Topic 3: Consumer Theory

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Based Primarily on Frank Chapters 3 - 5

Rational Consumer Choice

“A rational individual always chooses to do what she most prefers to do, given the options that are open to her.”

Two questions:
- How do we describe the options open to a consumer?
  » Individuals operate under constraints.
- How do we describe preferences?
  » We use indifference curves to represent preferences.
Two Goods are Enough

- In what follows, we will only study the choice between two goods.
  - This allows us to draw (two-dimensional) diagrams.
  - (And: Two goods are often enough: for instance, if we are interested in your choice about how much pizza to consume, we could make the two goods “pizza” and “money spent on everything else.”)

Constraints

Open Opportunities
**Constraints**

- Typically, we operate under many constraints:
  - time constraint:
    » How do you allocate time to the following activities: eating, sleeping, going to class, homework?
  - budget constraint:
    » How do you allocate your income to different consumption goods?

- We will be interested in budget constraints: how do you allocate your expenditure?
  - (We will later discuss the problem of how to allocate your time between leisure and work.)

**Bundles of Goods**

- **Definition**: A bundle of goods is a particular combination of quantities of (two or more) goods.
  - For instance, a bundle could be: (10 slices pizza, 6 tubs Häagen-Dazs).
  - Another bundle could be: (20 slices pizza, 0 tubs Häagen-Dazs)
  - (A bundle is just a vector whose elements are the quantities of goods.)

- We will often talk generally about two goods, good 1 and good 2.
  - If we want to talk about a bundle that has quantity $x_1$ of good 1, and quantity $x_2$ of good 2, we write this as $(x_1, x_2)$. 
Bundles of Goods, cont'd

- Graphically, we can illustrate bundles like this:
  - bundle A: (10 slices of pizza, 6 tubs Häagen-Dazs)
  - bundle B: (20 slices of pizza, 0 tubs Häagen-Dazs)

Budget Set

- The budget set tells you how much you can afford, given your income and given prices:
  - It is also sometimes called the affordable set.
- Suppose one slice of pizza costs $1.75 and a tub of Häagen-Dazs $2:
  - bundle A (10 slices pizza, 6 tub Häagen-Dazs) costs $29.50
  - bundle B (20 slices pizza, 0 tubs Häagen-Dazs) costs $35
- Suppose you have $30.
  - (Economists call this your income, or sometimes, your wealth.)
- Bundle A is in your budget set. Bundle B is not in your budget set.
Budget Set, cont’d

- We could now ask: how much pizza and Häagen-Dazs could you buy with $30?
- Buying $x_1$ slices of pizza and $x_2$ tubs of Häagen-Dazs costs
  - $1.75 \cdot x_1 + 2 \cdot x_2$
- Since you have $30 (your income), you can buy any combination of pizza and ice cream that costs $30 or less:
  - $1.75 \cdot x_1 + 2 \cdot x_2 \leq 30$
- This is your budget set.

Budget Set, cont’d

- More generally, if you want to buy an amount $x_1$ of good 1 (which costs $p_1$), and $x_2$ of good 2 (which costs $p_2$), the cost of bundle $(x_1, x_2)$ is:
  - $p_1 \cdot x_1 + p_2 \cdot x_2$
- Suppose that your income is $m$. Then you can buy any bundle with a total cost of less than (or just equal) $m$. That is, your budget set is described by:
  - $p_1 \cdot x_1 + p_2 \cdot x_2 \leq m$
Budget Constraint

- In fact, you will always spend all your income (not spending it all would amount to throwing it away):

- Your budget constraint tells you which bundles you can just afford (with your income and at given prices).
  - The budget constraint is also sometimes called the opportunity set.

