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Earnings Losses of Displaced Older Workers: Accounting for the Retirement Option

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Abstract

In this paper I estimate the magnitude of earnings losses faced by workers who are displaced when over the age of 50. This is potentially complicated by the self-selection of older individuals out of the labour force and into activities such as retirement, preventing observation of their potential earnings losses. Using data from the Survey of Labour and Income Dynamics (1993-2004), I use a Heckman selection model that accounts for individuals' departure from the labour force following displacement. Results indicate that self-selection is an important factor to consider when studying the earnings of older workers but does not bias estimates of earnings losses due to displacement. Further, the results suggest that workers over 50 do not face larger earnings losses upon displacement than 35-49 year olds. Losses are only slightly larger than that experienced by 25-34 year olds. Consistent with the existing literature, those workers displaced over 50 with high tenure on the lost job experience the largest earnings losses.

JEL Code: *J63, J31, J26*
Keywords: *Layoffs, Wage level, Wage Structure, Retirement, Retirement Policies*

The statistical analysis in this study relies on Statistics Canada microdata, made available through the South Western Ontario Research Data Centre.

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Executive Summary

As the Canadian population continues to age, the experiences and needs of older workers are taking on greater importance and relevance in the development of labour market policies and initiatives. Although experienced workers' earnings losses resulting from job displacement has long been an important policy concern, very little is known about the losses faced by our oldest workers. Are the earnings losses of older displaced workers in Canada actually larger than that experienced by their younger counterparts? Is it worth directing public resources to these older displaced workers? To date, there has not been enough information available about displaced older Canadian workers to answer these questions.

This paper provides estimates of the magnitude of short term and medium term earnings losses faced by Canadian workers who are displaced when over the age of 50 and under age 69. Displaced workers are those who have lost their job due to the company closing, the company moving, or being laid off due to business slowdown. This does not include workers laid off due to seasonal conditions or voluntary job separation.

To obtain my estimates, I use data from the Survey of Labour and Income Dynamics which is a panel data set covering the years 1993-2004. When forming these estimates, I have accounted for the self-selection of older individuals out of the labour force and into activities such as retirement. This self-selected departure prevents us from observing their potential earnings losses following displacement. It could be the case, for example, that older high tenured displaced workers face the smallest wage losses and have the best pensions available for retirement. By excluding these workers from our samples, we would overestimate the earnings losses of displaced older workers near retirement ages. To account for self-selection, I use a Heckman selection model in the estimation of earnings losses. The use of this model relies on the fact that a spouse's non-participation in the labour force is a strong predictor of an individual's likelihood to enter retirement after job loss. At the same time, a spouse's non-participation in the labour force is not a good predictor of earnings losses following job loss.

The results of this study indicate that, as with younger workers, older workers face large and persistent earnings losses upon displacement. When displaced over the age of 50, older men can expect earnings losses around $14,000 in the year following displacement - representing roughly 37% of their predisplacement earnings. Furthermore, some earnings losses begin before displacement actually occurs, particularly among those workers who are laid off due to the company closing (relative to the workers laid off due to business slowdown). The earnings losses of younger men age 25-34 in the first year after displacement are slightly smaller than those experienced by older men, but not significantly smaller (even in terms relative to pre-displacement earnings). There are not substantial or significant differences between the earnings losses of displaced individuals aged 35-49 and those aged 50-69.

High-seniority older men face the largest earnings losses upon displacement, of over $22,000 in the first year following displacement and longer-term losses of $16,314. Low tenured men face earnings losses of only $10,592 in the first year and longer-term losses of only $6,394.

There are also important differences by education level. Both high and lower education experience similar levels of earnings losses following displacement – around $13,000 in the first year following displacement. Relative to expected earnings, however, a highly educated worker may expect losses amounting to 23% of their predisplacement earnings while lower educated workers may expect losses close to 40% of predisplacement earnings. Interestingly, there are no significant differences between the earnings losses of displaced workers in rural or urban areas. Relative to predisplacement earnings, however, the losses of rural workers are slightly larger (at roughly 40%) than urban workers (at roughly 29%). Several previous studies have shown that displaced workers suffer large and persistent earnings losses, with losses continuing long after displacement. The estimates provided in this paper are consistent with those provided by Jacobson, Lalonde and Sullivan (1993) for U.S. workers under age 55 in Pennsylvania. They found that even six years after displacement, earnings remained 25% lower than predisplacement earnings.

Morissette, Zhang, and Frenette (2007) provide comparable Canadian estimates of earnings losses for workers between age 25 and 49. They find that high seniority displaced men in their sample experienced long-term losses between 18% and 35% of their predisplacement earnings. Again, these findings are consistent with estimates provided in this study.

From these results, it is not clear that directing resources to older displaced workers is merited. Recent initiatives such as the Targeted Initiative for Older Workers, which provides funds to help reintegrate older displaced workers over age 55 back into the labour force, may not be justified. Given the longer remaining working life of younger workers these resources might be more efficiently used in programs targeting these groups. In the interest of providing a social safety net for older workers, it appears some resources could be targeted toward the less educated and rural displaced workers who are facing the largest relative losses.

1 Introduction

As the Canadian population continues to age, the experiences and needs of older workers are taking on greater importance and relevance in the development of labour market policies and initiatives. Among policy makers, there have been concerns that stark labour shortages may occur as the baby boom generation retires en masse. Also concerned that many public programs will no longer be fiscally sustainable, there has been a general desire among policy makers to alter the structure of retirement and encourage participation among older individuals. There are also concerns that an ageing workforce is less mobile and less able to adjust to shocks to the economy.[1] Given further concerns for workers' earnings losses that result from job displacement, several recent policy initiatives have targeted older displaced workers.[2]

Although experienced workers' earnings losses resulting from job displacement has long been an important policy concern, very little is known about the losses faced by our oldest workers. It is not clear that such targeting of resources is merited or even useful. While we expect the earnings losses of older displaced workers to be significantly larger than losses experienced by their younger counterparts, to this author's knowledge this has not been properly quantified in the existing literature. Typically, studies of displaced workers have simply left older workers out of the samples. When older workers are not omitted, their wage losses may not be properly measured since we are unable to observe the wage losses faced by the displaced older workers who opt for retirement.

[1] See Kuhn (2003) for an interesting discussion of these concerns.

[2] For example, the recently introduced Targeted Initiative for Older Workers (TIOW) is a federal-provincial cost-shared initiative providing support to older workers affected by significant downsizing or plant closures. Thus far, programming appears to be focused on education, training, and skill development.

The primary goal of this study is to estimate the magnitude of short and longer-term earnings losses faced by older displaced workers, accounting for the fact that many older displaced workers will self-select into retirement following displacement. In this context, it is useful to begin by clarifying a few concepts and terms used throughout this paper. First, I refer to displacement as job separation due to a company closing, a company moving, or layoffs associated with business slowdown. This use of the term displacement does not refer to job separations that result from dismissal, layoff due to seasonal conditions, or voluntary job separations. Second, discussions of older workers are generally referring to workers over the age of 50 as these are the individuals more likely to have early retirement options available to them. Finally, the term retirement is used loosely in this study to describe a permanent departure from full-time employment at older ages.

A priori, the direction of the sample selection bias in estimates of short and long-term earnings losses is not obvious. It may be the case, for example, that many older, high tenured displaced workers face the smallest wage losses, but also have the best pensions or other compensation available for their retirement. On the other hand, it may be the case that those facing the largest wage losses have the greatest incentive to enter retirement post-displacement given their lower cost of leisure. While the first case will result in an overestimate of earnings losses when selection into retirement is not accounted for, the latter would result in an underestimate of losses.

