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## **Measures of Program Performance and the Training Choices of Displaced Workers**

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## **Abstract**

We consider theory and evidence on displaced workers' decision to seek retraining. Returning to school can improve displaced workers' earnings prospects by adding to their human capital or by facilitating their job searches. However, the costs and benefits of retraining differ according to the characteristics of the worker and the kind of training contemplated. Empirical results suggest that such considerations play a large role in determining which displaced workers seek retraining in Washington State Community Colleges. For instance, older workers likely face higher costs in the form of foregone wages as well as lower benefits in the form of a shorter remaining time horizon and empirical results confirm that older workers are less likely to return to school. Other groups found more likely to return to school include women, minorities, and those with previous community college education. Among those who return, many complete very little training. In general, differences across groups are less pronounced in credits obtained than enrollment rates. We also document large differences in returns to different types of courses, with more technically oriented courses often yielding relatively high returns and less technical courses yield zero or negative returns. Workers who take low return courses either view them as consumption or are misinformed about their benefits. We conclude by arguing that making more information about the likely benefits of training available to workers considering retraining may improve welfare.



## I. Introduction

Passage of the Work force Investment Act (WIA) has focused policy-makers' attention on measuring the performance of employment and training programs. Explicit performance measures can provide timely information to policy makers and program operators for assessing and improving their policies and programs.

Under WIA's predecessor, the Job Training Partnership Act (JTPA), policy makers relied on two approaches for obtaining this information: First, they used formal program evaluations, including the National JTPA Study. These evaluations estimated the "value added" or the return on investment (ROI) of these programs and their net benefit to participants, to taxpayers and to governments.

Second, policy makers implemented a system of performance standards. Under this system, they assess the performance of their programs by whether measures of participants' output, such as their entered employment rate, employment retention rates, or post-program wage levels, exceed pre-designated targets or standards (Barnow, 1992). Policy makers intend that these performance standards would substitute for more costly and less timely formal ROI evaluations. Although the relative merits of these approaches for measuring program performance has been hotly contested, one purpose they both share is that they provide policy makers and program operators with an objective basis for assessing and improving their programs.

It is our contention in this paper that timely and accurate "value-added" performance measures not only help policy-makers improve the effectiveness of their

programs, but these measures also can help improve programs by providing likely participants with better information. This information should affect their participation decisions, and lead to more efficient use of both their own and government's training resources. To understand this point consider that participation in many employment and training programs often involves (at least) a two stage decision process in which individuals decide whether to apply for programs, and program operators decide whether to admit them to the program. Individuals' decisions to apply for or enroll in a program depend on the net benefits that they expect to receive from them. Therefore, program performance measures should improve individual decision making and improve program performance by ensuring that those who apply to the program in the first place are those most likely to benefit from them. In this paper we show how information about (i) the training decisions made by unemployed adults, and (ii) the impact of the programs that they enrolled in, can improve program performance by potentially improving individual decision making. We base our analysis on the experiences of dislocated workers in Washington State, some of whom enrolled in community college courses around the time of their job losses.

In the remainder of the paper, we describe the factors that individuals should take into account when deciding whether to participate in training. Here we observe that the cost of retraining displaced workers is likely larger than the cost for other training participants, such as youths and economically disadvantaged persons. Therefore, this population likely requires that training generate larger impacts in order for it to be

worthwhile. We next examine how individuals' characteristics relate to their propensity to enroll and complete such courses. We assume that improving labor market prospects is the dominant factor influencing dislocated workers decisions to enroll in community college courses. Accordingly, information about the characteristics of individuals who enroll in these courses provides information about the types of individuals who are most likely to benefit from retraining. We then present estimates of the impact of alternative community college curricula on earnings based on a formal evaluation of the returns to classroom training. We believe that this information is not only helpful to policy-makers who subsidized community college schooling, but also to displaced workers. Finally, we discuss how to use this information to improve program performance by improving individuals' decision making.

## **II. Deciding Whether to Participate in Training**

We base our analysis of the training or schooling decisions of displaced workers on the simplifying assumption that dislocated workers view attending school as a way to improve their labor market prospects. Accordingly, we can judge the "success" of public investments in these workers' training or schooling on whether this goal is met. This section discusses two frameworks presented in the academic literature for characterizing the decision to invest training following the loss of a job (Heckman, LaLonde, and Smith, 1999).

A broader view of school attendance would include the possibility that dislocated workers attend school for their own immediate enjoyment or to open up job opportunities

that are more enjoyable, even if not higher paying. Because most displaced workers can attend school and not search for work, without jeopardizing their UI benefits, it is possible that substantial numbers decide to take a break from work to pursue personal interests. This motivation for attending school can be productive from a social point of view, because it lowers the cost of job loss, and thereby the cost born by firms and society from making production more efficient. The importance of investment versus consumption motives might be assessed by surveying dislocated workers about their motivation for seeking retraining. We know of no such survey data with which we could examine this contention. Accordingly, in this paper we focus on the implications of economic motives for seeking training.

### *II.a. Training Augments Human Capital*

In the more familiar “human capital” framework, individuals view training as an investment. Accordingly, individuals decide to participate in training when the benefits that they expect to receive exceed the costs of training. Further, when choosing among alternative courses of study, individuals will choose the one with the greatest net benefit.

