

Homework 1

ECON 380
UNC Chapel Hill

Name: _____

ONYEN: _____

Due date: **September 8 by 2:25PM**. You must turn in your work on a printed copy of this document in order for it to be graded. Your assignment must be stapled and in the correct order. Non-stapled assignments or those not on a copy of this document will automatically receive a 10 point deduction.

Labor Force Accounting and Unemployment

1. Determine the current labor force status (employed, unemployed, or out of the labor force) of [10 pts] the following individuals as determined by the Bureau of Labor Statistics.
 - (a) Corinne reports that she has not worked in the last three months. When interviewed further, she reveals that 3 weeks ago she applied for jobs at a hospital and at a Washington-based NGO. She currently is waiting to hear back from both businesses.
 - (b) Jasmine is graduating from college next month. She has submitted applications to four potential employers, but she cannot start work until after she finishes her college program.
 - (c) Kristina moved from Charlotte to Boston two weeks ago on the Wednesday of the CPS reference week. On Monday of the reference week, she worked her last day as a hostess at Paradise. Since moving, she has not looked for work in Boston.
 - (d) Taylor attends UNC as an undergraduate student. She does not currently have a job, but she has looked at classified ads in the town newspaper in the last month. However, she has yet to reach out to any potential employer.

(e) DeMario is 19 years old. He works about 20 hours a week on his family farm, though he is not paid. For the last six weeks, he has been contacting potential employers in town and sending them his resume in order to have extra spending money.

2. Suppose there are 12,500 individuals over age 16 in Waxhaw. Of these individuals, [12 pts]

- 3,500 work full-time in the private sector
- 2,000 work full-time in the public sector (non-military)
- 2,000 work part-time in the private sector . Of these part-time workers, 20% are working part-time, but would prefer full-time work.
- 1,500 individuals were laid off 6 months ago due to a plant closing. Of these laid off individuals, 1,000 have actively sought work since being laid off, while 500 searched for work immediately after being laid off, but not in the last four weeks.
- 1,000 do not have formal employment and instead choose to stay home to care for children
- 2,500 are retired from work and neither have nor seek employment.

Use this information to answer the following questions.

- (a) How many employed persons are there in Waxhaw?
- (b) How many unemployed persons are there in Waxhaw?
- (c) What is the labor force participation rate?
- (d) Calculate the U3 unemployment rate as defined by the Bureau of Labor Statistics.
- (e) Calculate the U5 unemployment rate as defined by the Bureau of Labor Statistics.
- (f) Calculate the U6 unemployment rate as defined by the Bureau of Labor Statistics.

3. For each of the following, determine which type of unemployment is present: frictional, seasonal, [10 pts] structural, or cyclical.

- (a) Boone, NC experiences low unemployment during the winter due to increased labor demand from ski resorts.
 - (b) Jack quit his job a few months ago due to poor work conditions. He is currently seeking work, but it is taking time for him to fill out applications and hear back from interested firms.
 - (c) NBC lays off all workers under its page program because robots are now able to perform their tasks.
 - (d) Jack has looked for work as an accountant for some time. While demand for accountants doesn't appear to be falling, there seems to be more people applying than there are jobs available.
 - (e) Maya worked as a stockbroker before a recession began, but was laid off. She is looking for work, but demand for labor in the financial industry is low.
4. **Directions:** Type your response to this question and attach it to the back of this packet. [10 pts]
Non-typed answers will receive zero points.

Listen to the podcast *50 Things that Made the Modern Economy: The Pill* and read sections I-II of the article *More Power to the Pill (2006)* by Martha Bailey found on Sakai. In 6-7 sentences, summarize the podcast episode and discuss the potential mechanisms through which access to oral contraceptives affected female participation in the labor force.

Worker Preferences and Constraints

5. Frank's preferences are represented by the following utility function: $U(C, L) = 4C^{2/5}L^{3/5}$.
- (a) Frank's marginal utility of consumption is $MU_C = \frac{8L^{3/5}}{5C^{3/5}}$ and his marginal utility of leisure [3 pts] is $MU_L = \frac{12C^{2/5}}{5L^{2/5}}$. Determine his marginal rate of substitution between leisure and consumption, $MRS_{L,C}$, simplifying your answer as much as possible.
- (b) Find the equation representing his indifference curve for the utility level $\bar{U} = 40$, solved [3 pts] for C .
- (c) Do Frank's preferences satisfy the property of monotonicity? Why or why not? [2 pts]
6. A worker has preferences given by $U(C, L) = 2C^{1/2}L^{1/2}$. If the worker is indifferent between [4 pts] bundle A , given by (\$900, 100 hours), and bundle B , given by (\$625, X), what is X ?

