**Managerial Economics:**

**A Problem-Solving Approach**

**5th Edition**

*End-of-Chapter Individual Problems - Key*

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# Chapter 1

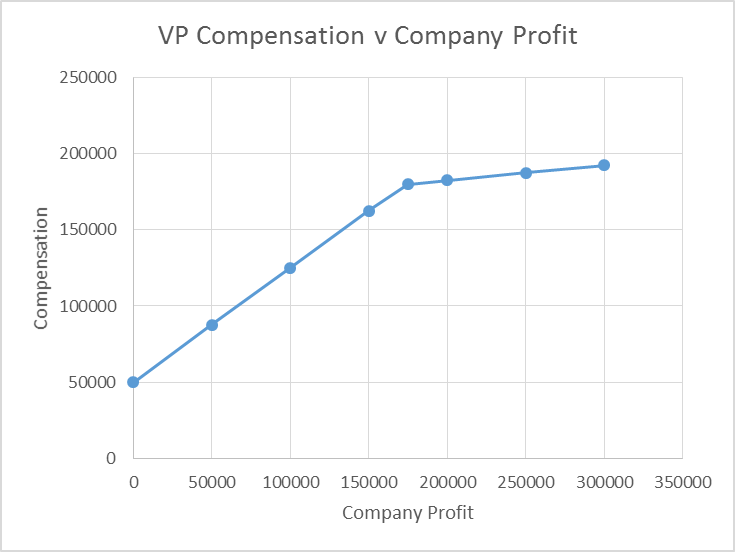
*Short Answer Key:*

## 1-1 Goal Alignment at a Small Manufacturing Concern

The owners of a small manufacturing concern have hired a manger to run the company with the expectation that he will buy the company after five years. Compensation of the new Vice President is a flat salary plus 75% of the first $150,000 profit, then 10% of profit over $150,000. Purchase price for the company is set at 4.5 times earnings (profit), computed as average annual profitability over the next five years.

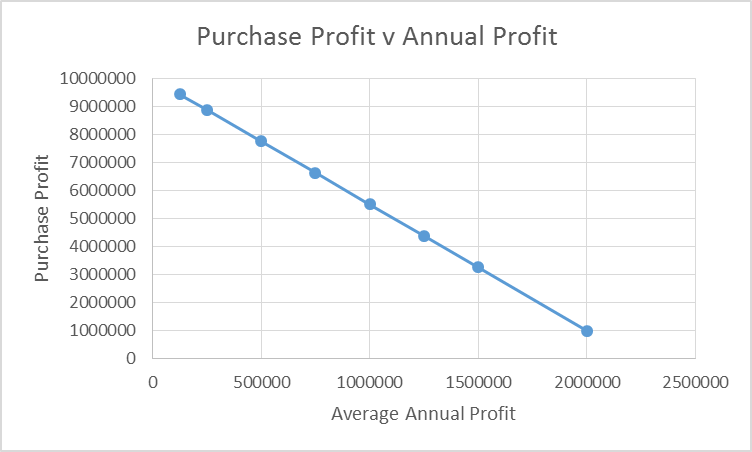
a. Plot the annual compensation of the vice president as a function of annual profit.

*Assume for now the VP has a base salary of 50,000. If so, when P≤$150000, his compensation can be determined by the equation C = 50000+0.75(P). When P≥150000, compensation is determined by the equation C=(50000+0.75(150000)) + 0.1P, which means C=162500+0.1P. The plot for compensation can be seen below.*

b. Assume the company will be worth $10million in five years. Plot the profit of buying the company as a function of annual profit.

*The purchase price will be 4.5x earnings, calculated as 4.5x average annual profitability. Therefore, the profitability of the purchase can be seen by the equation Ppurchase = 10,000,000 – 4.5(Pannual). The plot of this equation can be seen below.*

** 

## 1-2 Goal Alignment at a Small Manufacturing Concern (cont.)

Does this contract align the incentives of the new vice president with the profitability goals of the owners?

*No. Both the purchase price and the profit sharing create perverse incentives. The VP keeps $0.75 of each dollar earned up to $150,000, but only $0.10 of each dollar earned after $150K. Since earning more requires more effort (increasing marginal effort), he has little incentive to earn more than $150,000. And every dollar the VP earns raises the price that he will eventually pay for the company by $4.50, effectively penalizing him for increasing company profitability.*

## 1-3 Goal Alignment at a Small Manufacturing Concern (cont.)

Re-design the contract to better align the incentives of the new vice president with the profitability goals of the owners.

*One approach would be to establish a purchase price at the initiation of the contract. This would encourage the VP to make the company as profitable as possible, as it the increases to his marginal wealth of 10% above 150000 are not offset by the dramatic increases in purchase price. Also, this encourages him to make the company as profitable as possible as it will ultimately be his once the 5 years have passed.*

## 1-4 Goal Alignment at New York City schools

1,800 New York City teachers who lost their jobs earlier this year have yet to apply for another job despite the fact that there are 1,200 openings. Why not?

