# The Effects of Welfare-to-Work Program Activities on Labor Market Outcomes

Andrew Dyke
Department of Economics
University of North Carolina-Chapel Hill

Carolyn J. Heinrich
LaFollette School of Public Affairs
University of Wisconsin-Madison

Peter R. Mueser
Department of Economics
University of Missouri-Columbia

Kenneth R. Troske
Department of Economics
University of Missouri-Columbia and IZA

February 2005

We would like to thank Seth Sanders, Jeff Smith, Ed Vytlacil, Jennifer Ward-Batts and participants at the 2004 Summer Research Workshop at the Institute for Research on Poverty for helpful comments. Peter Mueser and Kenneth Troske wish to thank Kyung-Seong Jeon for his work in analyzing the data. This work was supported by a grant from the Rockefeller/Russell Sage Future of Work program. Any errors are our own.

## Abstract

Studies examining the effectiveness of welfare-to-work programs present findings that are mixed and sometimes at odds, in part due to research design, data, and methodological limitations of the studies. We aim to substantially improve on past approaches to estimate program effectiveness by using administrative data on welfare recipients in Missouri and North Carolina to obtain separate estimates of the effects of participating in sub-programs of each state's welfare-to-work program. Using data on all women who entered welfare between the second quarter of 1997 and fourth quarter of 1999 in these states, we follow recipients for sixteen quarters and model their quarterly earnings as a function of demographic characteristics, prior welfare and work experience, the specific types of welfare-to-work programs in which they participate, and time since participation. We focus primarily on three types of subprograms–assessment, job readiness and job search assistance, and more intensive programs designed to augment human capital skills–and use a variety of methods that allow us to compare how common assumptions influence results. In general, we find that the impacts of program participation are negative in the quarters immediately following participation but improve over time, in most cases turning positive in the second year after participation. The results also show that more intensive training is associated with greater initial earnings losses but also greater earnings gains in the long run.

## I. Introduction

Public investments in programs designed to move welfare recipients into the labor market–commonly known as welfare-to-work programs–are made with the expectation that these services will increase participants' employment success both by aiding their search activities and by improving their general skill levels. Yet a growing number of studies examining the effectiveness of different state-level programs to help welfare recipients become employed and exit welfare present mixed and sometimes discrepant findings.[1] One reason for these mixed finding is inadequacies in research design, data, and methodologies for assessing program effects. Many studies examining welfare-to-work programs treat the program as a single entity, when in fact, these programs typically consist of a variety of different sub-programs providing training such as: basic education; job preparation and search assistance; and/or vocational and on-the-job training. If outcomes differ by sub-program, then the different findings could reflect different states emphasizing different sub-programs in their overall welfare-to-work program.

Conflicting findings have, in turn, engendered an active debate over whether strategies designed to provide more intensive training opportunities versus those intended to help welfare recipients get into jobs quickly–referred to as "work-first" approaches–are more effective in assuring welfare recipients' labor market success. In their synthesis of the findings of a large number of studies on welfare recipient welfare-to-work and training program outcomes, Barnow and Gubits (2002) report that longer-term, more intensive training strategies appear to be considerably more effective than short-term, work-first strategies. Alternatively, in their review of experimental evaluation findings from 20 programs, Bloom and Michalopolous (2001)

[1] See recent reviews of this literature by Leahey (2001) and Barnow and Gubits (2002).

concluded that the most effective programs combined employment-focused and education/training strategies, with some flexibility allowed in determining the appropriate mix of these approaches for a given individual. These conclusions are at least partly at odds with the welfare reforms of the mid-1990s, which were predicated on the belief that welfare recipients needed jobs, not education and training, to advance in the labor market (Haskins and Blank, 2001).

In this paper we use administrative data on welfare recipients in the states of Missouri and North Carolina to obtain separate estimates of the effects of participating in sub-programs of each state's welfare-to-work program. Our data consist of all women who enter welfare between 1997:2 and 1999:4. We follow recipients for up to sixteen quarters after they enter welfare and model their quarterly earnings as a function of demographic characteristics, prior welfare and work experience, and the specific types of welfare-to-work programs in which they participate.

We divide training into three categories on the basis of the intensity of the activity. First, we identify those who went through assessment but received no other training. Second, we consider those who participated in job readiness or job search activities, generally short term programs that are central to a work-first strategy. Third, we consider those who receive more intensive training, including basic education, vocational skills training, or other longer-term programs. The results from this analysis provide a clearer picture of differences in the effects of the sub-programs in terms of subsequent labor market success than found in previous studies.

The remainder of the paper is as follows. In the next section we provide a brief review of relevant literature. In section III we describe our data and present the details of our empirical analysis. In section IV we introduce the various sub-programs that are part of each state's

welfare-to-work program. In section V we present estimates of the effects of the various activities on the earnings of welfare recipients based on a simple linear model. Section VI presents results of tests of whether the simple measures properly capture participation, and section VII examines how the impact of participation differs by subgroup. In section VIII we conclude.

## II. Evaluation of Welfare-to-Work Programs

As recent literature reviews by Leahey (2001) and Barnow and Gubits (2002) point out, broad areas of disagreement exist concerning the effects of programs designed to increase the employment, earnings, and probability of exit among women receiving welfare. Barnow and Gubits (2002) note that one reason for these inconsistent findings is that many studies do not adequately distinguish between specific types of services or activities. For example, it is common to see studies group low-cost, job-oriented activities together with the traditionally more intensive and expensive on-the-job training programs, which essentially muddles the distinction between a work-first strategy and one intended to increase general human capital. Some studies are plagued by unreliable records of individuals' participation in specific program activities. Furthermore, there are always the problems associated with program services or activities that are not implemented as planned, and this likewise is typically not distinguished in individual service records.

Any program analysis faces the complication that approaches to aiding welfare recipients and other disadvantaged groups which focus on building human capital are rarely fully developed and implemented in welfare-to-work programs (Gueron and Pauly, 1991; Jencks and

Edin, 1992; Friedlander and Burtless, 1995). Even among programs that implement such strategies, few have collected sufficient longitudinal data to fully assess their effects. Studies that extend analyses beyond three year tend to reach different conclusions than short-term assessments; see for example, both the shorter-term and longer-term analyses of the effects of Riverside, California's GAIN program (Riccio et al., 1994 and Hotz et al., 2001).[2] In addition, Jacobson, LaLonde and Sullivan's research on displaced workers (1994, 2004), which uses an eight-year follow-up period, similarly suggests that estimates of participants earnings will be lower for about two years following a more intensive classroom training activity, but that subsequent earnings effects turn positive. They conclude that "…when follow-up periods are relatively short, allowance needs to be made for a transition period... a simple average of the effects during a short follow-up period will tend to underestimate the true, long-run effects of retraining" (Jacobson, LaLonde and Sullivan, 2004, p. 22).

An additional and related reason for the divergent findings is that researchers' definitions of what constitute longer- versus shorter-term programs differ widely. Some of the "longer-term," intensive education and training strategies in current welfare-to-work programs limit participation to 12 weeks. This contrasts with the earlier Job Opportunities and Basic Skills (JOBS) and Job Training Partnership Act (JTPA) programs, which generally defined long-term

[2]In the GAIN program, Riverside's emphasis on job search activities contrasted with other county approaches, particularly those of Alameda and Los Angeles, which emphasized human capital development and had more registrants in basic skills activities. Adjusted difference-in-differences comparisons of Riverside-Alameda and Riverside-Los Angeles showed that initial differences in program effects (on yearly earnings) were large and in favor of Riverside; however, these were followed by a substantial and steady decline in Riverside's effects, leading to better outcomes (i.e., higher employment rates and earnings) in LosAngeles and Alameda than in Riverside in the later years (4-6), albeit not significantly so.

training as lasting six months to two years. In addition, few studies assess the cumulative effects of multiple, short-term episodes of participation in various types of welfare-to-work or training program activities.

More generally, this brief discussion suggests that we need better measures of welfare-to-work and training program activities, as well as a better understanding of what we are measuring. Our study of the effects of welfare-to-work program activities on the labor market outcomes of female welfare recipients responds to several shortcomings in the current literature. First, we examine participation in specific welfare-to-work program activities over a period when the emphasis on and use of alternative service strategies were changing. With comprehensive information on the types of services provided and the timing of participation, we assess the average and cumulative effects of different types of program activities on welfare recipients' outcomes. We use complete data on the populations of welfare recipients in two states, facilitating a comparison of program effects across sites using the same approach and methods of analysis.

## III. Data and Method of Analysis

Our analysis examines cash recipients in the Temporary Assistance for Needy Families (TANF) programs in the states of Missouri and North Carolina. Our data come from records maintained to administer the states' welfare programs, providing basic demographic and household information.

Our examination of employment for welfare recipients relies on earnings data collected by the states in support of their unemployment insurance programs. Employers report total

earnings for each individual in covered employment during each quarter, and we merge this information with records of welfare recipients. While these data omit self-employment, illegal or informal employment, and a small number of jobs not covered by unemployment insurance, the overwhelming majority of employment within each state is included. For welfare recipients in Missouri, we use employment data collected by the states of Missouri and Kansas, ensuring employment coverage for welfare recipients in Kansas City, Missouri, who often work in Kansas.[3] For welfare recipients in North Carolina, we use that state's employment data. Of course, employment will be understated for individuals who move out of state after leaving welfare.[4] We correct all earnings measures for inflation relative to 1997:2.

We focus on female payees, age 18 but less than 65 years, in single parent households, excluding "child only" cases.[5] We use quarters as our time unit, so that an individual who receives TANF cash payments at any point during a given quarter is considered a welfare recipient during that quarter. This approach tends to smooth welfare receipt, eliminating apparent movements off of welfare that are due to administrative errors and cause a case to be

[3]Approximately one in seven jobs held by welfare recipients in Jackson County (the central county in the Kansas City metropolitan area) is in Kansas. In St. Louis, the proportion of individuals holding jobs in Illinois is much lower, reflecting the relatively poor economy in East St. Louis.

[4]Kornfeld and Bloom (1997) compare experimental (job-training program) earnings impact estimates calculated using unemployment insurance (UI) data with those based on other more costly earnings data sources and conclude that UI wage data provide valid estimates for all low income persons except a small subgroup of male youths with past arrests.

