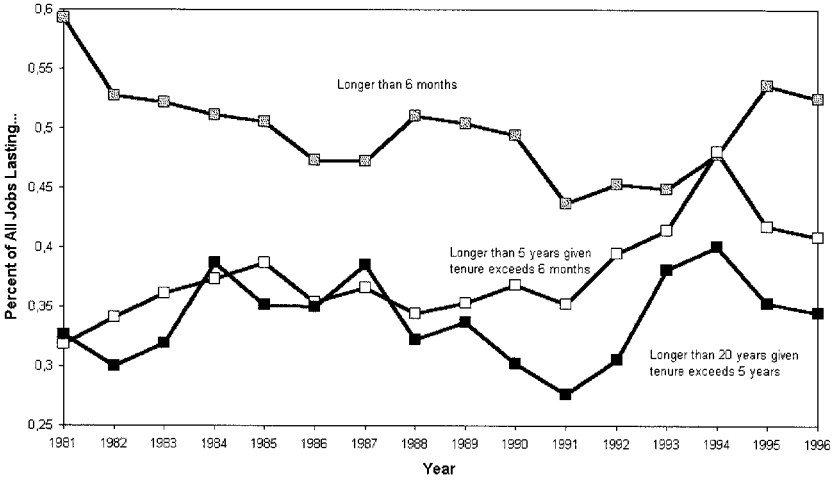


Figure 3 also shows the proportion of 5-year old jobs that go on to last beyond 20 years. This statistic moves cyclically, but shows no strong trend.

THE STABILITY OF NEW JOBS, A CLOSER LOOK

The apparent stability of new job lengths could occur if some demographic groups were enjoying longer jobs while others were not. Alternately, this pattern could repeat for all groups. The first result would suggest that some sectoral or demographic factor, such as the region or industry of employment, the age or gender of the worker, or the educational attainment of the worker is increasing in importance for attaining a long-term job. The second result implies that the changes are economy-wide and affect all workers. This section of the paper addresses this question by investigating whether the patterns that appear in the aggregate also appear within specific sectors or groups in the economy.

Summary statistics according to several breakdowns are given in table 2. Statistics include the average length of a new job, the proportion of new jobs which exceed 6 months in length, the proportion of 6-month old jobs which exceed 5 years in length and the proportion of five-year old jobs which exceed twenty years in length. The results are given by gender of

TABLE 2

Average Complete Job Length, Selected Portions of the Distribution of Completed Jobs, by Demographic Group, 1981–1996

	Average Complete Job Length (Months)	*The Proportion of Jobs Which Last Longer Than...*		
		6 Months	*5 Years Given They Lasted Longer than 6 Months*	*20 Years Given They Lasted Longer than 5 Years*
All	44.4	0.503	0.379	0.342
Males	42.6	0.478	0.377	0.359
Females	46.2	0.534	0.382	0.307
Age When Job Began				
15–24 Years	46.3	0.467	0.375	0.448
25–34 Years	50.2	0.557	0.364	0.421
35–44 Years	44.8	0.526	0.415	0.249
45–54 Years	32.9	0.484	0.404	0.028
55–64 Years	19.4	0.409	0.284	0.016
Educational Attainment				
10 Years or Less	24.1	0.349	0.308	0.185
11 Years or More	47.4	0.520	0.384	0.368
Industry of Employment				
Primary and Construction	21.6	0.305	0.296	0.251
Manufacturing	49.8	0.519	0.420	0.333
Distributive Services	55.9	0.584	0.412	0.368
Business Services	51.8	0.661	0.354	0.293
Consumer Services	32.3	0.517	0.288	0.184
Public Services	66.8	0.540	0.505	0.454
Region of Employment				
Atlantic Canada	31.2	0.352	0.362	0.369
Quebec	42.6	0.465	0.390	0.359
Ontario	54.3	0.588	0.404	0.336
Manitoba and Saskatchewan	42.1	0.494	0.369	0.318
Alberta	37.4	0.516	0.313	0.285
British Columbia	40.0	0.492	0.351	0.317

worker, age at which the worker started his or her job, region of employment, industry of employment,[10] and educational attainment of the worker.[11]