*New York is the only city in the U.S. where teachers are guaranteed pay for life even if their school closes and they no longer have a permanent job. The policy costs DOE more than $100 million per year in salary and benefits. Those teachers go into the Absent Teacher Reserve pool, where they can be used as substitutes. The average salary for an ATR pool teacher? $82,000, with some making $100,000. Some teachers have been in the pool since 2006.*

## 1-5 Goal Alignment between Airlines and Flight Crews

Planes frequently push back from the gate on time, but then wait 2 feet away from the gate until it is time to queue up for take-off. This increases fuel consumption, and increases the time that passengers must sit in a cramped plane awaiting take-off. Why does this happen?

*Airlines are often evaluated and measured by their “on time” performance metrics. As this refers to boarding times rather than the time of actual departure, airlines would rather board the planes on time and wait on the tarmac than leaves passengers waiting at the gate.*

## 1-6 Goal Alignment between Hospitals and the British Government

In 2008, the Labour party in Britain promised that patients would have to wait for no more than four hours to be seen in an emergency room. How is the National Health Service meeting this performance goal?

*To meet this performance goal, seriously ill patients are being kept in ambulances. Thousands of people a year are having to wait outside the emergency departments because the trusts will not let them in until they will be able to be treated within four hours in accordance with the Labour pledge and government targets. In addition to keeping people outside, this also has reduced the ability of the ambulances to respond to emergency calls, leading to serious problems throughout the region.*

# Chapter 2

*Short Answer Key:*

## 2-1 Airline Delays

How will commercial airlines respond to the threat of new $27,500 fines for keeping passengers on the tarmac for more than three hours? What inefficiency will this create?

*Carriers say that to avoid those fines, they will aggressively cancel flights before and during storms—even if the bad weather never materializes. The threats could foreshadow significant changes in air travel, making it even less reliable for millions of road warriors and vacationers. By canceling flights, it could take days for all travelers to get home when storms strike. [*[*link*](http://managerialecon.blogspot.com/2010/03/unintended-consequences.html)*].*

## 2-2 Selling Used Cars

I recently sold my used car. If no new production occurred for this transaction, how could it have created value?

*The value of my willingness-to-sell was less than the buyer's willingness-to-pay. Any transaction price between these allows for a voluntary exchange in which we both benefit. Since we are both better off, value was created.*

## 2-3 Flood Insurance

The U.S. government subsidizes flood insurance because those who want to buy it live in the flood plain and cannot get it at reasonable rates. What inefficiency does this create?

*Subsidies are like taxes in this case. Taxation will keep some efficient transactions from being consummated because potential transactions where the difference in buyer and seller valuation is positive will no longer cover the amount of the tax to be paid. This prevents the asset from moving to its highest valued use. With a subsidy, transactions in which the assets moves from a higher valued use to a lower valued use can be consummated so long as the difference is less than the amount of the subsidy. This moves the asset to a lower valued use. With flood insurance worth an expected $20,000, homeowners would be willing to spend $120,000 to build a house that they value at only $100,000. Wealth is destroyed.*

## 2-4 France’s Labor Unions Force Early Closing Times

In 2013, France’s labor unions won a case against Sephora to prevent the retailer from staying open late, and forcing its workers to work “antisocial hours”. The cosmetic store does about 20 percent of its business after 9 p.m., and the 50 sales staff who work the late shift are paid an hourly rate that is 25 percent higher than the day shift. Many of them are students or part time workers, who are put out of work by these new laws. Identify the inefficiency, and figure out a way to profit from it.

*The inefficiency in this situation stems from the fact that the staff working the late shift valued the opportunity to work at the 25 percent increased wage more than not working during “antisocial hours”. This regulation has not only diminished the value to the company, who is losing 20 percent of its business, but also the workers, who are now unemployed.*

## 2-5 Kraft and Cadbury

When Kraft recently bid $16.7 billion for Cadbury, Cadbury**’**s market value rose, but Kraft**’**s market value fell by more. What does this tell you about the value-creating potential of the deal?

*It means that Kraft's shareholders, and potential shareholders, think that Kraft’s profits will fall. This would be the case if Kraft's $16.7 billion bid is greater than the present value of the expected future profits from the Cadbury unit. Essentially, the combined market value of the firms separately is greater than the market value of the firms together. The market thinks that combining these assets will destroy value.*

## 2-6 Price of Breast Reconstruction Versus Breast Augmentation

Two similar surgeries, breast reconstruction and breast augmentation, have different prices. Breast augmentation is cosmetic surgery not covered by health insurance. Patients who want the surgery must pay for it themselves. Breast reconstruction following breast removal due to cancer is covered by insurance. The price for one of the surgeries has increased by about 10% each year since 1995, whereas the other has increased by only 2%per year. Which of the surgeries has the lower inflation rate? Why?

*Market pressure comes from two sources: consumers who can choose not to purchase, and competitors who can offer lower prices. Breast augmentation is subject to both of these forces, and thus has a lower price, while breast reconstruction is covered by insurance where the consumer pressure is weaker.*

# Chapter 3

## 3-1 Concert Opportunity Cost

You won a free ticket to see a Bruce Springsteen concert (assume the ticket has no resale value). U2 has a concert the same night, and this represents your next-best alternative activity. Tickets to the U2 concert cost $80, and on any particular day, you would be willing to pay up to $100 to see this band. Assume that there are no additional costs of seeing either show. Based on the information presented here, what is the opportunity cost of seeing Bruce Springsteen?

