

Homework 1, ECO 5351, Labor Economics, Darren Grant.

Supply /Demand Analysis.

1. The child care industry is a highly competitive industry, and child care workers are hired in a highly competitive labor market. There is a sizable Child Care Tax Credit, which lowers the taxes of those parents who put their children in (paid) child care while they (the parents) work.

a) Illustrate, on an S/D graph, the effect of the tax credit on the price and quantity of child care in the short run.

b) Illustrate, on an S/D graph, the effect of the tax credit on wages and employment in the nursing market (many nurses require child care for their children while they are at work).

c) Illustrate, on an S/D graph, how the tax credit affects wages and employment in the child care industry.

d) An academic study (really) has found that the supply of child care workers is quite elastic. Re-draw your graph in part c), showing this elasticity in your graph. In percentage terms, which changes more as a result of the tax credit: the wages of child care workers, or the total number of child care workers employed?

2. Read the article from the *New York Times*, “Vet Debt,” and examine the graphs that accompany the article. Then answer the following questions.

a) Draw out a S/D graph to explain and interpret the information in the graphs that accompany the article.

b) If the market for veterinarians is perfectly competitive, how does the typical vet office decide what to pay its vets?

c) The excerpt indicates substantial unemployment among recent graduates from vet school. Interpret that in terms of the graph you just drew. At the time of this article, does the market for veterinarians appear to be in equilibrium, or not?

d) Dr. Schafer’s pay, as a vet, can be partly explained by the attractiveness of the job of veterinarian but also by the working conditions in the specific clinic where she is employed. Explain, and describe how each of these two things affects the amount that she is paid.

3. Explain, using Supply/Demand analysis, the effects of the following. For each, draw two graphs, one for the labor market (workers), and one for the output market (the product).

a) A machine is developed that harvests tomatoes mechanically (on the market for laborers, and the tomato market).

b) An economic contraction leads to a slowdown in housing construction (on the housing market, and the market for construction workers).

c) Oil is discovered in tar sands in Alberta, Canada (on the market for oil workers, and the oil market).

d) World War I kills a substantial fraction of the unskilled (primarily young) workers in the countries involved (on the market for low-skill labor, and for products made by low-skill labor).

Homework 2, ECO 5351, Labor Economics, Darren Grant.

Labor Demand.

1. Cotton production basically involves two types of jobs: planting/harvesting, done by farm laborers, and cleaning/milling, done by mill workers. Around 1820, with the invention of improvements in the milling of cotton, such as the cotton gin, cotton production exploded. In 1950, with the invention of the mechanical cotton harvester, fewer farm laborers (or sharecroppers) were needed to harvest the cotton, further lowering the costs of production.

a) Consider the effect of the cotton gin on the demand for cotton farm laborers. Does demand increase or decrease? Is this because of a scale effect, a substitution effect, or both?

b) Consider the effect of the mechanical harvester on the demand for cotton farm laborers. Does demand increase or decrease? Is this because of a scale effect, a substitution effect, or both?

c) Consider the effect of the cotton gin on the demand for mill workers. Does demand increase or decrease? Is this because of a scale effect, a substitution effect, or both?

d) Consider the effect of the mechanical harvester on the demand for mill workers. Does demand increase or decrease? Is this because of a scale effect, a substitution effect, or both?

2. The institution of Blue Laws in many Southern states disallowed work on Sunday. Imagine a competitive manufacturing industry that operated twenty four hours per day, seven days a week prior to the Blue Laws, but now each firm must close on Sundays.

a) Law of Diminishing Returns. Assume the firm kept all its workers for the same number hours each, it just worked them all Monday-Saturday. Would it continue to produce the same amount of the product as before? Why or why not?

b) Is the firm likely to do this? Over time, which is most likely to occur in this firm? Why?