Using the longitudinal micro-data files of the Survey of Labour and Income Dynamics, and focusing on individuals over the age of 50, I estimate an earnings loss equation similar to that estimated by Jacobson et al. (1993) but using a Heckman selection model. A key feature of this study is the availability of an instrument that can be used to identify the parameters of the model. Here, I rely on the interdepen-

dence of couples' retirement decisions, using a spouse's participation in the labour force as an instrument in the selection equation. This makes a very good instrument because a spouse's participation is a strong predictor of an individual's likelihood to enter retirement or to return to work following job loss. More importantly, a spouse's labour force status is not expected to directly determine an individuals' wages.

The results indicate that, similar to younger workers, older workers face large and persistent earnings losses upon displacement. Furthermore, some earnings losses begin before displacement actually occurs. As expected, the potential earnings losses of older displaced workers appear to be larger than those experienced by their younger displaced counterparts (age 25-34). However, their losses are not larger than younger workers age 35-49. The results clearly demonstrate that self-selection is an important consideration when estimating the earnings of older workers, but does not result in biased estimates of the earnings losses due to displacement.

The rest of the paper is laid out as follows. I begin with a description of prior research and provide some context for the current study. I then describe the econometric model used to estimate earnings losses, identification of the model, and the data used in this study. I then present the results. Finally, I offer some conclusions.

2 Prior Research

There exists a fairly large body of evidence demonstrating that workers face large and persistent earnings losses upon displacement.[3] Using a sample of high tenured workers under the age of 55 from Pennsylvanian administrative data, Jacobson et al.

[3]Kletzer (1998) provides an overview of the job displacement literature.

(1993) estimated the magnitude and temporal pattern of displaced workers' earnings losses.[4] They found that even six years after experiencing displacement, the quarterly earnings of displaced workers (who separated from their jobs in mass layoffs) remained US$1600 (1987 prices) below their expected levels, representing 25% of their predisplacement earnings.[5] Furthermore, the earnings losses appear to begin 3 years prior to job loss. In the quarter prior to job separation, the displaced workers' earnings were approximately US$1000 (1987 prices) below their expected quarterly levels. Interesting to note, the earnings losses for job separators that do not experience mass layoffs are much smaller than the losses of displaced workers.[6] Ruhm (1991) provides U.S. evidence consistent with Jacobson et al. (1993), finding that in the short run the weekly wages of displaced workers were 16% below those of their nondisplaced peers. In the long run, the earnings gap remained above 13%.

Morissette et al. (2007) recently provided Canadian estimates of earnings losses using a model that is similar in nature to that used by Jacobson et al. (1993) and data from Statistics Canada's Longitudinal Worker File.[7] Their estimates rely on samples of workers that experience displacement between the ages of 25 and 49, noting that they make these age restrictions to "ensure that workers' earnings trajectories after displacement are not contaminated by early retirement patterns" (page 13). Their results are consistent with the findings in Jacobson et al. (1993). High

[4]It is not precise to say they used a sample of workers under age 55. Examining earnings between 1974 and 1986, Jacobson et al. (1993) only included workers born between 1930 and 1959. The median age in their sample in 1979 was 37 and the 90th percentile was 47.

[5]Using an average exchange rate for 1987 based on CANSIM II series V37426 and the CPI from CANSIM II series V737344, this is equivalent to C$2877 in 1996 prices ($11,507 annually).

[6]In Jacobson et al. (1993) this will include quitters and those discharged for cause.

[7]To note, the LWF is an administrative data set combining data from HRSCD Record of Employment files, the T1 and T4 files of CCRA and the LEAP files of the Business and Labour Market Analysis Division of Statistics Canada. Access to this data is restricted. Limited demographic and personal information is available. Their sample considers displacements that occur between 1988 and 1997.

seniority displaced men experience long-term losses between 18% and 35% of their predisplacement earnings (representing between $7,100 and $13,700 in 2000 constant dollars).[8] Their female counterparts experience long-term earnings losses between 24% and 35% of their pre-displacement earnings.

A large part of the literature examining displaced workers has focused on determining the extent to which these wage losses result from a loss of job-specific or even industry-specific skills.[9] Supporting the standard results of human capital theory, there have been several studies that show it is the most experienced and high seniority workers that face the largest wage losses. For example, Topel (1991) finds positive returns to seniority, with results suggesting that a worker with 10 years of job seniority would see his wages fall by 25% post-displacement due to a loss in job-specific skills. Note that Kletzer (1989) finds that previous job tenure is also positively related to post-displacement earnings, suggesting that individual heterogeneity in ability may cause some bias in estimates of the returns to seniority. Canadian evidence has been provided by Kuhn and Sweetman (1999), who use data from the Canadian Displaced Worker Survey (1986) and the Canadian Out-of-Employment Survey (1993 and 1995).[10] As expected, they find that the wage losses experienced by permanently displaced workers increases with tenure. Furthermore, they find a positive correlation between post-displacement wages and pre-displacement tenure for workers who lost non-union jobs and a negative correlation for workers who lost union jobs. The authors suggest this may be due to a depreciation of alternative skills with

[8] For later comparison, this is between $6,625 and $12,783 in 1996 constant dollars (using CANSIM II series V737344).

[9] Alternatively, the relationship between tenure and wages may be explained by a tendency for good employer-employee matches to survive (see Jovanovic, 1979). Also see evidence presented by Abraham and Farber (1987).

[10] The samples used include men who were between 20 and 64 when displaced. They also provide some evidence using a U.S. 1994 and 1996 Displaced Worker Surveys.

tenure in a unionized job.

More generally, older workers appear to experience the largest wage losses upon displacement. This appears to relate to a loss in specific skills upon displacement. Worthy of mentioning, Jacobson et al. (1993) find that workers' earnings losses do not depend substantially on the workers' age. Abe et al. (2002) find that older workers incur much larger wage losses following involuntary job loss.[11] As Kuhn (2003) points out, an aging workforce would therefore imply an increase in the costs of displacement to the Canadian economy.

While it seems quite reasonable to use such results to discuss the costs of displacement among relatively younger workers (under age 50), it may not be reasonable to extrapolate the results of existing studies to older groups in the workforce. Chan and Stevens (1999) find that reemployed displaced workers over age 50 (surveyed in the HRS) in the U.S. face large wage reductions, such that half of these workers receive wages at least 19 percent below their pre-displacement wages. These estimates correspond to estimates reported by Couch (1998) who also uses the HRS.[12] Chan and Stevens (2004) also demonstrate that men experience large and persistent effects of job loss on wages, finding that wages are immediately reduced by 50 percent and remain 23 percent below the level expected in the absence of displacement after six or more years. An important qualification for these results, as Chan and Stevens (2004) point out, is that these estimates can only describe the observed wage opportunities for those workers who actually return to work. Furthermore, selection into reemployment (or retirement) is undoubtedly more important when discussing older displaced

[11]Note that this result in Abe et al. (2002) (see Table 3.20) does not appear very robust. The significance of the estimated age effect appears to require dropping union status and tenure from the wage loss regression.

[12]Couch (1998) uses data from the Health and Retirement Survey (with individuals between age 51 and 61 in 1992) and finds that the median displaced worker's income falls by more than 50%.

workers than for an analysis of displaced workers in general.

There has been a growing literature examining the labour market transitions made by older workers following displacement. Rowe and Nguyen (2002) have demonstrated that the majority of job separations among Canadian workers age 50-65 are involuntary and that these workers have much lower re-employment rates than the rest of the labour force.[13] Chan and Stevens (2001) use the Health and Retirement Study (HRS) to examine the effects of involuntary job loss on employment outcomes for workers age 50 and above in the United States. Hazard model estimates in their study indicate that job loss has large and lasting effects on the future employment probabilities of older workers. More specifically, even four years after a job loss, the displaced workers' employment rates are 20 percentage points lower than their non-displaced counterparts. Chan and Stevens suggest the lower employment rates reflect both a reduction in the rates of return to employment after displacement and elevated rates of exit from post-displacement jobs. Considering the retirement decision itself, Chan and Stevens (1999) demonstrate that displaced workers in the U.S. are likely to revise their retirement expectations such that they tend to have higher expectations of working at older ages than those who have not experienced a job loss.[14]

Lower re-employment probabilities among older workers may also be due to a lack of job prospects for displaced older workers. Hirsch et al. (2000) examines the age structure of hires into different occupations and finds that the employment opportunities for older individuals are restricted. Maestas and Li (2006) use a sample of non-workers from the Health and Retirement Study to examine the job search

[13] Only about 16% of all job separations by men age 50-65, and about 12% of all job separations by women age 50-65 were retirements (Rowe and Nguyen, 2002).