*$20. Opportunity cost is the value of your next best alternative. In this case, your next best alternative is attending the U2 concert. Your value for this alternative is $100 with a corresponding cost of $80 leaving a net value of $20.*

*Note: This question is adapted from Paul J. Ferraro and Laura O. Taylor (2005) "Do Economists Recognize an Opportunity Cost When They See One? A Dismal Performance from the Dismal Science", Contributions to Economic Analysis & Policy: Vol. 4: No. 1, Article 7.*

## 3-2 Concert Opportunity Cost 2

You were able to purchase two tickets to an upcoming concert for $100 apiece when the concert was first announced three months ago. Recently, you saw that StubHub was listing similar seats for $225 apiece. What does it cost you to attend the concert?

*What you paid three months ago is irrelevant to your costs now. The decision you are facing is to attend the concert or not. If you do not attend, you can sell the tickets for $225 (ignoring any brokering fees and hassle costs). Thus, you forego $450 to attend the concert.*

## 3-3 Housing Bubble

Because of the housing bubble, many houses are now selling for much less than their selling price just two to three years ago. There is evidence that homeowners with virtually identical houses tend to ask for more if they paid more for the house. What fallacy are they making?

*These two homeowners have virtually identical houses that should sell at virtually identical prices. The purchase price from years ago is a sunk cost and therefore irrelevant to the pricing decision. They are committing the sunk cost fallacy.*

## 3-4 Opportunity Cost

The expression “3/10, net 45” means that the customers receive a 3% discount if they pay within 10 days; otherwise, they must pay in full within 45 days. What would the seller’s cost of capital have to be in order for the discount to be cost justified? (Hint: Opportunity Cost)

*The "opportunity cost" of receiving a late payment is the foregone benefit of receiving the money early.  This is determined by a firm’s cost of capital.  A 3% interest rate for 35 days corresponds to an annual rate of about 3%\*(365/35)=31%.*

## 3-5 Starbucks

Starbucks is hoping to make use of its excess restaurant capacity in the evenings by experimenting with selling beer and wine. It speculates that the only additional costs are hiring more of the same sort of workers to cover the additional hours and costs of the new line of beverages. What hidden costs might emerge?

*There could be many hidden costs. Here are a few examples:*

* *Some of Starbucks current baristas are underage and are not permitted to serve alcohol. Hiring new bartenders may raise the labor costs.*
* *The storage and preparation of cold drinks, like beer and wine, differs considerably from the storage and preparation of hot drinks, like coffee. This suggests two separate “production lines” at each store.*
* *The Starbucks brand is known for signaling a quiet, comfy place to linger in small groups or alone. Serving alcohol may change the atmosphere enough that traditional coffee drinkers in the afternoon and early evening will be turned off.*
* *The Starbucks brands is also known for high quality coffees that are high quality partly because of the care in choosing beans, roasting them and brewing on the premises. It is not clear that there is much scope for care in 'preparing' beer and wine beverages to add similar value. If not, this brand extension could dilute the signal of the brand.*

## 3-6 Dropping University Courses

Students doing poorly in courses often consider dropping the courses. Many universities will offer a refund before a certain date. Should this affect a student’s drop decision?

*Before this date, the tuition is avoidable. After this date, it is sunk. Before this date, students compare the expected benefits to the tuition cost. After this date, they compare the expected benefits only to avoiding the hassle costs of continuing to participate in the course.*

## 3-7 Business Costs

A business incurs the following costs per unit: labor $125/unit, materials $45/unit, and rent $250,000/month. If the firm produces 1,000,000 units a month, calculate the following:

a. Total variable costs

b. Total fixed costs

c. Total costs

*a. Total variable costs = $170,000,000 per month (($125+$45) x 1,000,000) b. Total fixed costs = $250,000 per month (rent) c. Total costs = $170,250,000 per month*

# Chapter 4

## 4-1 Extent Versus Discrete Problems

Identify which of the following are extent decisions.

a. Decide whether to expand an existing product into a new region.

*Discrete decision.*

b. What discount should be given on products during the upcoming holiday sale?

*Extent decision. You must evaluate the marginal increase in sales for each level of discount. Are the profit generated from the price discount greater than the loss from the discount?*

c. Should the advertising budget be changed for the upcoming year?

*Extent decision. If the increase in sales (revenue) is greater than the increase in budget (MR>MC), then the budget should be increased. You should also examine how sales would be affected if the budget is decreased.*

d. Should you develop a new product for an existing product line?

*Discrete decision. You must decide whether the product should be developed (yes or no*).

## 4-2 Game Day Shuttle Service

You run a game day shuttle service for parking services for the local ball club. Your costs for different customer loads are 1: $30, 2: $32, 3: $35, 4: $38, 5: $42, 6: $48, 7: $57, and 8: $68. What are your marginal costs for each customer load level? If you are compensated $10 per ride, what customer load would you want?

*Marginal Cost is the change in costs due to the additional customer. Since marginal revenue is the price of $10, you will serve customers up to the point where MC > MR or you will serve 7 customers.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q** | **TC** | **MC** | **Tot Rev** | **Profit** |
| 1 | 30 |  | 10 | -20 |
| 2 | 32 | 2 | 20 | -12 |
| 3 | 35 | 3 | 30 | -5 |
| 4 | 38 | 3 | 40 | -2 |
| 5 | 42 | 4 | 50 | 8 |
| 6 | 48 | 6 | 60 | 12 |
| **7** | **57** | **9** | **70** | **13** |
| 8 | 68 | 11 | 80 | 12 |

## 4-3 Paid for Grades

Children in poor neighborhoods have bleak outlooks on life and do not see much gain to studying. A recent experiment is paying children in poor neighborhoods $100 for each **“**A**”** they earn in a six-week grade reporting cycle. How does this affect behavior?

