

## 14.41 Problem Set #4 Solutions

1)

a) There are several possible reasons including but not limited to:

- Competition between MCO plans should reduce costs.
- Some politicians will hope that MCOs may make Medicaid a less attractive option, leading to less crowd-out and better cost-effectiveness for the program.
- Some politicians will hope that MCOs may make Medicaid a more attractive option, by increasing efficiency and access relative to the current system, which relies heavily on public clinics and emergency rooms.
- MCOs (rather than states) bear the risk of the Medicaid recipient's health care costs.
- Capitation, rather than the current retrospective reimbursement system, means that MCOs have an incentive to encourage preventative care and cost-efficient utilization of medical care.

b) MCOs may make Medicaid less attractive, so people who are eligible for private health insurance would be less likely to take up Medicaid. Even among those who aren't eligible for private insurance, some people may be discouraged from taking up Medicaid because the MCO may involve more rules and restrictions about medical care. This effect might be particularly pronounced among healthy individuals, who decide not to go to enroll due to the hassle costs of dealing with the MCO.

However, some eligibles may be more likely to take up if they perceive that they'll have better access to care than under the old program, which relies heavily on public clinics and emergency rooms. There may also be reduced stigma.

c) It may decrease access to care because MCOs can restrict access (i.e. the MCO can require that patients obtain a referral before they can see a specialist). Moreover, MCOs have the financial incentive to minimize the amount of care that an enrollee receives, since they don't get any extra money from the state when they provide more care. On the other hand, enrollees may have increased access to care, since their MCO doctors are guaranteed to accept them, whereas previously there was a good chance that any doctor they chose would not accept Medicaid recipients.

d) This could provide a good natural experiment. Control states would be the states that don't implement the policy change and treatment states would be the states that did. We could create a difference-in-difference estimate of the policy's effect on takeup rate:  $(\text{Takeup}_1^T - \text{Takeup}_0^T) - (\text{Takeup}_1^C - \text{Takeup}_0^C)$ , where C is the control state, T is the treatment state, 0 is the period before the policy, and 1 is the period after the policy. This procedure could also be used to look at other impacts, such as health outcomes.

However, you would need to worry about legislative endogeneity (i.e. maybe the states where takeup rates/crowdout rates have been increasing over time are the first to implement the MCO requirement), composition effects (i.e. might end up with sicker Medicaid population, which would bias estimates of health outcomes), or differential trends in different states. To deal with these threats, you can create other

control/treatment pairings, such as high-income vs. low-income groups (since the former aren't eligible), and see if you get similar estimates of the effects.

2)

a) Each worker must be paid his marginal product, \$200, because the labor market is perfectly competitive. Specifically, the combined cost of wages and EPHI to the firm must be \$200 per worker. Because firms cannot offer employee specific contracts, the labor market will have two types of firms – one which offers EPHI and the other which does not. The firms which offer EPHI will pay a wage of \$100 and provide EPHI (at a cost of \$100). The other firms will not offer EPHI and pay a wage of \$200. The worker utilities are as follows :

|       | EPHI offered | EPHI not offered |
|-------|--------------|------------------|
| $U_i$ | 150          | 200              |
| $U_k$ | 210          | 200              |
| $U_l$ | 250          | 200              |

As the tables makes clear, worker i will be employed by a firm which does not offer EPHI. If he initially went to work for a firm which offered EPHI, he would immediately be lured away by a firm offering no EPHI and higher wages. Workers k and l will be employed by a firm offering EPHI. The fact that the labor market is perfectly competitive and that workers place different values on EPHI ensures both types of firms will exist. The compensating differential is \$100. Workers who receive EPHI are paid \$100 less than those who do not. Worker k is earning a rent of 10 and worker l is earning a rent of 50. The perfectly competitive labor market suggests the workers are able to permanently capture these rents. If a firm attempts to seize any of the rent, another firm will bid the worker away.

b) If a firm of type 1 offers EPHI, it will be forced to pay a wage of zero. All three workers above receive higher utility by taking a job which offers no EPHI and a wage of \$200. Firm's of type 1 cannot attract workers if they offer EPHI and will therefore always offer no EPHI and a wage of \$200. Firms of type 2, as shown in part a, can either offer EPHI or not. If they offer, they will attract workers k and l. If they do not offer EPHI, they may attract worker i. Workers k and l will be employed by a firm of type 2 which offers EPHI and pays a wage of \$100. Worker i may be employed by a firm of type 1 or a firm of type 2 that does not offer EPHI. In either case, he is paid a wage of \$200.

