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Econ 321

Weeks 1-2: Labor Supply and Labor Demand

- I. Intro to Labor Economics
 - A. Labor economics is interesting for two main reasons.
 - 1. The enormous total value of labor - something like 70% of national income comes from sale of labor.
 - 2. The strong emotional commitments people have to their beliefs about how labor markets work.
 - B. Upshot: Emotional preconceptions strongly color the way we see the most important market in the world!
 - C. Economics, as always, begins by putting these preconceptions aside, and trying to think about matters analytically.
 - D. First pass: labor economics is simple. It's a market like any other, and can be analyzed with the same supply-and-demand tools.
 - E. But: The implications of the basic supply-and-demand model are so strong that it is useful to systematically reconsider our pre-scientific views.
 - F. Also, there are a number of ways labor markets actually do work in ways more complicated than S&D alone can explain.
- II. Individual Labor Markets, I: Basics of Labor Supply
 - A. Consider the market for barbering services, where barbers are self-employed.
 - B. On the x-axis, we have the number of hours worked or "sold"; on the y-axis, we have the price of an hour of labor, generally known as the "wage."
 - C. How does the supply of barbering services relate to the market wage?
 - 1. Number of people in the occupation.
 - 2. Number of hours people in the occupation work.
 - D. It is clear that the number of people in the barbering occupation will increase as the market wage rises, especially over a longer time horizon.
 - E. The second effect is more complicated. Economists call this the labor/leisure trade-off, with "leisure" being the amount of your time you decide NOT to sell on the market. (Note that labor might be fun and leisure might be unpleasant on this definition!)
 - E. Since you have 168 hours in a week, when you pick your hours of labor L , you simultaneously pick your hours of leisure $(168-L)$.
 - 1. While employers rarely let people "pick their own hours," people can choose their occupations and employers to try to match their desired labor/leisure mix.
- II. Individual Labor Markets, II: More on Labor Supply

- A. What determines the number of hours a barber wants to sell? If we mechanically apply the law of supply to labor, we discover that the higher the "price" of labor, the more labor people want to sell. *This is known as the **substitution effect**.*
 - B. But there is a major complication: Normally, sellers of a good consume little of their own product. Orange growers, for example, spend less than 1% of their income on oranges. However, sellers of labor consume an ENORMOUS amount of their own product; even the most extreme workaholic consumes 50% of his own hours in leisure.
 - C. Why is this important? An increase in the price of what you sell makes you richer, enabling you to afford more of everything. If you already consume a lot of what you sell, then as the price of your product rises, your tendency to buy more of everything (including your own product) as you get richer may overpower your tendency to sell more of your product as its price rises. *This is known as the **income effect**.*
 - D. Somewhat shocking implication: For products that are a large percentage of their budget - such as their own time - suppliers **might** actually sell LESS as the price rises, not more as economists usually assume. **Individual** supply curve might be "backwards-bending."
 - E. Implausible? Suppose your real wage was \$10 an hour. How many hours a week would you work? What about \$5? \$1? \$.10? Almost everyone's labor supply curve will "bend backward" at some point.
 - F. Still, for one occupation, the effect of a higher wage on the number of people in the occupation will almost surely ensure that the labor supply curve has its usual upward slope.
- III. Individual Labor Markets, III: Basics of Labor Demand
- A. Continuing with the barbering example, what determines labor demand?
 - B. Simple: The higher the price of barbering services, the less people will buy.
 - C. So how does the market for barbering services work? It looks like any other commodity market, with the wage and quantity of hours fluctuating in response to supply and demand.
 - D. Only unusual thing to note: When demand goes up, some barbers may actually cut back their hours. Total hours sold will still go up, though, because more people will decide to become barbers.
 - E. Most workers are not self-employed, however. Rather, consumers buy final products from firms, and it is the firms, rather than consumers, who demand labor. For example, consumers buy oranges, and orange-growing firms hire orange-pickers to pick the oranges. How does labor demand work then?