1) the firm will reduce production because marginal cost has increased

2) the firm will employ the number of workers needed to maintain production

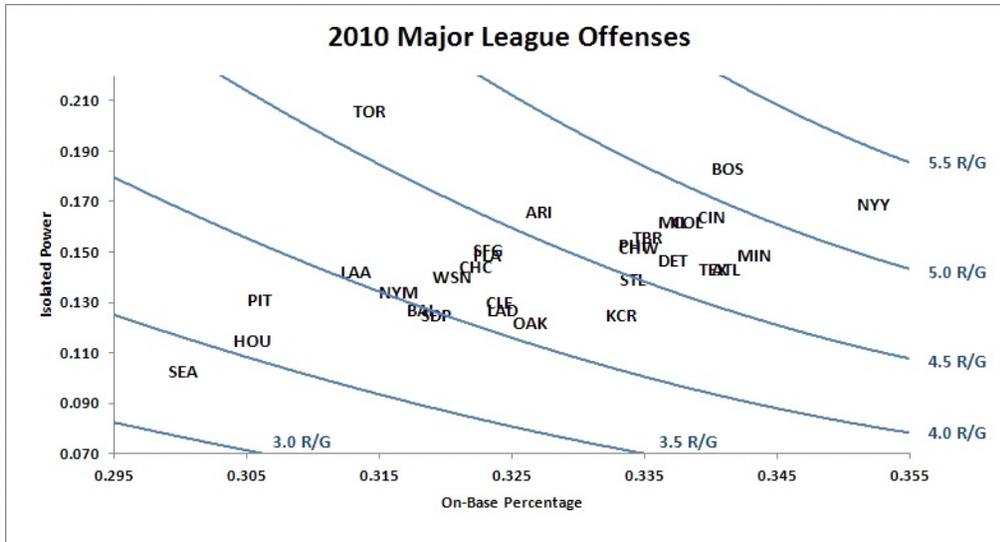
3) the firm will increase production

c) Scale Effect. Based on your result in part b), describe the scale effect on employment that results in the long run, and indicate whether it has a positive or negative influence on labor demand in the industry.

b) Substitution Effect. The Blue Laws have increased the effective price of capital, because it must sit idle on Sunday when there is no one to operate it. If you can only use your capital 83% of the time, then it is as if the price of capital has increased by 17%. Describe the substitution effect on employment that results in the long run. Does it have a positive or negative influence on labor demand?

3. Consider the graph below for Major League Baseball. The horizontal axis measures the team's on-base percentage, while the vertical axis measures the team's power, or slugging (in a slightly different way from *Moneyball*). R/G stands for the average number of runs per game. The graph identifies each team's actual combination of on-base percentage and power that they had in the 2010 season, along with isoquants associated with various numbers of runs per game.

In this question, instead of firms producing a product from labor and capital, you should think of teams producing runs (that's their output) from on-base percentage and power.



- a) Assume Baltimore (BAL) and San Diego (SDP) are maximizing their offensive output given their player budgets. Then, what does the isocost look like? Roughly reproduce this graph and draw it in.
- b) A movement directly outward on the graph, such as from St. Louis (STL) to Detroit (DET), in which the team was “producing more runs” per game, would be which: a scale effect, or a substitution effect? Why?
- c) Based on the graph, which team appears not to have selected an optimal mix of on-base percentage and slugging? How should this show up in their offensive performance? For this team, what will the intersection of the isocost and isoquant look like?
- d) In 2010, the year of this graph, all the other baseball teams had adopted the player selection strategy described in *Moneyball*. But in 2002, the season described in that book, the Oakland A’s strategy was unique. In 2002, where would most of the other baseball teams have been located on the graph above: in the upper-left, upper-right, lower-left, or lower-right? Why?

Compensating Wage Differentials.

1. (Ehrenberg and Smith, modified) Some employers offer jobs for which overtime is mandatory. Others offer jobs for which overtime hours are usually available to workers if they wish to work them. Still other employers offer jobs for which overtime hours are not commonly worked. By law, overtime pay for hourly workers is 50% greater than regular pay. Suppose that a careful study of wages finds that, all else equal, jobs for which overtime hours are commonly available pay lower wages than jobs for which overtime is not usually worked. (The term “wage” refers to the normal wage, not the overtime wage.) Furthermore, the study finds that jobs for which overtime is not usually worked pay less than jobs in which overtime is mandatory.

- a) What do the results of this study tell us about worker attitudes regarding overtime? Why?
- b) Illustrate the effects of these overtime provisions on wages using three supply/demand graphs.
- c) What kinds of workers would be sorted into each kind of job? Why?

2. A decade ago California passed a law that gave new parents six weeks of (partially) paid family leave (<http://www.paidfamilyleave.org/>). A recent study showed that, after the law was passed, the pay received by young women decreased by roughly the cost of the leave (to the employer).