[14] Chan and Stevens (1999) point out this may reflect underlying differences in retirement plans and labour force attachment between workers who were displaced and those who were not.

behaviour and employment outcomes of older workers. They find that only half of older searchers successfully attain jobs. Furthermore, their results suggest that 13% of older job searchers become discouraged workers.

Another important consideration in this study is the effects of job loss on the hours worked in subsequent employment. Many displaced older workers may become partially retired (working part-time) following displacement although they would have kept working full-time in the absence of displacement. While this has not been examined (to this author's knowledge) specifically in the context of older workers, McCall (1997) examines the determinants of full-time and part-time reemployment following job displacement among Canadian workers. He finds that the receipt of unemployment benefits substantially increases the probability that the post-displacement job is part time. This is of interest in the context of older displaced workers who might use the unemployment insurance programs as a bridge to retirement. McCall (1997) also finds much lower jobless durations for displaced workers age 55 to 64. Among these older workers there appears to be significant differences between the duration of joblessness before entering full-time vs. part-time employment.

To summarize, the existing literature has demonstrated there are large losses in earnings associated with displacement and we may expect these losses to be largest among our oldest workers. It is not clear, however, that existing estimates accurately represent the losses faced by older workers given that the self-selection of displaced workers into the state of retirement has not been accounted for. The existing evidence suggests this selection into retirement is not random and should be an important consideration in empirical work.

3 Empirical Strategy

3.1 Econometric Model and Identification

The econometric model may be stated as follows:

$$
\begin{aligned}
w^*_{it} &= \sum_{k=-2}^{2} D^k_{it}\delta_k + x_{it}\beta + \epsilon_{it} && (1)\\
E^*_{it} &= z_{it}\gamma + \upsilon_{it} && (2)\\
E_{it} &= 1 \text{ if } E^*_{it} > 0;\ E_{it} = 0 \text{ otherwise} && (3)\\
w_{it} &= w^*_{it} * E_{it} && (4)
\end{aligned}
$$

where w^*_{it} is the latent variable representing individual i's wage offer at time t with an observed counterpart w_{it}. The wage offer is not observed when the individual does not continue in full-time employment ($E = 0$) and enters retirement.[15] The covariates D^k_{it} in the wage offer equation (1) are dummy variables that represent the event of displacement in the period $t - k$. The parameter δ_k thus represents the effect of displacement on a worker's earnings k years following its occurrence. In the empirical work that follows, I allow displacement to affect earnings up to two years before and after displacement occurs. The wage equation includes a set of covariates x_{it} which includes gender, age, education indicators, public sector and union status, months of job tenure (on current or lost job), and a full set of industry, province and year dummy variables.

In the selection equation, x_{it} is contained in z_{it}. z_{it} also includes a dummy variable

[15] Retirement is loosely defined in this context as a departure from full-time employment to part time employment or out of the labour force. Here, we are really interested in marking those observations for which we are not able to observe wage outcomes post-displacement.

equal to 1 when the individual has a spouse that is in the labour force and zero otherwise. Further, z_{it} includes an indicator for whether the current/lost job offers a pension to its employees. The first of these acts as the instrument identifying the model. A spouse's participation in the labour force has been shown to be a good predictor of an individual's labour force participation at older ages given a complementarity in leisure time at older ages (see for example Schirle, 2006). It is not, however, a clear determinant of an individual's wage offer and is reasonably excluded from x_{it}.[16] Standard two-step procedures are used to estimate the econometric model specified above.[17]

3.2 Data and Summary Statistics

To estimate the model stated above, I use data from the Canadian Survey of Labour and Income Dynamics. This is a longitudinal data set following individuals for a period of 6 years, with 3 panels currently available (1993-1998, 1996-2001, and 1999-2004).[18] Information specific to each job spell experienced by the individual over the 6 year period is collected and includes a specific end date for the job and the reason for job separation.[19] All individuals in a household are interviewed in the survey with

[16] I have also considered using a spouse's health as an instrument. However, a spouse's health does not appear to be a good predictor of an individuals likelihood to continue participation in the labour force.

[17] The use of maximum likelihood relies heavily on the assumption that the error terms $(\epsilon_{it}, \upsilon_{it})$ follow a bivariate normal distribution and the estimates are inconsistent if normality fails. Given the loose structure placed on the selection equation in this model, it seems inappropriate to rely on such assumptions and the two-step procedure is preferred despite the potential loss in efficiency. Maximum likelihood methods were also used in earlier stages of this study, and while there were few differences in estimates when using male samples, there were often differences in magnitudes between two-step and maximum likelihood estimates for the full sample. See Vella (1998).

[18] A fourth panel began in 2002 but is not yet complete or available.

[19] The survey collects some information about the wages specific to the job, but the information is incomplete and inappropriate for use in this study. That is, it would be useful to look at the wages

fairly comprehensive demographic and income information collected.

The sample used to estimate the model includes four groups of individuals, based on their observed behaviour in a 5-year 'window' (for example 1993-1997).[20] First, an individual is included as a displaced worker whose wage losses are observed if they were displaced from a full-time job when over the age of 50, and return to full-time employment within the 5-year window of observation. Here, I define an individual as displaced if their job came to an end because the company moved, the company went out of business or the individual was laid off due to business slowdown (not caused by seasonal conditions). Second, a comparison group consists of all individuals who were at least 50 years old at some point in the 5-year window and held continuous employment in the same full-time job over the 5 years. The third and fourth samples represent their counterparts whose potential wage offers are not fully observed. The third subsample consists of all individuals who were displaced from full-time work when over the age of 50 but do not return to full-time employment before the end of the 5 year window of observation. The fourth subsample includes those individuals who voluntarily left full-time work when over age 50 and do not return to full-time employment before the end of the 5 year window of observation.[21] For the purposes of estimating the wage model, I then measure w_{it} as the individual's annual wages

at the end of a lost job and then the wages at the start of the next job. This is not always possible, however, as starting wages are only reported at the start of the year and are not provided for jobs that started during the calendar year.

[20] From each 6-year panel, I create two overlapping 5-year windows. When estimating the model, standard errors are clustered at the individual level.

[21] There are of course several individuals not included in this sample. For example, individuals who leave full-time employment voluntarily to switch to new full-time employment are not included. Here, it is not clear if they switched jobs in anticipation of future displacement or simply because of better job prospects and therefore do not make a clearly defined comparison group. Further, these are not likely the individuals of interest to policy makers. It also seems likely that job-switchers are not going to experience the same loss in industry-specific vs. job-specific skills as the group sampled here.

and salaries in year t (stated throughout this paper in \$1996), where year t marks the centre of this 5-year window.[22]

From these samples, I trim the sample to exclude any individuals with wages and salaries greater than \$150,000.[23] I also exclude all construction workers and agriculture workers as "business slowdown" is not as easily defined in these industries. I also exclude anyone who would be over the age of 67 in year t (and over 69 before the end of the 5-year window of observation).

