Job Loss in the United States, 1981-2001

by

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ABSTRACT

I examine changes in the incidence and consequences of job loss between 1981 and 2001 using data from the Displaced Workers Surveys (DWS) from 1984-2002. The overall rate of job loss has a strong counter-cyclical component, but the job loss rate was higher than might have been expected during the mid-1990's given the strong labor market during that period. While the job loss rate of more-educated workers increased, less-educated workers continue to have the highest rates of job loss overall. Displaced workers have a substantially reduced probability of employment and an increased probability of part-time employment subsequent to job loss. The more educated have higher post-displacement employment rates and are more likely to be employed full-time. The probabilities of employment and full-time employment among those reemployed subsequent to job loss increased substantially in the late 1990s, suggesting that the strong labor market eased the transition of displaced workers. Reemployment rates dropped sharply in the recession of 2001. Those re-employed, even full-time and regardless of education level, suffer significant earnings declines relative to what they earned before they were displaced. Additionally, foregone earnings growth (the growth in earnings that would have occurred had the workers not been displaced), is an important part of the cost of job loss for re-employed full-time job losers. There is no evidence of a decline during the tight labor market of the 1990s in the earnings loss of displaced workers who were reemployed full-time. In fact, earnings losses of displaced workers have been increasing since the mid 1990s.

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1 Introduction

The tight labor market of the 1990s saw a dramatic reduction in the civilian unemployment rate from the average of 7.3 percent in the 1980s to a low of 4.2 percent in 1999. However, by the end of 2001 the unemployment rate increased to 5.8 percent and further to 6.0 percent by November 2002. Job loss and worker displacement remain a concern, both because of the perception that rates of job loss remained high despite the strong labor market of the 1990s and because of the substantial costs borne by job losers. In this study, I use data from the Displaced Workers Surveys (DWS), which have been regular supplements to the Current Population Survey (CPS) at two year intervals from 1984 through 2002, to investigate movements over time in the rate of job loss and the costs of job loss to displaced workers.

I find that the rate of job loss followed a cyclical pattern between 1981 and 1991. However, the overall rate of job loss increased through the 1993-95 period despite the sustained economic expansion. Using additional data from debriefings of respondents to the February 1996 and later DWSs, I address the possibility that the elevated rates of job loss in the mid-1990s are a statistical artifact resulting from changes in the wording of a key question in the DWS in 1994 and 1996, exacerbating a problem of misclassification of some workers as displaced. Even after making a liberal adjustment for over-reporting of job loss, it appears that the overall rate of job loss has not declined in the 1993-95 time period, despite the strong labor market. However, the rate of job loss did decrease substantially in the latter half of the 1990s before increasing substantially the most recent period.

I investigate the consequences of job loss in several dimensions. These include post-displacement probability of employment, the probability of part-time employment, and the magnitude of the earnings loss suffered by job losers. I break the earnings loss into two components: 1) the difference between the earnings received by job losers workers on their post-displacement job and the earnings they received prior to displacement and 2) foregone earnings growth measured by the earnings growth received by a group of non-displaced workers. I find that more educated job losers have higher post-displacement employment rates and are more likely to be employed full-time. Those re-employed, even full-time and regardless of education level, suffer significant earnings declines relative to what they earned before they were displaced. In addition to the decline in earnings, foregone earnings growth is an important additional part of the cost of job loss.

Here is a brief outline of the study. In the next section I present a short review of the literature on job stability and job loss. In section 3, I discuss measurement and data issues relevant to the analysis of job loss, including problems introduced by changes to the DWS in 1994. Section 4 contains my analysis of the incidence of job loss. In section 5, I analyze the consequences of job loss. I begin this analysis with an investigation of post-displacement

employment probabilities. Next, I consider full-time/part-time status of re-employed job losers. Finally, carry out a pair of analyses of the loss of earnings due to displacement. Section 6 contains a discussion of the findings and concluding remarks.

2 Review of Recent Literature on Job Loss

In an earlier paper (Farber 1993), I used the five DWSs from 1984 to 1992 to examine changes in the incidence and costs of job loss over the period from 1982-1991. I found that there were slightly elevated rates of job loss for older and more educated workers in the slack labor market in the latter part of the period compared with the slack labor market of the earlier part of the period. But I found that job loss rates for younger and less educated workers were substantially higher than those for older and more educated workers throughout the period. These findings are consistent with the long-standing view that younger and less educated workers bear the brunt of recessions. I also confirmed the conventional view that the probability of job loss declines substantially with tenure.

Gardner (1995) carried out the first analysis of which I am aware that incorporated the 1994 DWS. She examined the incidence of job loss from 1981-92. While she found roughly comparable overall rates of job loss in the 1981-82 and 1991-92 periods, she found that the industrial and occupational mix of job loss changed over this period. There was an decreased incidence of job loss among blue-collar workers and workers in manufacturing industries and an increase in job loss among white-collar workers and workers in non-manufacturing industries.

In another paper (Farber 1997), I used the seven DWSs from 1984 to 1996 to revisit the issue of changes in the incidence and costs of job loss. I found that the overall rate of job loss increased in the first half of the 1990s despite the sustained economic expansion. Hipple (1999) carried out the first analysis of the 1998 DWS, and he finds that the displacement rate among workers who had held their jobs for at least three years fell only slightly between the 1993-1994 period and the 1995-1996 period despite the sustained economic expansion.

There is a substantial literature using the DWS to study the post-displacement employment and earnings experience of displaced workers.[1] This work demonstrates that displaced workers suffer substantial periods of unemployment and that earnings on jobs held after displacement are substantially lower than pre-displacement earnings. In my earlier work (Farber 1993), I found that there was no difference on average in the consequences of job loss between the 1982-83 recession and the the 1990-91 recession.

[1] See, for example, Podgursky and Swaim (1987), Kletzer (1989), Topel (1990), Farber (1993), Farber (1997).

The earnings loss suffered by displaced workers is positively related to tenure on the pre-displacement job. On the other hand, Kletzer (1989) found further that the post-displacement earnings *level* is positively related to pre-displacement tenure, suggesting that workers displaced from long jobs are more able on average than those displaced from shorter jobs. In more recent work, Neal (1995) using the DWS and Parent (1995) using the National Longitudinal Survey of Youth (NLSY) found that workers who find new employment in the same industry from which they were displaced earn more than do industry switchers. This work suggests that Kletzer's finding that post-displacement earnings are positively related to pre-displacement tenure may be a result of the transferability of industry-specific capital. Workers who are re-employed in the same industry "earn a return" on their previous tenure while those re-employed in a different industry do not.

3 Measuring Job Loss Using the Displaced Workers Surveys

I analyze data on 765,469 individuals between the ages of twenty and sixty-four from the DWSs conducted as part of the January CPSs in 1984, 1986, 1988, 1990, 1992, and 2002 and the February CPSs in 1994 and 1996, 1998, and 2000. Each Displaced Workers Supplement from 1984-92 asks workers if they were displaced from a job at any time in the preceding five-year period. The 1994 and later DWSs ask workers if they were displaced from a job at any time in the preceding three-year period. Displacement is defined in the interviewer instructions to the relevant Current Population Surveys as involuntary separation based on operating decisions of the employer. Such events as a plant closing, an employer going out of business, a layoff from which the worker was not recalled are considered displacement. Other events, including quits and being fired for ". . . poor work performance, disciplinary problems, or any other reason that is specific to the individual alone . . .", are not considered displacement (U.S. Department of Commerce, 1988, Section II. p.4). Workers who are laid off from a job and rehired in a different position by the same employer are considered to have been displaced. Thus, the supplement is designed to focus on the loss of specific jobs that result from business decisions of firms unrelated to the performance of particular workers.

There are some important issues of definition implicit in the design of this question that do not seem to have been addressed adequately in earlier work using the DWS. Job loss as measured in these data almost certainly does not represent all job loss about which we ought to be concerned. Specifically, the distinction between quits and layoffs is not always clear. Firms may wish to reduce employment without laying off workers, and they might accomplish this by reducing or failing to raise wages.[2] This can encourage workers (perhaps those least

[2] This is consistent with work by Jacobsen, Lalonde, and Sullivan (1993) who find that displaced workers

averse to the risk of a layoff due to having better alternatives) to quit. Other workers (perhaps those most averse to the risk of a layoff due to having worse alternatives) might be willing to continue to work at reduced wages. To the extent that these are important phenomena, the sample of individuals observed to be displaced by the definition used in the DWS is a potentially non-random sub-sample of "truly displaced" workers. The consequences of this are difficult to measure, but it is worth noting that the ability of employers to offer wage decreases to their workers can be quite limited.

More importantly for analysis of "involuntary" job change is the fact that the DWS collects and reports information on at most one job loss for each individual. For workers with more than one job loss, this information refers to the longest job lost. Since it is possible (and not rare) for workers to have lost more than one job in a five-year (or three year) period, the DWS cannot be used to measure the total quantity of job loss. At best, it measures the number of workers who have lost at least one job in the relevant time period.[3]

Even if it is agreed that the focus of the analysis is on those workers who have lost at least one job, there is the problem of how to compute the job loss rate. Consider some category of workers (defined by such characteristics as age, sex, and/or education). The DWS provides a direct measure of the number of workers in that category who have lost at least one job, and this is a reasonable numerator for the category-specific job loss rate. However, the pool of workers who were at risk to lose a job during the relevant time period is not easily measurable. I take the straightforward approach, as I did in my earlier studies (Farber, 1993, 1997) of using the number of workers in the given category who were either employed at the survey date or reported a job loss as measuring the relevant pool, and this number serves as the denominator in the calculation of the job loss rate. This is likely to be a good approximation unless employment in the group is changing rapidly over the relevant time period (three years).

3.1 Changes in the Recall Period: The Adjusted Job Loss Rate

In order to make meaningful comparisons of job-loss rates over time, it would be best if the questions in the DWS asking whether workers had lost a job remained fixed over time. Unfortunately, this was not so. A major change in the DWS was a change in the recall period for which information on job loss was collected. From 1984 through 1992, the core DWS question asked workers if they had lost a job in the last five years. Since 1994, the

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suffer wage declines even before they are displaced.

[3] There also is the commonly noted problem of recall bias due to the likelihood that workers fail to report job loss that occurred long before the interview date. See Topel (1990) for evidence suggesting that recall bias is an important problem in the DWS. Farber (1993) also presents some evidence on this issue.

core DWS question asked workers if they had lost a job in the last three years. In order to make job loss rates computed from the DWS comparable over time, some adjustment to a common time period is required.

I use three-year rates of job loss, which are computed as the number of workers who reporting having lost a job in the three calendar years prior to the survey date divided by employment plus not-employed job losers at the survey date. This calculation is straightforward using the data from the 1994 and later DWSs because the central question on job loss uses a three-year recall period. But there is an important problem of comparability that needs to be addressed when using the earlier DWSs due to the five-year recall period used in the 1984-92 DWSs. Obviously, it does not make sense to compare displacement rates from a five-year period with displacement rates from a three-year period. It would seem reasonable to count only job loss in the most recent three years from the 1984-92 surveys. Workers who reported losing jobs four and five years ago would be counted as non-losers. The result would be a three-year job loss rate which could be compared with the three-year job loss rate computed directly from the 1994 and later DWSs. However, this approach would certainly underestimate job loss in the most recent three years because some (probably non-negligible) fraction of the workers who lost a job four and five years ago lost at least one shorter job in the most recent three-year period.[4]

The problem is that three-year job loss rates computed from the 1984-92 DWSs do not include jobs lost in the last three years by individuals who also lost (longer) jobs four and/or five years ago. The solution I adopt is to adjust the three-year job-loss rates computed from the 1984-92 DWSs upward to reflect the "missing" job losses. The procedure I use, described in detail in Farber (1997), is based on longitudinal data from the PSID, suggests that approximately 30 percent of workers who lost a job four years earlier lost another job in the next three years and that approximately 27 percent of workers who lost a job five years earlier lost another job in the three years immediately prior to the survey. This adjustment, admittedly crude, results in an average upward adjustment in three-year job loss rates from the 1984-92 DWSs of about 11 percent. While this procedure is surely not perfect, it is difficult to think of a better feasible alternative.

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[4] Workers who lost multiple jobs were expected to report the loss of the longest job held. The debriefing questions asked of job losers in the February 1996 DWS suggest that approximately 30 percent of job losers lost more than one job in the *three* year window and that approximately 73 percent of multiple job losers reported the loss of the longest job.

3.2 Changes in the Wording of the Core Displacement Questions

In addition to the change in the recall period, the core question asking individuals if they were displaced has varied somewhat from survey to survey. From 1984-1992 the question was *"In the past 5 years, that is, since January 19xx, has . . . lost or left a job because of a plant closing , an employer going out of business, a layoff from which . . . was not recalled, or other similar reasons?"* In February 1994 the question was *"During the past 3 calendar years, that is, January 1991 through December 1993, did (name/you) lose or leave a job because a plant or company closed or moved, (your/his/her) position or shift was abolished, insufficient work, or another similar reason?"* Finally, in February 1996, 1998, 2000, and 2002 the question was *"During the past 3 calendar years, that is, January xxxx through December xxxx, did (name/you) lose a job, or leave one because a plant or company closed or moved, (your/his/her) position or shift was abolished, insufficient work, or another similar reason?"* Comparisons over time are complicated by the fact that the wording of the core question changed fairly substantially in 1994 and then less dramatically in 1996.

If the response to the core question on job loss is positive, the respondent is asked the reason for the job loss, and six responses are allowed: 1) plant closing, 2) slack work, 3) position or shift abolished, 4) seasonal job ended, 5) self-employment failed, and 6) other. The BLS considers only the first three responses to represent displacement.[5] As a result, their published tabulations and analyses of displacement consider only workers who report a job loss for these three reasons, and, in the 1994 and later DWSs, individuals who reported a job loss for any of the other three reasons were not asked follow-up questions about the lost job.

In my earlier work (Farber, 1993, 1997), I measured job-loss rates including job loss for all reasons rather than the more restrictive measure used by the BLS. This makes a substantial difference in the rate of job loss and its movement over time. This is because, while only a small fraction of job loss is due to a seasonal job ending or self-employment failing, a substantial and sharply increasing fraction of reported job loss is for "other" reasons. On this basis, I concluded that the overall rate of job loss has increased in the 1990's (through 1995) despite the sustained expansion, particularly for more educated workers (Farber, 1997).

