

Worker Displacement: A Literature Review and Potential Policy Responses

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INTRODUCTION

I am delighted and honoured to be part of this wonderful celebration of David Dodge's illustrious career in the Public Service of Canada. From my vantage point in Kingston, not too far from the fleshpots of the nation's capital, what has long impressed me about David's distinguished and varied career in the Government of Canada (interspersed with short spells in the friendly groves of academe) is the all-too-rare combination of intelligence, knowledge, honesty, and forthrightness he brought to the many high positions he held. The formulation and administration of public policy in this country over the past three to four decades have been much the better for these qualities. And though David's service and character will be greatly missed in Ottawa, I and many others at Queen's University are delighted that he has taken on the role of Chancellor at his undergraduate alma mater. Chrysler (the auto maker) may not be doing very well these days, but there is a Dodge that everyone would like to have on their side.

The consequences and policy responses to worker displacement is an incredibly timely subject. As economies around the world enter a period of severe and perhaps prolonged economic contraction, the incidence of worker displacement will surely increase—quite possibly dramatically—in the months and years ahead. It is therefore appropriate that we take stock both of what we know, or think we know, about the nature and consequences of worker displacement, and of the government programs and policies that may help to ameliorate the adverse impacts of worker displacement on individuals and society. I have chosen to review in some detail what I regard as the best recent empirical evidence on the incidence and earnings effects of worker displacement in Canada and the United States, since I think this evidence provides a compelling case for public policies specifically aimed at mitigating the adverse individual and social effects of displacement. I also present my views (and some evidence) on the rationale for, and probable effectiveness of, such policy measures.

Any attempt to summarize the current state of knowledge about worker displacement probably focuses on one or more of three questions. What are the causes of worker displacement? What is the incidence of worker displacement; i.e., what types of workers are more likely to experience displacement, or what observable worker characteristics are associated with job displacement? And what are the consequences of worker displacement?

The causes of worker displacement have been the subject of little empirical research, with the unsurprising result that not much is known about them. In contrast, considerably more is known about the incidence and consequences of worker displacement. With respect to the incidence of displacement, I think it is accurate to say that there exists much more comprehensive evidence on the types of workers who experience displacement in the United States than in Canada, primarily because there is a long series of Displaced Workers Surveys for the United States but not for Canada. Fortunately, this disparity in evidence between the two countries is no longer as great with respect to the consequences of worker displacement. Much recent empirical research on worker displacement in both Canada and the United States has investigated the incidence and duration of joblessness/unemployment following displacement, and the magnitude and persistence of earnings losses associated with displacement.

DEFINITION OF WORKER DISPLACEMENT: HOW ARE DISPLACED WORKERS DEFINED AND IDENTIFIED?

How are displaced workers different from other workers who experience a permanent layoff? First, separation from the pre-displacement job is *involuntary*, not voluntary, on the part of workers; *voluntary* or worker-initiated separations—for example, quits—do not constitute displacement. Admittedly, this distinction can be blurred in cases where wage or hours changes before the displacement event may induce some employees to quit and therefore not be counted as displaced workers, whereas other employees do not quit and subsequently become displaced. Second, displaced workers' job separations are *permanent*, not temporary, in the sense that there is little or no likelihood of recall to their pre-displacement employer or of re-employment in their pre-displacement industry. Workers on temporary layoff are therefore not categorized as displaced workers. Third, the reason for job separation is unrelated to the job performance of individual workers; there are no "lemons and layoffs" selectivity problems of the sort identified by Gibbons and Katz (1991), whereby firms lay off their least productive workers first. In other words, the job separation is exogenous to the worker: the probability of job displacement is orthogonal to the observed and unobserved determinants of individual workers' job performance and pay. Workers discharged for cause (unsatisfactory job performance) are therefore not classified as displaced workers. In the empirical literature on worker displacement, the most common proximate reasons for worker displacement include: plant/establishment closures, complete or partial; firm closures or deaths (employer going out of business); and mass layoffs involving large reductions in employment. Finally, workers who experience displacement have strong, long-standing attachments to their pre-displacement employer (and/or pre-displacement industry)—they are *established* workers with *higher* levels of firm and industry tenure. Much of the research into the consequences of worker displacement has focused on high-tenure workers,¹ perhaps because, should they become displaced, *high-tenure* workers have much to lose: job-specific, firm-specific, and industry-specific human capital; match capital (the returns to higher productivity from a long-standing "good" match); deferred compensation that they would have received had they remained with their pre-displacement employer; and wage premiums associated with seniority or with the direct or indirect effects of unions.

1. In this connection, it is noteworthy that the U.S. Bureau of Labor Statistics actually *defines* displaced workers as persons who had at least three years of tenure with their former employer when they permanently lost their jobs.

IMPORTANCE OF WORKER DISPLACEMENT

Why are the consequences of worker displacement important? First, the joblessness and earnings losses associated with worker displacement measure the individual economic hardship arising from displacement, and evidence makes clear that these earnings losses are both large and enduring. But, more fundamentally, the costs of resource reallocation are heavily concentrated on displaced workers: a relatively small number of displaced workers incur very large costs. To the extent that workers cannot privately insure themselves against the risks of job displacement associated with structural shocks such as technological change, increased import competition in domestic markets, increased foreign outsourcing of domestic jobs, declining industries, and shifts in consumer preferences, they can be expected to strongly resist the resource reallocation occasioned by such structural changes. These considerations necessitate public policy measures to mitigate the private economic costs that resource reallocation imposes on displaced workers. Finally, from an analytical perspective, the wage and earnings losses associated with displacement provide indicators of the importance of *firm-specific* and *industry-specific* human capital in labour markets.

INCIDENCE OF WORKER DISPLACEMENT

What types of workers are more likely to experience job displacement? Or, to put the question another way, what are the observable characteristics of workers who experience displacement? As I have already noted, the evidence on this question is much more comprehensive and complete for the United States than it is for Canada, primarily for data reasons.

Using data on 839,434 individuals aged 20–64 years from the eleven biannual U.S. Displaced Workers Surveys (DWSs) for the years 1984 to 2004 inclusive, Farber (2005) provides recent evidence for the United States on the observable characteristics of displaced workers and on changes over time in both the cyclical patterns and secular trends of worker displacement. Farber (2005, 14) defines job losers in each DWS as “workers who reported a job loss in the three calendar years prior to the survey;” he calculates the 3-year job loss rate as “the ratio of the number of reported job losers divided by the number of workers who were either employed at the survey date or reported a job loss but were not employed at the survey date.” His main findings are as follows:

- The aggregate 3-year job loss rate exhibited a moderately strong positive correlation with the aggregate U.S. unemployment rate over the 1981–2003 period, but the gap between the aggregate 3-year job loss rate and the aggregate unemployment rate was larger during the 1990s and the early years of the 21st century than it was during the 1980s.
- Job loss rates are strongly negatively correlated with the education levels of workers, as measured by years of completed formal schooling. Less-educated workers exhibited much higher 3-year job loss rates than did more-educated workers over the 1981–2003 period. And the cyclical variation in job loss rates is much stronger for less-educated than for more-educated workers.

- Job loss rates are also strongly negatively correlated with workers' ages. Workers 20–29 years of age had the highest job loss rates, followed by workers 30–39 years of age; older workers in the 40–49 and 50–64 age groups had the lowest, and very similar, job loss rates throughout the 1981–2003 period. The cyclical variation in job loss rates was also more pronounced for younger than for older workers.

CONSEQUENCES OF WORKER DISPLACEMENT: RE-EMPLOYMENT EXPERIENCES

Farber (2005, 17–19) also provides evidence on the labour force status of displaced workers in the United States as of the survey date for the eleven biannual U.S. DWSs covering the years 1981–2003. His analysis reveals some general differences in employment rates, unemployment rates, and non-participation rates among displaced workers of different sexes, ages, and education.

