The Source of the New Canadian Job Stability Patterns

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Abstract

This paper explores the causes of the recent change in the Canadian job stability patterns. Using the Labour Force Survey master files (1977-2008), I find that what was previously seen as a cyclical increase in job stability is actually a secular change. Results indicate that the ageing of the workforce, the increased educational attainment, and the increased labour force attachment of women play important roles in explaining the aggregate job stability patterns that emerge. For education, the declining importance of low educated workers is the key—and not the rising importance of workers with university degrees. With respect to gender, the evidence points towards a cohort-based explanation. Surprisingly, the changing industry structure has little explanatory powers. Finally, only the rising educational attainment matters for newer jobs—leaving a large part of the increase still unexplained.

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1 Introduction

It is widely acknowledged that technological change, combined with an increase in international trade, has had a significant impact on the economy. The 'New Economy' literature has emphasized how these forces have altered the employer-employee relationship, resulting in a breakdown of traditional job arrangements and a rise in non-standard work such as temporary work and self-employment (e.g. Autor (2003); Vosko, Zukewich, and Cranford (2003)). A perception exists that, in this new economy, workers have become as disposal as any other resource—implying that job stability has declined. However, researchers who directly examined this issue found modest evidence, if any, of a long term decline in job stability (e.g. Bernhardt, Morris, Handcock, and Scott (1999); Gottschalk and Moffitt (1999); Heisz (2005); Neumark, Polsky, and Hansen (1999)). Except for Heisz (2005) who used Canadian data, this U.S. based literature faced significant data limitations that made it difficult to differentiate between cyclical and secular changes.[1]

Using Canadian Labour Force Survey (LFS) data, Heisz (2005) concluded that there was no long term drop in job stability. He did, however, find some evidence of increased stability in the mid- to late 1990s. By updating the Canadian evidence into the late 2000s, this paper clearly shows that changes first observed by Heisz (2005) represent secular increases in job stability, not cyclical as was previously believed. The main objective of this paper is, hence, to explore the causes of these striking new Canadian job stability patterns.

Identifying changes in job stability is important for many reasons. Given that pensions are typically associated with long term employee-employer relationships, a decline in job stability would affect the efficient design of employer-based pension plans, and that of government sponsored saving plans, e.g. RRSPs in Canada and 401Ks in the United States. Understanding changes in job stability is also a necessary first step towards better labour

[1]This may be why the U.S. job stability literature never went beyond a basic characterization of job stability patterns, and a possible reason why the belief still persists that the employee-employer relationship has changed (e.g. Autor (2003)).

market policies—even if job security is the object of interest.[2] There is often a fine line between a quit and a layoff, e.g. voluntary buy-out packages.[3] As a result, focusing exclusively on layoffs (or quits) may lead to incomplete, or even incorrect, policy recommendations. Finally, economic theory does not typically make a distinction between quits and layoffs: there is a separation when the surplus is gone.[4] As a result, job stability is a natural focus. In a world of incomplete contracts, for example, a decrease in job stability may lead to lower productivity and thus be detrimental to economic growth (e.g. Francois and Roberts (2003) and Ramey and Watson (1997)).

The job stability literature has relied on the retention rate, the probability that a job with a particular employer will last one more period, to proxy for job stability.[5] In order to examine long term changes in job stability using retention rates, it is essential to have detailed and consistent tenure data that is available on a regular basis.

In this paper, I use the Canadian LFS files (1977-2008) as repeated cross sections. The LFS is the only North American data set that satisfies the stringent data requirements of the retention rate approach.[6] A consistent job tenure question has been part of the regular monthly LFS questionnaire since its inception. As a result, a full set of one-year retention rates can be constructed dating back to 1977. Using this full set of retention rates, one can identify new patterns and explore their causes. Due to the many similarities between the

[2]Job security refers to involuntary job loss, while job stability does not make a distinction between voluntary and involuntary job separation.

[3]More specifically, a firm may offer voluntary buy-out packages as a first step in reducing its workforce. More vulnerable workers may decide to accept this option only because their future with the company looks bleak.

[4]There are some exceptions. Within an efficient turnover model where only non-surplus producing matches are dissolved, McLaughlin (1991) labels a separation as a quit (layoff) if the worker (firm) initiates the unsuccessful wage change.

[5]The advantages of the retention rate approach over in-progress measures are discussed in the next section.

[6]Commonly used panel data sets (in North America) fail to meet these stringent requirements in various ways. One cannot separate out the cohort effect from the period effect in both U.S. national longitudinal surveys. The Panel Study of Income Dynamics (PSID) and the Survey of Income and Program Maintenance (SIPP), suffer from serious measurement error with respect to the job tenure data. Finally, the two main Canadian panels, the Survey of Income Dynamics (SLID) and the Labour Market Activities Survey (LMAS) have limited historical coverage. The SLID only dates back to 1993, while the LMAS has only two short panels, a 1986-1987 panel, and a 1988-1990 panel. See Brochu (2006) for a comprehensive discussion of the limitations of other North American datasets—both panel and repeated cross sections.

Canadian and U.S. labour markets, the LFS may shed light on the changes in job stability not only for Canada, but also for the United States.

This work contributes to the literature in the following ways: First, I examine whether the Canadian job stability patterns first identified by Heisz (2005), and by Green and Riddell (1997), extend into the 2000s—a period of strong economic expansion. This part of my paper most closely follows that of Heisz (2005) in that we both rely on the LFS master files and both use a retention rate approach.[7] By extending the period of analysis to the late 2000s, I can show that recent changes, previously believed to be cyclical in nature, actually represent secular increases in job stability. I find that the retention rate remained at historically high levels into the late 2000s despite the strong showing of the Canadian labour market. Prior to the mid-1990s, the overall retention rate was counter-cyclical; it almost perfectly mirrored the unemployment rate cycle. The divergence in pattern which started in the mid-1990s became more apparent in the 2000s. I also find that the rise in job stability of low tenured workers which was first documented by Heisz (2005) continued into the 2000s. By 2007, the retention rate of workers with less than one year of tenure on job had exceeded 57%—a historical high.

