Are There Treatment Duration Differences in the Seattle and Denver Income Maintenance Experiments?

by

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Abstract. This paper re-examines the labor supply responses in the Seattle and Denver Income Maintenance Experiments (SIME/DIME). Specifically, the original experimental results show a larger labor supply response for men and women from dual-headed households in the five-year treatment relative to those in the three-year treatment. Although typically thought of as a Negative Income Tax (NIT) Experiment, the SIME/DIME also included a job training experiment that enrolled roughly 60 percent of households, including both NIT treatment and control households. Once the assigned duration (three or five years) of the concurrent job training experiment is accounted for in the original empirical specification, the differences in NIT treatment response by program duration fall by over 50 percent in magnitude and become statistically insignificant. Since the original results of the SIME/DIME were inconsistent with the standard life-cycle labor supply model, the second part of the paper examines whether the revised results can be reconciled with a variant of this model. Specifically, the role of liquidity constraints in the labor supply responses is examined using self-reported information on access to capital markets. The support for the liquidity constrained interpretation is, at best, mixed and then only for one sub-sample of individuals.

JEL Classification. I38, J22

1. Introduction

The Seattle and Denver Income Maintenance Experiments (SIME/DIME) began in the early 1970s as the last of the four major evaluations of the proposed negative income tax (NIT).[1] The impetus behind implementing an NIT was two-fold. First, the growing size of welfare programs such as Aid to Families with Dependent Children and Food Stamps led to concerns that the existing income maintenance system was inefficient. Second, analysts worried that the high tax rates on earned income, especially when combined across programs, would greatly reduce labor supply and not provide the proper incentives for households to subsequently become independent of the programs. Not only did the experiments allow the theorized impacts of a negative income tax to be quantified, the data produced by these experiments led to the development of a number of influential econometric methodologies for a variety of important topics such as analyzing the impact of taxation on labor supply (Burtless and Hausman 1978) and correcting for the effect of sample attrition in panel data (Hausman and Wise 1977).

The SIME/DIME differed from prior NIT experiments along a number of dimensions. While all of the NIT experiments used various combinations of grant levels (i.e., benefit levels for households not working) and tax rates on earned income (i.e., the amount by which the grant is reduced for each dollar earned), the SIME/DIME enrolled a larger number of participants than all of the previous NIT experiments combined. The SIME/DIME also included a randomized job training component while only one of the other experiments added a non-NIT treatment.[2] And whereas the previous NIT experiments were limited to three years in length, the SIME/DIME included treatment durations of both three and five years.[3] Since the experiments would be temporary, there was a concern that the resulting labor supply estimates would not correctly identify the impact of a permanently

[1] Prior to the SIME/DIME, the other NIT experiments were the New Jersey Experiment, the Rural Experiment (conducted in Iowa and North Carolina), and the Gary, Indiana Experiment. See Spiegelman and Yaeger (1980) for a discussion of the history of the NIT and the SIME/DIME.

[2] The Gary Experiment included a randomized child care subsidy component.

[3] After the first two years of the SIME/DIME, a small number of households were shifted from either control status or the three-year treatment into a twenty-year treatment. However, data collection for these households ended when the interviewing for the three- and five-year duration households was completed. The twenty-year treatment was officially ended after six years (Robins 1984).

implemented NIT (Metcalf 1973). Thus, the varying program lengths in the SIME/DIME were initiated to help identify the parameters necessary to estimate the long-run impact of a permanent NIT (Keeley et al. 1978; Burtless and Greenberg 1982).

Figure 1a presents the estimated experimental impact for males in dual-headed households that is reported in the Final Report of the Seattle and Denver Income Maintenance Experiments (United States Department of Health and Human Services 1983).[4] Once households have fully adjusted to the experiment by the second year, average hours of work are significantly reduced by 133 hours annually for the three-year experimentals and by 228 hours for the five-year treatments. The impact remains essentially constant throughout the remainder of the experimental period for both treatment duration groups. T-tests for the equality of the impact across duration groups reject the null hypothesis for each of the first three experimental years. The larger impact of the five-year treatment is consistent with a significantly larger (life-cycle) wealth effect for households in the longer program. Similar differences are found for women in dual-headed households while there are no treatment duration differences for women in single-headed households. Since none of the other NIT experiments varied the length of the treatment duration, these findings represent the only experimental evidence regarding the importance of wealth effects in life-cycle labor supply decisions.

Although the SIME/DIME is primarily thought of as a negative income tax experiment, it was, in fact, comprised of *two* major experimental components: an NIT treatment and a job training treatment. The Final Report notes that "[s]ince SIME/DIME essentially consists of two experiments conducted simultaneously, a family may be an experimental in one treatment and a control in the other." (United States Department of Health and Human Services 1983, p. 26) Thus, households could be assigned to treatment status for both experiments, to control status for both experiments, or they might serve as a control for one experiment while simultaneously being assigned to treatment status in the other experiment. Of the original 4,800 SIME/DIME families, 57 percent were assigned to an

[4] The point estimates and standard errors for Figure 1a are presented in Panel A of Table 1 and have been taken from Table 3.4 on p.120 of the Final Report. The t-statistics for the difference between the three- and five-year treatment effects shown in the Table are converted from F-statistics that are reported in the same Table in the Final Report for expositional ease.

NIT treatment while 59 percent were assigned to a job training treatment. As the above quote makes clear, however, some of the NIT control households were in fact enrolled in the job training treatment. While 21 percent of the overall sample fell into this category, these households comprised 49 percent of the NIT control group. Therefore, it is important to control for the treatment status of each experiment.[5] Furthermore, the response to the experimental treatment may differ by program duration (three or five years). As such, it is also important to control for the duration of *each* experiment separately.

While previous papers have examined the differential response to the SIME/DIME by the NIT treatment duration, many of these same studies overlooked the possibility that the response to the concurrent job training experiment may have differed by treatment duration. The empirical specifications used in the Final Report (United States Department of Health and Human Services 1983) as well as in the other papers that examined treatment duration differences did not include separate indicators for whether a household assigned to the job training experiment belonged to the three- or five-year program duration.[6] If the impact of the job training experiment on work effort varied by the length of time the household was assigned to the treatment, then the failure to control for the program duration of this experiment may confound the findings that the response to the NIT experiment differed by treatment duration.

Appendix Table 1 presents the impact of the job training treatments on labor supply for men in dual-headed households as reported in the Final Report (Table 4.5, p. 224, United States Department of Health and Human Services 1983). The job training experiment contained three treatments: a counseling only treatment, a counseling plus a 50 percent subsidy for educational subsidy treatment, and a counseling plus a 100 percent subsidy for educational subsidy treatment although the third treatment was not offered to households enrolled in the five-year program. The rows of the Table show the response to the job training treatments by treatment duration. As can be seen in the Table, especially for

[5] Some studies that use the SIME/DIME only for the panel data aspect limit their sample to the "control" observations only. However, a control observation is typically defined as a financial control. By ignoring the fact that roughly half of the financial controls are enrolled in the job training experiment, these studies may have produced biased estimates.

[6] E.g., see Keeley et al. 1978; Robins and West 1980; Burtless and Greenberg 1982

the second job training treatment, the response to the job training experiment differ by program duration. Note that this difference is *not* due to a failure to control for the duration of the NIT experimental assignment since these regressions control for "whether the family was eligible for the negative income tax experiment and whether they were eligible for 3 of for 5 years." (p. 219, United States Department of Health and Human Services 1983). Thus, failure to control for the differential response to the job training experiment by program duration may impart a bias on the estimates of the NIT labor supply impact.

This paper presents a re-analysis of the Seattle and Denver Income Maintenance Experiments. The estimates found in the Final Report indicate that labor supply exhibits a significantly larger response in the five-year experiment than in the three-year experiment for both men and women in dual-headed households. Once the duration of the job training experiment treatment is accounted for in the analysis, these duration differences become statistically insignificant. Furthermore, for women, the point estimates for both treatment durations are almost identical. A variety of robustness checks all indicate that there is no evidence for differences in treatment response by program duration once the specification is appropriately corrected to account for the job training experiment.

After presenting the re-analysis of the SIME/DIME data, the second part of the paper assesses the importance of the findings for the life-cycle labor supply model. In particular, previous researchers have suggested that the differences in work effort by treatment duration combined with the lack of any lasting treatment effects in the post-experimental period (see Figure 1a) provide strong evidence against the standard life-cycle labor supply model (Ashenfelter 1984; Browning, Deaton, and Irish 1985). As will be discussed below, the finding that there are no treatment duration differences invalidates their rationale for rejecting the life-cycle model.

Within the framework of the standard life-cycle labor supply model, the finding of equal effects for the three- and five-year treatment groups can only be reconciled with the model if life-cycle wealth effects cancel out one another. A plausible modification to the standard model, adding liquidity (borrowing) constraints, that is also consistent with the finding that the experimental impacts are the same for both treatment duration groups

during the experiment as well as the finding that there are no post-experiment differences in work effort between the treatment and control observations. Liquidity constraints are likely particularly relevant for the households examined in the SIME/DIME. In fact, self-reported responses to a module in the eliciting information concerning household access to capital markets suggests that roughly half of the SIME/DIME households in fact face these constraints. These questions are then used to test whether liquidity constraints can in fact explain these findings. The evidence for the liquidity constrained interpretation of the results is, at best, mixed.

2. The Seattle and Denver Income Maintenance Experiment

The Seattle and Denver Income Maintenance Experiments began in 1970 with the enrollment of households in Seattle.[7] The enrollment of households in Denver was started in the following year after high levels of unemployment in Seattle led to a decision to extend the experiment to an additional city. Since the possible expansion of the NIT to a national setting would include both dual-headed as well as single-headed households, both types of households were included in the experiment. The Seattle experiment included only Black and White families while the Denver experiment also included Latino families.

The SIME/DIME consisted of a number of experimental treatments. Three different grant levels ($3800, $4600, and $5600) and four different marginal tax rates (50%, 70%, a declining 70%, a declining 80%) were used to generate eleven experimental grant level-tax rate combinations.[8] In addition, households were also exposed to a job training treatment. Households selected for job training could either be given a) counseling on the benefits of undertaking job training, b) counseling plus a 50 percent subsidy for direct costs of any job training that was undertaken, or c) counseling plus a 100 percent subsidy.

[7] Most of the discussion in this section is taken from the United States Department of Health and Human Services (1983, 1985).

[8] The grant dollar levels are as of the beginning of the experiment and were adjusted by each city's CPI in order to maintain the real amounts. The grant amounts were adjusted for family size with the amounts listed in the text being for a family of four. For the declining marginal tax rates, households were taxed at the initial rate for the first $1000 of earned income, at a rate 5 percent lower for the next $1000 of earned income, and declining by 5% for each $1000 thereafter until reaching the breakeven level. All of the grant level-tax rate combinations were used except for the interaction of the declining 70 percent tax rate with the $5600 grant level.

Assignment to experimental treatment used the Conlisk-Watts assignment model to determine how to assign treatments rather than pure random assignment (Conlisk 1972). The assignment model minimizes the variance of the estimated parameters for a given budget amount.[9] The idea is that a more efficient allocation of resources can be achieved by taking into account the costs of various treatments and any expected cost differences across households. In the SIME/DIME, costs were expected to vary by pre-experimental "normal" income and therefore the household's level of normal income (divided into six categories) was used in the assignment model.

The designers of the SIME/DIME also believed that treatment response would vary over other dimensions (Conlisk and Kurz 1972). Previous studies had found differences in labor supply responses across racial groups. In addition, it was decided that it was important to examine the impact of the NIT separately for single- and dual-headed households. Furthermore, as discussed above, programs of differing durations were examined in order to extrapolate the results from a limited duration experiment to a permanent national program.