The outgoing rotation groups (one quarter of the overall sample) in the 1996, 1998, and 2000 DWSs were asked a series of debriefing questions designed in part to determine whether a job loss for "other" reasons was, in fact, job loss or whether it represented a voluntary job change.[6] The key information obtained in the debriefing is a detailed reason for the reported

[5] See Esposito and Fisher (1997) for a discussion of the BLS concept of displacement.

[6] Esposito (1999) presents an interesting discussion of measurement issues related to the DWS and assesses the quality of the data using the responses to the debriefing questions. Farber (1998) recalculates the job

job loss. I have analyzed the responses to the debriefing questions 1996, 1998, and 2000 DWSs, and I find that only 20.3 percent of job losers who reported "other" as the reason for their job loss in the main DWS, reported that the job loss was for a reason that could be interpreted as involuntary. Another 22.4 percent continued to report "other" as the reason for job loss ("other-other"). However, the 1996 debriefing survey recorded verbatim reasons for job loss reported by those who reported "other" on the debriefing question, and, while I do not have direct access to the these verbatim responses, a tabulation was provided to me by economists at the BLS that categorized the job loss of those who responded "other" both to the main DWS question and to the debriefing question on reason for job loss. Three categories were identified: 1) displacement reasons (12.9%), 2) possible displacement reasons (17.8%), and 3) nondisplacement reasons (69.3%).[7] I use this breakdown to estimate the share of "other-other" job losers who were involuntarily terminated as all who reported displacement reasons (12.9%) plus one-half of those who reported possible displacement reasons (8.9%) for a total involuntary share of "other-other" of 21.8%.

With this estimate in hand, I assume that 25.2% of "other" job losers in the 1994 and later DWSs lost their jobs involuntarily ($0.252 = 0.203 + 0.218 \cdot 0.224$). The conclusion to be drawn from this analysis of the debriefing data is that only a minority of job loss for "other" reasons is involuntary. Abraham (1997), using the 1996 debriefing and the verbatim responses, argued that the "other" category should be heavily discounted and that care must be taken in comparing displacement rates over time. In an earlier analysis (Farber, 1998), I computed job loss rates through 1996 that discount the job loss for "other" reasons applying the results of the 1996 debriefing to all years. Polivka (1998) argued that applying a common discount factor to all years is not appropriate because the wording of the core displacement questions changed in ways that make it more likely that workers would inappropriately report a displacement for "other" reasons in the more recent DWSs.

The BLS partially avoids these problems by defining the job loss rate to include only job loss due to 1) plant closing, 2) slack work, or 3) position or shift abolished.[8] The cost is that some legitimate job loss is missed. In my earlier work, I generally have included "other" job loss as well as the three reasons counted by the BLS. However, based on the evidence from the debriefings and from the analyses of Abraham (1997) and Polivka (1998), it is appropriate to discount "other" job loss in the 1994 and later DWSs.

While the debriefings included in the 1996-2000 DWSs were " . . . **not** undertaken to

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loss rate in the 1993-1995 period using data from the 1996 debriefing.

[7] This breakdown is based on unweighted counts covering all eligible individuals (ages twenty and older). In contrast, my analysis relies on weighted counts and uses a sample of workers ages 20-64.

[8] The BLS definition also restricts job loss to those jobs where the worker had held the job for at least three years. I make no restriction based on tenure.

produce, nor can it [they] be expected to provide, accurate adjustment factors . . . ." for rates of job loss (Esposito and Fisher, 1997, p. 1), my analysis of the debriefing data does provide some guidance in formulating adjustment factors. Based on the analysis above, I discount "other" job loss in the 1994 and later DWSs by 74.8% (100% - 25.2%). It is also likely appropriate to discount "other" job loss in the earlier DWSs, but not by as large a factor. While there is no direct evidence on how much "other" job loss is involuntary in the 1992 and earlier DWSs, I proceed using an assumed discount rate of half of that I apply to the later DWSs. This is 37.4%.

4 The Rate of Job Loss

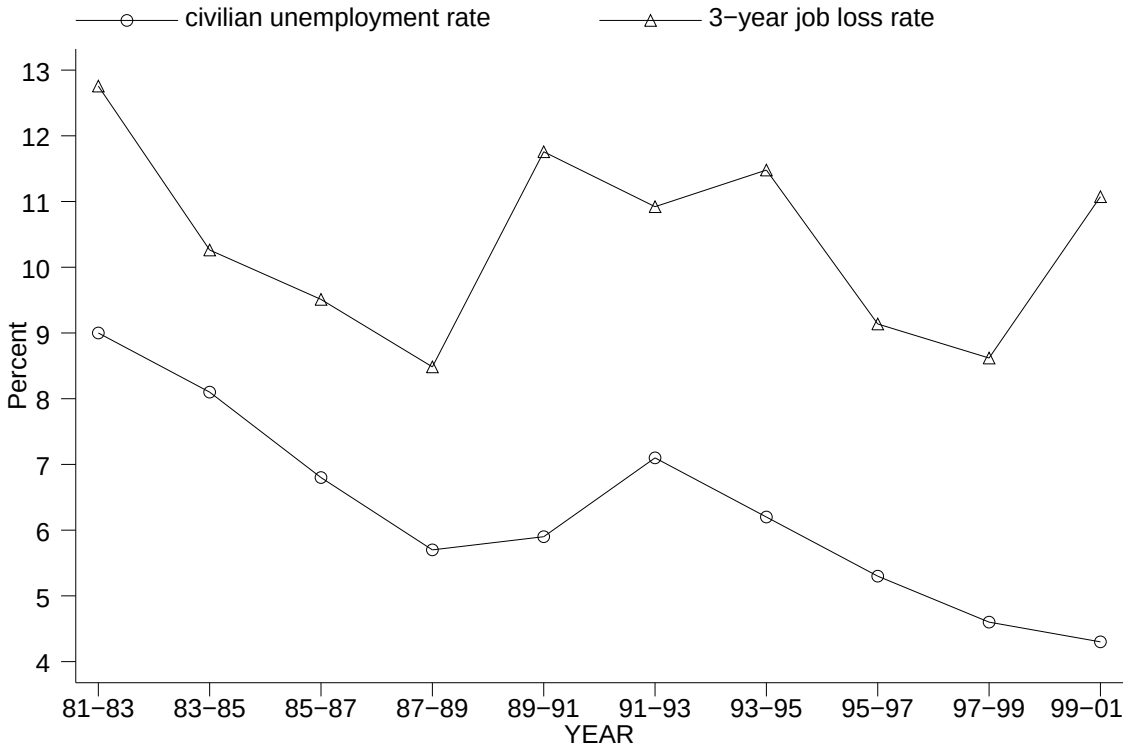

Figure 1: Unemployment and Job Loss Rates, by Year

Information on rates of job loss is presented most accessibly in graphical form, and the discussion here is organized around a series of figures.[9] All job loss rates presented in this section from the 1984-1992 DWSs are adjusted upward as described briefly above (and in detail in Farber (1997)) to account for the change in the recall period from five years to three years.

[9] The numerical values underlying all figures in this study are contained in the appendix. All counts are weighted using the CPS sampling weights.

Figure 1 contains plots of adjusted three-year job loss rates computed from each of the ten DWSs from 1984-2002 along with the average civilian unemployment rate for each three-year period.[10] The cyclical behavior of job loss is apparent, with job-loss rates clearly positively correlated with the unemployment rate ($\rho = 0.50$). Both unemployment and job-loss rates were high in the 1981-83 period, and they both fell sharply during the expansion of the mid-1980's. However, the job-loss rate rose much more sharply from the 1987-89 to the 1989-91 period than did the unemployment rate. The job-loss rate rose by fully 3.1 percentage points (from 7.1 percent to 10.2 percent) while the average unemployment rate rose by only 0.2 percent (from 5.7 percent to 5.9 percent) over this period. Between 1993 and 1999, both the job-loss and unemployment rates fell sharply, but the gap between them remained larger than in the strong labor market of the late 1980's.[11] It does appear that there was more job loss in the early part of the 1990's than during other periods after accounting for the state of the labor market (using the unemployment rate), and this may account in part for workers' perceptions of declining job security (Schmidt, 1999).

In the most recent three-year period (1999-2001), the average unemployment rate fell slightly while the job loss rate increased sharply. The use of three-year averages here hides the fact that the job loss rate was steady in 1999 and 2000 before increasing sharply in 2001 while the unemployment rate declined slightly in 1999 and 2000 before increasing slightly in 2001.[12] Taken together, the evidence from 2001 and from 1989-91 suggests that the rate of job loss rises sharply while the unemployment rate increases relatively slowly as the labor market weakens.

The stacked-bar graphs in Figure 2 provide information on not only on overall job loss rates (the total height of each bar) but also on job loss rates by reason (the shaded segments of each bar). Four classifications of reason are presented: 1) plant closing, 2) slack work, 3) position or shift abolished, and 4) other.[13]

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[10] The job loss rates for 1984-1992 are adjusted upward, as described above, to account for the change in recall period from five years to three years in 1994. Job loss for "other" reasons is discounted, as described above, by 37.4% for the 1984-1992 DWS and by 74.8% for the 1994 and later DWSs.

[11] The difference between the job-loss rate and the unemployment rate was 2.8 percentage points in 1987-89, rose to 5.9 percentage points in 1989-91, and fell to 3.8 percentage points in 1995-97.

[12] The comparison of job loss rates for specific years of job loss compares the job loss rates across surveys computed using only job losers who reported losing jobs the same number of years prior to the survey date. For example, the 2001 job loss rate is computed from the 2002 DWS and compared with the 1999 job loss rate computed from the 2000 DWS. Similarly, the 2000 job loss rate is computed from the 2002 DWS and compared with the 1998 job loss rate computed from the 2000 DWS.

[13] Note that the "other" category I use merges the "seasonal job ended", "self-employment ended", and "other" categories as coded in the DWS. This was done for graphical clarity, and it does not affect the general results. The (unadjusted) rates of job loss due to "seasonal job ended" and "self-employment failed" are small throughout the period studied.

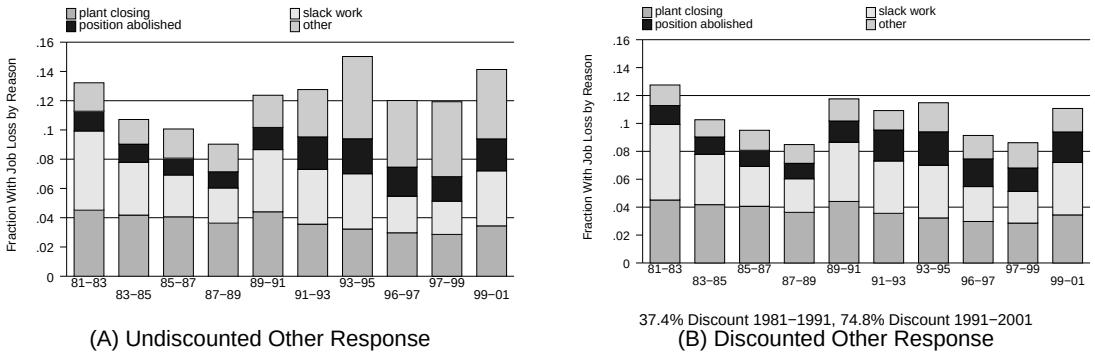

Figure 2: Rate of Job Loss by Reason, 1981-1999

The rates of job loss in panel A of figure 2 do not discount the "other" job losers. By this measure there is a sharp drop in job-loss rates from the 1981-83 period through the 1987-89 period. The job-loss rate then increases sharply from 1987-89 through 1993-95 before declining in the late 1990s. The most striking change in the rate of job loss by reason is the dramatic increase in job loss for "other" reasons since 1991-93. As discussed above, this increase may be a result of changes in wording of the key displacement question in the DWS, and I presented an adjustment to be applied to these data.

Panel B of figure 2 contains plots of the three-year job loss rates with job loss for "other" reasons discounted by 37.4% from 1981-1991 and by 74.8% from 1991-2001.[14] Comparison of panels A and B show that the large discount applied to "other" job loss decreases the overall job-loss rate by a significant amount in the later years. The effect is to change fairly substantially the time-series pattern of job-loss rates. Consistent with the undiscounted results in panel A, the discounted estimates of the job-loss rate show a high rate of job loss during the slack labor market of the early 1980's following by a decline during the expanding labor market of the mid-1980's. This is followed by a sharp increase between 1987-89 and 1989-91 as the labor market slackened once again. However, in contrast to the sharp increase in the overall rate of job loss subsequent to 1993 found in the undiscounted data, the discounted data show only a slight increase in the overall rate of job loss during the strong labor market of 1993-1995 followed by a substantial decline in the late 1990s before increasing in the 1999-2001 period.

In what follows, I focus on the estimates (like panel B) that discount "other" job loss differentially in the 1984-1992 DWSs and the 1994-2002 DWSs.

[14] The discount is applied only to the portion of the combined category that was "other" in the DWS, and not to job loss due to loss of self-employment or seasonal jobs.

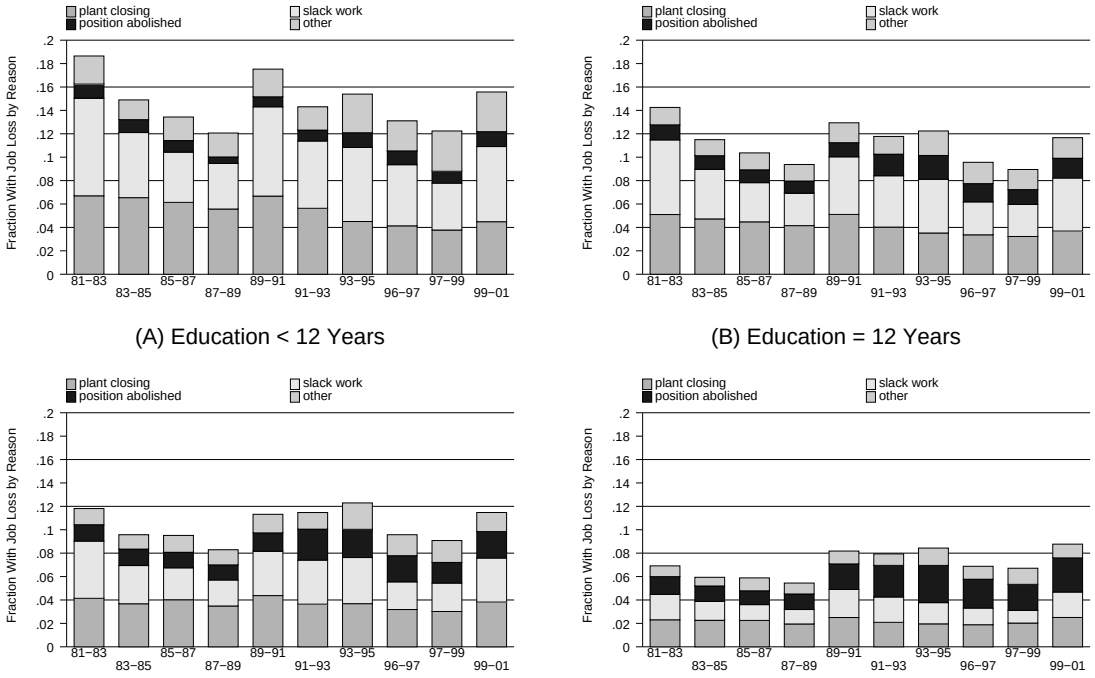

Figure 3: Three-Year Job Loss Rate by Education, 1981-2001 (Discounted "other").