Second, this paper is the first to systematically explore the sources of change in aggregate job stability.[8] I find that the ageing of the workforce, the increased labour force attachment of women, and the increased educational attainment of workers play important roles in the new aggregate job stability patterns. With respect to gender, the evidence points towards a cohort-based explanation. More recent cohort of women behave more like men along the

[7]Heisz (2005) examined job stability patterns over the 1976 to 2001 period. I extend the analysis up to 2008. Green and Riddell (1997) also used the LFS to examine changes in job stability, but relied on the public access files for 1979-1989, and 1991. In the public access files, tenure was only available by broad categories, making it impossible to directly calculate retention rates. As a result, they had to examine the distribution of in-progress jobs, a method more sensitive to job inflows. More importantly, their data ended just prior to a period of important change in job stability.

[8]Although the main focus of Heisz (2005) was to characterize the long term job stability patterns for Canada and to compare them with U.S. findings, he also carried out composition-constant counterfactuals. In all cases, he controlled for initial tenure composition. Yet, tenure is clearly an outcome variable; a change in educational attainment, for example, will probably tenure composition. As such, controlling for tenure composition can help better characterize the Canadian patterns, but it cannot answer the key question of this paper: What is the source of change? I elaborate on this issue in Section 4.1.

job retention dimension. This is in line with Baker and Drolet (2009) whose findings suggest that cohort effects may play a role in explaining the declining male-female wage ratio. For education, the declining importance of low educated workers is the key, particularly in the 2000s. Surprisingly, the changing industry structure has little explanatory powers.

Finally, this paper is also the first to examine the source of change in job stability of workers with less than one year of tenure.[9] The traditional decomposition approach will not address the counterfactual of interest when applied to more narrowly defined rates—like those that condition on low tenure. The decomposition controls for the composition of a *conditional* population (i.e. a sub-group of the workforce), and not of the *unconditional* population (i.e. the overall workforce). As such, it cannot address the source of the change in job stability.[10] I propose an adjustment to the traditional decomposition exercises that can separate out compositional effects. Using the proposed adjustment, I find that education is the only compositional change that matters, but even then much remains unexplained.

The structure of this paper is as follows: Section 2 presents the data set and the empirical strategy which is based on the retention rate approach. Section 3 updates the Canadian job stability evidence into the 2000s. In Section 4, I explore the source of the new aggregate job stability patterns. Section 5 examines what led to the dramatic increase in job stability of low tenured workers. Finally, Section 6 examines the transitional path of female job stability, and in particular, whether cohort effects have a role to play.

2 Data and Empirical Approach

The main data used in this paper is from the LFS master files. The LFS is a large monthly household survey of approximately 54,000 households per month, with a focus on gathering information about the labour market activities of Canadians. A unique strength of the LFS is the quality and consistency of the tenure data. As part of the regular LFS questionnaire,

[9] Heisz (2005) noted the increase in job stability for workers with less than one year of tenure, but did not explore its source.

[10] For more details see Section 5.1.

dating back to 1976, employed respondents are asked, *"When did he/she start working for [name of employer]?"*[11]

My sample contains all individuals between the ages of 20 and 55 in the incoming rotation group over the 1977-2008 period.[12] The LFS follows a rotating panel design, where a household remains in the sample for six consecutive months, and every month one sixth of the sample is replaced. By restricting attention to the incoming group one can ensure a random sample, in the sense that individuals will enter the sample only once.[13]

The upper age limit accounts for the changes in retirement age (e.g. Milligan and Schirle (2008)). By excluding those above the age of 55, one can focus on quits and layoffs, and not have the results tainted by voluntary retirement.[14] The lower age limit accounts for the small fraction of 15-19 year olds who work, with the majority still in school.

This paper uses a retention rate approach to identify the job stability patterns in Canada. The one year retention rate for workers with characteristics c in year j, R_j^c, is simply the probability that such a worker remains with the same employer for an additional year. There are two advantages to adopting a retention rate approach as opposed to in-progress measures. One advantage is the direct link between job stability and retention rates—a job with the same employer is less stable if it has a lower probability of lasting one more period. The

[11] While the LFS focusses on *when you started*, the American CPS Respondents are asked *how long* they have been working for their present employer. Researchers (e.g. Ureta (1992)) have found the former question to be more precise, leading to less problems of heaping, i.e. rounding of answers to 5-year intervals. A similar conclusion was drawn in this study; heaping does not appear to be an important problem in the LFS.

[12] Although data is available as of January 1976, the first year was a ramping up year for the survey. As such, the 1976 files are much smaller than in subsequent years. The increase in sample size was not uniform across time or province; it started in urban areas (and Prince Edward Island), probably because it was easier to do so. Even if the 1976 weights were adjusted to reflect these changes, the start year plays a critical role in determining the group proportions for the counterfactual exercises. Considering the 33 years of available data, the benefits of starting the sample in 1977, outweigh the costs of discarding some information.

[13] An alternative strategy would be to do as in Heisz (2005) and restrict the sample to surveys that are six months apart, say March and September. The LFS does not follow households if they change dwelling. It is therefore reasonable to assume that workers that have less stable jobs also have less stable living arrangements. As such, the proposed strategy of using all months, but focus only on incoming rotation groups, will minimize this self-selection problem. However, the LFS survey weights are calibrated using all rotation groups; focussing only on the incoming rotation will therefore make the weights less representative of the population. As a robustness check, I re-estimated the retention rates using the strategy favoured by Heisz (2005). It does not materially affect my findings. I discuss this issue further in Section 4.

[14] As a robustness check, I extended the upper age limit to 64 years of age; it does not affect the key findings of this paper.

second important advantage is that a well-conditioned retention rate will be less sensitive to job inflows than in-progress job measures. Canada has experienced a historically large increase in labour force participation of women and a significant demographic change brought about by the baby-boomers, indicating that job inflows are an important issue for Canada.[15]

The retention rates are estimated non-parametrically using cross-sectional data. This paper uses a cross-sectional estimator commonly employed in the job stability literature (Heisz (2005), Neumark, Polsky, and Hansen (1999), Swinnerton and Wial (1995)). This estimation approach has also been used outside of the job stability literature to estimate other continuation/transition probabilities (e.g. the probability of staying unemployed (Baker 1992)).