- Not surprisingly, the aggregate employment rate of displaced workers varied procyclically (rising during cyclical expansions and falling during cyclical contractions), while the aggregate unemployment rate of displaced workers varied countercyclically (falling during cyclical expansions and rising during cyclical contractions).
- Although male and female displaced workers had similar cyclical patterns in employment, unemployment, and non-participation rates, women exhibited lower survey-date employment and unemployment rates than men, and much higher non-participation rates. In other words, female workers' weaker labour force attachment is reflected in appreciably higher rates of non-participation in the labour force following job displacement.
- More-educated displaced workers exhibited higher survey-date employment rates and lower survey-date rates of unemployment and non-participation than did less-educated displaced workers. In other words, Farber (2005) finds that the education levels of displaced workers are positively related to post-displacement employment rates and negatively related to both post-displacement unemployment rates and post-displacement non-participation rates.
- Prime-age displaced workers in the 25–44 and 45–54 age groups had considerably higher survey-date employment rates and appreciably lower survey-date non-participation rates than did either younger workers 20–24 years of age or older workers 55–64 years of age. Moreover, older displaced workers in the 55–64 age group were far more likely than their younger counterparts to be out of the active labour force at the survey, perhaps because many displaced workers choose early retirement following job displacement, an option that is not nearly as feasible for younger workers.

CONSEQUENCES OF WORKER DISPLACEMENT: EARNINGS LOSSES

Two types of studies of the earnings losses associated with worker displacement

Studies of the earnings losses associated with worker displacement have been of two types: those of *short-term* earnings *changes* and earnings *losses*, and those of *long-term*

earnings losses. Short-term earnings changes are defined as the mean difference between displaced workers' pre- and post-displacement earnings. These short-term earnings changes likely understate the actual short-term earnings losses associated with worker displacement, because they ignore any earnings growth that displaced workers would have realized had they remained employed with their former firm. Some empirical studies of the short-run earnings effects of worker displacement (e.g., Farber 2005) have therefore attempted to estimate the short-run earnings losses incurred by displaced workers by subtracting (i) an estimate of the change in mean earnings of some comparison group of non-displaced workers over a comparable interval of time—the foregone earnings increase—from (ii) the short-run earnings change between the lost pre-displacement job and the first post-displacement job realized by displaced workers who become re-employed by the survey date—the short-run earnings decline between pre- and post-displacement jobs experienced by displaced workers. The short-run nature of both these earnings changes stems from the typically short observation period of the data, often of one to three years. In contrast, long-term earnings losses are defined as the mean earnings differences between displaced workers and a comparison group of observationally similar non-displaced workers who were continuously employed with the same employer over several periods before and after displacement. Studies of long-term earnings losses may also understate the earnings losses associated with worker displacement, inasmuch as they include in their estimation samples only those displaced workers who become re-employed within the observation period of the data. They therefore do not account for the zero earnings of displaced workers who experience long spells of joblessness following displacement.

Two important methodological issues that arise in estimating the *long-term earnings losses* associated with worker displacement warrant mention. One is identifying and estimating the counterfactual mean earnings of displaced workers, i.e., the expected mean earnings per period that displaced workers would have realized had they remained continuously employed with their pre-displacement firms. This requires data on an appropriate comparison group of continuously employed workers who remain with the same firm over the entire observation period, which for estimating long-run earnings losses must be a period of several consecutive years. A second issue is ensuring that job separations are exogenous with respect to individual workers' earnings or wages. This means that the probability of permanent job separation must be uncorrelated with the unobserved determinants of workers' earnings, since any such correlation would impart bias to earnings-function coefficient estimates, and hence to estimates of mean earnings differences between displaced workers and comparison groups of non-displaced, continuously employed workers.

Relative advantages of administrative data and survey data

Earlier studies of the earnings losses associated with worker displacement relied primarily on survey data, usually individual-level panel data that provided observations on the same set of workers over successive periods of time. But more recent studies of the earnings losses of displaced workers have exploited administrative panel data that link individual workers to their employers. What are the relative advantages of these two types of data in estimating the earnings losses arising from worker displacement?

Administrative panel data linking workers to firms have several advantages relative to panel survey data. First, they provide more accurate measurement of wage and salary earnings, data that are likely less subject to recall and reporting error than retrospective

survey data. Second, administrative data provide larger—often *much* larger—samples of both displaced workers and non-displaced workers than can be assembled from survey data sets. Third, they offer more accurate identification of the timing and nature of job separations; for example, fewer recall errors in measuring the timing of separations, and more accurate identification of separations arising from firm closures and mass layoffs. And fourth, administrative data provide longer observation periods that permit individual workers to be tracked for much longer periods of time than survey data. Survey panel data sets such as the biannual U.S. DWS and the Canadian Survey of Labour and Income Dynamics (SLID) have relatively *short* observation periods: a 3-year recall period for the U.S. DWS, and 6-year overlapping panels in the Canadian SLID. In contrast, Jacobson, LaLonde, and Sullivan (1993) have quarterly observations on individual workers and their firms in Pennsylvania for the period 1974–86: for displaced workers, they have 20 quarters (5 years) of pre-displacement earnings, and 28 quarters (7 years) of post-displacement earnings. Similarly, the recent Canadian study by Morissette, Zhang, and Frenette (2007) has annual observations on workers and their firms for the 20-year period 1983–2002: for displaced workers, there are three years of pre-displacement earnings and five years of post-displacement years—a total of nine years of data on each displaced worker (including the year of displacement). The relative advantages of survey panel data for purposes of estimating the earnings losses associated with worker displacement consist mainly of the more detailed and complete information they provide on observable worker and job characteristics, such as education, visible minority status, nativity or immigrant status, marital and family status, union status, occupation, and full-time/part-time and full-year/part-year status. In addition, survey panel data are more likely than administrative data to contain information on individuals' family and household income.

Short-run earnings changes and earnings losses of displaced workers

An early Canadian study of short-term earnings changes following displacement is that by Crossley, Jones, and Kuhn (1994), which is based on a special one-time Ontario Ministry of Labour (OML) survey of 21 randomly selected firms in Ontario that had experienced mass layoffs in 1980 or 1981 (of which 18 were complete plant closures and 3 were partial plant closures).² The OML data measured *hourly* wage rates (in 1981 dollars per hour)—as distinct from weekly, monthly, or annual earnings—in the pre-displacement job for all displaced workers and in the post-displacement job for those displaced workers who had become re-employed by the post-displacement survey date. The objective of Crossley, Jones, and Kuhn (1994) was to estimate how the change in hourly wage rates between pre- and post-displacement jobs is related to displaced workers' pre-displacement tenure.³ The regressand in their estimated wage-change equations is the post-displacement/pre-displacement change in log wage, defined as the natural logarithm of a displaced worker's post-displacement hourly wage rate minus the natural logarithm of that worker's pre-displacement hourly wage rate.

Table 1 summarizes Crossley, Jones, and Kuhn's (1994) tenure coefficient estimates for displaced men and women in the three alternative specifications of their log-wage change equations. Their main findings are that the short-term wage losses incurred by displaced

2. All 2,650 employees involved in these plant closures were sampled; of these, 1,736 workers (1,124 men and 612 women) were ultimately included in the sample, and were interviewed, on average, 20 months after being notified of their mass layoff.
3. The tenure categories in the pre-displacement job are: less than 1 year, 1–3 years, 3–5 years, 5–10 years, 10–15 years, 15–25 years, and more than 25 years.

workers generally increase with pre-displacement tenure for both men and women, and are substantially larger for women than for men at all pre-displacement tenure levels. These findings are quite robust across the three alternative specifications of the econometric model for which the authors report estimates: the first specification controls for observable worker and job characteristics only, the second controls for both observables and pre-displacement firm fixed effects, and the third controls for observables and for sample selectivity into re-employment following displacement.⁴

Table 1

Tenure coefficient estimates in equations for log-wage changes between post- and pre-displacement jobs, men and women, dependent variable = $\Delta \ln W = \ln(\text{post-displacement } W) - \ln(\text{pre-displacement } W)$

Tenure (years)	Controls for observables only		Observables + firm fixed effects		Selectivity corrected with observables	
	Men	Women	Men	Women	Men	Women
1-3 yrs	-0.029 (0.064)	-0.227*** (0.077)	0.014 (0.066)	-0.193** (0.079)	-0.050 (0.067)	-0.198** (0.083)
3-5 yrs	-0.068 (0.068)	-0.184** (0.085)	-0.023 (0.071)	-0.192** (0.087)	-0.080 (0.070)	-0.128 (0.010)
5-10 yrs	-0.116* (0.067)	-0.207*** (0.077)	-0.107 (0.069)	-0.187** (0.079)	-0.144** (0.071)	-0.116 (0.110)
10-15 yrs	-0.177*** (0.067)	-0.350*** (0.095)	-0.107 (0.072)	-0.288*** (0.101)	-0.207*** (0.072)	-0.241* (0.135)
15-25 yrs	-0.245*** (0.070)	-0.429*** (0.098)	-0.181** (0.075)	-0.300*** (0.111)	-0.274*** (0.074)	-0.382*** (0.110)
Over 25 yrs	-0.235*** (0.076)	-0.381*** (0.145)	-0.178** (0.080)	-0.310** (0.057)	-0.260*** (0.080)	-0.311* (0.165)
N	645	212	645	212	645	212
R-squared	0.244	0.461	0.298	n.a.	n.a.	n.a.