[5]The payee in a child only case is not a parent and receives payment on behalf of the children. Such payees normally do not face work or training requirements, and their income does not count in the calculation of benefits.

omitted from the files for a month or two.[6] We focus on the subset of individuals who are new entrants into the TANF cash program during the quarters 1997:2 through 1999:4, that is, those who receive payments during at least one of these quarters but not the prior quarter. We then follow these individuals for a total of up to 16 quarters, identifying their participation in work component activities and their earnings during each quarter.[7]

Our dependent variable is earnings obtained in a specific quarter, and the determinants include individual characteristics, labor market experience and welfare receipt prior to the welfare entry that we observe, measures of the local labor market during the current quarter, and work component participation after entering welfare. Since an individual who enters welfare and then obtains adequate employment will subsequently be required to move off of welfare, taking account of welfare exits would be tantamount to controlling for labor market success. We therefore structure our analysis to predict earnings in the 16 quarters beginning with welfare entry regardless of whether the individual leaves welfare during that period.

For an individual who leaves welfare for at least one quarter and then returns, we must decide how each entry onto welfare is to be treated. In the absence of welfare data prior to 1995 in North Carolina, we are not able to identify a "first" entry onto welfare. Eliminating subsequent welfare entries after the first entry observed would omit later welfare entries but not earlier ones. We therefore treat each entry onto welfare separately, counting the 16 quarters

---

[6]Luks and Brady (2003) studied the definition of welfare spells and concluded that because of "administrative churning," a break of up to three months is necessary in most cases to say with confidence that a recipient has gone off of welfare.

[7]We do not have a full 16 quarters of follow-up data for those entering TANF near the end of our entry window.

from that entry even if those same quarters are also included in the period following a prior or subsequent entry.[8] The analysis should thus be properly viewed as identifying earnings outcomes following a particular entry onto welfare. We control for the extent of the welfare experience in the prior two years, but we do not control for past participation in welfare-to-work activities or other training. Hence, the estimated impact of welfare-to-work (or work component[9]) participation is an incremental impact, indicating the effect beyond whatever training was received prior to entering welfare. As such, these estimates address the appropriate policy question of how the "average" welfare recipient's earnings trajectory is affected by these welfare-to-work and training program activities.

It is important to recognize that entry onto welfare is selective not only of particular kinds of individuals but is also selective along a temporal dimension for these individuals. We focus on female payees in single-parent households, with the obvious implication that a woman can only enter welfare during a period when she is caring for children without the financial support of a partner. It must also be a period in which her own earnings are low enough that she qualifies for TANF payments. For low-skilled individuals who are normally employed, entry onto welfare will occur in a period where there is an unexpected negative event or circumstance, that is, a period of unusually "bad luck." Insofar as such circumstances are not perfectly correlated over time, subsequent earnings would be expected to increase even in the absence of

[8]We found that in both Missouri and North Carolina, approximately one in ten quarters in our analysis appears twice, with less than 1 percent of earnings quarters appearing more than twice.

[9]We use the term "work component" to refer to the particular components or sub-programs of welfare-to-work program activities.

any government intervention. For this reason, our analysis will control for the time since entry onto welfare for the individual. This approach accounts for "regression to the mean" and for the impacts of the TANF program that may not be captured in work component participation.

Perhaps the most important challenge in assessing the impact of participation in work component programs is that participation is not random. Whether a TANF recipient is required to participate in a work component activity, and the activity that is recommended, depends on the circumstances of the recipient. Program rules exempt certain recipients from participation, such as individuals with very young children. Other exemptions are based on the judgment of the caseworker, as where an individual is viewed as facing personal obstacles that make it too difficult to engage in training or employment. There is also an element of personal choice. In Missouri, individuals who fail to participate in required programs face sanctions that reduce their payments (generally by about 25 percent) but are permitted to continue receiving these reduced TANF benefits until the five years of eligibility is exhausted. However, in North Carolina, those who fail to cooperate can have the full value of their benefit withheld. Equally important, in both Missouri and North Carolina, individuals who work a minimum number of hours are exempted from participation in work component activities. As a result, those who participate may be individuals whose labor market opportunities are particularly limited or who are facing an extended streak of bad luck.

We attempt to deal with the problem of selection in a number of ways. As noted above, we control for a variety of personal characteristics, including number and age of children and recipient educational attainment, in addition to labor market experiences in the two years prior to entering welfare. We also fit models that control for individual fixed effects. This approach, in

essence, obtains estimates of the impact of work component participation by comparing a recipient's experience prior to component participation with her subsequent experience. Finally, in a further attempt to control for selection, we assume that selection into assessment is similar to selection into the other sub-programs, and we therefore estimate the effects of the other programs relative to the effect of assessment. If assessment provides very little benefit to participants–which seems reasonable given the limited time individuals spend in assessment–this approach should provide accurate estimates of the impacts of job search and intensive training.

The models we estimate make a variety of assumptions about the effects of the program and the control variables used. In the initial set of models we present, program impacts are assumed to be the same for all individuals, and the linear structure is assumed to adequately control for all relevant variables. If impacts of either the program or control variables differ by subgroup, estimates of program effects may be biased. As a test of the models' assumptions, we estimate the model for three groups based on prior employment experience. Our findings suggest that even if the model's assumptions are, in fact, violated our basic findings are robust to these violations.

Matching methods are more general than linear models in that they provide estimates of program effects that relax several of the assumptions of the linear model. First, these models recognize that program effects may differ across individuals, explicitly producing estimates that are averages in the specified population. In addition, it is well-known that linear regression models of the kind we are using may perform badly when participants and comparison groups have very different values on control variables. In the extreme case, some of the treated cases may not have any comparable cases in the comparison sample, and a matching approach allows

us to identify such failures of common support. We implement propensity score matching to determine whether this approach provides different estimates. Since the results of the matching analysis produce very similar program effect estimates, we present them in abbreviated form in an appendix.

We also undertook an instrumental variables estimation approach, using variation over time in the level of participation in training programs across counties as the identifying variable. However, estimates were frequently implausible, suggesting that the identifying variable was correlated with unmeasured individual or labor market differences. We therefore do not report those estimates here.

## IV. Work Component Activities

The emphasis on moving welfare recipients to work began to take concrete form in the early 1990s with the implementation of the federal JOBS program, which, for the first time, required states to provide explicit services to recipients of Aid to Families with Dependent Children (AFDC). These programs expanded during the decade under federal waivers to states that allowed modification of the AFDC program and then under the federal reforms that replaced AFDC with Temporary Assistance for Needy Families (TANF). Nationally, there was substantial emphasis on the work-first approach, which focused primarily on getting recipients into jobs and only secondarily on training programs to improve skills. North Carolina explicitly adopted this strategy, whereas Missouri's approach was less clear. North Carolina's TANF program website describes its approach as "grounded in the 'work-first' philosophy," with a

"primary focus on job placement assistance."[10] Under JOBS, Missouri had tended to emphasize long-term training, and the program was modified in the direction of work-first only in the face of federal pressure implicit in the TANF rules. Nonetheless, Missouri's program retained a greater emphasis on long-term training, and, by 2000, Missouri had managed another policy turnaround, adopting rules that increased the ability of TANF recipients to engage in long-term training.

We have classified the various work component activities into six categories that allow comparability between Missouri and North Carolina. Table 1 provides basic information on the character of these activities. We present statistics on the duration of each activity and the number of hours per week of participation normally scheduled. We have calculated duration as the number of weeks between the date the activity commences and the date when it is completed.

As expected, there are substantial differences between activities in their duration and intensity, as well as differences between states. The first category, assessment, may include formal paper-and-pencil testing, as well as development of a "self-sufficiency plan," which provides a schedule of activities leading to employment and exit from TANF. In North Carolina, the numbers in the table show that these activities usually take only around three hours per week and extend for less than two weeks. In Missouri, both the reported duration and intensity of assessment activities are greater, but we have evidence that the longer duration is at least partly due to systematic errors in data entry.[11]

---

[10] North Carolina TANF website: http://www.joblink.state.nc.us/centers/resources.asp.

[11] Although case managers are formally required to specify the date when assessment is completed, in practice they may frequently fail to enter it. In some cases, this may occur when individuals are classified as exempt or are removed from the program for some other reasons.

Job search and job readiness training appear to have similar levels of intensity in both locations, although the upper tail is much higher for Missouri, likely reflecting data errors. The types of activities defined as "work experience" may differ appreciably across programs. Nonetheless, the patterns of participation are similar in the two states, again with the exception of Missouri's longer upper tail.

The category basic education includes attendance in public schools up through twelfth grade, and English as a second language training, although the largest category by far is adult education and literacy programs, such as those preparing individuals for the high school equivalency diploma. Interestingly, the median number of weeks is slightly greater in North Carolina than in Missouri, although there are more individuals with very long recorded involvement in Missouri.

The typical vocational and technical skills training program lasts about nine weeks in Missouri but only six weeks in North Carolina. In the case of post-secondary education, the median involvement is about 20 weeks in Missouri but only 14 in North Carolina. Yet, the number of hours of involvement per week is much higher in North Carolina, with the median over 40 hours as compared to less than 20 in Missouri, very likely due to differences in coding practices.[12]

---

By statute, assessment can take no more than 30 days, in contrast to a median reported assessment time of 4.9 weeks. We were told that apparent deviations from the 30-day limit very likely reflect entry errors.

[12]In Missouri, caseworkers are instructed to include in the scheduled hours one hour of study for each class hour, so 17 scheduled hours would indicate 8.5 hours of classes per week, more than half-time in most colleges. We suspect that the 42.5 hours per week scheduled in North Carolina reflects a more liberal coding for study time.

Despite differences in the duration of training, it is worth noting that the median duration of participation is short in all activities, less than 10 weeks in every category except for post-secondary education. Differences in duration among recipients in a particular type of activity are greater in Missouri than in North Carolina, due largely to the longer upper tail in the Missouri distribution.

In order to avoid problems associated with small numbers of observations, we group together activities in the bottom four categories as "intensive." Although there is appreciable variation among them, in both states median duration is longer for each of these categories than for assessment, or job readiness and job search. We therefore consider the three categories of participation as assessment, job readiness or job search, and intensive training. This classification also allows us to easily compare the effect of participation in work-first activities, such as job search, with more intensive activities, such as vocational education, that are designed to enhance participants' human capital. In a later section we consider how this aggregation affects our results.