In its simplest and most intuitive form, the cross-sectional estimator for period j requires that the period j and $j+1$ cross sections be drawn from a population cohort; that the two cross sections select from the same pool of individuals, but at different moments in time. Like in the cross-sectional literature, this paper also uses a slight variation of the basic approach—one that allows for population changes due to immigration, emigration, or deaths. Brochu (2009) shows that this approach will be consistent if the population changes lead to breaks in tenure spells—a relatively mild identifying assumption. This implies that the worker does not stay with the same employer when he migrates to/from Canada. In practice, the choice to adjust (or not) for population changes does not materially affect the findings when estimating one-year retention rate—as is the case in this paper. This illustrates the strength of the LFS. Even with different identifying assumptions, the frequency of the LFS tenure data ensures similar results.

The minimum conditioning characteristic common to all retention rates include: all currently employed individuals between the ages of 20 and 54, except full-time students, the

[15]See Hall (1982), Ureta (1992) and, Diebold, Neumark, and Polsky (1997) for further discussion of the merits of the retention rate approach. It should be noted that the retention rate approach has also been used to explore other continuation/transition rates of interest. For example, it has been used to explore for changes in Canadian job security using both objective (Morissette 2004) and subjective data (Brochu and Zhou 2009).

self-employed and those in the military. Full-time students, as well as young adults that worked during the summer months but intended to go back to school in the fall, are not part of this study because working was not their main activity. The self-employed and those working in the military were also excluded because the process determining their job tenure spell is very different from (non-military) paid employees.

3 Job Stability Patterns

In this section, I update the Canadian job stability evidence by extending the data into the 2000s—a period that has not been previously examined in the literature.[16] By including 2000s data, I can see whether the high job stability levels of the 1990s were temporary/cyclical or more permanent in nature. The evidence suggests a secular change in job stability.

The retention rates are calculated in a forward manner, i.e. the one-year retention rate for year j estimates the proportion of jobs that continue into year $j+1$. As a result, a sample extending to 2008 generates one-year retention rates up to 2007.

Figure 1 shows the overall one-year retention rates for 1977-2007. The overall rate is contrasted with the annual unemployment rate to clearly highlight the changing patterns.[17] In the early part of the sample, the overall retention rate was counter-cyclical; it almost perfectly mirrored the unemployment rate cycle. However, the retention rate increased substantially in the 1990s and stayed fairly constant at historically high levels (i.e. above 80%) for the duration of the 1990s and into the 2000s. The findings for the 2000s are particularly striking given that the Canadian unemployment rate reached a 34-year low in 2007. The narrow width of the 95 percent confidence interval shows that the break in the aggregate pattern was also statistically significant.[18] These findings do not match up with the 'New Economy'

[16] As discussed earlier, Heisz (2005)'s data ends in 2001 while mine ends in 2008.

[17] I used Canada's official (annual) unemployment rate for individuals 15 years and up. This result is not sensitive to the choice of age group. I got a similar result using the unemployment rate for individuals 20 to 54 years of age.

[18] I also checked for a post-1993 break by regressing the overall retention rate on the unemployment rate (UR), a post-1993 dummy (Dpost93), and their interaction (UR*Dpost1993). The UR coefficient was

literature's belief that the employer-employee relationship has changed—that workers are now disposable just like any other resource. If this were the case, one should have seen a secular *decrease* in job stability—and not a secular *increase* as is observed in the data.

Figure 2 shows differences in retention rates between men and women. Prior to the 1990s, the male retention rate exceeded the 80% mark on more than one occasion, but never remained above this threshold for long. For females it was a different story. The retention rates of the 1990s and 2000s are well above anything achieved prior to this period.[19] The fact that there was a important gender gap, and that it narrowed over time, is consistent with the findings of the Canadian job stability literature (e.g. Green and Riddell (1997) and Heisz (2005)).[20] What is novel, however, is that the male-female gap became systematically negative in the 2000s—and for most years the negative gap is also statistically significant. Finally, the retention rate stabilized at high levels in the 2000s for both men and women which is indicative that the new patterns identified in Figure 1 are not simply gender driven.

An important finding of this paper is the continued rise in retention rates of low tenure workers. Figure 3 illustrates that for much of the first part of the sample, the retention rate for workers with less than one year of initial tenure hovered in the 44-49% range, but starting in the 1990s this changed dramatically. The increase began in 1992, and continued into the 2000s with the low tenure rate exceeding 57% by 2007—a historical high. The confidence interval in Figure 3 points to a statistically significant change. For those with initial tenure of more than one year, see Figure 4, there is no apparent break in the pattern.

Table 1 documents the job stability patterns along other dimensions by comparing the 1979-1981, 1987-1989, 1998-2000 and 2006-2008 years, all strong expansionary periods.[21] By

negative in the pre-1993 period (and both statistically and economically significant). For the post-1993 period, however, the UR effect became both economically and statistically insignificant.

[19]The decline in retention rates observed over the expansionary periods of the 1970s and 1980s is also more pronounced for women than it is for men. In the next section I exploit these cyclical differences to identify the source of change for women.

[20]In Section 5.3 I explore the source of this disappearing gender gap.

[21]A weighted average of two consecutive years' retention rates was used to minimize the sensitivity of results to the choice of start and end years. For example, $R_{1987,1988}$ is the retention rate for a randomly chosen worker in year 1987 or 1988.

comparing retention rates at similar stages of the business cycle, one can put in perspective the importance of changes in job stability.[22] The 2006-2008 period is somewhat less comparable in the sense that the labour market was stronger than in the other three periods—as measured by a much lower unemployment rate. Given the clear counter-cyclical nature of the job stability patterns in the pre-1993 period, one can still draw certain conclusions. If it is truly the case that the job stability patterns have not changed, the 2006-2008 rates should be systematically lower than in the other three periods.