The assignment model was run separately for each race-family type (single- or dual-headed)-program duration combination to determine the optimal number of observations for each treatment and control group within each of the normal income categories for a single site.[10] Thus, the probability of assignment to treatment depends upon race, family type, and normal income. According to the Final Report, "[a]ll families who had the same [normal] income class, race, and family type constituted a group. The assignment model then specified the number from each group to be enrolled in each of the experimental treatments and control group. A random draw from within each group then determined which families would be enrolled and to which treatments." (United States Department of

[9] An illustration of the Conlisk-Watts model in the single treatment case (and with a fixed budget) is given by Keeley and Robins (1980). If the costs of treatment and control group observations are the same, then the variance of the difference in the average outcomes between the two groups is minimized by assigning equal numbers of observations to each group. However, if the costs of observations differ between groups (which occurs in an NIT since treatments are given payments whereas controls are not), then the optimal ratio of the treatment to control observations to minimize the variance of the differences is inversely related to the ratio of their respective costs.

[10] The allocations determined by the assignment model were identically applied to each site.

Health and Human Services 1983, p.61) Thus, all empirical specifications need to control for these characteristics in order to consistently estimate the program parameters.

After screening over 90,000 households, approximately 5,900 households where assigned for enrollment and over 4,800 were actually enrolled. Approximately 57 percent of households were assigned to an NIT treatment. Enrollment of over 2,000 households began in Seattle in October 1970 and continued through November 1971. In Denver, over 2,700 households were enrolled starting in October 1971 and lasting through August 1972. Treatment and control observations in the three-year program duration were interviewed for at least four years. Half of those enrolled in the three-year program duration were also given a follow-up survey to gather information on the fifth year following enrollment. Households assigned to the five-year program were interviewed for up to six years. Households that split due to events such as divorce were followed as separate households as were households that become established when kids of the original households move out.

Households in the SIME/DIME sample were given a periodic interview approximately once every four to five months until they were disenrolled from the experiment. These interviews collected information on each household member's employment history, government benefits received, expenses (such as child care and alimony), and subsidized housing information. In addition, each of the treated families was required to file an income and expense report form (IRF) at the end of each month listing all income receipt plus some expenses (child support and alimony).[11]

3. The Theoretical Labor Supply Impact of the SIME/DIME

Before turning to the re-analysis of the experimental data, it is useful to examine the theoretical impact of the SIME/DIME in the context of a life-cycle labor supply model. Since Heckman's (1974) and MaCurdy's (1981) seminal works on life-cycle labor supply had yet to be published, the original papers on the SIME/DIME did not use this framework to analyze the labor supply response to the experiment. Rather, most of the theoretical analysis

[11] A random sample of control households in Denver also filled out IRFs.

surrounding the experiment uses a cross-sectional framework to examine the theoretical response.[12]

Following MaCurdy (1981), the household's period specific utility function can be written as

$$U(C_t, L_t) = [C_t]^{\omega_1} + [N_t]^{\omega_2} \tag{1}$$

where C_t and N_t are household consumption and hours of work, respectively, in period t.[13] ω_1 and ω_2 are assumed to be invariant parameters across workers with $0 < \omega_1 < 1$ and $\omega_2 > 1$ in order to generate a commonly assumed concave utility function.

Beginning in period τ, the household maximizes utility over the remainder of its life (until period T). Assuming that utility is time-separable, capital markets are perfect, and household decisions are made in a certain environment, the corresponding lifetime utility function is

$$\mathcal{U} = \sum_{t=\tau}^{T} \left(\frac{1}{1-\rho}\right)^{t-\tau} [[C_t]^{\omega_1} + [N_t]^{\omega_2}] \tag{2}$$

subject to the wealth constraint

$$A_\tau + \sum_{t=\tau}^{T} \left(\frac{1}{1-r}\right)^{t-\tau} [N_t W_t + M_t] = \sum_{t=\tau}^{T} \left(\frac{1}{1-r}\right)^{t-\tau} C_t \tag{3}$$

where A_τ is assets on hand as of period τ, W_t is the wage in period t, M_t is non-labor income in period t, r is the constant interest rate, and ρ is the rate of time preference.

As MaCurdy shows, the solution to this problem yields an equation for optimal hours of work in period t of

$$\ln N_t = F + \delta(\rho - r)(t - \tau) + \delta \ln W_t \tag{4}$$

where $\delta = 1/(\omega_2 - 1)$, $F = \delta(\ln \lambda - \ln \omega_2)$, and λ is the marginal utility of wealth over the remainder of the life cycle.[14] . The above assumptions that ensure concavity of the empirical utility function also imply that assumption of concavity means that $\delta > 0$.

[12] A notable exception is provided by Metcalf (1973) who highlights the differences in the labor supply response to a temporary NIT experiment and a permanent NIT program. Metcalf's model, in a sense, anticipated the work of Heckman and MaCurdy as will be illustrated below.

[13] For dual-headed households, it is straightforward to add the work effort of a second household member. The qualitive predictions of the model do not change with this modification.

[14] λ is the Lagrange multiplier for the optimization problem.

The marginal utility of wealth, λ, is a function of wages and non-labor income in all periods, as well as assets on hand at the beginning of the life-cycle. Since F includes λ, estimation of (4) typically assumes F to be a fixed effect for each household. As such, estimation is typically achieved by estimating first-differenced versions of (4).

In order to make predictions regarding the impact of the SIME/DIME on labor supply behavior, however, it is necessary to make additional assumptions regarding F. Again following MaCurdy, λ is assumed to be a linear function of (log) wages and non-labor income in each period, as well as assets on hand in period τ. Thus, F can be written as

$$F = \sum_{t=\tau}^{T} \gamma_t \ln W_t + \sum_{t=\tau}^{T} \psi_t M_t + \theta A_\tau \tag{5}$$

where γ_t, ψ_t, and θ are parameters that are assumed to be constant across households. Concavity of the utility function implies that γ_t, ψ_t, and θ are all negative (MaCurdy 1981). Thus, an increase in the wage or non-labor income in any period as well as an increase in assets on hand as of period τ will reduce the marginal utility of wealth, λ.

As described above, the SIME/DIME changes both non-labor income as well as the marginal tax rate on wages during the experimental period. However, these changes will affect F which means that work effort will change not only during the experimental period but it will also be affected after the experiment. Let $\Delta \ln W_t$ and ΔM_t be the changes in the (log) wage and non-labor income, respectively, in period t of the experiment. For an experiment of length d beginning in period τ, the impact of the experiment on hours of work in each period during the experiment is

$$\Delta H_{t,DURING} = \delta \Delta \ln W_t + \sum_{t=\tau}^{\tau+d-1} \gamma_t \Delta \ln W_t + \sum_{t=\tau}^{\tau+d-1} \psi_t \Delta M_t \tag{6}$$

From the experimental design, $\Delta \ln W_t < 0$ since the marginal tax rate is increased for (most) households which in turns lowers the wage the household receives. Also, $\Delta M_t > 0$ since the guaranteed level of income when not working is increased. Furthermore, the theoretical assumptions made above imply that $\delta > 0$ while $\gamma_t < 0$ and $\psi_t < 0$ for all t. Combining all of these effects actually results in an ambiguous prediction for the impact of the experiment on hours of work during the experimental period. The reason

is that although the intertemporal substitution effect ($\delta\Delta \ln W_t$) and the life-cycle wealth effect from the increased guarantee level during the experimental period ($\sum_{t=\tau}^{\tau+d-1} \psi_t \Delta M_t$) both lead households to lower hours of work during the experiment, the life-cycle wealth effect from the reduced wages during the experiment ($\sum_{t=\tau}^{\tau+d-1} \gamma_t \Delta \ln W_t$) exerts a positive influence on work effort. Given the results from the life-cycle labor supply labor literature (e.g., MaCurdy 1981) as well as the experimental results themselves, one would suspect that the latter effect would be dominated by the former effect and that hours of work would be reduced during the experiment.

Equation (6) also has implications for the difference in the labor supply response during the experiment for programs of differing lengths. In particular, SIME/DIME had programs of three and five years in duration. For each of the first three periods when both program durations are in effect, the difference in the labor supply response between the two programs is

$$\begin{aligned}
&\Delta H_{t,DURING,5YR} - \Delta H_{t,DURING,3YR} \\
&= \left[\delta\Delta \ln W_t + \sum_{t=\tau}^{\tau+4} \gamma_t \Delta \ln W_t + \sum_{t=\tau}^{\tau+4} \psi_t \Delta M_t\right] - \left[\delta\Delta \ln W_t + \sum_{t=\tau}^{\tau+2} \gamma_t \Delta \ln W_t + \sum_{t=\tau}^{\tau+2} \psi_t \Delta M_t\right] \\
&= \sum_{t=\tau+3}^{\tau+4} \gamma_t \Delta \ln W_t + \sum_{t=\tau+3}^{\tau+4} \psi_t \Delta M_t
\end{aligned} \tag{7}$$

Thus, the theoretical difference between the three- and five-year treatments is also *a priori* ambiguous. The findings from the Final Report presented in Figure 1A that men in the five-year experiment reduced their hours of work more than did workers in the three-year experiment imply that the effect of changing the guarantee level ($\sum_{t=\tau+3}^{\tau+4} \psi_t \Delta M_t$) dominates the effect of changing the marginal tax rate ($\sum_{t=\tau+3}^{\tau+4} \gamma_t \Delta \ln W_t$).[15]

As can be seen, the theoretical impact of the experiment is *a priori* ambiguous along a number of dimensions. However, theory can be used as a guide to determine if the findings as a whole from the SIME/DIME are consistent with the theoretical model. One interesting implication of the theory is how hours of work should change from the experimental period

[15] It is also useful to note that the approach used to analyze the differences for the three- and five-year treatments can also be used to interpret the difference between a temporary experiment of length d and a permanent program that would last until the end of the household's lifetime. This difference can be

to the post-experimental period. Following an experiment of length d, hours of work in all future periods will be changed by

$$\Delta H_{t,AFTER} = \sum_{t=\tau}^{\tau+d-1} \gamma_t \Delta \ln W_t + \sum_{t=\tau}^{\tau+d-1} \psi_t \Delta M_t \tag{10}$$

To examine the changes from the experimental period to the post-experimental period, assume (for simplicity) that pre-tax wages are constant before and after the experiment such that $\Delta \ln W_t = \Delta \ln W$ for all t. Combining equations (6) and (10), the change in hours of work for a household over this period is

$$\begin{aligned}
&\Delta H_{t,DURING} - \Delta H_{t,AFTER} \\
&= \left[\delta \Delta \ln W + \sum_{t=\tau}^{\tau+d-1} \gamma_t \Delta \ln W + \sum_{t=\tau}^{\tau+d-1} \psi_t \Delta M_t\right] - \left[\sum_{t=\tau}^{\tau+d-1} \gamma_t \Delta \ln W + \sum_{t=\tau}^{\tau+d-1} \psi_t \Delta M_t\right] \\
&= \delta \Delta \ln W
\end{aligned} \tag{11}$$

This last result has an important implication. Hours of work should change by the same amount from the experimental period to the post-experimental period *no matter the length of the experiment.* However, the results for the SIME/DIME shown in Figure 1a (and Panel A of Table 1) are inconsistent with this finding. While labor supply is reduced by a larger amount for individuals in the five-year versus the three-year treatment, in both

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written as

$$\begin{aligned}
&\Delta H_{t,DURING,PERMANENT} - \Delta H_{t,DURING,TEMPORARY} \\
&= \left[\delta \Delta \ln W_t + \sum_{t=\tau}^{T} \gamma_t \Delta \ln W_t + \sum_{t=\tau}^{T} \psi_t \Delta M_t\right] - \left[\delta \Delta \ln W_t + \sum_{t=\tau}^{\tau+d-1} \gamma_t \Delta \ln W_t + \sum_{t=\tau}^{\tau+d-1} \psi_t \Delta M_t\right] \\
&= \sum_{t=\tau+d}^{T} \gamma_t \Delta \ln W_t + \sum_{t=\tau+d}^{T} \psi_t \Delta M_t
\end{aligned} \tag{8}$$

As with the difference between the three- and five-year programs, the difference between the temporary and the permanent program is theoretically ambiguous. Metcalf (1973) first noted the difference in responses to a permanent NIT and temporary experiment. Using a two-period model, Metcalf shows that the income effect will be understated will the wage effects will be overstated in a temporary experiment relative to a permanent experiment. These implications are also found in (8). The negative impact of the increased guarantee level on hours of work each period would be even more negative in a permanent program by the additional amount of $\sum_{t=\tau+d}^{T} \psi_t \Delta M_t$. The negative substitution effect from the lower wage received during the experiment would be partially offset due to a permanently lowered wage in a long-run program by the amount $\sum_{t=\tau+d}^{T} \gamma_t \Delta \ln W_t$.

treatment durations the work response is reduced to zero following the experiment. Thus, the five-year treatment group exhibits a larger response than the three-year treatment group moving from the experimental period to the post-experimental period.