Since a large share of participants enter more than one type of component, it is necessary to decide how impacts will be gauged in such cases. A simple additive model would assume that a component contributes to outcomes without regard for whether it is combined with other components. Such an approach would also require that we decide how individuals who participate in more than one component within our categories will be treated. In keeping with our focus on the impact of component intensity, we have identified the type of training by the highest intensity component that the individual participated in since coming onto welfare. In particular, a quarter is coded as "assessment only" if the individual received assessment services

at some prior point since coming onto welfare but has not received any other work component services. The "job readiness or job search" category applies to quarters following receipt of such services; although assessment may have occurred since entering welfare, no intensive services would have been received. The final category, intensive services, applies to quarters following the receipt of intensive services, without regard for whether any other services were received. Hence, the intensive service category includes any effects of other services received by such individuals, and impact estimates must be interpreted accordingly.

TANF recipients are most likely to participate in work components in the first year after they enter the program. Table 2 indicates job component participation by quarter since entering welfare. The sample of cases is limited to those entering welfare in 1997:2-1997:4 in order to allow us to examine a full 16 quarters of data following entry. The first column of figures shows that, in Missouri, 10 percent of the sample participates in some component in the entry quarter, whereas the number for North Carolina is 9 percent.

In both states, the proportion who had participated in at least one component (the sum of the last four columns) increases to over 20 percent in the quarter following entry. The number increases somewhat more slowly in successive quarters, exceeding half by the end of our 16-quarter period. Since most individuals do not enter welfare at the beginning of a quarter, it is easy to see that the hazard of beginning a first work component (that is the chance per unit time) must be at its highest in the quarter in which they enter welfare, declining in each quarter after that. In both states, for those individuals who have participated in at least one work component activity in the four years after entering TANF, about 80 percent had participated in the first two years.

Of course, the chance of participation declines over time in part because, after several quarters, a substantial portion of recipients have left welfare. Comparing columns 1 and 2 in the table, we see that by quarter 3 most of those who had not participated in any component had left welfare, and, by quarter 11, about 95 percent of those who had not participated had left welfare. These patterns likely reflect in part the strict work and program participation requirements for welfare recipients following the 1996 welfare reforms. In turn, it is clear that the welfare exit rate has an important impact on the pattern of overall participation in work component activities that we observe, since almost everyone who continues to receive welfare participates within several years.

Of those participating in a component in their first quarter, in both states more than half participate in assessment only, while about a quarter in both states are listed as participants in job search/readiness (these may or may not have participated in assessment). More than twice as many participants in Missouri (as in North Carolina)–nearly a third of those participating in some component–participate in an intensive activity in the first quarter. As we look at later quarters, we see that there is greater involvement in intensive activities in Missouri, but that by the end of the 16 quarters, most of the difference has disappeared.

Other patterns are quite similar across the two states, although by quarter 15, a substantially larger share of North Carolina's recipients have participated in assessment only, while more Missouri recipients have participated in job search/readiness. It is perhaps useful to note that in both Missouri and North Carolina, the number of recipients coded as having participated in assessment remains steady after about the eighth quarter. This implies that although new participants may be assessed each quarter, an equal number of those who were

assessed in prior quarters are receiving other services.

How has participation changed for those entering welfare during the period of our study? Table 3 examines cumulative participation at the eighth quarter after entering TANF by quarter of entry. We see in both states that the chance of participation in at least one component has increased from about 40 percent to over 50 percent. The two more intensive activities show substantial increases, both increasing by more than 50 percent. The assessment category does not increase over time. This is a result of the fact that although more individuals are, in fact, receiving assessment services, the growth in other services hides this. This analysis of work component participation suggests that the differences in welfare-to-work strategies adopted by North Carolina and Missouri are primarily rhetorical, and that patterns of participation in the different activities are not only similar, but changing in similar ways over time.

## V. Effects of Work Component Participation

The outcome of interest is the earnings in a quarter for an individual following entry onto TANF. The total sample size is the number of quarters following welfare entries, and for each of the models estimated, we correct the standard errors to account for clustering, i.e., the impact of a common error structure for earnings of a given individual.

Work component participation is captured by two alternative specifications. In the first, we identify whether an individual participated in any work component activity, with no distinction according to type of activity. In the second, we distinguish activities according to the three categories indicated above: assessment; job search and job readiness training; and intensive activities. As described above, a given quarter is identified by the highest-order activity that the

individual participated in since entering welfare. This assumes that a lower-order activity influences earnings in quarters after it occurs but only until the individual participates in a higher-order activity.

For each quarter following participation, we capture length of time since participation with 16 dummies. This approach allows impacts to differ arbitrarily by time since participation began, with the coefficient on each dummy providing an estimate of how the quarter's earnings are affected by participation. When the activity commences, and in the immediately subsequent quarters, earnings may be reduced relative to what they would have been in the absence of participation, since the individual may withdraw from the labor market. Benefits may vary as well over later quarters as individuals seek employment and obtain job experience.[13]

We present results based on the four models described in Table 4. Model 1 controls for calendar quarter (dummy for each quarter) and time since coming onto welfare (15 dummies). Model 2 adds controls for individual welfare recipient characteristics, the county unemployment rate in the quarter, and fixed effects for each county. Model 3 is a difference specification, where the dependent variable is the difference between earnings in the quarter in question and the base earnings. In this analysis, the base is the average earnings in the fifth through eighth quarters prior to entry onto welfare. We choose this period because preliminary tabulations indicated that it precedes the dip in earnings that accompanies entry onto welfare. Model 4 predicts earnings controlling for individual fixed effects. In this specification, recipient

[13]Heinrich et al. (2005) find that temporary help services employees have lower earnings than other welfare recipients but experience faster earnings growth.

characteristics that seldom change, such as race and education[14] are omitted, as are county dummies, because very few individuals move between counties.

Figure 1 presents the 16 quarterly impact estimates based on the specification that considers the effects of participation without differentiating by type of activity. Although there are obvious differences across models and states, the pattern of results is similar: participation is associated with an earnings loss in the initial quarter of participation, which grows smaller over time, ultimately becoming positive in most models. Model 1 shows the largest initial loss and only in Missouri is there ever any positive increment to earnings, and that only occurs in the last period. Model 2 produces similar results with a smaller initial loss and positive earnings occurring sooner. Model 3 suggests that the earnings increment becomes positive in about six to seven quarters and that the increment continues to grow. In model 4, earnings increments become positive in the third or fourth period after beginning participation but then quickly level out and begin to decline towards the end of the data.

Table 5 presents some basic information about the estimated effects. The top panel presents effects without differentiating by type of activity. The initial estimates reported in this table are the effects on earnings in the initial quarter of participation. For Missouri, model 1 implies that earnings are reduced by $480 during the initial quarter of participation, whereas models 2, 3, and 4 imply somewhat smaller losses. The table also reports the "crossover quarter," which is the first quarter with a positive estimated earnings increment, as well as the sum of the earnings increments over the initial quarter and the 15 subsequent quarters, applying

[14]Education information on the file is not generally updated during a welfare spell. Changes over time are as likely to reflect coding errors as genuine educational advancement.

an annual discount rate of 5 percent.[15] Finally, the table also reports the average quarterly effect, which is computed as the mean increment in earnings over the last five quarters. This will be the best estimate of the long-run impact of these programs if they provide earnings increments over many years.

Looking at our estimates of the cumulative effect, we can see that there are substantial differences across the three models. In both Missouri and North Carolina the estimates from models 1 and 2 suggest large losses due to participating in these programs, while the estimates from models 3 and 4 are either insignificantly different from zero or imply much smaller losses. Our estimates of the average effect also vary across models, although the variation is much smaller. Model 1 still produces negative estimates of the effect of the program, while model 3 produces significantly positive estimates of approximately $120 per quarter.

These results identify effects that combine all types of program activities, and they will be misleading if outcomes differ by type. Figure 2 shows the effects when the three kinds of activities are distinguished; the lower section of Table 5 provides summary measures based on these estimates. It is worth stressing that although these are estimated in a single model, the three categories of activity are exclusive, with a quarter classified by the highest-order activity undertaken since entering welfare and the length of time since initial participation in that activity.

Panel A of Figure 2 shows the effects of assessment only. We see that in both states and in all models, the initial increment is negative, varying between about $200 and $400. The

[15] Recall that we count the quarter in which someone first participates in a component as quarter 0. So, for example, if the crossover quarter is quarter 2, this is the second quarter after the quarter of initial entry into the program.

subsequent effect shifts noticeably, either turning positive (models 2 and 3) or approaching zero (model 4). Panel B shows that the effect of job search and job readiness training follows a similar pattern, although the initial increment is larger and the shifts are more dramatic. However, the estimated impact over the long term for job search and job readiness differs for the three models. For both Missouri and North Carolina the estimates based on model 4 become negative in the later quarters. In contrast, the estimates based on models 2 and 3 are positive in the later quarters.

Panel C of Figure 2 shows that for more intensive activities, the pattern is quite different. The earnings loss in the initial quarter of the activity is somewhat greater, but most notable is that the effects shift less dramatically in the quarter after beginning participation. Rather than an immediate increase, there is a gradual improvement, with the crossover point at least four quarters after beginning participation. Of course, part of the reason that the earnings decrement continues beyond the first quarter is that training itself may continue. However, given the median length of training (most training requires less than one quarter), such an impact will seldom extend past the quarter immediately following the initial participation quarter. The estimates therefore suggest, consistent with the Jacobson et al.'s findings (1994), that participants must undergo some period in the labor market before the benefits of the training become evident. Perhaps most notable, the figures suggest there is a substantial positive impact in all models in both states for the final year for which we have data.

Since model 4 controls for person fixed effects, which we expect to be of importance, we view it as the most credible of these models on *a prior* grounds. The patterns of impact tend to support this view. Estimates based on model 4 imply that the effects of intensive activities on

earnings become positive somewhat sooner than implied by the other models. At the same time, model 4 produces more plausible estimates for long run effects of intensive training. If intensive training increases earnings by augmenting human capital, we expect the benefits to stabilize after two or three years as model 4 suggests, in contrast to the apparent continued increases implied by models 2 and 3.