- F. Before we can analyze labor demand in this familiar sort of market, we must understand two concepts: marginal physical productivity and marginal value productivity.
 - G. Concept #1: How many additional oranges does one more worker-hour allow the firm to produce? This is called the *marginal physical product* of an hour of labor, or MPP.
 - H. Concept #2: What is the market price of an orange? Multiplying the price of an orange times the MPP gives us the dollar value one worker-hour adds, the *marginal value product*, or MVP.
 - I. Ex: If an additional worker produces 30 oranges in an hour, and the market price of an orange is 50 cents, then the worker's $MPP=30$ oranges and his $MVP=\$15.00$.
- V. Individual Labor Markets, IV: More on Labor Demand
- A. Question: What determines an employer's willingness to pay for another hour of labor?
 - B. Put yourself in the shoes of an employer in the orange industry. You will keep buying more labor until it is no longer profitable. It is profitable to hire a worker so long as his marginal value product exceeds his wage: $MVP \geq w$. If the value a worker produces in an hour is greater than or equal to the hourly wage, he is profitable to employ!
 - 1. Ex: If a worker's $MVP=\$15$, then employers want to hire him if the market wage is \$15 or less.
 - C. Imagine employers adding more and more workers to their workforce until it ceases to be profitable. They finally stop hiring more once the last worker's marginal productivity is exactly equal to his wage.
 - D. Amazing conclusion: labor demand is entirely determined by workers' **marginal productivity**. Using this concept we can trace out the whole labor demand curve.
 - E. If the product price goes up, labor demand rises. If product price falls, labor demand falls. Similarly, if workers' MPP rises (and product price stays the same), labor demand rises. If MPP falls (and product price stays the same), labor demand falls.
- VI. Individual Labor Markets, V: Market Equilibrium
- A. If wages are below the equilibrium level, there is a shortage of labor and wages get bid up; if wages are above the equilibrium level, there is a surplus and wages get bid down.
 - B. What about shifts?
 - C. In a single occupation, labor supply responds to changes in expected ways. Ex:
 - 1. What happens to supply of orange-pickers if a new strain of poisonous fruit fly appears?
 - D. Shifts in labor demand are trickier, because you have to consider both the product market and the labor market.

- E. One worker essentially has no effect on product price. So if *one* worker grows more productive, he gets paid proportionally more.
 - F. But if *all* workers in an industry get more productive, matters are more complex.
 - G. E.g. suppose all orange workers get faster. In the product market, this means that the supply of oranges increases, so the price falls. But in the labor market, does labor demand rise or fall?
 - H. It all depends on *demand elasticity* in the product market. If the demand curve is relatively flat (elastic), then when the quantity of oranges rises a lot, the price of oranges only falls a little. Thus, MVP rises and labor demand increases.
 - I. But if the demand curve is relatively steep (inelastic), then when the quantity of oranges rises a lot, the price of oranges drastically falls. Thus, MVP falls and labor demand falls!
 - J. There are definitely cases where all-around increases in worker productivity have actually hurt workers in that industry. Agriculture is the most prominent example.
 - K. There are other cases where an occupation only came to exist due to rises in worker productivity. Computers are probably a good example.
- VII. Basic Empirics of Marginal Productivity
- A. After all of this theory, how about some empirical evidence? Workers may be paid for productivity, but what makes workers productive?
 - B. There is no way to predict individuals' wages or income perfectly, but there are better and worse ways of guessing. **Regression** is a standard statistical technique that people use to make the "best guess" about what one thing will be given some other things.
 - C. For example, *given* that someone is a male 16-year-old living in Nebraska, what would your *best guess* of his annual income? No guess will hit the nail on the head, but all guesses are **not** created equal!
 - D. What are some of the obvious factors linked with higher value-productivity of workers?
 1. Education
 2. Experience
 3. Innate ability (strength, intelligence...)
 4. Character (punctuality, honesty...)
 - E. It is a lot easier to measure some things than others! Education is easy to measure; experience can be roughly approximated by (age-education-5). (Innate ability and character are harder).
 - F. So what is our best guess of a person's Income (from labor) given their education and experience?
 - G. Using the NLSY for 1992, I get:
 Annual Labor Income=
 $-29,645 + 3318 \cdot \text{Years of School} + 728 \cdot \text{Years of Experience}$