In most settings, analysts measure the benefit of training as the difference between participants' post-program earnings and the earnings that they would have received had they not participated in training. This earnings “impact” could result either from increased wage rates or from increased hours worked. Therefore, in order for displaced workers to make productive decisions about whether to participate in training



and what to study, they should know what is the likely impact of training is and whether this impact varies among programs or alternative courses of study.

The impacts of classroom training reported in studies of economically disadvantaged persons or the returns to community college schooling reported for young adults may provide a misleading basis for displaced workers training decisions. First, displaced workers are older than these other training participants are and the impacts of retraining may differ by age. Second, they are also better educated and already possess more vocational skills on which to build.

Finally, if impacts of retraining vary among individuals in a population, then the average impact for a group whose cost of participation is low is likely to be lower than for a population whose cost of participation is high. In the later case, the only persons who participate in training are those who expect the benefits of retraining to outweigh the more substantial costs. If displaced workers based their training decisions on the average annual impacts measured for young community college students or economically disadvantaged trainees, they may understate the likely benefits of training. Individuals who have had difficulty finding and keeping any job may participate in a training program that they expect to yield relatively small impacts, whereas a corresponding displaced worker would not. As a consequence the impact of training as measured by the average of the individual impacts for all young participants is likely to be lower than for a sample of displaced workers. A related point is that evidence showing displaced workers receive larger impacts from training than younger individuals does not imply that training is more

effective for displaced workers.

Another determinant of displaced workers' decisions to participate in retraining is the cost of these programs. There are three components of the cost of training. First are the direct costs of training, which include tuition, fees, and supplies, transportation, and care for children and elderly relatives. Next are the personal costs associated with retraining, which include the psychic costs of returning to a classroom setting and the toll that time spent in training might take on a person's family. These costs might be "negative" for some participants if they consider schooling a form of consumption or entertainment. In any case, these psychic costs are difficult to quantify. As a result, although they are acknowledged, analysts usually do not explicitly take them into account.

Finally, the largest cost of retraining can be the "lost earnings" that displaced workers experience if they delay their return to work in order to invest in new skills. If displaced workers decide to return to school to acquire new skills, they are likely to search for new jobs less intensely. As a result, while they are in school they lose earnings that they would have received had they found a new job. These lost or "foregone" earnings constitute a cost of training. Further, displaced workers who return to school also may forego, at least for the time being, both the formal and informal on-the-job training that they would have received on a new job. Under these circumstances, the labor market experience that they lose while in school also is a cost of training.

Compared to other individuals who policy-makers encourage to receive training,

the foregone earnings cost of training are likely to be especially high for displaced workers. Foregone earnings are likely lower for economically disadvantaged workers and for teenagers and young adults, whose likelihood of being employed and earnings power are lower. The upshot is that in order to justify their higher costs of training, displaced workers must experience larger “impacts” (in terms of dollars gained) from retraining programs than do other training participants.

### *III.b. Training Facilitates Job Search*

A second way to characterize the training decisions of displaced workers is based on the idea that access to training may facilitate job search. In this setting unemployed persons seek to enroll in training because they believe that this opportunity increases their chances of receiving an acceptable job offer. What distinguishes this framework is that training may facilitate productive “networking” by the unemployed. The increased “contacts” that they experience at a training center or community college may increase the likelihood that they receive an offer of a new job. In this case, training does not increase skills, but would increase employment rates and possibly wages if this networking lead to better job “matches” between displaced workers and employers.

According to the job search characterization of training, evidence that displaced workers have high early dropout rates from training programs or community college courses would not necessarily indicate that these programs or courses were ineffective. Instead, this evidence may simply indicate that displaced workers use training

opportunities to facilitate their job search and that they leave training once they are reemployed.

### **III. Determinants of Training Participation**

In order for displaced workers to make productive decisions about training participation, they need to know more than the likely “impacts” of training. According to the human capital framework outlined in the previous section, individuals participate in training only if the benefits exceed the costs. Evidence on how different personal characteristics affect the propensity to participate in training provides information about what characteristics of individuals make them more likely to benefit from training.

The evidence that we present in this chapter on the determinants of displaced workers' decisions to participate in training comes from studying all persons displaced from (UI covered) jobs in Washington State during the first half the 1990s. The evidence we present is largely based on the sub-sample of persons who filed a valid claim for unemployment insurance benefits following the loss of a job that they had held for at least 6 quarters, and who were consistently attached to the state's work force during the period that we studied. Our sample is unusually large for this kind of study, containing over 121,000 persons.

The last of the foregoing restrictions reduced our sample by nearly one-half. One implication of this fact is that many displaced workers, including those who attend community college around the time of their job loss, do not remain consistently attached

to the state's UI covered work force. We find that such persons are more likely to be women and older. Neither of these groups is known for high rates of geographic mobility. Thus, they are likely to be still residing in the state after their displacements. Therefore, if policy makers subsidize training for the purposes of raising worker productivity, a significant amount of community college schooling must generate very low returns because many participants do not work very often following training

Nonetheless, our results on the propensity to participate in training are not sensitive to our restricting the sample to displaced workers who remain consistently attached to the state's work force. In results reported elsewhere, we find that the influence of factors that are associated with community college participation among displaced workers who remain consistently attached to the state's work force is the same as it is for displaced workers who are not consistently attached to the state's work force following their job loss (Jacobson, LaLonde, and Sullivan, 1999).

