

## Homework Mod 3 answer key

This assignment covers material from CORE'S The Economy Units 4, 5, and 6.

### Economic Models and Problem Solving

#### Unit 4

1. Many people consider political advertising (campaign advertisements) to be a classic example of a prisoners' dilemma.
  - a. Using examples from a recent political campaign with which you are familiar, explain whether this is the case.

**Consider the US presidential campaign from 2020.**

**This campaign is an example of a two-player game (Biden v Trump) where a similar outcome could have been achieved if both sides had agreed on lower spending on ads. The cooperative outcome would have had higher payoffs (same outcome with lower costs), than the non-cooperative one. In the Nash equilibrium, both sides end up spending large amounts, as this is the dominant strategy.**

- b. Write down an example payoff matrix for this case.

**An example payoff matrix is given below, where the first entry is for Party A and the second for Party B. The payoffs here are defined as the value of winning the election, net of the cost of ad spending:**

	Party B spends	Party B doesn't spend
Party A spends	100, 100	250, 50
Party A doesn't spend	50, 250	200, 200

*Marking guidance. A good answer should:*

- *describe why political advertising is a prisoner's dilemma*
- *include a payoff matrix as presented in the reading or lecture (this does not need to be numerical)*
- *use a real-life political campaign to explain*

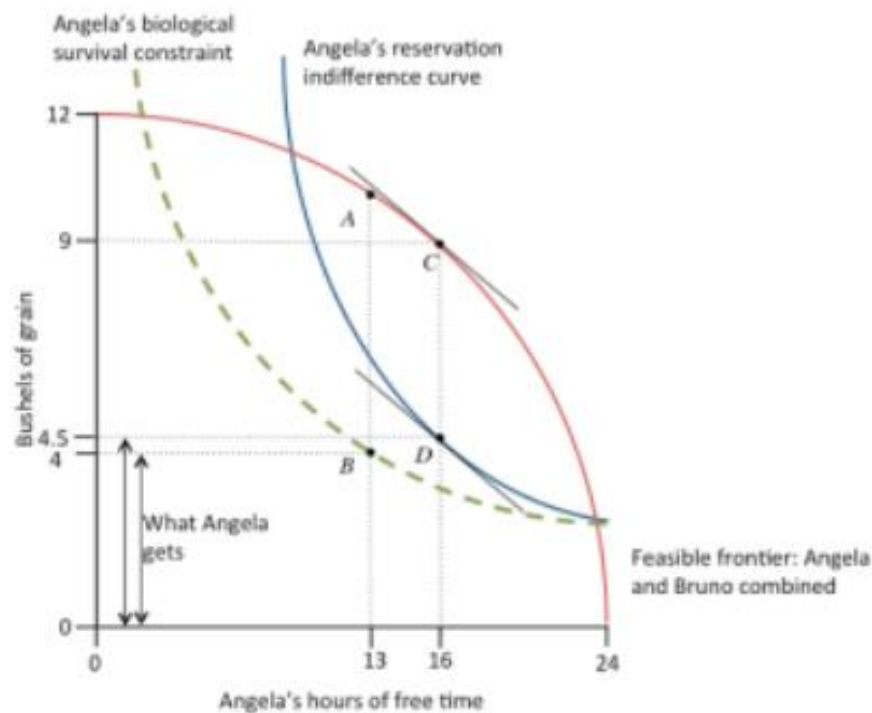
#### Unit 5

2. Angela's income is the amount she produces minus the land rent she pays to Bruno.
  - a. Using Figure 5.7a, suppose Angela works 11 hours. Would her income (after paying land rent) be greater or less than when she works 8 hours? Suppose instead, she works 6 hours, how would her income compare with when she

works 8 hours?

The figure is reproduced below. If Angela worked 11 hours she would have 13 hours of free time. If the rent that Bruno is charging remained at 4.5 bushels then she would now be worse off because the surplus generated at 13 hours of free time is less than 4.5, and so Angela would be below her reservation indifference curve. We know that the surplus at 13 hours of free time is less than 4.5 bushels because we know that the surplus is maximized at 8 hours of work, where it is exactly 4.5 bushels. Similarly, if she works 6 hours and has 18 hours of free time, the total surplus generated would be less than 4.5 bushels. If the rent remained at 4.5 bushels, Angela would be worse off.

Figure 5.7a Bruno's take-it-or-leave-it proposal when Angela can refuse



- b. Explain in your own words why she will choose to work 8 hours

**The reason Angela works 8 hours is because this is the only level at which she is able to generate a surplus of 4.5 bushels which, after payment to Bruno, would leave her just on her reservation indifference curve.**

## Unit 6

3. As in all economic models, our simplified representation of Maria's employment rent has deliberately omitted some aspects of the problem that might be important. For example, we have assumed that:

- Maria finds a job with the same pay after her spell of unemployment.

- She does not experience any psychological or social costs from being unemployed.