It is this last finding that has led previous authors to interpret that the results from the Final Report presented in Figure 1a as evidence against the standard life-cycle labor supply model. According to Ashenfelter (1984, p.19), these results "are not easily explained by the life-cycle model..." Browning, Deaton, and Irish (1985) state that the "perhaps most convincing" evidence against the model are the SIME/DIME duration results (1985, p.538).[16]

4. The Data

This paper makes use of the Work Impact files contained in the Seattle and Denver Income Maintenance Experiment data that is available from the National Archives (United States Health and Human Services Department 1985).[17] This file contains one observation for each of the original household heads from the single and dual-headed households. Variables from the original monthly Labor Supply files such as work effort and wages are contained as six-month aggregates on the Work Impact file. The data are further aggregated to annual measures for the current study to match the observation periods used in the Final Report as well as other studies. For each observation, the data span the year prior to enrollment as well as up to six years following enrollment. The files also contain information on household demographics, assignment variables, and treatment status along with some wealth and asset information.

[16] Browning, Deaton, and Irish further elaborate on this point. As shown in Figure 1a, "those enrolled in the five-year [treatment] program [reduced their hours relative to the controls] by more than those enrolled in the three-year [treatment] program. This is consistent with the existence of life-cycle income effects as predicted by the theory. However, in both the three and five year [treatment] programs, there is no continuing evidence of hours reduction beyond the end of the experiment, contradicting the income effects explanation. It is far from clear what theory would explain this evidence, but it is certainly not the standard life-cycle one" (1985, p.538).

[17] It is not clear if the Work Impact files were used in the original analysis of the SIME/DIME. However, as will be shown below, the estimates produced using these data are virtually the same as those appearing in the Final Report when using the same specification. In addition, the Work Impact files have been used in prior studies examining non-experimental outcomes (e.g., Abowd and Card 1989).

In order to reduce the quantity of results presented here, the primary focus of this paper are the original male and female heads (i.e., those present at the household's enrollment date) of dual-headed households since treatment duration differences exist for these individuals in the Final Report. A brief discussion of the results for original female heads in single-headed households, who also exhibit treatment duration differences, is also provided although there are no treatment duration differences for this group of individuals.

To match the results produced in the Final Report, the following set of sample restrictions is imposed. The sample is restricted to households who have non-missing data for the demographic variables found in the basic specification labor supply specification used in the report. In addition, observations for the first four experimental years are limited to those individuals that are present in all four of these years. Observations used to analyze the fifth experimental year must be present for the first five years and observations used for year six must be present for all six years. After imposing these restrictions on the males in dual-headed households, there are 1923 in observations for the first four years, 1256 for year five, and 661 for year six. The analogous numbers from the Final Report are 1911, 1243, and 647, respectively.[18] Thus, the sample sizes are very similar to those in the Final Report and are likely not the reason for any differences between the prior findings and those presented here.

5. Re-Analysis of the SIME/DIME

The specification used in the Final Report is

$$H_{it} - H_{ip} = \alpha + \beta T_i + \gamma A_i + \delta X_i + \epsilon_{it} \tag{12}$$

The dependent variable, $H_{it} - H_{ip}$, is the difference between experimental year hours of work and pre-experimental work hours. The set of regressors includes indicators for the assignment variables, A_i, which includes the normal income categories, race (White, Black,

[18] For women in dual-headed households, the sample used here has 2074, 1373, and 726 observations while the Final Report has 2043, 1347, and 705 observations. For women in single-headed households, the current sample has 1433, 945, and 458 observations and the Final Report numbers are 1459, 951, and 458 observations.

and Latino), and site (Denver and Seattle).[19] An indicator for being an IRF control is also included among the assignment variables. As mentioned above, the specification also controls for whether the household is assigned to one of the three job training components but does not control for the duration of the job training treatment. The Final Report specifications included household demographic information at the time of enrollment, X_i, such as the age of the individual, the number of family members, and the number of children under five years of age. Also, hours of work and AFDC benefits in the pre-experimental year are included among the X_i. Finally, indicators for being in either a three- or five-year NIT experimental treatment are included in the model and the main results presented in the Tables and Figures. The results for each experimental year are from separate cross-sectional regressions at each point in time.

Figure 1b presents the results of using the data from the Work Impact files to estimate the same specification as used in the Final Report. The results in the Figure which estimate (12) are very similar to those found in Figure 1a. Hours of work fully adjust to their experimental level by the second year of the experiment and essentially remain constant until the end of the experiment. The reduction in hours of work is greater for households in the five-year experiment than those in the three-year experiment. Finally, there are no differences in work hours for the treatment and control households once the experiment ends for each treatment duration group.

The results shown in Figure 1b can be found in Panel B of Table 1. The analogous results from the Final Report are shown in Panel A of the Table. As illustrated in the Figures, the point estimates from the Final Report and those from the re-analysis using the Work Impact files are very similar. If anything, the estimated impact of the experiment is slightly larger in the re-analysis but the results are well within the confidence intervals of the Final Report estimates. In addition, the first column of Panel B shows that in the re-analysis there is no pre-experimental differences in hours worked between the controls and either treatment duration group.

[19] Family type is not controlled for in the regressions since the sample is limited to men in dual-headed households.

The estimated differences in hours worked by treatment duration are nearly identical between the results reported in the Final Report and those estimated in the re-analysis. For example, the bottom of Panel A of Table 1 indicates that the difference in the first year of the experiment is -78.2 annual hours with a t-statistic of 2.14. The analogous result in the re-analysis (Panel B) is -75.8 with a t-statistic of 2.07. The findings for the remaining experimental years also correspond to a very high degree. Thus, the re-analysis using the same sample specification yields very comparable results as those found in the Final Report.

As discussed above, many analyses of the SIME/DIME do not control for whether the household was enrolled in the three-year or five-year job training experiment. The results in Panel A of Table 2 show the labor supply response by NIT treatment duration once the impact of the job training experiment is allowed to vary by three- or five-year treatment. Figure 2a plots these results. The findings still indicate that there is a significant reduction in hours worked relative to the control households for both the three- and five-year NIT treatment groups. However, the difference in the impact by treatment duration is no longer statistically significant. While the t-statistic for the difference is close to being marginally significant (1.54) in the first year of the experiment, the t-statistic is below 1 in the second and third year of the experiment. The differences between the three- and five-year program durations remain significant during years four and five when the experimental period has ended for the three-year treatment but continues for the five-year experiment. However, the magnitude of the difference during this period is also somewhat smaller than the findings from the Final Report.

To see more clearly the impact that allowing the effect of the job training experiment to differ by program duration has on estimated NIT treatment duration differences, Figures 3a and 3b plot the differences using the Final Report specification (Panel B of Table 1) and control for job training treatment duration (Panel A of Table 2), respectively. The solid line in these Figures is the point estimate for the program duration differences while the dashed lines are the bounds of the 95 percent confidence intervals. The addition of the job training duration controls has little effect on the magnitude of the NIT duration differences in the first year of the experiment although the difference becomes insignificant.

The estimated differences fall by 50 percent, however, in the second and third experimental year and are now statistically insignificant. Thus, correcting the specification only for the job training program duration leads to an insignificant finding for the NIT treatment duration differences.

Another characteristic of the experiment that was not accounted for in the Final Report specification is the assignment of the *control* households to either the three- or five-year program duration. As mentioned above in the description of the experiment, assignment to the three- or five-year program is random conditional upon race, family type, normal income group, and site. Therefore, including an indicator for program duration assignment of a household - whether involved in the NIT experiment, the job training experiment, or a control - should not impact the findings.

Panel B of Table 2 presents the estimates when modifying the specification to include an indicator for being involved in the five-year experiment (as either a treatment or a control) along with the indicators that separately control for the program duration of the job training experiment. The indicator of being enrolled in the five-year experiment is negative and insignificant in the first four experimental years and becomes marginally significant in the five experimental years. These findings are somewhat surprising since random assignment to the three- or five-year program should have led these estimated coefficients to equal zero. The insignificant coefficients on this indicator can still be viewed as evidence that assignment to program duration was indeed random although the findings are not altogether reassuring.

Figure 2b plots the impact of the NIT treatment by program duration for the specification that also includes a program duration indicators while the duration differences are shown in Figure 3c. The estimated differences shrink even further when also adjusting for the job training duration differences. The t-statistics for the estimated differences (Panel B of Table 2) are below 0.6 for the three years during which both program duration groups are exposed to the treatment. Overall, as can be seen clearly in Figures 3a-3c, adjusting the basic specification used in the Final Report to account for the job training experimental duration as well as for the program duration assignment of the control households indicates that the NIT treatment duration differences decrease in magnitude by at least 50 percent and become statistically insignificant.

Results for Women

Table 3 presents findings of the Final Report for women in dual-headed households along with the re-analysis of the SIME/DIME data. According to the Final Report (Panel A of Table 3), significantly larger effects are found for the five-year treatment group in the first two experimental years.[20] The estimated impact is also larger in the third experimental year although the difference is not statistically significant.

As shown in Figure 4b and Panel B of Table 3, nearly identical results are found in the re-analysis of the data using the Final Report specification. As with the men, the NIT treatment duration differences are nearly identical in the Final Report and in the re-analysis. For example, the difference in hours worked between treatment duration groups in the second year of the experiment is -79.9 in the Final Report and -75.2 in the re-analysis. One slight difference to note is the significance level for these differences. While the duration differences are significant in the Final Report for the first two years of the experiment, these differences are only marginally significant in the re-analysis.

As with the men, the impact of the job training treatments on work effort varied by program duration for women in dual-headed households. Appendix Table 2 presents these results as reported in the Final Report (Table 4.6, p. 225, United States Department of Health and Human Services 1983). The job training effects are large and, for the most part, significant for the five-year program. The effects for the three-year program are much smaller and insignificant. Given these results, it is likely that adjusting for the job training program duration will alter the results for women as well.

The results when including separate job training treatment indicators by program duration are presented in Panel A of Table 4 along with Figure 5a. During the first three experimental years, the treatment duration differences upon implementing this adjustment are roughly two-thirds smaller in magnitude. None of these estimates are statistically significant while the largest t-statistic is only 0.61. As shown both in Panel B of Table 4 and in Figure 5b, further adjusting the specification for enrollment in the five-year program, regardless of treatment status, also leads to insignificant NIT treatment duration

[20] These results are found in Table 3.5 on p.121 of the Final Report.

differences for women in dual-head households. The impact of changing the specification on the treatment duration differences are plot in Figures 6a-6c. As with the men, women in dual-headed households exhibit a small and insignificant difference in work effort across the three- and five-year treatment durations.

Finally, Table 5 presents both the results from the Final Report as well as a re-analysis of the SIME/DIME for women in single-headed households. The Final Report estimates (Panel A) indicate that the treatment duration differences are small and statistically insignificant. The replication of the original findings (Panel B) shows essentially non-existent differences between the different NIT treatment duration groups. In results not shown here, applying the same specification adjustments to this set of respondents as were applied above continues to yield small and insignificant differences across the two groups.