- H. We'll refine our guess further throughout the semester.
- VIII. Compensating Differentials
- A. Do people always choose the highest-paying occupation open to them? No. "Man does not live by bread alone."
 - B. Conversely, does everyone refuse to do the truly miserable jobs (like garbage man)? No.
 - C. Easy to analyze this using S&D: the funner the job, the more labor supply increases; the more horrible the job, the more labor supply decreases.
 - D. The result: Fun jobs pay less; yucky jobs pay more. Economists call this pattern "compensating differentials." (aka "equalizing differences") Wage differences **compensate** people for job-related joy and misery.
 - E. This only works holding everything else constant. 7-11 workers have low wages and high risk; professors have above-average wages and a lot of fun. But what are the *other* options of the people in these jobs?
 - F. This simple principle is amazingly general. It works for:
 - 1. Safety
 - 2. Job security
 - 3. On-the-job amenities (free or discounted meals)
 - 4. Non-wage income
 - 5. More!
 - G. This also means that if you happen to really like something that most people hate, you get more money and more fun!
 - 1. Ex: Economists have much better job prospects than mathematicians, even though the latter are smarter and train for more years.
- IX. What (Else) Do Employers Do?
- A. A long tradition of thinkers see employers as parasites who "exploit" their workers.
 - B. Economists, in contrast, regard employers as "middle men" between workers and consumers.
 - C. Middle men in the wheat market buy wheat from farmers, package it, and then sell it to consumers. Calling it "exploitation" is folly: *middle men save farmers and consumers from the inconvenience of doing this themselves.*
 - D. But employers don't just buy and re-sell labor. They do much more:
 - E. Extra Employer Activity #1: Often labor themselves - directly in small business, indirectly by planning and organizing production, thinking up new ideas, etc.
 - F. Extra Employer Activity #2: Serve as implicit lenders to workers. It usually takes time before a worker's product reaches a market, as anyone who starts up a new business learns. Employers usually start paying workers almost immediately. In essence, they are giving workers money now for a product that can only be sold in the

future. To make employers do this, there has to be an implicit interest payment; the amount employers pay you for your product today is less than the amount they later sell it for.

1. As with lending in general, economists see mutual gains to trade from this implicit loan, where others cry "exploitation."
- G. Extra Employer Activity #3: Implicit insurance. If a business goes bankrupt, do workers have to return their wages? No. Employers pay you a specific amount for a product, and then "spin the wheel" and see how well they do with it. If they get lucky, they earn more than they paid you; if they get unlucky, they earn less. This is essentially no different from any other insurance contract, where you pay someone a fixed amount, and then they bear the risk.
- X. Aggregate Labor Markets, I: Labor Supply
 - A. If you add up everyone's labor supply curves, and abstract from differences between workers, you can draw the Aggregate Labor Supply curve. This curve shows the total number of hours people will choose to work at given wages.
 - B. For a single labor market, occupational choice basically guarantees that labor supply slopes upwards. But for the labor market as a whole, that doesn't really work.
 - C. Exceptions probably aren't enough to reverse this conclusion:
 1. Non-workers entering the labor force
 2. Immigrants
 - D. Depending on the relative strength of the substitution and income effects, then, the Aggregate Labor Supply curve could be positively or negatively sloped.
 - E. Empirically, males in the past did sell far more hours of their time than they do today. It definitely looks like the income effect was greater than the substitution effect in their case: as real wages increased, men have worked less.
 - F. Women sold far fewer than they do today, but this is a clear case where fun and "leisure" are different! Big effect for women: development of machines to do household tasks leaves them with surplus time, which more and more have chosen to sell.
 - G. For most purposes, it is more or less reasonable to assume that the Aggregate Labor Supply is vertical.
 1. Typical hours of work have stopped falling for the past couple decades.
 2. Intuitively, how many adult males want less than a 40-hour/week job?
 - H. Throughout this course, then, the Aggregate Labor Supply curve will normally be drawn as vertical.
- XI. Aggregate Labor Markets, II: Labor Demand
 - A. Aggregate Labor Demand just shows the quantity of labor-hours people want to buy at a given real wage. It is just the sum of all employers' labor demand curves.