- The budget constraint is described by:
  - \( p_1 x_1 + p_2 x_2 = m \)

Budget Constraint, cont’d

- \( p_1 x_1 + p_2 x_2 = m \) defines the budget constraint
- this can be rewritten \( x_2 = m/p_2 - (p_1/p_2) x_1 \)
Budget Constraint: Slope

- The slope of the budget constraint is \(- \frac{p_1}{p_2}\).
- This is the relative price of good 1 in terms of good 2:
  - As you move down the budget constraint, you trade off more of good 1 for less of good 2.
  - To buy one more unit of good 1, you need to have \(p_1\) available to spend. Since you are on your budget constraint, you need to give up some of good 2 in order to “free up” enough money to buy more of good 1.
  - How much of good 2 do you need to give up to “free up” amount \(p_1\)?
  - If you give up one unit of good 2, you “free up” amount \(p_2\). So if you want to “free up” an amount \(p_1\), you need to give up \(\frac{p_1}{p_2}\) units of good 2.

Buzz Group

- A family with an income of $32 to be allocated to drink chooses its consumption of milk and beer.
  - 1 quart of milk costs $1,
  - 1 sixpack of beer costs $8.
- What is the budget constraint? Draw it!
  - The government wants to encourage people to drink more milk, and therefore distributes vouchers; each voucher gives you a free quart of milk. Each family gets 10 vouchers.
- Draw the budget constraint!
Price Increase: Good 1

- Budget constraint: \( x_2 = \frac{m}{p_2} - \left(\frac{p_1}{p_2}\right) x_1 \)
- Suppose \( p_1 \) increases to \( p_1' \).
  - The budget constraint rotates in around the vertical intercept.

Price Fall: Good 1

- Budget constraint: \( x_2 = \frac{m}{p_2} - \left(\frac{p_1}{p_2}\right) x_1 \)
- Suppose \( p_1 \) falls to \( p_1'' \).
  - The budget constraint rotates out around the vertical intercept.
Price Increase: Both Goods

- Suppose $p_1$ increases to $2p_1$ ($p_1$ doubles).
- Suppose $p_2$ increases to $2p_2$ ($p_2$ doubles).

Income Changes

- Suppose your income halves. This is just the same as if all prices had doubled:
  - Consider the vertical intercept: $m/p_2$.
  - Double price: $m/2p_2$.
  - This is just the same as $(m/2)/p_2$ (i.e. halving income).
  - Similarly for the horizontal intercept.
Income Changes, cont’d

- Budget constraint: $x_2 = \frac{m}{p_2} - \left(\frac{p_1}{p_2}\right) x_1$
- Generally, if income increases, the slope of the budget constraint remains unchanged: it is a parallel shift.
  - If income increases, the budget constraint shifts out.
  - If income decreases, the budget constraint shifts in.

More than two Goods

- What if there are more than 2 goods that the consumer can choose between?
- We can always represent this as a choice between one good (which we call $x$) and “money spent on all other goods” or a composite good (which we call $y$):
  - That is, we envisage the consumer to choose how much of her income to allocate to one good, and how much to allocate to all other goods.
  - You can think of $y$ as the amount of income the consumer has left after buying (some of) $x$. 
More than two Goods, cont’d

- If we think about the composite good in terms of “money left over”, this good has a price of 1.
  - budget constraint (two goods): \( x_2 = \frac{m}{p_2} - \left(\frac{p_1}{p_2}\right) x_1 \)
  - budget constraint (x and y): \( y = m - p_1 x_1 \)

“Available Options”

- “A rational individual always chooses to do what she most prefers to do, *given the options that are open to her.*”
- We now have an interpretation of “… options open to her”:
- A rational individual always chooses to consume the bundle that she most prefers, *from all the bundles on her budget constraint.*
Preferences

As You Like It

- We have now developed our tool for modeling “the options open to the consumer.” We have used this consumption space:

- Now we need to represent your preferences over different bundles of goods.

- We need some way of representing your preference ordering over different bundles of goods.
Preference Orderings

- This is where the rationality assumption is important:
  - **Completeness**: You can always rank two bundles against each other: more preferred, less preferred or indifferent (equally preferred).