There is clearly a premium associated with belonging to certain demographic groups. For example, workers in the public services industry enjoy average jobs lengths which are twice that of those in consumer services. And workers with 11 or more years of education have average job lengths almost twice the length of those with less. Older workers have shorter average job lengths than younger workers, and fewer older job starters pass the 6 month tenure milestone (we discuss older workers in more depth below). What is also notable is that females have jobs which are on average slightly longer than males. This is mainly due to higher retention rates in short- and medium-term jobs for women.[12] Average tenure is 1.7 times

10. Industry aggregates (based upon 1980 SIC classifications) are: Primary and Construction: Agriculture (011–023), Forestry (041–051), Fishing and Trapping (031–033), Mines, Quarries and Oil Wells (061–092), General and Special Trade Contractors (401–449). Manufacturing: (101–399). Distributive Services: Transportation and Storage, Communications and Other Utilities (451–499), Wholesale Trade (501–599). Business Services: Finance, Insurance and Real Estate (701–761), Services to Business Management (771–779). Consumer Services: Retail Trade (601–692), Amusement and Recreation Services (961–969), Personal, Accommodation, Food and Miscellaneous Services (911–922), (971–979), (982–999). Public Services: Education Health and Social Services (851–869), Religious Organizations (981), Federal, Provincial and Local Administration (811–841).

11. Our choice of education groups – 10 years or less, and 11 years or more – was necessitated by a change in the definition of educational attainment in 1990 in the LFS which makes time series comparisons of other educational attainment groups problematic (see Gower 1993 for a discussion of the impacts of the 1990 LFS redesign on education level data). Nevertheless, examining these education levels allows us to compare the job stability of the most disadvantaged workers (in terms of educational attainment) with other workers.

12. This finding runs contrary to the common perception that females have shorter job tenure on average than males. This usually comes from an examination of interrupted or complete in-progress spell lengths which, as shown above, are susceptible to changes in participation rates. Over the period 1966 to 1996, the female labour force participation rate rose by 22 percent while that of men declined by 6 percent. This change has the effect that the stock of employed females during the 1981–96 period is more heavily weighted with individuals who have been in the labour force a shorter amount of time, and will have lower interrupted tenure than the stock of employed males over the period. Our estimates for the average complete length of in-progress spells by gender are 18.4 years for males and 16.5 years for females. In addition, past estimates for the length of current job spells were often based upon contemporaneous rather than historical retention rates. As noted earlier, complete job lengths are affected by changes in inflows to employment when contemporaneous retention rates are used. Hasan and de Broucker (1985) estimated that the median complete length of an in-progress spell in 1981 to be 12.4 years for men and 6.1 years for women using contemporaneous rates. Our estimates for 1981, using a slightly different sample and historical retention rates, imply that the median complete length of an in-progress spell to be 13.0 years for men and 9.0 years for women.

longer in Ontario than in the Atlantic Provinces, arising from a relatively lower probability that a job will be short-term. Five-year old jobs in Atlantic Canada are as likely to last to 20 years as in any other region.

The pattern of change over the period in the distribution of complete job lengths is qualitatively similar for each sub-group studied as it is in the aggregate. This is confirmed by the results of regressions of 192 monthly values of each of the variables in table 2 upon monthly dummies, the unemployment rate, and a linear time trend. Results for the time trend are shown in table 3. For reporting convenience, we divide the trend variable by 12 making the reported coefficient the average annual change in the dependant variable over the period.[13] For the probability that a new job would last beyond 6 months we estimate two versions of this model, one with a simple linear time trend, and a second with a linear spline function with the spline break in 1991(7). This second model was estimated in order to accommodate the apparent shift in direction of change (from

TABLE 3

Changes in Average Job Length and the Distribution of Completed Jobs by Demographic Group, 1981–1996

	Average Complete Job Length (Months)	*The Proportion of New Jobs Which Last Longer Than...*				
		6 Months			*5 Years Given They Last Longer Than 6 Months*	*20 years Given They Last Longer Than 5 Years*
	OLS 1981–96	*OLS 1981–96*	*OLS with Spline in 1991 1981–91(6)*	*1991(7)–96*	*OLS 1981–96*	*OLS 1981–96*
All	0.008	-0.005	-0.022***	0.036***	0.017***	0.003
	(0.006)	(0.003)	(0.003)	(0.005)	(0.005)	(0.010)
Males	0.008	-0.002	-0.021***	0.041***	0.015**	0.000
	(0.007)	(0.003)	(0.003)	(0.007)	(0.006)	(0.008)
Females	0.008	-0.009***	-0.024***	0.031***	0.018***	0.010
	(0.006)	(0.003)	(0.003)	(0.007)	(0.006)	(0.011)