6. Implications for Life-Cycle Labor Supply Models

As mentioned in the introduction, the results from the Final Report presented in Figure 1a have been interpreted as evidence against the standard life-cycle labor supply model. According to Ashenfelter (1984, p.19), these results "are not easily explained by the life-cycle model..." Browning, Deaton, and Irish (1985, p.538) state that the "perhaps most convincing" evidence against the model are the SIME/DIME duration results.

Can a finding of *no* treatment duration differences be reconciled with the life-cycle labor supply model discussed above? As can be seen in equation (6), the experimental labor supply impact will be the same for the three- and five-year treatment durations if the experimental wage change and the grant level have the exact opposite effects on the marginal utility of wealth. Furthermore, as shown in equation (10), if these two effects perfectly offset each other then there will be no impact on work effort during the post-experimental period for either treatment duration group. Since the findings presented here yield both of these results, the SIME/DIME results would appear to be consistent with the standard life-cycle model.

One possible concern with this interpretation is that it requires households to have access to perfect capital markets. In order to reduce hours of work and smooth consumption across the experimental and post-experimental period, households must have the ability

to not only save current income but, more importantly, borrow from future income. The implications shown in equations (6) and (10) assume that households have the ability to borrow from future program income. However, for many of low income households involved with the SIME/DIME, this possibility seems highly unlikely.

A slight modification to the standard model that is consistent with the labor supply responses found here is the presence of borrowing, or liquidity, constraints. Constrained households, by definition, would like to borrow from future resources to purchase more current consumption and leisure but are unable to do so. Although these households are unable to smooth intertemporally (i.e., satisfy the standard Euler Equation), they should still satisfy their intra-temporal optimization condition which is to set the ratio of the marginal utility of leisure to marginal utility of consumption equal to the market wage rate. In other words, constrained households will solve a static optimization problem during each period.

If households in the SIME/DIME face borrowing constraints, then these capital market impediments can explain the lack of differential labor supply responses for the three- and five-year treatment groups. Treated households in both duration programs would like to borrow from future experimental income in order to smooth work effort throughout the experiment. However, since they are constrained from doing so, they are forced to solve the static optimization problem. Since households in both duration programs face roughly the same distribution of treatments, the overall effect of the experiment in a given period should be the same.

Testing for whether liquidity constraints are important determinants of behavior is typically difficult since researchers are usually limited to using proxies for the presence of these constraints. However, the SIME/DIME included a number of modules to elicit a range of information in addition to the labor market information that is collected at each periodic interview. In particular, a module gathering information on the household credit attitudes and access to credit was included among this set of modules. This module is included with the sixth and eleventh periodic interviews in both Seattle and Denver as well as the Post-Enrollment interview in Denver which took place within a couple of months after households were enrolled in the experiment. Since access to capital markets

may change over time (possibly due to experimental status), only information from the Denver Post-Enrollment interview is used here.

A series of questions reflecting credit market access is asked of the head of household if there is just one head and is asked of the male head if more than one head is present. Respondents are first asked "Have you ever tried during the past year to purchase anything on credit or to get a loan from a bank, or other regular lending institution?" The follow-up to this question for those who give an affirmative answer is "Were any of your applications for credit, charge accounts, or loans denied during the past year?" Households that applied for a loan and were denied can be classified as credit constrained. However, households that do not apply for credit because they believe that they will denied will not be deemed constrained from this set of questions. Fortunately, a series of two additional questions are also asked which attempt to get at this other group of "discouraged" households. First, respondents are queried "Suppose you decide today to buy something worth, say $500 on a credit plan, that is, on installment. Do you think that you will be able to get the credit?" Next, respondents are asked "If you wanted to take out today a loan for, say, $1000 from a bank, credit union, or any other regular lending institution, do you think you will be able to get the loan?" Responses to these questions are used in conjunction with information on credit denial to determine which individuals are credit constrained.

Other studies have used subjective credit access information found in the Survey of Consumer Finances to determine whether households are credit constrained (Jappelli 1990; Jappelli, Pischke, and Souleles 1998). In addition to information on whether households were recently denied credit, Jappelli (1990) uses a question which asks "Was there any time in the past few years that you (or your husband/wife) thought of applying for credit at a particular place but changed your mind because you thought you might be turned down?" People responding affirmatively to this question as well as the denied credit question are combined to determine which consumers are considered to be borrowing constrained in the U.S., a number which turns out to be 19 percent of the sample.

Table 6 shows the responses to the individual questions concerning credit that are listed above for the Denver households responding to these questions. Notice that while only 16 percent and 14 percent of dual-headed and single-headed households, respectively,

were denied access to credit during the past year, only 60 percent and 43 percent of these households report attempting to obtain a loan or even purchase an item using credit. These responses are then used to create an indicator of which households are constrained. Following a procedure similar to the one used by Jappelli (1990), households that answer no to either of the discouraged borrower questions or answered yes to the denied credit question are deemed to be constrained. Among the Denver households responding to these questions, roughly 45 percent of dual-headed households and two-thirds of single-headed households are constrained by this definition. Thus, while credit constraints affect a large number of participants in the SIME/DIME, it is not the case that the lack of a difference between three- and five-year households in their labor supply response will be driven entirely by these constraints.

Nevertheless, differences in labor supply responses between the constrained and unconstrained households may provide insight into the importance of these constraints for labor supply behavior. Table 7 along with Figures 7a and 7b present the results of estimating, for men in dual-headed households, the model in Panel B of Table 2 but with additional interactions for credit market constraints. In particular, the treatment responses for each duration group are allowed to differ by constraint status. In addition, separate effects by constrained status and program duration are included for the control group to allow for a fully flexible specification.

The results provide mixed evidence for the liquidity constrained hypothesis. First, the impact of the experiment is larger for constrained households relative to unconstrained households in both the three- and five-year treatments (with the exception of year three in the five-year treatment). Whereas unconstrained households will adjust work effort in accordance with the standard wage and wealth effects, constrained households will have an additional adjustment factor due to the presence of the constraint. In particular, the consumption Euler Equation for constrained households indicates that these households consume less than they would if constraints were not present (Zeldes 1989). Similarly, constrained households consume less leisure, i.e. work more, than they would if the constraint was not present. In response to a temporary increase in income such as the SIME/DIME, constrained households should exhibit a sharper increase in consumption, both of goods

as well as leisure, since the marginal utility of a dollar among these households is higher in the present than in the future. This prediction is consistent with the larger response found for constrained households.

Second, unconstrained households have a smaller change in work effort at the end of the experiment, especially in the five-year experiment, also consistent with a liquidity constraint interpretation. Since the end date of the experiment is known well in advance, in the standard model there should only be an intertemporal substitution effect at the end of the experiment but no wealth effect. Among constrained households, however, the inability to borrow money to smooth means that a wealth effect will be present for them at the end of the experiment. In fact, since constrained households are solving static labor supply problems each period, we should expect their work effort to be similar to that of the control households after the experiment ends.

On the other hand, the results are not consistent with the standard model for the unconstrained households. First, unconstrained households in the five-year treatment duration should have a larger wealth effect than those in the three-year experiment. The results in Table 7 and Figures 7a and 7b, however, indicate that the labor supply response is essentially the same for both of these unconstrained groups. Second, while the response at the end of the experiment is smaller for unconstrained relative to the constrained households, their work effort is not statistically different from that of the control households once the experiment ends. Thus, rather than carry over their reduced work effort to the post-experimental period due to a life-cycle wealth effect, all of the impact on the work effort of the unconstrained households appears to occur during the experiment.

Furthermore, although not presented here, the results for women in dual-headed and single-headed households are even more inconsistent with the liquidity constrained story. The finding of a larger response for constrained households is reversed for women from dual-headed households in the three-year experiment. And while the implication for larger responses among constrained households roughly holds for women in single-headed households, the continual decrease in work effort among these women is hard to reconcile with either model.

7. Conclusion

This paper re-analyzes the labor supply responses in the Seattle and Denver Income Maintenance Experiments. Specifically, the results in the Final Report show a larger labor supply response for men and women from dual-headed households in the five-year experiment relative to those in the three-year experiment. However, the original specification did not control for the program duration of the job training experiment. Since the Final Report shows differences between the three- and five-year treatments in the labor supply response to the job training experiment, the specification should control for differences in the assigned job training duration. Upon making this adjustment, the results presented here show that the labor supply response differences between treatment duration groups falls by over 50 percent in magnitude and becomes insignificant. Further adjusting for the program duration of control households reduces these differences even further.

The second part of the paper asks whether the adjusted results from the SIME/DIME can be reconciled with the life-cycle labor supply model. Within the standard model, the work effort of the different treatment duration groups will be equally affected by the experiment only if the wage and non-labor income effects on the marginal utility of wealth cancel out each other. While the standard model can explain the results found here, this model relies on the household having access to perfect capital markets. If households instead are liquidity constrained, a finding of no difference between the three- and five-year treatment duration households would be expected. Self-reported data from the SIME/DIME indicates that roughly half of the survey households are liquidity constrained. When labor supply responses are examined by constrained status, the support for the liquidity constrained interpretation is, at best, mixed and then only for men in dual-headed households.

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TABLE 1 - IMPACT OF THE SIME/DIME NEGATIVE INCOME TAX EXPERIMENT ON HOURS WORKED
YEAR BY YEAR REGRESSIONS
MEN IN DUAL-HEADED HOUSEHOLDS

	Pre-Experiment	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
A. Final Report Results							
Three-Year Treatment		-27.6	-133.1	-128.6	-7.8	-2.9	
		(31.7)	(37.4)	(40.5)	(43.0)	(61.0)	
Five-Year Treatment		-105.8	-227.6	-239.4	-234.3	-214.6	49.2
		(38.1)	(45.0)	(48.8)	(51.8)	(60.2)	(70.5)
Five-Year - Three Year Treament Differential		-78.2	-94.5	-110.8	-226.5	-211.7	
T-Test for Duration Differences		2.14	2.19	2.36	4.56	3.30	
N		1911	1911	1911	1911	1243	647
B. Re-Analysis Using Final Report Specification							
Three-Year Treatment	8.8	-42.1	-149.2	-139.0	-19.5	-2.5	
	(38.4)	(31.5)	(37.4)	(42.1)	(42.8)	(60.6)	
Five-Year Treatment	-11.8	-117.9	-243.7	-242.5	-232.8	-210.5	34.4
	(46.4)	(38.0)	(45.1)	(50.9)	(51.7)	(60.0)	(70.1)
Five-Year - Three Year Treament Differential	-20.6	-75.8	-94.5	-103.5	-213.4	-208.1	
T-Test for Duration Differences	0.46	2.07	2.18	2.11	4.29	3.26	
N	1923	1923	1923	1923	1923	1256	661

TABLE 2 - IMPACT OF THE SIME/DIME NEGATIVE INCOME TAX EXPERIMENT ON HOURS WORKED
YEAR BY YEAR REGRESSIONS
MEN IN DUAL-HEADED HOUSEHOLDS

	Pre-Experiment	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
A. Re-Analysis Including Job Training Duration Indicators							
Three-Year Treatment	-14.1	-44.6	-165.7	-156.8	-37.0	-14.9	
	(39.8)	(32.6)	(38.7)	(43.7)	(44.4)	(65.8)	
Five-Year Treatment	45.4	-116.3	-213.7	-205.0	-193.9	-196.5	16.0
	(52.5)	(43.1)	(51.1)	(57.6)	(58.5)	(65.7)	(70.5)
Five-Year - Three Year Treament Differential	59.5	-71.7	-48.0	-48.2	-156.9	-181.5	
T-Test for Duration Differences	1.05	1.54	0.87	0.77	2.48	2.20	
N	1923	1923	1923	1923	1923	1256	661
B. Re-Analysis Including Job Training Duration Indicators and a Five-Year Program Indicator							
Five-Year Program	44.6	-64.3	-82.7	-69.9	-93.6	-140.7	-96.6
	(58.3)	(47.9)	(56.8)	(55.5)	(65.0)	(83.1)	(114.9)
Three-Year Treatment	-2.7	-61.1	-186.9	-164.3	-61.1	-50.4	
	(42.5)	(34.9)	(41.4)	(46.7)	(47.4)	(69.0)	
Five-Year Treatment	29.5	-93.3	-184.2	-200.8	-160.5	-162.9	28.2
	(56.5)	(46.3)	(54.9)	(60.7)	(62.9)	(68.6)	(72.0)
Five-Year - Three Year Treament Differential	32.1	-32.2	2.7	-36.5	-99.4	-112.5	
T-Test for Duration Differences	0.48	0.59	0.04	0.51	1.33	1.22	
N	1923	1923	1923	1923	1923	1256	661