Preference Ordering, cont’d

- What else can we assume about preferences?
  - “More is better” (*monotonicity*): If one bundle has more of all goods, you prefer it.
Indifference Curves

- Suppose you are indifferent between (equally prefer) the following bundles:
  
<table>
<thead>
<tr>
<th>Pizza</th>
<th>Häagen-Dazs</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
</tr>
</tbody>
</table>

- The curve connecting all the bundles that you are indifferent between (all the bundles that you equally prefer) is called an indifference curve.

Indifference Curves, cont’d

- An indifference curve separates the consumption space into:
  - those bundles that are more preferred than any bundles on the indifference curve, and:
  - those bundles that are less preferred than any bundles on the indifference curve.
Indifference Curves, cont’d

- There are many indifference curves:
  - For every bundle, there is a curve connecting all the bundles that you prefer equally;
  - Bundle B is less preferred than A; bundle C is more preferred than A.
  - As we go from B to C, there must be a bundle that is equally as preferred as A.

- We can repeat this process for every bundle.

Indifference Map

- An indifference map is the family of all indifference curves of a consumer.
  - As we know, there are infinitely many indifference curves - we only draw a few representative indifference curves ...
  - … and label them $I_0$, $I_1$, $I_2$, etc., in increasing order of preference.
"Most Preferred"

- "A rational individual always chooses to do what she most prefers to do, given the options that are open to her."
- We now have an interpretation of "... what she most prefers to do":
- A rational individual always chooses to consume the bundle that is on the highest indifference curve, from all the bundles on her budget constraint.

Properties of Indifference Curves

- Indifference curves are downward-sloping:
  - "more is better" (monotonicity) assumption
  - violation:
Properties of Indiff. Curves, cont’d

- Indifference curves cannot cross:
  - transitivity (the second rationality assumption)
  - violation:
    - By monotonicity: A is preferred to B
    - B is preferred to C
    - By transitivity: A is preferred to C
    - But this is a contradiction with the graph, where A is equally as preferred as C.

Transitivity: A Refresher

- The preference relation is transitive if:
  - whenever A is preferred to B
  - and B is preferred to C
  - A is also preferred to C.
- There are many examples of other transitive relations:
  - stronger than, taller than, richer than …
Transitivity: A Refresher, cont’d

- Why is this a rationality requirement?
  - Suppose you prefer apples to bananas, and bananas to cactus fruit.
    - Transitivity says that you should then also prefer apples to cactus fruit.
  - You start out with a cactus fruit. Then you should be willing to swap the cactus fruit for a banana (and give me a cent because you prefer the banana), and then swap the banana for an apple (and give me a cent).
  - If your preferences were not transitive, i.e. you did not also prefer apples to cactus fruit, you should then be willing to swap your apple for a cactus fruit.
  - You are back at the start (cactus fruit), but have lost 2 cents!

Properties of Indiff. Curves, cont’d

- Indifference curves are convex:
  - convexity assumption: averages are preferred to extremes
    - Bundle A is (1, 8), bundle B is (7, 2).
    - The average bundle is (4, 5).
    - If averages are preferred to extremes, indifference curves are convex.
Convexity: A Refresher

- **Definition**: A graph is convex if every straight line connecting two points on the graph lies entirely above the graph.

![](image)

Marginal Rate of Substitution

- The slope of the budget constraint had a “nice” interpretation:
  - The slope of the budget constraint is the rate at which you can trade off less of good 2 for more of good 1.
- The slope of an indifference curve has a similar interpretation:
  - The slope of the indifference curve is the rate at which you are willing to trade off less of good 2 for more of good 1 … without making you any better or worse off.
- The (absolute value of the) slope of the indifference curve is therefore referred to as the marginal rate of substitution (MRS).
  - (Note that the MRS changes along an indifference curve.)
MRS, cont’d

- In order to acquire a little more of good 1, how much of good 2 are you willing to give up (so that you are neither better nor worse off)?
  - At bundle A, to acquire a little \( \Delta x_1 \) more of good 1, you need to give up \( \Delta x_2 \) of good 2.
  - If \( \Delta x_1 \) is small enough, this ratio approximates the slope of the indifference curve at A.