Summary statistics for each of the subsamples are provided in Table 1. It is useful to note those factors that should be properly controlled for when estimating the econometric model and the potential importance of selection in this model. First, there appears to be some selection along gender lines out of employment as more men than women are likely to continue in employment. There is not, however, a large difference in the gender composition of those who were or were not displaced. Considering age, there are not significant differences except that those leaving employment are slightly older, supporting the notion that they are leaving for retirement. In terms of education, more educated individuals are less likely to be in the displaced samples, but there does not appear to be a selection issue here. There are clear differences in the job characteristics between those who experience displacement and those who do not. As expected, individuals with jobs in the public sector and those who are unionized are the least likely to be displaced. These public sector and union jobs are also more likely to have pension benefits available to employees. It is also clearly the individuals with the least seniority who are most likely to be laid off. There is not any clear selection out of employment by job characteristics. In terms of industry compo-

[22]This may include wages and salaries from other jobs.
[23]This is equivalent to working at \$75/hour, 50 weeks at 40 hours/week.

sition, there are some industries that are more likely to experience displacement than others - manufacturing relative to education services for example. There is not much suggestion of selection by industry except that individuals in professional, technical and scientific services are less likely to leave employment.

Important for the identification of the econometric model, there are obvious differences in the selection of individuals into retirement based on their spouse's labour force status. Individuals least likely to enter retirement are the most likely to have a spouse in the labour force. Given that both married and single individuals are included in this sample, it is important to note that this selection is not present by marital status.[24]

Recall that the selection equation is meant to loosely capture the concept of retirement as a departure from full- time employment. From individuals' self-reports of their major activity during the year, I constructed two variables that indicate whether the individual considers themselves retired. First, I create a dummy variable equal to one if the individual self-reports their major activity as retirement at any time during the 5-year window of observation. Second, I create an indicator for the individual reporting retirement as their major activity at the end of the 5-year window. Similarly, there is an indicator for reporting employment as their major activity at the end of the 5-year window. In the samples of workers whose wages are observed, the likelihood of reporting employment as the major activity is very high relative to their likelihood of reporting retirement. Although I am reluctant to formally define the selection equation in the econometric model as a retirement equation, it is reasonable to claim that the model is representing a selection of individuals into the state of

[24]That is, it is not a matter that there is simply something that characterizes married people that makes them less likely to retire and that this characteristic is also related to the wage offers they would receive.

retirement.

4 Results

Results using the full sample of individuals described above are presented in Table 2. The OLS estimates in the first column of the table demonstrate the necessity of controlling for differences across individuals that make them more or less likely to be displaced. Consider the OLS estimates provided in the second column, which effectively ignore the selection equation in the econometric model. Consistent with results in previous research, individuals appear to experience earnings losses long before displacement occurs. These losses prior to displacement, however, are not significantly different from zero. The losses are much larger in the year of displacement, with results indicating that workers face earnings losses of $11,408 , representing 29% of their predisplacement earnings. These losses potentially represent a combination of lower wages at a new job (likely resulting from a loss of job-specific skills), reduced hours at a new job, and a spell of non-employment following displacement. It is important to notice that the earnings losses associated with job loss are actually underestimated in the year of displacement since the annual wages and salaries will include some wages from the lost job. For this reason, the losses in the year following displacement appear largest at $13,907 (35% of predisplacement earnings). The earnings losses remain very large even two years after displacement occurs at 27% of predisplacement earnings.

Using a Heckman selection model to estimate the magnitudes of earnings losses does not produce substantially or significantly different results than using OLS to es-

timate the model. The coefficient on the Inverse Mills Ratio, however, is significantly different from zero, indicating self-selection is an important issue when estimating this model.[25] A closer examination of other estimates in this model exemplify the importance of accounting for selection into retirement among older workers when estimating a wage equation. For example, the estimated effect of age is significantly lower (more negative)and the return to tenure is much larger when using the selection model .

The first stage (Probit) results for this model are presented in the first column of Table 11. Having a spouse in the labour force proves to be a good predictor of whether a person chooses to continue with employment rather than entering retirement. As expected, older individuals with employer-provided pension plans are much less likely to continue with employment.

With consideration for the different labour force attachment among men and women in the older age groups, I also provide the comparable earnings loss estimates for the sub-sample of men. The earnings losses experienced by displaced men are not significantly different from those experienced by the larger sample. Here, in the year following displacement, older men face earnings losses at 37% of predisplacement earnings.

The earnings losses due to displacement among older men are slightly larger than the losses experienced by younger men age 25-34 in the first year after displacement (as presented in Table 3). These differences, however, are not significant. Similarly, there are no substantial or significant differences between the earnings losses experienced by individuals age 35-49 (in Table 4) and the older individuals age 50-69.

Consistent with the literature, the results in Tables 5 and 6 demonstrate that

[25]That is, this indicates a strong correlation in the error terms $(\epsilon_{it}, \upsilon_{it})$.

among individuals age 50-69, the largest wage losses are experienced by individuals with the most pre-displacement job tenure. Here, high tenured individuals are those with more than 10 years of tenure. While high-tenured men experience earnings losses of $22,431 in the first year following displacement and longer-term losses of $16,314, low-tenured displaced men face earnings losses of only $10,592 in the first year and longer-term losses of only $6,394.

Given recent policy goals that could involve the training of older workers, it is interesting to investigate the extent to which various other groups are affected by displacement. In Tables 7 and 8 the results are reproduced for sub-samples of individuals with high levels of education (more than high school graduation) and those with lower levels of education (indicating high school graduation or less). There appear to be substantial differences between the predisplacement losses of higher and lower educated individuals in that low educated individuals faced earnings losses of more than $5,000 in the year prior to displacement. (To note, that loss is not significant for the male lower education subsample.) In the years following displacement, there are not significant differences between education groups.

Similarly, there are no significant differences between the earnings losses of displaced workers in rural or urban areas (Table 9). Contrary to expectations, the estimates indicate the urban workers face slightly larger losses than rural workers in the year following displacement. Important to note, however, this simple analysis does not account for individuals moving from rural to urban areas following displacement.

In Table 10 I provide estimates using samples based on different definitions of displacement given concerns about the differences between individuals who are laid-off and those who lose jobs due to businesses closing. Gibbons and Katz (1991) suggest that wage losses that result from displacement should be larger for those laid

off than for those displaced by plant closings. This does not, however, appear to be the case in this sample of workers. Prior to displacement, individuals that will be displaced due to a business closing face large and significant losses that are not facing the individuals that will be laid off. Following displacement, the workers displaced due to business closure also have larger immediate losses. The long-term losses for these two groups, however, are not different.

The final set of estimates presented in the fifth and sixth columns of Table 10 address concerns that many people would like to return to full-time work but end up working part-time. Reasonably, we would want to include this type of change in earnings when forming estimates of earnings losses. To do this, I redefined the sampling procedures such that any individual displaced from a full-time job that returns to any form of paid employment (full-time or part-time) would be included in the sample of displaced workers whose earnings are fully observed. Once again, the results are not substantially different from the full sample used in Table 2.

Overall, the estimates provided here indicate that the earnings losses faced by displaced older workers are large and persistent, consistent with previous research. These losses appear slightly larger than losses among younger workers. Further, estimates are robust to the exclusion of laid off individuals from the displaced worker samples.

5 Concluding Remarks

To summarize, the results of this study confirm that workers over the age of 50 face large and persistent earnings losses upon displacement. These losses appear slightly larger than those experienced by the youngest displaced workers but are not substantially nor significantly larger than displaced workers between the ages of 35 and 49. The results indicate that selection into retirement is an important consideration when estimating the earnings of older workers. Interestingly, however, this self-selection does not result in a significant bias in estimates of displaced workers' earnings losses.