*** significant at the 1% level. ** significant at the 5% level. * significant at the 10% level.

13. The specific model used is:

$$\log DV = a + bMONTHLY\_DUMMIES + cTIME + d \log UNEMPLOYMENTRATE$$

DV is the dependent variable identified at the top of each column of table 3.

TABLE 3 Continued

	Average Complete Job Length (Months)	*The Proportion of New Jobs Which Last Longer Than...*				
		6 Months			*5 Years Given They Last Longer Than 6 Months*	*20 years Given They Last Longer Than 5 Years*
	OLS 1981–96	*OLS 1981–96*	*OLS with Spline in 1991 1981–91(6)*	*1991(7)–96*	*OLS 1981–96*	*OLS 1981–96*
Age When Job Began						
15–24 Years	0.014*	−0.004	−0.023***	0.043***	0.022***	−0.002
	(0.007)	(0.003)	(0.004)	(0.008)	(0.007)	(0.015)
25–34 Years	0.007	−0.005	−0.022***	0.038***	0.018***	−0.004
	(0.006)	(0.003)	(0.004)	(0.008)	(0.005)	(0.009)
35–44 Years	−0.008*	−0.008**	−0.022***	0.025**	0.007	−0.029***
	(0.005)	(0.003)	(0.005)	(0.010)	(0.006)	(0.011)
45–54 Years	−0.013*	−0.008*	−0.026***	0.037***	−0.001	−0.013
	(0.007)	(0.004)	(0.006)	(0.014)	(0.009)	(0.020)
55–64 Years	−0.027***	−0.032***	−0.058***	0.035**	0.010	−0.093
	(0.009)	(0.006)	(0.008)	(0.017)	(0.017)	(0.071)
Educational Attainment						
10 Years or Less	−0.032**	−0.024***	−0.037***	0.008	−0.006	−0.044
	(0.016)	(0.006)	(0.009)	(0.019)	(0.023)	(0.036)
11 Years or More	0.007	−0.006**	−0.023***	0.034***	0.017***	0.001
	(0.005)	(0.003)	(0.003)	(0.006)	(0.004)	(0.009)
Industry of Employment						
Primary and Construction	0.003	−0.008	−0.033***	0.051***	0.005	0.027**
	(0.012)	(0.006)	(0.008)	(0.017)	(0.020)	(0.013)
Manufacturing	0.015	−0.005	−0.032***	0.061***	0.028**	−0.005
	(0.015)	(0.005)	(0.006)	(0.013)	(0.011)	(0.015)
Distributive Services	0.004	−0.001	−0.021***	0.047***	0.006	0.002
	(0.008)	(0.004)	(0.006)	(0.012)	(0.007)	(0.010)
Business Services	0.015**	−0.007**	−0.018***	0.020*	0.020**	0.014
	(0.006)	(0.003)	(0.005)	(0.011)	(0.010)	(0.022)
Consumer Services	0.011**	0.000	−0.012***	0.032***	0.019**	0.004
	(0.006)	(0.002)	(0.003)	(0.007)	(0.008)	(0.011)
Public Services	−0.009	−0.015***	−0.025***	0.009	0.009**	0.000
	(0.006)	(0.004)	(0.006)	(0.013)	(0.004)	(0.010)
Region of Employment						
Atlantic Canada	−0.010	−0.016***	−0.044***	0.050***	0.002	0.010
	(0.009)	(0.005)	(0.004)	(0.009)	(0.008)	(0.009)
Quebec	0.001	−0.009***	−0.021***	0.023**	0.009	0.009
	(0.007)	(0.003)	(0.005)	(0.010)	(0.009)	(0.011)
Ontario	0.011	0.000	−0.015***	0.036***	0.018***	−0.006
	(0.007)	(0.003)	(0.003)	(0.007)	(0.006)	(0.015)
Manitoba and Saskatchewan	−0.002	−0.013***	−0.029***	0.027***	0.011*	0.010
	(0.006)	(0.003)	(0.004)	(0.009)	(0.006)	(0.009)
Alberta	0.010*	−0.006	−0.024***	0.040***	0.023***	−0.008
	(0.006)	(0.004)	(0.005)	(0.010)	(0.007)	(0.015)
British Columbia	0.019***	0.002	−0.016***	0.048***	0.020***	0.015
	(0.006)	(0.004)	(0.006)	(0.012)	(0.007)	(0.013)