Notes: * Significant at the 10 per cent level. ** Significant at the 5 per cent level. *** Significant at the 1 per cent level. The reference category for tenure level consists of displaced workers who had less than one year of tenure with their pre-displacement employer.

Source: Crossley, Jones, and Kuhn (1994, Tables 2, 4, and 5)

4. The instrument used in the first-stage probit model of post-displacement re-employment is a variable that measures the elapsed time between the date the mass layoff was announced and the survey date.

Farber (2005, 20–21) provides more recent and comprehensive evidence for the United States for the years 1981–2003 on the short-run earnings changes of displaced workers who become re-employed before the survey date following their displacement. Following are Farber’s main findings on the real weekly earnings change between the lost, pre-displacement job and the survey-date job for displaced workers who were employed on the survey date, were not self-employed in either job, and worked full-time in both jobs.

- The average earnings decrease between pre-displacement and survey-date jobs was strongly cyclical over the 1981–2003 period, rising appreciably during recessions and falling during expansions.
- During the 1981–91 period, differences in earnings changes across education categories were statistically significant, and indicated that more-educated displaced workers, on average, experienced smaller earnings decreases than did less-educated workers. But, since 1991, differences in short-run earnings changes by education level have been statistically insignificant and numerically somewhat smaller than they were in the 1980s. In the recent 2001–03 period, the mean earnings declines of displaced workers with 13–15 and 16-plus years of education actually exceeded those of displaced workers with 12 and less than 12 years of schooling.
- Farber reports finding no statistically significant differences in pre- to post-displacement earnings changes by either sex or race.
- Farber does, however, find a strong relationship of mean earnings changes between pre- and post-displacement jobs to workers’ tenure in their pre-displacement job. In particular, the average earnings decrease between the lost job and the survey-date job was substantially larger for high-tenure workers than for low-tenure workers, a finding that is consistent with those of Crossley, Jones, and Kuhn (1994) for Ontario workers displaced by plant closures in the early 1980s.

Farber (2005, 23–24) also provides evidence for the 1981–2003 period on the short-run earnings losses of displaced workers in the United States who become re-employed before the survey date following their displacement. For displaced workers who were full-time in both their pre-displacement and post-displacement jobs, Farber finds that displaced workers’ short-run earnings losses varied between 10 and 15 per cent during the 1981–91 period, averaging about 13 per cent; decreased abruptly during the 1990s from a high of 13.8 per cent in 1989–91 to a low of 6.7 per cent in 1995–97; and then increased very sharply from 7.8 per cent in 1997–99 to 17.1 per cent in 2001–03. Moreover, the relative magnitude of short-run earnings losses by education level changed quite dramatically in the United States over the 1981–2003 period. Farber (2005, 23) estimates that, throughout the period, the short-run earnings losses associated with displacement remained quite stable for high school graduates (in the range of 10 to 15 per cent), but decreased from the 10–20 per cent range in the 1980s to the 0–10 per cent range in the 1990s for those with less than a high school education. But for displaced workers with 13–15 years of schooling and 16 or more years of education, estimated short-run earnings losses increased dramatically between the mid-1990s and the 2001–03 period—from approximately 6 per cent in 1997–99 to about 20 per cent in 2001–03 for workers with 13–15 years of schooling, and from about 4.5 per cent in 1995–97 to about 21 per cent in 2001–03 for workers with 16 or more years of schooling. The result of these recent trends

is that, since 1999, the short-run earnings losses of displaced U.S. workers with more than a high school education have substantially exceeded the short-run earnings losses of displaced workers with a high school education or less, largely because of sharp increases in the average earnings decline experienced by more-educated displaced workers. This evidence suggests that the short-run earnings losses associated with worker displacement are no longer smaller for those with higher levels of education than for those with the lowest levels of education.

Long-run earnings losses of displaced workers: Evidence for the United States

Jacobson, LaLonde, and Sullivan (hereafter, JLS) (1993) provide the seminal empirical study of the long-run earnings losses associated with worker displacement in the United States. They not only report the first good evidence of the long-run earnings losses of displaced workers, but also propose the econometric framework that was to become the template for later studies of the long-run earnings losses associated with worker displacement. JLS (1993) use unemployment insurance tax reports and quarterly firm reports on employment levels for the state of Pennsylvania to construct a large longitudinal administrative sample of displaced and non-displaced workers that provides observations on workers' quarterly earnings (in 1987 dollars) for 52 quarters over the period 1974 to 1986. They restrict their sample of *displaced* workers to *high-tenure, prime-age* workers who had at least six years of firm tenure at the beginning of 1980, who were at most 50 years of age, and who were displaced by mass layoffs during the early 1980s. To reduce biases from sample attrition, JLS (1993) include only displaced workers who had positive earnings in at least one quarter of each calendar year between 1974 and 1986. They use a comparison group of *non-displaced* prime-age workers who remained continuously employed with their firms during all quarters from 1980 to 1986 inclusive to estimate displaced workers' counterfactual mean quarterly earnings. JLS (1993) estimate the mean quarterly earnings losses of workers displaced by mass layoffs during the early 1980s⁵ for each quarter, beginning with the 20th quarter *before* their separation and ending with the 27th quarter *after* their separation—a total of 48 quarters.

JLS's (1993) main finding is that displaced workers experienced *large* and *persistent* earnings losses relative to the earnings of comparable non-separators who remained continuously employed with the same firm over the 1974–86 period. JLS (1993) also find that the time pattern of earnings losses associated with worker displacement is remarkably similar across worker groups (i.e., for males and females and for younger and older prime-age workers), and can be characterized as consisting of three distinct phases: (i) a pre-displacement *dip*, a gradual earnings decline that begins up to three years (12 quarters) before separation; (ii) a displacement *drop*, a sharp earnings decline that occurs at the time of separation; and (iii) a post-displacement *recovery*, during which displaced workers' relative earnings increased rapidly during the first six post-separation quarters but then rose much more slowly over subsequent quarters. Five years (20 quarters) after separation, displaced workers' earnings losses still amounted to about 25 per cent of their pre-displacement earnings.

JLS (1993) do not find evidence of large gender differences in either the magnitude or the time pattern of displaced workers' earnings losses. Over the 12 quarters *before separation* (the dip), men's rate of quarterly earnings decline was only slightly *higher* than women's.

5. The mass-layoff sample includes separators whose firms' employment in the year *after* their separation was at least 30 per cent below their maximum employment levels in the late 1970s. Only firms that had at least 50 employees in 1979 were included in the mass-layoff sample.

But during the six quarters *immediately after separation* (the drop), men's average quarterly earnings losses were substantially *larger* than women's average quarterly earnings losses. However, over the *subsequent post-separation quarters* (the recovery), men's quarterly rate of earnings *growth* was only slightly *higher* than women's. By the fifth post-displacement year, displaced men's earnings losses were moderately *larger* than displaced women's.

JLS (1993) find some evidence of differences in the magnitude and pattern of earnings losses between *younger* displaced workers (those born in the 1950s) and *older* displaced workers (those born in the 1930s). Over the 12 quarters *before separation* (the dip), younger workers' rate of quarterly earnings *decline* was slightly *higher* than older workers'. During the six quarters *immediately after separation* (the drop), younger workers' average quarterly earnings losses were somewhat *larger* than older workers'. Over the *subsequent post-separation quarters* (the recovery), younger workers' quarterly rate of earnings *growth* was considerably *higher* than that of older workers. During the fifth post-displacement year, *older* workers' quarterly earnings losses were moderately *larger* than those of *younger* workers.

Long-run earnings losses of displaced workers: Recent evidence for Canada

Until the past two years, there was very little good Canadian evidence of the long-run earnings losses associated with worker displacement. Fortunately, that gap has recently been remedied by studies by Morissette, Zhang, and Frenette (2007); Schirle (2007); and Neill and Schirle (2007). Prior to those studies, Canadian evidence on displaced workers' earnings losses had been based on survey panel data and therefore pertained only to the short-run earnings changes between pre-displacement and post-displacement jobs.

