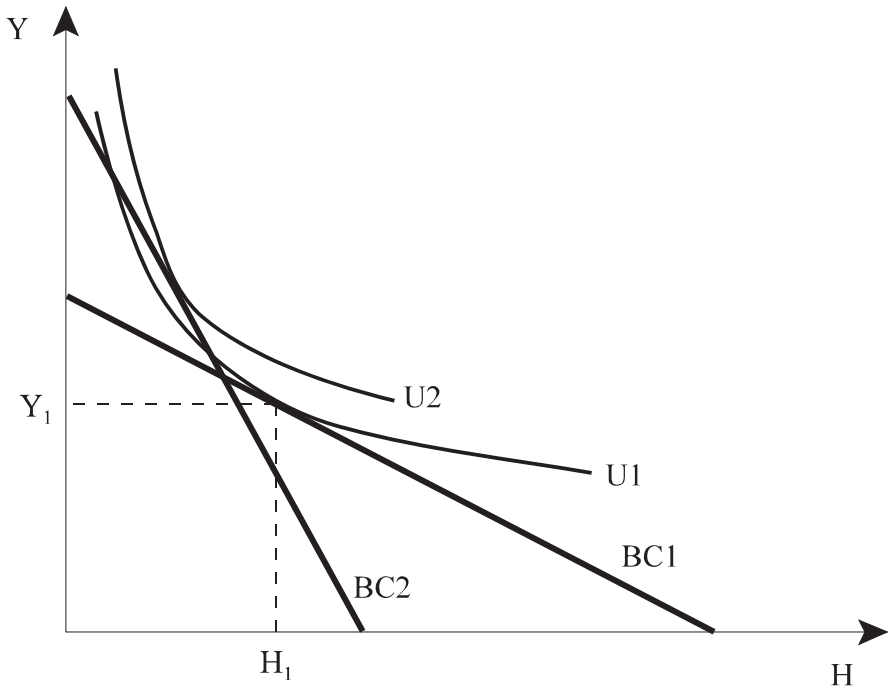
Short Questions

1. Consider a worker who is moving from Champaign to Chicago. His budget constraint in Champaign is given by the line *BC1*, and the consumer spends his money on housing *H* and other goods *Y*. The optimal consumption of *H* and *Y* in Champaign is given by H_1 and Y_1. The worker's budget constraint in Chicago is given by *BC2*. The price of other goods, *Y*, is the same in Chicago as in Champaign, but the price of housing differs.



a. Is the worker's salary in Chicago higher or lower than his salary in Champaign? Give a complete explanation to your answer.

The worker's salary in Chicago is higher than his salary in Champaign. This can be determined because the Y intercept of BC2 is higher than the Y intercept of BC1, i.e., the amount of other goods the consumer can purchase in Chicago, if he spends nothing on housing, is more than the amount of other goods he can purchase in Champaign. Since the price of other goods is the same in both cities, this means that his salary in Chicago is higher than his salary in Champaign.

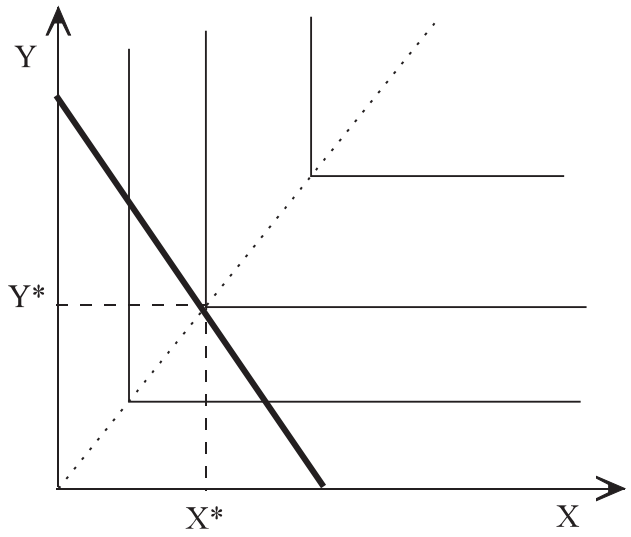
b. Is the price of housing in Chicago higher or lower than the price of housing in Champaign? Give a complete explanation to your answer.

The slope of the budget constraint is equal to $-P_H/P_Y$. Observe that the budget constraint in Chicago is steeper than the one in Champaign and that the price of other goods is the same in the two cities. Therefore, the price housing in Chicago is higher than the price of housing in Champaign.

c. "The worker is worse off in Chicago than he was in Champaign, because after he moves to Chicago he can no longer afford the consumption he enjoyed in Champaign." Is this statement true or false? Explain your answer.