4.1 The Rate of Job Loss by Education

Figure 3 contains three-year rates of job loss by year for each of four education categories. Not surprisingly, job loss rates are dramatically higher for less educated workers than for more educated workers. There is a strong cyclical pattern in job loss rates for less educated workers, but the cyclical pattern is weaker for more educated workers. For example, the job loss rate for workers with twelve years of education was 8.9 percent in 1997-99 (the lowest in the sample period) compared with 14.3 percent in 1981-83. In contrast, the job loss rate for workers with at least sixteen years of education was 6.7 percent in 1997-99 compared with 6.9 percent in 1981-83 and 5.4 percent in 1987-89.

It appears that there was an upsurge in job loss rates for more educated workers in the early and mid-1990s. This is due primarily to an increase in job loss due to position/shift abolished among workers with at least some education beyond high school. Among workers with at least 16 years of education, the fraction reporting a job loss due to position/shift abolished increased from 1.5 percent in 1981-83 to 3.2 percent in 1993-95, falling to 2.2 percent in 1997-99, before rising again to 2.9 percent in 1999-2001. This is consistent with reports of elimination of substantial numbers of white-collar jobs in some large organizations in the early and mid-1990s. In contrast, among workers with 12 years of education, the percent who reported a job loss due to position/shift abolished increased from 1.3 percent in 1981-83 to 2.0 percent in 1993-95, before falling back to 1.3 percent in 1997-99 and rising

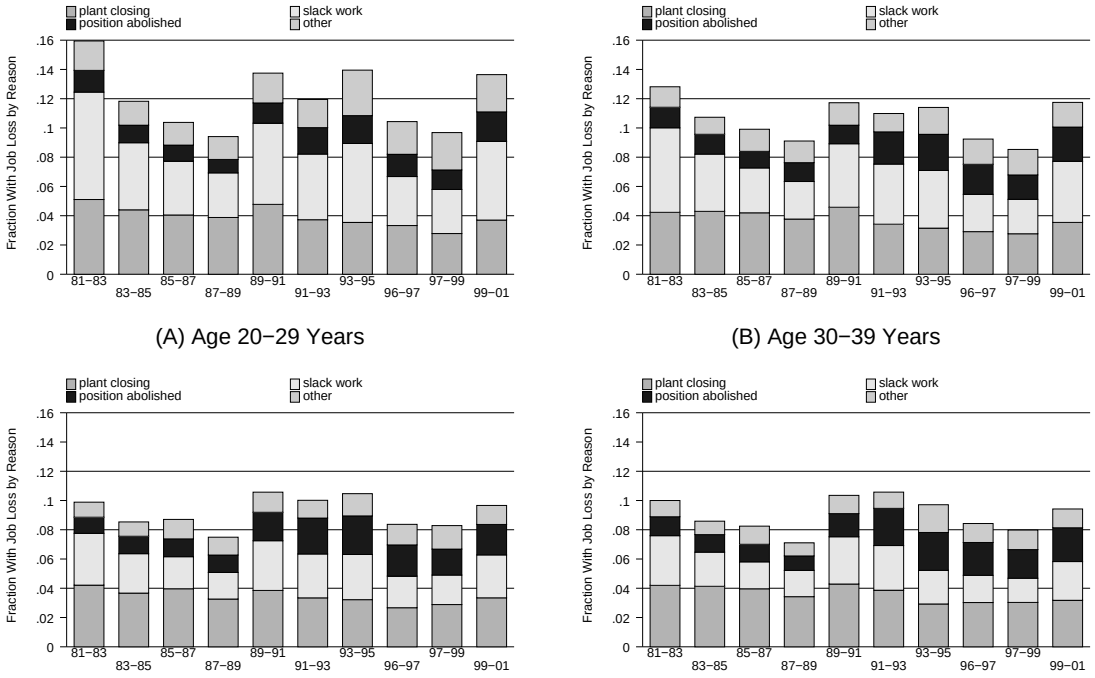

Figure 4: Three-Year Job Loss Rate by Age, 1981-1999 (Discounted "other").

to 1.7 percent in 1999-2001.

4.2 The Rate of Job Loss by Age

Figure 4 contains three-year job loss rates by year for four age groups covering the range from 20-64. Job loss rates are highest for the youngest workers (20-29) and, apart from the 1993-95 period, show the standard cyclical pattern. The older age groups show job loss rates declining somewhat until 1987-89 increasing in 1989-91 before declining slowly during the 1990s and increasing again in the most recent period. For workers in the two oldest age categories, comprising workers 40-64 years old, job loss rates were as high from 1989-93 as they were in the deep recession of the early 1980's. The bulge in job loss rates in the 1990s among older workers appears to be due largely to an elevation in position-abolished category through 1997 as well as some persistence in cyclical job loss due to slack work.

4.3 Has there been a Secular Increase in the Rate of Job Loss?

Time series patterns in the job-loss rates presented in figures 1 – 4 needs to be interpreted carefully due to the changes in the wording of the displacement questions and the admittedly conjectural nature of the adjustments I used to account for these changes. What appears clear is that job loss was slow to decline in the early stages of the economic expansion of the

1990s relative to the decline in the economic expansion of the 1980s. Overall job-loss rates did decline substantially beginning in the 1995-97 period and, by 1997-1999 job-loss rates were approximately as low as they had been in the late 1980s. There was some variation by education and age. Job-loss rates among older and more educated workers did decline after 1995, but they remained higher than they were at the peak of the 1980s expansion. Thus, it appears that, while there was no secular increase in overall rates of job loss, there was a secular increase in the rate of job loss for the older and more educated, due largely to an increase in job loss due to position/shift abolished. This may reflect the kinds of restructuring that has been the subject of much attention for the past decade. Job loss rates increased substantially in the 1999-2001 period, due entirely to a higher job loss rate in 2001 (not shown) as the recession took hold.

5 The Consequences of Job Loss

Given the sustained economic expansion of the mid- to late-1990s, it is interesting to ask whether workers who lost jobs over that period bore smaller costs than workers who lost jobs in earlier periods. It is also interesting to consider whether workers who lost jobs in the most recent period as the economy weakened bore higher costs relative to job losers in the 1990s. I consider three dimensions of labor-market experience subsequent to job loss. First, because it can be difficult for individuals to find new jobs, I examine the post-displacement probability of employment. Second, where a new job is found, it may have reduced hours relative to the lost job. To the extent that the new job is part-time, it is likely to pay a lower hourly rate as well as yield less total income. In order to investigate this possibility, I examine the probability that workers are employed in part-time jobs subsequent to displacement. Third, even controlling for hours, the new job may not pay as much as the lost job paid or would pay currently had the worker not been displaced. Thus, I examine the change in weekly earnings for displaced workers between the pre-displacement job and the job held at the DWS survey date.[15] Because earnings of displaced workers would likely have changed had the workers not been displaced, I also use a control group of workers from the outgoing rotation groups of the CPS to compute the change in earnings over the same period covered by each DWS for workers who were not displaced. I then use these changes to compute difference-in-difference (DID) estimates of the effect of displacement on earnings of re-employed workers.

The design changes in the DWS since 1994 complicate the analysis of the consequences of job loss. Most importantly, the follow-up questions designed to gather information on the characteristics of the lost job and experience since job loss were asked only of job losers whose

[15] This analysis is restricted to displaced workers who are employed at the DWS survey date.

reported reason for the job loss was one of the "big three" reasons: slack work, plant closing, or position/shift abolished. Workers who lost jobs due to the ending of a temporary job, the ending of a self-employment situation, or "other" reasons were not asked the follow-up questions. In order to maintain comparability across years and because the set of workers who lost jobs for "other" reasons contains many workers who were not, in fact, displaced, my analysis, regardless of year, uses only workers who lost jobs for the "big three" reasons. Additionally, in order to have a consistent sample over time, I do not use information on job losers in the 1984-1992 DWSs who lost jobs more than three years prior to the interview date.

5.1 Post-Displacement Employment Rates

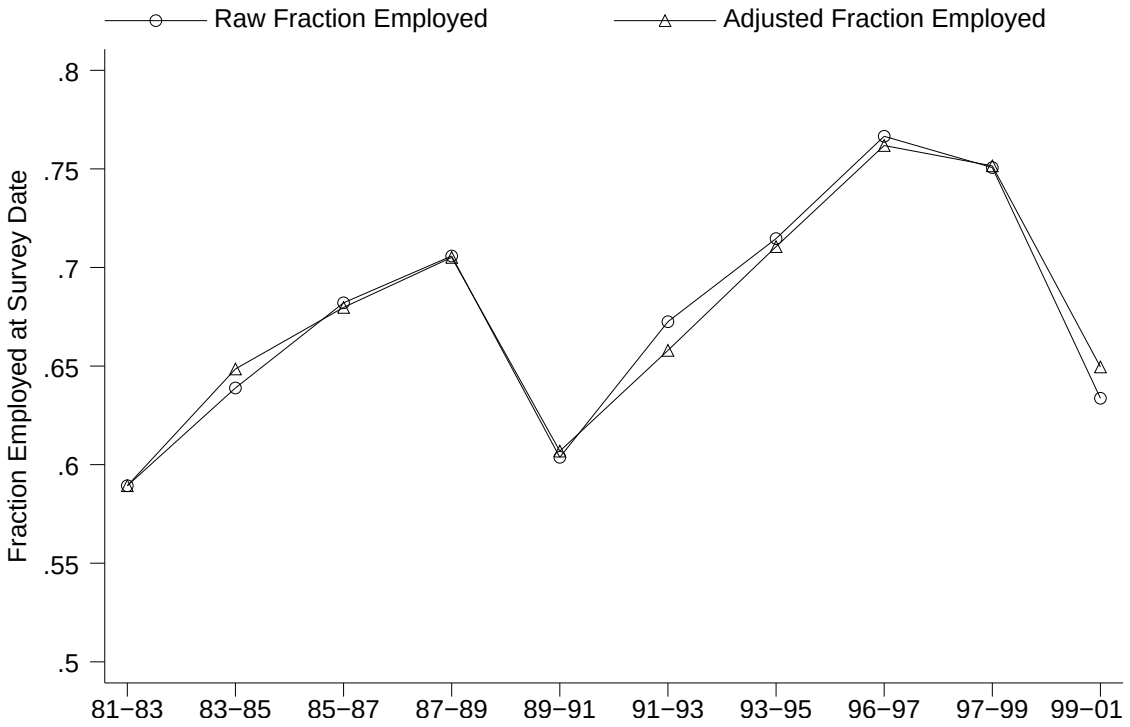

Figure 5: Fraction of Job Losers Employed at Survey Date, by Year

In this section, I examine how the probability of survey-date employment of workers has varied over time and with other factors including sex, race, age, education, tenure on the lost job, and the number of years between the job loss and the survey date. Figure 5 contains plots of the (raw and regression-adjusted) fraction employed at the DWS survey date for job losers in each of the DWSs. The raw fractions are simple tabulations of the data while the adjusted fractions are derived from a linear probability model of survey-date employment status on controls for sex, race, education (four categories), age (five categories), tenure on

the lost job (five categories), years since job loss (three categories), and survey year (ten categories).[16] It is clear from this figure that the post-displacement employment rate is cyclical, with relatively low rates in the slack labor market periods of 1981-83 and 1989-91. The figure also shows that the post-displacement employment rate has been increasing since 1989-91, reaching its highest levels in 1995-97 before declining slightly in 1997-99 and then more sharply in 1999-2001. This finding is evidence that, while rates of job loss were higher than might have been expected in the first part of the 1990's, the economic costs of job loss diminished somewhat later in the decade.

The fact that the raw and adjusted probabilities are almost identical throughout (simple correlation = 0.991) implies that any changes in the characteristics of job losers over time are unrelated to the time-series movements in post-displacement employment probabilities. However, there are substantial differences in post-displacement employment probabilities for workers of different characteristics.

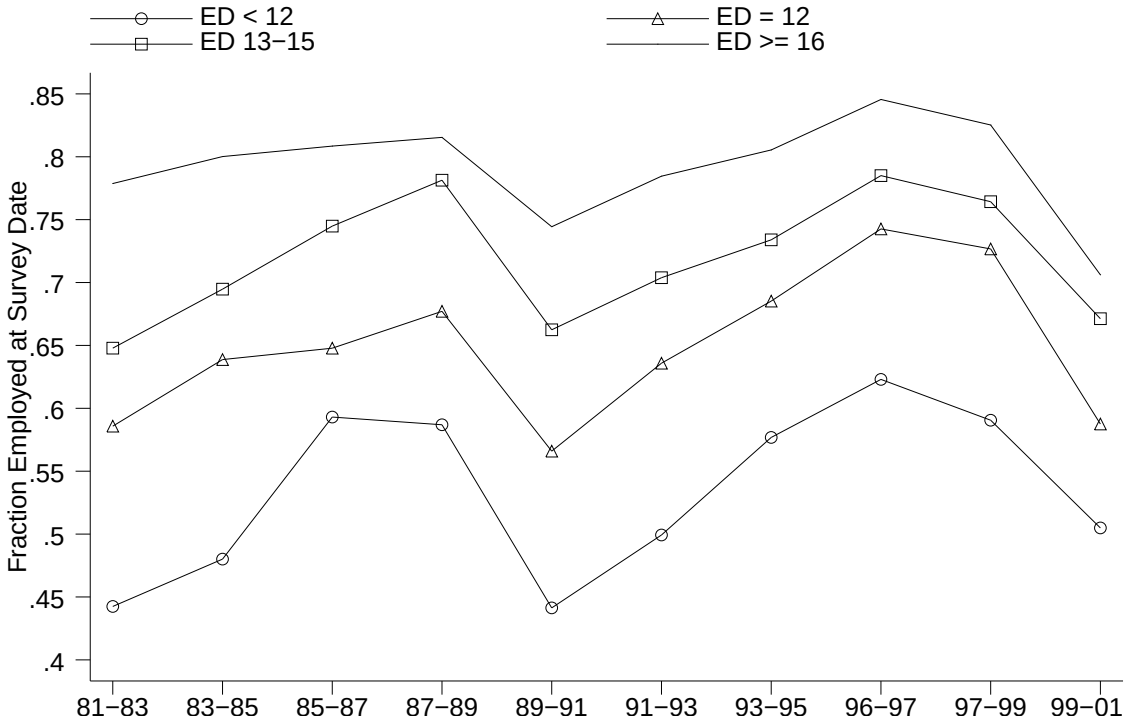

Figure 6: Fraction of Job Losers Employed at Survey Date, by Education

One important dimension along which there are differences is education. Figure 6 contains plots of survey-date employment probabilities for displaced workers by year broken down by

[16] The actual numbers presented for the adjusted probabilities are the coefficients on the survey year dummy variables in the linear probability model plus the measured average employment probability for the omitted survey year (1984).

education. Not surprisingly, workers with higher levels of education are more likely than workers with less education to be employed subsequent to a job loss. The college – high school gap in employment rates is substantial, ranging from about 19 percentage points in 1981-83 to about 11 percentage points in 1999-2001.[17] The movement over time in this gap is largely due to the fact that the post-displacement employment rate of shows a greater degree of cyclical variation for less-educated workers.