*** significant at the 1% level. ** significant at the 5% level. * significant at the 10% level.

decline to growth) which we observed in the aggregate of this statistic.[14] Two coefficients are reported for this model reflecting in turn the annual change in the dependant variable over the periods 1981-1991(6) and 1991(7)-1996. There is a significant amount of autocorrelation in each series so the results are corrected for AR(1) using the Cochrane-Orcutt iterative procedure.

The probability that a new job would last longer than 6 months declined significantly for all groups over the period 1981-1991(6). Hardest hit were workers over age 55, workers with low educational attainment, workers in the non-services industries and workers in Atlantic Canada. The decline hit males and females about equally. These declines are substantial in magnitude. For example, coefficient estimates for females suggest that the probability a new job will last beyond 6 months fell by 2.4 percent per year, or 26 percent between 1981 and 1991. Thus, 26 percent fewer female job starters held those jobs beyond 6 months at the end of the 1980s than the beginning. The corresponding drop for males is 23 percent.

After the 1991 recession, the probability that a new job would last beyond 6 months rose remarkably for all groups except the least educated and workers in the public services. This post-recession rise was largest for males, workers 34 years of age and under, workers in the goods sectors and workers in Atlantic Canada, Alberta and British Columbia. This increase negated the 1980s drop for many groups, with the result that by period end this probability showed no overall trend for males, young workers, workers in the goods industries, workers in the distributive and consumer services industries and workers in Ontario, Alberta and British Columbia.

At the same time, the proportion of 6-month old jobs which lasted longer than 5 years increased significantly for many groups. This proportion increased for both genders, younger workers, workers in manufacturing, and business, consumer and public services, and workers west of Quebec. Again the sizes of these changes are significant. For females who reach 6 months of tenure, 29 percent more held these jobs beyond 5 years in the mid-1990s than was the case in the early 1980s. For males, this increase amounts to 24 percent. This proportion increased, but not significantly for workers in nearly all the other groups.

The proportion of 5-year old jobs which would continue to last more than 20 years remained stable for most groups. All trend coefficients were

14. Similar spline functions were estimated for the other dependant variables in table 3 but the results proved less interesting. We also experimented with the timing of the spline, moving it to the beginning and end of 1991, and adding a separate spline for 1991 itself (to account for exceptionally low level in that recession year). This did not change the pattern of results substantially.

insignificant with the exception of those for workers aged 35–44 years and workers in primary and construction industry.

Despite these changes in the distribution of complete jobs, average job lengths for most groups remained steady, with some important exceptions. First, workers aged 55–64 when they started their jobs and workers with 10 or fewer years of education experienced significantly shorter jobs at the end of the period compared to the beginning. The coefficient estimates imply that for older workers the average complete length of a new job fell by 43 percent or 8.4 months (evaluated at the period average) and that for less educated workers it fell by 51 percent between 1981 and 1996. Second, workers in business and consumer services and Alberta and British Columbia enjoyed increases in job tenure over the period.

OLDER WORKERS AND LONG LASTING JOBS

It is often argued that, because of structural changes in the economy, older workers are at an increased risk of losing what were once stable jobs. One way of examining this question is to look at changes in five-year retention rates for workers of various ages and interrupted job lengths. Table 4 contains the time trend estimates from regressions of selected five-year retention rates upon monthly dummies, the log of the unemployment rate and a linear time trend for workers of various advanced ages. Each coefficient gives the annual change in the probability that, for example, a job held by a worker aged between 35 and 44 that has lasted 10 years will continue on for another 5 years. As in table 3, the results are corrected for AR(1).