The training that we consider here are courses that dislocated workers enrolled in at 25 of Washington State's community colleges around the time of their displacements. About one-fifth or approximately 25,000 persons in our sample enrolled in at least one community college course around the time of their job loss. We define the period around individuals' job loss to encompass the 3 quarters leading up to the quarter that they separate from their employer and the 11 quarters following the quarter of their job loss. Our sample consists primarily of prime-aged workers and so the participation behavior and impacts that we report here are for a population that is not often studied in this

literature. The average age of our sample members is approximately 37, and their wage rate prior to the quarter of their job loss was about \$18 per hour.

Washington State's dislocated workers were not restricted in making choices about their selection of courses or which colleges to attend. In particular, there were no entrance restrictions based on education levels or prior success in school. However, schools did enforce the usual prerequisites for attendance in more advanced courses. There also were no requirements to enter a degree or certificate granting program, but only a very small fraction of workers in our sample appeared to pursue a new credential.

Dislocated workers were aided in attending school by low in-state tuition, as well as counseling programs, particularly those supported by unions and firms in the aerospace and timber industries. Some workers obtained financial support through JTPA, but very few qualified for substantial amounts of federal Pell Grants or Stafford Loans. Perhaps most important, starting in late 1992, Washington State routinely permitted UI recipients to attend school without having to satisfy any requirement to search for work. In addition, starting in 1994, the state funded a special program that provided financial assistance to community colleges that expanded their enrollments of displaced workers, and developed new more relevant curricula.

We find that nearly one-half of Washington State's displaced workers who enrolled in community college courses dropped out or otherwise did not complete a single course with a passing grade. As a result, only 11 percent of the state's displaced workers completed one or more community college courses around the time of their job loss.

These students who completed at least one course acquired on average 28 community college credits. The state's community college system operates on a quarter system in which the typical course is worth five credits and an Associates Degree requires 90 credits. Hence, even among this subset of trainees, the average number of credits obtained amounts to slightly more than one-half of a year of full-time schooling.

We also considered the types of course completed by displaced workers. Of the 28 completed credits, approximately 12 were completed in courses teaching more technically oriented vocational skills or in academic math and science classes. These courses included those teaching skills in the health fields, such as a respiratory therapist or a dental hygienist, and in the construction trades.

In our analysis, we found that these types of courses generated larger earnings impacts. As a result, below we refer to them as "high return" classes. We arrived at this grouping of courses after we first considered the "returns" associated with courses in nine different subject areas. From this analysis it was apparent that the impacts of community college schooling were concentrated entirely in a subset of these subject areas. Within these particular subject areas completing more courses was associated with increased earnings. We refer to all other courses as "low return" classes. These courses included academic courses in the humanities and social sciences, as well as relatively non-quantitative vocational courses.

As shown by Table 1, the distribution of completed credits among displaced workers is skewed. Approximately, one-half of those who complete at least one credit

complete no more than ten credits. This amounts to about two classes. The table also indicates that most displaced workers completed ten or fewer credits in “high return” classes. The point to take away from the table is that the very few displaced workers who enroll in community college courses complete enough classes to obtain even a certificate. If community college schooling is a productive investment, it must be because of the benefit stemming from completing only a few courses.

### *III.a. Determinants Of Training Participation*

As we discussed in the previous section, evidence that displaced workers who possess particular characteristics are more likely than others to receive training suggests that these types of persons are more likely to view the benefits of training as outweighing its costs. We begin by considering how different personal characteristics are associated with the rates that displaced workers enroll in and complete community college schooling.

In our analysis, we hold constant differences among individuals' gender, whether they are non-Hispanic whites, their age at displacement, prior schooling levels, years of service with their prior employer, their prior industry, whether their prior employer was located in the Seattle MSA, the state's other MSA's, or the rural regions of the state, the year and calendar quarter of displacement, and their earnings prior to displacement.

We summarize our analysis in Table 2. As shown by the first row of the table, women's enrollment rates are 8 percentage points greater than observationally similar males. In other words, if we were to observe a sample of male and female displaced



workers who were all non-Hispanic whites, the same age, the same number of years of prior schooling, the same tenure at displacement, who were displaced from the same industry, located in the same region of the state, and at the same time, we would predict that the enrollment rates of the women would be 8 percentage points greater than those of their male counterparts. Given that the average enrollment rate for the entire sample is approximately 20 percent, this impact is substantial. In the second column of the table, we observe that women also are more likely than males to both enroll and complete some community college schooling. The gap between the gender's training rates is 4 percentage points. Given that the average training rate for the entire sample is 11 percent, this impact also is substantial. These results indicate that dislocated females are more likely than males to view training as beneficial either as a vehicle to improve their skills or as a vehicle to facilitate their job search.

The reason that women complete more training than men is that they are more likely to enroll in community college courses in the first place. However, once they enroll, they are not more likely than are their male counterparts to complete a course. Indeed, we find that among displaced workers who enroll in community college courses, women are, if anything, less likely to complete at least one course. This finding suggests that the factors, which determine and motivate displaced workers' enrollment decisions, may differ from their decisions to complete training. In light of our discussion in section II about the varied motivations for training participation, this finding is not surprising.