- B. This takes us near complicated macro issues that are best avoided. Easy way out: Make the plausible assumption that *the central bank adjusts the money supply to keep the price level constant.*
 - C. Since Aggregate Labor Demand depends solely on the MVP of a unit of labor, and $MVP = P * MPP$, Aggregate Labor Demand is directly proportional to MPP.
 - D. Thus, at the aggregate level, higher average productivity ALWAYS translates into **higher** demand for labor, and vice versa for lower average productivity. Productivity gains are sometimes bad for workers in specific occupations, but are always good for workers in general.
- XII. Aggregate Labor Markets, III: Market Equilibrium
- A. Aggregate Labor Supply is determined by workers' labor/leisure trade-offs. Aggregate Labor Demand is determined by workers' productivity. So what determines average wages and employment?
 - B. If the wage is below the intersection of ALS and ALD, employers want to hire more workers than are willing to work. They accordingly bid up the wage.
 - C. If the wage is above the intersection of ALS and ALD, more workers are willing to work than employers want. Workers bid down the real wage.
 - D. At the intersection of ALS and ALD, the quantity of labor hours employers desire to buy and the quantity of labor hours employees desire to sell are equal.
 - E. What happens if...
 1. Workers get stronger?
 2. Someone invents a new productive technique?
 3. Someone invents the dishwasher?
 4. A new law bans the use of some machinery?
 5. Workers slack off more on the job?
- XIII. Application: Multinational corporations and Third World Labor
- A. Using what we've learned, what can we say about low wages in the Third World?
 - B. How about: on average, workers are much more productive in the rich countries than in the poor countries.
 1. Of course, this may be more the fault of bad economic policies than individual workers.
 - C. What can we say about bad working conditions?
 - D. How about: when people are poor, they are more willing to trade-off fun for income?
 - E. What would banning foreign employers from countries accomplish?
- XIV. Fundamental Labor Fallacies
- A. Fallacy #1: Make-work. Many variants: "Reduce the work-week to create more jobs," "NAFTA costs us jobs," "New machines destroyed jobs," "Immigrants are taking our jobs."

- B. The essence of the fallacy: Focusing on effort instead of result. Bastiat calls this "Sisyphism," after the legendary Sisyphus. If people figure out a way to accomplish the same result with less labor, this means that there is **more** labor to accomplish some other goal.
 - 1. Partly, this is just a special case of the broken window fallacy, of measuring wealth by inputs rather than output. Saving one person's job may make *that* person better off, but it also means wasting valuable labor.
 - 2. Additional confusion: a decline in labor demand only leads to involuntary unemployment if real wages cannot fall.
 - 3. Unemployment is frequently just a symptom of *shifts* in labor demand, not a lower level. Unemployment and job search go together, and job search is vital for prosperity.
 - C. Fallacy #2: Subsistence wages. Many variants: "Employers pay whatever they want," "The workers are exploited," "Without unions and regulation, workers would still live in poverty."
 - D. The essence of the fallacy: Employers have to compete for workers; employers care about their own profits, not the profits of employers in general. If the real wage is too low, then each employer can get richer by raising wages a little bit and attracting more workers.
 - 1. Lenin: "The capitalists will sell you the rope you are going to use to hang them."
 - E. Why then were wages once low in the West, and still low in the Third World? Two words: **marginal productivity**. When workers' productivity is low, employers won't pay a lot to hire them.
 - 1. Immigration restrictions are also a big part of the explanation for why wages can be so much lower in some countries than in Western countries. Otherwise, many would move to get higher wages.
 - F. How can real wages rise for everyone? Worker productivity has to increase. Efforts to "create jobs" by restricting machinery, or union activity such as slow-downs are directly counter-productive.
- XV. Time Allocation, Opportunity Cost, and Comparative Advantage
- A. What is the "cost" of an hour you spend doing nothing? Most people would say "zero," but economists point out that you could have been working.
 - 1. If you can pick your hours exactly, then you should value an hour of time at your wage.
 - 2. If you want to work **more** hours than your employer permits, then you should value an hour of time at less than your wage.
 - 3. If you want to work **fewer** hours than your employer permits, then you should value an hour of time at more than your wage.

- B. This all comes back to "opportunity cost." If you spend an hour "doing it yourself" to save \$5, is that smart? Probably not.
- C. It often makes sense to hire people to do things you are quite able to do yourself, because this frees up your time for what you do best.
- D. Tyler on time: You can probably make your life a lot better if you always factor in your opportunity cost of time when you make decisions.
- E. In international trade, economists call this the principle of "comparative advantage." But it works just as well for individuals.
- F. Warning: If you *like* doing something, the time you spend on it "costs" you less; if you *hate* doing something, the time you spend on it "costs" you more. Be sure to count this!

Shifts in Labor Demand

Product Demand Elasticity	MPP	P	MVP=MPP*P	Labor Demand
<i>Workers' physical productivity rises.</i>				
relatively elastic	↑	↓ a little	↑	↑
relatively inelastic	↑	↓ a lot	↓	↓
<i>Workers' physical productivity falls.</i>				
relatively elastic	↓	↑ a little	↓	↓
relatively inelastic	↓	↑ a lot	↑	↑
<i>Product demand rises.</i>				
any	no change	↑	↑	↑
<i>Product demand falls.</i>				
any	no change	↓	↓	↓