According to the bottom panel in Table 5, model 4 suggests modest net gains associated with intensive training over the 16 periods of our analysis, assuming a 5 percent discount rate. In addition, our estimate of the average effect for model 4, which is our best estimate the long-term impact of the program, is $186 for Missouri and $215 for North Carolina. Although the implied $800 annual earnings increment will not alter the life chances of recipients in a dramatic way, the present value of such a lifetime earnings supplement is substantial. In both states, model 3 implies substantially larger impacts, as does model 2 in Missouri.[16]

As noted above, model 4 controls for person fixed effects, but there may be intertemporal selection effects associated with participation that may bias our results. In particular, since participation is required for individuals who are unable to find employment, work component activities could occur during periods when an individual faces particularly poor prospects. In this case, earnings would ultimately be expected to improve for such individuals even in the absence of intervention. If this were the dominant effect, both the earnings loss and the later

[16]In an experimental evaluation of the National Jobs Corps program, Mathematical Policy Research Inc. tracked the earnings of participants and control group members over a four-year period and estimated that the average earnings gains for Job Corps participants in the last year of follow-up was $1,150 (McConnell and Glazerman, 2001). The estimated lifetime gains to participants, assuming a 4 percent discount rate and assuming that this benefit would continue indefinitely, is $31,000, which is $27,000 greater than the estimated gain in the follow-up period.

improvement could be attributed to selection effects.[17]

How important is such selection? One indicator may be the estimated impact of assessment. In both states, assessment involves a very small time investment, and it is unlikely that such a minimal intervention could have a substantial effect on long-term earnings. Therefore, our estimates showing an impact of assessment suggest that we may actually be observing the effects of selection rather than program impact. On the other hand, the impact of assessment, based on model 4, is both small and not significantly different from zero in the last five quarters for which we have data, suggesting that selection may not be important in explaining ultimate earnings.

If we assume that selection into assessment is similar to selection into the other programs, then one correction for selection is to measure the effect of these other programs relative to the effect of assessment. This is a reasonable correction assuming that assessment has very little impact on earnings–which seems plausible given what is involved in assessment. Figure 3 presents our quarterly estimates of the incremental effect on earnings of the job search/readiness and intensive training programs, based on model 4 where the effect of these programs is relative to the effect of assessment.[18]

The top panel of Figure 3 shows that, in both states, the incremental effect of job

---

[17]Not all selection effects are expected to have this impact. Some individuals are exempted from training requirements because they face barriers that make employment particularly difficult. As a result, some of those who do not participate in training may actually have inferior immediate employment prospects than participants.

[18] In this specification we have dropped all observations prior to the quarter in which an individual participates in a program. Individuals who never participate in a training program are completely dropped from the analysis.

search/readiness in all but the first two quarters is essentially zero. Given the limited time individuals spend in these programs, this result is not surprising. The bottom panel reveals a pattern quite similar to that seen in Figure 2. The impact of intensive training is initially negative but exhibits a steady increase, becoming positive around the fourth quarter after entering the program and the growth in impact slowing around the tenth quarter. Table 6 presents some basic information about our estimates. Here we see that in Missouri our estimate of the total effect of job search/readiness is essentially zero, while in North Carolina it is negative and significant but much smaller than our previous estimates. In both states, our estimates of the mean effect in the last five quarters is -$24 and not significant. Our estimate for the cumulative effect of the intensive training programs for Missouri is approximately $1800, while for North Carolina it is are approximately $1300. Our estimates of the average quarterly effect for both states are very similar (approximately $300).

We view these final figures as our best estimate of the impact of job search/readiness and intensive training on the earnings of workers who participate in these programs. These estimates suggest that, in the long run, workers who participate in more intensive training programs experience a larger increase in earnings than workers who participate in programs designed to more quickly move workers back into the labor market. Our estimates of the total effects of these programs show that this is true even after taking into account the fact that individuals participate in the intensive training programs for longer periods of time.

In order to make stronger statements concerning which of these subprograms are more beneficial to society as a whole, we would need data on the per-person cost of each program. Unfortunately, these data are not publicly available, and precise cost estimates may not be

calculable even with internal agency data, given the lack of detailed record-keeping on program expenses by activity and/or participant (Heinrich, Marschke and Zhang, 1998). However, we can say, at least from the perspective of participants, that participating in the more intensive training programs produces a bigger increment, on average, in quarterly earnings.

## VI. Disaggregating Work Component Activities

The specification above provides parsimony at the cost of many assumptions about how participation in work component activities affects labor market success. In this section, we investigate the extent to which the grouping of various activities as "intensive" hides important differences in impact among them. Since we view our fixed-effects specification that measures impacts of the sub-programs relative to assessment as our most appropriate model, this is the model we focus on in the rest of the paper.

In the above analyses, we have grouped three kinds of activities as "intensive," reflecting the greater time investment that they entail: work experience, basic education, and vocational and technical training or post-secondary education. Table 7 presents statistics where we estimate separate effects for these three activities.[19] Here we use a hierarchical coding system parallel to that described above, so that in a given quarter, a training activity is coded to identify only the highest order participation since coming onto welfare. The ordering of these activities (originally grouped together) continues to be based on approximate intensity: work experience

[19]We also present estimates of impacts for job search and job readiness training obtained in this specification. These estimates are essentially the same as those reported in Table 6, confirming that our specification of control variables is not seriously biased by the aggregation of intensive activities.

the lowest order, followed by basic education, and then vocational and technical training or post-secondary education.[20]

In both Missouri and North Carolina, there are important differences in impacts of intensive activities. For all the disaggregated sub-program activities, it is evident that the initial earnings decrement associated with participation is smaller in Missouri than in North Carolina, although the rank order of estimate sizes is the same. In both states, the initial earnings loss is largest for vocational and technical training/post-secondary education but the cumulative estimated effect is positive and large. In Missouri, participation in this class of programs contributes to significant gains in earnings, with program effects turning positive in the third quarter and implying an average earnings gain of nearly $800 in quarters 11-15. The comparable estimated average gain resulting from participation in vocational and technical training/post-secondary education in North Carolina is approximately half as large, but still substantial.

The impacts of participation in basic education and work experience appear quite different. The crossover to positive returns from training occurs much later for participants in basic education, and the estimated cumulative effect of participation is negative and large. The pattern of effects for those who participated in work experience is slightly more negative in North Carolina and somewhat more favorable in Missouri as compared to basic education. Overall, it is clear that the impacts of these measures are much smaller–as well as less beneficial–as compared to vocational and technical training/post-secondary education.

---

[20]In Missouri, the classification of activities changed during our study period. Through 1998, there was a separate coding for activities classified as "vocational and technical training" and "post-secondary education," but after 1998, these were combined. To accommodate this coding, we use a combined measure for these activities.

These results suggest that most of the positive impacts we observe for this class of training can be traced to those who participate in vocational and technical training/post-secondary education. Work experience and basic education imply relatively modest initial costs and few ultimate benefits. We must conclude that although intensive activities, taken together, may imply important benefits, not all intensive activities produce comparable market returns. It appears likely that if marginal individuals can be placed in vocational and technical training, or post-secondary education, rather than other kinds of training activities, they will experience greater benefits.

In fact, vocational and technical training/post-secondary education is the most common of the intensive activities we observe, and it became more important over the period of our study. Slightly more than a third of intensive activities in Missouri at the beginning of our period were in this category, increasing to one-half by the end, while the comparable figures in North Carolina increased from just over three-fifths to nearly 70 percent.[21]

## VII. Effects of Work Component Participation: Comparisons Between Subgroups

All of the models we have fitted assume that the impact of program participation is the same for all individuals. Of course, two issues are of concern. The first is that if effects differ by individual characteristics, there may be policy implications for the kinds of individuals who should be channeled into training. The second is that because the linear model assumes that effects do not vary across individuals, it may produce biased estimates, which may not even

[21]These percentages are based on examining participation by individuals in the first eight quarters after entering the program. Participation in any of the three intensive categories is considered, and an individual may participate in more than one category.

identify average program effects.

In our initial analysis, we conducted simple tests of this assumption by dividing the sample by education, race and work history in the eight quarters prior to entering welfare. In Figure 4, we present estimates where we have fitted our models on our sample divided by work history, since we found these differences most substantial. Table 8 presents summary statistics for these models. The three groups are those with no earnings or earnings only in one quarter during that two-year period, those with two to six quarters of earnings, and those with seven or eight quarters of earnings.

Among participants in North Carolina, there are some differences in our estimates of the total effect of the program. Those with the most limited work histories experience smaller initial losses and obtain greater ultimate gains than the other groups as a result of participation in intensive activities. In effect, the earnings profile is shifted up for these individuals, resulting in a substantially larger cumulative effect. However, the estimated average quarterly effects differ much less, so estimates of ultimate benefits are not so discrepant. Other differences across groups are smaller.

Overall, patterns for the three groups are quite similar. Perhaps most significant, regardless of any differences, the estimated impacts are larger for intensive training than job search for all three groups of workers. Our primary conclusion–that intensive training provides larger benefits to workers than job search or job readiness training–appears robust.

As a further check on the specification of our model we have estimated the effects of these sub-programs using propensity score matching (See Rosenbaum and Rubin (1983) and Mueser, Troske, and Gorislavsky (2004)) continuing to use quarters as the unit of analysis.

Matching methods can provide valid estimates of the average impact of a program even when program impacts differ across participants. Matching will also provide valid estimates when the effects of control variables deviate from the assumptions of the linear model. The disadvantage of matching is that there is no form of matching corresponding exactly to our fixed-effect model, which is our preferred specification.

The results based on a matching approach are presented in Appendix Figure 1. This figure shows that the matching estimates are quite similar to the comparable estimates from our linear models (model 3) suggesting that the linear model does not suffer from the problems matching is designed to address. Given that we cannot implement our preferred specification in the matching framework, we choose not to pursue this analysis further.

## VIII. Conclusion

A primary objective of this study was to provide a clearer picture of the differences in the effects of work components or sub-programs of welfare-to-work programs in terms of welfare recipients' subsequent labor market outcomes. Our analyses covered a four-year period when the emphasis on and use of alternative service strategies were changing.