There is strong evidence, particularly for older workers with high seniority, that 5-year retention rates declined through the period. Again, these declines were significant in magnitude. For workers currently aged 50–59 with 15 years of tenure, the probability that that job would last another 5 years declined by 2.0 percent per year, or 32 percent over the 16 year period. For younger workers and workers with less seniority there was no significant change. Unfortunately it is not possible to tell with this data what is driving this change. Although some of it will be due to increasing job loss, some will also be the result of the rising prevalence of early retirement for older workers. That declines in retention rates were concentrated among older workers with high seniority suggests that the second explanation is more important.

Structural changes in the economy are also identified as having caused increased instability in long jobs held in certain industries. Changes in 5 year retention rates for jobs of various interrupted lengths in the manufacturing, trade, community services and business and personal services are

TABLE 4

Changes in the Retention Rates of Long Lasting Jobs by Current Age of Worker, 1981–1996

	Annual Change in the Probability That a Job Will Last an Additional 5 years					
	Current Age of Worker					
	30–39	*35–44*	*40–49*	*45–54*	*50–59*	*55–64*
Job Has Lasted						
10 years		-0.005 (0.004)		-0.005 (0.005)		
15 years	0.001 (0.002)		0.000 (0.002)		-0.020*** (0.005)	
20 years		0.005** (0.002)		-0.008** (0.003)		-0.014 (0.011)
25 years			-0.007* (0.004)		-0.025*** (0.005)	

*** significant at the 1% level. ** significant at the 5% level. * significant at the 10% level.

shown in table 5.[15] Long-term jobs held in the manufacturing and trade industries are less stable now than in the early 1980s, but this change is not large and is offset by an increased stability of long-term jobs in the community services and business and personal services industries. This rate declined significantly only for jobs in the distributive services industry which had lasted 25 years, which may be partially due to an increased prevalence for early retirement. This change amounted to a 22.4 percent decline in the proportion of these jobs which continued for 5 more years. Changes in retention rates for long-term jobs in the primary and construction industry, although jointly significant in table 3, are individually not significant in table 5, although they are consistently positive. Overall, there is no widespread evidence that long-lasting jobs are at any greater risk of ending in the 1990s in any industry.

15. Derived from regression of five-year retention rates upon monthly dummies, the log of the unemployment rate and a linear time trend. Results are corrected for AR(1) and represent the average annual change in the dependant variable.

TABLE 5

Changes in the Retention Rates of Long Lasting Jobs by Industry, 1981–1996

	Annual Change in the Probability That a Job Will Last an Additional 5 years					
	Primary and Construction	*Manufacturing*	*Distributive Services*	*Business Services*	*Consumer Services*	*Public Services*
Job Has Lasted						
10 years	0.007	0.001	-0.002	0.007	0.010	-0.002
	(0.005)	(0.007)	(0.005)	(0.011)	(0.008)	(0.005)
15 years	0.005	-0.002	0.003	0.000	-0.001	0.004
	(0.004)	(0.004)	(0.004)	(0.008)	(0.004)	(0.003)
20 years	0.006	0.000	0.000	0.011	0.008	0.004
	(0.008)	(0.004)	(0.005)	(0.007)	(0.007)	(0.004)
25 years	0.004	-0.006	-0.014**	0.022	-0.012	-0.005
	(0.011)	(0.004)	(0.005)	(0.014)	(0.011)	(0.005)

*** significant at the 1% level. ** significant at the 5% level. * significant at the 10% level.

CONCLUSION

This paper examines changes in job stability over the period 1981 to 1996. We do this by (1) examining changes in the complete length of new jobs and (2) looking directly at changes in the job survival function. Although the average complete length of new jobs showed no significant trend over the period, we identified two changes in the distribution of new jobs over this period. The first, occurring over 1981–91, is a shift in the distribution of complete new job lengths towards shorter term jobs. This shift advanced through the recovery of the 1980s, but after the recession of the 1990s it retreated substantially. The second change in the duration of new jobs is an increased likelihood that a job, having passed a 6 month milestone, will continue on past 5 years. This shift persisted (and grew) throughout the entire period. The net effect of these changes were (1) a shift from medium- to short-term jobs over the 1980s and early 1990s, and (2) a shift away from short-term jobs towards longer term jobs in the mid 1990s.