Table 1 shows the overall, male, female and low tenure rates for each of the four expansionary periods. The findings of the last two expansionary periods confirm the presence of new patterns; the more recent rates are systematically higher (both in an economic and statistical sense) than in the late 1970s or late 1980s. The one exception is the male rate for 2006/2007. It is essentially the same as in the late 1970s (although still higher than in the late 1980s). This result is in line with Figure 2 which shows a decline in stability for males in the last few years of my sample—a period where the unemployment rate reached historically low levels.

Panel A of Table 2 shows that the new job stability patterns are broadly based; the higher job stability observed in the 1990s continued into the 2000s irrespective of whether one looks at goods versus services, public versus private, or by region.[23] These changes are not only statistically significant at the 5% confidence level, but also economically significant. The one exception is the goods sector. The rate in the 2000s is only modestly higher than in the late 1970s; the higher rate of the late 1990s did not continue into the 2000s. A breakdown of the goods sector shows that manufacturing is the main culprit, a sector in which job stability decreased by 5.5% points from the late 1990s to the late 2000s.[24]

[22]This approach takes into account of systematic changes in firm or employee behavior that are linked to the business cycle. For example, employees may be more reticent to leave jobs in recessions when outside job prospects are limited. It also addresses self-selection problems associated with systematic changes in the composition of the workforce.

[23]This holds true whether one uses the late 1970s or the late 1980s as the base group.

[24]There was also a decrease in the primary sector but it represents a much smaller fraction of the goods sector than manufacturing as indicated by the size of the standard errors.

Panel B of Table 2 shows that the positive correlation between education and job stability identified by Heisz (2005) is still present in the 2000s.[25] The three education attainment categories are high school or less, post-secondary diploma or certificate, and university degree (bachelor or more). The categories are self-explanatory, with one exception. Respondents with some post-secondary, but who did not complete their program, were included in the high school or less group. A precise breakdown can be found in the Appendix A.1. A positive correlation exists for finer education breakdowns. For example, workers with very low levels of education, i.e. Grade 10 or less, were the least stable. The results for the low education group are robust to the exclusion of post-secondary dropouts.

Finally, Panel B of Table 2 also shows that the positive age profile present in the first three expansionary periods is still present in 2006/2007. Given the continued ageing of the workforce, these evidence suggest that age may play an important role in the new Canadian job stability patterns.

4 Source of Change - Aggregate Patterns

In this section, I formally examine the potential causes of the new aggregate job stability patterns documented in Section 3. I start by examining the impact of compositional changes in the workforce using standard decomposition techniques. I conclude by exploring some structural explanations which include: the decline of unions, changes in industry structure, and the decline in seasonal jobs.

[25] Starting in 1990, the LFS introduced some important modifications to its education questions. The focus changed from measuring years of education to measuring education attainment. As a result, the construction of time consistent education groupings can be problematic.

4.1 Compositional Changes

Due to its straightforward mathematical representation, the aggregate retention rate, R_j, can be expressed as a weighted average of retention rates for any G sub-groups (sub-populations)

$$R_j = \sum_{g=1}^{G} \gamma_j^g R_j^g \tag{1}$$

where γ_j^g represents the proportion of the working population in year j that are in group g—as long as the G groups are mutually exclusive and exhaust the conditioned population. One can, therefore, explore for the source of change in the aggregate retention rate by creating a counterfactual retention rate which holds the group proportions, i.e. the γ^g's in equation (1), constant at year 1 levels.

As previously discussed, Heisz (2005) is the only other researcher to have carried out composition-constant counterfactuals of Canadian retention rates. His counterfactuals controlled for both age and tenure composition.[26] This exercise is useful if one wants to characterize the job stability patterns, but it does not answer the question of interest: What is the source of change of the new job stability patterns? The following will best illustrate this point. Assume, for example, that more educated workers have more stable jobs (which is the case) and that workers are now more educated than before (which is also the case). The overall retention rate will change, but so will the tenure composition. By construction, there will be more workers in longer tenured jobs. Tenure is clearly an outcome variable, and as such, one must not control for it if one wants to explore the source of the change in aggregate job stability.

Canadian workers have become more educated over time, and there is a positive correlation between education and job stability (Table 2). Together, these findings suggest that rising education levels may play a role in the new aggregate patterns.

Figure 5 shows the education counterfactual where the proportion of workers with Grade

[26]He carried out age and tenure composition constant counterfactuals of the overall rate, and also of the male and female rates.

10 or less of education is held constant at 1977 levels.[27] The results indicate that rising education levels can explain part of the aggregate increase in job stability. I carried out the same educational counterfactual, but for males and females separately. Controlling for education matters for both groups. The decline, in absolute terms, is similar across gender, albeit slightly larger for males.

Using standard decomposition techniques, one can quantify the impact of the compositional change - like a change in education levels. One can express the retention rates differential, $R_2 - R_1$, as

$$R_2 - R_1 = \left[\sum_{g=1}^{G}(\gamma_2^g - \gamma_1^g)R_2^g\right] + \left[\sum_{g=1}^{G}\gamma_1^g(R_2^g - R_1^g)\right] \tag{2}$$

The first square bracket term in equation (2) represents the differences attributable to compositional changes in the workforce. The second reflects what remains to be explained, i.e. changes in sub-group retention rates. Assume the overall retention rate increased by 0.15 and that the first and second term in equation (2) equalled 0.1 and 0.05, respectively. One would conclude that the retention rate increased by 15 percentage points, 10 percentage points of which can be explained by compositional changes in the workforce. Said differently, changes in workforce composition would explain 66.6% of the increase in aggregate stability.