As described earlier, North Carolina and Missouri adopted somewhat different approaches to helping welfare recipients become employed, with North Carolina more explicitly focused on work-first strategies, although our analysis of patterns of subprogram participation suggested that, in implementation, these differences were minimal. The results of the models estimated separately for these two states showed that despite geographical, demographic and policy differences between them, the findings of the effects of work components participation on

earnings were remarkably consistent. Generally, the impacts of participation were initially negative but improved over time, in most cases turning positive by the sixth quarter after participation. We found that more intensive training was associated with greater initial earnings losses but also greater gains in the long run.

The structure of these results makes clear that an extended follow-up period is essential; a study of the programs we consider with up to three years of data would find no evidence of positive impacts. Our findings also provide support for those who argue that there are benefits of more intensive training, and that these gains are generally realized over a longer post-program period. On the other hand, not all kinds of intensive training appear to provide equal benefits; vocational, technical and post-secondary education may be more beneficial than basic education or work experience. That we observe increased emphasis on participation in more intensive training activities–and on the most productive activities within that category–in both states, is therefore encouraging and may yield substantial benefits.

## References


Barnow, Burt and Daniel B. Gubits. 2002. "Review of Recent Pilot, Demonstration, Research and Evaluation Initiatives to Assist in the Implementation of Programs Under the Workforce Investment Act." Chapter 5 of the Strategic Plan for Pilots, Demonstrations, Research, and Evaluations, 2002-2007, U.S. Department of Labor.

Bloom, Dan and Charles Michalopoulos. 2001. *How Welfare and Work Policies Affect Employment and Income: A Synthesis of Research*. New York: Manpower Demonstration Research Corporation.

Friedlander, Daniel and Gary Burtless. 1995. *Five Years After: The Long-Term Effects of Welfare-to-Work Programs*. New York: Russell Sage.

Gueron, Judith and Edward Pauly. 1991. *From Welfare to Work*. New York: Russell Sage.

Haskins, Ron and Rebecca M. Blank. 2001. "Welfare Reform Reauthorization." *Poverty Research News* 5(6), (see http://www.jcpr.org/newsletters/vol5_no6/index.html).

Heinrich, Carolyn J., Peter Mueser, and Kenneth Troske. 2005. "Welfare to Temporary Work: Implications for Labor Market Outcomes." *Review of Economics and Statistics* 87(1).

Heinrich, Carolyn J., Gerald Marschke and Annie Zhang. 1998. "Using Administrative Data to Estimate the Cost-Effectiveness of Social Program Services." Technical report, The University of Chicago.

Hotz, V. Joseph, Guido Imbens and Jacob Klerman. 2001. "The Long-Term Gains from GAIN: A Re-Analysis of the Impacts of the California GAIN Program." NBER working paper 8007, Cambridge, MA.

Jacobson, Louis S., Robert J. LaLonde, and Daniel G. Sullivan. 1994. "The Returns from Classroom Training for Displaced Workers." Federal Reserve Bank of Chicago Working Paper No. 94-27. Chicago, IL.

Jacobson, Louis S., Robert J. LaLonde, and Daniel G. Sullivan. 2004. "Estimating the Returns to Community College Schooling for Displaced Workers." IZA discussion paper No. 1017, Bonn. Germany.

Jencks, Christopher and Kathryn Edin. 1992. "The Real Welfare Problem." In *Rethinking Social Policy*, Christopher Jencks (ed.). Cambridge, MA: 204-235.

Kornfeld, Robert and Howard S. Bloom, 1997. "Measuring Program Impacts on Earnings and Employment: Do UI Wage Reports from Employers Agree with Surveys of Individuals?" Working paper, Abt Associates and New York University.

Leahey, Erin. 2001. "A Help or Hindrance? The Impact of Job Training on the Employment Status of Disadvantaged Women." *Evaluation Review* 25(1): 29-54.

Luks, Samantha and Henry E. Brady. 2003. "Defining Welfare Spells: Coping with Problems of Survey Responses and Administrative Data." *Evaluation Review* 27(4): 395-420.

McConnell, Sheena and Steven Glazerman. 2001. "National Job Corps Study: The Benefits and Costs of Job Corps." Report Submitted to U.S. DOL by Mathematica Policy Research, Inc. MRP Ref. No. 8140-530. Washington D.C. (June).

Mueser, Peter, Kenneth Troske and Alexey Gorislavky. 2004. "Using State Administrative Data to Measure Program Performance." Unpublished paper, University of Missouri.

Riccio, James, Daniel Friedlander and Stephen Freedman. 1994. *GAIN: Benefits, Costs and Three-Year Impacts of a Welfare-to-Work Program*. New York: Manpower Demonstration Research Corporation.

Rosenbaum, P. and D. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika* 70: 41-55.

**Table 1: Work Component Activities Duration and Intensity**

| | Missouri | | | | North Carolina | | | |
|---|---|---|---|---|---|---|---|---|
| | Duration (Weeks) | | | | Duration (Weeks) | | | |
| Activity | 25th Percentile | Median Duration | 75th Percentile | Median Hours per Week | 25th Percentile | Median Duration | 75th Percentile | Median Hours per Week |
| Assessment | 1.6 | 4.9 | 59.7 | 20 | 0.0 | 1.4 | 4.3 | 3 |
| Job search and job readiness training | 1.6 | 4.4 | 23.0 | 25 | 2.4 | 4.9 | 10.3 | 20 |
| Work experience | 1.9 | 6.4 | 28.1 | 20 | 2.4 | 5.7 | 12.1 | 26 |
| Basic education | 1.6 | 5.9 | 30.9 | 20 | 4.1 | 8.4 | 15.0 | 20 |
| Vocational and technical skills training | 2.6 | 9.4 | 44.4 | 25 | 2.7 | 6.3 | 13.0 | 35 |
| Post-secondary education | 3.6 | 19.3 | 116.4 | 17 | 7.4 | 13.8 | 24.5 | 42.5 |

Statistics are based on all work component activities that begin in the quarters 1997:2-2000:2 in Missouri and 1997:2-2001:4 in North Carolina for TANF payees who are females aged at least 18 but less than 65, in the single parent program and not in child only cases.

**Table 2: Component Cumulative Participation by Quarter After TANF Entry (Percent)**

| Quarter After TANF Entry | No Component Receiving TANF | No Component and Exit from TANF | Assessment Only | Job Search/ Readiness, No Intensive Training | Intensive Training | Total |
|---|---|---|---|---|---|---|
| **Missouri** | | | | | | |
| 0 | 90.2 | 0.0 | 5.1 | 1.8 | 3.0 | 100.0 |
| 1 | 64.8 | 14.8 | 8.9 | 4.0 | 7.6 | 100.0 |
| 2 | 44.8 | 28.8 | 11.3 | 5.4 | 9.8 | 100.0 |
| 3 | 32.8 | 36.4 | 12.6 | 6.6 | 11.6 | 100.0 |
| 5 | 19.4 | 43.5 | 13.5 | 9.3 | 14.3 | 100.0 |
| 7 | 11.6 | 46.3 | 13.7 | 11.7 | 16.8 | 100.1 |
| 11 | 5.9 | 45.9 | 14.2 | 13.9 | 20.1 | 100.0 |
| 15 | 3.3 | 44.7 | 14.2 | 14.6 | 23.2 | 100.0 |
| **North Carolina** | | | | | | |
| 0 | 90.9 | 0.0 | 6.2 | 1.7 | 1.2 | 100.0 |
| 1 | 65.9 | 11.1 | 13.1 | 5.0 | 4.9 | 100.0 |
| 2 | 40.2 | 31.6 | 14.6 | 6.4 | 7.2 | 100.0 |
| 3 | 26.7 | 41.2 | 15.8 | 7.4 | 8.9 | 100.0 |
| 5 | 13.7 | 47.6 | 17.4 | 9.3 | 12.0 | 100.0 |
| 7 | 7.2 | 49.6 | 17.8 | 10.4 | 14.9 | 100.0 |
| 11 | 2.6 | 49.4 | 18.1 | 11.3 | 18.6 | 100.0 |
| 15 | 1.6 | 48.0 | 17.9 | 11.7 | 20.8 | 100.0 |

**Table 3: Component Cumulative Participation Eight Quarters After Entering Welfare by Quarter of Entry (Percent)**

| First Quarter in TANF Spell | No Component, Receiving TANF | No Component and Exit from TANF | Assessment Only | Job Search/ Readiness, No Intensive Training | Intensive Training | Total |
|---|---|---|---|---|---|---|
| **Missouri** | | | | | | |
| 1997:2 | 8.4 | 51.3 | 14.1 | 10.5 | 15.8 | 100.0 |
| 1997:3 | 6.4 | 52.5 | 13.3 | 11.5 | 16.3 | 100.0 |
| 1997:4 | 6.5 | 48.6 | 13.6 | 13.1 | 18.1 | 100.0 |
| 1998:1 | 6.8 | 47.0 | 13.8 | 15.1 | 17.3 | 100.0 |
| 1998:2 | 7.7 | 46.4 | 11.1 | 18.3 | 16.5 | 100.0 |
| 1998:3 | 6.4 | 45.7 | 11.4 | 16.7 | 19.7 | 100.0 |
| 1998:4 | 7.0 | 41.8 | 10.9 | 18.6 | 21.8 | 100.0 |
| 1999:1 | 6.9 | 38.3 | 11.9 | 19.7 | 23.2 | 100.0 |
| 1999:2 | 7.2 | 38.5 | 12.4 | 19.6 | 22.3 | 100.0 |
| 1999:3 | 6.6 | 37.4 | 12.8 | 18.4 | 24.7 | 100.0 |
| 1999:4 | 6.6 | 35.6 | 14.9 | 16.1 | 26.8 | 100.0 |
| **North Carolina** | | | | | | |
| 1997:2 | 6.0 | 50.0 | 18.8 | 10.2 | 15.0 | 100.0 |
| 1997:3 | 5.5 | 50.2 | 17.7 | 10.4 | 16.2 | 100.0 |
| 1997:4 | 5.4 | 48.4 | 17.7 | 11.4 | 17.1 | 100.0 |
| 1998:1 | 3.8 | 44.2 | 19.0 | 13.0 | 20.0 | 100.0 |
| 1998:2 | 3.7 | 44.5 | 19.0 | 12.9 | 20.0 | 100.0 |
| 1998:3 | 3.9 | 42.6 | 17.6 | 13.3 | 22.6 | 100.0 |
| 1998:4 | 3.3 | 39.1 | 17.8 | 15.6 | 24.3 | 100.0 |
| 1999:1 | 3.2 | 36.6 | 17.9 | 15.5 | 26.8 | 100.0 |
| 1999:2 | 3.2 | 35.3 | 19.6 | 15.5 | 26.4 | 100.0 |
| 1999:3 | 2.9 | 35.0 | 17.9 | 15.6 | 28.6 | 100.0 |
| 1999:4 | 2.9 | 33.0 | 17.0 | 16.4 | 30.7 | 100.0 |