TABLE 3 - IMPACT OF THE SIME/DIME NEGATIVE INCOME TAX EXPERIMENT ON HOURS WORKED
YEAR BY YEAR REGRESSIONS
WOMEN IN DUAL-HEADED HOUSEHOLDS

	Pre-Experiment	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
A. Final Report Results							
Three-Year Treatment		-20.9 (29.5)	-101.4 (35.8)	-102.6 (39.0)	-14.4 (40.8)	100.4 (60.8)	
Five-Year Treatment		-90 (35.2)	-181.3 (42.8)	-157.7 (46.6)	-205.5 (48.7)	-192.7 (59.8)	-33.8 (71.8)
Five-Year - Three Year Treament Differential		-69.1	-79.9	-55.1	-191.1	-293.1	
T-Test for Duration Differences		2.05	1.95	1.24	4.10	4.63	
N		2043	2043	2043	2043	1347	705
B. Re-Analysis Using Final Report Specification							
Three-Year Treatment	-89.1 (38.4)	-26.5 (29.3)	-95.2 (35.5)	-98.7 (38.5)	-6.6 (40.6)	97.6 (60.2)	
Five-Year Treatment	18.5 (46.2)	-85.3 (35.2)	-170.4 (42.6)	-158.0 (46.3)	-195.8 (48.8)	-189.4 (59.3)	-25.6 (71.3)
Five-Year - Three Year Treament Differential	107.6	-58.8	-75.2	-59.3	-189.1	-286.9	
T-Test for Duration Differences	2.44	1.75	1.85	1.34	4.06	4.59	
N	2074	2074	2074	2074	2074	1373	726

TABLE 4 - IMPACT OF THE SIME/DIME NEGATIVE INCOME TAX EXPERIMENT ON HOURS WORKED
YEAR BY YEAR REGRESSIONS
WOMEN IN DUAL-HEADED HOUSEHOLDS

	Pre-Experiment	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
A. Re-Analysis Including Job Training Duration Indicators							
Three-Year Treatment	-75.6	-38.0	-112.3	-114.8	-15.3	96.2	
	(39.8)	(30.4)	(36.8)	(40.0)	(42.1)	(65.7)	
Five-Year Treatment	-11.6	-64.3	-136.0	-120.6	-174.4	-190.5	-36.6
	(52.2)	(39.8)	(48.2)	(52.4)	(55.2)	(64.9)	(72.0)
Five-Year - Three Year Treament Differential	64.0	-26.2	-23.6	-5.7	-159.0	-286.7	
T-Test for Duration Differences	1.14	0.61	0.46	0.10	2.67	3.52	
N	2074	2074	2074	2074	2074	1373	726
B. Re-Analysis Including Job Training Duration Indicators and a Five-Year Program Indicator							
Five-Year Program	109.6	65.9	-33.8	-118.1	-88.1	-15.4	60.7
	(58.5)	(44.6)	(54.0)	(58.7)	(61.9)	(83.2)	(119.0)
Three-Year Treatment	-46.9	-20.8	-121.1	-145.6	-38.3	92.1	
	(42.7)	(32.5)	(39.4)	(42.8)	(45.1)	(69.3)	
Five-Year Treatment	-51.0	-88.0	-123.8	-78.0	-142.6	-186.8	-43.8
	(56.3)	(42.9)	(52.0)	(56.4)	(59.5)	(67.9)	(73.4)
Five-Year - Three Year Treament Differential	-4.2	-67.2	-2.6	67.6	-104.3	-278.9	
T-Test for Duration Differences	0.06	1.32	0.04	1.01	1.47	3.05	
N	2074	2074	2074	2074	2074	1373	726

TABLE 5 - IMPACT OF THE SIME/DIME NEGATIVE INCOME TAX EXPERIMENT ON HOURS WORKED
YEAR BY YEAR REGRESSIONS
WOMEN IN SINGLE-HEADED HOUSEHOLDS

	Pre-Experiment	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
A. Final Report Results							
Three-Year Treatment		-50 (38.7)	-134.1 (45.7)	-222.8 (49.7)	-96.7 (52.0)	-87.3 (73.3)	
Five-Year Treatment		-87 (48.0)	-170.4 (56.6)	-252.1 (61.6)	-340.9 (64.4)	-405.7 (76.3)	-170.1 (94.4)
Five-Year - Three Year Treament Differential		-37.0	-36.3	-29.3	-244.2	-318.4	
T-Test for Duration Differences		0.85	0.71	0.53	4.20	4.22	
N		1459	1459	1459	1459	951	458
B. Re-Analysis Using Final Report Specification							
Three-Year Treatment	43.1 (41.4)	-55.8 (39.0)	-142.0 (45.9)	-231.9 (49.9)	-82.5 (52.5)	-124.3 (74.2)	
Five-Year Treatment	115.9 (51.4)	-61.1 (48.4)	-152.0 (57.1)	-228.4 (62.0)	-335.3 (65.3)	-414.7 (77.1)	-197.1 (94.0)
Five-Year - Three Year Treament Differential	72.8	-5.4	-10.0	3.5	-252.8	-290.4	
T-Test for Duration Differences	1.55	0.12	0.19	0.06	4.25	3.79	
N	1433	1433	1433	1433	1433	945	458

TABLE 6 - CREDIT MARKET ACCESS MODULE RESULTS
DENVER HOUSEHOLDS IN POST-ENROLLMENT INTERVIEW

	Dual-Headed Households	Single-Headed Households
"Have you ever tried during the past year to purchase anything on credit or to get a loan from a bank, or other regular lending institution?"	60%	43%
"Were any of your applications for credit, charge accounts, or loans denied during the past year?"	16%	14%
"Suppose you decide today to buy something worth, say $500 on a credit plan, that is, on installment. Do you think that you willl be able to get the credit?"	67%	49%
"If you wanted to take out today a loan for, say, $1000 from a bank, credit union, or any other regular lending institution, do you think you will be able to get the loan?"	55%	34%
Constrained: Denied credit or unable to obtain a loan	45%	67%

TABLE 7 - IMPACT OF THE SIME/DIME NEGATIVE INCOME TAX EXPERIMENT ON HOURS WORKED
YEAR BY YEAR REGRESSIONS
SPLIT BY CONSTRAINT STATUS
MEN IN DUAL-HEADED HOUSEHOLDS

	Pre-Experiment	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Three-Year Treatment Interacted With:							
Unconstrained Households	13.3 (70.9)	-58.0 (53.1)	-133.7 (64.5)	-145.7 (64.3)	-57.9 (74.2)	-26.3 (112.9)	
Constrained Households	-112.1 (97.1)	-70.9 (75.0)	-247.5 (92.0)	-221.7 (101.2)	-109.9 (106.2)	-6.0 (147.9)	
Five-Year Treatment Interacted With:							
Unconstrained Households	-44.9 (75.4)	-111.3 (65.5)	-173.8 (88.0)	-280.8 (156.5)	-159.9 (106.5)	-160.9 (118.1)	-63.3 (134.7)
Constrained Households	80.2 (114.5)	-282.7 (96.9)	-291.5 (117.7)	-201.0 (129.8)	-332.7 (132.3)	-264.7 (134.8)	138.5 (136.1)
T-Test for Difference in Three-Year Effects	0.88	0.93	2.16	2.00	0.85	0.17	
T-Test for Difference in Five-Year Effects	0.69	2.28	2.13	1.60	1.99	1.61	0.85
N	1033	1033	1033	1033	1033	693	378

APPENDIX TABLE 1 - IMPACT OF THE SIME/DIME JOB TRAINING EXPERIMENT ON HOURS WORKED
FINAL REPORT RESULTS
MEN IN DUAL-HEADED HOUSEHOLDS

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counseling Only:						
Three-Year Treatment	-3	34.9	33.1	24.1	-52.5	
	(37.8)	(49.6)	(57.2)	(61.8)	(99.6)	
Five-Year Treatment	-2.8	32	-115.3	-80.6	12.8	-115.6
	(47.1)	(60.9)	(70.5)	(76.6)	(83.9)	(87.1)
Five-Year - Three-Year Impact	0.2	-2.9	-148.4	-104.7	65.3	
Counseling Plus 50 Percent Subsidy:						
Three-Year Treatment	-71.7	37.9	62.6	22.4	-16.9	
	(33.6)	(44.4)	(49.7)	(54.2)	(75.3)	
Five-Year Treatment	-105.6	-94.2	-36.7	-73.7	-45.3	-18.7
	(41.9)	(54.1)	(59.4)	(64.5)	(70.5)	(73.7)
Five-Year - Three-Year Impact	-33.9	-132.1	-99.3	-96.1	-28.4	
Counseling Plus 100 Percent Subsidy:						
Three-Year Treatment Only	-88.8	-40.3	-52.7	-37.9	-43.7	
	(33.9)	(44.3)	(49.6)	(53.8)	(75.0)	

APPENDIX TABLE 2 - IMPACT OF THE SIME/DIME JOB TRAINING EXPERIMENT ON HOURS WORKED
FINAL REPORT RESULTS
WOMEN IN DUAL-HEADED HOUSEHOLDS

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counseling Only:						
Three-Year Treatment	-8.6	-28.6	-24.3	-61.8	-65.3	
	(34.3)	(46.3)	(54.0)	(57.8)	(96.3)	
Five-Year Treatment	-77.1	-164	-163.9	-197.9	-68.4	-125.8
	(42.6)	(56.7)	(66.9)	(71.2)	(82.9)	(86.2)
Five-Year - Three-Year Impact	-68.5	-135.4	-139.6	-136.1	-3.1	
Counseling Plus 50 Percent Subsidy:						
Three-Year Treatment	-14.9	-25.3	-5.1	-63.9	-6.2	
	(30.5)	(41.1)	(47.2)	(50.9)	(77.4)	
Five-Year Treatment	-107.8	-109.8	-83.2	-43.1	-44.1	-52.1
	(38.5)	(51.0)	(57.8)	(61.8)	(71.7)	(75.1)
Five-Year - Three-Year Impact	-92.9	-84.5	-78.1	20.8	-37.9	
Counseling Plus 100 Percent Subsidy:						
Three-Year Treatment Only	-10	-71.1	6.3	-96.1	-64.4	
	(30.9)	(41.5)	(47.6)	(51.5)	(76.1)	

Figure 1a - Experimental Estimates from the Final Report
Men in Dual-Headed Households