Table 3 quantifies the importance of rising education levels in explaining overall job stability patterns by comparing the 1987-1989 and 1998-2000 periods.[28] The decomposition results are expressed in percentage terms. Table 3 shows that controlling for education composition can explain 25.7% of the increase for males, but only 8.8% for females. These results

[27]For the 1977-1989 period, I held constant the proportion of workers with 10 or less years of education. Gower (1993) analyzed the impact of the 1990 changes to the education question and did not find any important discontinuity in the 0-10 grouping. As a robustness check, I repeated the decomposition exercise using the highest grade of elementary or high school ever completed, and as such, may be more comparable with the pre-1990 entries. The results are essentially the same.

[28]I did not use 2006-2008 because it is less comparable with other expansionary periods, i.e. the unemployment rate was systematically lower. Finally, there is a persisting belief that the labour market changed in the early to mid-1990s (i.e. the New Economy literature). By choosing a period just before (late 1980s) and just after (late 1990s) I can further address the validity of this belief.

indicate that for females there are other factors at work; factors related to the important increases in labour force attachment of women over the past thirty years.

Interestingly, also controlling for the proportion of workers with university degrees barely impacted the counterfactual.[29] There are three reasons why this may be the case. One, the proportion of workers with university degrees has increased over time, but this highly educated group still remains a minority in the workforce. Two, differences in job stability between adjacent education groups are much less pronounced at the upper end of the education distribution. Three, it can be easily shown that controlling for the proportion of workers with university degrees only imposes one additional cross group restriction—that the fraction of Grade 11 or more educated workers with university degrees remains constant over time. The data does not find this restriction too onerous. Changes to the education question introduced in 1990 preclude any further breakdown of the middle group, i.e. those with at least Grade 11, but less than a university degree. I believe that the same three reasons mentioned above also apply to the middle group. As such, controlling only for the proportion of low educated workers will be a good approximation of the true education effect.

The ageing of the workforce is another factor that merits attention. Some economists/demographers, including David Foot as a leading proponent, have argued that the demographic composition of a society has strong economic implications. Foot and Stoffman (1996) maintain that the baby-boom cohort, those born between 1947 and 1966, through its sheer size has changed the economy and will continue to do so as it ages. One possible link between the demographic structure and job stability can be seen through the lens of a search model. Within the Burdett (1978) framework, jobs are inspection goods. Baby-boomers who are now in the latter stages of their careers will have a lower probability of receiving a better outside offer, and as a result, job stability will increase.

Over the last thirty years, there has been a dramatic increase in the labour force participation of women. More women now than ever are permanently attached to the workforce.

[29]The results are available upon request.

As such, gender may also have a role to play in the new job stability patterns.

Figure 5 takes into account these two changes by holding both the age and gender of the workforce composition constant at 1977 level—where age was broken down into seven intervals of five years each. Starting in the mid-1980s, the age-gender constant counterfactual is consistently lower than the overall rate. The differential becomes economically significant as of 1992, averaging 2.83 percentage points over the 1992-2007 interval. These findings support the theory that the ageing of the workforce, and the increased labour force attachment of women have impacted job stability.

To separate the baby-boom effect from the increase in participation by women, I also carried out an age-constant decomposition for males and females separately. By focussing on the male rate, one can more cleanly identify the effect of the demographic changes in the workforce.[30] Starting in the mid-1980s, Figure 6 shows that the male age-constant rate is consistently lower than the age-varying one, with the gap averaging 2.2 percentage points over the 1992-2007 period. More importantly, there is still a break in the pattern in the early 1990s. The demographic changes cannot explain why the male retention rate has stabilized in the second half of the sample. It is a similar story for females. The main difference is that for the 1992-2007 period the gap is larger, averaging 3.5 percentage points. The increased labour force participation of women appears to have re-enforced the baby-boom effect.

Table 3 quantifies the importance of ageing and gender in explaining overall job stability patterns by comparing the 1987-1989 and 1998-2000 periods. Controlling for age and gender composition can explain close to half of the increase in overall stability. Table 3 also shows that ageing has more explanatory power for men (54.7% for men versus 45.3% for women) indicating that holding the female age structure constant cannot account for the full impact of the increased labour force attachment of women. Finally, a gender differential counterfactual was also estimated; one where females are given the male retention rate. This gender counterfactual can explain 25% of the increase in aggregate job stability.

[30]This approach cannot, however, deal with potential general equilibrium effects where male jobs could be affected by the increase in labour force participation of women.

In a final decomposition, I control for both education and age. In doing so, one can also account for any multiplicative effect, i.e. that the ageing effect may not be constant across education groupings. Figure 6 shows that education and ageing can explain a very large part of the changes to male stability. Table 3 shows that the combined effect can account for 86.1% of the increase in male job stability from the late 1980s to the late 1990s.[31]

4.2 Alternative Hypotheses

The long term decline in union coverage in Canada is well documented (e.g. Riddell and Riddell (2004)). This decline could account for the new patterns only if union covered jobs were less stable than non-union jobs. This presumption is counter-intuitive; it contradicts a fundamental goal of unions to safeguard jobs. Unfortunately, a union question was not part of the regular LFS questionnaire prior to 1997, so one cannot comment on potential long term changes. But over the 1997-2008 period, jobs were more stable in the union sector, with a gap ranging from 12 to 14 percentage points. As such, it is very unlikely that the decline in unionization could explain the new job stability patterns in Canada.

The industry structure in Canada is another area that has undergone many changes over the last 30 years, both within and across industries. Table 2 shows that the changing job stability patterns were not restricted to individual sectors, but are economy-wide. However, as Table 2 illustrates, there are important level differences across sectors. As a result, a change in the relative importance of sectors, such as the well-documented decline of the primary sector, could have impacted the overall long term job stability patterns in Canada. A decomposition exercise can help judge the merits of this hypothesis. The LFS uses the North American Industry Classification System (NAICS) which divides the economy into twenty broad industry categories.[32] Although there are further divisions, the decomposition

[31] Age (alone) can explain 54.7% of the increase, education another 25.7%, and the remaining 5.7% is the multiplicative effect.