**Table 4: Regression Models Estimating the Impact of Work Component Participation on Quarterly Earnings**

| **Controls** | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Constant | x | x | x | x |
| Current quarter (calendar quarter dummy) | x | x | x | x |
| Time since coming onto welfare (15 dummies) | x | x | x | x |
| Unemployment rate in that county in that quarter | | x | x | x |
| Dummy for each county | | x | x | |
| Age and age-squared | | x | x | x |
| Age of oldest child | | x | x | x |
| Number of children | | x | x | x |
| Nonwhite | | x | x | |
| Less than high school | | x | x | |
| Prior 8 quarter work history: Proportion of time working, no work, worked all 8 quarters | | x | | x |
| Earnings prior 4 quarters | | x | | x |
| Earnings prior quarters 5-8 | | x | | x |
| Prior 8 quarter proportion of time receiving welfare | | x | | x |
| Fixed person effects | | | | x |
| Difference | | | x | |

**Table 5: Estimates of the Impact of Work Component Participation on Quarterly Earnings**

| | | Missouri N = 939,405 | | | | North Carolina N = 1,038,490 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) |
| **Participation in any component** | Initial effect | -480 | -416 | -365 | -297 | -635 | -481 | -394 | -332 |
| | | (8) | (7) | (9) | (7) | (7) | (7) | (9) | (7) |
| | Crossover quarter | 15 | 9 | 6 | 3 | . | 13 | 5 | 4 |
| | Cumulative effect (16 quarters)[1] | -2154 | -719 | 67 | 82 | -3956 | -1634 | -61 | -343 |
| | | (189) | (168) | (198) | (90) | (197) | (178) | (207) | (89) |
| | Quarterly average effect (quarters 11-15)[2] | -40 | 80 | 127 | 37 | -120 | 12 | 121 | -9 |
| | | (24) | (22) | (25) | (10) | (25) | (23) | (25) | (10) |
| **Participation in:** | | | | | | | | | |
| Assessment Only | Initial effect | -389 | -336 | -276 | -187 | -615 | -305 | -221 | -161 |
| | | (11) | (10) | (13) | (11) | (10) | (9) | (11) | (9) |
| | Crossover quarter | 13 | 7 | 1 | 1 | 4 | 1 | 1 | 1 |
| | Cumulative effect (16 quarters)[1] | -1026 | -95 | 385 | 625 | 60 | 767 | 1886 | 801 |
| | | (296) | (262) | (306) | (130) | (266) | (242) | (280) | (116) |
| | Quarterly average effect (quarters 11-15)[2] | 10 | 63 | 73 | 9 | 128 | 150 | 228 | 20 |
| | | (39) | (36) | (40) | (16) | (34) | (32) | (35) | (14) |
| Job search and job readiness training | Initial effect | -432 | -415 | -353 | -299 | -947 | -591 | -458 | -413 |
| | | (11) | (11) | (14) | (11) | (11) | (10) | (14) | (11) |
| | Crossover quarter | 7 | 7 | 2 | 1 | 13 | 13 | 3 | 2 |
| | Cumulative effect (16 quarters)[1] | -558 | -58 | 776 | -117 | -3279 | -1473 | 549 | -884 |
| | | (293) | (266) | (310) | (133) | (312) | (289) | (334) | (142) |
| | Quarterly average effect (quarters 11-15)[2] | 14 | 93 | 150 | -68 | -16 | 43 | 179 | -82 |
| | | (43) | (39) | (44) | (19) | (45) | (42) | (46) | (20) |
| Intensive Training | Initial effect | -769 | -639 | -569 | -462 | -1137 | -871 | -761 | -588 |
| | | (9) | (9) | (12) | (10) | (9) | (9) | (12) | (10) |
| | Crossover quarter | 13 | 7 | 6 | 4 | 11 | 10 | 7 | 4 |
| | Cumulative effect (16 quarters)[1] | -3099 | -458 | 344 | 461 | -3201 | -1906 | -410 | 534 |
| | | (254) | (229) | (262) | (124) | (286) | (269) | (305) | (126) |
| | Quarterly average effect (quarters 11-15)[2] | 50 | 267 | 303 | 186 | 200 | 214 | 277 | 215 |
| | | (37) | (34) | (36) | (16) | (45) | (44) | (47) | (18) |

Controls as indicated in Table 4. Standard errors in parentheses.

[1]Sum across 16 quarters using a 5% annual discount rate.

[2]Mean of the estimated effects over quarters 11-15 following entry, without discounting.

**Table 6: Estimates of the Impact of Work Component Participation on Quarterly Earnings Relative to Assessment**

| Participation in: | | Missouri N = 400,226 | North Carolina N = 469,050 |
|---|---|---|---|
| Job search and job readiness training | Initial effect | -63 | -158 |
| | | (17) | (15) |
| | Crossover quarter | 2 | 13 |
| | Cumulative effect (16 quarters)[1] | 87 | -445 |
| | | (229) | (201) |
| | Quarterly average effect (quarters 11-15)[2] | -24 | -24 |
| | | (25) | (23) |
| Intensive training | Initial effect | -139 | -282 |
| | | (18) | (15) |
| | Crossover quarter | 4 | 4 |
| | Cumulative effect (16 quarters)[1] | 1808 | 1281 |
| | | (239) | (205) |
| | Quarterly average effect (quarters 11-15)[2] | 308 | 296 |
| | | (24) | (23) |

Controls as indicated for model 4 in Table 4. Standard errors in parentheses

[1]Sum across 16 quarters using a 5% annual discount rate.

[2]Mean of the estimated effects over quarters 11-15 following entry, without discounting.

**Table 7: Estimates of the Impact of Work Component Participation on Quarterly Earnings Relative to Assessment: Disaggregated Measures**

| Participation in: | | Missouri N = 400,226 | North Carolina N = 469,050 |
|---|---|---|---|
| Job search and job readiness training | Initial effect | -76 | -165 |
| | | (17) | (15) |
| | Crossover quarter | 2 | 13 |
| | Cumulative effect (16 quarters)[1] | 186 | -539 |
| | | (228) | (200) |
| | Quarterly average effect (quarters 11-15)[2] | -9 | -29 |
| | | (25) | (23) |
| Work experience | Initial effect | -124 | -243 |
| | | (28) | (29) |
| | Crossover quarter | 2 | 4 |
| | Cumulative effect (16 quarters)[1] | 682 | -858 |
| | | (357) | (370) |
| | Quarterly average effect (quarters 11-15)[2] | 68 | -116 |
| | | (39) | (46) |
| Basic education | Initial effect | -36 | -127 |
| | | (24) | (32) |
| | Crossover quarter | 14 | 6 |
| | Cumulative effect (16 quarters)[1] | 4 | -17 |
| | | (30) | (58) |
| | Quarterly average effect (quarters 11-15)[2] | -815 | -721 |
| | | (294) | (431) |
| Vocation and technical training or post-secondary education | Initial effect | -260 | -312 |
| | | (21) | (16) |
| | Crossover quarter | 3 | 4 |
| | Cumulative effect (16 quarters)[1] | 5312 | 2003 |
| | | (285) | (218) |
| | Quarterly average effect (quarters 11-15)[2] | 776 | 429 |
| | | (31) | (25) |

Controls as indicated for model 4 in Table 4. Standard errors in parentheses

[1]Sum across 16 quarters using a 5% annual discount rate.

[2]Mean of the estimated effects over quarters 11-15 following entry, without discounting.

**Table 8: Estimates of the Impact of Work Component Participation on Quarterly Earnings Relative to Assessment**

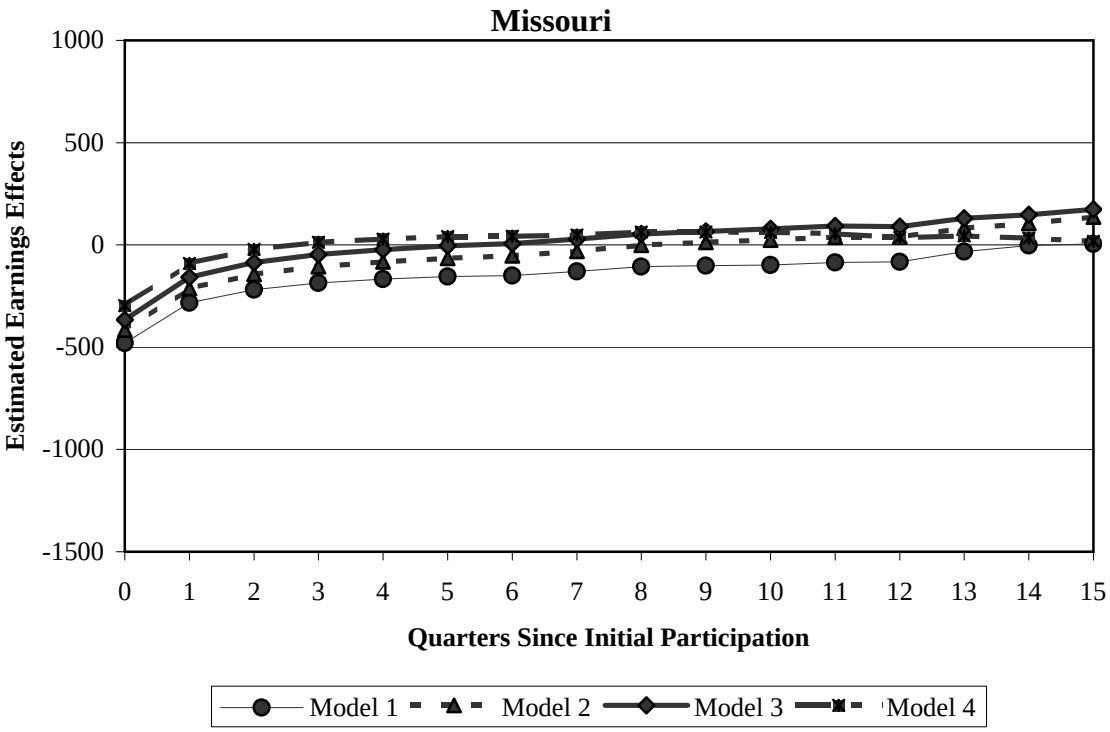
| Participation in: | | Work 0-1 qrts | Work 2-6 qrts | Work 7-8 qrts |
|---|---|---|---|---|
| | | **Missouri** | | |
| Job search and job readiness training | Initial effect | -80<br>(32) | -35<br>(24) | -55<br>(39) |
| | Crossover quarter | 1 | 2 | 10 |
| | Cumulative effect (16 quarters)[1] | 712<br>(440) | 356<br>(328) | -813<br>(525) |
| | Quarterly average effect (quarters 11-15)[2] | 79<br>(44) | -35<br>(37) | -99<br>(55) |
| Intensive training | Initial effect | -78<br>(34) | -105<br>(26) | -191<br>(44) |
| | Crossover quarter | 2 | 3 | 4 |
| | Cumulative effect (16 quarters)[1] | 2770<br>(476) | 2365<br>(352) | 2417<br>(594) |
| | Quarterly average effect (quarters 11-15)[2] | 341<br>(42) | 314<br>(35) | 513<br>(58) |
| **Participation in:** | | **North Carolina** | | |
| Job search and job readiness training | Initial effect | -63<br>(28) | -162<br>(22) | -177<br>(29) |
| | Crossover quarter | 1 | 2 | 4 |
| | Cumulative effect (16 quarters)[1] | 1000<br>(407) | -631<br>(313) | 54<br>(385) |
| | Quarterly average effect (quarters 11-15)[2] | 35<br>(43) | -92<br>(36) | 103<br>(43) |
| Intensive training | Initial effect | -99<br>(31) | -251<br>(23) | -322<br>(30) |
| | Crossover quarter | 2 | 4 | 4 |
| | Cumulative effect (16 quarters)[1] | 3958<br>(450) | 1396<br>(329) | 1630<br>(402) |
| | Quarterly average effect (quarters 11-15)[2] | 408<br>(46) | 275<br>(36) | 387<br>(41) |