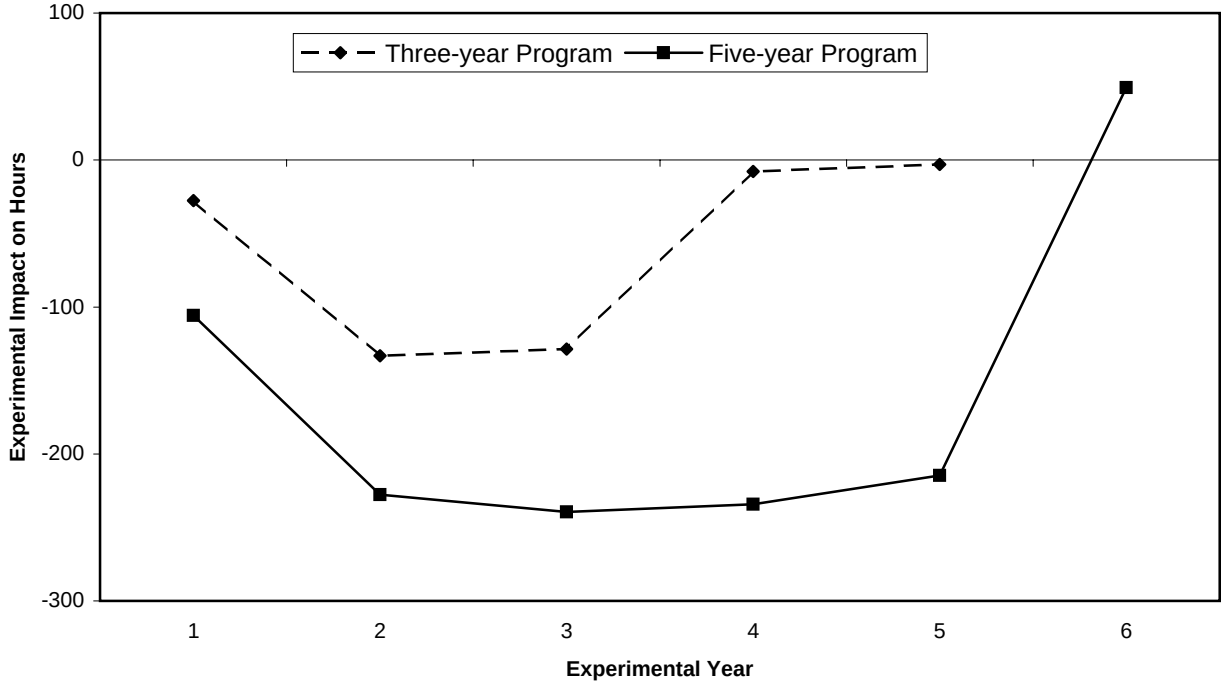

Figure 1b - Re-Analysis Using the Final Report Model
Men in Dual-Headed Households

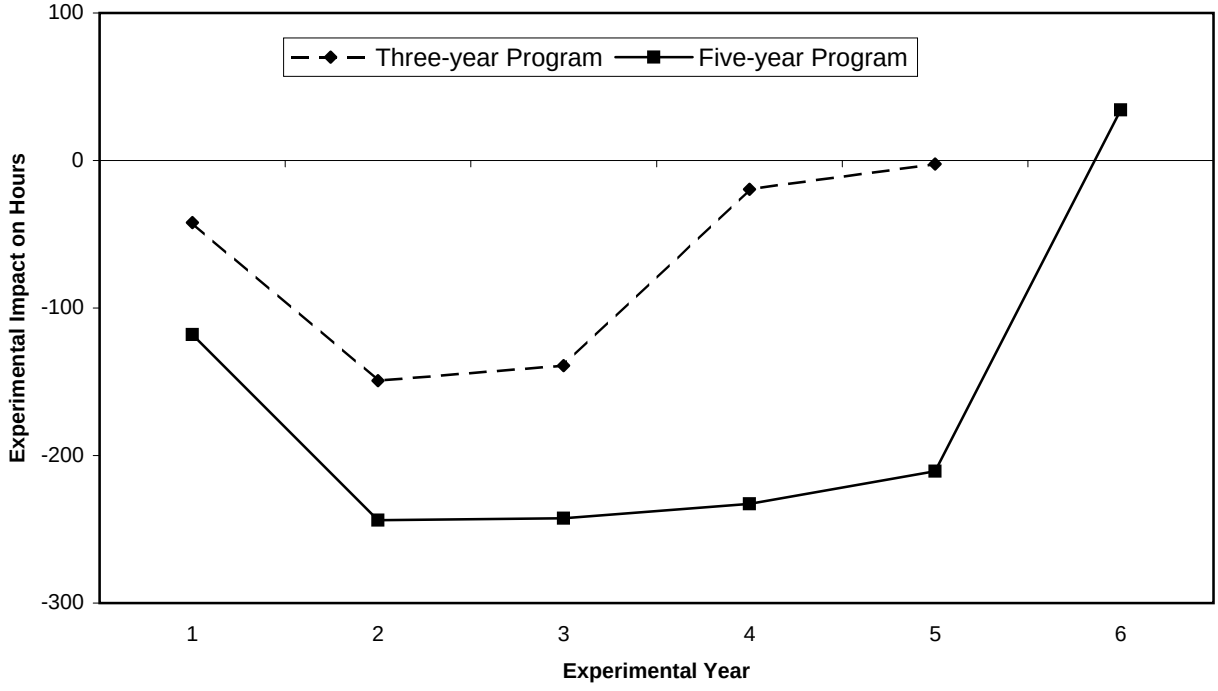

Figure 2a - Including Job Training Duration Indicators
Men in Dual-Headed Households

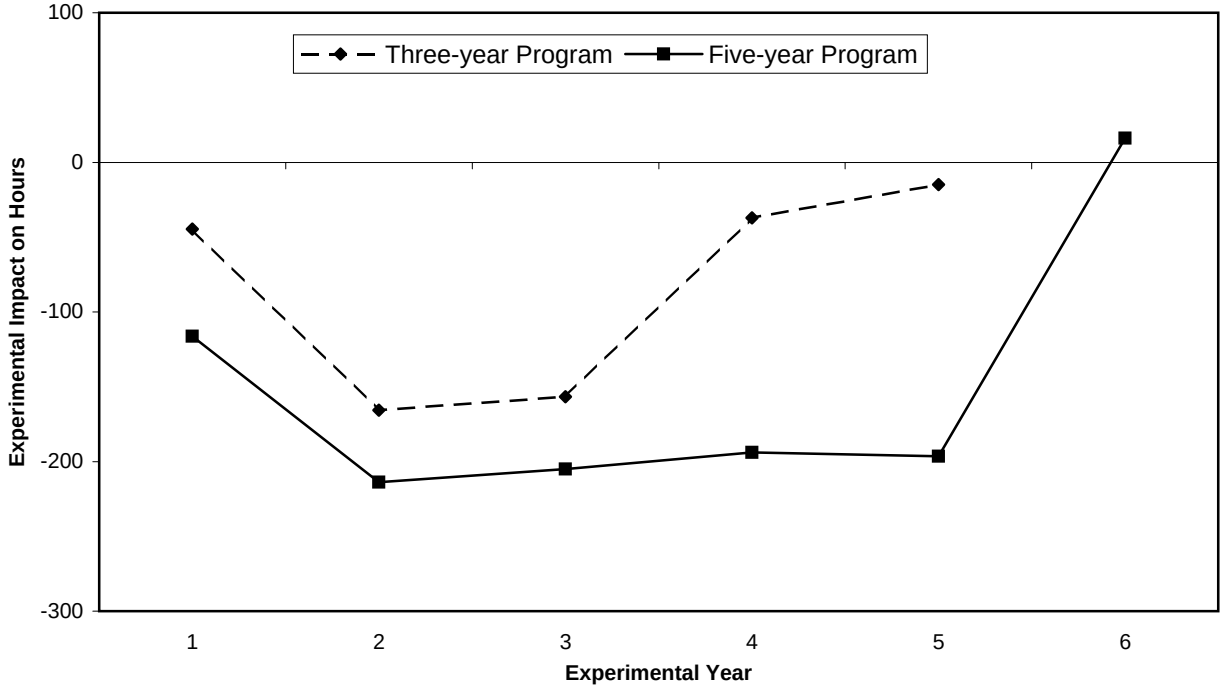

Figure 2b - Including Job Training Duration and Five-Year Program Indicators
Men in Dual-Headed Households

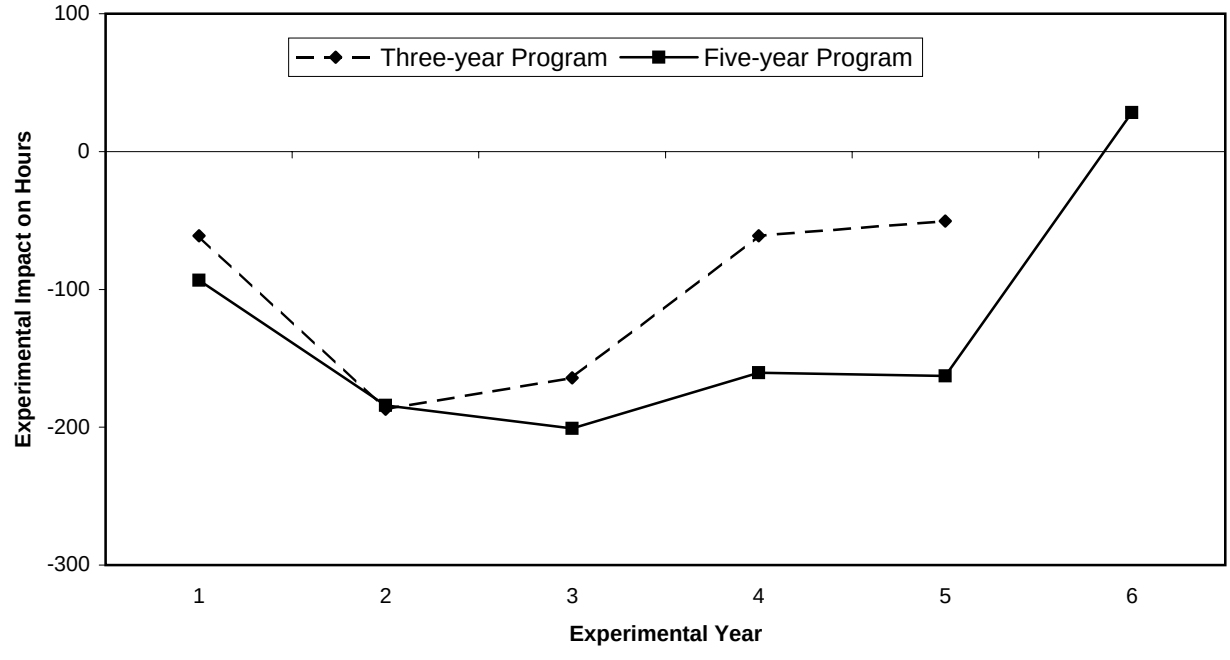

Figure 3a - Differences Between Three- and Five-Year Treatments
Re-Analysis Using the Final Report Model
Men in Dual-Headed Households

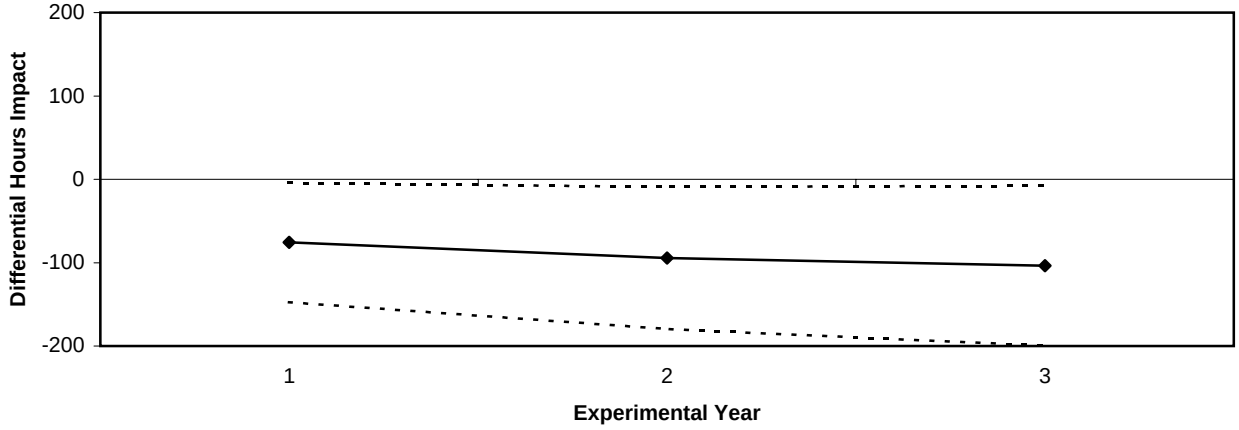

Figure 3b - Differences Between Three- and Five-Year Treatments
Re-Analysis Using the Final Report Model
Plus Job Training Duration Indicators