Morissette, Zhang, and Frenette's (2007) investigation has recently produced new Canadian evidence of the *long-run* earnings losses of worker displacement in Canada, based on Statistics Canada's Longitudinal Worker File (LWF), a unique longitudinal administrative database that tracks a large, nationally representative (10 per cent) random sample of all Canadian paid workers over the 20-year period 1983-2002 and links them to their firms. The LWF is created and maintained by the Business and Labour Market Analysis (BLMA) Division of Statistics Canada, and integrates data from several administrative sources, including: the Record of Employment files of Human Resources and Social Development Canada on worker separations; the T1 and T4 files of the Canada Customs and Revenue Agency on earnings from paid employment; and the Longitudinal Employment Analysis Program of the BLMA, Statistics Canada, which identifies firm births and deaths. Morissette, Zhang, and Frenette (2007) identify displaced workers as those who experience a permanent job separation arising from firm closures or mass layoffs. A worker displacement arising from a firm closure is defined as occurring when a worker is permanently laid off in year t from a firm that ceases operating in year t . A worker displacement arising from a mass layoff is defined as occurring when a worker is permanently laid off in year t from a firm that had at least 50 employees in year $t - 4$ and experienced an employment reduction of 30 per cent or more between year $t - 4$ and year $t + 1$ (the year following the layoff). A major advantage of the LWF is that it permits displaced workers to be tracked for several years *before* and *after* permanent separation.

Morissette, Zhang, and Frenette (2007) estimate earnings losses arising from worker displacement for the three years *before* the year of displacement, the displacement year, and the first five years *after* the year of displacement. Their samples of *displaced* workers include workers in 10 annual cohorts who were displaced by firm closures or mass layoffs

that occurred in the commercial (private) sector between 1988 and 1997, and who were 25 to 49 years of age in the year of displacement. Each of the 10 annual cohorts of displaced workers is followed for a period that begins in the year 1988 and ends five years after displacement. *High-seniority* displaced workers are defined as those who had five or more years of tenure with their pre-displacement firm at the time of displacement.

Morissette, Zhang, and Frenette (2007) use an econometric framework very similar to the one introduced by JLS (1993) and subsequently adopted by Stevens (1997) using Panel Study of Income Dynamics (PSID) data for the United States. Their estimating equation takes the form

$$y_{it} = \alpha_i + X_{it}\beta + \sum_{k=a}^b D_{it}^k \delta_k + \omega_i t + \varepsilon_{it}, \quad (1)$$

where y_{it} equals the regression-adjusted annual earnings of worker i in year t ⁶; X_{it} is a vector of observable characteristics of worker i in year t ; D_{it}^k is a vector of displaced worker dummy variables that equal 1 if worker i is displaced k years before year t , and that equal 0 for workers who were not displaced, where $a = -3$ and $b = 5$; α_i is a vector of worker-specific fixed effects; $\omega_i t$ are worker-specific time trends; and ε_{it} is a person- and year-specific random-error term. Morissette, Zhang, and Frenette (2007) report estimates of displaced workers' earnings losses for two alternative specifications of equation (1): a worker fixed effects model, with $\alpha_i \neq 0$ and $\omega_i = 0$; and a worker fixed effects model with worker-specific time trends, with $\alpha_i \neq 0$ and $\omega_i \neq 0$. Both specifications are estimated separately on two subsamples of displaced workers. The first is a narrow subsample that requires displaced workers to have *positive* earnings in all five years following displacement (i.e., for all $k = 1, 2, \dots, 5$). The second is a broad subsample that includes displaced workers who may have zero earnings in post-displacement years 1 to 4, but who must have *positive* earnings in post-displacement year 5. The comparison group of *non-displaced* workers consists of workers who were 25 to 40 years of age in 1988, had positive earnings throughout the 1983–2002 period, and never experienced a permanent lay-off during the period 1983–2002.

Morissette, Zhang, and Frenette's (2007) main finding is that Canadian workers—both males and females—who were displaced from jobs by firm closures or mass layoffs experienced *large* and *persistent* mean earnings losses relative to observationally similar workers who remained continuously employed with the same firm. Moreover, the temporal pattern of these earnings losses is very similar to that found by JLS (1993) using administrative data for Pennsylvania linking individual workers to their firms, and can be characterized as consisting of three distinct phases. The first phase is a pre-displacement earnings *dip*, a gradual earnings decline that begins for some groups up to three years before displacement. The second phase is a displacement earnings *drop*, a sharp earnings decline that occurs in the year of displacement and reaches a maximum in the first post-displacement year; in other words, earnings losses increase sharply in the year of displacement and reach a maximum in the first post-displacement year. The third phase is a post-displacement earnings *recovery*, during which displaced workers' earnings losses decline gradually, but remain substantial, from the second through the fifth post-displacement years. In other words, displaced workers' earnings rose quite slowly after

6. In Morissette, Zhang, and Frenette (2007), the y_{it} are residuals from a regression of workers' annual earnings (in constant year-2000 dollars) on a full set of province-by-year dummy variables. These residuals adjust observed annual earnings for province-specific earnings trends and for province-specific business cycle effects.

the first post-displacement year relative to the earnings of non-displaced workers, with the result that they remained well below those of observationally similar non-displaced workers even five years after displacement; Table 2 compiles Morissette, Zhang, and Frenette's (2007) estimated mean earnings losses in the fifth post-displacement year for displaced men and displaced women. Morissette, Zhang, and Frenette find that the rate of post-displacement earnings recovery was quite slow for both male and female displaced workers in Canada, especially for high-seniority workers. More generally, the earnings losses associated with displacement were considerably *larger*—in both absolute dollar terms and in relative terms—for *high-seniority* workers (those with more than five years of tenure with their pre-displacement employer) than for all displaced workers. With respect to male-female differences in long-term earnings losses, Morissette, Zhang, and Frenette find that *post-displacement* earnings losses were typically *larger* in absolute dollar terms for displaced *male* workers than for displaced *female* workers in the year of displacement (year t) and in the five post-displacement years (years $t + 1$ to $t + 5$), but that *pre-displacement* earnings losses were typically *larger* in absolute dollar terms for displaced *female* workers than for displaced *male* workers in the three years prior to displacement (years $t - 3$ to $t - 1$). However, in relative terms (i.e., *relative* to mean pre-displacement annual earnings in year $t - 4$), the earnings losses associated with displacement were typically *larger* for displaced *female* workers than for displaced *male* workers in the year of displacement (year t) and in the five post-displacement years (years $t + 1$ to $t + 5$).

A limitation of Morissette, Zhang, and Frenette's (2007) study is that its analysis sample is confined to displaced workers who were 25 to 49 years of age in the year of displacement; it is therefore incapable of providing evidence on the earnings losses experienced by older displaced workers 50 years of age and over. But this gap has been addressed in a recent paper by Schirle (2007) based on individual panel data from Statistics Canada's Survey of Labour and Income Dynamics (SLID), a longitudinal survey that follows individuals for a period of six years. The SLID interviews all individual members of households in the survey (to reduce proxy respondent problems), and gathers fairly detailed information on individuals' demographic and human capital characteristics, and on their labour force status, earnings, and income. An advantage of the SLID is that it provides fairly complete information on individuals' personal, demographic, and human capital characteristics, and on the characteristics of the jobs they held during the 6-year survey window, including the start and end dates of jobs and the reasons for job separation. The main disadvantage of the SLID is that its 6-year window is comparatively short for investigating the earnings losses of displaced workers in the years before and after a job displacement. For displaced workers, annual earnings in full-time employment are observed only for two pre-displacement years, the year of displacement, and the first two post-displacement years—a total of five years; in contrast, Morissette, Zhang, and Frenette's (2007) study has nine years of earnings data for displaced workers, including three pre-displacement years and five post-displacement years.