Controls as indicated for model 4 in Table 4.

[1]Sum across 16 quarters using a 5% annual discount rate.

[2]Mean of the estimated effects over quarters 11-15 following entry, without discounting.

**Figure 1: Estimates of Effects of Participation in Any Component by Quarter**



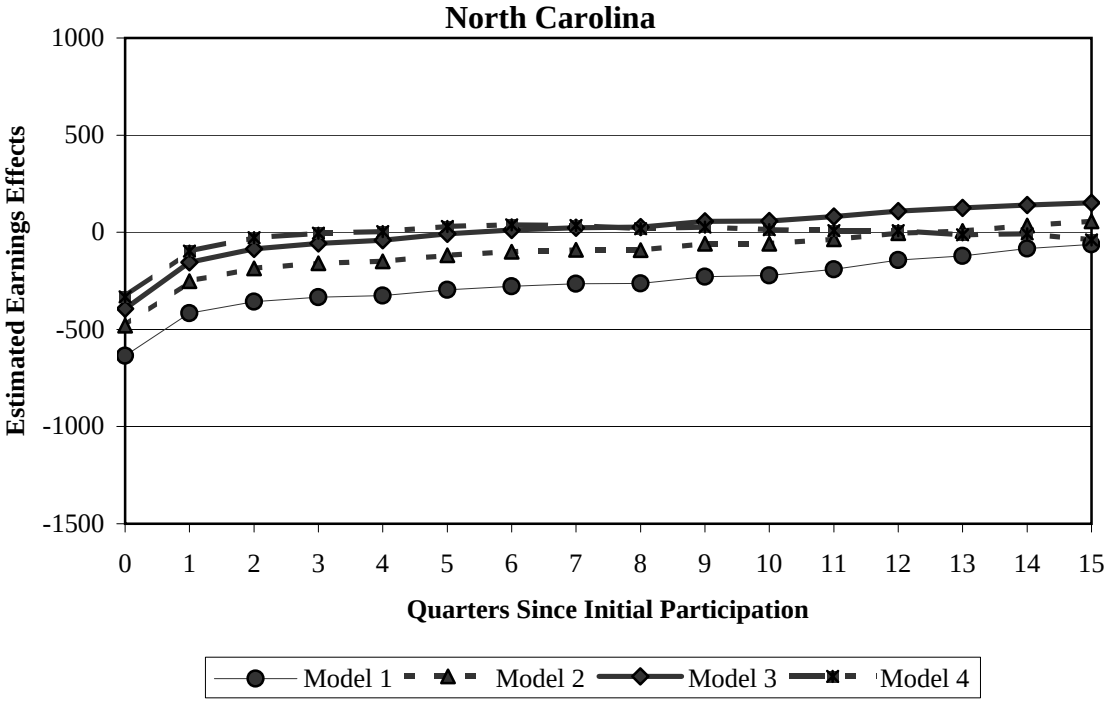



**Figure 2: Estimates of Effects of Participation in Sub-Programs by Quarter**

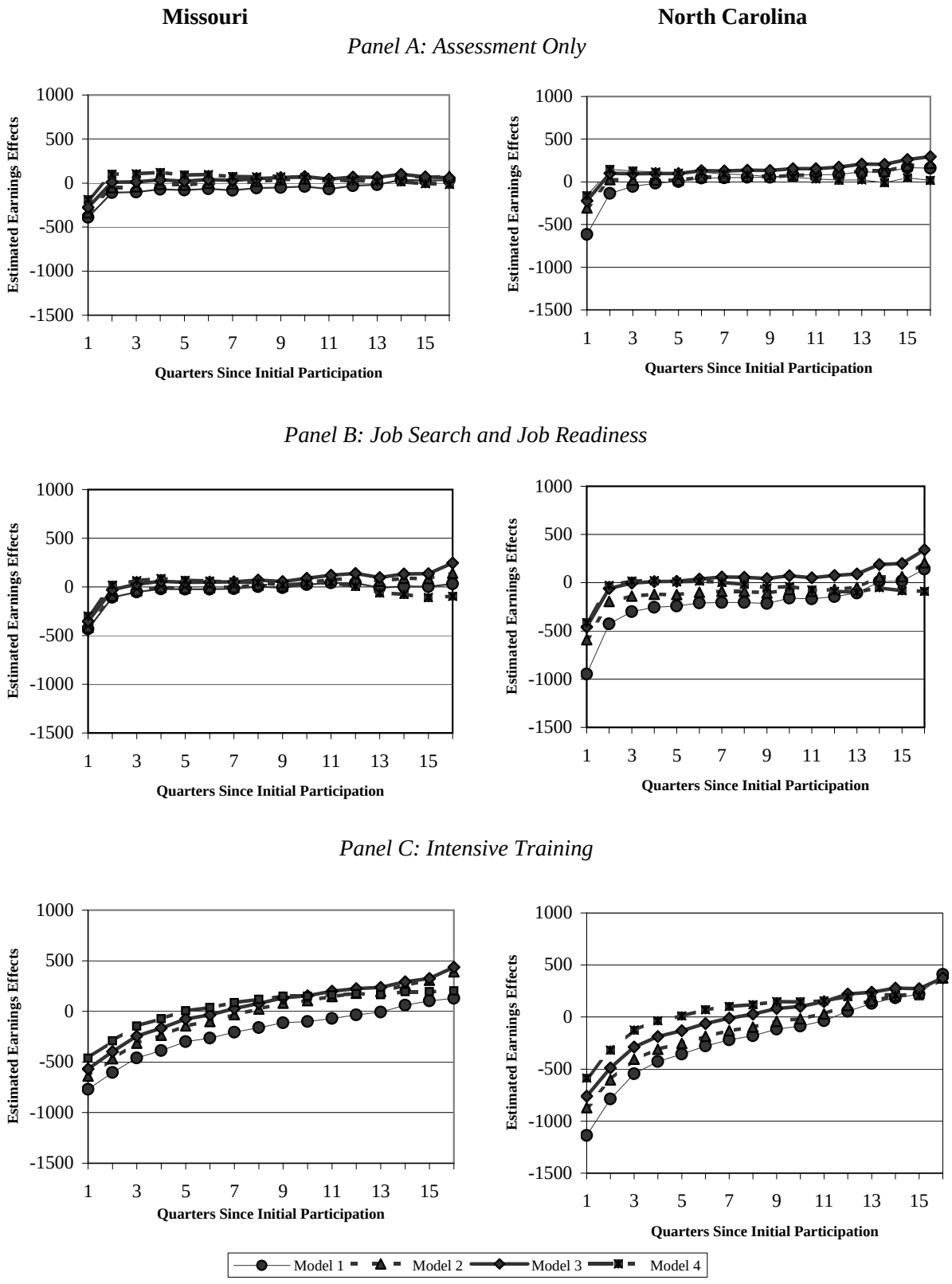
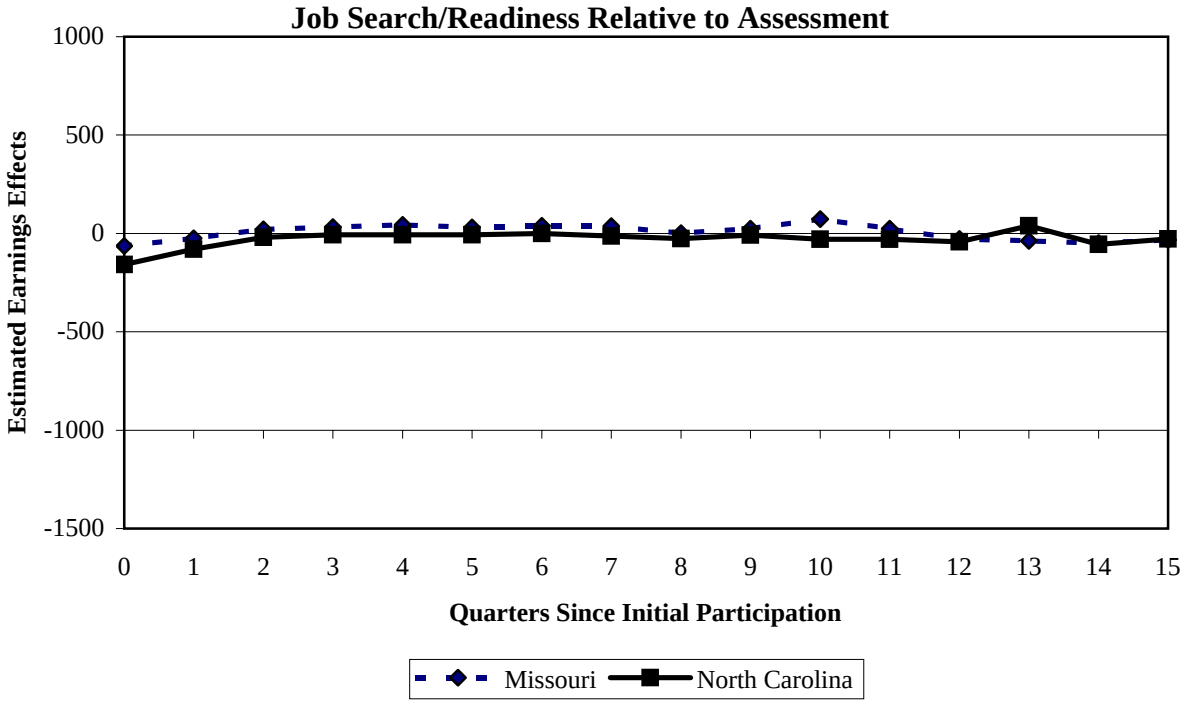