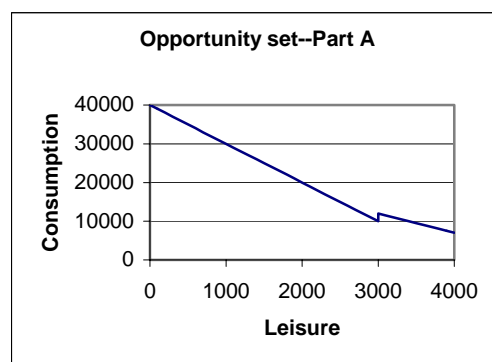
c) The workers' utilities are as follows:

|       | Type 1 : does not offer EPHI | Type 1 : EPHI offered | Type 2 : does not offer EPHI | Type 2 : EPHI offered |
|-------|------------------------------|-----------------------|------------------------------|-----------------------|
| $U_i$ | 230                          | 80                    | 200                          | 150                   |
| $U_k$ | 230                          | 140                   | 200                          | 210                   |
| $U_l$ | 230                          | 190                   | 200                          | 250                   |

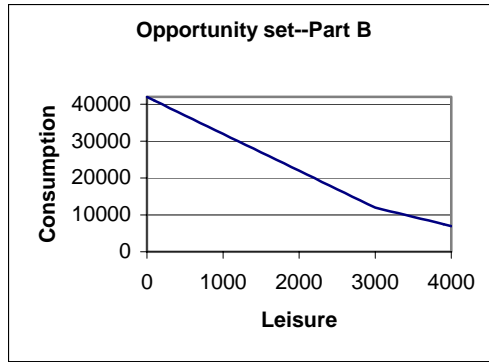
Worker i continues to work at a firm with no EPHI. Worker k now switches to work for a firm which does not offer EPHI, but pays a higher wage of \$230. Worker l continues to work for a type 2 firm which offers EPHI. He continues to work at a type 2 firm despite the fact that his marginal productivity is higher at a type 1 firm. He is suffering from job-lock. As in part b, type 1 firms will never offer EPHI. Type 2 firms will always offer EPHI – otherwise they fail to attract any workers.

3)

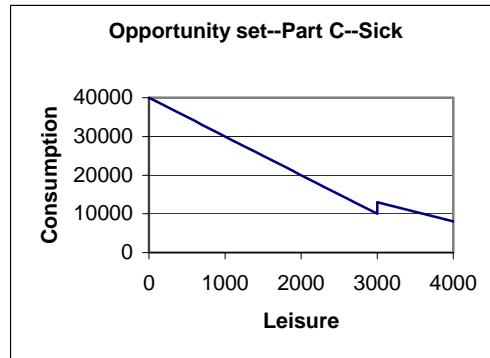
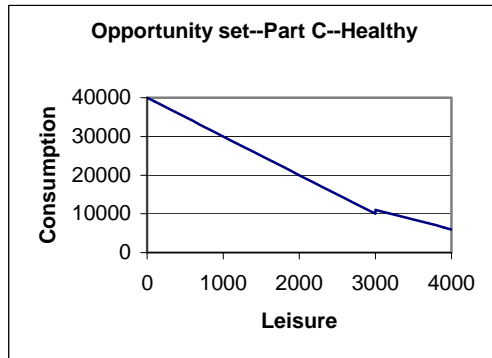
- a) For the entire question, hours refers to hours of leisure (hours of leisure = 4000 – hours of work). The key features of the budget constraint are that there are points at (4000,7000) and (0,40000) and that the slope from 0 to 3000 hours is –10 and the slope from 3000 to 4000 hours is –5. Also, the budget constraint has a big discontinuity at 3000 hours because Pam loses her health insurance by decreasing her hours of leisure from 3001 to 3000 (at 3001 hours consumption is 11,995, at 3000 hours consumption is 10,000). Thus it is very unlikely that she will choose 2800-3000 hours of leisure; she is likely to end up just before the discontinuity, at 3001 hours of leisure.