7. Tom earns \$15 per hour and is exempt from paying taxes, regardless of the number of hours he works. Additionally, Tom must pay \$3 per hour in child care expenses for each hour he works and receives \$200 in tax-exempt lottery winnings each week. There are 110 hours in a week for Tom to allocate between work and leisure.

- (a) Write out the equation for Tom's weekly budget line. **[4 pts]**
- (b) Sketch the equation for Tom's weekly budget line. Make sure to label (i) his endowment point and (ii) his total consumption if he took no leisure time. **[2 pts]**
- (c) Now, suppose Tom's wage earnings, and only his wage earnings, are taxed at a flat 15% rate. Write out the new equation for Tom's budget line and sketch it (in a different color) on your plot above, labeling it similarly to (b). **[3 pts]**
- (d) Suppose there are 50 weeks in a year that Tom could potentially work. Write out the equation for Tom's yearly budget line (under the assumption his wage earnings are taxed at 15%). **[2 pts]**

8. Charlie faces the following marginal tax rates on his gross earnings:

[5 pts]

Table 1: Marginal Tax Rates

Marginal Tax Rate	Gross Earnings
10%	$\leq \$15,000$
20%	\$15,001 - \$40,000
25%	\$40,001 - \$90,000
30%	\$90,001 - \$200,000

Before taxes, Charlie earns a gross wage of \$7.50 per hour. He also receives a lump sum, tax-exempt \$5,000 per year from his grandmother. Suppose Charlie has 5,000 available hours to split between work and leisure during the year. Draw his budget line in the plot below. Make sure to label (i) his endowment point, (ii) each “kink” point in his budget line, (iii) his net wages along each portion of the budget line, and (iv) his total consumption if he took no leisure time.

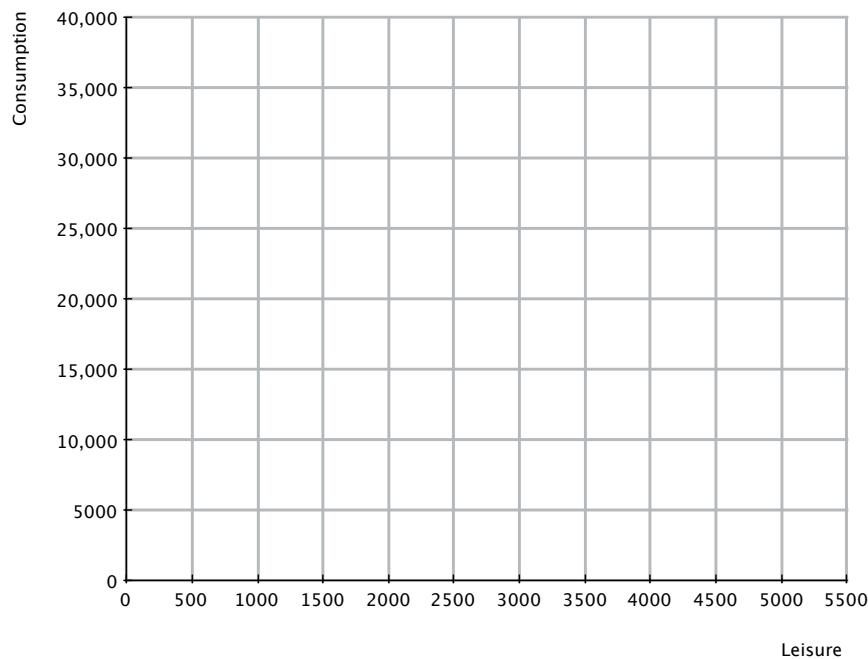


Figure 3: Charlie's Budget Set

FOR GRADING:

Question:	1	2	3	4	5	6	7	8	Total
Points:	10	12	10	10	8	4	11	5	70
Score:									