MRS, cont’d

- Why is it called the marginal rate of substitution?
  - It tells us at what rate (or, ratio) the consumer is willing to substitute one good for the other ... at the margin:
  - “at the margin” means that this refers to small changes: how much is the consumer willing to give up of one good in order to get just a little more of the other good?
  - Remember Topic 1 (Thinking Like an Economist): the importance of marginal analysis.
**MRS, cont’d**

- As we move down the indifference curve (you have more and more of good 1), the MRS declines:
  - You are willing to give up less and less of good 2 in exchange for an extra unit of good 1.
  - Or: you are more willing to give up a little of good 1 (in exchange for more of good 2) the more you have of good 1.

- This is just the fact that consumers like variety:
  - You don’t like to consume a lot of one and not much of the other good.

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**Special Indifference Curves**

- Indifference curves of *perfect substitutes*:

  - Here, goods 1 and 2 are one-for-one substitutes:
    - giving up one unit of good 2 for one more unit of good 1 gives the consumer an equally preferred bundle.

  - Examples:
    - Coke and Pepsi
    - tea and coffee
    - Trek and Cannondale
**Special Indifference Curves, cont’d**

- Indifference curves of *perfect complements*:

  - Here, goods 1 and 2 are (one-for-one) complements:
    - Suppose you have one unit of each good. One more unit of one good (but not the other) gives you an equally preferred bundle.
  
  - Examples:
    - vodka and Coke
    - skis and bindings
    - left and right shoes

- Here, the consumer does not care about good 1:

  - If this consumer gets more of good 1, she consumes a bundle that she neither prefers nor "dis-prefers".

  - Examples:
    - green peppers on pizza?
Buzz Group

- You have to choose between two “goods:” general consumption and work. Draw some of your indifference curves.
- (Presumably you don’t like work, but do like consumption. Also assume that you are rational, i.e. that you prefer averages to extremes.)
Rational Consumer Choice

- We have now interpreted:
  - “A rational individual always chooses to do what she most prefers to do, given the options that are open to her.”
- as:
  - “A rational individual always chooses to consume the bundle that is on the highest indifference curve, from all the bundles on her budget constraint.”
- All we now need to do is put indifference curves and budget constraint together.

Rational Consumer Choice, cont’d
Rational Consumer Choice, cont’d

Could bundle A be an optimal choice?
- At bundle A, the MRS is greater than the (absolute value of the) slope of the budget constraint, that is:
- In order to get one more unit of good 1, the consumer would be willing to give up more of good 2 (MRS!) than she has to at given prices (slope of budget constraint!).

So bundle A cannot be the optimal choice:
- The consumer prefers a bundle to the right.

Rational Consumer Choice, cont’d

Could bundle B be an optimal choice?
- At bundle B, the MRS is less than the (absolute value of the) slope of the budget constraint, that is:
- In order to be willing to give up unit of good 1, the consumer would need to be compensated with less of good 2 (MRS!) than she could get at given prices (slope of budget constraint!).

So bundle B cannot be the optimal choice:
- The consumer prefers a bundle to the left.
Rational Consumer Choice, cont'd

- The only bundle for which no argument like the previous can be constructed is the "optimal choice" bundle, the bundle \((x_1^*, x_2^*)\).
  - At that bundle, the MRS equals the (absolute value of the) slope of the budget constraint.
  - Neither a bundle to the left or to the right is more preferred.

Corner Solution

- The optimal solution need not always be at a point of tangency:
  - At the bundle labeled "optimal choice", suppose the consumer were to consume more of good 1:
  - To get one more unit of good 1, she would have to give up more of good 2 (slope of budget constraint) than she is willing to (MRS).
  - "optimal choice" is optimal

- At corner solutions, the equality \(\text{MRS} = \frac{p_1}{p_2}\) need not always hold.
Application: Cash or In-Kind Transfers?

Medicare or Money?