- b) The budget constraint now looks exactly like part (a), except that there is no discontinuity and therefore the new intercept point is (0, 42000). If a parent was at the discontinuity in part a, the health insurance expansion will likely encourage her to work more hours and take less leisure, since now there is no big penalty for decreasing her leisure hours from 3001 hours to 3000 hours. If a parent was taking between 0 and 2800 hours of leisure, the expansion has an income effect only, which will lead her to choose more hours of leisure (work less).

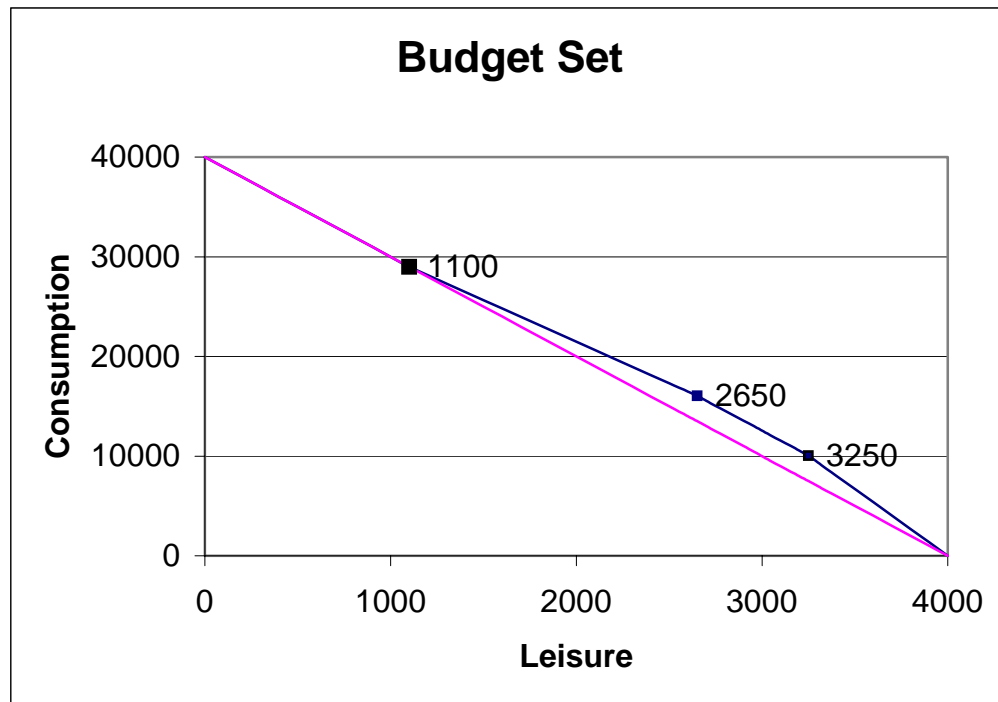


- c) Sick parents will have less incentive to leave welfare, since there is a smaller range of non-welfare consumption-leisure bundles at which they are plausibly better off than on welfare. In addition, sicker parents probably have higher cost of working anyway, so they were already more likely to stay on welfare.



- d) This will have a larger incentive effect on sick parents than on healthy parents, since for the sick there has been a larger increase in the number of consumption-leisure combinations that are attractive to them.

4)  
a)