*The amount to study to earn good grades is an extent decision. For most of these children, the marginal costs exceeded the marginal benefits at low levels of effort. With the cash payment, the marginal benefit rises and so they will put in more effort.*

## 4-4 Supplier Bids

Your company is contemplating bidding on an RFP (Request For Proposal) for 100,000 units of a specialized part. Why might the amount be more than the requesting company actually wants?

*It is likely that your chosen supplier will bear some fixed costs to setup for this specialized input and will bear a marginal cost per unit. His bid will be based on his average costs = FC/Q +MC. This is lower if he assumes a larger quantity. If you could get away with making him make this calculation for more than 100,000 units, you might get a lower bid price.*

## 4-5 Processing Insurance Claims

Your insurance firm processes claims through its newer, larger high-tech facility and its older, smaller low-tech facility. Each month, the high-tech facility handles 10,000 claims, incurs $100,000 in fixed costs and $100,000 in variable costs. Each month, the low-tech facility handles 2,000 claims, incurs $16,000 in fixed costs and $24,000 in variable costs. If you anticipate a decrease in the number of claims, where will you lay off workers?

*What costs would be avoided under the two options? The fixed costs at each facility must be incurred (unless the reduction is so big that you can close a facility). Only the variable costs can be avoided. In the high-tech facility, the average variable cost per claim - an approximation of the marginal costs -is $100,000/10,000 = $10 per claim. In the low-tech facility, the average variable cost per claim is $24,000/2,000 = $12 per claim. Therefore, by reducing the work apportioned to the low-tech facility will help you avoid more costs.*

## 4-6 Copier Company

A copy company wants to expand production. It currently has 20 workers who share eight copiers. Two months ago, the firm added two copiers, and output increased by 100,000 pages per day. One month ago, they added five workers, and productivity also increased by 50,000 pages per day. Copiers cost about twice as much as workers. Would you recommend they hire another employee or buy another copier?

*This is an extent decision, so we have to measure the marginal benefit of adding a copier and the marginal benefit of adding a worker. The marginal productivity of a copier is 50,000 pages per day (100,000 pages/2 copiers). The marginal productivity of a worker is 10,000 pages per day (50,000 pages/5 workers). An extra copier will add five times much as an extra worker, but will cost less than five times as much. Buy a copier.*

# Chapter 5

## 5-1 George’s T-Shirt Shop

George**’**s T-Shirt Shop produces 5,000 custom printed T-shirts per month. George**’**s fixed costs are $15,000 per month. The marginal cost per T-shirt is a constant $4. What is his break-even price? What would be George**’**s break-even price if he were to sell 50% more shirts?

*The break-even price is the average unit cost which equals $15,000/5,000 + $4 = $7. If George sold 50% more he would sell 7,500 units and the break-even price would be $15,000/7,500 + $4 = $6.*

## 5-2 Net Present Value

Suppose an initial investment of $100 will return $50/year for three years (assume the $50 is received each year at the end of the year). Is this a profitable investment if the discount rate is 20%?

*Yes, the project has a positive NPV, so it is profitable*

*NPV = -$100 + 50/1.2 + 50/1.22 + 50/1.23*

*= -$100 + 41.67 + 34.72 + 28.94*

*= $5.33*

## 5-3 Doctor’s Human Capital

Probably the most important source of capital is human capital. For example, most medical doctors spend years learning to practice medicine. Doctors are willing to make large investments in their human capital because they expect to be compensated for doing so when they begin work. In Canada, the government nationalized the healthcare system and reduced doctors**’** compensation. Is this a form of post-investment hold-up?

*If the Canadian doctors can relocate to the United States or to another country where they can earn a competitive rate of return on their human capital, then the capital is fixed and cannot be expropriated by the Canadian government. But, if Canadian doctors are unwilling or unable to migrate to another country, then their human capital is sunk and can be expropriated by the Canadian government, at least in the short-run. In the long-run, the Canadian government will get exactly what they pay for, i.e. lower-quality medical care, because reducing the rewards for investing in human capital reduces investment in human capital. In the long-run we would expect Canadian doctors to have less human capital than those in the United States.*

## 5-4 Solar Panel Installation

A university spent $1.8 million to install solar panels atop a parking garage. These panels will have a capacity of 500 kw, have a life expectancy of 20 years and suppose the discount rate is 10%.

a. If electricity can be purchased for costs of $0.10 per kwh, how many hours per year will the solar panels have to operate to make this project break even?

*We need that the present value (PV) of the electricity generated by the solar panels be equal to the cost. The PV is the 20 year discounted value. Suppose it operates for one hour each of 20 years and thus generates 500kwh each year. For one hour of operation each year, it generates $50 worth of electricity (500kwh\*$0.10/kwh) per year. The present value is:   
PV = $50/(1+10%) + $50/(1+10%)2 +  + $50/(1+10%)3 + ... +  + $50/(1+10%)20  
PV = $468.25. (I would accept end of year accruing too.)*

b. If efficient systems operate for 2,400 hours per year, would the project break even?