[32] Although there has been some changes in industry classification systems over time (e.g. from SIC to NAICS), the LFS provides a consistent industry affiliation variable based on the NAICS that goes back to 1976.

was restricted to twenty categories to ensure more accurate industry retention rates. Holding the industry structure constant at 1977 proportions, however, does alter the pattern in the data.[33] Therefore, the changing industry structure, both within and across sectors, does not appear to be the source of the new patterns in job stability.

The possibility of Employment Insurance (EI) reforms in 1989 and the mid-1990s contributing to the new aggregate job stability patterns requires some attention; particularly the impact of reforms on seasonal work. Researchers (e.g. Green and Sargent (1998); and Shen (2004)) found seasonal workers to be more responsive to changes in EI than non-seasonal workers. Changes to the program rules could have limited the appeal of seasonal work, thereby encouraging workers to seek more stable forms of employment. That is simply not the case. Marshall (1999) identifies a long term decline in seasonal variation in employment starting in 1976, but that decline flattens in the 1990s. An industry decomposition also indicates that a possible movement towards less seasonal industries is not critical to job stability patterns. Furthermore, Table 2 shows that the changes in patterns are not restricted to regions historically dependent on seasonal jobs. The job stability patterns of Ontario, for example, the least seasonally dependent region, mirrors those of Canada as a whole. Finally, changes in job stability are not restricted to periods of the year where seasonal jobs are historically most prevalent, i.e. from May to October. The same patterns hold true if the analysis is restricted to January data, or that of any other month.

5 Source of Change - Newer Jobs

In this section I explore the source of the important changes in job stability of workers with less than one year of tenure. I start by focussing on compositional changes to see whether the driving forces behind the new aggregate rates—gender, ageing and education—can also explain the changes at low levels of tenure. I conclude by exploring some structural

[33]The industry-constant counterfactual slightly diverges from the true rate in the last couple of years. This is probably due to the fact that job stability in the manufacturing recently fell. The results are available upon request.

explanations: technological change, changing industry structure and the rise of non-standard work.

5.1 Compositional Changes

The one-year retention rate for those with less than 12 months of initial tenure in period j, $R_j^{1,11}$, can be decomposed by education groups

$$R_j^{1,11} = \sum_{g=1}^{G} \gamma_j^{g|1,11} R_j^{g;1,11} \tag{3}$$

where $\gamma_j^{g|1,11}$ now represents the proportion of low tenured workers that are in education group g in year j. Holding the $\gamma^{g|1,11}$'s constant at year 1 levels will not control for the education level in the *workforce*, i.e. the counterfactual of interest; it will control for the level of education in *low tenure jobs*. As such, one cannot separate education from tenure effects. I propose an alternative representation that remedies this limitation. By Bayes' Law, one can write the group proportion as

$$\gamma_j^{g|1,11} = \frac{Prob_j(\text{“1 to 11 months of tenure”}|\text{“group } g\text{”})Prob_j(\text{“group } g\text{”})}{\sum_{l=1}^{G} Prob_j(\text{“1 to 11 months of tenure”}|\text{“group } l\text{”})Prob_j(\text{“group } l\text{”})} \tag{4}$$

The arguments can be generalized to control for other workforce characteristics (such as age). The proof is presented in the Appendix A.2. Equation (4) shows that holding the $\gamma^{g|1,11}$'s constant at year 1 levels would confound education and tenure effects; it controls for a non-linear combination of the two. To control for changes in education composition in the workforce one must keep constant the *unconditional* probability of being in a particular education group.[34] Figure 7 shows that holding the proportion of male workers with Grade 10

[34] One replaces $\gamma_j^{g|1,11}$ in equation (3) with

$$\gamma_1^{g|1,11} = \frac{Prob_j(\text{“1 to 11 months of tenure”}|\text{“group } g\text{”})Prob_1(\text{“group } g\text{”})}{\sum_{l=1}^{G} Prob_j(\text{“1 to 11 months of tenure”}|\text{“group } l\text{”})Prob_1(\text{“group } l\text{”})}$$

Notice that the last term in both the numerator and denominator are different than in equation (4).

or less constant at 1977 levels decreases the retention rate in subsequent years. Interestingly, this dampening effect starts to be significant in the mid-1980s—meaning that the dramatic increase in stability experienced in the 1990s is still very present.

Gender effects do not explain the striking increase in stability of newer jobs. The increase in stability at low levels of tenure was present for both males and females, with the relative gap remaining fairly constant over the 1990s and 2000s.[35] Using the proposed counterfactual approach, I can control for the age structure of the workforce in the retention rate for workers with less than one year of initial tenure.[36] Figure 7 shows the age-constant counterfactuals for low tenured workers. The analysis was restricted to males in order to more cleanly identify the effect of a demographic change. As Figure 7 indicates, the ageing of the workforce has very little impact on newer jobs. As a robustness check, I carried out additional tenure breakdowns. If one controls for the age structure of workers with more than one year of initial tenure the impact is slightly stronger. More refined tenure breakdowns (i.e. one to three years, three to seven years, seven to twelve years, and twelve and up) reveal that this slight drop was limited to the one to three year group. Therefore, the ageing effect must have had a significant impact on the proportion of workers within each tenure group—a conclusion confirmed in the data.

5.2 Alternative Hypotheses

Since the changes in stability of newer jobs are economy wide, the potential source of change must also be wide in scope. Technological change is one such candidate. It has been offered as a determining factor for many changes and could also be at the root of the new patterns in job stability. However, the timing is wrong. The effects of technology would have occurred gradually, beginning well before the 1990s. By contrast, the rise in stability only started in the early 1990s, and the increase was dramatic.

[35]The decline in the male-female retention rate differential was, however, observed over longer tenured jobs. The results are available upon request.

[36]One can also construct age-constant retention rates for other tenure groups.

Although not relevant to the aggregate level, the changing industry structure could have mattered for low tenured jobs. Newer jobs account for less than 20% of the overall workforce, and as such, the impact of such a group could be lost in the aggregate. This is not the case. I controlled for industry decomposition and found its effect to be negligible.