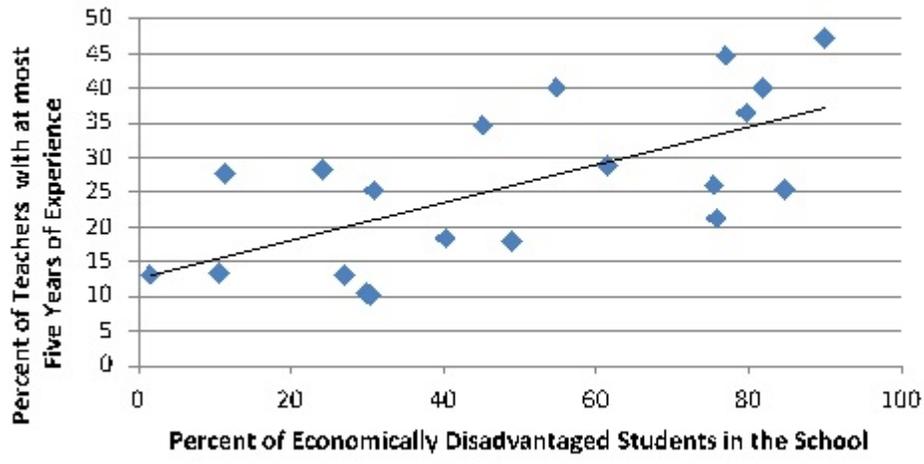
- a) Show how young women’s wages and employment were affected by this law, on a supply/demand graph.
- b) Explain how such a requirement could make young women worse off as a group, using the theory of compensating wage differentials. Do you think that is what happened in this particular case?

3. Most public school districts set their salaries based only on teaching experience and whether you have a master’s degree. The subject or grade that you teach doesn’t affect the salary at all. However, some subjects (English) or grades (elementary) are much more popular to teach, while others (Math, high school) are much less popular. Universities, in contrast, pay market-based salaries for every subject. These differ substantially though the qualification for becoming a professor is the same in almost every field (a Ph.D., which typically takes five years to complete).

- a) Draw a pair of supply/demand graphs for professors in two fields, Math and English. Identify the equilibrium salary in each field. What would we call the difference in these salaries?
- b) Draw a pair of supply/demand graphs for teachers in two fields, Math and English. Assume that the school district sets the salary in between the equilibrium for Math and the equilibrium for English. Which field has a surplus of teachers? Which has a shortage? Clearly identify the shortage / surplus on the relevant graph.

c) On the back, you will find a graph that relates the fraction of economically disadvantaged children in a school to the percentage of inexperienced teachers in that school, taken from recent data for a number of elementary schools in the Cy-Fair ISD, the largest school district in Texas. (Each dot is a school; the line is the regression line that best fits the points in the graph.) Explain how the absence of compensating wage differentials can generate the pattern shown in the graph.

# Cy-Fair ISD, 2014



Theory of Incentives

1. At most country fairs, you pay for the rides with tickets, and for the dart/water pistol/guess-my-weight games with cash.

a) Why is this?

b) Who gets paid more, the ride operators or the game hucksters? Why?

2. Incentive conflicts show up in the sports world, too. This question looks at three such ways. (You need not know much about professional sports to answer this question.)

a) Off-season training requires a lot of time and effort, yet is vital for many sports, such as soccer and football, for conditioning and injury prevention. Using a supply/demand type graph for effort, identify the optimal level of off-season training. Then explain why an athlete on a long-term, guaranteed contract could choose a level of off-season training that differs from the optimum.

b) The “horizons” problem appears in football too: playing harder helps your team win more, but also leads to more injuries. The “optimal” degree of effort properly balances the two. This is a potential source of an incentive conflict between the team and the worker. First, describe this incentive conflict. Then determine whether it is likely to be stronger when the player is on a short-term contract or a long-term contract. (It might be useful to know that NFL players on contract are typically paid while injured.)

c) Basketball consists of a few fundamental skills, passing, dribbling, shooting, defense. Yet basketball teams don’t just pay their players per shot made, shot blocked, shooting percentage, etc. Give one good reason why this would be unwise (economically).

3. (Brickley et al., adapted) The Roman Empire taxed many faraway provinces. Every few years, Rome would auction tax collection rights for the next several years to the highest bidder, who then set the tax rate for the province, collected the taxes, and kept what they collected. For more information, see <http://www.unrv.com/economy/roman-taxes.php>.

a) Why might this be superior to just sending out soldiers to collect the taxes?

b) Why might multi-year auctions be superior to annual auctions? (That is, the Empire collects more revenue from multi-year auctions than a series of annual auctions.) Describe how multi-year auctions help solve a horizons problem that would be associated with single-year auctions.

Homework 5, ECO 5351, Darren Grant.