*It would have to run for 3,844 hours per year ($1.8 million / $468.25) to break even.*

*No, an efficient system (2,400 hours) is not efficient enough.*

c. The university is seeking a grant to cover capital costs. How big of a grant would make this project worthwhile (to the university)?

*The electricity for an efficient system (2,400 hours) would have a PV of $468.25\*2400 or just under $1,124,000. This is about $676,000 short of $1.8million. A grant of $676,000 would make it worthwhile. (In fact, the grant was for the whole $1.8million)*

## 5-5 Toy Trucks

Last year, a toy manufacturer introduced a new toy truck that was a huge success. The company invested $2.5 million for a plastic injection molding machine (which can be sold for $2.0 million) and $100,000 in plastic injection molds specifically for the toy (not valuable to anyone else). Labor and the cost of materials necessary to make each truck is about $3. This year, a competitor has developed a similar toy that has significantly reduced demand for the toy truck. Now, the original manufacturer is deciding whether they should continue production of the toy truck. If the estimated demand is 100,000 trucks, what is the break-even price for the toy truck? Should you shut down?

*The break-even price is equal to the average avoidable cost of producing the trucks. The costs consist of $3 per truck plus $2.0 million (recoverable value). With a demand of 100,000, the break-even price is $23 [=($2.0 million / 100,000) + $3]. If the manufacturer cannot sell 100,000 trucks for a minimum of $23, they should stop selling this product.*

## 5-6 Running a Hotel During a Recession

In early 2008, you purchased and remodeled a 120-room hotel to handle the increased number of conventions coming to town. By mid-2008, it became apparent that the recession would kill the demand for conventions. Now, you forecast that you will only be able to sell 20,000 room-nights that cost on average $50 per room per night to service. You spent $20 million on the hotel in 2008, and your cost of capital is 10%. The current going price to sell the hotel is $15 million. What is your break-even price?

*The breakeven price is the average avoidable cost. This is the annual cost of avoidable capital per room plus marginal costs. The fixed costs are avoidable only through a sale. That is, only $15million of the original $20million are still avoidable. So you have PBE = $15million\*10%/20,000 + $50 = $125.*

*Another way to see this is by focusing on the costs of the decisions. The decision is to keep operating the hotel or not and you want to know which will earn you more money. If you stop running the hotel, you can sell it for $15million (the $20million initial cost is now irrelevant). If you keep running the hotel you earn the average hotel rate minus the average room cost on the expected number of room-nights into the foreseeable future. This must be larger than the alternative. That is:*

*Opportunity cost < 20,000(PBE-50)/10%  
10%($15million) < 20,000(PBE-50)  
PBE-50 > $75  
PBE > $125  
  
Either way, you run the hotel only if you can fetch an average $125 per room.*

## 5-7 Short Run versus Long Run

A firm sells 1,000 units per week. It charges $70 per unit, the average variable costs are $25, and the average costs are $65.

a. What should the firm do in the short run? Why?

b. What should the firm do in the long run? Why?

c. At what price would the firm consider shutting down in the short run?

d. At what price would the firm consider shutting down in the long run?

*a. The firm should continue to operate, as the $70 price is greater than the $25 average variable costs, which are the only avoidable costs in the short run.*

*b. The firm should continue to operate, as the $70 price is greater than the $65 average costs, all of which is avoidable in the long run.*

*c. The short run shut-down price is $25, the same as the short run avoidable costs.*

*d. The long run shut-down price is $65, the same as the long run avoidable costs.*

Note to instructors: the above assumes that $65 represents *total* average cost (both fixed and variable)

# Chapter 6

## 6-1 Elasticity of T-Shirt Sales

George has been selling 5,000 T-shirts per month for $8.50. When he increased the price to $9.50, he sold only 4,000 T-shirts. What is the demand elasticity? If his marginal cost is $4 per shirt, what is his desired markup and what is his initial actual markup? Was raising the price profitable?

*The elasticity formula is e = (Q1-Q2)/(Q1+Q2) × (P1+P2)/(P1-P2). In this case, we have e = (5,000-4,000)/(5,000+4,000) × (8.50+9.50)/(8.50-9.50) = (1/9) × (18/-1) = -2. The desired markup is -1/e = 0.5 and his initial actual markup was (P-MC)/P = (8.50-4)/8.5 ≈ 0.53. Since his actual margin was already greater than his desired margin, raising his price (and thus margin) would decrease profits*

## 6-2 Increasing Movie Ticket Prices

To conduct an experiment, AMC increased movie ticket prices from $9.00 to $10.00 and measured the change in ticket sales. Using the data over the following month, they concluded that the increase was profitable. However, over the subsequent months, they changed their minds and discontinued the experiment. How did the timing affect their conclusion about the profitability of increasing prices?

*Demand is more elastic in the long run. By the long run, we mean enough time so that all the adjustments that are going to occur will have occurred. In this case, one month is most likely not long enough. Customers who have already come to the theater will likely go through with the transaction. Once they become aware of the price increase, many will seek alternatives for their future entertainment. For some, these future transactions will occur many months later. After just the first month, demand did not fall much due to the price increase. Only after subsequent months did they get a truer view of just how elastic demand is. When it was revealed to be so much more elastic, the decrease in quantity demanded was so great that the fee increase was unprofitable.*

## 6-3 Promotional Pricing

An end-of-aisle price promotion changes the price elasticity of a good from **–**2 to **–**3. If the normal price is $10, what should the promotional price be?