These patterns of change persist when different demographic groups are studied. The only exceptions to this are job starters 55 years of age and over and job starters with low educational attainment where changes are better described as a shift towards more short-term jobs. For each of these groups of workers, the shift towards more short-term jobs was not offset by

an increased likelihood that jobs having passed the 6-month milestone, would go on to last beyond 5 years.

Despite the stability in the proportion of new jobs which last to become long-term, there is some evidence that long lasting jobs held by older workers are at a higher risk of ending now than in the early 1980s. However, this decline is concentrated among older workers with high seniority which suggests it may be largely due to an increased prevalence for early retirement. In addition, there is no widespread evidence that long jobs are declining in stability for any particular industry.

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RÉSUMÉ

Évolution de la durée de l'emploi au Canada

La présente recherche vient combler une lacune dans la littérature. En effet, la plupart des études récentes sur le sujet négligent le problème de l'estimation de la durée moyenne de l'emploi. Partant des données mensuelles de l'Enquête sur la population active du Canada, le présent article étudie la façon dont la stabilité de l'emploi a varié entre 1981 et 1996. Pour ce faire, (1) on examine la fluctuation de la durée complète d'un nouvel emploi et (2) on analyse directement les changements subis par la fonction de survie de l'emploi. L'étude est basée sur un échantillon prélevé à partir de l'enquête sur la population active et comprenant des travailleurs âgés entre 15 et 64 ans, ne retournant pas aux études et n'étant pas étudiant à temps plein.

On s'accorde généralement à dire que les emplois stables à long terme sont de plus en plus rares dans les années 90. Cette impression n'est peut-être pas sans fondement. Bon nombre d'analystes du marché du travail croient en effet que les employeurs adaptent leurs effectifs en fonction des fluctuations de la demande, si bien qu'on assiste à une diminution de l'offre du nombre d'emplois à long terme. L'évidence toutefois pointe dans une autre direction, et ce, dans toutes les industries examinées.

D'après cette étude, deux tendances se dégagent. La première, apparue durant la période couvrant les années 1981 à 1991, est caractérisée par des emplois de courtes durées. La deuxième, qui prit son essor suivant la récession de 1991, montre une hausse dans la probabilité qu'un emploi, une fois franchi le cap des six mois, dure 5 ans ou plus. Cette dernière tendance a persisté, et a éventuellement pris de l'ampleur, durant toute la période étudiée. Les effets de ces deux tendances sont clairs : (1) une évolution d'emplois à moyen terme vers des emplois de courte durée entre 1981 et 1991 ; et (2) un glissement de la tendance au milieu des années 90 vers des emplois à plus long terme.

Cette dernière tendance affecte presque tous les sous-groupes de la population examinés. Les seules exceptions concernent les personnes qui ont plus de 55 ans au début de l'emploi et celles qui ont un niveau de scolarité peu élevé, où les changements dessinent une tendance plus nette vers les emplois à court terme. Quoique ce résultat nous amène à croire que les emplois de longue durée détenus par les travailleurs âgés courent plus de risques de disparaître aujourd'hui qu'au début des années 80, cette tendance chez les travailleurs âgés ayant beaucoup plus d'ancienneté, nous donne à penser qu'elle pourrait largement résulter d'une plus grande prévalence des retraites anticipées. Par ailleurs, il ne semble pas que la

stabilité des emplois soit en déclin dans une ou plusieurs des industries examinées.

En général, les tendances que nous venons de décrire sont cohérentes avec d'autres tendances qui ont vu le jour dans l'économie. Parmi elles, on remarque notamment l'augmentation des emplois atypiques, la polarisation des gains et des heures de travail et le recours croissant des entreprises à un noyau d'employés permanents. De plus, les conclusions de la présente étude contredisent les résultats d'études comparables portant sur des données américaines, mais ces travaux ne permettent pas d'examiner les changements subis par les emplois de moins de quatre ans. Cependant, il reste à expliquer les facteurs à l'origine des changements observés. Quoique le présent article ne tente pas d'identifier des causes en particulier, les preuves suggèrent qu'on doit ces changements à des facteurs qui touchent l'économie dans son ensemble plutôt qu'au seul niveau d'un secteur ou d'un groupe démographique.