In order to more generally how worker characteristics are related to post-displacement employment probabilities, table 1 contains estimates of separate linear probability models for each year of the probability of being employed at the DWS survey date subsequent to job loss. These models control for sex, race, education, age, tenure, and time since job loss.

The results with regard to education are qualitatively similar to the bivariate results shown in figure 6. Workers with more education have higher post-displacement employment probabilities, and the education differential moves countercyclically because the employment probabilities for less educated workers are more cyclically sensitive than are those for more educated workers.

With regard to age, there is not much difference in post-displacement employment probabilities for workers who are less than 55 years old. However, displaced workers who are more than 55 years old are substantially less likely than younger workers to be employed at the DWS survey date. The difference in post-displacement employment rates between workers at least 55 years old and workers 20 to 24 years old is 15 to 25 percentage points. While there is substantial year-to-year variation in the year-specific estimates, there does not appear to be a trend in this differential. The fact that older workers are less likely to be employed likely reflects movement into retirement subsequent to job loss. Fully 28.8 percent of job losers who are at least 55 years old are not in the labor force at the survey date compared with 12.3 percent of job losers who are less than 55 years old.

With regard to other characteristics, women are consistently 4 to 9 percentage points less likely to be employed subsequent to displacement. This seems to be due to lower labor force participation rates after displacement for women than for men. The fraction of displaced workers who are not in the labor force at the survey date is about 19.1 percent for women and only about 10.0 percent for men. At the same time 36.0 percent of displaced females and 30.5 percent of displaced males are are not employed at the survey date. These differences may reflect time-use options other than work that are available to women when they lose their jobs involuntarily.

The racial differential in employment rates is clearly cyclical with larger differentials in

[17] This gap is the difference in post-displacement employment rates for workers with at least 16 years of education and workers with twelve years of education.

Table 1: Probability of Survey-Date Employment, 1981-2001

Displaced Workers, Linear Probability Model Estimates
(standard errors)

Variable	1981-83	1983-85	1985-87	1987-89	1989-91	1991-93	1993-95	1995-97	1997-99	1999-01
Constant	0.545	0.578	0.545	0.594	0.445	0.524	0.646	0.654	0.698	0.549
	(0.020)	(0.021)	(0.024)	(0.025)	(0.022)	(0.026)	(0.025)	(0.025)	(0.028)	(0.024)
Female	-0.093	-0.067	-0.064	-0.063	-0.032	-0.069	-0.062	-0.088	-0.080	-0.044
	(0.013)	(0.015)	(0.015)	(0.015)	(0.014)	(0.013)	(0.015)	(0.014)	(0.015)	(0.014)
Nonwhite	-0.199	-0.128	-0.087	-0.085	-0.138	-0.100	-0.123	-0.051	-0.071	-0.093
	(0.018)	(0.020)	(0.020)	(0.022)	(0.018)	(0.018)	(0.020)	(0.020)	(0.021)	(0.019)
Ed $<$ 12	-0.106	-0.133	-0.037	-0.077	-0.116	-0.131	-0.082	-0.110	-0.149	-0.076
	(0.017)	(0.019)	(0.020)	(0.021)	(0.020)	(0.022)	(0.025)	(0.024)	(0.027)	(0.025)
Ed 13-15	0.049	0.049	0.095	0.085	0.088	0.058	0.034	0.043	0.032	0.069
	(0.017)	(0.019)	(0.019)	(0.019)	(0.016)	(0.016)	(0.018)	(0.018)	(0.019)	(0.017)
Ed $\geq$ 16	0.168	0.138	0.148	0.098	0.158	0.118	0.102	0.084	0.072	0.106
	(0.021)	(0.022)	(0.022)	(0.022)	(0.019)	(0.019)	(0.020)	(0.020)	(0.021)	(0.019)
Age 25-34	-0.014	-0.014	-0.003	0.007	0.033	0.046	0.012	0.052	0.023	-0.002
	(0.018)	(0.021)	(0.022)	(0.024)	(0.021)	(0.023)	(0.025)	(0.025)	(0.028)	(0.024)
Age 35-44	-0.033	-0.006	-0.040	0.008	0.023	0.026	-0.020	0.031	-0.017	-0.040
	(0.021)	(0.023)	(0.025)	(0.026)	(0.023)	(0.024)	(0.026)	(0.025)	(0.028)	(0.024)
Age 45-54	-0.063	-0.041	-0.096	-0.031	-0.014	-0.020	-0.039	0.009	0.002	-0.037
	(0.025)	(0.027)	(0.029)	(0.030)	(0.025)	(0.026)	(0.028)	(0.027)	(0.030)	(0.026)
Age 55-64	-0.260	-0.156	-0.232	-0.145	-0.110	-0.153	-0.222	-0.160	-0.184	-0.157
	(0.028)	(0.032)	(0.034)	(0.034)	(0.031)	(0.031)	(0.035)	(0.033)	(0.035)	(0.031)
Ten 1-3	0.043	0.005	0.069	0.012	0.035	0.053	0.051	0.043	0.054	0.015
	(0.016)	(0.017)	(0.018)	(0.018)	(0.016)	(0.019)	(0.018)	(0.018)	(0.019)	(0.017)
Ten 4-10	0.047	0.023	0.102	0.047	0.047	0.083	0.075	0.047	0.049	0.014
	(0.019)	(0.020)	(0.021)	(0.022)	(0.020)	(0.022)	(0.021)	(0.021)	(0.023)	(0.021)
Ten 11-20	0.022	-0.046	0.077	-0.042	0.040	0.001	0.063	0.057	0.027	0.070
	(0.028)	(0.029)	(0.029)	(0.031)	(0.028)	(0.029)	(0.030)	(0.029)	(0.030)	(0.030)
Ten $>$ 20	-0.082	-0.137	0.075	-0.171	-0.030	0.055	-0.018	-0.049	-0.074	-0.095
	(0.043)	(0.044)	(0.044)	(0.049)	(0.042)	(0.037)	(0.040)	(0.041)	(0.044)	(0.042)
2 Years	0.173	0.218	0.198	0.213	0.193	0.174	0.145	0.174	0.156	0.212
Since	(0.015)	(0.017)	(0.017)	(0.019)	(0.016)	(0.016)	(0.017)	(0.017)	(0.018)	(0.017)
3 Years	0.215	0.249	0.226	0.254	0.292	0.232	0.158	0.188	0.137	0.256
Since	(0.016)	(0.017)	(0.018)	(0.018)	(0.016)	(0.016)	(0.018)	(0.018)	(0.019)	(0.018)
N	5226	4157	3814	3327	4887	4554	3653	3163	2924	4391
$\bar{P}$	0.589	0.639	0.682	0.706	0.604	0.672	0.715	0.767	0.751	0.634
R-Squared	0.131	0.124	0.109	0.123	0.122	0.108	0.083	0.102	0.090	0.092

Note: Based on data from the 1984-2002 DWS. Weighted by CPS sampling weights. The base category consists of white males aged 20-24 with 12 years of education and less than one year of tenure and who lost a job in the calendar year immediately prior to the survey date. The numbers in parentheses are standard errors.

slack labor market periods (10 to 20 percentage points) and smaller differentials in strong labor market periods (5 to 10 percentage points). Nonwhite job losers are substantially more likely not to be employed than whites (43.0 percent vs. 31.0 percent) and more likely than whites to be out of the labor force (15.4 percent vs. 13.5 percent). The regression-adjusted white-nonwhite gap in post-displacement employment rates fell to its lowest level (5.1 percentage points) in 1995-97, and the second and third lowest levels estimated over the sample period were in 1997-99 (7.1 percentage points) and in 1987-89 (8.5 percentage points) respectively. This suggests that there is relatively more cyclicality in the re-employment rate for nonwhites so that nonwhites benefit substantially in this dimension from a strong labor market.

The probability of employment does not show a monotonic relationship with tenure on the lost job. Workers with less than one year and workers with more than 20 years tenure on the lost job are somewhat less likely to be employed at the survey date than are workers with tenure between 1 and 20 years. Since tenure is correlated with age, it is important to note that these patterns are derived from linear probability models that control for age. Based on simple tabulations (not presented here), it is the case that, even within age category, 1) workers with less than one year of tenure are less likely to be employed than are workers with more tenure and 2) workers with more than twenty years of tenure are more likely to be out of the labor force than are workers with less tenure. This pattern suggests that workers who lose low-tenure jobs may have less stable employment histories generally that include more unemployment while workers who lose high-tenure jobs may be more likely to retire conditional on age subsequent to job loss, perhaps because they have qualified for a pension based on their long tenure.

The estimates of the variables measuring time since displacement show the strong result that it takes displaced workers time to find a new job. Workers who lost a job in the calendar year immediately prior to the DWS survey date (the base category) are substantially less likely to be employed at the DWS survey date than are workers displaced two or three calendar years prior to the survey date. The estimates suggest that workers displaced two or three years prior to DWS survey date are 15 to 25 percentage points more likely to be employed at the DWS survey date than are workers displaced in the year immediately prior to the DWS survey date.

5.2 Post-Displacement Full-Time / Part-Time Status

In addition to having lower earnings, it is well known that part-time workers have substantially lower wage rates than do full-time workers. The DWSs collect information on part-time status (less than 35 hours per week) on the lost job, and it is straightforward to compute part-time status on post-displacement jobs from the standard CPS hours information. The

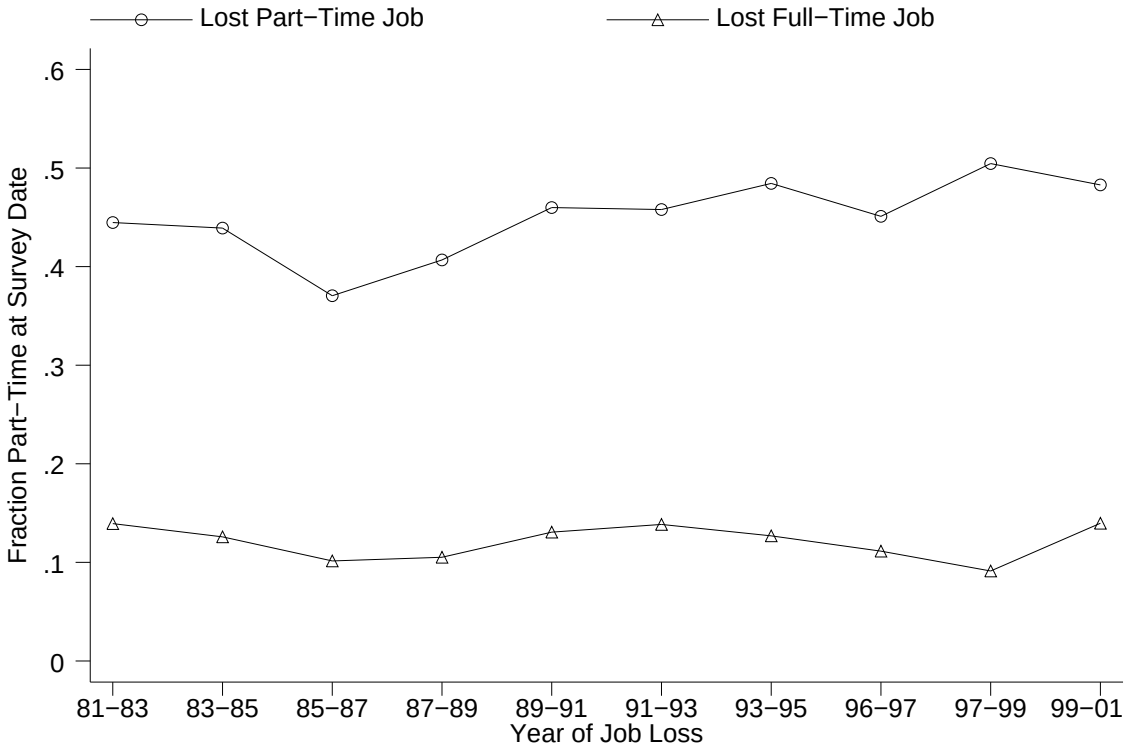

Figure 7: Fraction Part-Time at Survey Date, by Part-time Status on Lost Job and Year

analysis in this section focuses only on individuals employed at the survey date, and all part-time rates are computed based on this group of workers.

Figure 7 contains a plot of the fraction employed part-time at each survey date conditional on part-time status on the lost job.[18] Not surprisingly, workers who lose part-time jobs are substantially more likely to be working on part-time jobs at the survey date. Many of these workers are part-time due to labor supply choices, and it is reasonable to expect that these workers would continue to choose to work part time. It is noteworthy, then, that on the order of 50 percent of part-time job losers are working full-time at the survey date.