Turning to the second row of the table, we observe that the enrollment and training

rates of both minority and non-Hispanic white displaced workers are similar. The results indicate that non-Hispanic whites are slightly more likely to complete some training, while minorities are more likely to enroll in community college courses following their job loss. In work not summarized in the table, we find that the reason for this result is that although minorities are more likely to enroll in community college schooling, once they have enrolled, they are approximately 15 percent less likely to complete at least one course. Although this result may suggest that minorities have more difficulty adapting to a classroom-training environment, this may not be the correct interpretation of this finding. As our discussion in the previous section suggested, the networking opportunities associated with being at a community college may be greater for minorities, whose transition rates from unemployment to new jobs in the absence of training are usually lower than are those of whites.

Beginning in the third row of table 2, we observe that participation in training declines with age. Enrollment and training rates are the largest for the youngest displaced workers in their early twenties and decline with age. The probability that displaced workers in their early twenties enroll in community college courses is approximately 12 percentage points greater than observationally similar workers who are in their late fifties. Participation rates drop sharply with age until individuals are in their mid thirties. At this point participation rates decline slowly, but steadily, as individuals approach their sixties. As shown by the table the enrollment rates of displaced workers in their thirties and forties is approximately 6 percentage points greater than the enrollment

rates of displaced workers in their late fifties. This difference implies that the enrollment rates in community college schooling is approximately one third less for displaced workers in their late fifties compared to those in their thirties and forties.

This relationship between displaced workers' age and participation rates in training is consistent with the human capital rationale for training. Younger displaced workers are more likely to enroll in training because their forgone earnings are likely lower and they have a longer time frame to realize "returns" to their investments. At the very least, our findings indicate that displaced workers who are older have less incentive to participate in training or perhaps encounter greater barriers to acquiring skills through community colleges.

One of the most interesting results in the table is the relationship between displaced workers' prior schooling and their participation rates in community college. The displaced workers who are most likely to enroll in these courses are those who previously had acquired some post secondary schooling. Enrollment and training rates among high school graduates are approximately 6 and 5 percentage points, respectively, lower than those with some post-secondary schooling. The gap between high school dropouts is even larger. Further, those with some prior secondary schooling also are more likely to receive training than those with college degrees.

The foregoing relationship between displaced workers' prior schooling and training participation also holds among the subset of displaced workers who enroll in at least one community college course. In results not reported in the table, we find that displaced

workers with some prior post-secondary schooling are approximately 33 percent more likely to complete at least one community college course than high school dropouts who enroll in courses. They also are more likely to complete at least one course than enrollees who have only a high school degree or who have a higher degree.

These results suggest that community college retraining is more attractive to displaced workers with prior post-secondary schooling than it is for other dislocated workers. Because we account for many productivity-related characteristics, such as individuals' prior industry, years of service, and earnings, our result implies that among workers with approximately the same productivity, those who had acquired some prior post-secondary schooling benefit more from retraining. Further, since we attempt to account for the magnitude of displaced workers' earnings losses in our analysis, it is unlikely that differences between individuals' foregone earnings could explain our result. Instead, our result suggests that displaced workers with prior post-secondary schooling are a good "match" for community college based retraining.

There are a couple of reasons why displaced workers with prior post-secondary schooling may find attending community colleges an attractive option following their job loss. First, the psychic costs associated with enrolling in community college courses may be less for displaced workers who acquired this type of schooling in the past. An advantage that these displaced workers have is that they know more about community colleges and their programs. Second, these individuals also may benefit more from returning to school than those with post-secondary degrees or those who have no more

than a high school education, because they may be able to quickly obtain a degree or some other credential. This possibility would influence displaced workers' training decisions if employers viewed having a credential as an important factor when making hiring decisions. However, when we took into account the number and type of credits displaced workers completed, we did not find evidence that obtaining a degree worked to their advantage.

### *III.b What Determines the Number of Completed Credits?*

Another measure of displaced workers' participation in retraining is how "intensely" they participated in community college schooling. To address this question, we examined how displaced workers' personal characteristics predict the number of credits that they complete in Washington State's community colleges. For this analysis we limited our sample to displaced workers who completed at least one course. As we noted above, this group of trainees completed on average approximately 28 credits.

We find that the personal characteristics that are associated with greater participation rates in retraining also are associated with greater "intensity" of participation. However, these relationships are often not very strong. Accordingly, these results highlight the importance of the enrollment decision in explaining differences in the amount of training acquired by displaced workers. As shown by Table 3, women complete on average two more credits than observationally similar men. Given that this sub-sample of displaced workers complete an average of 28 credits, this difference is relatively modest.

By contrast, we observed above that women were substantially more likely than men to enroll in community college courses.

The relation between displaced workers' age when they lost their job and the number of credits they complete also is weaker. As shown by the table, the youngest displaced workers complete 6 more credits than the oldest displaced workers, but they complete about the same number of credits as displaced workers in the early forties. These results indicate that young displaced workers acquire more training than their prime age counterparts, because they are more likely to enroll and complete at least one course. However, among displaced workers who complete at least one course, age is not a strong predictor of how much training they acquire.