Table 2

Estimates of long-term annual earnings losses of displaced workers 20–49 years of age in Canada for men and women, by seniority and reason for displacement

Gender and subsample	Estimated annual mean earnings loss in year $t + 5$ (in year-2000 dollars)	Relative long-term (5-year) earnings loss (as percentage of year $t - 4$ earnings)
High-seniority workers (over 5 years of tenure) displaced by firm closures		
Men, narrow subsample	6,600 to 9,600	19 to 28
Men, broad subsample	8,500 to 11,600	25 to 34
Women, narrow subsample	4,700 to 5,800	23 to 29
Women, broad subsample	7,100 to 7,500	35 to 37
All workers displaced by firm closures—fixed effects model only		
Men, narrow subsample	4,500	16
Men, broad subsample	6,200	22
Women, narrow subsample	4,300	25
Women, broad subsample	5,700	34
High-seniority workers displaced by firm closures or mass layoffs		
Men, narrow subsample	7,100 to 10,900	18 to 28
Men, broad subsample	9,700 to 13,700	25 to 35
Women, narrow subsample	5,500 to 6,100	24 to 26
Women, narrow subsample	5,500 to 6,100	24 to 26
All workers displaced by firm closures or mass layoffs		
Men, narrow subsample	2,800 to 4,800	9 to 15
Men, broad subsample	5,000 to 6,900	16 to 22
Women, narrow subsample	2,300 to 4,000	12 to 21
Women, broad subsample	4,100 to 5,800	22 to 31

Notes: The narrow subsample includes only displaced workers who had *positive* earnings in all five years following displacement, i.e., for all $k = 1, 2, \dots, 5$. The broad subsample allows displaced workers to have zero earnings in post-displacement years 1 to 4, but requires them to have positive earnings in post-displacement year 5.

Source: Morissette, Zhang, and Frenette (2007, various tables)

Schirle's (2007) analysis samples are assembled from the three complete 6-year SLID panels that are currently available for the years 1993–98, 1996–2001, and 1999–2004. Her sample of *displaced* workers includes workers who were displaced from a full-time job between the ages of 27 and 67, where individuals are defined as being displaced if (i) their job ended because the company moved (firm relocation), (ii) their job ended because the company went out of business (firm closure), or (iii) they were permanently laid off owing to a business slowdown not caused by seasonal factors. Schirle performs separate analyses for three age groups of displaced workers: those who were 25–34 years of age, 35–49 years of age, and 50–69 years of age during the SLID's 5-year observation window. Her comparison group consists of *non-displaced* workers who were at least 25 years of age but no more than 69 years of age during each 5-year survey window, and *continuously employed* at the *same full-time job* over the entire 5-year observation window.

Schirle (2007) estimates empirical annual earnings functions that include, in addition to a set of dummy variables for displaced workers indicating the current year's relationship to the year of displacement, a fairly extensive set of observable covariates on workers' age, education level, province of residence, and months of tenure in their current or pre-displacement job, together with controls for union status, industry of employment, sector of employment (public or private), and year effects. Although her earnings equations do not include individual fixed effects (or individual-specific time trends), Schirle does estimate her earnings models both with and without controls for sample selection into full-time employment in each year.⁷

Schirle's (2007) estimates of the annual real earnings losses of displaced male workers for the age groups 25–34 years, 35–49 years, and 50–69 years are summarized in Table 3. Her main finding is that, like their younger prime-age counterparts, older displaced male workers 50–69 years of age experience *large* and *persistent* earnings losses. However, she finds no consistent evidence of large or significant differences in earnings losses between older displaced male workers 50–69 years of age and either younger prime-age displaced male workers 25–34 years of age or older prime-age displaced male workers 35–49 years of age: both the size and time pattern of earnings losses are quite similar across all three age groups. Both older and younger displaced males experienced a large and abrupt earnings drop in the year of displacement and in the first post-displacement year, followed by a modest earnings recovery in the second post-displacement year; earnings losses were largest in the first post-displacement year, and somewhat smaller, though still large, in the second post-displacement year. The only real difference between older and younger displaced workers is that, for older displaced male workers 50–69 years of age, Schirle finds no evidence of a pre-displacement earnings dip; estimated earnings losses are not significantly different from zero for older displaced males in either the first or second pre-displacement year. In contrast, displaced males 35–49 years of age experienced large and significant earnings losses in both pre-displacement years, while displaced prime-age males 25–34 years of age experienced significant earnings losses in the first, but not the second, pre-displacement year. Schirle's selectivity-corrected (Heckman) estimates of earnings losses are not appreciably different from the ordinary least squares (OLS) estimates without selectivity correction, either for older or younger displaced workers; but the coefficient estimates of the Inverse Mills Ratio are positive and statistically significant in all models estimated for older workers. Neill and Schirle (2007, 16–17) observe that the

7. The vector of observed covariates in Schirle's (2007) employment selection equation includes all the covariates in the annual earnings equation together with a dummy variable instrument indicating whether individual *i* had a spouse who was in the labour force in year *t*. Schirle's estimation procedure is a conventional Heckman two-step procedure for correcting for sample selectivity into full-time employment.

absence of evidence of appreciable differences in earnings losses between older and younger displaced workers is apparently inconsistent with the presumption of some government policy that the financial consequences of displacement are greater the older the workers at the time they become displaced; Neill and Schirle cite an evaluation report (HRDC 1999, 4), which states that “among *older displaced workers*, the financial repercussions are progressively worse, the older the workers are when they are laid off.”

With respect to how pre-displacement tenure affects the size and pattern of displaced workers’ earnings losses, Schirle (2007) and Neill and Schirle (2007) find that *high-tenure* older males with more than 10 years of pre-displacement tenure experienced much larger earnings losses than did low-tenure older males with less than 10 years of pre-displacement tenure—about two to two-and-a-half times larger in absolute size in the year of displacement (year t), the first post-displacement year (year $t + 1$), and the second post-displacement year (year $t + 2$); see Table 4.

SUMMARY OF CANADIAN AND U.S. EVIDENCE ON DISPLACED WORKERS’ EARNINGS LOSSES

What do we currently know empirically about the magnitude, persistence, and temporal pattern of displaced workers’ earnings losses? Here is my attempt at a short summary of what I think can be learned from existing empirical evidence for the United States and Canada.

- First and foremost, the earnings losses of displaced workers are *large* and *persistent*. This basic empirical fact has been amply documented in studies for both Canada and the United States.
- Evidence for both Canada and the United States indicates that the time pattern of displaced workers’ earnings losses can be characterized as consisting of three distinct phases, first documented empirically by JLS (1993):
 - (i) A **pre-displacement earnings dip**: a gradual earnings decline that begins up to three years before separation.
 - (ii) An **earnings drop** at time of displacement and immediately after displacement: a sharp earnings decline that occurs at the time of separation and immediately following separation.
 - (iii) A **subsequent post-displacement earnings recovery**: In the later periods following job separation, the relative earnings of displaced workers increase gradually relative to the earnings of comparable non-displaced, continuously employed workers; i.e., the earnings losses of displaced workers gradually decrease beginning about one to two years after separation. But, several years after displacement, displaced workers’ mean earnings still remain considerably below pre-displacement levels.

Table 3

Estimates of the annual real earnings losses (in 1996 dollars) of displaced male workers, by age group

	Males age 50–69		Males age 25–34		Males age 35–49	
	OLS	Heckman	OLS	Heckman	OLS	Heckman
Displaced						
2 years before	-2263 (6128)	-2969 (6068)	-1207 (2785)	-1703 (2770)	-7541*** (2249)	-6646*** (2207)
1 year before	-85 (3700)	487 (3613)	-4901** (2386)	-5365** (2374)	-4209** (1939)	-3469*** (1962)
year of displacement	-12036*** (3635)	-11834*** (3647)	-11011*** (1803)	-11446*** (1883)	-12625*** (1654)	-11629*** (1755)
1 year after	-14565*** (2365)	-15203*** (2391)	-12549*** (1897)	-13016*** (1920)	-16470*** (1740)	-15185*** (1792)
2 years after	-10417*** (2419)	-10623*** (2464)	-11375*** (1969)	-11818*** (1966)	-13851*** (1978)	-12290*** (1990)
Inverse Mills Ratio	—	32163*** (5532)	—	3022 (4092)	—	-18140*** (6264)

Notes: Dependent variable = real annual wage and salary earnings (in constant 1996 dollars). * Significant at the 10 per cent level. ** Significant at the 5 per cent level. *** Significant at the 1 per cent level

Source: Schirle (2007, Tables 2, 3, and 4)

- Both short-run and long-run earnings losses are substantially larger for *high-tenure* displaced workers (who have several years—five or more—of firm tenure with their pre-displacement employer) than for *low-tenure* displaced workers (who have few years of firm tenure with their pre-displacement employer).
- Earnings losses are somewhat larger in absolute dollar terms for displaced *men* than for displaced *women*; but the Canadian evidence seems to indicate that, *relative* to their pre-displacement earnings, earnings losses may be somewhat larger for displaced women than for displaced men.
- Earnings losses do not appear to exhibit sizable and significant differences across age groups.
- U.S. evidence indicates that earnings losses are especially large for displaced workers who become re-employed in a different industry or sector, and for displaced workers who are displaced from jobs in heavily unionized industries.