Budget Constraint

- A direct money transfer shifts the budget constraint out:
  - this is just an increase in income.
  - Example: $100
- An in-kind transfer allows the individual to consume more healthcare - not more of anything else:
  - Example: $100 in healthcare
For this consumer, there is no difference between an in-kind transfer program and a direct money transfer:
- With direct money transfers, she will consume bundle B.
- With in-kind transfers, she will consume bundle B.

This consumer would prefer to receive a direct money transfer:
- With direct money transfers, she will consume bundle B.
- With in-kind transfers, she will consume bundle C.

On economic grounds, money transfers are “better” than in-kind transfers.
Buzz Group: True or False?

- The price of food rises by 10% and disposable income by 5%. A man initially spending half his income on food would be neither better nor worse off as a result of these changes.
The Price-Consumption Curve

- Suppose we lowered the price of good X.
- Whenever the price of good X changes, the consumer optimizes, and consumes her optimal bundle.
- The set of all optimal bundles, as we change the price of one good, is the price-consumption curve (PCC).

Individual Demand

- Whenever price changes, the consumer optimizes:
  - As the price of good X changes, the consumer chooses to buy different quantities of good X.
  - Plotting the prices of good X and the quantity of good X the consumer chooses to consume at that price gives the ...
- Consumer’s (individual) demand for good X.
Income-Consumption Curve

Recall the price-consumption curve:
- We can derive a similar curve for changes in income:
  - Whenever income changes, the consumer optimizes and consumes her optimal bundle.
- The set of all optimal bundles, as we change income, is the income-consumption curve (ICC).

Engel Curve

Whenever income changes, the consumer optimizes:
- As the consumer’s income changes, she chooses to buy different quantities of good X.
- Plotting the consumer’s income and the quantity of good X the consumer chooses to consume with that income, gives us the:
- Engel curve.
Behind Individual Demand

Income and Substitution Effects

What happens as price falls (holding money income constant)?

- The good is now relatively cheaper (relative to other goods).
  - Typically, the consumer will substitute away from other goods, and towards the good for which the price has fallen.
  - This is the substitution effect.
- The consumer is now “wealthier” (she could still buy the same bundle and have money left over).
  - Typically, this will lead the consumer to buy more of that good as her wealth increases.
  - This is the income effect (wealth effect).
Behind Individual Demand, cont’d

- Similarly for a price increase (holding money income constant):
  - The good is now relatively more expensive.
    - Typically, the consumer will want to consume less of it.
  - The consumer is now “less wealthy”: she could not still buy the same bundle.
    - Typically, the consumer will want to consume less of the good as her wealth falls.

Total Effect of a Price Increase

- The total effect of a price increase is the change in the quantity demanded of a good in response to a change in its price:
  - Here, it is the movement from bundle A to bundle C.
Substitution Effect

To isolate the substitution effect, ask:
- How much extra income would the consumer need to be able to reach her original indifference curve, after the loss of purchasing power due to the price increase?
- If (hypothetically) the consumer were to get this extra income, she would be back on her original indifference curve. But since relative prices have changed, she will typically choose to consume a different bundle to that consumed originally.
- This is the substitution effect (Hicks).

Substitution Effect, cont’d

The substitution effect isolates the effect that a consumer is likely to substitute away from a good whose price has increased.
- Given just enough extra income to reach her original indifference curve, the consumer would still (typically) choose to consume a bundle (B) different from the original bundle (A).

The substitution effect is the movement from bundle A to bundle B.
Income Effect

- To isolate the income effect, ask:
  - How much extra income would the consumer need to be able to reach her original indifference curve, after the loss of purchasing power due to the price increase?
  - If (hypothetically) the consumer were to get this extra income, she would (most likely) consume different amounts of the good than she would if she were not compensated with this extra income.
  - This is the income effect (Hicks).

Income Effect, cont’d

- The income effect isolates the effect that a consumer is likely to consume less after a price has increased (lower purchasing power).
  - Given just enough extra income to reach her original indifference curve, the consumer would (typically) choose to consume a bundle (B) different from the final bundle (C).