We reach a similar conclusion when examining the relation between prior schooling and the "intensity" of retraining. Once again this relation is much weaker than the relation between this characteristic and enrollment or training rates. Displaced workers with some prior post-secondary schooling complete approximately same number of credits as those with a high school degree. They complete approximately one course more than their counterparts who were high school dropouts or who had a college degree. These results indicate that the reason displaced workers with some prior post-secondary schooling receive more training is that they are more likely to enroll in community college courses and complete at least one course. Once they have completed that course they take additional training only modestly more intensely than other dislocated workers.

#### **IV. Impact of Community College Schooling on Subsequent Earnings**

Measures of the “value-added” of community college courses provide information on the average impact of training. But by themselves such measures are not sufficient to guide displaced workers' training decisions. The impact of training received by displaced workers who are indifferent about participating in community college schooling, and who require encouragement from counselors, may differ from the impact for the “average” participant. More importantly, information about the impact of training is insufficient, because training decisions depend on individuals' perceptions of both the impacts and the costs of training.

Nevertheless, before we can assess the net benefits of retraining we must document the likely gains from community college schooling. To arrive at our estimate, we developed a statistical model of individual earnings that took account of differences among individuals' observed characteristics and unobserved characteristics that were fixed through time. Accordingly, our framework controls for differences among displaced workers' prior schooling, prior work experience, and family background characteristics that could account for differences in the amount of community college schooling that they acquire around the time of their displacements. Further, we also account for differences in the rate of growth in earnings as a function of gender, ethnicity, and the likely size of the earnings loss that is connected with their displacements.

We identify the impact of community college schooling essentially by comparing

the post-schooling earnings of displaced workers who are observationally similar but who had acquired different more or less community college credits. In this framework, information about displaced workers who did not acquire any schooling is not required to estimate the impacts of schooling, (although it does help us obtain more precise estimates).

#### *IVa Average Impact of Community College Courses*

As shown by Table 4, male displaced workers' who acquired community college schooling around the time of their displacements saw their annual (long-term) earnings rise by approximately \$24 per completed credit. For females we estimate that an impact of \$20 per completed credit. Therefore, a male displaced worker who completed the average number of credits (among those who completed at least one credit) experienced an earnings increase of approximately \$672 (\$24 per credit times 28 credits). The average earnings of these displaced workers in the post displacement period were approximately \$20,000. Hence, this impact of retraining constitutes approximately 3 to 4 percent of total earnings.

Turning to the impacts of community college schooling for selected demographic groups, we observe that minority men benefited less from the training that they received than white men, whereas among women the impacts for minorities and whites were about the same. Community college schooling increased the earnings of younger displaced workers by more than the earnings of their older counterparts. This result is consistent



with our earlier finding that younger displaced workers are more likely to participate in training.

The figures in table 4 also suggest that the estimated impact of community college schooling is larger for those who are more experienced and better educated begin with. In general, low tenure displaced workers are less productive than their counterparts with more tenure with their former employers. Among those who had acquired relatively little tenure, the estimated impact of a community college credit is approximately one-third less than the average impact. Similarly, we find that the impact of schooling is modestly higher among displaced workers who had more prior schooling. These results help to explain why high tenure displaced workers with more prior schooling are more likely to participate in training, despite probably having higher costs of participation.

Despite these positive earnings gains, our results indicate that community college schooling usually helped displaced workers offset only a fraction of the losses associated with their displacements. Trainees completed on average about one-half of a years worth of community college schooling. We observed above that this investment subsequently translated into an approximately 3 to 4 percent earnings increase. Extrapolating further we would expect one year of community college schooling to raise the typical displaced worker's earnings by about 6 percent. In our sample, it is unusual for displaced workers to complete this much schooling. As other research has shown, however, long-term earnings losses associated with displacement range from 15 to 25 percent per year, and can be larger for workers from some industries (Ruhm, 1991; Jacobson, LaLonde, and

Sullivan, 1993; Schoeni, 1996). Therefore, our results suggest that it would take three to four years of full-time community college style retraining in order for displaced workers to obtain the skills necessary to offset the long-term losses associated with displacement.

#### *IVb. Average Impact of Different Types of Courses*

Our analysis of community college schooling indicates that it can generate modest earnings impacts for a variety of displaced workers. However, as we analyzed our results more closely, it became clear that the impacts of community college schooling resulted almost entirely from large impacts associated with courses in the health-related fields, in more technically oriented vocations including the trades, and in academic math and science classes. As shown by panel B, the impact of community college schooling appears to depend more on the types of courses that individual complete, than on their characteristics. Displaced workers who complete what we call “high return” courses experience very large earnings increases per completed credit. Extrapolating from the figures in the table, we estimate that a displaced worker who completed 15 “high return” credits or just 3 to 4 courses experienced nearly a \$1,000 rise in their annual earnings.

All other categories of courses, including those that taught less technically oriented vocational skills or academic subject matter, usually generated small or even negative earnings impacts. These results imply that such courses probably make displaced workers financially worse off. Indeed, male displaced workers appear to be made substantially worse off on average by enrolling in school and completing “low return”

courses. This result could be spurious if displaced workers who experienced larger earnings losses in connection with their job losses also tended to complete more “low return” courses. However, our statistical framework takes this possibility into account. One way to interpret our finding for “low return” courses is that when displaced workers invest in such training, they not only may fail to acquire any productive skills, but they also may lose valuable labor market experience.