6 TABLES

Table 1: Summary Statistics

	Displaced & Return FT	Continuous FT Work	Displaced & Leave	Voluntarily Leave
Number of observations	1,013	7,046	689	3,186
Wages and Salaries	21,219	39,487		
Age	54.9	52.9	56.1	58.9
Male	0.66	0.64	0.50	0.55
Education				
Less than high school	0.34	0.20	0.35	0.28
High school graduate	0.14	0.18	0.20	0.18
Some post-secondary	0.10	0.09	0.07	0.07
Post-secondary	0.33	0.35	0.31	0.29
University	0.09	0.18	0.07	0.18
"Lost" Job:				
Public sector	0.06	0.30	0.08	0.35
Unionized	0.27	0.50	0.21	0.52
Job tenure (months)	90	232	108	214
Pension Plan	0.32	0.59	0.23	0.62
Industry				
Forestry, Fishing	0.06	0.03	0.03	0.02
Utilities	0.01	0.01	0.02	0.02
Manufacturing	0.28	0.20	0.23	0.17
Trade	0.17	0.14	0.22	0.11
Transportation	0.06	0.06	0.06	0.06
FIRE	0.06	0.06	0.06	0.07
Professional... services	0.07	0.05	0.02	0.03
Business... support	0.06	0.02	0.04	0.03
Education	0.02	0.10	0.02	0.14
Health & Soc. Assistance	0.03	0.12	0.06	0.12
Culture & Rec	0.03	0.03	0.03	0.05
Accomm. & Food Services	0.07	0.02	0.08	0.05
Other services	0.06	0.06	0.09	0.05
Public administration	0.04	0.10	0.04	0.09
Spouse in the labour force	0.48	0.57	0.40	0.34
Married	0.77	0.79	0.77	0.79
Reports poor health	0.02	0.01	0.06	0.04
Spouse reports poor health	0.03	0.02	0.05	0.04
Main Activity				
Ever report retired	0.11	0.00	0.39	0.76
Retired at end of window	0.08	0.00	0.32	0.67
Employed at end of window	0.71	0.99	0.28	0.15

Weighted sample means are presented. Samples and variables are described in text.

Table 2: Earnings - Baseline Results

	Full sample			Male	
	OLS	OLS	Heckman	OLS	Heckman
Displaced					
2 years before	-11318 **	-5580	-5350	-2263	-1969
	(4926)	(4237)	(4125)	(6128)	(6068)
1 year before	-10131 ***	-2651	-2273	-85	487
	(2994)	(2581)	(2545)	(3700)	(3613)
year of displacement	-18672 ***	-11408 ***	-11283 ***	-12036 ***	-11834 ***
	(2592)	(2454)	(2450)	(3635)	(3647)
1 year after	-22930 ***	-13907 ***	-13970 ***	-14565 ***	-15203 ***
	(1499)	(1751)	(1736)	(2365)	(2391)
2 years after	-20859 ***	-10725 ***	-10752 ***	-10417 ***	-10623 ***
	(1520)	(1798)	(1808)	(2419)	(2464)
Male	-	8320 ***	12571 ***	-	
		(880)	(1076)		
Age	-	-632 ***	-2632 ***	-791 ***	-2753 ***
		(122)	(341)	(165)	(362)
Education					
High School	-	2709 **	2458 **	2646	3284 *
		(1286)	(1253)	(1876)	(1821)
Some PS	-	7549 ***	8115 ***	8398 ***	8750 ***
		(2002)	(2004)	(2759)	(2753)
Post-secondary	-	7426 ***	7604 ***	7218 ***	7394 ***
		(1071)	(1056)	(1466)	(1456)
University	-	20348 ***	19358 ***	22050 ***	21207 ***
		(1955)	(1951)	(2575)	(2570)
Public sector	-	10928 ***	9163 ***	10033 ***	5852 ***
		(1562)	(1565)	(2005)	(2147)
Unionized	-	6189 ***	4903 ***	6883 ***	5132 ***
		(1091)	(1092)	(1430)	(1443)
Tenure	-	24 ***	41 ***	27 ***	38 ***
		(4)	(5)	(5)	(6)
Mills Ratio	-	-	30400 ***	-	32163 ***
			(4862)		(5532)
Constant	39487 ***	57164 ***	141909 ***	72989 ***	160659 ***
	(584)	(7063)	(15318)	(9294)	(16994)
Industry	No	Yes	Yes	Yes	Yes
Province	No	Yes	Yes	Yes	Yes
Year	No	Yes	Yes	Yes	Yes

Notes: Dependent variable: Annual wages and salary. Heckman refers to the Heckman two-step procedure. Robust standard errors are in parentheses.
**, **, * indicate significance at the 1%, 5%, and 10% levels.

Table 3: Earnings - Age 25-34

	Age 25-34		Age 25-34, Male	
	OLS	Heckman	OLS	Heckman
Displaced				
2 years before	-4041 *	-5408 ***	-1207	-1703
	(2256)	(2300)	(2785)	(2770)
1 year before	-6685 ***	-8108 ***	-4901 **	-5365 **
	(1746)	(1799)	(2386)	(2374)
year of displacement	-10859 ***	-12240 ***	-11011 ***	-11446 ***
	(1339)	(1364)	(1803)	(1883)
1 year after	-11618 ***	-13025 ***	-12549 ***	-13016 ***
	(1405)	(1413)	(1897)	(1920)
2 years after	-10412 ***	-11741 ***	-11375 ***	-11818 ***
	(1467)	(1479)	(1969)	(1966)
Male	8252 ***	10535 ***	-	-
	(769)	(942)		
Age	489 ***	712 ***	764 ***	833 ***
	(125)	(130)	(175)	(191)
Education				
High School	2799 ***	2571 **	2659 **	2629 **
	(1006)	(1013)	(1336)	(1338)
Some PS	3958 ***	3177 ***	3625 **	3330 **
	(1065)	(1102)	(1440)	(1501)
Post-secondary	6671 ***	6832 ***	6495 ***	6493 ***
	(887)	(903)	(1174)	(1179)
University	14690 ***	14332 ***	15102 ***	15101 ***
	(1702)	(1721)	(2301)	(2303)
Public sector	2006	1436	2550	2479
	(1601)	(1618)	(2655)	(2663)
Unionized	4588 ***	5176 ***	5424 ***	5524 ***
	(889)	(913)	(1196)	(1219)
Tenure	48 ***	98 ***	52 ***	63 ***
	(10)	(17)	(14)	(20)
Mills Ratio	-	11349 ***	-	3022
		(2922)		(4092)
Constant	1240	-12260 **	-137	-3229
	(4124)	(5073)	(5417)	(6671)

Notes: Dependent variable: Annual wages and salary. Heckman refers to the Heckman two-step procedure. Robust standard errors are in parentheses. All specifications include a set of industry, province and year indicators.
**, **, * indicate significance at the 1%, 5%, and 10% levels.

Table 4: Earnings - Age 35-49

	Age 35-49		Age 35-49, Male	
	OLS	Heckman	OLS	Heckman
Displaced				
2 years before	-7026 ***	-6598 ***	-7541 ***	-6646 ***
	(1669)	(1676)	(2249)	(2207)
1 year before	-4436 ***	-4021 ***	-4209 **	-3469 *
	(1456)	(1475)	(1939)	(1962)
year of displacement	-11475 ***	-10940 ***	-12625 ***	-11629 ***
	(1156)	(1203)	(1654)	(1755)
1 year after	-14185 ***	-13584 ***	-16470 ***	-15185 ***
	(1329)	(1371)	(1740)	(1792)
2 years after	-12098 ***	-11408 ***	-13851 ***	-12290 ***
	(1406)	(1466)	(1978)	(1990)
Male	9421 ***	8573 ***	-	-
	(637)	(772)		
Age	43	105	60	215 **
	(68)	(74)	(96)	(106)
Education				
High School	1774 **	1340 *	878	93
	(774)	(810)	(1077)	(1115)
Some PS	5891 ***	5827 ***	6495 ***	6455 ***
	(945)	(949)	(1316)	(1310)
Post-secondary	7839 ***	7402 ***	8412 ***	7483 ***
	(735)	(771)	(1004)	(1064)
University	18180 ***	17653 ***	19746 ***	18716 ***
	(1302)	(1328)	(1779)	(1848)
Public sector	6778 ***	6459 ***	6010 ***	5423 ***
	(1095)	(1101)	(1774)	(1759)
Unionized	2793 ***	2465 ***	3320 ***	2641 ***
	(653)	(662)	(917)	(929)
Tenure	37 ***	28 ***	39 ***	20 ***
	(4)	(6)	(5)	(8)
Mills Ratio	-	-6776 **	-	-18140 ***
		(3309)		(6264)
Constant	16898 ***	17802 ***	24078 ***	24335 ***
	(3175)	(3224)	(4134)	(4140)

Notes: Dependent variable: Annual wages and salary. Heckman refers to the Heckman two-step procedure. Robust standard errors are in parentheses. All specifications include a set of industry, province and year indicators.
**, **, * indicate significance at the 1%, 5%, and 10% levels.