Table 4

**Estimates of the annual real earnings losses (in 1996 dollars)
older displaced male workers age 50–69, by pre-displacement tenure**

	High-tenure males age 50–69		Low-tenure males age 50–69	
	OLS	Heckman	OLS	Heckman
Displaced				
2 years before	10817 (11250)	11627 (10707)	-9201* (5282)	-8886* (5347)
1 year before	-137 (4256)	130 (4093)	290 (5467)	-4 (5470)
year of displacement	-17485*** (5610)	-17709*** (5622)	-9178* (5501)	-9480* (5494)
1 year after	-22431*** (3632)	-24089*** (3776)	-10592*** (3515)	-10969*** (3512)
2 years after	-16314** (3932)	-17107*** (4104)	-6394** (3045)	-7143** (3030)
Inverse Mills Ratio	—	21376*** (5125)	—	9696 (8140)

Notes: Dependent variable = real annual wage and salary earnings (in constant 1996 dollars). * Significant at the 10 per cent level. ** Significant at the 5 per cent level. *** Significant at the 1 per cent level

Source: Schirle (2007, Tables 5 and 6)

GAPS IN CANADIAN EVIDENCE ON DISPLACED WORKERS' EARNINGS LOSSES

What don't we yet know about the earnings losses incurred by displaced workers in Canada? Given the still fairly small body of empirical evidence for Canada on the earnings losses experienced by displaced workers, it is not surprising that there remain several important gaps in our knowledge. First, there exists little Canadian evidence on industry and sectoral differences in displaced workers' earnings losses, or on how earnings losses vary with union status in the pre-displacement job. Evidence for the United States indicates that earnings losses are especially large for displaced workers who become re-employed in a different industry or sector, and for displaced workers who separated from heavily unionized industries. Kuhn and Sweetman (1998) find evidence for both Canada and the United States that the short-run wage losses of displaced workers increase more rapidly with pre-displacement tenure in the union than in the non-union sector, and that displaced workers' short-term earnings losses are *larger* for transitions from unionized to

non-unionized (U-N) jobs than for either non-unionized to unionized (N-U) transitions or non-unionized to non-unionized (N-N) transitions. Second, I am not aware of any Canadian evidence on regional differences in the earnings losses arising from worker displacement. Third, there is also apparently no evidence for Canada on whether and how displaced workers' earnings losses vary with visible minority status or immigrant status. Fourth, it would appear that little is known about the impact of cyclical conditions on the magnitude and time pattern of earnings losses, or about the extent to which displaced workers shift into self-employment to mitigate earnings losses in paid employment. Finally, we do not yet have good evidence on how much of displaced workers' earnings losses are accounted for by reductions in wages (or hourly earnings) and by reductions in hours worked. So, although there have been some important recent additions to existing Canadian evidence on the earnings losses of displaced workers, there is still much that we do not know about their dimensions and nature.

PUBLIC POLICY RESPONSES TO WORKER DISPLACEMENT: RATIONALE AND EXPECTATIONS

What role can public policy play?

It is well to bear in mind—particularly in the current environment of serious economic contraction—that the first objective of public policy must be to help alleviate the personal economic hardship associated with worker displacement. But this primary objective must be pursued concurrently with other objectives. These include shortening post-displacement jobless spells by hastening post-displacement re-employment, and reducing post-displacement earnings losses by increasing the rate of post-displacement earnings recovery. It is also worth bearing in mind that government policies aimed at reducing the incidence of worker displacement run the risk that they will impede the essential process of resource reallocation required to adjust efficiently to structural changes in the economy. There also exist potential conflicts among government policies intended to provide ex post assistance to displaced workers. Policies that hasten re-employment following displacement may do little to mitigate the large earnings losses of displaced workers, while policies that materially alleviate the private economic hardship caused by displacement may hinder or retard the economic reintegration of displaced workers into employment.

Why do displaced workers warrant special policy treatment?

A fundamental question concerning displaced worker programs is why displaced workers should be singled out for special policy programs beyond those that are made available to all unemployed workers. In other words, what distinguishes displaced workers from all other workers who experience unemployment following a permanent layoff? Recall that worker displacement is a consequence of economic restructuring occasioned by structural factors such as technological change, increased import competition, and shifts in consumer demand. The primary argument for policies aimed specifically at displaced workers is that, whereas the social benefits from economic restructuring are widely diffused across all members of society, the costs of such restructuring are narrowly and disproportionately concentrated on the relatively small number of workers who experience displacement. Efficiency considerations therefore recommend measures that facilitate or accelerate the necessary resource reallocation occasioned by restructuring. Equity considerations imply that the small number of large losers from restructuring be somehow compensated for the disproportionate costs that they incur. Political economy considerations justify special programs for displaced workers as means of allaying workers' fears of

displacement and thereby reducing worker and voter resistance to policies conducive to economic growth, productivity enhancement, and increased standards of living. The market failure rationale for displaced worker programs requires special social policies to address the inability of private markets to provide individual workers with adequate insurance against the risks of costly displacement. And, finally, since government policies promoting economic growth, international trade liberalization, and improved environmental standards may themselves induce economic restructuring and worker displacement, it can be argued that governments have a moral obligation to help alleviate the most adverse consequences of their policy measures. Taken together, these considerations, I think, provide a compelling argument for special public policy measures to mitigate the large and persistent private economic costs that economic restructuring imposes on displaced workers.

What can we realistically expect of public policies targeted at displaced workers?

Given the size and persistence of displaced workers' earnings losses, it is highly unlikely that these can be fully offset by active labour market policies such as government training programs. To fully compensate displaced workers for their earnings losses would require either far more effective programs than we have observed to date, or public investments per displaced worker that are orders of magnitude greater than those of previous and existing programs. At best, only *partial* mitigation of displaced workers' earning losses can realistically be expected of public programs targeted at displaced workers. As JLS (2005b, 47) observe with respect to government training programs in the United States: "current public investments in retraining are far too small to substantially mitigate the earnings losses of displaced workers. Because the long-term effects of displacement on earnings are large, policy-makers would need to make comparably large investments in workers' skills to fully offset displaced workers' losses."

ALTERNATIVE POLICY INSTRUMENTS FOR MITIGATING THE EFFECTS OF WORKER DISPLACEMENT

In assessing current and proposed public policies as they relate to displaced workers, it is useful to distinguish between active and passive labour market policies. Passive labour market policies are intended primarily to mitigate the economic hardship or private costs arising from worker displacement; they include income replacement and supplementation programs such as unemployment/employment insurance (UI/EI) systems, public pension plans, and social assistance (welfare) programs. Active labour market policies, in contrast, are intended to expedite or facilitate the adjustments that individual workers must make after becoming displaced, and include measures designed to reduce the duration of post-displacement jobless spells and the post-displacement earnings losses of displaced workers.

Unemployment/Employment insurance

Income replacement through public unemployment/employment insurance systems has several serious limitations in mitigating the large and persistent costs incurred by displaced workers. The major limitation of UI/EI arises from the well-documented empirical fact that the largest portion of the private costs incurred by displaced workers arises not from temporary earnings losses associated with post-displacement unemployment spells, but rather from substantially and persistently lower re-employment earnings. As JLS

(2005b, 47) state, “a period of unemployment is not the only, or even the major, cause of financial loss suffered by displaced workers. Rather, the majority of their losses are attributable to their subsequent reemployment in lower paying jobs. The standard unemployment insurance program obviously does not address such losses.” The deficiencies of the current Canadian EI system in addressing the financial losses of displaced workers arise from several specific features of that system. First, eligibility for EI benefits in Canada is determined by workers’ previous 12 months of employment—a period too short for displaced workers, since empirical evidence indicates that earnings losses begin up to three years prior to the actual displacement event. Second, EI benefit eligibility requirements are based on workers’ hours of paid employment over the 12-month qualifying period, and these are likely to be reduced for many workers in the period immediately preceding displacement. Third, EI benefit payments are too small and too limited in duration to substantially mitigate the large and persistent earnings losses of displaced workers. Serious consideration should be given to proposals that would relate supplementary EI benefits for displaced workers to their prior firm tenure and work experience and to their prior history of EI benefit receipt.