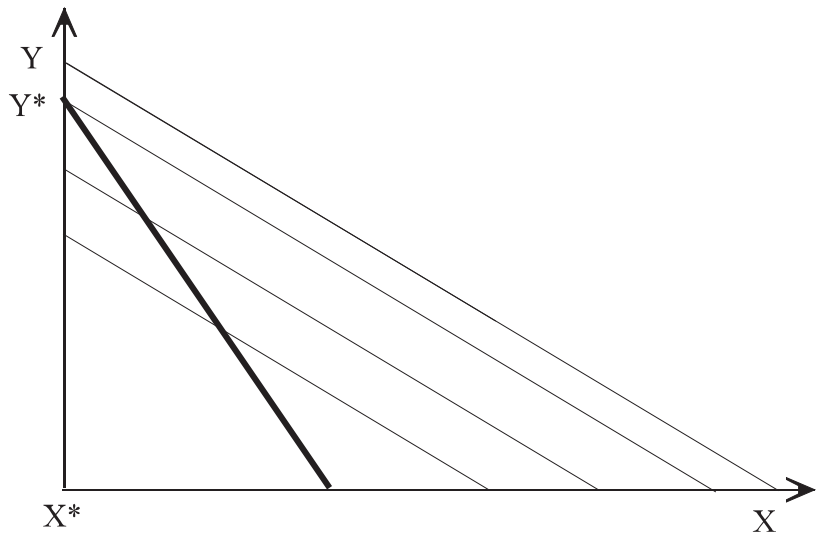
This statement is false. Even though the worker cannot afford the consumption he enjoyed in Champaign after he moves in Chicago [observe that the consumption bundle (Y_1, H_1) is outside the budget constraint BC2], his optimal consumption level in Chicago [obtained from the tangency of the indifference curve U2 with the budget constraint BC2] yields higher utility that the level he enjoyed in Champaign. Therefore, the consumer is better off after his move.

2. Consider two goods *X* and *Y* that are perfect complements. Draw a couple of indifference curves with good *Y* on the vertical axis and good *X* in the horizontal axis. On the same figure, draw a budget constraint and show the optimal consumption of *X* and *Y*.



The indifference curves are L-shaped, and the corners are all on the dotted line from the origin. The budget constraint is drawn with the bold-faced line. The optimal consumption bundle is given by (Y* , X*).

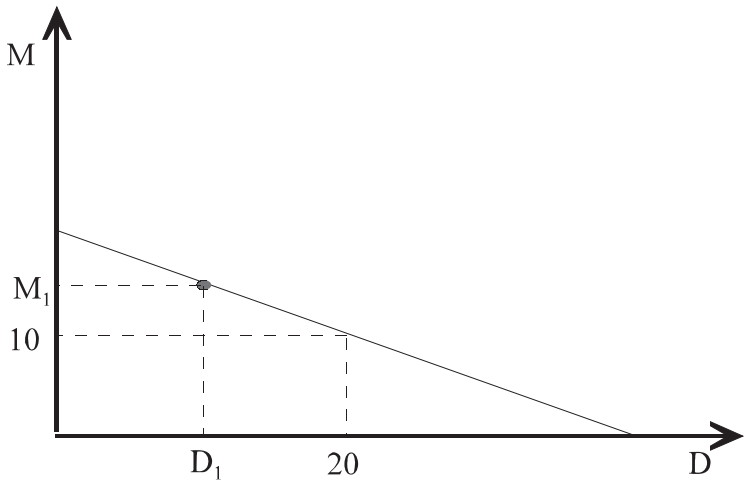
3. Consider two goods X and Y that are perfect substitutes. Draw a few indifference curves with good Y on the vertical axis and good X in the horizontal axis. On the same figure, draw a budget constraint and show the optimal consumption of X and Y.



The indifference curves are the thin straight lines. The budget constraint is the thick line. The optimal choice of goods involves purchasing only Y and no X, as Y* and X* indicate. This choice allows the consumer to attain the highest level of utility given his budget constraint.

4. The following figure plots a budge constraint for DVD rental (D) and movie theater tickets (M). Movie theater tickets have a price of 8 and DVD rentals a price of 2. A consumer devotes *I* dollars on his motion picture entertainment, i.e., the he will spend *I* dollars on *M* and *D*.

This person's budget constraint is picture below.



a. What is the value of *I*? Your answer should be a number.

Any point on the budget constraint corresponds to expenditure equal to *I*. Given that the bundle D=20, M=10 is on the budget constraint, the value of *I* is given by:

$$I = P_D D + P_M M$$
$$= P_D 20 + P_M 10$$
$$= 2 \times 20 + 8 \times 10$$
$$= 120$$

b. Write in the above figure the numerical value of the M-axis and D-axis intercepts.

The M-axis intercept indicates the number of movies the person can go to if he spends all $120 on movies. Given that each movie costs $8, he can afford 15 movies.

Similarly, the D-axis intercept is equal to the ratio of *I* over the price of a DVD rental, or equal to 120/2=60.