Table 5: Earnings - High Tenure

	High Tenure		High Ten., Male	
	OLS	Heckman	OLS	Heckman
Displaced				
2 years before	2440	2685	10817	11627
	(8018)	(7766)	(11250)	(10707)
1 year before	-2496	-2438	-137	130
	(3198)	(3129)	(4256)	(4093)
year of displacement	-15505 ***	-15527 ***	-17485 ***	-17709 ***
	(4189)	(4155)	(5610)	(5622)
1 year after	-18376 ***	-18504 ***	-22431 ***	-24089 ***
	(3286)	(3451)	(3632)	(3776)
2 years after	-13995 ***	-13794 ***	-16314 ***	-17107 ***
	(3160)	(3289)	(3932)	(4104)
Male	9371 ***	11356 ***	-	-
	(1051)	(1155)		
Age	-636 ***	-1825 ***	-838 ***	-2096 ***
	(149)	(360)	(199)	(376)
Education				
High School	2023	2150	1005	1368
	(1579)	(1547)	(2227)	(2146)
Some PS	8644 ***	8515	10616 ***	9955 ***
	(2582)	(2586)	(3464)	(3439)
Post-secondary	8116 ***	8006 ***	7678 ***	7760 ***
	(1315)	(1306)	(1741)	(1737)
University	20017 ***	20001 ***	21312 ***	21744 ***
	(2133)	(2127)	(2777)	(2774)
Public sector	11978 ***	10247 ***	11433 ***	8455 ***
	(1825)	(1873)	(2199)	(2319)
Unionized	5603 ***	3940 ***	5557 ***	3026 *
	(1324)	(1342)	(1698)	(1726)
Tenure	19 ***	10	19 **	6
	(6)	(6)	(8)	(8)
Mills Ratio	-	18162 ***	-	21376 ***
		(4808)		(5125)
Constant	59632 ***	116020 ***	81318 ***	142846 ***
	(8428)	(17766)	(10919)	(18974)

Notes: Dependent variable: Annual wages and salary. Heckman refers to the Heckman two-step procedure. Robust standard errors are in parentheses. All specifications include a set of industry, province and year indicators. High tenure samples include individuals with more than 10 years tenure on their (pre-displacement) job.
**, **, * indicate significance at the 1%, 5%, and 10% levels.

Table 6: Earnings - Low Tenure

	Low Tenure		Low Tenure, Male	
	OLS	Heckman	OLS	Heckman
Displaced				
2 years before	-10655 ***	-10518 ***	-9201 *	-8886 *
	(4046)	(4097)	(5282)	(5347)
1 year before	-3137	-3344	290	-4
	(3710)	(3756)	(5467)	(5470)
year of displacement	-10188 ***	-10497 ***	-9178 *	-9480 *
	(3583)	(3619)	(5501)	(5494)
1 year after	-11720 ***	-11967 ***	-10592 ***	-10969 ***
	(2657)	(2636)	(3515)	(3512)
2 years after	-8560 ***	-9019 ***	-6394 **	-7143 **
	(2407)	(2387)	(3045)	(3030)
Male	5953 ***	7837 ***	-	-
	(1584)	(2147)		
Age	-585 ***	-1006 **	-694 ***	-1165 **
	(190)	(407)	(269)	(517)
Education				
High School	4652 **	3763	6281 **	5838 *
	(2118)	(2406)	(3192)	(3320)
Some PS	4265 *	4487 *	1740	1897
	(2543)	(2545)	(3489)	(3501)
Post-secondary	5212 ***	5161 ***	5096 **	4692 *
	(1808)	(1812)	(2551)	(2593)
University	21755 ***	20917 ***	25449 ***	23930 ***
	(4495)	(4726)	(6075)	(6355)
Public sector	8079 **	8393 ***	5802	4867
	(3259)	(3254)	(4750)	(4696)
Unionized	7302 ***	7667 ***	9567 ***	10559 ***
	(1860)	(1922)	(2521)	(2673)
Tenure	1	52	-1	52
	(30.5)	(55.9)	(41.1)	(64.4)
Mills Ratio	-	8111	-	9696
		(6465.1)		(8140.4)
Constant	54524 ***	69775 ***	63173 ***	82621 ***
	(11934.3)	(18452.0)	(16009.8)	(24997.4)

Notes: Dependent variable: Annual wages and salary. Heckman refers to the Heckman two-step procedure. Robust standard errors are in parentheses. All specifications include a set of industry, province and year indicators. Low tenure samples include individuals with less than 10 years tenure on their (pre-displacement) job.
**, **, * indicate significance at the 1%, 5%, and 10% levels.

Table 7: Earnings - High Education Sample

	High Educ.		High Educ., Male	
	OLS	Heckman	OLS	Heckman
Displaced				
2 years before	-913	-988	3423	3258
	(6426)	(6208)	(7860)	(7522)
1 year before	61	270	3584	3670
	(3896)	(3869)	(5083)	(4949)
year of displacement	-12644 ***	-12352 ***	-13713 **	-13426 **
	(4140)	(4165)	(5658)	(5695)
1 year after	-14985 ***	-14785 ***	-14860 ***	-15123 ***
	(2780)	(2801)	(3725)	(3773)
2 years after	-11506 ***	-11566 ***	-9213 **	-9662 **
	(2761)	(2786)	(3695)	(3791)
Male	7707 ***	9497 ***	-	-
	(1214)	(1374)		
Age	-712 ***	-1803 ***	-956 ***	-2642 ***
	(156)	(491)	(195)	(493)
Education				
Post-secondary	-11	-236	-1002	-1185
	(1859)	(1861)	(2592)	(2592)
University	12853 ***	12344 ***	13815 ***	13533 ***
	(2467)	(2472)	(3324)	(3317)
Public sector	13144 ***	11655 ***	11620 ***	7276 ***
	(2039)	(2111)	(2582)	(2834)
Unionized	4385 ***	3992 ***	4002 **	3196 *
	(1467)	(1460)	(1892)	(1863)
Tenure	28 ***	38 ***	36 ***	50 ***
	(6)	(7)	(8)	(9)
Mills Ratio	-	16506 **	-	27832 ***
		(7012)		(7558)
Constant	71498 ***	117776 ***	88837 ***	162530 ***
	(9226)	(21727)	(11189)	(22519)

Notes: Dependent variable: Annual wages and salary. Heckman refers to the Heckman two-step procedure. Robust standard errors are in parentheses. All specifications include a set of industry, province and year indicators. Sample excludes individuals with high school graduation or less as their highest level of education.
**, **, * indicate significance at the 1%, 5%, and 10% levels.