To explore further our finding about the adverse impacts of “low return” courses, we limited our analysis to the sub-sample of displaced workers who had completed 15 or more “high return” credits. This group of displaced workers was, on average, more skilled than other training participants. We then asked whether this more skilled group experienced any earnings gains from completing “low return” courses? Once again, we found that even among this group of displaced workers, the numbers of “low return” courses completed were not associated with increased earnings. We interpret this result as strong evidence that our findings on the disparate impacts of “high” and “low” return courses are not due to differences in the types of individuals who enroll in these kinds of classes.

The impacts of “high return” courses that we report here help explain why more productive and younger displaced workers experience larger average impacts of schooling. We find that both more skilled displaced workers and younger displaced workers are more likely than other displaced workers to enroll in such courses. Consequently, they gain more from training partly because they complete training in

areas that are better rewarded in the labor market. These results also are consistent with a general finding in the training literature indicating a complementarity between skills and the receipt of training. In the private sector, employers are much more likely to train their most skilled workers, probably because the gains from training are largest for this group.

## **V. Program Performance And Individual Decision Making**

Whether displaced workers' retraining is likely to payoff depends on the types of courses that they complete and the costs that they incur in order to be retrained. As we observed in the previous section, a displaced worker choosing to complete "low return" courses is likely to be worse off as a result participating in training. Individuals unaware of this tendency would make better decisions, if they received this information around the time of their displacements. By contrast, those who complete some of the "high return" courses may benefit from training, depending on its costs.

To assess whether the benefits of "high return" courses likely exceed their costs, we consider a hypothetical example. Suppose that a displaced worker enrolled in community college courses for one full academic quarter. During that period she completed 15 credits in "high return" classes. We estimate above that this training might increase her annual earnings by an average of \$1,000 per year. If this displaced worker could expect to earn \$20,000 a year in the absence of training, and she losses one quarter of that pay because she enrolls in school full-time, then the forgone earnings cost of her retraining is about \$5,000. Alternatively, if she works part-time while going to

school, the forgone earnings cost of her retraining might be closer to \$2,500. We also assume that the cost of tuition, fees, transportation, and childcare amounts to \$2,000. Ignoring the psychic costs of training, total training costs for the trainee who works part-time amounts to \$4,500. The question now becomes is a \$1,000 annual impact sufficient to justify a \$4,500 "investment" in training? The answer is that it depends. If the displaced worker is relatively old, her working career may not be long enough for the impacts to offset the costs. Further, if a displaced worker's newly acquired skills depreciate, over time her annual earnings impacts from this retraining will diminish so that the cumulative impacts may be insufficient to cover the cost of retraining.

The answer also depends on how we "discount" the future earnings gains from retraining. We must discount future gains because a \$1,000 gain in earnings ten years from now is not worth the same to an individual as a \$1,000 gain in earnings one year from now. If we use an interest rate of 5 percent, then an individual should be indifferent between receiving \$1,000 ten years from now or \$614 today.

In this example, we discount future gains according to a rate of 5 percent. We also assume that during the first year after leaving training, displaced workers did not experience any earnings gains. We impose this assumption, because in our study, we found that earnings impacts during the first year after training were often either negative or zero.

We now consider the calculation of net benefits of "high return" community college courses for four hypothetical displaced workers who were 25, 35, 45, and 55 when they

lost their jobs. We also show how the calculation is sensitive to assumptions about the depreciation rate of skills by assuming (i) no skill depreciation, and (ii) a 5 percent rate of skill depreciation. In Table 5, we present the net benefit calculation based on these assumptions. In the third row we report we report the adjustment that we make to annual earnings gains to account for (i) these gains continuing through the remainder of a persons' career, (ii) the possibility that the skills acquired in community college courses depreciate, and (iii) the discount rate. The present value of the gains from schooling at the time a displaced worker makes her decision to enroll in courses is given by the product of the average annual impact times the adjustment factor. The net benefit of schooling is the difference between the total impact and the costs.

As we can see from Table 5, if newly acquired skills do not depreciate, the net benefits of retraining for all but the oldest displaced workers are very substantial. The net present value of a 35 year old, the approximate mean age of our sample of displaced workers, completing an academic quarter of high return courses is \$14,400. Given the assumed costs of this retraining, this gain implies an (internal) rate of return on investment of approximately 20 percent. Even by the standards of the late 1990s stock market, this gain is substantial. By contrast, the same \$1,000 gain in annual earnings translates into a smaller \$6,800 present value for displaced workers in their mid-fifties. If the foregone earnings associated with training participation were double their assumed levels, the net benefit of completing an academic quarter of high return courses would be negative. Under these circumstances, older displaced workers would be better off not

enrolling in training.

The calculations in Table 5 depend on several assumptions. We assumed that skills did not depreciate. Some analysts of private sector training have reported evidence of skill depreciation (Lillard and Tan, 1992). If the value of newly acquired skills depreciate at a rate of only 5 percent per year, the net benefit of retraining declines substantially. As shown by Table 5, the present value of the gain for a 35-year-old displaced worker falls from \$9,900 to only \$3,600.