Schooling and Human Capital

1. Below, from an academic study, is a table of the returns to education of white and black males in South Africa, showing the wage premia for being in the schooling category indicated vs. the next worse (less schooling) category. White males have many more years of schooling, on average, than do black males.

- a) The numbers in the table are much smaller than theory suggests they should be. Explain why.
- b) Which of the following explanations are best supported by the data? Why? Explain, using a supply/demand graph for the effect of each of the following explanations on the rate of return to schooling for blacks.

- 1) Discrimination forces blacks into low wage jobs; that is, firms are reluctant to employ high skill blacks.
- 2) Blacks lack the resources needed to obtain more schooling.

c) Read the accompanying article on education in South Africa. Is the article’s thesis consistent with your conclusion in part b)?

|                            | Blacks | Whites |
|----------------------------|--------|--------|
| Primary (Grammar School)   | 10%    | 0%     |
| Secondary (High School)    | 15%    | 10%    |
| Higher Education (4 years) | 30%    | 10%    |

2. The labor market in Japan is different than that in the United States in several different ways.
- a) One difference is that, in Japan, entry into college is (essentially) limited to those who can pass certain standardized tests. In the United States entry is not so limited. Illustrate the effect of the college entry limitations on the rate of return to schooling in Japan, using an appropriate supply/demand graph.
  - b) A second difference is that in Japan there is more protectionism, and hence less international trade. How does this affect the rate of return to schooling? Discuss briefly and illustrate on an appropriate supply/demand graph.

Human Capital and OJT

3. (Milgrom and Roberts) Actuaries perform the crucial task of estimating the time paths and probability distributions of costs and revenues for different insurance contracts. Becoming an actuary takes several years, and involves passing a series of rigorous examinations given either by the Society of Actuaries (<http://www.soa.org/>) or by the Casualty Actuarial Society (<http://www.casact.org/>). Usually the individual works for an insurance company while studying for the exams, and the company gives the individual time off to study for the exams. Passing an exam usually results in a significant pay increase.

- a) Do actuaries have general or firm-specific human capital?

b) Who “pays for” the worker’s time off to study for the exams? Choose one answer and explain.

1) the worker does, by accepting a lower salary

2) the firm does, to invest in the worker’s human capital

c) Why does the individual get a pay increase after passing each exam? Why not evaluate the employee once per year, like many companies do?

Homework 6, ECO 5351, Darren Grant.

### Human Capital and OJT

1. Public accounting, which consists mostly of auditing the financial records of public companies, requires lots of travel and a certification, the CPA (“certified public accountant”). Corporate accounting—“crunching numbers for internal review to help companies budget and perform better”—requires neither, although of course knowledge of accounting is helpful. © Auditing must be done to standardized, generally-accepted procedures, while corporate accounting is more flexible. In general, the skill requirements of the two types of accounting are similar.

a) Which type of accounting job can be expected to have more turnover, in which employees leave one company to do the same type of accounting in another company? Why?

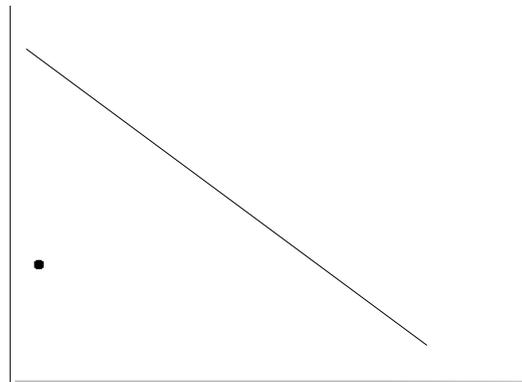
b) How similar would you expect the wages paid by different firms for equally-skilled public accountants to be? Why?

c) How do the travel requirements of public accounting affect the pay of public accountants? Use supply/demand graphs to illustrate, and describe how different types of workers get sorted into the two types of jobs.

d) In recessionary periods, which type of accounting would tend to have the largest employment declines? (Think of relative declines, or job reductions in percentage terms.) Why?

2. (Milgrom and Roberts, revised) Workers who are laid off from their jobs generally receive lower wages once they find new jobs (*Fact 1*). Moreover, the wage reduction appears to be persistent—for many years, wages are lower than they would have been had the worker keep his/her old job (*Fact 2*). Moreover, the wage loss differs by the type of job—nurses and truckers, for example, have smaller wage declines than do automobile production workers (*Fact 3*). Explain these three facts using human capital theory.