- b) The introduction of the EITC will have different effects depending on the parent's initial (consumption, leisure) choice.
- For those currently not working at all, the effective wage for an additional hour of work has gone up (the slope of the budget set is steeper). This will cause a positive substitution effect towards work. Since at the current hours of work (zero), they get no transfer, there is no income effect. Therefore the EITC should either have zero effects or should unambiguously increase labor force participation.
  - For those currently working between 1 and 750 hours, there are countervailing income and substitution effects. The effective wage for an additional hour of work has gone up (the slope of the budget set is steeper). This will cause a positive substitution effect towards work. But they are now richer (the budget set is pushed outward), which means they will consume more of everything, including leisure, causing a negative income effect towards work. Therefore the EITC should have ambiguous effects on labor supply among this group.
  - For those currently working between 750 and 1350 hours, there is no substitution effect—the wage is the same as it was before the EITC (the slope of the budget set hasn't changed). But they are now richer (the budget set is pushed outward), which means they will consume more of everything, including leisure, causing a negative income effect towards work. Therefore the EITC should either have zero effect or have an unambiguously negative effect on hours worked among this group.
  - For those currently working between 1350 and 2900 hours, there is a negative substitution effect (the slope of the budget set is flatter than before). And they are now richer (the budget set is pushed outward), so there is a negative income effect.

Therefore the EITC should either have zero effect or have an unambiguously negative effect on hours worked among this group.

- For those currently working more than 2900 hours, there is no direct effect. However, if the indifference curve that is tangent to the budget set above 2900 hours passes below the EITC budget set at a lower number of hours, those in this group will choose to reduce hours worked and receive the EITC. Therefore the EITC should either have zero effect or have an unambiguously negative effect on hours worked among this group.

c)

- i) Ideally, we would want to have two perfectly comparable groups, one of which is randomly assigned to receive the EITC and the other of which is randomly assigned to not receive it. Unfortunately, since eligibility for the EITC is based on a person's characteristics (specifically, income and parent status), those who aren't eligible for the EITC are by definition different from those who are eligible. Nonetheless, we want to identify a treatment group—those who are eligible—and then find “control groups” that are as similar as possible to the treatment group, but are not eligible. While the control groups will necessarily differ in characteristics from the control group, we want to select control groups that differ in ways we can identify and therefore address.

On this table, the best proxy that we have for treatment group is single mothers without a high school degree, since they meet the parent criterion and are likely to meet the income criterion as well.

Now we must find control groups.

- *Single mothers with at least some college.* Pros: would be unlikely to be eligible for the EITC because they earn too much; they might make a good control for what changes between 1993 and 1995 in the child care market that will affect the costs of working (for example, an increase in the number or decrease in the price of day care centers). Cons: they may have different changes between 1993 and 1995 in the demand for their skills, since they are in a different labor market (the high-skill labor market).
- *Single childless women without a high school degree.* Pros: would not be eligible for the EITC because they aren't parents; they might make a good control for what changes between 1993 and 1995 in the low-skill labor market (for example, an increase in the demand for service workers). Cons: they will not be affected by changes in the child care market, so they can't be used as a control for changes in that market.
- *Single childless women with at least some college.* This group will not make a good control group, since they are less comparable to the treatment group than the two groups above.
- *Elderly women.* This would make a terrible control group, since we expect that very different forces (changes in health care, changes in Social Security, changes in retirement behavior, changes in the demand for elderly workers) will be affecting this group's labor supply.

So there are two difference-in-difference pairings that would be informative (though not perfect, relative to a randomized experiment, obviously):

**#1—Single mothers with some college as control group:**

$$(LS_{\text{moms no HS 1995}} - LS_{\text{moms no HS 1993}}) - (LS_{\text{moms some college 1995}} - LS_{\text{moms some college 1993}})$$

$$\begin{aligned} &= (\text{Effect of change in EITC} + \text{change in child care market} + \text{change in low-skill labor market}) - (\text{Effect of change in child care market} + \text{change in high-skill labor market}) \\ &= \text{Effect of change in EITC} + (\text{change in low-skill labor market} - \text{change in high-skill labor market}) \end{aligned}$$

*We can trust this estimate if we're willing to believe that the low-skill and high-skill labor markets changed in the same way between 1993 and 1995.*

**#2—Single childless women without a high school degree as control group:**

$$(LS_{\text{moms no HS 1995}} - LS_{\text{moms no HS 1993}}) - (LS_{\text{non-moms no HS 1995}} - LS_{\text{non-moms no HS 1993}})$$

$$\begin{aligned} &= (\text{Effect of change in EITC} + \text{change in child care market} + \text{change in low-skill labor market}) - (\text{Effect of change in low-skill labor market}) \\ &= \text{Effect of change in EITC} + \text{change in child care market} \end{aligned}$$