Changes in the employer-employee relationship is another possible source of change. Vosko, Zukewich, and Cranford (2003) document that many Canadians are now engaged in non-standard/contingent work, i.e. not full-time, permanent jobs. This would include self-employment, part-time work and also temporary work. Non-standard work accounted for 37% of all jobs in 2002, a rise of 4% point since 1989. The new economy literature argues that these types of jobs offer less security, implying that job stability has declined. Yet, this is not the case—job stability actually increased over the 1990s and remained at high levels into the 2000s. The timing also precludes other potential links between the two. Since 1993, there has been little, if any, change in the proportion of Canadian workers in non-standard work arrangements. Yet during this same time period, job stability for newer jobs actually began its dramatic climb. The timing issue precludes the possibility that less stable workers moved into self-employment, thereby increasing the retention rate of the remaining paid workers. As a robustness check I also estimated retention rates which included the self-employed; the results were not materially different.

These findings indicate that technological change, changing industry structure and the rise of non-standard work do not appear to drive the results.

5.3 Further Exploration of the Female Retention Rate

In this sub-section I further explore the transitional path of the female retention rate. As with other labour market outcomes, female retention rates now more closely resemble those of men,[37] but little is known about the transition itself, i.e. whether the changes were restricted

[37]Unlike the male-female wage gap, the male-female retention rate gap actually turned negative in the 2000s.

to newer cohorts or were experienced by all cohorts of women.[38]

Figure 8 shows the female retention rates by age group.[39] The post-1993 period is clearly more stable for all age groups which indicates some commonality of change across cohorts. However, it is a well-known fact that the labour force participation rate (or employment rate) of women increased dramatically over the last thirty years (e.g. Fortin (2009); Baker and Drolet (2009)). It is also well-known that the life-cycle profile of more recent cohorts of women tend to be flatter and have a higher starting point, as compared to older cohorts (e.g. Schirle (2008)).[40] These evidence point to a possible cohort explanation for the declining male-female retention rate gap.

Figure 9 shows the female retention rate by 5-year birth cohorts. One can see a clear cohort effect. The more recent cohorts tend to have more stable jobs over their life-cycle.[41]

There was a clear cyclical pattern in the female retention rate in the first half of my sample period (Figure 2). Combined with the fact that different cohorts experienced a (particular) recession at different age, it is possible that what one observes in Figure 9 is not just a cohort effect (i.e. it is confounded by the business cycle effect). As a robustness check, I used the fact that female retention rates fell at a faster rate than for males in the late 1970s and late 1980s expansionary periods to identify the cohort effect. More precisely, I compared the male-female differential across cohorts for the 1977-1980, and 1984-1989 periods. The differential is economically significant (in both periods) for earlier cohorts, but declines with subsequent cohorts. By the time one reaches the 1953-57 cohort, the differential is already economically insignificant; the difference (when averaged over each period) is approximately one percentage point. This is further evidence that cohort effects have a role to play in the

[38]The findings of Baker and Drolet (2009) suggest that cohort effects may play a role in explaining the decline in the male-female wage ratio.

[39]A weighted average of two consecutive years was used to smooth out the series. I used a similar approach in the subsequent cohort approach.

[40]Using the LFS master files, I found that the profiles started to flatten starting with the 1953-57 cohort.

[41]I actually estimated retention rates for 11 birth cohorts (i.e. for the 1928-32, 1933-37, 1938-42, 1943-47, 1948-52, 1953-57, 1958-62, 1963-67, 1968-72, 1973-77, and 1978-82 cohorts). I chose to only present the results of four cohorts (that are ten years apart from each other) to make the reading of the graph easier. The pattern would be the same if I were to use all 11 cohorts.

declining male-female retention rate ratio.[42]

6 Conclusion

There are three main contributions to the literature found in this paper: First, I update the job stability evidence into the 2000s. I show that what was previously believed to be a cyclical increase in job stability is actually a secular change. The aggregate retention rate stabilized at historically high in the 2000s. I also show that the rise in job stability of low tenure workers which had started in the 1990s, continued into the 2000s. By 2007, the retention rate for workers with less than one year of tenure had exceeded 57%—a historical high. These findings do not match up with the 'New Economy' literature's belief that workers are now disposable just like any other resource. In fact, this paper shows the opposite: The employer-employee relationship is now more stable than it was in the 1970s and 1980s.

Second, compositional changes in the workforce matter for the aggregate rate. Using standard decomposition techniques, I show that the changing age structure of the workforce can explain approximately half of the increase in job stability in Canada. I also find that both the increase in labour force attachment of women and the rising educational levels have a role to play. For women, the evidence points towards a cohort-based explanation. More recent cohorts are more attached to their jobs. With respect to education, it is the decreasing importance of low levels of education, and not the rising proportion of workers with university degrees, that matter most.

Third, compositional changes in the workforce do not drive the new patterns for low tenured jobs. Using decomposition tools developed in this paper, I show that ageing of the workforce is not a key; neither are gender differences. I do find that controlling for low levels of education does impact the rate for newer jobs, but cannot explain the dramatic increase

[42] As an interesting side note, I also explored whether the presence of young children impacted the female retention rate and whether the link had changed over time due to changing government policies (such as more generous maternity benefits). The presence of small children does not appear to drive any of my findings. In fact, the retention rate of women with children four years or younger has been systematically higher than for other women since 1977.

in the 1990s.

A Appendix

A.1

The following rules were applied to determine the three mutually exclusive educational categories

- High school: Individuals with 13 years or less of schooling. This education category also includes individuals with some post-secondary education as defined by the LFS. This refers to individuals who attended a post-secondary institution, but did not complete the required program (e.g. degree, diploma).
- Post secondary certificate or diploma: Individuals who completed a post-secondary program below a university degree. For the 1977-1989 sample, only formal post-secondary institutions where included. For the post-1990 sample, the category was expanded to include trade certificates which do not require high school graduation.
- University degree: Individuals with a university degree or more.