In terms of the cost of job loss, a more interesting group to study consists of those workers who lost full-time jobs. About ten percent of these workers are working part-time at the survey date. It appears that there is a cyclical component to the ability of full-time job losers to find full-time employment. The post-displacement part-time rate among full-time job losers is higher in the slack labor markets of the early 1980s and the early 1990s, and this part-time rate reached its lowest level in the late 1990s. A similar pattern is not evident

[18] Note that there is a problem of temporal comparability of the data on part-time employment at the survey date. The new survey instrument, first used in the 1994 CPS, asks a different battery of questions about hours of work on the current job, and this may have the effect of raising the fraction of workers reporting they are currently working part time (Polivka and Miller, 1994). The survey question regarding whether the lost job was part-time is unchanged in the 1994 and later DWSs.

Table 2: Probability of Part-Time Employment at Survey Date, 1981-99

Displaced Workers Employed at Survey Date
Linear Probability Model Estimates
(standard errors)

Variable	1981-83	1983-85	1985-87	1987-89	1989-91	1991-93	1993-95	1995-97	1997-99	1999-01
Constant	0.162	0.153	0.094	0.106	0.201	0.199	0.169	0.106	0.140	0.152
	(0.021)	(0.021)	(0.022)	(0.024)	(0.023)	(0.027)	(0.025)	(0.026)	(0.025)	(0.024)
Part-Time	0.243	0.248	0.237	0.267	0.285	0.285	0.298	0.316	0.372	0.300
Lost Job	(0.022)	(0.023)	(0.022)	(0.024)	(0.023)	(0.021)	(0.022)	(0.022)	(0.023)	(0.023)
Female	0.143	0.136	0.079	0.101	0.062	0.114	0.128	0.109	0.086	0.122
	(0.014)	(0.014)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Nonwhite	0.059	0.007	0.013	-0.019	0.024	-0.013	-0.041	-0.040	-0.017	0.037
	(0.021)	(0.021)	(0.019)	(0.021)	(0.020)	(0.019)	(0.021)	(0.020)	(0.019)	(0.019)
Ed $<$ 12	0.056	0.040	0.014	0.009	0.024	-0.022	0.045	0.008	0.053	0.095
	(0.019)	(0.020)	(0.018)	(0.021)	(0.022)	(0.025)	(0.026)	(0.025)	(0.026)	(0.027)
Ed 13-15	0.017	0.004	-0.036	-0.032	0.036	-0.027	0.000	-0.024	0.034	0.022
	(0.017)	(0.017)	(0.016)	(0.017)	(0.016)	(0.016)	(0.017)	(0.017)	(0.016)	(0.017)
Ed $\geq$ 16	-0.055	-0.007	-0.061	-0.040	-0.021	-0.056	0.001	-0.053	0.014	0.018
	(0.019)	(0.019)	(0.018)	(0.019)	(0.018)	(0.018)	(0.019)	(0.019)	(0.018)	(0.018)
Age 25-34	-0.031	-0.030	0.039	0.046	-0.058	-0.038	-0.056	0.012	-0.099	-0.065
	(0.018)	(0.020)	(0.020)	(0.022)	(0.022)	(0.023)	(0.024)	(0.025)	(0.024)	(0.023)
Age 35-44	-0.030	-0.021	0.057	0.031	-0.051	-0.030	-0.052	-0.002	-0.112	-0.065
	(0.021)	(0.022)	(0.022)	(0.024)	(0.023)	(0.024)	(0.025)	(0.025)	(0.025)	(0.024)
Age 45-54	-0.054	-0.024	0.076	0.026	-0.083	-0.027	-0.035	-0.020	-0.094	-0.060
	(0.026)	(0.027)	(0.026)	(0.028)	(0.026)	(0.027)	(0.027)	(0.027)	(0.026)	(0.025)
Age 55-64	0.046	0.092	0.159	0.086	0.026	0.061	0.005	0.030	-0.007	0.058
	(0.033)	(0.033)	(0.032)	(0.033)	(0.033)	(0.033)	(0.037)	(0.034)	(0.032)	(0.032)
Ten 1-3	-0.043	-0.034	-0.044	-0.053	-0.031	-0.030	-0.028	-0.014	-0.009	-0.008
	(0.016)	(0.017)	(0.016)	(0.017)	(0.016)	(0.019)	(0.017)	(0.018)	(0.017)	(0.016)
Ten 4-10	-0.040	-0.065	-0.065	-0.031	-0.032	-0.034	-0.054	-0.009	0.004	-0.022
	(0.019)	(0.019)	(0.019)	(0.020)	(0.019)	(0.022)	(0.020)	(0.021)	(0.020)	(0.020)
Ten 11-20	-0.050	-0.058	-0.063	-0.040	-0.055	-0.057	-0.034	0.009	0.021	-0.084
	(0.031)	(0.029)	(0.026)	(0.030)	(0.028)	(0.030)	(0.029)	(0.028)	(0.027)	(0.028)
Ten $>$ 20	-0.107	0.012	-0.060	-0.063	0.104	-0.059	-0.046	0.006	0.015	0.005
	(0.055)	(0.051)	(0.041)	(0.054)	(0.047)	(0.038)	(0.042)	(0.043)	(0.041)	(0.045)
2 Years	-0.031	-0.048	-0.026	-0.033	-0.042	-0.038	-0.040	-0.013	-0.022	-0.034
Since	(0.016)	(0.016)	(0.015)	(0.017)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
3 Years	-0.022	-0.051	-0.020	-0.045	-0.066	-0.033	-0.023	-0.004	-0.031	-0.047
Since	(0.016)	(0.017)	(0.016)	(0.016)	(0.016)	(0.016)	(0.017)	(0.018)	(0.017)	(0.017)
N	3111	2647	2595	2326	2886	3061	2614	2408	2196	2828
$\bar{P}$	0.172	0.156	0.127	0.134	0.162	0.174	0.170	0.155	0.133	0.173
R-Squared	0.113	0.115	0.088	0.100	0.097	0.100	0.127	0.126	0.169	0.119

Note: Based on data from the 1984-2002 DWS. Weighted by CPS sampling weights. The base category consists of white males aged 20-24 with 12 years of education and less than one year of tenure and who lost a full-time job in the calendar year immediately prior to the survey date. The numbers in parentheses are standard errors.

among part-time job losers.

Table 2 contains estimates of a linear probability model of the probability of part-time employment among workers employed at the survey date. Since the sample used in this estimation includes losers of both full- and part-time jobs, I include an indicator variable for whether the lost job was part-time. This has the expected strong positive relationship with part-time status on the post-displacement job.

With regard to worker characteristics, the post-displacement part-time rate is substantially higher (about 10 percentage points) among females, even controlling for part-time status on the lost job. The part-time rate generally weakly declines with education, with the college-high school gap ranging from zero to about five percentage points through the mid-1990s. Workers in the oldest age category were significantly (about 5 percentage points) more likely to be working part time through 1993, perhaps reflecting a move toward retirement. However, this difference declined between 1993 and 1999 before increasing in the most recent period.

The part-time rate is highest among losers of low-tenure jobs, and there is no increase in the part-time rate among workers in the highest tenure category once age is controlled for. Unfortunately, the relatively small sample sizes in each year and the resulting relatively large standard errors do not allow me to draw conclusions about changes in the relationship between tenure on the lost job and the likelihood of part-time employment. While the point estimates do change over the sample period, none of the changes are statistically significant at conventional levels.

Time since job loss is an important determinant of part-time employment rates. Workers who lost jobs in the calendar years two and three years prior to the DWS survey date are about 3 to 4 percentage points less likely to be employed part-time than are workers who lost a job in the calendar year immediately prior to the DWS survey date. Thus, it appears that part-time employment is part of a transition process for some workers leading to full-time employment.[19]

5.3 The Loss in Earnings Due to Displacement

The analysis of the loss in earnings of re-employed displaced workers proceeds in two stages. First, I investigate the change in earnings between the lost job and the job held at the DWS survey date. However, had the displaced worker not lost his or her job, earnings likely would have grown over the interval between the date of job loss and the DWS survey date. Thus, second, I investigate the earnings loss suffered by displaced workers including both

[19] I investigate the use of alternative employment arrangements subsequent to job loss in Farber (1999).

the decline in earnings of the displaced workers and the increase in earnings enjoyed by non-displaced workers that is foregone by displaced workers. In order to measure this earnings loss, a control group of non-displaced workers is required, and later in this section, I provide such a control group using data from the CPS outgoing rotation groups.

5.3.1 Difference Estimates of The Change in Earnings as a Result of Job Loss

I begin the analysis of earnings by examining the difference in real weekly earnings between the post-displacement job and the job from which the worker was displaced.[20] I restrict my analysis of weekly earnings changes to workers who make full-time to full-time employment transitions (i.e., lost a full-time job and are re-employed on a full-time job).[21]

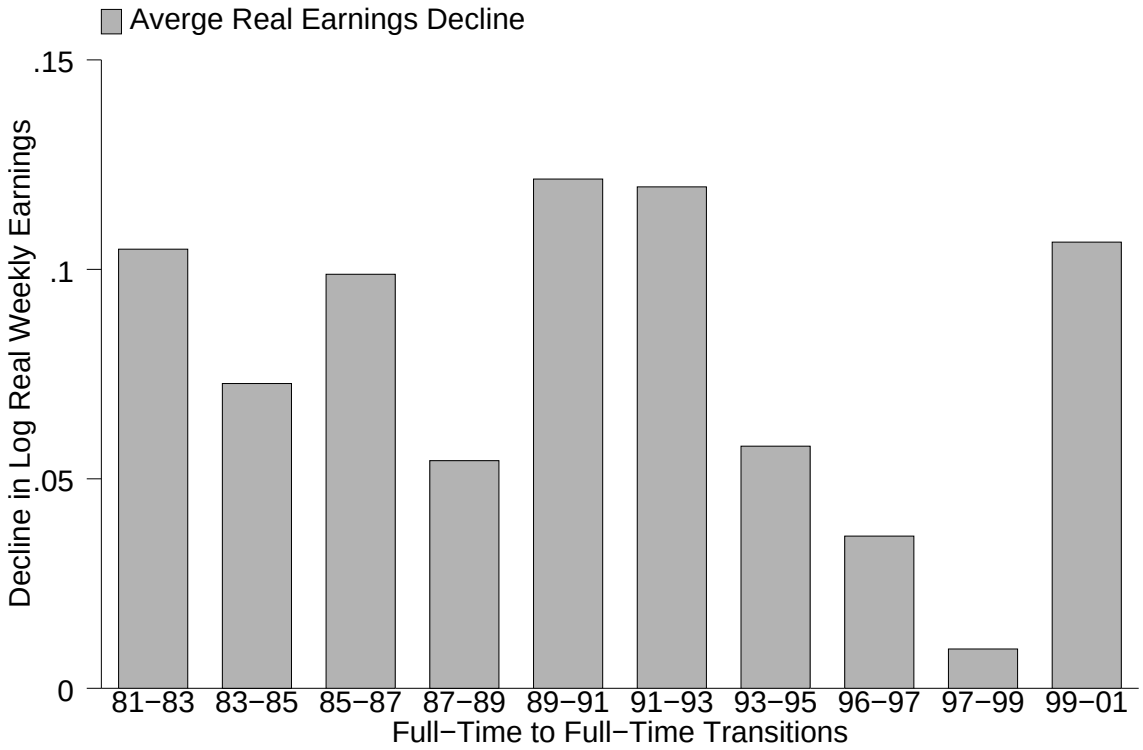

Figure 8: Average Decline in Log Weekly Earnings, by Year.

Figure 8 contains the average decline in log real weekly earnings between the lost job and the survey-date job for workers who make full-time to full-time transitions broken down

[20] Earnings are deflated by the 1982-84=100 consumer price index (CPI). The CPI in the reported year of displacement is used to deflate earnings on the old job. The CPI for the DWS survey month is used to deflate current earnings.

[21] The change in real weekly earnings for workers who make a full-time to full-time transition is a straightforward measure, but it only gets at part of the effect of displacement on earnings. It does not account for the effect of job loss on unemployment spells, employment probabilities, probabilities of part-time work. Nor does it account for earnings growth that may have occurred absent the job loss.

by survey year. It is clear that there is a strong cyclical component to the earnings change. The average earnings decline was quite large in 1981-83 (10.5 percent) and eventually fell to 5.4 percent in 1987-89 before rising to 12.2 percent in 1989-91. During the 1990s the decline in average real earnings decreased, falling to a statistically insignificant 0.9 percent in the 1997-99 period. The decline increased to 10.6 percent in the most recent period.

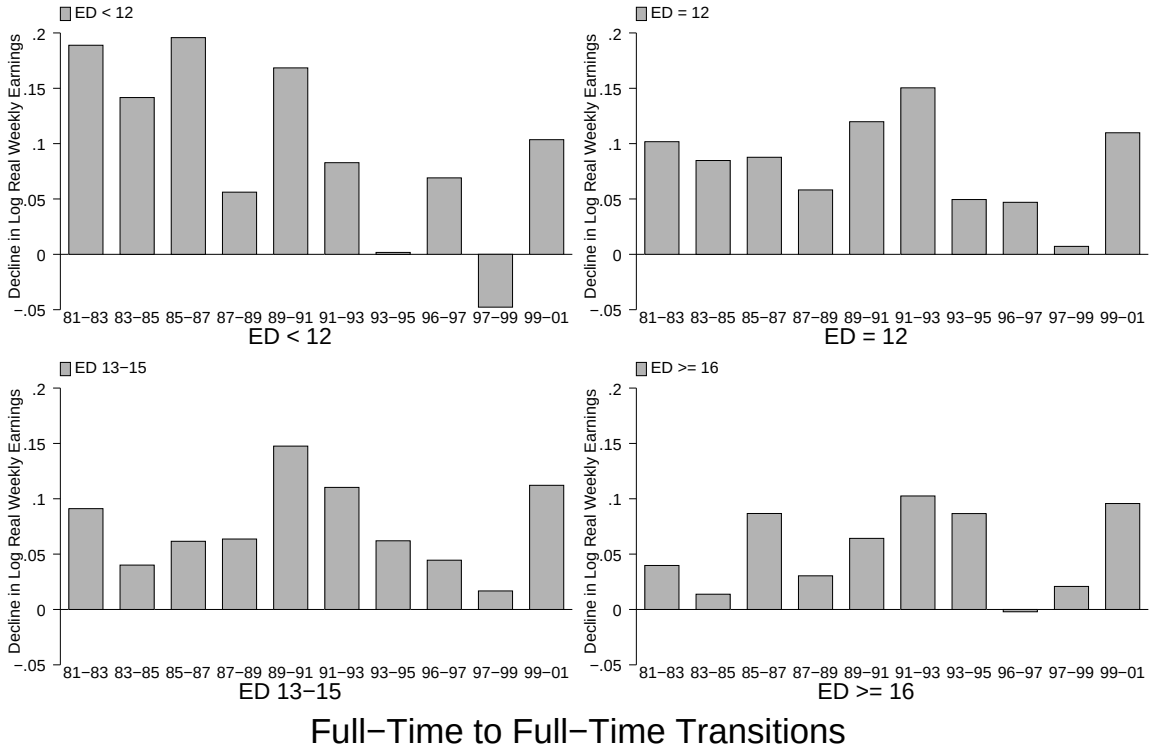

Figure 9: Average Decline in Log Weekly Earnings, by Year and Education

Figure 9 contains the average decline in log real weekly earnings between the lost job and the survey-date job for workers who make full-time to full-time transitions broken down additionally by education. During the first part of the sample period (1981-1991), there were statistically significant differences in earnings changes across educational categories, with workers with more education suffering smaller earnings declines, on average, than workers with less education. However, since 1991 the differences in earnings changes across educational groups have not been statistically significant. There was a general decline in the earnings loss across educational categories during the 1990s that reversed in the most recent period.