Redraw Figure 6.2 to show how relaxing each of these assumptions would alter the employment rent. Specifically, assume:

- a. Maria can only find a job with the lower pay of \$6 per hour after her spell of unemployment.
- b. She experiences a psychological cost of being unemployed of \$1 per hour. When unemployed, she gains \$2 per hour because there is no longer the disutility of working so the net gain is \$1.

**Relaxing the first assumption means that, after a spell of unemployment, Maria finds another job at lower pay. Holding the disutility of effort when employed constant, the duration of unemployment, and the unemployment benefit, her employment rent from her current job would be larger, because she has more to lose from becoming unemployed. The employment rent increases by the area between the original wage of \$12 and the new lower wage (see below).**

**Relaxing the second assumption means that Maria faces additional costs if she were to lose her job. In other words, her disutility of effort when employed is partially offset by the psychological cost of being unemployed. Holding the disutility of effort when employed, the duration of unemployment, and the unemployment benefit constant, her employment rent increases. Note that her reservation wage decreases, because her net benefit from being unemployed is now the unemployment benefit minus the larger expected cost of being unemployed, which is smaller.**

The first graph below shows the case in which Maria's new job after unemployment pays an hourly wage of \$6.

**The employment rent per hour following the spell of unemployment**

**= wage – disutility of work**

**= \$6 - \$2 = \$4**

**The second graph shows the case where Maria's psychological cost of joblessness is half the disutility of working.**

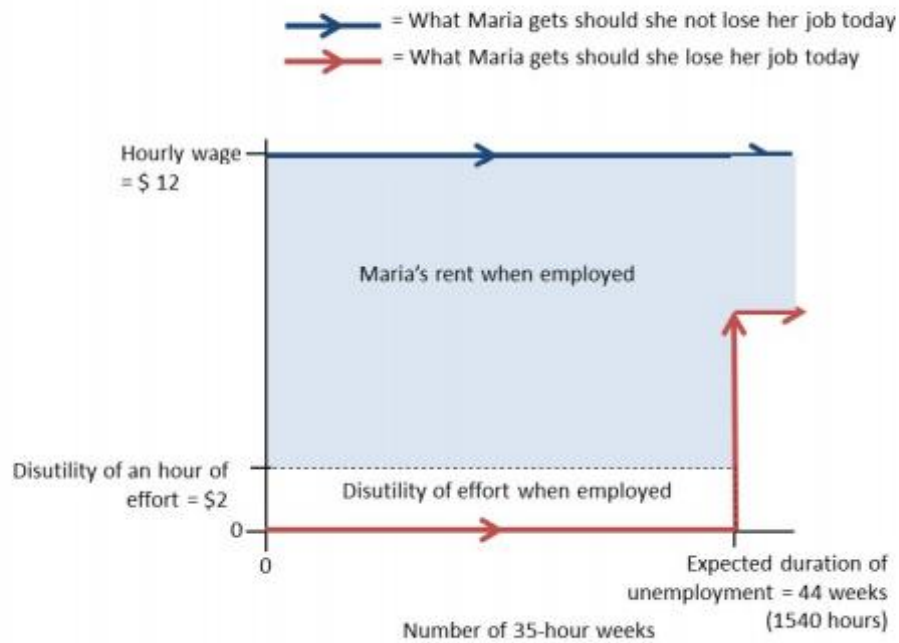
**In each case, the blue shaded area is her employment rent.**

**If Maria gets a job that pays less than her original job: Her employment rent is larger than before. She has more to lose by the loss of her high-paying job. •**

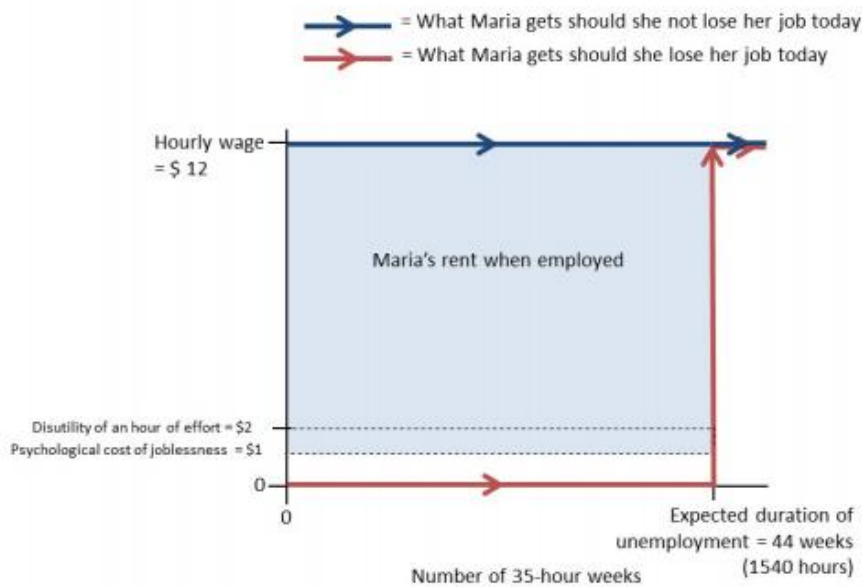
**If she must bear the psychological costs of joblessness: Her employment rent is larger than before.**