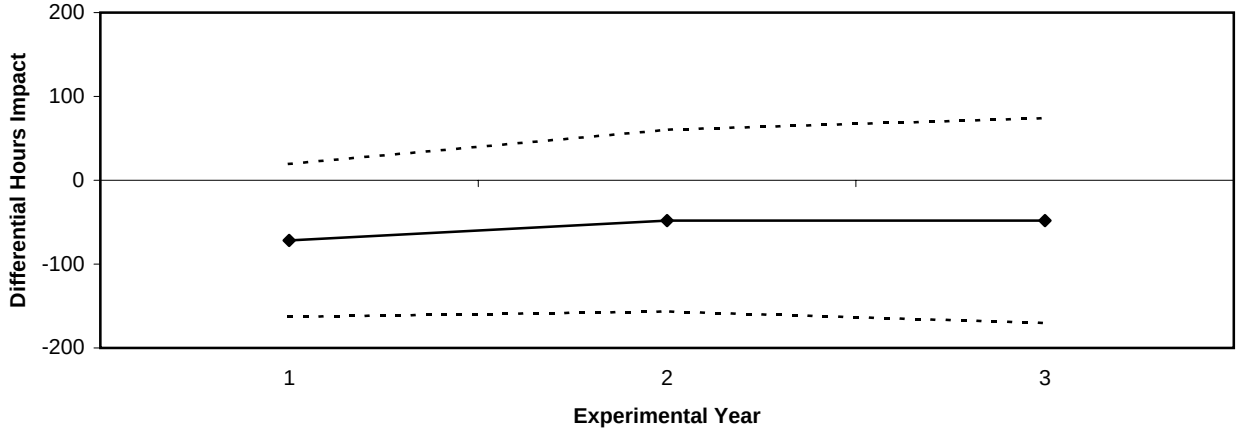

Figure 3c - Differences Between Three- and Five-Year Treatments
Re-Analysis Using the Final Report Model
Plus Job Training Duration and Five-Year Control Indicators

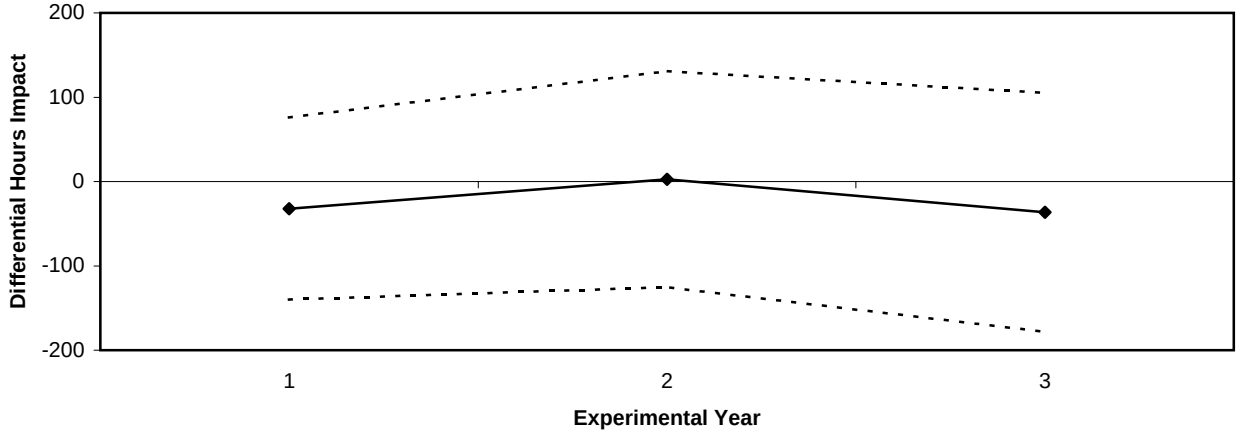

Figure 4a - Experimental Estimates from the Final Report
Women in Dual-Headed Households

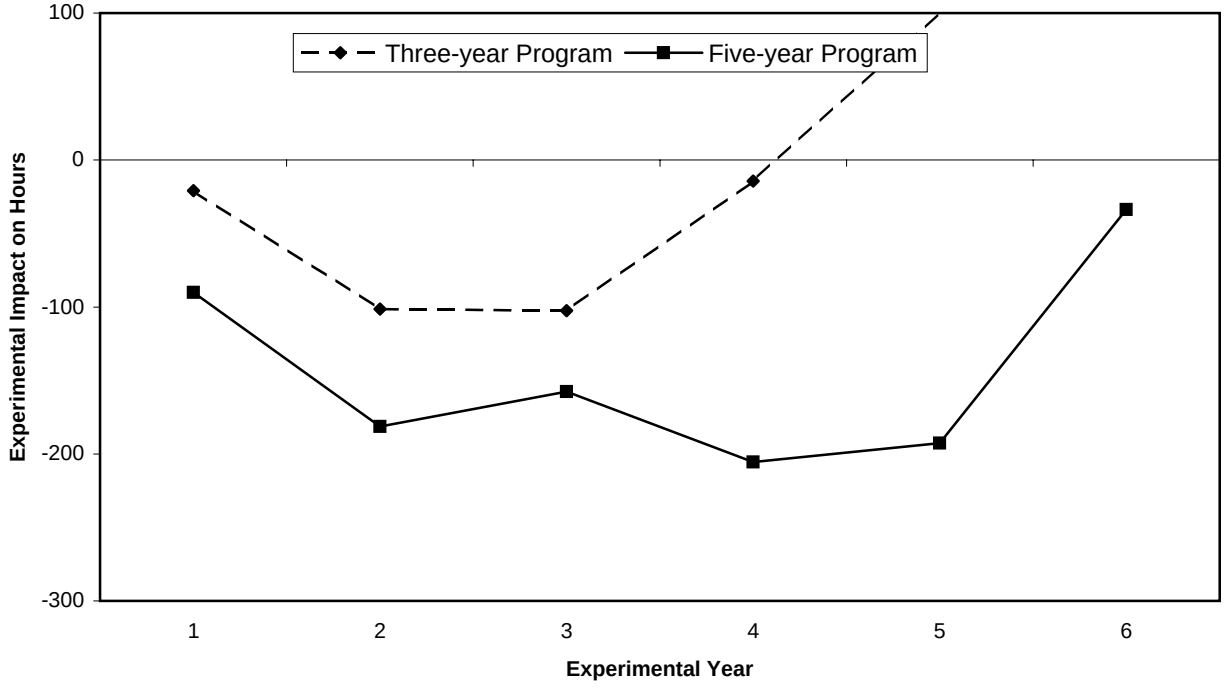

Figure 4b - Re-Analysis Using the Final Report Model
Women in Dual-Headed Households

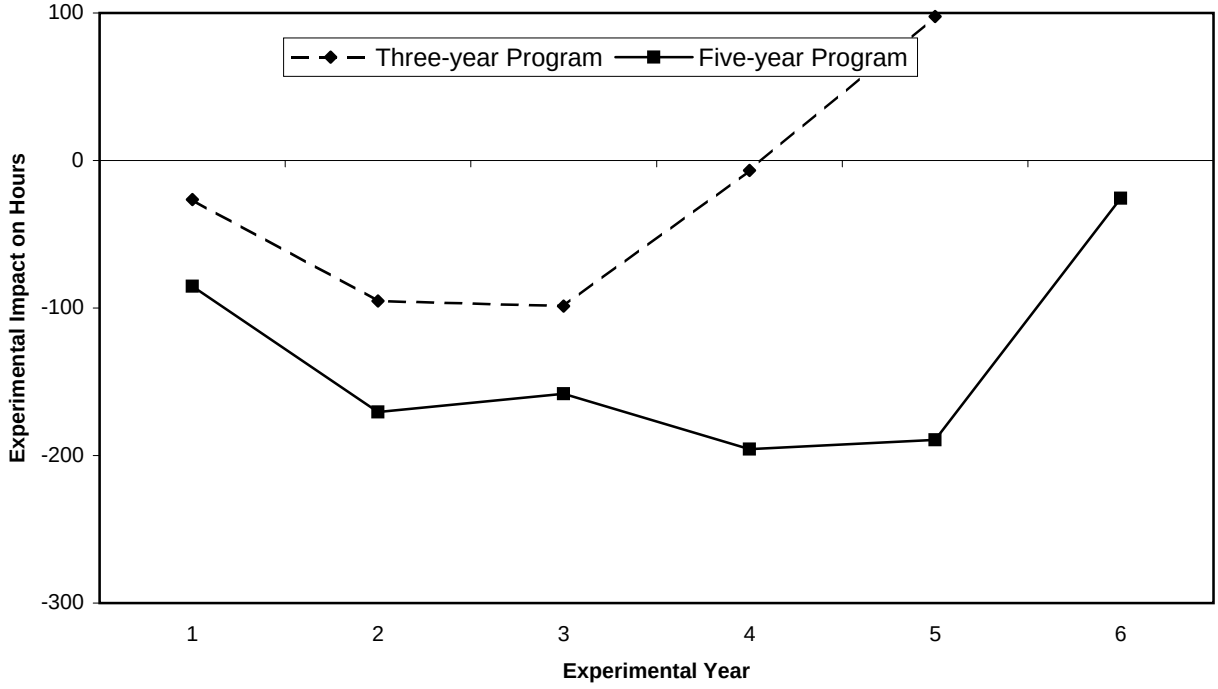

Figure 5a - Including Job Training Duration Indicators
Women in Dual-Headed Households

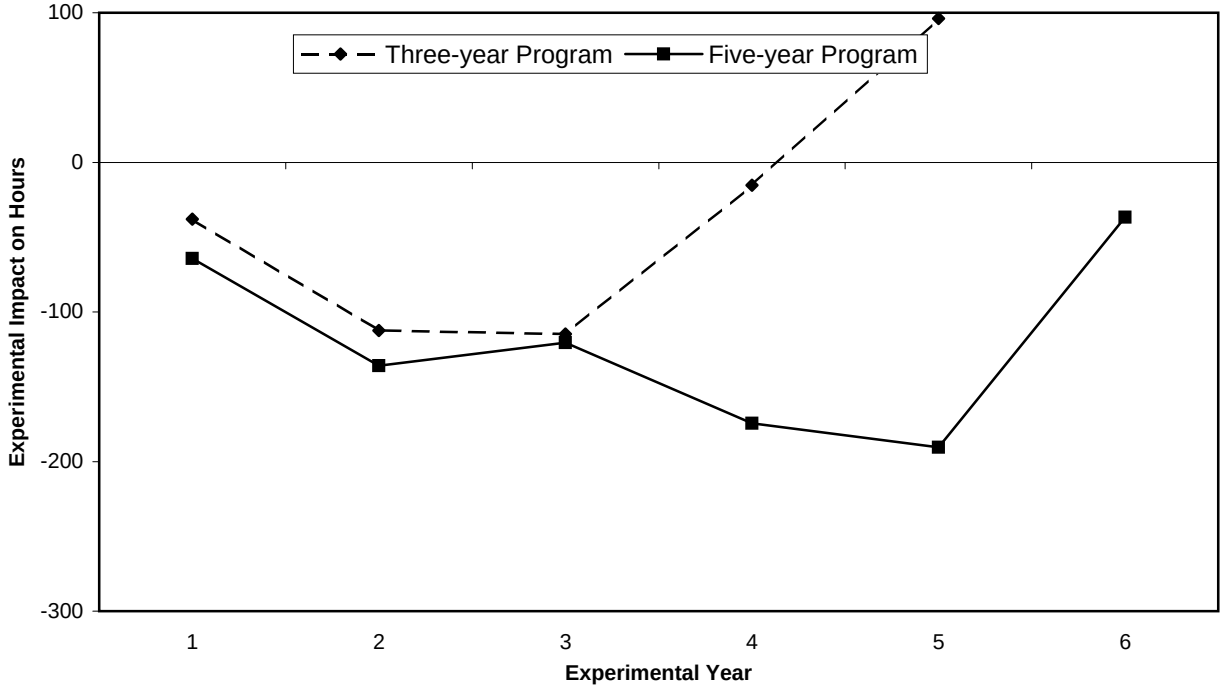

Figure 5b - Including Job Training Duration and Five-Year Program Indicators
Women in Dual-Headed Households