A.2

Proposition 1 *Given G groups, i.e. $1, \ldots, G$, that are mutually exclusive and exhaust the conditioned population, one can write the retention rate that conditions on the worker having t to t' months of initial tenure, $R_j^{t,t'}$, as*

$$R_j^{t,t'} = \sum_{g=1}^{G} \left(\frac{Prob_j(\text{“}t \text{ to } t' \text{ months of tenure”} | \text{“group } g\text{”}) Prob_j(\text{“group } g\text{”})}{\sum_{l=1}^{G} Prob_j(\text{“}t \text{ to } t' \text{ months of tenure”} | \text{“group } l\text{”}) Prob_j(\text{“group } l\text{”})} \right) R_j^{g;t,t'}$$

Proof: The retention rate can be expressed as

$$\begin{aligned} R_j^{t,t'} &= \sum_{g=1}^{G} \gamma_j^{g|t,t'} R_j^{g;t,t'} \\ &\equiv \sum_{g=1}^{G} Prob_j(\text{“}t \text{ to } t' \text{ months of tenure”} | \text{“group } g\text{”}) R_j^{g;t,t'} \end{aligned}$$

and by Bayes' Law

$$Prob_j(\text{“}t \text{ to } t' \text{ months of tenure”}|\text{“group } g\text{”}) = \frac{Prob_j(\text{“}t \text{ to } t' \text{ months of tenure”}|\text{“group } g\text{”})Prob_j(\text{“group } g\text{”})}{\sum_{l=1}^{G} Prob_j(\text{“}t \text{ to } t' \text{ months of tenure”}|\text{“ group } l\text{”})Prob_j(\text{“group } l\text{”})} \quad \blacksquare$$

To control for group composition, one holds the unconditional probability of being in each group constant at year 1 levels. As such, the counterfactual, $RC_j^{t,t'}$, takes the form

$$RC_j^{t,t'} = \sum_{g=1}^{G} \left(\frac{Prob_j(\text{“}t \text{ to } t' \text{ months of tenure”}|\text{“group } g\text{”})Prob_1(\text{“group } g\text{”})}{\sum_{l=1}^{G} Prob_j(\text{“}t \text{ to } t' \text{ months of tenure”}|\text{“group } l\text{”})Prob_1(\text{“group } l\text{”})} \right) R_j^{g;t,t'}$$

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Table 1: Retention rates Across Business Cycles

	$R_{1979,1980}$	$R_{1987,1988}$	$R_{1998,1999}$	$R_{2006,2007}$
Overall	0.783	0.777	0.820	0.809
	(0.002)	(0.002)	(0.002)	(0.002)
Male	0.795	0.785	0.819	0.799
	(0.002)	(0.003)	(0.003)	(0.003)
Female	0.766	0.767	0.821	0.820
	(0.003)	(0.003)	(0.003)	(0.003)
Tenure $<$ 1 year	0.476	0.444	0.546	0.569
	(0.004)	(0.004)	(0.005)	(0.005)

Notes. A weighted average of two consecutive years' retention rates was used to minimize the sensitivity of results to the choice of start and end years. For example, $R_{1987,1988}$ is the retention rate for a randomly chosen worker in year 1987 or 1988. Standard errors are in parentheses.

Table 2: Retention Rates Across Business Cycles, by industry, region, age and education

	$R_{1979,1980}$	$R_{1987,1988}$	$R_{1998,1999}$	$R_{2006,2007}$
		Panel A		
Sector				
Goods	.778	.784	.828	.790
	(.003)	(.004)	(.004)	(.004)
Services	.786	.774	.818	.816
	(.002)	(.002)	(.002)	(.002)
Agriculture, Forestry, Fishing and Hunting	.662	.639	.640	.615
	(.014)	(.016)	(.016)	(.018)
Mining, Oil and Gas Extraction, Utilities and Construction	.720	.741	.773	.781
	(.007)	(.007)	(.009)	(.008)
Manufacturing	.813	.815	.863	.809
	(.004)	(.005)	(.005)	(.006)
Public	.882	.869	.923	.924
	(.004)	(.004)	(.005)	(.005)
Private	.747	.745	.788	.774
	(.002)	(.002)	(.002)	(.002)
Region				
Atlantic	.760	.753	.769	.797
	(.008)	(.008)	(.008)	(.009)
Quebec	.804	.774	.835	.830
	(.004)	(.004)	(.004)	(.005)
Ontario	.808	.794	.832	.819
	(.003)	(.003)	(.003)	(.003)
Prairies	.719	.750	.798	.775
	(.005)	(.005)	(.005)	(.005)
British Columbia	.761	.776	.817	.794
	(.006)	(.007)	(.006)	(.006)
		Panel B		
Age				
20 to 29	0.699	0.679	0.698	0.692
	(0.003)	(0.003)	(0.004)	(0.004)
30 to 39	0.812	0.809	0.836	0.813
	(0.004)	(0.004)	(0.004)	(0.004)
40 to 54	0.862	0.848	0.878	0.868
	(0.004)	(0.004)	(0.003)	(0.003)
Education				
High school or less	0.768	0.754	0.801	0.763
	(0.002)	(0.002)	(0.003)	(0.003)
Post sec. diploma/certificate	0.820	0.815	0.824	0.831
	(0.006)	(0.005)	(0.003)	(0.003)
University degree	0.829	0.823	0.856	0.845
	(0.006)	(0.005)	(0.005)	(0.004)

Notes. A weighted average of two consecutive years' retention rates was used to minimize the sensitivity of results to the choice of start and end years. For example, $R_{1987,1988}$ is the retention rate for a randomly chosen worker in year 1987 or 1988. Standard errors are in parentheses.

Table 3: Decomposition Across Business Cycles: 1987-88 and 1998-99

	Compositional effect (%)	Remaining effect (%)
Education Decomposition		
Male	25.7	74.3
Female	8.8	91.2
Overall	16.0	84.0
Age/Gender Decomposition	46.8	53.2
Age Decomposition		
Male	54.7	45.3
Female	40.8	59.2
Gender Differential Decomposition	25.0	75.0
Education and Age Decomposition		
Male	86.1	13.9