**Note that this problem shows that many standard variations can be analyzed using this simple model, which makes the model powerful. Think of some other examples – what happens if Maria's wage increases over time whilst she's in the job.**

Maria's unemployment rent when the job she gets after unemployment pays half the wage of her old job



Maria's employment rent when the psychological cost of joblessness is \$1/hour



Marking guidance. A good answer will:

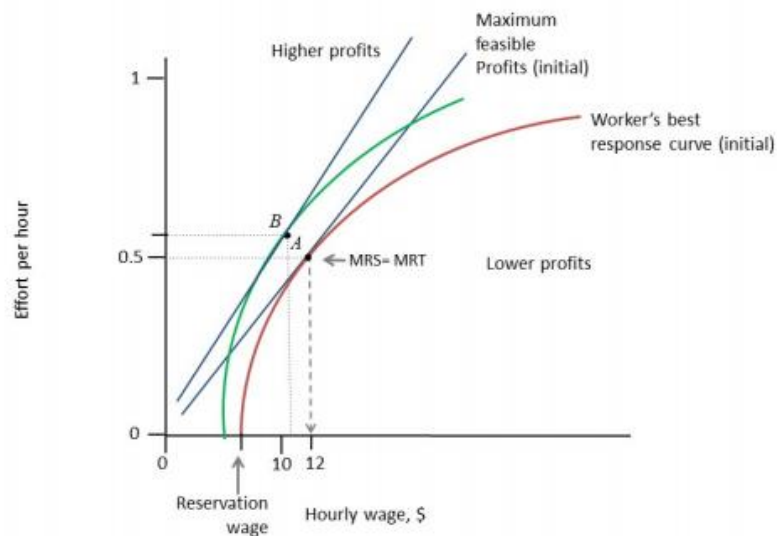
- discuss how relaxing each of these assumptions will affect Maria's costs and

benefits of working

- draw a graph for each case using Figure 6.2 as the base

4. Would any of the following affect Maria's best response curve or the firm's isocost lines for effort in Figure 6.6? If so, explain how.
- a. The government decides to increase childcare subsidies for working parents but not for those unemployed. Assume Maria has a child and is eligible for the subsidy.

**If childcare for someone with a job is now cheaper, then Maria's reservation wage may fall because she now pays less for childcare and is happy to work at a lower wage. Therefore, the horizontal axis intercept of her best response curve moves to the left. Maria may also choose to use more childcare services because it is now cheaper, making her less stressed and more productive at work. This may lead to her best response curve rotating upward, as well as shifting to the left, which would mean that she puts in more effort for exactly the same wage (the green line in the first diagram). This would then lead to the firm producing on a higher isoprofit line and making more profit (for example, point B instead of A in the figure below).**

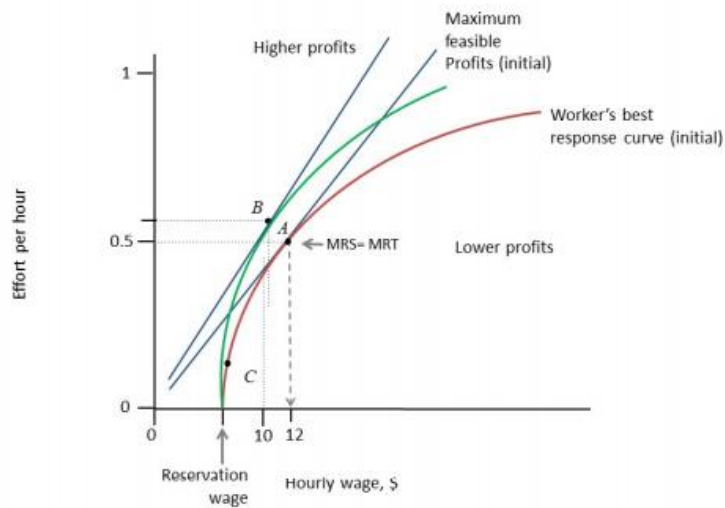


- b. Demand for the firm's output rises as celebrities endorse the good.

**Doesn't affect effort or cost of effort.**

- c. Improved technology makes Maria's job easier.

**If doing the job is now easier, Maria may put in more effort at a given wage, such that best response curve rotates upwards with the same reservation wage (the green curve below). This would also lead to the firm producing on a higher isoprofit line and thus making more profit.**



Marking guidance. A good answer will:

- recognize that the reservation wage depends on the provision of childcare and other outside opportunities (Note the importance of the assumption that the childcare subsidy is only for working parents. If it were general, it would not shift the best response function because there would be no change in her cost of childcare, whether she was in work relative or unemployed. Therefore, there would be no change in her reservation option. The work-dependent subsidy makes the cost of job loss higher because her employment rent is higher).
- draw the relevant graphs