- The income effect is the movement from bundle B to bundle C.
Income and Substitution Effects

**price increase**

Income and Substitution Effects

**price fall**
Substitution Effect, cont’d.

- Note that the substitution effect of a price increase is always negative:
  - the consumer wants to substitute away from the good that has become more expensive.
- Likewise, the substitution effect of a price fall is always positive:
  - the consumer wants to substitute towards the good that has become less expensive.
- This is just a result of our assumption that indifference curves are convex.

Income Effect, cont’d

- The income effect is more ambiguous:
  - For a price increase and a normal good, the income effect is negative (i.e. reinforces the substitution effect.
  - For a price increase and an inferior good, the income effect is positive (i.e. works against the substitution effect.
- … and for a price fall:
  - For a price fall and a normal good, the income effect is positive.
  - For a price fall and an inferior good, the income effect is negative.
Normal and Inferior Goods

- **Normal goods:**
  - For a normal good, and a price increase, the income effect is negative.
    - This just expresses the fact that as your purchasing power falls, you buy less of a good.

- **Inferior goods:**
  - For an inferior good, and a price increase, the income effect is positive.
    - That is, as your income falls, you buy more of the good.
    - Example: Grand Union own-brand white bread?

Inferior Good

[Diagram showing the effects of a price increase on demand, with labels for total effect, substitution effect, and income effect.]
Inferior Good & its Engel Curve

Inferior Goods: Examples
**Giffen Good**

- When a good is so strongly inferior that the income effect outweighs the substitution effect, it is called a Giffen good.
  - How likely is this?
    - Not very. (Any examples?)
  - Giffen goods imply an upward sloping demand curve.

**Consumer Surplus**

How are you?
   Good.
   How good?
Measuring Welfare

- It is often important to have a measure of how much individuals benefit from a transaction.
  - Example (cost-benefit analysis):
    - It is often easy to evaluate the costs of building a new road.
    - How do we measure the benefit (to consumers)?
- Consumer surplus is a way of measuring how much a consumer benefits from buying a certain quantity of a good.
  - (“Buying” includes buying at a zero price, as in the example of the road, above.)

Consumer Surplus

- How much do you value the first, second, … unit of a good that you buy?
- The demand curve tells you what your marginal willingness to pay is: how much you are just willing to pay for the first, second, … unit of the good.
Consumer Surplus, cont’d

- Suppose the good costs $p^*$. You will then buy $q^*$ units.
- What is your benefit from buying $q^*$ units at a price of $p^*$ each?
- The demand curve tells you what you are just willing to pay for each unit:
  - But for all units below $q^*$, you actually pay less!

The shaded area is your consumer surplus.

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Consumer Surplus, cont’d

- The area under demand curve (and over the price of the good) is the consumer surplus.
Changes in Consumer Surplus

- Suppose the price of a good falls from $p'$ to $p''$.
- What happens to consumer surplus?
- Compare consumer surplus when the price is $p'$ (and you buy $q'$) with consumer surplus when the price is $p''$ (and you buy $q''$).

The blue shaded area is the change in consumer surplus.

Market Demand

$1 + 1 = ?$
Individual and Market Demand

- This is what we have achieved so far:
  - description of “options available to the consumer” (budget constraint)
  - description of “most preferred” (indifference curves)
  - derivation of an individual’s demand curve from preferences and budget constraint
- We now only need one last step on our way to deriving a market demand curve:
  - we need to aggregate all individuals’ demand curves for a good.

From Individual to Market Demand

- Suppose there is a good for which there are only two potential consumers, A and B.
- Each of these two consumers has her own (individual) demand curve for the good:
  - An individual’s demand curve tells us how much she will buy at any given price (and for given income).
- We construct market demand from individual demands:
  - For any given price, ask this question:
    » What is A’s demand? What is B’s demand?
  - Adding these two quantities gives us market demand at that price.
Individual to Market Demand, cont.