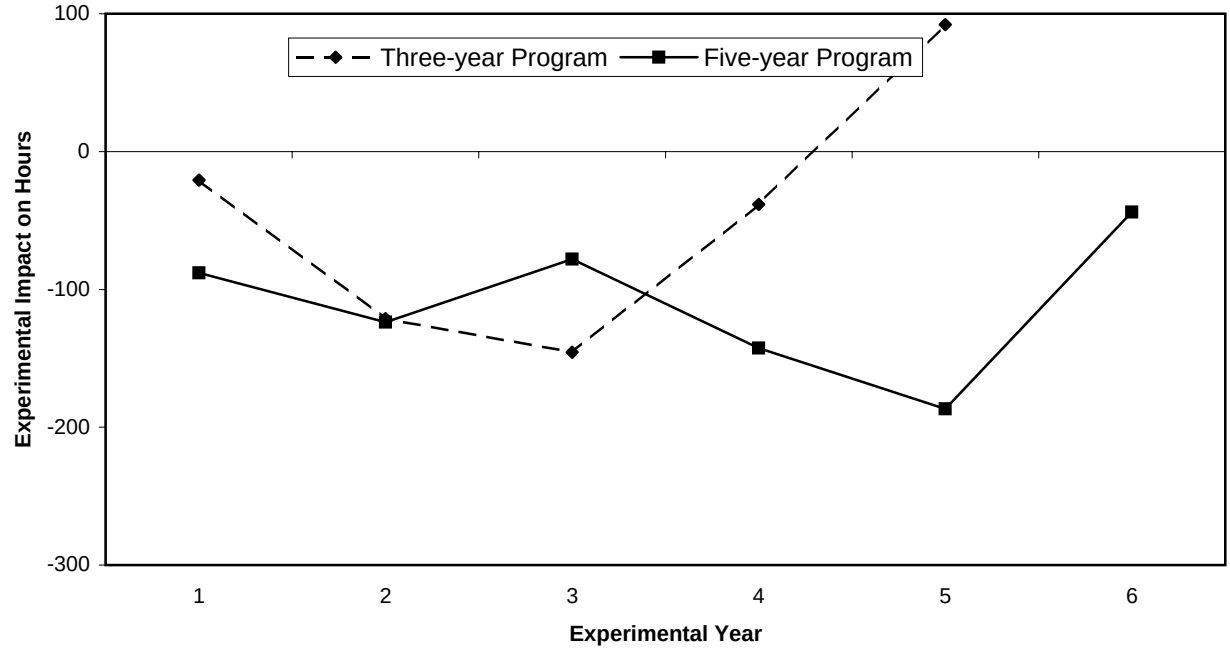

Figure 6a - Differences Between Three- and Five-Year Treatments
Re-Analysis Using the Final Report Model
Women in Dual-Headed Households

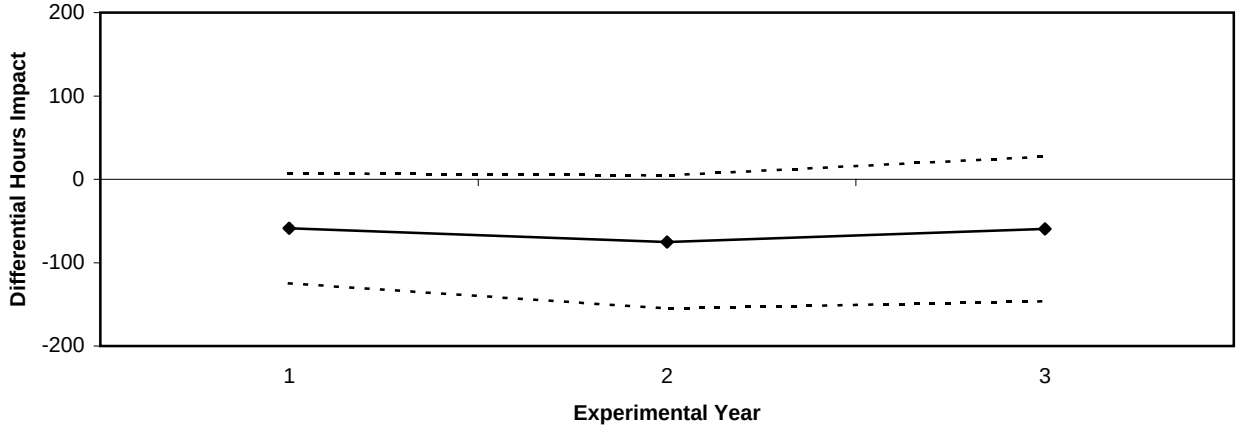

Figure 6b - Differences Between Three- and Five-Year Treatments
Re-Analysis Using the Final Report Model
Plus Job Training Duration Indicators

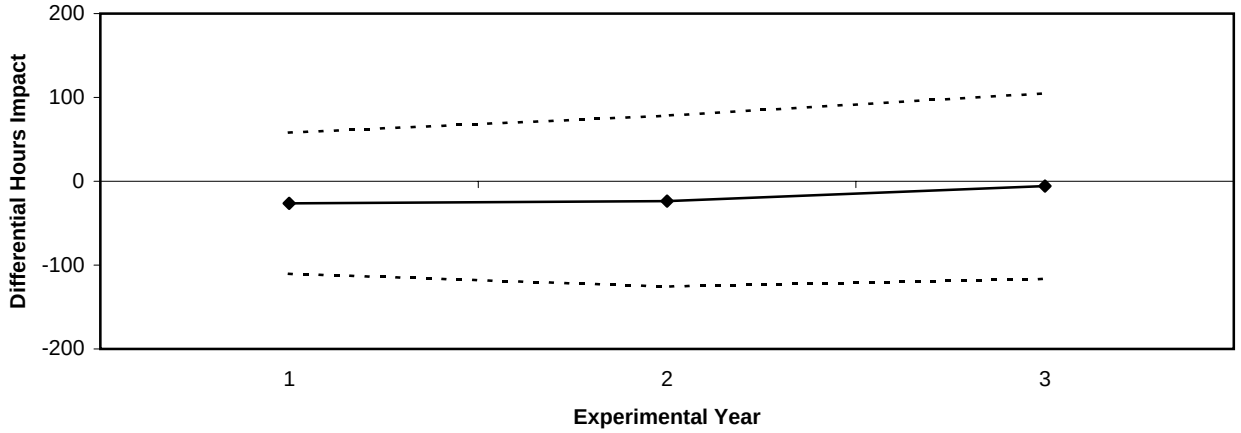

Figure 6c - Differences Between Three- and Five-Year Treatments
Re-Analysis Using the Final Report Model
Plus Job Training Duration and Five-Year Control Indicators

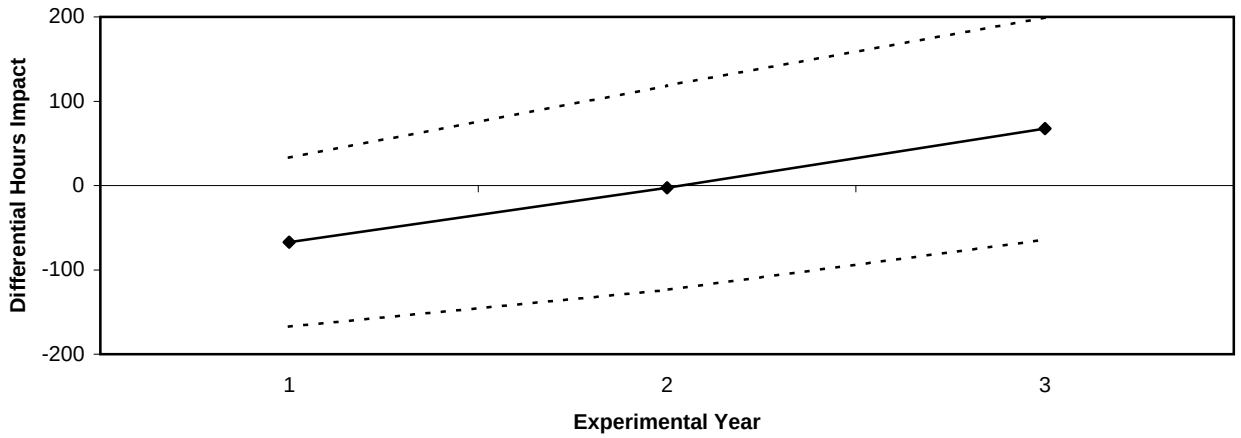

Figure 7a - Three-Year Program Split by Constrained Status
Men in Dual-Headed Households

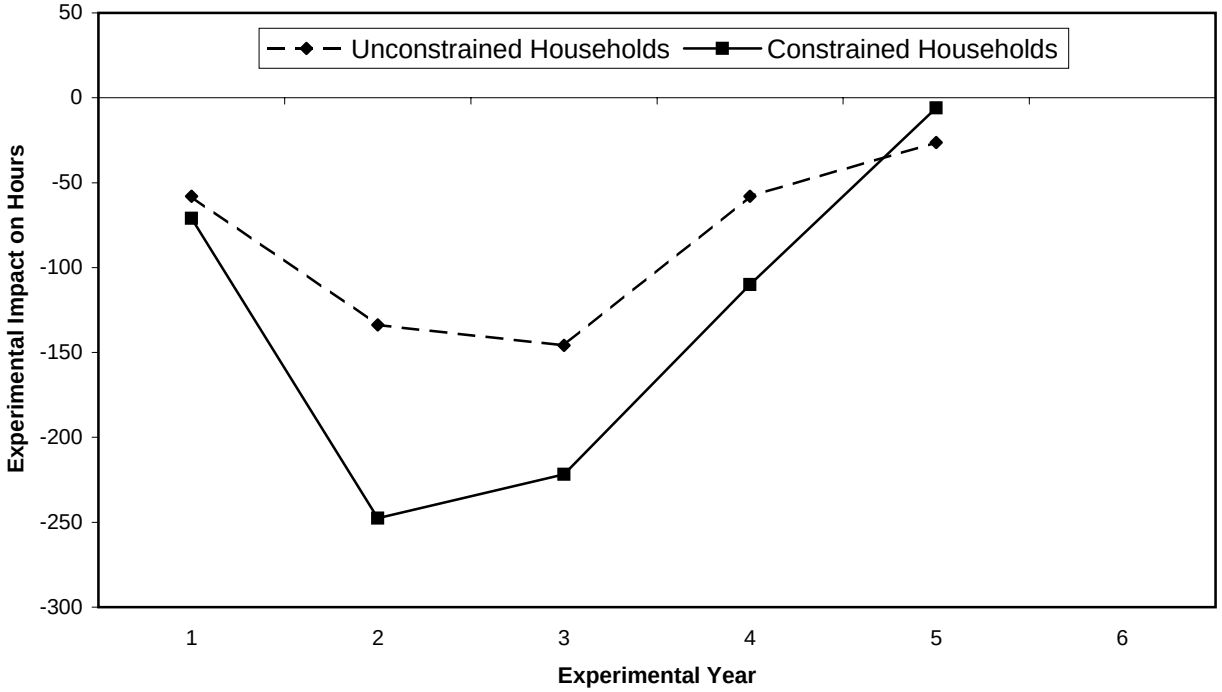

Figure 7b - Five-Year Program Split by Constrained Status
Men in Dual-Headed Households