Econ 101A
Midterm 1

Instructor: Stefano DellaVigna

February 25, 2021

Write your NAME:______________________

Write your Student ID:______________________

Read carefully and sign this statement

I swear on my honor that I will neither give nor receive aid with this assessment/exam.

Signature

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Econ 101A – Midterm 1

Th 25 February 2020.

You have approximately 1 hour and 20 minutes to answer the questions in the midterm. After you are finished, scan and upload the exam on Gradescope by 12.40 the latest. There is only 1 problem in today's exam. Show your work!

Problem 1. Consumption and Leisure. (67 points) A consumer makes a choice about consumption c and leisure l. The utility function is

$$u(c,l) = ln\,(c) + 30l$$

1. Plot 3 indifference curves $u(c,l) - \bar{u} = 0$ for different values of $\bar{u}$. Have the leisure l as the y axis and consumption c as the x axis. Do you notice a special feature of these preferences? (Hint: calculating the slope of the indifference curve, the MRS, might help you with the drawing) (5 points)

2. In the next 4 sub-questions, I ask for features of the preferences represented by the utility function above. Write the definition if you can recall it and explain to the best you can why you think the preferences have, or do not have, those features. (12 points)

   (a) Are the preferences complete?

   (b) Are the preferences transitive?

   (c) Are the preferences monotonic?

   (d) Are the preferences convex?

3. We now consider the budget constraint. The individual has income M and in addition can earn from working at wage w, where hours worked h satisfy $h + l = 24$. The price of c is p. Thus, $pc \leq M + wh$. Transform the budget constraint into a constraint written over c and l, and the constants M, p and w. (4 points)

4. Why is w the price of leisure l in the budget constraint? (3 points)

5. The consumer maximizes utility subject to budget constraint. Assume that the budget constraint is satisfied with equality (it is) and write the Lagrangean function. Derive the set of first order conditions. (4 points).

6. Use the first-order conditions to solve for $l^*$and c^*. (5 points)

$l^*=$
$c^*=$

7. How does the optimal choice of l^* and of c^* depend on income M? Are the two good normal goods? (4 points)

8. What is the special feature of the utility function above that accounts for the above result? (4 points)

9. Check now under what conditions $l^* \geq 0$ and $c^* \geq 0$ are satisfied. (4 points)

10. Consider now an individual with utility function

$$v(c, l) = ln\,(c) + 10l$$

which differs from the above because of the $10l$ term, instead of $30l$. An economist says – "You do not need to solve again for the optimal $l^*$and c^* for this case, as this utility function $v(c, l)$ is a monotonic transformation of the original utility function $u(c.l)$, thus it represents the same preferences and will have the same solutions". Do you agree with this? Explain your thinking. (5 points)

11. Consider now an individual with utility function

$$w(c, l) = ln\,(c) + ln(l).$$

Write the Lagrangean, take first order conditions and solve for $l^*$and $c^*$for this case. (8 points)

$l^*=$

$c^*=$

12. For this utility function $w(c, l)$, how does the optimal choice of l^* and of c^* depend on income M? Are the two good normal goods? (4 points)

13. Compare the answers to question (12) to the answer for question (7). Relate the difference to the difference in utility functions. (5 points)

For notes

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For notes