*We can trust this estimate if we're willing to believe that the child care market didn't change between 1993 and 1995.*

We can do better with a **triple-difference** estimate. Here, it is useful to have information on single childless women with some college:

$$\begin{aligned} &[(LS_{\text{moms no HS 1995}} - LS_{\text{moms no HS 1993}}) - (LS_{\text{non-moms no HS 1995}} - LS_{\text{non-moms no HS 1993}})] \\ &\quad - [(LS_{\text{moms some college 1995}} - LS_{\text{moms some college 1993}}) - (LS_{\text{non-moms sc 1995}} - LS_{\text{non-moms sc 1993}})] \end{aligned}$$

$$\begin{aligned} &= [(\text{Effect of change in EITC} + \text{change in child care market} + \text{change in low-skill labor market}) - (\text{Effect of change in low-skill labor market})] - [(\text{Effect of change in high-skill labor market} + \text{change in child care market}) - (\text{Effect of change in high-skill labor market})] \end{aligned}$$

=Effect of change in EITC

ii)

**#1—Single mothers with some college as control group:**

$$(LS_{\text{moms no HS 1995}} - LS_{\text{moms no HS 1993}}) - (LS_{\text{moms some college 1995}} - LS_{\text{moms some college 1993}})$$

$$\text{Participation: } (61\% - 52\%) - (91\% - 90\%) = 8\%$$

Hours:

$$\text{Absolute change: } (1262 - 1120) - (1676 - 1650) = 116$$

$$\text{Percentage change: } 12.7\% - 1.6\% = 11.1\%$$

**#2—Single childless women without a high school degree as control group:**

$$(LS_{\text{moms no HS 1995}} - LS_{\text{moms no HS 1993}}) - (LS_{\text{non-moms no HS 1995}} - LS_{\text{non-moms no HS 1993}})$$

$$\text{Participation: } (61\% - 52\%) - (80\% - 75\%) = 4\%$$

Hours:

$$\text{Absolute change: } (1262 - 1120) - (1595 - 1450) = -3$$

Percentage change:  $12.7\% - 10.0\% = 2.7\%$

**Triple difference:**

$$[(LS_{\text{moms no HS 1995}} - LS_{\text{moms no HS 1993}}) - (LS_{\text{non-moms no HS 1995}} - LS_{\text{non-moms no HS 1993}})] \\ - [(LS_{\text{moms some college 1995}} - LS_{\text{moms some college 1993}}) - (LS_{\text{non-moms sc 1995}} - LS_{\text{non-moms sc 1993}})]$$

Participation:  $[(61\% - 52\%) - (80\% - 75\%)] - [(91\% - 90\%) - (96\% - 95\%)] = 4\%$

Hours:

Absolute:  $[(1262 - 1120) - (1595 - 1450)] - [(1676 - 1650) - (1875 - 1850)] = -4$

Percentage:  $[(12.7\% - 10.0\%) - (1.6\% - 1.4\%)] = 2.5\%$

***We can estimate that the \$1000 increase in the EITC increased labor force participation by 4 to 8 percentage points, and had little effect on hours worked.***

(Answers may vary based on the interpretation of the results.)

iii) There are at least two obvious reasons:

- People may not fully understand the marginal incentives of the EITC, which are quite complicated. They may perceive the EITC as simply a subsidy for working—you now get more money for working than you did before—so that it has only positive substitution effects in practice.
- People don't get to pick the hours they work—the increase in the EITC may lead them to want to work 10 hours less per year, but jobs don't usually work that way—in general, people have to optimize over a small set of hours choices: full-time, half-time, and no work. This can diminish the effect of marginal incentives.

iv) We know that traditional cash welfare has negative effects on work—there is both an income effect towards not working, due to the transfer, and a substitution effect, due to the decrease in benefits when working. If EITC can raise incomes without discouraging—or even better, encouraging—work, then it may be preferable as an anti-poverty program (it crowds in labor income rather than crowding it out).

v) Some people are not able to work—they can't find a job, or they are too sick to work, or have a sick child, or are mentally impaired, etc. Society may want to have a “safety net” for these people.