Wage subsidies

Wage subsidies to displaced workers have one major advantage over conventional income replacement programs: they are paid only to *employed* workers, and thus provide stronger incentives to post-displacement re-employment than do unconditional income transfers. Moreover, evidence from the randomized experiments performed by the Canadian Self-Sufficiency Project indicates that wage subsidies to welfare recipients can result in both higher earnings and increased labour force participation, at least in the short run (Michalopoulos, Robins, and Card 2002).

Wage insurance

LaLonde (2007) has recently proposed a wage insurance scheme as a means of augmenting the earnings of displaced workers while at the same time avoiding the labour supply disincentive effects inherent in conventional income supplementation and income replacement programs. The main features of such a wage insurance scheme are as follows. First, it would make subsidy payments only to *employed* persons, and so would tend to encourage post-displacement labour force participation and employment; moreover, since it would supplement a recipient’s hourly wage rather than weekly, monthly, or annual earnings, it would presumably not induce individuals to shift from full-time to part-time employment. Second, benefit payments would be funded by contributions from currently employed workers along the lines of the current UI/EI system. Third, it would replace some percentage—for example, 50 per cent—of the difference between displaced workers’ pre- and post-displacement wages for a period of two to three years after displacement. LaLonde (2007) argues—correctly, it seems to me—that such a wage insurance scheme would be particularly well suited to displaced workers, for whom a large fraction of the earnings losses following displacement occur *after* re-employment rather than during the relatively short period of joblessness that immediately follows displacement and precedes re-employment. It is therefore encouraging to learn that the Expert Panel on Older Workers is recommending what Craig Riddell describes as “a rigorous demonstration project . . . to assess impacts of wage insurance.”

However, despite their apparent attractiveness, wage subsidy and wage insurance schemes are not without their possible drawbacks, some of which are enumerated by

Neill and Schirle (2007, 20). First, they would be quite costly to design and introduce. Second, they could distort individual decisions about the types of jobs workers choose to accept, both before and after displacement. For example, they might induce workers to stay in lower-paying local jobs rather than relocate to take a higher-paying job elsewhere. And third, they would likely reduce the incentives for younger displaced workers to invest in education and training (since such investments involve incurring large up-front costs to achieve longer-run wage and earnings increases). Although LaLonde (2007) explicitly intends his wage insurance scheme to benefit primarily workers who are prime age when they become displaced, Neill and Schirle (2007, 20–21) suggest that such a scheme might be less distortionary if it were restricted to older displaced workers. At the very least, these potential drawbacks of a wage insurance or wage subsidy program imply that any demonstration project to assess their outcome effects must take into account not only the substantial costs of such programs, but also their possible adverse effects on workers' decisions respecting job choice and participation in formal education and training.

Job search assistance

One active labour market policy instrument that deserves serious consideration as the Canadian economy enters a severe and quite possibly prolonged recession is job search assistance (JSA), which typically consists of a mix of services, including job counselling, job readiness assessment sessions, job search workshops, and job development and referral services. An apparent attraction of JSA, at least from the perspective of government budgets, is its relatively low average direct costs per person served compared with the much higher average direct costs of classroom training and on-the-job training. But the key questions concerning its impacts are whether JSA, either alone or in combination with classroom training or on-the-job training, reduces the duration of jobless spells following displacement and increases the post-displacement earnings (or reduces the post-displacement earnings losses) of displaced workers.

There exists some empirical evidence on these questions, much of it derived from several demonstration/evaluation projects undertaken in the 1980s by the U.S. Department of Labor to assess the effectiveness of displaced worker programs. Although I am far from an authority on this literature, let me attempt briefly to summarize some of its more salient features and findings.⁸ The Buffalo Dislocated Worker Demonstration Program (which operated from October 1982 to September 1983) targeted older, experienced male production workers who had been displaced in large layoffs from selected area steel and auto plants. It utilized a treatment group/comparison group evaluation design whereby some plants were designated as treatment group sites and other plants were designated as control group sites; displaced workers were then randomly selected from each of the two groups of plants. Treatment group workers were offered JSA, followed, where necessary, by classroom training or on-the-job training, but the vast majority of Buffalo program participants—about 82 per cent, according to JLS (2005b, 57)—received only JSA. The evaluation of the Buffalo program indicated a positive and significant weekly earnings increase of 134 dollars per week for workers who received JSA only, but found no evidence of incremental earnings effects for those workers who received either classroom training or on-the-job training in addition to JSA (Leigh 1992, 28). Moreover, since the average direct cost per participant was about three times greater for the JSA plus training than for

8. My review of evidence on the outcome effects of JSA relies heavily on the summaries given in Leigh (1992) and JLS (2005b).

JSA only, Leigh (1992, 28) concludes that “JSA is the only potentially cost effective treatment of the three evaluated.”

The Texas Worker Adjustment Demonstration (WAD), which operated from 1983 to 1985 at sites in Houston and El Paso, identified displaced workers in terms of their eligibility for benefits under Title III of the federal Job Training Partnership Act (JTPA), and provided services to a wider range of displaced workers than did the Buffalo demonstration. The Houston site of the WAD enrolled experienced male professional workers laid off from high-wage jobs in area petrochemical plants. The El Paso site of the WAD enrolled predominantly Hispanic low-wage workers laid off from light manufacturing plants, including roughly equal numbers of males and females. The Texas WAD evaluation randomly assigned eligible displaced workers to treatment and control groups. Two levels of employment services were offered to treatment group members: one consisted of JSA only, and the other of JSA followed by classroom training. The outcome evaluations for both Houston and El Paso found positive annual earnings effects for both male and female workers who received treatment, but these earnings effects were appreciably larger for females than for males, and were statistically significant only for females.

The Job Search Assistance Demonstration in Washington, D.C., and Florida also used random assignment of participants to treatment and control groups to assess the outcome effects of JSA. In Washington, D.C., recipients of JSA services realized an average earnings gain of 10 per cent relative to the control group, but in Florida the evaluation evidence indicated no significant earnings differences between treatment group members who received JSA and control group members who did not (JLS 2005b, 58).

The New Jersey UI Demonstration (which operated from July 1986 to autumn of 1987) was targeted at UI claimants who had three or more years of tenure with their pre-layoff employer. It enrolled adult men and women who were laid off from jobs in the manufacturing, trade, and service sectors, and employed a series of screens to distinguish displaced workers who were eligible for the federal JTPA program from other unemployed workers who were filing UI benefit claims. Like the Texas WAD, the New Jersey UI Demonstration employed random assignment of eligible UI claimants to treatment and control groups. Treatment group participants were offered three levels of re-employment services: JSA only, JSA followed by classroom training or on-the-job training, and JSA followed by a re-employment bonus. The evaluation evidence indicated sizable and significant short-term increases in quarterly earnings (in the second quarter following the UI claim) for those treatment group members who received only JSA and for those who received JSA and the re-employment bonus, but, by the fourth quarter after filing a UI claim, the positive earnings effects of both treatments had become negligible and statistically insignificant, which suggests that the positive earnings effects of JSA for displaced workers may be transitory.

A common finding of several of the U.S. demonstration projects is the paucity of evidence of significant positive incremental earnings effects for either classroom training or on-the-job training beyond those associated with JSA only. Leigh (1992, 31) and JLS (2005b, 58–59) suggest some possible reasons for this finding. These include small sample sizes for those who actually received classroom or on-the-job training; insufficient time for job placement assistance for those who received skills training in fixed, limited-duration demonstration projects; a scarcity of training providers capable of delivering high-quality, short-duration training courses; and possible mismatches between the type of classroom training provided and both the skills requirements of local employers and the interests

and aptitudes of training recipients. In contrast to the generally pessimistic findings for skills retraining, there is some evaluation evidence that JSA is associated with at least modest positive gains in the post-displacement earnings of displaced workers. For example, JLS (2005b, 58) summarize the U.S. evaluation evidence for JSA as follows: "When job search assistance is effective, studies indicate that it is associated with about a 3 per cent to 5 per cent increase in short-term earnings."

Skills retraining (classroom training or on-the-job training)

Since displaced workers are generally older than other unemployed workers, it is important to understand how age is related to displaced workers' participation in retraining and to the earnings effects of retraining for those displaced workers who choose to participate. JLS (2005b, 52) observe that *older* workers in general have *less* incentive to invest in retraining than younger workers: they have fewer remaining years in their work lives, they may have higher opportunity costs of training arising from higher foregone earnings associated with reductions in work hours, and they may incur higher psychological costs in returning to the classroom. Older workers who do invest in retraining must therefore do so in the expectation of realizing annual earnings gains sufficiently large to fully compensate them for their shorter remaining work lives and their higher training costs.