Table 3 contains estimates of regressions by year of the difference in log real weekly earnings between the job held at the survey date and the pre-displacement job for workers who make full-time to full-time transitions. Race and sex differences are not significant, and there does not seem to be any relationship between time since displacement and the change

Table 3: Change in Log Real Weekly Earnings
(Post-Displacement - Pre-Displacement)
OLS Regression Estimates

Full-Time to Full-Time Transitions

Variable	1981-83	1983-85	1985-87	1987-89	1989-91	1991-93	1993-95	1995-97	1997-99	1999-01
Constant	-0.004	0.064	0.062	0.041	-0.054	0.035	0.053	0.028	0.065	0.075
	(0.032)	(0.033)	(0.037)	(0.042)	(0.037)	(0.050)	(0.042)	(0.062)	(0.058)	(0.051)
Female	0.022	-0.005	-0.040	-0.019	0.037	0.030	0.015	0.052	-0.019	0.011
	(0.021)	(0.023)	(0.023)	(0.026)	(0.021)	(0.025)	(0.024)	(0.033)	(0.031)	(0.029)
Nonwhite	0.011	0.038	-0.009	-0.035	0.040	-0.028	-0.030	0.011	-0.067	0.017
	(0.033)	(0.032)	(0.032)	(0.038)	(0.032)	(0.035)	(0.034)	(0.046)	(0.043)	(0.041)
Ed $<$ 12	-0.078	-0.033	-0.093	0.006	-0.055	0.084	0.028	-0.041	0.038	0.000
	(0.027)	(0.030)	(0.031)	(0.037)	(0.034)	(0.043)	(0.042)	(0.056)	(0.060)	(0.058)
Ed 13-15	0.011	0.039	0.027	-0.012	-0.037	0.029	-0.006	-0.011	-0.013	-0.003
	(0.026)	(0.027)	(0.027)	(0.031)	(0.025)	(0.028)	(0.028)	(0.040)	(0.037)	(0.035)
Ed $\geq$ 16	0.061	0.088	0.014	0.026	0.051	0.067	-0.022	0.052	-0.018	0.019
	(0.028)	(0.030)	(0.031)	(0.035)	(0.028)	(0.032)	(0.030)	(0.042)	(0.040)	(0.038)
Age 25-34	-0.026	-0.139	-0.087	-0.025	-0.027	-0.019	0.008	0.016	0.002	-0.095
	(0.027)	(0.032)	(0.034)	(0.040)	(0.035)	(0.043)	(0.043)	(0.060)	(0.058)	(0.051)
Age 35-44	-0.042	-0.159	-0.125	-0.025	-0.087	-0.128	-0.080	-0.051	0.018	0.081
	(0.032)	(0.035)	(0.038)	(0.042)	(0.037)	(0.044)	(0.045)	(0.061)	(0.059)	(0.053)
Age 45-54	-0.035	-0.181	-0.142	-0.073	-0.104	-0.139	-0.095	-0.044	-0.046	-0.101
	(0.038)	(0.042)	(0.044)	(0.050)	(0.042)	(0.049)	(0.048)	(0.065)	(0.063)	(0.056)
Age 55-64	-0.072	-0.239	-0.241	0.004	-0.071	-0.222	-0.150	-0.123	0.021	0.035
	(0.051)	(0.055)	(0.058)	(0.065)	(0.056)	(0.060)	(0.063)	(0.083)	(0.077)	(0.072)
Ten 1-3	-0.057	-0.022	-0.028	-0.074	0.002	-0.079	-0.019	-0.007	-0.058	0.012
	(0.024)	(0.026)	(0.027)	(0.030)	(0.026)	(0.036)	(0.029)	(0.041)	(0.038)	(0.035)
Ten 4-10	-0.141	-0.055	-0.090	-0.121	-0.078	-0.163	-0.071	-0.067	-0.116	-0.060
	(0.028)	(0.029)	(0.032)	(0.035)	(0.030)	(0.040)	(0.033)	(0.047)	(0.045)	(0.043)
Ten 11-20	-0.167	-0.179	-0.159	-0.141	-0.153	-0.250	-0.222	-0.259	-0.141	-0.190
	(0.043)	(0.044)	(0.044)	(0.054)	(0.043)	(0.053)	(0.047)	(0.061)	(0.059)	(0.056)
Ten $>$ 20	-0.232	-0.113	-0.203	-0.328	-0.205	-0.336	-0.286	-0.138	-0.249	-0.384
	(0.076)	(0.082)	(0.068)	(0.088)	(0.079)	(0.065)	(0.065)	(0.094)	(0.094)	(0.091)
2 Years	-0.002	0.018	-0.005	0.012	-0.006	0.022	0.001	-0.020	0.029	0.124
Since	(0.023)	(0.025)	(0.026)	(0.031)	(0.025)	(0.028)	(0.027)	(0.037)	(0.035)	(0.034)
3 Years	-0.017	0.027	0.046	0.027	0.036	-0.002	-0.024	-0.010	0.035	0.132
Since	(0.025)	(0.026)	(0.027)	(0.029)	(0.025)	(0.028)	(0.028)	(0.041)	(0.038)	(0.035)
N	1970	1740	1795	1542	1880	2032	1663	1558	1492	1804
R-Squared	0.038	0.049	0.054	0.022	0.038	0.057	0.052	0.027	0.015	0.032

Note: Standard Errors are in parentheses. Based on data from the 1984-2002 DWS. Weighted by CPS sampling weights. The change in log real weekly earnings age is computed as the difference between post-displacement log real weekly earnings and pre-displacement log real weekly earnings. Earnings are deflated by the 1982-84=100 CPI. The base category consists of white males aged 20-24 with 12 years of education and less than one year of tenure and who lost a full-time job in the calendar year immediately prior to the survey date.

in earnings.

There is a very strong relationship between the change in earnings and tenure on the lost job. The average earnings loss is dramatically larger when the work had accumulated substantial tenure on the lost job. Workers who lose jobs with more than ten years of tenure appear to lose between 15 and 30 percentage points more in earnings than do workers who lose jobs with less than one year of tenure. This is consistent with the destruction of job specific human capital when a long-term job ends.[22] The estimates with respect to age, which show a weak relationship with the earnings change, taken together with the estimates with respect to tenure, generally confirm the standard finding that older job losers, who are more likely to have lost a high-tenure job, suffer larger wage declines than do younger workers.[23]

The estimates in table 3 suggest that the relationship between education and the earnings change associated with job loss is cyclical. In the slack labor market periods, workers with at least 16 years of education have a larger (more positive) earnings change than do workers with 12 years of education. This relationship does not exist in the tight labor market periods.

Finally, note that the wage change is not significantly related to time since job loss in any period other than 1999-2001. Workers who lost jobs in 1999 and 2000 have substantially larger (more positive) wage changes than do those who lost a job in 2001. This is likely the result of the fact that the very strong labor market of the 1990s did not weaken until 2001.

5.3.2 Difference-in-Difference Estimates of the Effect of Job Loss on Earnings

An important weakness of the difference analysis of the effect of job loss on earnings is that it does not take into account the extent to which earnings might have grown had the workers not been displaced. But the appropriate counter-factual is not clear because it depends on the interpretation given to the cause of displacement, even abstracting from poor work performance on an individual basis. It is almost a tautology to say that the job loss occurred because of a shock to the value of output produced that caused the value of output to fall below the wage (interpreted to include all variable labor costs associated with the worker). I consider two extreme interpretations that lead to different counter-factuals.

In the first interpretation, the counter-factual is that the shock occurred, but the response to the shock was such that the firm lowered wages and did not displace the worker. In this case, the worker might have quit to find a better-paying job or the worker might have stayed with the firm at the reduced wage. With either response, the worker's wage would

[22] Kletzer (1989), Neal (1995), and Parent (1995) address the issue of job loss and specific capital, both at the firm and industry level.

[23] See, for example, Podgursky and Swaim (1987), Kletzer (1989), Topel (1990), and de la Rica (1992).

have evolved "naturally" subsequent to the initial adjustment. With this interpretation, the shock itself is not counted as part of the effect of job loss on the wage. An appropriate estimate of the effect of job loss is the difference between the wage at the survey date and the wage the firm would have been willing to pay the worker rather than terminate him orher (the firm's reservation wage). There are at least two problems with this interpretation. First, an operational problem is that the firm's reservation wage is not observable, and there is no obvious control group from which to calculate the reservation wage.[24] Second, it may be that the direct negative effect of the shock itself ought be part of the cost of job loss. Otherwise, in many cases job loss would appear to have a positive effect on the wage. For example, consider a worker with particular skills useful in a variety of industries but whose current industry of employment is hit with a substantial negative demand shock. This worker is likely to find comparable employment in other industries, but the current employer's reservation wage is considerably lower than either the pre-displacement wage or the wage on the new job. It appears that the "effect" of job loss on this worker is positive.

In the second interpretation, the counter-factual is that the shock never occurred so that the worker would have had the option of remaining with the firm at the old wage which would then have evolved "naturally" between the date of pseudo-displacement and the survey date. In this case, it is easier to conceive of a (somewhat imperfect) control group of workers whose employers did not suffer job-ending shocks. This control group consists of workers who were not displaced, and I proceed using this group.

Define the difference in log real earnings for displaced workers, analyzed earlier in this section, as

$$\Delta_d = (lnW_{dt} - lnW_{d0}), \tag{1}$$

and define the difference in log real earnings for workers in the control group as

$$\Delta_c = (lnW_{ct} - lnW_{c0}), \tag{2}$$

where d refers to displaced workers (the "treatment" group), c refers to non-displaced workers (the "control" group), t refers to "current" (post-displacement) period, and 0 refers to the "initial" (pre-displacement) period.

A difference-in-difference estimate of the loss in real weekly earnings due to job loss in is computed as

$$\Delta\Delta = \Delta_d - \Delta_c. \tag{3}$$

The second difference (Δ_c) is the estimate, based on the control group, of the amount earnings would have grown over the period had the worker not been displaced.

[24] Such a control group would include workers who sustained a similar negative shock to the value of their output but whose employers reduced wages rather than terminate them.

This estimate of the difference-in-difference estimate of the effect of job loss on earnings needs to be interpreted appropriately. First, to the extent that the displaced workers find jobs in sectors that were not adversely affected by the shock that caused the job loss, this estimate counts the effect of the initial shock as part of the wage effect of job loss. Second, it might be that some of the non-displaced workers in the control group also worked for firms that suffered negative shocks but whose employers chose to reduce wages rather than to displace workers. In this case, the wage trajectory of the control group is also affected by shocks to the economy. This will tend to offset to some extent the negative shock to the earnings of displaced workers, and reduce the estimate of the earnings growth of the control group.[25]

I generate a control group using a random sample from the merged outgoing rotation group (MOGRG) files of the CPS for the three calendar years prior to each DWS together with all workers from the outgoing rotation groups of the CPSs containing the DWSs. The data from MOGRG files of the CPS provides the period 0 earnings, and the data from the outgoing rotation rotation groups in the CPSs containing the DWSs provide the period t earnings.

Ideally, the control group would contain only workers who had not lost a job during the relevant period. While I can identify the displaced workers in period t (since the data come from the CPSs with DWSs), I cannot identify the workers who will be displaced in the MOGRG samples. To the extent that earnings growth for displaced workers is different from that for the non-displaced workers, earnings growth computed from the control group as defined here would lead to biased estimates of earnings growth for a group of non-displaced workers. However, the estimates based on the outgoing rotation groups can be adjusted to provide unbiased estimates of the earnings change for a control group of non-displaced workers. the effect of job loss on earnings.

The observed wage change of workers in the outgoing rotation groups (which include both displaced and non-displaced workers) is a probability-of-job-loss weighted average of the change in earnings for displaced and non-displaced workers. Define the change in earnings for the outgoing rotation groups as

$$\Delta_g = (1-\theta)\Delta_c + \theta\Delta_d, \tag{4}$$

where Δ_g is the earnings change in the outgoing rotation group sample ($lnW_{gt} - lnW_{g0}$) and θ is the fraction of workers in the outgoing rotation group sample who lost a job (the displacement rate).

[25] While including the effect of the initial shock in the earnings change of either group is not necessarily wrong or inappropriate, it needs to be clearly understood.

The observable quantities are Δ_g and Δ_d, but calculation of the difference-in-difference estimate of the earnings change due to job loss requires both Δ_d and Δ_c (equations 1 and 2).[26] I can compute Δ_c with the available data on Δ_g, Δ_d, and θ. Using equation 4, the change in earnings for the control group is

$$\Delta_c = \frac{\Delta_g - \theta\Delta_d}{(1-\theta)}, \tag{5}$$

and the difference-in-difference estimate of the effect of job loss on earnings is

$$\Delta\Delta = \frac{\Delta_d - \Delta_g}{(1-\theta)}. \tag{6}$$

Intuitively, the samples from the outgoing rotation groups are "contaminated" with displaced workers so that the difference-in-difference estimate computed using this contaminated control group need to be scaled up by the factor $\frac{1}{(1-\theta)}$ to compensate. I proceed in computing the difference-in-difference estimate using this relationship.