Table 8: Earnings - Lower Education Sample

	Low Educ.		Low Educ., Male	
	OLS	Heckman	OLS	Heckman
Displaced				
2 years before	-9340 **	-9362 **	-8831	-9172
	(4068)	(4416)	(6299)	(6817)
1 year before	-5331 **	-5338 **	-4686	-4242
	(2591)	(2514)	(4057)	(3933)
year of displacement	-9887 ***	-10564 ***	-10088 ***	-10309 ***
	(2319)	(2309)	(3681)	(3649)
1 year after	-12638 ***	-13426 ***	-15413 ***	-16584 ***
	(2045)	(2059)	(2779)	(2814)
2 years after	-10245 ***	-10527 ***	-12826 ***	-13195 ***
	(2056)	(2097)	(2730)	(2778)
Male	9121 ***	15584 ***	-	-
	(1147)	(1607)		
Age	-485 ***	-2866 ***	-548 **	-2520 ***
	(187)	(444)	(274)	(497)
Education				
High School	2587 **	2293 *	2457	3183 *
	(1309)	(1262)	(1887)	(1839)
Public sector	5731 ***	5472 ***	7571 **	4371
	(1978)	(2018)	(2959)	(3368)
Unionized	9315 ***	6954 ***	11207 ***	8743 ***
	(1567)	(1648)	(2129)	(2276)
Tenure	18 ***	35 ***	14 **	20 ***
	(5)	(6)	(7)	(7)
Mills Ratio	-	36038 ***	-	31528 ***
		(6050)		(7099.8)
Constant	47268 ***	148431 ***	62819 ***	153067 ***
	(10365)	(19817)	(15009)	(23772)

Notes: Dependent variable: Annual wages and salary. Heckman refers to the Heckman two-step procedure. Robust standard errors are in parentheses. All specifications include a set of industry, province and year indicators. Sample includes individuals with high school graduation or less as their highest level of education.
**, **, * indicate significance at the 1%, 5%, and 10% levels.

Table 9: Earnings - Other samples

	Rural		Urban		Private sector	
	OLS	Heckman	OLS	Heckman	OLS	Heckman
Displaced						
2 years before	2005	2933	-7517	-7559	-5049	-4869
	(4862)	(4623)	(5063)	(4884)	(4511)	(4266)
1 year before	-4675	-4748	-2126	-1712	-2118	-2072
	(3165)	(3092)	(3160)	(3112)	(2761)	(2724)
year of displacement	-11470 ***	-11796 ***	-11238 ***	-10867 ***	-10330 ***	-10780 ***
	(2009)	(1957)	(3190)	(3188)	(2648)	(2643)
1 year after	-11790 ***	-12804 ***	-14552 ***	-14288 ***	-12462 ***	-13140 ***
	(2774)	(2781)	(2074)	(2053)	(1834)	(1806)
2 years after	-12204 ***	-13799 ***	-10120 ***	-9821 ***	-9759 ***	-10547 ***
	(2725)	(2750)	(2070)	(2076)	(1958)	(1963)
Male	8173 ***	11290 ***	8611 ***	13035 ***	8474 ***	15364 ***
	(1466)	(1512)	(1003)	(1294)	(1123)	(1353)
Age	-572 ***	-2593 ***	-614 ***	-2533 ***	-742 ***	-3083 ***
	(185)	(458)	(139)	(397)	(152)	(317)
Education						
High School	3453	1373	2033	2136	2665 *	3595 **
	(2221)	(2265)	(1487)	(1446)	(1525)	(1472)
Some PS	2705	3843	7863 ***	8470 ***	8196 ***	9997 ***
	(3155)	(3076)	(2278)	(2284)	(2512)	(2507)
Post-secondary	5541 ***	6592 ***	7411 ***	7508 ***	6792 ***	8543 ***
	(1796)	(1781)	(1257)	(1239)	(1295)	(1266)
University	15757 ***	15513 ***	20584 ***	19605 ***	18421 ***	19495 ***
	(3153)	(3218)	(2193)	(2188)	(3010)	(2965)
Public sector	6674 ***	1808	12115 ***	11070 ***	-	-
	(2418)	(2579)	(1804)	(1787)		
Unionized	9246 ***	9234 ***	5041 ***	3471 ***	8672 ***	6434 ***
	(1711)	(1667)	(1259)	(1279)	(1245)	(1246)
Tenure	14 **	32 ***	27 ***	43 ***	26 ***	55 ***
	(6)	(7)	(5)	(6)	(5)	(6)
Mills Ratio	-	29979 ***	-	29528 ***	-	39611 ***
		(5846)		(5756)		(4718)
Constant	38805 ***	131645 ***	64814 ***	143205 ***	61946 ***	155834 ***
	(10722)	(22429)	(8075)	(17273)	(8482)	(14061)

Notes: Dependent variable: Annual wages and salary. Heckman refers to the Heckman two-step procedure. Robust standard errors are in parentheses. All specifications include a set of industry, province and year indicators. Samples of rural and urban are based on the reported residence at the time wages are observed. The private sector sample excludes any jobs involving public sector workers (defined within SLID, based on pre-displacement jobs).
**, **, * indicate significance at the 1%, 5%, and 10% levels.

Table 10: Earnings - Alternative definitions of sample

	Laid-Off		Business Closed		Return to FT or PT	
	OLS	Heckman	OLS	Heckman	OLS	Heckman
Displaced						
2 years before	-1911	-1879	-9079 ***	-8639 ***	-5136	-4707
	(7884)	(7691)	(2672)	(2573)	(3506)	(3419)
1 year before	115	308	-7505 **	-6680 **	-4629 *	-4410 *
	(3461)	(3439)	(3033)	(2884)	(2373)	(2323)
year of displacement	-9723 ***	-9656 ***	-14503 ***	-14089 ***	-11756 ***	-11712 ***
	(3233)	(3176)	(3180)	(3300)	(2240)	(2221)
1 year after	-13485 ***	-13442 ***	-14692 ***	-14822 ***	-14160 ***	-14156 ***
	(2017)	(1952)	(2971)	(3079)	(1650)	(1635)
2 years after	-11300 ***	-11343 ***	-9375 ***	-9117 ***	-11343 ***	-11356 ***
	(2222)	(2254)	(2501)	(2522)	(1700)	(1714)
Male	8322 ***	12374 ***	8032 ***	11584 ***	8263 ***	11702 ***
	(910)	(1052)	(924)	(1068)	(870)	(992)
Age	-571 ***	-2655 ***	-590 ***	-2523 ***	-611 ***	-2500 ***
	(124)	(336)	(127)	(349)	(120)	(315)
Education						
High School	2425 *	2381 *	2853 **	2456 *	2699 **	2695 **
	(1329)	(1290)	(1361)	(1324)	(1268)	(1236)
Some PS	7777 ***	8377 ***	8050 ***	8012 ***	7258 ***	8367 ***
	(2065)	(2066)	(2147)	(2161)	(1969)	(1972)
Post-secondary	7594 ***	7990 ***	7448 ***	7181 ***	7404 ***	8131 ***
	(1105)	(1086)	(1145)	(1133)	(1053)	(1040)
University	20641 ***	19711 ***	20240 ***	18957 ***	20217 ***	19857 ***
	(1999)	(1991)	(1936)	(1945)	(1943)	(1933)
Public sector	10877 ***	9063 ***	11596 ***	9773 ***	10789 ***	7750 ***
	(1590)	(1589)	(1593)	(1607)	(1533)	(1580)
Unionized	6192 ***	4596 ***	6530 ***	4752 ***	6209 ***	4833 ***
	(1116)	(1119)	(1133)	(1151)	(1079)	(1081)
Tenure	25 ***	42 ***	23 ***	39 ***	24 ***	39 ***
	(4)	(5)	(4)	(5)	(4)	(5)
Mills Ratio	-	31034 ***	-	27913 ***	-	30762
		(4661)		(4751)		(4734)
Constant	53591 ***	142211 ***	56711 ***	139204 ***	56106 ***	135502 ***
	(7183)	(15211)	(7427)	(15797)	(6931)	(14165)

Notes: Dependent variable: Annual wages and salary. Heckman refers to the Heckman two-step procedure. Robust standard errors are in parentheses. All specifications include a set of industry, province and year indicators. Sampling for laid off and closed are based on self-reports of reasons for job separation (see text for description of sample).
**, **, * indicate significance at the 1%, 5%, and 10% levels.