**Figure 3: Estimates of Effects of Participation in Job Search/Readiness and Intensive Training Relative to Assessment by Quarter**



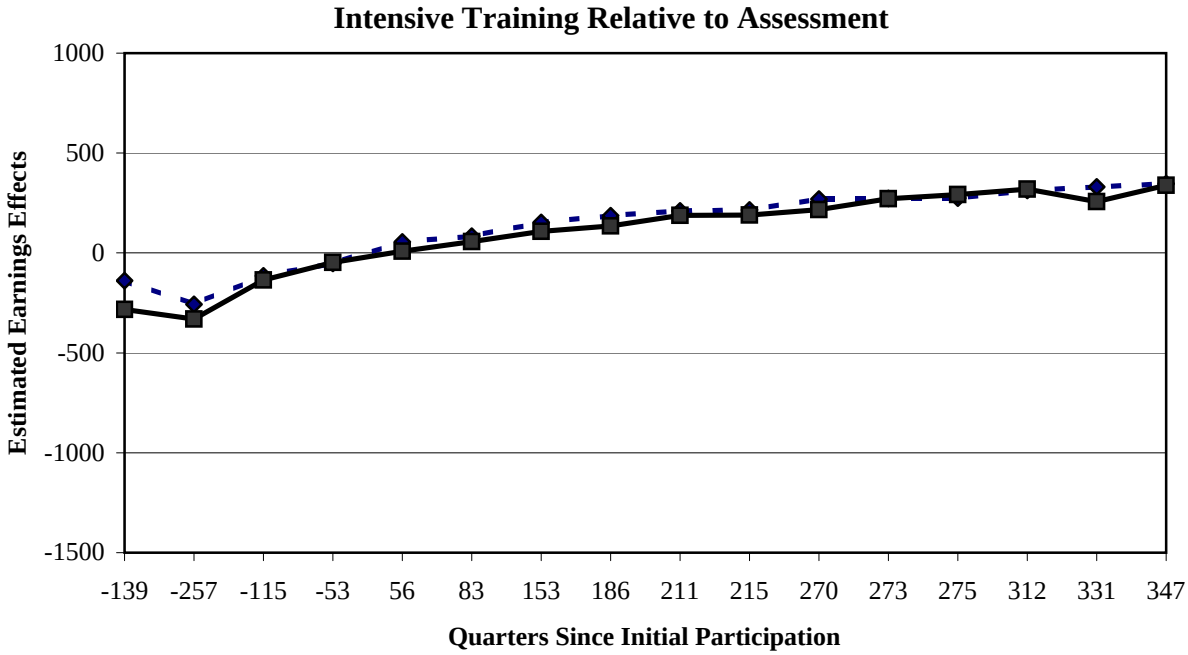
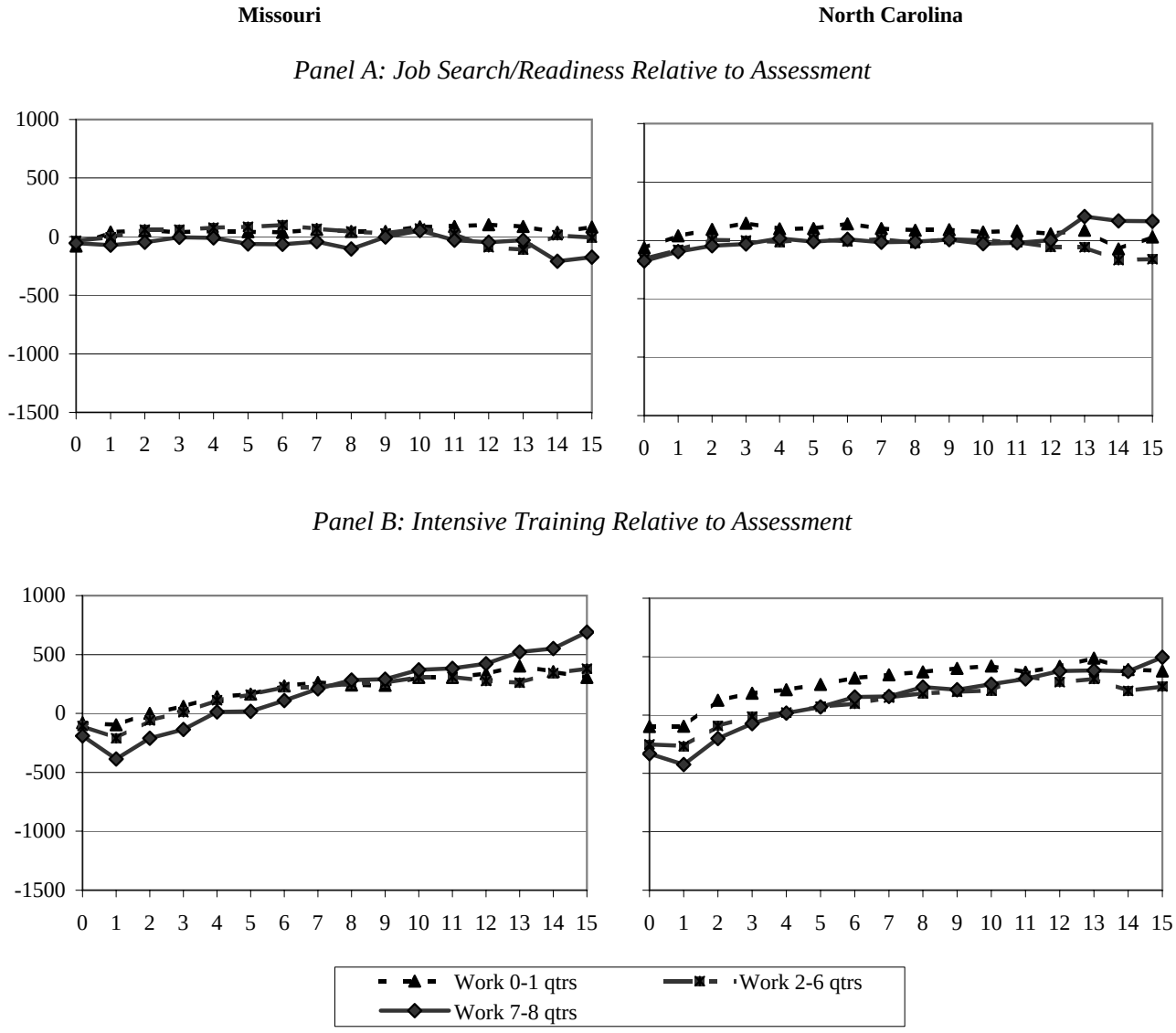
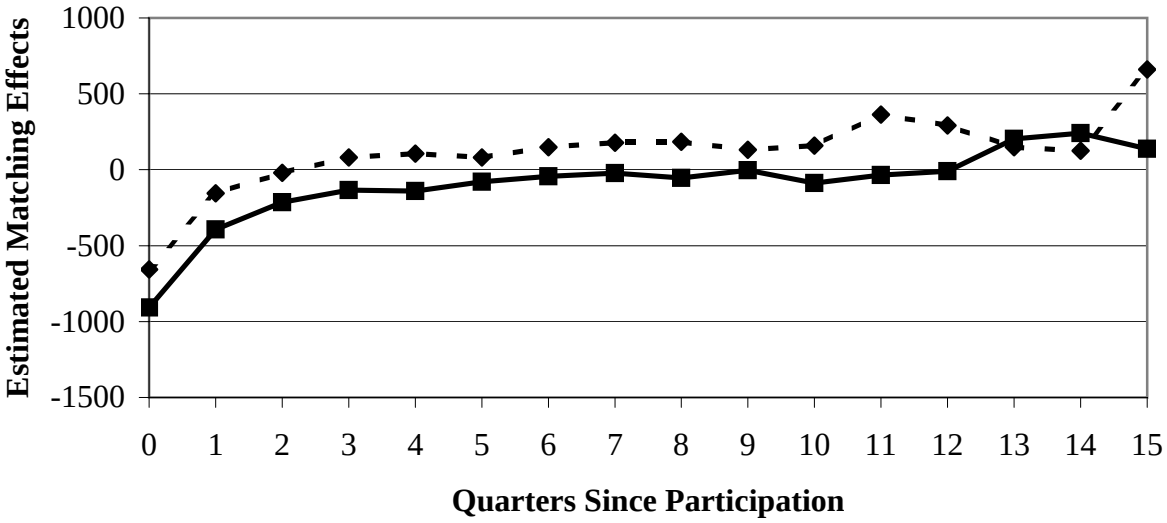



**Figure 4: Estimates of Impact by Quarter Since Initial Participation**



**Appendix Figure 1: Matching Estimates of Participation in Sub-Programs by Quarter Using Differenced Quarterly Earnings**

*Panel A: Job Search/Readiness Relative to Assessment*




*Panel B: Intensive Training Relative to Assessment*