In order to get initial earnings for the "contaminated" control group (lnW_{g0}), I take a random sample from the merged outgoing rotation group CPS file (MOGRG) each year from 1981-99. The size of the random sample was set so that 1) the size of the sample with initial earnings on the control group was expected to be the same size as that with current earnings on the control group (two rotation groups) and 2) the distribution of years since the associated DWS survey date roughly mimicked the distribution of years since displacement in the sample of displaced workers. While this distribution varied over time, the share of job loss reported was largest in the year immediately prior to the survey.[27] In other words, a separate control sample was drawn for each DWS from the three MOGRGs for the years immediately prior to the DWS that reflected the distribution of time since job loss. Each MOGRG file has 24 rotation groups (2 per month for 12 months). Denote the share of reported job loss one, two, and three years prior to the survey date t as p_{1t}, p_{2t}, and p_{3t} respectively. In order to get the appropriate sample size in survey year t, I took a random sample with probability $(p_{1t})(2)/24$. Similarly, for the second and third years prior to to the DWS I took random samples with probability $(p_{2t})(2)/24$ and $(p_{3t})(2)/24$, respectively. The resulting sample of earnings for full-time workers contains 105,268 observations.

The CPSs containing the DWSs have two outgoing rotation groups (OGRGs) with earnings data for all workers. These provide the observations on current earnings for the "contam-

[26] Note that I do not use the information on who is displaced that is available in the DWS outgoing rotation groups. My estimate of Δ_g includes both displaced and non-displaced workers at both time 0 and time t.

[27] Averaged over all survey years, the distribution of years since job loss is 37.2 percent from the year prior to the DWS, 33.1 percent from two years prior to the DWS, and 29.7 percent from 3 years prior to the DWS.

inated" control group of non-displaced workers (lnW_{gt}). This sample contains observations on full-time earnings for 104,224 workers at the DWS survey date.

The source of data for the treatment group earnings is clear. These data come from the DWSs, where lnW_{dt} is survey-date earnings for displaced workers and lnW_{d0} is earnings on the lost job. Since there is heavy selection regarding which workers are employed full-time and since I cannot tell which of the control group observations pertain to workers who are full time both in the initial year and in the DWS year, the samples of displaced workers includes those for whom full-time earnings are reported before displacement (n=31,502) and at the DWS survey date (n=21,613).

The difference-in-difference estimates are derived from separate ordinary least squares (OLS) regressions for each DWS survey year of log real earnings (deflated by the CPI) on a set of worker characteristics and an indicator for time period (before or after displacement), an indicator for whether the observation is part of the "contaminated" control sample or part of the displacement sample, and the interaction of the time period and sample indicators.[28] This regression is

$$lnW_{is} = X_{is}\beta + \gamma_1 T_s + \gamma_2 D_i + \gamma_3 T_s D_i + \epsilon_{is}, \tag{7}$$

where lnW_{is} measures log real full-time earnings for individual i in period s (either 0 or t), X is a vector of individual characteristics, β is a vector of coefficients, T_s is a dummy variable indicating the post-displacement period, D_i is a dummy variable indicating the displacement sample, and ϵ is an error term.[29] The parameters γ_j are used along with information from the DWS on job loss rates (θ) to compute estimates of the earnings effects as follows:

$$\Delta_g = \gamma_1, \tag{8}$$

$$\Delta_d = \gamma_1 + \gamma_3, \tag{9}$$

$$\Delta_c = \gamma_1 - \frac{\theta\gamma_3}{(1-\theta)}, \quad \text{and} \tag{10}$$

$$\Delta\Delta = \frac{\gamma_3}{(1-\theta)}. \tag{11}$$

Figure 10 contains the overall regression-adjusted difference-in-difference estimates of the earnings loss from job loss for full-time workers for each year. In order for the figure to be clearly readable, the earnings loss for displaced workers in presented as a positive number (the

[28] Note that I do not calculate first-differenced estimates for the displaced workers (as in table 3) despite the fact that the observations are paired. This is because observations for the control group are from a set of cross-sections and are not paired. I do not account for the correlation over time in the two observations for each displaced worker.

[29] The X vector includes a constant, dummy variables for sex, race, nine age categories, and four educational categories. Unfortunately, there is no information in the outgoing rotation groups on job tenure. Thus, I cannot control for tenure in this analysis.

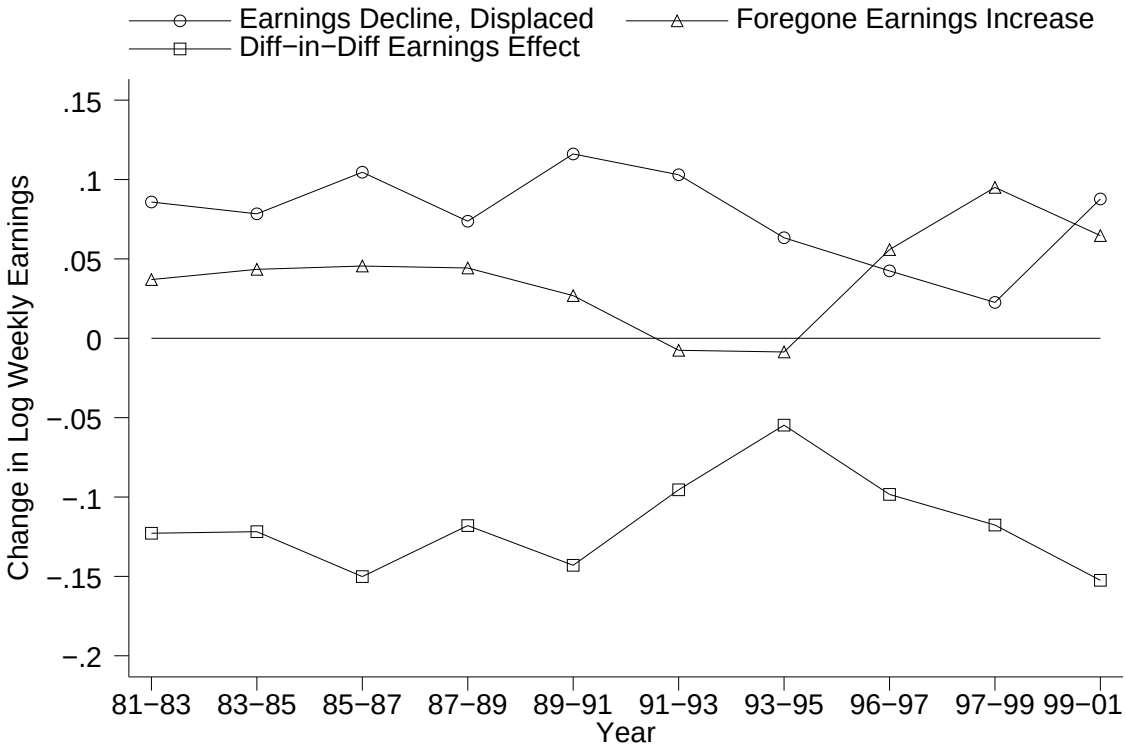

Figure 10: Difference-in-Difference Analysis of Earnings Loss, by Year.

negative of the earnings change for displaced workers: $-\Delta_d$). The foregone earnings increase is Δ_c, and the Diff-in-Diff earnings effect is $\Delta\Delta$. Note that these estimates incorporate the effect of normal growth along the age-earnings profile. This is because the age variables in the regression are measured at the DWS survey date (period t) for both the period 0 and period t observations.[30] The results show that in the 1980s displaced workers earned about 9 percent less on average after displacement than before while earnings for the control group rose by about 4 percent over the same period. The difference-in-difference estimate of the earnings loss is the difference between these number, which is a loss of 13 percent during the 1980s.[31] The 1990s show a more striking pattern. The earnings decline of displaced workers in the 1990s dropped sharply during the decade, from 11.6 percent in the 1989-91 period to a statistically insignificant 2.3 percent in 1997-99 before increasing to 8.8 percent in 1999-2001. During the same period, the earnings growth of the control group increased from 2.7 percent in 1989-91 to 9.5 percent in 1997-99 before declining to 6.5 percent in the

[30] This is one reason why it was important that the sample fractions in the initial-earnings control group mimic the fractions in the treatment group with respect to the time until the DWS survey date.

[31] Since in the figure I present the earnings loss rather than the earnings change for displaced workers, the difference-in-difference estimate is the negative of the sum of the earnings decline for displaced workers and the foregone earnings increase.

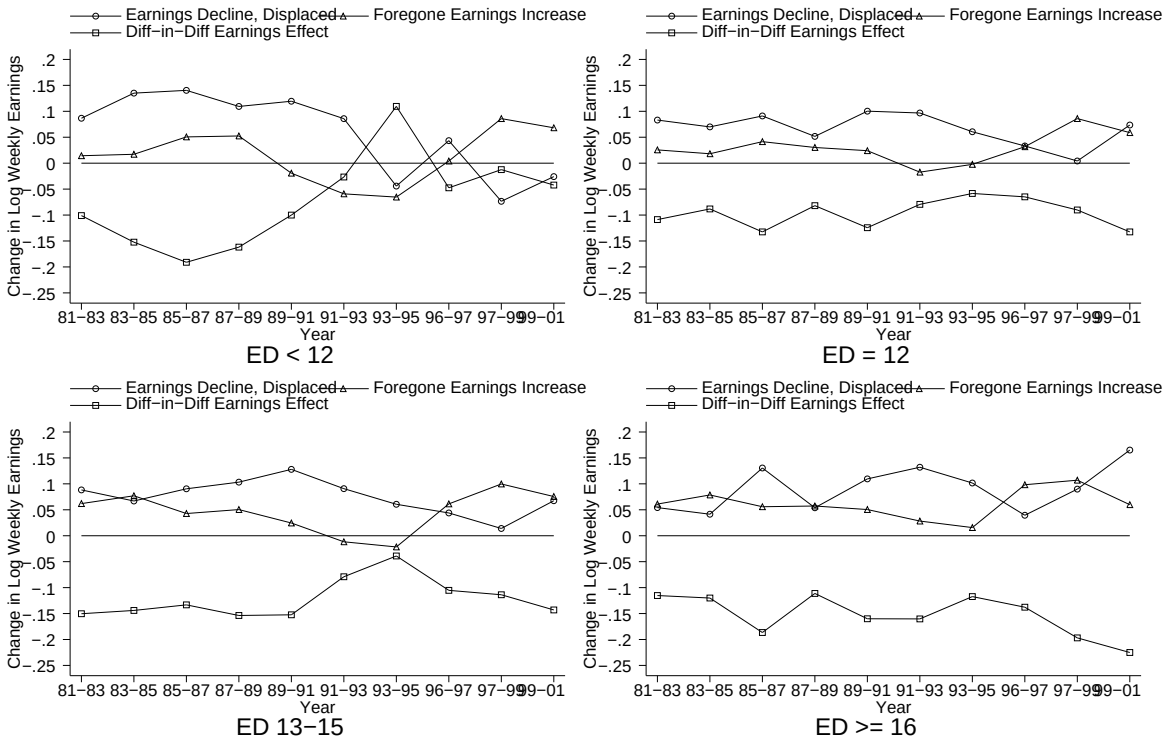

Figure 11: Difference-in-Difference Analysis of Earnings Loss, by Year and Education.

1999-2001 period. This increase in control group earnings reflects the general increase in real wages since 1995. What this means is that the difference-in-difference estimate of the earnings loss associated with job loss has increased substantially over this period, from a low of 5.5 percent in 1993-95 to a high of 15.2 percent in 1999-2001.

Figure 11 contains contains difference-in-difference estimates of the earnings loss by education category.[32] Examining the year-by-year estimates by education level, there are some interesting changes over time. For job losers in all education levels, the earnings decline associated with displacement fell in the 1990s before increasing in the most recent period. Offsetting this for workers in all but the lowest educational category, the rate of increase of earnings of control group workers increased through the 1990s before declining in 1999-2001. On net, for all but the lowest educational category, the difference-in-difference effect of job loss increased during the 1990s through 2001. The increase is particularly striking for workers with at least 16 years of education. The cost of job loss for these workers increased from 11.7 percent in 1993-95 to 22.5 percent in 1999-2001.

It is worth noting that foregone earnings growth (the earnings change of the control group) became a more important component of the overall earnings effect of job loss in the late 1990s. This was particularly true for workers with at least sixteen years of education

[32] These estimates are based on separate regressions by educational category for each year.

since 1995, but it is a factor in all education groups in the 1995-99 period. Job losers with at least sixteen years of education in the 1997-1999 period suffered a dramatic real earnings decline on average while the earnings of the college-educated control group saw a sharp rise in real earnings. The result is that, despite the very strong labor market, college-educated job losers suffered an overall loss of earnings of about 20 percent, equally split between an earnings decline and a foregone earnings increase. This pattern reversed in the 1999-2001 period, with foregone earnings growth becoming less important relative to the earnings decline among those displaced.

Note also that there is virtually no real earnings growth during the 1980's among control-group workers in the lowest educational category, reflecting the well-known deterioration of the low-skilled labor market.

The general pattern of both substantial earnings declines and substantial foregone earnings increases in a strong labor market raises questions about the validity of a causal interpretation of the difference-in-difference estimates. The resurgence in real earnings growth generally in the late 1990s, reflected in the earnings changes of the control group, at least partially reflects a resurgence in productivity growth. If it were the case that workers lost jobs because of adverse firm or industry shocks, these workers should share in the same general increase in productivity and wages on their new jobs. The fact that they do not suggests that job losers may differ, on average, from other workers in unmeasured characteristics that make them unable to share in the general productivity and wage growth. The implication of this is that these workers may not have enjoyed earnings growth comparable to non-losers even if they had not lost jobs. Nevertheless, it is clear that job losers fall substantially behind non-losers in earnings.

6 Concluding Remarks

While job loss rates have a strong cyclical component, they rates did not decline as early or as much as might have been expected in the 1990s given the sustained expansion. The recession that took hold in 2001 is reflected in sharply higher job loss rates in the 1999-2001 period. While the least educated workers continue to have the highest rates of job loss, there appears to have been a secular increase in the job loss rates of college educated workers from the early 1990s forward.

The costs of job loss are substantial in all periods. Employment probabilities are reduced substantially. There is an increased probability of working part-time, yielding lower earnings both through shorter hours and lower wage rates. These costs are larger for those workers with less education. And even those re-employed full-time suffer substantial earnings losses on average, regardless of education level. On the other hand, there is fairly strong evi-

dence that some of the costs of displacement are temporary. The probability-of-employment penalty and the part-time-employment penalty for displacement both decline with time since displacement. However, there is little evidence that the full-time earnings penalty for displacement narrows with time since displacement. And the cost due to foregone earnings growth are not likely to be recouped. An additional cost of job loss that is not accounted for in this framework is earnings loss during the period of non-employment before a new job is located.