JLS (2005a, b), examining a large sample of 65,000 displaced workers in Washington State who lost their jobs between 1990 and 1994, find evidence of how age is related to participation in community college retraining. They examine three measures of participation in community college schooling: the probability of enrolling in a community college, the probability of completing one or more credit courses given enrollment, and the number of course credits completed. They find that both older displaced men and older displaced women, compared with their younger counterparts, are much less likely to enroll in a community college credit course, are appreciably less likely to complete at least one community college credit, and, on average, complete fewer community college credits. But, conditional on enrolling in a credit course, the probability of displaced workers earning at least one college credit is essentially unrelated to age. And conditional on completing at least one college credit, older displaced men complete nearly the same number of credits as younger displaced men (except for the very youngest and very oldest male age groups), while older displaced women complete somewhat fewer college credits than younger displaced women. JLS (2005b, 54) interpret these findings as evidence that the primary reason older displaced workers complete fewer community college credits than younger displaced workers is that *older* workers are *less* likely to enroll in college credit courses in the first place.

JLS (2005a, b) also provide evidence on the earnings effects of community college retraining for a large sample of displaced workers in Washington State who completed one or more community college courses during the early 1990s. Their findings indicate that completion of the equivalent of one academic year of community college credits increased post-displacement earnings by 9 per cent for all displaced men and by 13 per cent for all displaced women. The annual earnings effects of community college retraining were only slightly smaller for older displaced workers 35 years of age and over than for all displaced workers: JLS (2005a, b) estimate that the equivalent of one year of community college credits increased post-displacement earnings by 7 per cent for older displaced males and by 10 per cent for older displaced females. JLS (2005b, 59) also find evidence that the earnings effects of community college retraining differed among displaced workers who took different types of courses. The equivalent of one year of community college

credits in more quantitative courses raised displaced workers' post-displacement earnings by even larger amounts than did the equivalent credits in all community college courses—by about 14 per cent for all displaced men and by 29 per cent for all displaced women. For older displaced workers aged 35 years or older, completion of one year of community college credits in more quantitative subjects produced post-displacement earnings gains of about 10 per cent for older displaced males and of more than 10 per cent for older females, whereas completing one year of all other community college courses increased older displaced workers' post-displacement earnings by only 3 to 5 per cent (JLS 2005b, 59). These estimated earnings effects of completing the equivalent of one year of community college credits, particularly in more quantitative subjects, compare very favourably with the estimated returns to completing an additional year of formal education, which are typically in the range of 7 to 10 per cent. In contrast, the earnings effects of less-quantitative courses were probably less than conventional estimates of the return to an additional year of formal schooling. The implication of these findings is that the nature or content of community college courses clearly matters—the effects of community college retraining on the post-displacement earnings of displaced workers may differ considerably, depending on the type of training received.

I am not aware of any evidence for Canada on the earnings effects of community college retraining for displaced workers similar to that of JLS (2005a, b) for displaced workers in Washington State. However, recent studies by Palameta and Zhang (Palameta and Zhang 2006; Zhang and Palameta 2006) do provide Canadian evidence on the short-run earnings gains from a post-secondary certificate for adult workers who return to school, although this evidence is not specific to displaced workers. Using data from two 6-year panels of Statistics Canada's SLID (for 1993–98 and 1996–2001), Palameta and Zhang compare changes in hourly earnings (in the main job that had the most scheduled hours during the year) and annual earnings (in all paid worker jobs held during the year) between the first and sixth years of a given SLID observation period across three groups of adults: those who did not attend school at any time during the 6-year period, those who attended school sometime between years two and five but who did not complete a post-secondary certificate, and those who completed a post-secondary certificate sometime between years two and five of the observation period for a given SLID panel. Palameta and Zhang define younger persons as those who are 17–34 years of age, and older workers as those who are 35–59 years of age.⁹

At least three of Palameta and Zhang's findings respecting the hourly and annual earnings effects of classroom training for adult school returnees in Canada are worth noting. First, Zhang and Palameta (2006, 18–21) find no evidence of hourly wage or annual earnings gains for any adult workers—male or female, younger or older—who attended a post-secondary institution but did not complete a post-secondary certificate.¹⁰ Second, completion of a post-secondary certificate had significant positive effects on both the hourly and annual earnings of men, but did not have significant effects on either the hourly or annual earnings of women. Third, they find that the hourly and annual earnings effects of completing a post-secondary certificate differed not only between males and females, but also between younger adults 17–34 years of age and older adults 35–59 years of age.

9. It is unfortunate that recent empirical studies of the incidence and earnings effects of adult education define older workers as those who are 35 years of age and over. A finer age classification of individuals (even one that simply distinguishes between 35–49 year olds and 50–64 year olds) would be more appropriate in assessing who gets adult education, who benefits from it, and whether the benefits vary with age.
10. This finding differs from that of JLS (2005b, 59) that displaced workers in Washington State who completed one or more community college credits realized positive earnings gains even if they did not complete the equivalent of one year of community college credits.

Younger men and younger women realized significant increases in both hourly wages and annual earnings from completion of a post-secondary certificate; moreover, both the hourly wage and annual earnings gains were appreciably larger for younger women than for younger men. The estimated increase in mean hourly wages was 6.9 per cent for younger men and 10.6 per cent for younger women, while the estimated increase in mean annual earnings was 8.9 per cent for younger men and 14.7 per cent for younger women. For older women, completion of a post-secondary certificate had no significant effect on either hourly wages or annual earnings.¹¹ For older men, completion of a post-secondary certificate was associated with a statistically significant increase in mean hourly wages of 7.6 per cent but a statistically insignificant increase in mean annual earnings of 4.5 per cent. In short, Zhang and Palameta (2006) find only limited evidence that completion of a post-secondary certificate increases the earnings of older men who return to school, and no evidence that it increases the earnings of older women who return to school. Finally, completion of a post-secondary certificate had larger positive earnings effects for those adults—particularly adult men—whose prior level of education was a high school diploma or less, than for those whose prior level of education was some post-secondary (college) or higher. Since evidence such as Palameta and Zhang’s is clearly not specific to displaced workers per se, the earnings effects of community college retraining for displaced workers in Canada remains an important area for future empirical policy research.

CONCLUSION

I conclude with two questions and some final observations. First, does there exist in Canada, particularly among federal and provincial governments, the institutional and political commitment to conduct randomized assignment demonstration projects and evaluations of the earnings effects for displaced workers of active labour market policy instruments such as job search assistance, classroom training, and on-the-job training?

Second, is there any evidence yet on the outcome effects of the Targeted Initiative for Older Workers, a Government of Canada program that provides federal money for community-based training and re-employment programs targeted at older workers aged 55 and over? The stated aim of this program is to assist older workers who have lost their jobs owing to industrial restructuring to reintegrate into the employed labour force. It may well be too soon to evaluate this program’s impact on the duration of displaced workers’ jobless spells following separation, and on mitigating their post-displacement earnings losses. But it would indeed be a wasted research opportunity—not to mention a possible waste of federal tax money—if systematic evaluation of the outcome effects of the training and re-employment services provided under this initiative were not undertaken.

I think there are three important messages to take away from this session. First, displaced workers really are fundamentally different from other workers who experience a permanent layoff: they lose their jobs for reasons unrelated to their own job performance, have a very low probability of becoming re-employed in the pre-displacement firm and industry, and personally bear a disproportionate share (relative to their financial resources) of the costs of economic restructuring and the attendant resource reallocation such restructuring entails. Second, there is ample credible evidence—for Canada, as well as the United States—that the earnings losses experienced by displaced workers are both large and persistent. Third, special policy measures, both active and passive, are needed to mitigate

11. In fact, the point estimates of the earnings effects for older women are negative but statistically insignificant for both hourly and annual earnings.

the substantial earnings losses incurred by displaced workers and to facilitate their re-training and reintegration into productive employment. These measures must include changes to the Canadian EI system to better meet the particular needs of displaced workers, needs the current system manifestly fails to address adequately. They should also include serious (and politically disinterested) efforts to determine whether and how displaced workers' post-displacement employment and earnings outcomes can be improved by job search assistance, by classroom and on-the-job training, and by promising new policy measures such as wage insurance.

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