Table 11: First Stage Probit Results

	Full Sample	Male	25-34	25-34 Male	35-49	35-49 Male
Spouse	0.208 ***	0.296 ***	-0.096	-0.062	0.152 ***	0.311 ***
In labour force	(.046)	(.060)	(.062)	(.101)	(.042)	(.058)
Pension	-0.217 ***	-0.386 ***	-0.081	0.114	0.189 ***	0.202 ***
	(.062)	(.083)	(.074)	(.105)	(.054)	(.074)
Male	0.326 ***	-	0.453 ***		0.463 ***	
	(.051)		(.062)		(.047)	
Age	-0.142 ***	-0.143 ***	0.052 ***	0.068 ***	-0.026 ***	-0.033 ***
	(.005)	(.006)	(.010)	(.014)	(.005)	(.007)
High School Grad.	-0.019	0.057	-0.036	-0.033	0.231 ***	0.198 *
	(.075)	(.100)	(.118)	(.161)	(.075)	(.111)
Some PS	0.077	0.055	-0.164	-0.214	0.004	-0.043 *
	(.095)	(.115)	(.115)	(.157)	(.089)	(.125)
Post Secondary	0.034	0.028	0.037	0.029	0.203 ***	0.205 **
	(.062)	(.079)	(.102)	(.141)	(.066)	(.099)
University	-0.053	-0.026	-0.069	0.001	0.192 **	0.191
	(.086)	(.108)	(.119)	(.168)	(.085)	(.125)
Public Sector	-0.083	-0.228 *	-0.157	-0.108	0.158 *	0.166
	(.097)	(.122)	(.144)	(.257)	(.095)	(.160)
Unionized	-0.016	0.014	0.169 **	0.064	0.133 **	0.142 *
	(.061)	(.078)	(.082)	(.113)	(.060)	(.078)
Tenure	0.001 ***	0.001 ***	0.015 ***	0.018 ***	0.006 ***	0.006 ***
	(.000)	(.000)	(.001)	(.001)	(.000)	(.001)
Constant	7.655 ***	8.208 ***	-1.410 ***	-1.477 ***	1.100 ***	1.619 ***
	(.312)	(.400)	(.342)	(.462)	(.260)	(.361)

Probit coefficients are presented with standard errors in parentheses.

***, **, * indicate significance at the 1%, 5%, and 10% levels.

Included are indicators for industry, year and province.

Table 12: First Stage Probit Results

	High Educ.	High Educ. Male	Low Educ.	Low Educ. Male	High Ten.	High Ten. Male
Spouse	0.220 ***	0.299 ***	0.194 ***	0.320 ***	0.120 **	0.274 ***
In labour force	(.061)	(.078)	(.072)	(.092)	(.061)	(.076)
Pension	-0.132	-0.346 ***	-0.327 ***	-0.446 ***	-0.415 ***	-0.676 ***
	(.083)	(.112)	(.093)	(.125)	(.089)	(.125)
Male	0.255 ***		0.402 ***		0.317 ***	
	(.068)		(.077)		(.072)	
Age	-0.147 ***	-0.148 ***	-0.139 ***	-0.144 ***	-0.171 ***	-0.175 ***
	(.006)	(.008)	(.008)	(.010)	(.007)	(.009)
High School Grad.	-	-	-0.003 ***	0.076	-0.013	0.006
			(.078)	(.102)	(.099)	(.124)
Some PS	-	-	-	-	0.016	-0.079
					(.124)	(.141)
Post Secondary	-0.043	-0.028	-	-	0.040	0.044
	(.094)	(.113)			(.082)	(.100)
University	-0.080	-0.008	-	-	0.049	0.156
	(.112)	(.134)			(.112)	(.132)
Public Sector	-0.205	-0.342 **	0.079	-0.134	-0.168	-0.274 *
	(.125)	(.159)	(.157)	(.192)	(.126)	(.143)
Unionized	-0.004	0.068	0.000	-0.004	-0.151 **	-0.177 *
	(.081)	(.103)	(.094)	(.119)	(.081)	(.102)
Tenure	0.002 ***	0.001 ***	0.001 ***	0.001 *	-0.001 ***	-0.002 ***
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Constant	7.903 ***	8.267 ***	7.501 ***	8.371 ***	10.136 ***	10.917 ***
	(.410)	(.524)	(.477)	(.631)	(.488)	(.586)

Probit coefficients are presented with standard errors in parentheses.

***, **, * indicate significance at the 1%, 5%, and 10% levels.

Included are indicators for industry, year and province.

Table 13: First Stage Probit Results

	Low Ten.	Low Ten Male	Rural	Urban	Private Sector
Spouse	0.271 ***	0.286 ***	0.210 ***	0.205 ***	0.268 ***
In labour force	(.078)	(.103)	(.080)	(.053)	(.056)
Pension	-0.183 *	-0.255 **	-0.325 ***	-0.198 ***	-0.307 ***
	(.097)	(.124)	(.110)	(.071)	(.068)
Male	0.497 ***		0.251 ***	0.353 ***	0.401 ***
	(.083)		(.095)	(.058)	(.060)
Age	-0.108 ***	-0.113 ***	-0.145 ***	-0.142 ***	-0.133 ***
	(.008)	(.010)	(.009)	(.006)	(.006)
High School Grad.	-0.186 *	-0.040	-0.162	0.007	0.059
	(.112)	(.152)	(.126)	(.087)	(.083)
Some PS	0.114	0.099	0.112	0.080	0.137
	(.155)	(.224)	(.169)	(.111)	(.103)
Post Secondary	0.051	-0.020	0.122	0.025	0.136 *
	(.102)	(.134)	(.106)	(.073)	(.071)
University	-0.160	-0.302 *	0.043	-0.067	0.114
	(.143)	(.185)	(.160)	(.098)	(.111)
Public Sector	0.138	-0.145	-0.326 *	-0.031	
	(.174)	(.248)	(.169)	(.111)	
Unionized	0.146	0.331 **	0.130	-0.056	0.001
	(.105)	(.135)	(.105)	(.071)	(.072)
Tenure	0.014 ***	0.014 ***	0.002 ***	0.001 ***	0.002 ***
	(.001)	(.001)	(.000)	(.000)	(.000)
Constant	5.544 ***	6.485 ***	8.295 ***	7.436 ***	7.012 ***
	(.497)	(.663)	(.555)	(.363)	(.356)
	0.49685999	0.66333735	0.5554319	0.36297074	0.35609897

Probit coefficients are presented with standard errors in parentheses.

***, **, * indicate significance at the 1%, 5%, and 10% levels.

Included are indicators for industry, year and province.

Table 14: First Stage Probit Results

	Laidoff	Bus. Closed	full (FT and PT)
Spouse	0.207 ***	0.206 ***	0.213 ***
In labour force	(.048)	(.050)	(.048)
Pension	-0.265 ***	-0.284 ***	-0.236 ***
	(.065)	(.067)	(.064)
Male	0.315 ***	0.313 ***	0.279 ***
	(.053)	(.056)	(.053)
Age	-0.148 ***	-0.158 ***	-0.140 ***
	(.005)	(.006)	(.005)
High School Grad.	0.001	-0.034	0.001
	(.078)	(.083)	(.076)
Some PS	0.086	0.038	0.129
	(.099)	(.104)	(.101)
Post Secondary	0.060	0.006	0.082
	(.064)	(.068)	(.063)
University	-0.045	-0.087	0.000
	(.088)	(.094)	(.088)
Public Sector	-0.071	-0.090	-0.187 *
	(.099)	(.101)	(.101)
Unionized	-0.027	-0.059	-0.024
	(.063)	(.067)	(.063)
Tenure	0.001 ***	0.002 ***	0.001 ***
	(.000)	(.000)	(.000)
Constant	7.971 ***	8.428 ***	7.578 ***
	(.321)	(.356)	(.322)

Probit coefficients are presented with standard errors in parentheses.

***, **, * indicate significance at the 1%, 5%, and 10% levels.

Included are indicators for industry, year and province.

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