3. Below is drawn a graph of pay and productivity at WeirdCo, a company with “innovative” pay practices. The vertical axis is in dollars, and the horizontal axis indicates years spent at this firm. The point indicates the value of the worker’s general human capital at the time they join the firm; this human capital never goes away. The downward sloping line is the worker’s pay. Each year you work at WeirdCo, your salary goes down. Initially, assume all human capital accumulated at WeirdCo is general.



a) If human capital acquisition follows theory, what would happen? Draw the path of human capital acquisition on the graph, beginning, of course, at the point provided.

b) How long would an individual joining this firm remain before leaving? Identify clearly on the graph, and briefly explain below.

c) Now let all human capital acquired at WeirdCo be firm-specific. How long would an individual joining this firm remain before leaving? Identify clearly on the graph and briefly explain below.

d) Under what circumstances would this pay policy be effective? Choose one answer and explain.

1) none–this pay policy just makes no sense

2) it is a standard example of “backloaded compensation” used to incentivize effort

3) this is the way most internal labor markets pay people

Homework 7, ECO 5351, Darren Grant.

### HRM Systems

1. Read the accompanying article, “Pressure at Mortgage Firm Led to Mass Approval of Bad Loans,” published at the beginning of the subprime crisis, and then answer the following questions.

a) There are three parties here: employees, managers, and shareholders. Multiple incentive conflicts between these parties are discussed in this article. Identify and describe two of these conflicts.

b) The horizon problem is particularly acute here. Discuss how it applies.

c) From the information in the article, identify the way decision rights, evaluation, and incentives are *supposed* to work for the underwriters, such as Ms. Hardiman, who approve loans but do not “sell” them, i.e., meet with customers. In what way did these not operate as they were supposed to?

2. I have taken a few liberties with the facts in order to make this question more clear-cut. Two of our largest groups of Native Americans are the Apache, located primarily in reservations in Arizona, and the Sioux, located primarily in reservations in South Dakota.

Prior to American settlement, the Apache subsisted on agriculture, raising sheep, and food-gathering. While land was plentiful, agricultural land, and the crops grown on it, were private property; nevertheless, chiefs could and did tax families and redistribute income (food) to the less fortunate, though complete income equality did not occur. Chiefs were also responsible for deciding how many animals (sheep) should be eaten in any given year. Chiefs were vested with a great deal of decision making power, and generally served for life.

The Sioux, on the other hand, subsisted on buffalo. While buffalo were plentiful enough, they don’t stay in one place, so the band constantly migrated as it searched for food. Hunting buffalo is very difficult, dangerous work. Buffalo hunts are very much team efforts, and the food killed in the hunt is shared completely within the band. The Sioux were loosely organized, bands were much smaller, and band chiefs had limited power and primarily operated through persuasion, and served at the pleasure of the band. Families can leave one band and join another if they wish.

a) In the Apaches, band chiefs would redistribute income from the those with good harvests to those with worse harvests, but did not equalize income across families. Why is this the optimal system from the perspective of the “firm” or tribe? Discuss in terms of incentive pay.

b) From an economic perspective, giving the Apache chief a life reign may be advantageous because it can reduce incentive conflicts. Discuss.

c) The Sioux system has the following features: 1) Small bands, 2) free movement from one band to another, and 3) limited power on the part of the chief. Describe how these features work together to help the bands operate most effectively.

d) Explain how the organization of each tribe is shaped by the environmental conditions under which it operates. To do this, articulate the primary HRM objective of each tribe, relate it to the tribe's environment, and then show how the tribe's organization best achieves that objective.

3. Read the attached article, "How a Creaky Factory Got Off the Hit List, Won Respect at Last," and then answer the following questions. Note that this article is fairly old: do not assume it describes events that have taken place recently.

a) The article describes two different HRM systems: the one that prevailed before Mr. Ponchak took over the factory, and the one that he installed afterwards. Describe both.

b) Consider the original HRM system: the one that prevailed before Mr. Ponchak took over. What are some of its beneficial features? Why might this system have been suitable when the factory was first getting started?

c) Consider the new HRM system, which Mr. Ponchak installed. What are some of its beneficial features? Why might this system be suitable under "current" conditions, that is, the market conditions facing Mr. Ponchak at the time he took over the factory?

d) In class we have discussed how different HRM systems can be suited to different market environments. Describe the changes in the market environment, mentioned in the article, that could justify the change in HRM systems that Mr. Ponchak was instituting.

Helpful hint! The answers to several of these questions can utilize key concepts discussed in this course: supply and demand, human capital, and incentives.