*The promotion has made consumers more price sensitive and has made demand more elastic. As demand becomes more elastic, the firm should decrease price. The exact price level will depend on the costs but the desired markup (which should be -1/e) will decrease from 1/2 to 1/3. If the $10 price were optimal at the previous elasticity, then (P-MC)/P=(10-MC)/10=1/2, so MC=5. Therefore, at the new elasticity, (P-5)/P=1/3, so P=7.50.*

## 6-4 Bar Nuts

Why do bars offer free peanuts?

*Peanuts are complements to the alcohol consumption and socializing that bars offer. By offering peanuts for free, the demand for purchased drinks increases. Bars earn higher profits from this increased demand in excess of the costs of the peanuts. (This is like free parking at retail outlets.)*

# Chapter 7

## 7-1 Scale and Scope

What is the difference between economies of scale and economies of scope?

*Scale economies arise from producing greater quantities of the* ***same*** *product. Average total costs fall as you produce more of the same product. Scope economies arise from producing* ***different*** *products together – total production cost of producing the two goods together is less than the cost of producing them separately.*

## 7-2 Brand Extensions

Suppose Nike**’**s managers were considering expanding into producing sports beverages.

Why might the company decide to do this under the Nike brand name?

*This is an example of economies of scope. It would be less expensive to produce their current products and the sports beverage under a common brand name as opposed to going to the great expense of building an additional brand with the same cachet as Nike. (Nike, of course, must be careful not to dilute the power of the brand too far).*

## 7-3 Rangers’ T-Shirts

The variety of Riverside Ranger logo T-shirts includes 12 different designs. Setup between designs takes one hour (and $18,000), and, after setting up, you can produce 1,000 units of a particular design per hour (at a cost of $8,000). Does this production exhibit scale economies or scope economies?

*Your marginal costs per shirt are MC = $8,000/1,000 = $8. Your total cost for a quantity (Q) is:*

*TC = $18,000 + 8\*Q*

*and average costs are*

*AC=$18,000/Q + $8*

*This equation indicates average costs decline with quantity. Since average costs fall with output, there are scale economies for any one design.*

## 7-4 Average and Marginal Costs

Describe the change in average costs and the relationship between marginal and average costs under the following three conditions as quantities produced increase:

|  |  |  |
| --- | --- | --- |
|  | Average Cost | Marginal Cost Versus Average Cost |
| Constant Returns to Scale | Rising, Falling, Flat | Higher, Lower, Equal |
| Decreasing Returns to Scale | Rising, Falling, Flat | Higher, Lower, Equal |
| Increasing Returns to Scale | Rising, Falling, Flat | Higher, Lower, Equal |

|  |  |  |
| --- | --- | --- |
|  | *Average Cost* | *Marginal Cost versus Average Cost* |
| *Constant returns to scale* | *Rising Falling* ***Flat*** | *Higher Lower* ***Equal*** |
| *Decreasing returns to scale* | ***Rising*** *Falling Flat* | ***Higher*** *Lower Equal* |
| *Increasing returns to scale* | *Rising* ***Falling*** *Flat* | *Higher* ***Lower*** *Equal* |

## 7-5 Learning Curves

Suppose you have a production technology that can be characterized by a learning curve. Every time you increase production by one unit, your costs decrease by $6. The first unit costs you $64 to produce. If you receive a request for proposal (RFP) on a project for four units, what is your break-even price? Suppose that if you get the contract, you estimate that you can win another project for two more units. Now what is your break-even price for those two units?

|  |  |  |  |
| --- | --- | --- | --- |
| *Quantity* | *Marginal Cost* | *Total Cost* | *Average Cost* |
| *1* | *$64* | *$64* | *$64* |
| *2* | *$58* | *$122* | *$61* |
| *3* | *$52* | *$174* | *$58* |
| *4* | *$46* | *$220* | *$55* |
| *5* | *$40* | *$260* | *$52* |
| *6* | *$34* | *$294* | *$49* |

*Based on the table above, the break-even price for 4 units is $55. The extra cost of the fifth and sixth units is only $74 or $37/unit.*

## 7-6 Multiconcept Restaurants Are a Growing Trend

A multiconcept restaurant incorporates two or more restaurants, typically chains, under one roof. Sharing facilities reduces costs of both real estate and labor. The multiconcept restaurants typically offer a limited menu, compared with full-sized, stand-alone restaurants. For example, KMAC operates a combination Kentucky Fried Chicken (KFC)/Taco Bell restaurant. The food preparation areas are separate, but orders are taken at shared point-of-sale (POS) stations. If Taco Bell and KFC share facilities, they reduce fixed costs by 30%; however, sales in joint facilities are 20% lower than sales in two separate facilities. What do these numbers imply for the decision of when to open a shared facility versus two separate facilities?

*If real estate is costly, or sales are low, then multiconcept restaurants are more profitable. If, however, real estate is cheap, or sales are big, then separate facilities are more profitable.*

# Chapter 8

## 8-1 Widget Market

The widget market is competitive and includes no transaction costs. Five suppliers are willing to sell one widget at the following prices: $30, $29, $20, $16, and $12. Five buyers are willing to buy one widget at the following prices: $10, $12, $20, $24, and $29. What is the equilibrium price and quantity?