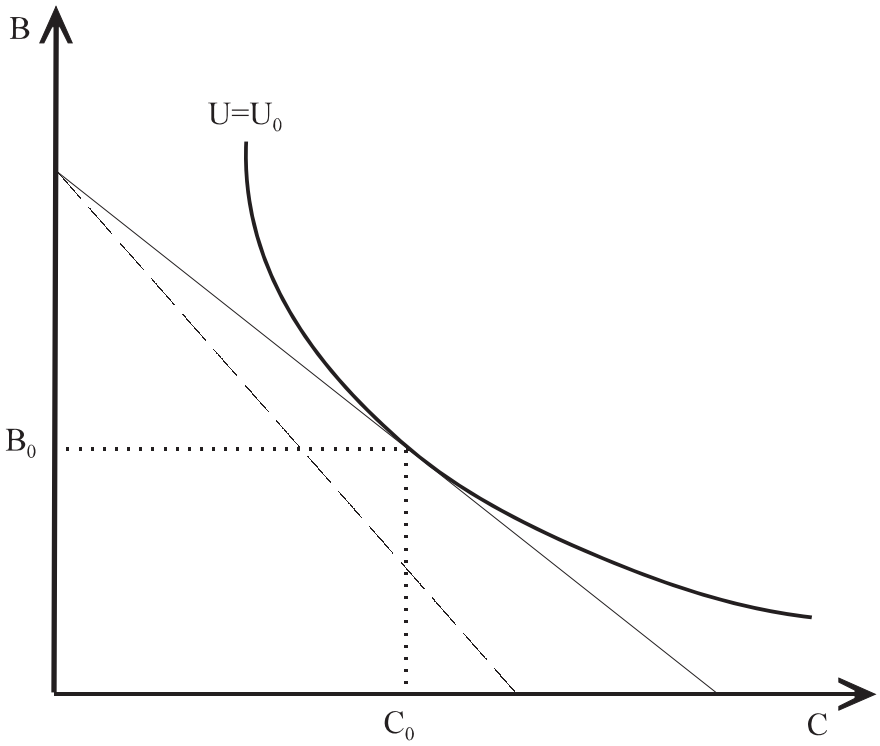
c. Compared to the consumption of 10 movie theater tickets and 20 DVD rentals, would the consumption of M_1 movie theater tickets and D_1 DVD rentals cost (i) more, (ii) as much as, (iii) less, or (iv) is it impossible to tell?

It would cost the same, because both bundles are on the same budget constraint.

d. Compared to the consumption of 10 movie theater tickets and 20 DVD rentals, would the consumption of M_1 movie theater tickets and D_1 DVD rentals yield (i) more utility, (ii) as much utility, (iii) less utility, or (iv) is it impossible to tell?

It is impossible to tell, because we have no information about preference (i.e., there are no indifference curves on this figure).

5. A consumer is observed to consume B_0 units of beef and C_0 units of chicken. The indifference curve that goes through this consumption bundle is given in the figure below.



a. For this consumer, are beef and chicken (i) complements, (ii) perfect substitutes, (iii) imperfect substitutes, or (iv) is no determination possible on the basis of the above figure?

They are imperfect substitutes. The indifference curve is downward sloping and exhibits diminishing MRS.

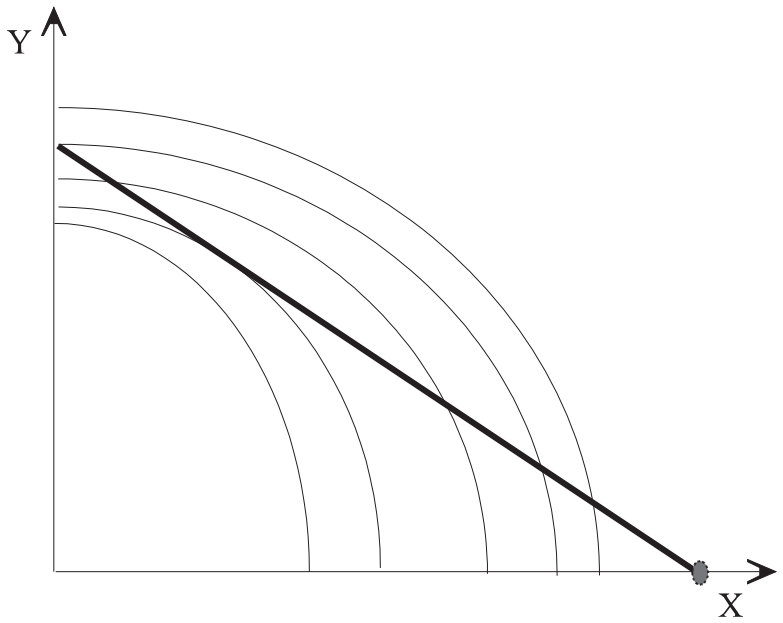
b. In the above figure, draw this person's budget constraint for beef and chicken that is consistent with B_0 units of beef and C_0 units of chicken being the utility maximizing choice.

The budget constraint is a straight line that is tangent to the indifference curve at B_0 units of beef and C_0 of chicken.

c. Suppose the price chicken goes up. Draw in the above graph this consumer's new budget constraint following this price increase.

The new budget constraint is the dashed straight line.

6. In the figure below, the budget constraint is drawn with a bold line. A set of indifference curves is drawn in regular width. Finally, utility is increasing in both *X* and *Y*, i.e., indifference curves that are further out from the origin correspond to higher utility.



On this figure, label the combination of *X* and *Y* that maximizes this consumer's utility.

The consumer will consume only good X (and zero units of good Y). The utility maximizing amount is given by dot.

Problems

There are none for this lecture.