Application: Labor Supply

To Work or not to Work: That is the Question.
Modeling Strategy

- What do we want to model?
- What does it mean to supply (more) labor?
  - less leisure time
  - more income = more consumption
- Note that the choice between labor and leisure is automatic:
  - if you choose to work 10 hours/day, you have 14 hours of leisure time.
- So we will model the choice between two goods: leisure and consumption. Why?
  - Presumably, both leisure and income are goods, not “bads”.

Modelling Strategy, cont’d

- We will work in this space:
Budget Constraint

- **Notation:**
  - \( l \): hours of labor
  - \( h \): hours of leisure
  - \( t \): max. time available (*endowment* of time)
  - (therefore: \( t - h = l \))
  - \( w \): wage rate (per hour)
  - \( c \): consumption (composite good)
  - \( p \): price of consumption

- **Watch out:**
  - This notation is slightly different from Frank’s.

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Budget Constraint, cont’d

- **Remember what the budget constraint says:**
  - \( p \cdot c = m \)
  - \( p \cdot c = w \cdot l \)
  - \( p \cdot c = w \cdot (t - h) \)
  - \( p \cdot c = w \cdot t - w \cdot h \)
  - \( c = (w / p) \cdot t - (w / p) \cdot h \)

- **Recall the interpretation of the slope of the budget constraint as relative price:**
  - \((w / p)\), the “real wage” is the price of leisure, or its *opportunity cost.*
Budget Constraint, cont’d

Both goods (consumption and leisure) are “goods” (not “bads”) … that is, you prefer to have more of both.

And you prefer averages to extremes: Indifference curves should therefore have the “normal” (convex) shape.
Preferences and Optimal Choice

Comparative Statics

- Effects of varying wage rate \( w''' > w'' > w' \):
  - recall budget constraint: \( c = (w/p) t - (w/p) l \)

Implication: labor supply
Comparative Statics, cont'd

- What's going on?
  - As the price for leisure increases from \( w' \) to \( w'' \), the consumer consumes less leisure (as we would expect).
  - As the price for leisure increases from \( w'' \) to \( w''' \), the consumer consumes more leisure. Is this counterintuitive?
    - Does this mean leisure is a Giffen good?
    - (Answer: No.)

Income and Substitution Effects

- Substitution and income effects operate in the opposite direction. Here, the income effect is stronger.

- As we would expect, the substitution effect (A to B) from this price increase is negative:
  - As the price for leisure increases, consumers substitute away from leisure (work more).
- The income effect (B to C) is positive:
  - Really this is not surprising. Leisure is a normal good: as income rises, a consumer wants to consume more of it.
  - As the price for leisure (the wage rate) increases, the value of your endowment increases.
The Income Effect

- Here, the increase in the wage does two things:
  - it increases the price of something the consumer buys: the price (the opportunity cost) of leisure;
  - it increases the value of something the consumer sells: the value of her endowment (i.e. her "wealth").

- So leisure is not a Giffen good.
  - (In fact, we have seen that the indifference curves are such that leisure is a normal good ... and all Giffen goods are inferior goods.)

Buzz Group

- Eve lives in a town called Paradise. For a living, she works on an apple farm, just outside Paradise.
  - She makes $10/hr. In Paradise there is no income tax.
    (Assume each unit of the general consumption good costs $1.)

- Draw Eve's budget constraint for a typical day. Also draw some of her indifference curves.

- Paradise now establishes the following income tax scheme:
  - The first $50 are tax-free; additional earnings are taxed at 50%.

- Draw Eve's budget constraint now. What has happened to her choice about how much to work?
Buzz Group

- The income tax is repealed. Instead, Paradise now introduces the following unemployment benefit scheme:
  - If you don’t work you get $50 per day. As you start earning (e.g. by working for one hour at $10/hr), your unemployment benefit is withdrawn dollar-for-dollar (i.e. if you work for 1 hour and earn $10, your unemployment benefit receipts are only $40).
- Draw the new budget constraint. What happens to Eve’s choice about how much to work?