*Equilibrium Price = $20 and Equilibrium Quantity = 3*

*Price Demand Supply*

*10 5 0*

*12 4 1*

*16 3 2*

*20 3 3*

*24 2 3*

*29 1 4*

*30 0 5*

## 8-2 Cotton Prices

The “A” index is a proxy for the world price of cotton. From January 2010 to October of 2010, the price reflected by the “A” index increased about 80%.

a. Provide two separate explanations for this price increase using shifts in supply or demand.

b. What one piece of information would allow you to decide which of the two is a better explanation?

*a. An increase in price could be explained by either*

* + - *An increase in demand*
    - *A decrease in supply*

*b. Knowing whether quantity increased or not would allow you to distinguish between the two explanations. An increase in demand with no change in supply would result in higher quantity. A decrease in supply with no change in demand would result in lower quantity.*

*It turns out that both explanations were actually contributing to the higher prices according to an article in the Wall Street Journal. “Cotton prices have been driven higher by demand from developing countries, notably China and India, where rising wealth is boosting consumption patterns. Mother Nature is also to blame, with the deadly floods in Pakistan and heavy rains in China damaging many crops and limiting cotton supply.”*

## 8-3 Hand Sanitizer

Due to the H1N1 flu outbreak, the demand for hand sanitizer tripled. Should Johnson &

Johnson increase production of their Purell hand sanitizer? Should it invest in doubling production capacity?

*An increase in demand will usually increase the price and, thus, greater production levels are profitable. One way to do this is to increase manufacturing capacity. However, capacity will be increased for many years and the H1N1 flu is likely to be a temporary phenomenon. That is, demand for hand sanitizer is likely to return to pre-2009 levels in a year or two. In this case, the extra capacity will likely be idle and unprofitable.*

## 8-4 Chocolate Candy Bars Market

1. In the accompanying diagram (which represents the market for chocolate candy bars), the initial equilibrium is at the intersection of S1 and D1. Circle the new equilibrium if there is an increase in cocoa prices.
2. In the same diagram, the initial equilibrium is at the intersection of S1 and D1. Circle the new equilibrium if there is rapid economic growth.



1. *An increase in cocoa prices would cause a decrease in supply. The new equilibrium would be at the intersection of S2 and D1 (higher price and lower quantity)*
2. *Rapid economic growth would cause an increase in demand. The new equilibrium would be at the intersection of S1 and D3 (higher price and higher quantity)*

## 8-5 Demand Shifts

Indicate whether the following changes would cause a shift in the demand curve for Product A and, if so, the direction of the shift.

|  |  |  |  |
| --- | --- | --- | --- |
| Change | Demand Curve Shift? | | Direction of Shift? |
| Increase in price of complementary product | Yes | No | Increase, Decrease, NA |
| Increase in the price of the Product A | Yes | No | Increase, Decrease, NA |
| Launch of effective advertising campaign for Product A | Yes | No | Increase, Decrease, NA |

|  |  |  |
| --- | --- | --- |
| ***Change*** | ***Demand Curve Shift?*** | ***Direction of Shift?*** |
| *Increase in price of complementary product* | ***Yes*** *No* | *Increase* ***Decrease*** *N/A* |
| *Increase in the price of the Product A* | *Yes* ***No*** | *Increase Decrease* ***N/A*** |
| *Launch of effective advertising* | ***Yes*** *No* | ***Increase*** *Decrease N/A* |
| *campaign for Product A* |  |  |

## 8-6 Valentine’s Day

On Valentine**’**s Day, the price of roses increases by more than the price of greeting cards. Why? (Hint: Consider what makes roses and cards different and how that difference might affect supply**’**s responsiveness to price.)

*Greeting cards can be stored, so manufacturers can easily step up production and prepare larger stocks ahead of Valentine’s Day. This means that the supply of cards is relatively responsive to price, flat, or elastic; hence, an increase in demand has little effect on price. By contrast, roses are perishable. Only roses maturing around Valentine’s Day will be suitable for that day. It is relatively costly to increase the quantity supplied on Valentine’s Day. This means that the supply is relatively unresponsive to price, steep, or inelastic, and consequently, the increase in demand causes the price to increase sharply.*

# Chapter 9

## 9-1 Faculty Housing Benefits

At a university faculty meeting in 2012, a proposal was made to increase the housing benefits for new faculty to keep pace with the high cost of housing. What will likely be the long-run effect of this proposal? (Hint: Think indifference principle.)

*The proposal will likely have no net long-run effect. Higher housing benefits mean that schools do not have to offer as much in other incentives (e.g., pay) to new faculty members to induce them to come to the university. Consequently, the increased housing benefits will be offset with a compensating reduction in the wages of new Faculty members. Overall, any housing benefits, or lack thereof, will be capitalized in the salary package offered to the faculty member.*

## 9-2 Snacks, Beer, and Marijuana

Snack food venders and beer distributors earn some monopoly profits in their local markets but see them slowly erode from various new substitutes. When California voted on legalizing marijuana, which side would you think that California beer distributors were on? What about snack food venders? Why?