Another important assumption underlying our calculations concerns how much displaced workers would have earned had they not been in school. In a depressed labor market the likelihood of receiving a job offer may be so low that the foregone earnings associated with retraining are insubstantial. By contrast, the cost of retraining displaced workers is greater when labor markets are tight and unemployment rates are low as they have been during recent years. If there are no foregone earnings cost associated with training, the net benefits of retraining would rise by an additional \$2,500 for each age group in the table. The internal rate of return from training also would then rise substantially for each group. Nevertheless, an important point to recognize is that even if the retraining costs depicted in the table are too large, the net benefits are always larger for younger displaced workers.

We believe in general there are some foregone earnings costs associated with retraining. In our data, we find that displaced workers earn less when they are enrolled in school, than when they are out of school. Those who enroll in community college

courses earn less than observationally similar persons who did not enroll in such classes. Further, those who enroll in more courses during any given time period earn less than their counterparts who enroll in fewer courses (Jacobson, LaLonde, and Sullivan, 1997). On the one hand, this evidence may indicate that those who train more intensely are those who had not yet received an acceptable job offer. On the other hand, it also may indicate the potential for substantial foregone earnings costs associated with retraining.

## **VI. Concluding Remarks**

The foregoing discussion outlines a framework that program operators, counselors, and displaced workers can use to assess whether retraining in a college environment is likely to raise earnings. We have contended in this paper that policy makers can enhance program performance not only when program operators understand the benefits of training, but also when individuals themselves have better information to make more informed decisions. Displaced workers who are contemplating retraining should be aware of all the costs of their decisions as well as the benefits that they are likely to receive from different curricula.

By having this information dislocated workers are likely to direct their energies toward more productive activities, which may include foregoing training and focusing on job search. For many displaced workers, policies designed to facilitate reemployment are likely more beneficial than those designed to encourage retraining. Among those displaced workers who opt for retraining, policies that encourage more skilled persons to



acquire more quantitatively oriented skills are likely more beneficial than those that encourage them to acquire less quantitative or more general skills.

Although our results indicate that the subset of “high return” courses generate substantial gains for displaced workers, this finding does not imply that those displaced workers who are inclined to enroll only in less quantitative courses would experience the same large returns if instead they enrolled in the “high return” courses. Our results measure the impact of “high return” courses among those displaced workers who actually enrolled in them. Indeed, our findings suggest that because these persons were more skilled to begin with—more tenure with their former employer and higher pre-displacement earnings—they would experience higher returns from these types of classes. We would expect that those inclined to enroll only in the “low return” courses would not experience as large gains if policy makers encouraged them instead to enroll in more “high return” courses.

At the same time, we should note that we found that those who benefit from the “high return” classes do not appear to benefit from completing additional “low return” courses. Therefore, the substantial gains that we report in this paper for “high return” courses are not simply a result of the skills of individual, but an interaction between the individual and the type of courses (or programs) that they complete.

Our empirical results apply to displaced workers from Washington State who enrolled in community college courses around the time of their job losses in the early 1990s. Obviously, the impacts for other displaced workers, in other time periods, in other

parts of the country, or for those who matriculated into private training institutions could be different. We have performed a similar analysis for workers who were displaced from firms in Allegheny County, Pennsylvania in the early 1980s and obtained similar results (Jacobson, LaLonde, and Sullivan, 1997). With the growth in popularity of vocational programs in community colleges during the last two decades, it would be surprising if the benefits associated with these private institutions were substantially larger. In any event, even for individuals considering enrolling in private training institutions, our framework and results are still valuable. If applied it would ensure that applicants for such programs are those who expected to obtain the largest net benefits from retraining.

Finally, we contend that the impact that information from this study has on dislocated workers' decisions to enroll in community colleges and select specific courses of study would depend on the extent to which:

- o Their personal goal is to increase their earnings power
- o The accuracy of their assessments of the returns to various courses
- o The accuracy of their assessment of the costs of attending school

The social value of providing this information would be highest if dislocated workers (i) do not have an accurate view of the benefits and costs of attending school, and (ii) are attending school primarily to increase their future earnings.

Importantly, the value of the information to dislocated workers would be even

greater if they are interested and able to excel in high return courses. However, from society's viewpoint the cost-effectiveness of training also would increase if policy makers and program operators simply discouraged those displaced workers from taking training who are likely to make themselves financially no better off or even worse off by attending school. One way to discourage such persons from taking training is to provide them with accurate information about the likely costs and benefits of specific types of training. Provided the cost of providing this information is sufficiently low, it could constitute an exceptionally effective way to raise both the private and social returns to government subsidized training. Such information would help individuals self-select into training in a way that would make it more likely that public training resources are directed toward those who are likely to derive the greatest benefit from retraining. Clearly, the value of providing such information should be assessed in future research.

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Table 1  
Credits Completed By Washington State Displaced Workers

All Community College Credits:

	<u>Mean</u>	<u>1-5</u>	<u>Number of Completed Credits</u>				
			<u>6-10</u>	<u>11-20</u>	<u>21-40</u>	<u>41-75</u>	<u>76+</u>
Males	28 (30)	.27	.15	.16	.17	.15	.10
Females	25 (28)	.32	.15	.15	.14	.15	.08

By Type of Community College Credits:

	<u>Mean</u>	<u>0</u>	<u>Number of Completed Credits</u>			
			<u>1 - 5</u>	<u>6 - 20</u>	<u>21+</u>	
<u>Group 1:</u>						
Males	15 (23)	.30	.23	.22	.24	
Females	7 (15)	.42	.25	.20	.13	
<u>Group 2 :</u>						
Males	13 (19)	.31	.22	.27	.20	
Females	16 (21)	.18	.27	.29	.27	

Notes: Total credits accumulated in Washington State community colleges. Group 1 credits are from courses teaching more technical academic and vocational skills. Group 2 credits are from all other courses, including basic skills classes. Source: Authors calculations from a sample of workers dislocated from UI covered jobs between 1990 and 1994. Each worker had filed a valid UI claim, accumulated at least six quarters of tenure with his or her former employer, and had remained consistently attached to the state's work force during the period that we studied.