It is clear that the costs of job loss are generally counter-cyclical, with larger costs of job loss in slack labor markets and relatively smaller costs in tight labor markets. Post-displacement employment probabilities and the probability of full-time employment among re-employed workers are both lower in slack labor markets. An exception to this pattern is that the difference-in-difference estimate of the effect of job loss on earnings increased steadily during the 1993-2001 period due entirely to an increase in the earnings increase foregone. The weak labor market in 2001 had particularly strong adverse effects on job losers. The earnings loss suffered by full-time job losers who found another full-time job increased significantly in 1999-2001, particularly among the highly-educated.

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APPENDIX

Appendix Table 1:
Three-Year Rate of Job Loss and Unemployment Rate, 1981-99
(Numbers for Figure 1)
All Individuals

Year	Job-Loss Rate	Unemployment Rate
1981-83	12.8	9.0
1983-85	10.3	8.1
1985-87	9.5	6.8
1987-89	8.5	5.7
1989-91	11.8	5.9
1991-93	10.9	7.1
1993-95	11.5	6.2
1995-97	9.1	5.3
1997-99	8.6	4.6
1999-01	11.1	4.3

Appendix Table 2a
Three-Year Rate of Job Loss by Reason, 1981-99
Undiscounted Other Job Loss
(Numbers for Figure 2a)
All Individuals

Year	Total	Pl Close	Slack Wk	Pos Abol	Other
1981-83	0.132	0.045	0.054	0.014	0.019
1983-85	0.107	0.042	0.036	0.012	0.017
1985-87	0.101	0.041	0.029	0.012	0.020
1987-89	0.090	0.036	0.024	0.011	0.019
1989-91	0.124	0.044	0.042	0.015	0.022
1991-93	0.128	0.036	0.037	0.022	0.032
1993-95	0.150	0.032	0.038	0.024	0.056
1996-97	0.120	0.030	0.025	0.020	0.046
1997-99	0.119	0.029	0.023	0.017	0.051
1999-01	0.141	0.034	0.038	0.022	0.047

Appendix Table 2b
Three-Year Rate of Job Loss by Reason, 1981-99
Discounted Other Job Loss
(Numbers for Figure 2b)
All Individuals

Year	Total	Pl Close	Slack Wk	Pos Abol	Other
1981-83	0.128	0.045	0.054	0.014	0.015
1983-85	0.103	0.042	0.036	0.012	0.012
1985-87	0.095	0.041	0.029	0.012	0.014
1987-89	0.085	0.036	0.024	0.011	0.013
1989-91	0.118	0.044	0.042	0.015	0.016
1991-93	0.109	0.036	0.037	0.022	0.014
1993-95	0.115	0.032	0.038	0.024	0.021
1996-97	0.091	0.030	0.025	0.020	0.017
1997-99	0.086	0.029	0.023	0.017	0.018
1999-01	0.111	0.034	0.038	0.022	0.017

Appendix Table 3:
Three-Year Rate of Job Loss by Reason, 1981-99
(Numbers for Figure 3, by Education)

Education < 12 years

Year	Total	Pl Close	Slack Wk	Pos Abol	Other
1981-83	0.186	0.067	0.083	0.012	0.024
1983-85	0.149	0.065	0.056	0.011	0.017
1985-87	0.134	0.061	0.043	0.010	0.020
1987-89	0.121	0.056	0.039	0.006	0.020
1989-91	0.175	0.067	0.076	0.009	0.024
1991-93	0.143	0.056	0.057	0.009	0.020
1993-95	0.154	0.045	0.063	0.012	0.033
1996-97	0.131	0.041	0.052	0.012	0.026
1997-99	0.122	0.038	0.040	0.010	0.034
1999-01	0.156	0.045	0.064	0.013	0.034

Education = 12 years

Year	Total	Pl Close	Slack Wk	Pos Abol	Other
1981-83	0.143	0.051	0.064	0.013	0.015
1983-85	0.115	0.047	0.042	0.012	0.014
1985-87	0.104	0.045	0.033	0.011	0.014
1987-89	0.094	0.042	0.028	0.010	0.014
1989-91	0.129	0.051	0.049	0.012	0.017
1991-93	0.118	0.040	0.044	0.018	0.015
1993-95	0.122	0.035	0.046	0.020	0.021
1996-97	0.096	0.034	0.028	0.016	0.018
1997-99	0.090	0.032	0.027	0.013	0.017
1999-01	0.117	0.037	0.045	0.017	0.018

Education 13-15 years

Year	Total	Pl Close	Slack Wk	Pos Abol	Other
1981-83	0.118	0.041	0.049	0.014	0.014
1983-85	0.096	0.037	0.033	0.014	0.012
1985-87	0.095	0.040	0.027	0.013	0.014
1987-89	0.083	0.035	0.022	0.013	0.013
1989-91	0.113	0.044	0.038	0.016	0.016
1991-93	0.115	0.036	0.038	0.026	0.014
1993-95	0.123	0.037	0.039	0.024	0.023
1996-97	0.096	0.032	0.024	0.022	0.018
1997-99	0.091	0.030	0.024	0.018	0.019
1999-01	0.115	0.038	0.038	0.023	0.016

Education $\geq$16

Year	Total	Pl Close	Slack Wk	Pos Abol	Other
1981-83	0.069	0.023	0.022	0.015	0.009
1983-85	0.059	0.023	0.016	0.013	0.007
1985-87	0.059	0.023	0.014	0.012	0.011
1987-89	0.054	0.020	0.012	0.013	0.009
1989-91	0.082	0.025	0.024	0.022	0.011
1991-93	0.079	0.021	0.022	0.027	0.010
1993-95	0.084	0.020	0.018	0.032	0.015
1996-97	0.069	0.019	0.014	0.025	0.011
1997-99	0.067	0.020	0.011	0.022	0.014
1999-01	0.088	0.025	0.022	0.029	0.012

Appendix Table 4:
Three-Year Rate of Job Loss by Reason, 1981-99
(Numbers for Figure 4, by Age)

Age 20-29

Year	Total	Pl Close	Slack Wk	Pos Abol	Other
1981-83	0.159	0.051	0.073	0.015	0.020
1983-85	0.118	0.044	0.046	0.012	0.016
1985-87	0.104	0.040	0.037	0.011	0.016
1987-89	0.094	0.039	0.030	0.009	0.016
1989-91	0.137	0.048	0.056	0.014	0.020
1991-93	0.119	0.037	0.045	0.018	0.019
1993-95	0.140	0.035	0.054	0.019	0.031
1996-97	0.104	0.033	0.033	0.015	0.022
1997-99	0.097	0.028	0.030	0.013	0.026
1999-01	0.136	0.037	0.054	0.020	0.025

Age 30-39

Year	Total	Pl Close	Slack Wk	Pos Abol	Other
1981-83	0.128	0.042	0.058	0.014	0.014
1983-85	0.107	0.043	0.039	0.014	0.012
1985-87	0.099	0.042	0.031	0.011	0.015
1987-89	0.091	0.038	0.026	0.013	0.015
1989-91	0.117	0.046	0.043	0.013	0.015
1991-93	0.110	0.034	0.041	0.022	0.013
1993-95	0.114	0.032	0.039	0.025	0.018
1996-97	0.092	0.029	0.025	0.020	0.017
1997-99	0.085	0.028	0.024	0.017	0.017
1999-01	0.117	0.035	0.042	0.023	0.017

Age 40-49

Year	Total	Pl Close	Slack Wk	Pos Abol	Other
1981-83	0.099	0.042	0.035	0.011	0.010
1983-85	0.085	0.037	0.027	0.012	0.010
1985-87	0.087	0.040	0.022	0.012	0.013
1987-89	0.075	0.033	0.018	0.012	0.012
1989-91	0.106	0.039	0.034	0.019	0.014
1991-93	0.100	0.033	0.030	0.025	0.012
1993-95	0.105	0.032	0.031	0.026	0.015
1996-97	0.084	0.027	0.022	0.021	0.014
1997-99	0.083	0.029	0.020	0.018	0.016
1999-01	0.097	0.033	0.029	0.021	0.013

Age 50-64

Year	Total	Pl Close	Slack Wk	Pos Abol	Other
1981-83	0.100	0.042	0.034	0.013	0.011
1983-85	0.086	0.041	0.023	0.012	0.009
1985-87	0.082	0.040	0.018	0.012	0.012
1987-89	0.071	0.034	0.018	0.010	0.009
1989-91	0.104	0.043	0.032	0.016	0.012
1991-93	0.106	0.039	0.031	0.025	0.011
1993-95	0.097	0.029	0.023	0.026	0.019
1996-97	0.084	0.030	0.019	0.022	0.013
1997-99	0.080	0.030	0.017	0.020	0.013
1999-01	0.094	0.032	0.027	0.023	0.013

Appendix Table 5:
Fraction of Job Losers Employed at Survey Date, by year
(Numbers for Figure 5)

Year	Raw	Adjusted
1981-83	0.589	0.589
1983-85	0.639	0.649
1985-87	0.682	0.680
1987-89	0.706	0.705
1989-91	0.604	0.607
1991-93	0.672	0.658
1993-95	0.715	0.711
1996-97	0.767	0.762
1997-99	0.751	0.752
1999-01	0.634	0.650

Appendix Table 6:
Fraction of Job Losers Employed at Survey Date, by year and Education
(Numbers for Figure 6)

Year	ED<12	ED=12	ED 13-15	ED≥16
1981-83	0.442	0.586	0.648	0.779
1983-85	0.480	0.639	0.695	0.800
1985-87	0.593	0.648	0.745	0.808
1987-89	0.587	0.677	0.781	0.815
1989-91	0.441	0.566	0.662	0.744
1991-93	0.499	0.636	0.704	0.785
1993-95	0.577	0.685	0.734	0.805
1996-97	0.623	0.743	0.785	0.846
1997-99	0.591	0.727	0.764	0.825
1999-01	0.505	0.588	0.671	0.706

Appendix Table 7:
Fraction Part-Time at Survey Date, by Part-time Status on Lost Job and Year
(Numbers for Figure 7)

Year	Old PT	Old FT
1981-83	0.445	0.139
1983-85	0.439	0.126
1985-87	0.370	0.101
1987-89	0.407	0.105
1989-91	0.460	0.131
1991-93	0.458	0.138
1993-95	0.484	0.127
1996-97	0.451	0.111
1997-99	0.505	0.091
1999-01	0.483	0.140

Appendix Table 8:
Decline in Log Real Weekly Earnings, by year
Full-Time to Full-Time Transitions (Numbers for Figure 8)

Year	ΔW
1981-83	0.105
1983-85	0.073
1985-87	0.099
1987-89	0.054
1989-91	0.122
1991-93	0.120
1993-95	0.058
1996-97	0.036
1997-99	0.009
1999-01	0.107

Appendix Table 9:
Decline in Log Real Weekly Earnings, by year and Education
Full-Time to Full-Time Transitions
(Numbers for Figure 9)

Year	ED<12	ED=12	ED 13-15	ED≥16
1981-83	0.189	0.102	0.091	0.040
1983-85	0.142	0.085	0.040	0.014
1985-87	0.196	0.088	0.062	0.087
1987-89	0.056	0.058	0.064	0.030
1989-91	0.168	0.120	0.148	0.064
1991-93	0.083	0.150	0.110	0.103
1993-95	0.002	0.049	0.062	0.087
1996-97	0.069	0.047	0.045	-0.002
1997-99	-0.048	0.007	0.017	0.021
1999-01	0.104	0.110	0.112	0.096

Appendix Table 10:
Loss in Log Real Weekly Earnings, by year
Regression Adjusted Difference-in-Difference Estimates
Full-Time to Full-Time Transitions
(Numbers for Figure 10)

Year	$-\Delta W_d$	ΔW_c	$\Delta\Delta W$
1981-83	0.086	0.037	-0.123
1983-85	0.078	0.043	-0.122
1985-87	0.105	0.046	-0.150
1987-89	0.074	0.044	-0.118
1989-91	0.116	0.027	-0.143
1991-93	0.103	-0.008	-0.095
1993-95	0.063	-0.009	-0.055
1996-97	0.042	0.056	-0.098
1997-99	0.023	0.095	-0.118
1999-01	0.088	0.065	-0.152

Appendix Table 11:
Loss in Log Real Weekly Earnings, by year and Education
Regression Adjusted Difference-in-Difference Estimates
Full-Time to Full-Time Transitions
(Numbers for Figure 10)

Education < 12 years

Year	$-\Delta W_d$	ΔW_c	$\Delta\Delta W$
1981-83	0.087	0.014	-0.101
1983-85	0.135	0.017	-0.152
1985-87	0.140	0.051	-0.191
1987-89	0.109	0.052	-0.162
1989-91	0.119	-0.019	-0.100
1991-93	0.086	-0.059	-0.027
1993-95	-0.044	-0.065	0.110
1996-97	0.043	0.004	-0.048
1997-99	-0.073	0.086	-0.012
1999-01	-0.026	0.068	-0.042

Education 12 years

Year	$-\Delta W_d$	ΔW_c	$\Delta\Delta W$
1981-83	0.083	0.026	-0.109
1983-85	0.070	0.018	-0.088
1985-87	0.091	0.041	-0.132
1987-89	0.052	0.030	-0.082
1989-91	0.100	0.024	-0.124
1991-93	0.097	-0.017	-0.079
1993-95	0.061	-0.002	-0.058
1996-97	0.033	0.032	-0.065
1997-99	0.004	0.086	-0.090
1999-01	0.074	0.059	-0.133

Education 13-15 years

Year	$-\Delta W_d$	ΔW_c	$\Delta\Delta W$
1981-83	0.088	0.062	-0.150
1983-85	0.067	0.077	-0.144
1985-87	0.090	0.043	-0.133
1987-89	0.103	0.050	-0.154
1989-91	0.128	0.024	-0.152
1991-93	0.091	-0.012	-0.079
1993-95	0.061	-0.022	-0.039
1996-97	0.044	0.061	-0.105
1997-99	0.014	0.100	-0.114
1999-01	0.067	0.076	-0.143

Education ≥ 16 years

Year	$-\Delta W_d$	ΔW_c	$\Delta\Delta W$
1981-83	0.054	0.061	-0.115
1983-85	0.042	0.079	-0.120
1985-87	0.131	0.056	-0.187
1987-89	0.054	0.057	-0.111
1989-91	0.110	0.051	-0.160
1991-93	0.132	0.028	-0.160
1993-95	0.102	0.016	-0.117
1996-97	0.039	0.098	-0.138
1997-99	0.090	0.107	-0.197
1999-01	0.165	0.060	-0.225