Table 2

Impact of Demographic Characteristics on Enrollment and Training Rates of Displaced Workers in  
Washington State  
[Percentage Point Difference in Enrollment and Training Rates]

<u>Characteristic</u>	<u>Enrollment Rate</u>	<u>Training Rate</u>
Females v. Males	8%	4%
Non-Hispanic Whites v. Minority	-2%	1%
<u>Age at Displacement:</u>		
22 - 24 v. 55 - 60 years	12%	9%
25 - 29 v. 55 - 60 years	9%	6%
30 - 34 v. 55 - 60 years	7%	5%
35 - 39 v. 55 - 60 years	6%	5%
40 - 44 v. 55 - 60 years	6%	4%
45 - 49 v. 55 - 60 years	5%	3%
50 - 54 v. 55 - 60 years	3%	2%
<u>Prior Education:</u>		
H. S. Dropout v. Some College	-8%	-8%
H. S. Graduate v. Some College	-6%	-5%
College Graduate v. Some College	-4%	-4%
<u>Tenure at Displacement:</u>		
3 - 6 years v. 1.5 - 3 years	1%	1%
6 or more years v. 1.5 - 3 years	3%	3%

Notes: Workers displaced during 1990 through 1994 from UI covered employment in Washington State. "Enrollment rate" measures the percentage of persons who enrolled in a community college course during the period between 3 quarters prior to the quarter of their jobs loss until the 11th quarter after their job loss. The "training rate" measures the percentage of displaced workers who enrolled in and completed at least one community college credit around the time of their job losses. Because of our sample is large, these results are generally statistically significant at conventional levels of statistical significance. For information on the standard errors associated with these estimates see Jacobson, LaLonde, and Sullivan (1999).

Table 3  
Impact of Demographic Characteristics on the Number of Credits Completed by Displaced Workers

[Difference between groups' Credits]

<u>Characteristic</u>	<u>Total Credits</u>		<u>Total Credits</u>	
			<u>Males</u>	<u>Females</u>
Females v. Males	2		—	—
Non-Hispanic Whites v. Minority	2		3	1
<u>Age at Displacement:</u>				
22 - 24 v. 55 - 60 years	6	5		8
25 - 29 v. 55 - 60 years	7	5		9
30 - 34 v. 55 - 60 years	7	6		7
35 - 39 v. 55 - 60 years	8	7		8
40 - 44 v. 55 - 60 years	7	5		8
45 - 49 v. 55 - 60 years	4	3		5
50 - 54 v. 55 - 60 years	3	2		4
<u>Prior Education:</u>				
H. S. Dropout v. Some College	-4	-6		-2
H. S. Graduate v. Some College	0	0		0
College Graduate v. Some College	-6		-6	-6
<u>Tenure at Displacement:</u>				
3 - 6 years v. 1.5 - 3 years	3		3	2
6 or more years v. 1.5 - 3 years	4	3		4

Notes: See notes to Table 1. Difference between the number of credits completed by groups indicated in the rows of the table.

Table 4

Impact of Community College Credits on Annual Earnings  
 [Average Impact of a Completed Credit on Earnings  
 Three Years After Completing Last Community College Course]

Group	Males	Females
A. Total	\$24	\$20
B. Demographic Group		
Minority	\$8	\$20
Age 22 - 24	\$32	\$36
Less Than Six Years Tenure	\$16	\$12
More Than H.S. Degree	\$28	\$28
C. Type of Course		
"High Return" Courses: More quantitative vocational courses or academic math and science courses		
	\$64	\$68
"Low Return" Courses: All other courses, including less quantitative vocational courses or humanities and social sciences courses		
	-\$36	-\$12

Source: Authors' calculations based on Washington State administrative data. See Table 1. For information about the standard errors associated with these estimates see Jacobson, LaLonde, and Sullivan, 1997; 1999).



Table 5

## Computing the Net Benefit of "High Return" Community College Courses

Age at Displacement	25		35		45		55
Annual Impact	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Depreciation Rate	0%	5%	0%	5%	0%	5%	0%
Adjustment for: time value of money skill depreciation years left in career	16.2	8.4	14.4	8.1	11.5	7.3	6.8
Total Impact	\$16,200	\$8,400	\$14,400	\$8,100	\$11,500	\$7,300	\$6,800
Costs	\$4,500	\$4,500	\$4,500	\$4,500	\$4,500	\$4,500	\$4,500
Net Benefit	\$11,700	\$3,900	\$9,900	\$3,600	\$7,000	\$2,800	\$2,300

Notes: The calculations are based on a discount rate of 5 percent, and an assumption that individuals' working lives end when they are 65. The figures in the row labeled "total impact" are the product of the annual impact and the adjustment for the time value of money, skill depreciation, and years left in career.