*The potential legalization of marijuana would have different effects on different related markets. In the category of recreational drugs, beer and marijuana are likely substitutes. Legalization would shift demand away from beer sales and thus reduce the profits of beer distributors. We would expect them to oppose legalization.*

*On the other hand, marijuana and snack foods are strong complements (or so we are told). Legalization would shift demand out for snack food companies and thus increase their profits. We would expect them to support legalization.*

## 9-3 Entry and Elasticity

Suppose that new entry decreased your demand elasticity from **–**2 to **–**3 (made demand more elastic). By how much should you adjust your price of $10?

*First, use the formula (P-MC)/P=1/|elasticity| to determine marginal cost. If the old price is $10 with an elasticity of -2, marginal cost is $5.*

*(10 - MC)/10 = 1/2*

*10 - MC = 5*

*10 = 5 + MC*

*5 = MC*

*Next, use the same formula with the marginal cost and the new elasticity to determine the price. The new price will be $7.50.*

*(P - 5)/ P = 1/3*

*P - 5 = 1/3 P*

*P = 1/3 P + 5*

*2/3 P = 5*

*P = 5(3/2)*

*P = 7.5*

## 9-4 Competitive Industries

Relative to managers in more monopolistic industries, are managers in more competitive industries more likely to spend their time on reducing costs or on pricing strategies?

*Competitive industries are those in which products have many close substitutes, firms have many rivals, and there are minimal entry and exit barriers. This implies very elastic demand and, therefore, not much ability to raise price. Therefore, the only way to increase profit is to reduce costs. Managers in these industries should spend more time on reducing costs.*

## 9-5 Economic Profit

Describe the difference in economic profit between a competitive firm and a monopolist in both the short and long run. Which should take longer to reach the long-run equilibrium?

*In the short run, a monopolist should have higher economic profit than a competitive firm has. In the long run, both are expected to have zero economic profit. The monopolist will take longer to reach the long run.*

## 9-6 Economics Versus Business

Describe an important difference in the way an economist and a businessperson might view a monopoly.

*An economist might likely view a monopoly in a negative light, as the monopoly power prevents the market from operating at full efficiency. A business person might instead view monopoly power as a goal for his or her business, as this power would allow the business to more easily generate positive economic profits.*

# Chapter 10

## 10-1 High Rivalry

For each category, indicate which condition is associated with higher rivalry among competitors.

|  |  |  |
| --- | --- | --- |
| Number of Firms | High | Low |
| Fixed Costs | High | Low |
| Level of Product Differentiation | High | Low |
| Industry Growth | High | Low |
| Buyer Switching Costs | High | Low |

*The following are associated with higher rivalry:*

|  |  |  |
| --- | --- | --- |
| *Number of firms* | ***High*** | *Low* |
| *Fixed costs* | ***High*** | *Low* |
| *Level of product differentiation* | *High* | ***Low*** |
| *Industry growth* | *High* | ***Low*** |
| *Buyer switching costs* | *High* | ***Low*** |

## 10-2 Increasing Customer Value

To increase a company**’**s performance, a manager suggests that the company needs to increase the value of its product to customers. Describe three ways in which this advice might be incorrect (Hint: Think about what else might or might not change that affects profit.)

*1. Value increases but price does not; consumer surplus increases but not profit*

*2. Value increases, price increases and cost increases all by the same amount– no change to profit*

*3. Value increases, price increases but cost increase is greater than price increase; profit is reduced.*

## 10-3 Intangible Resources

Why might intangible resources like human capital and intellectual assets be a more likely source of sustainable competitive advantage than tangible resources?

*Intangible; they are likely to be harder to imitate*

## 10-4 Five Forces and the Airline Industry

Examine the U.S. passenger airline industry using the Five Forces. Is this an attractive industry? Why or why not?

*Supplier power*

*Labor unions: labor is a significant portion of cost, and unionization increases power. This is a significant concern*

*Aircraft manufacturers: potentially high power given the relatively few number of suppliers but there is fierce competition among them so power is less significant.*

*Fuel: fuel is a commodity and its suppliers have little power*

*Airports: can have significant power given limited supply of gates and landing rights, especially international expansion.*

*Buyer power*

*Buyer power is moderately high; the product / service offered by the different airlines is relatively undifferentiated and switching costs are low.*

*Substitutes*

*Alternate travel (car or train): can be a significant threat, especially for regional airlines.*

*Information technology alternative (e.g. videoconferencing): more threat for long distance, slows down industry growth*

*Rivalry*

*Rivalry is high; there are many similarly situated airlines that tend to compete aggressively on price. Fixed costs are high and industry growth is relatively low*

*Entry*

*While there are some significant entry costs, these can be overcome (e.g., via leasing rather than purchasing jets)*

*Overall, this industry is not particularly attractive*

## 10-5 Smartphone Market

The smartphone market has been dominated by Apple, but recently the Droid has been able to leverage Google**’**s information services into market gains while Blackberry, known for its secure business-oriented network, has attempted to become more attractive with a **“**friendlier**”** interface. At the same time, a number of less capable fringe firms are emerging. How do these features fit into an industrial organization (IO) view of the market versus a resource-based view (RBV)?

*The IO view - The market had been a near Apple monopoly. The profits from this monopoly attracted entry by Droid- and Blackberry-based phones that tended to increase rivalry between firms. The emergence of smaller fringe firms suggests that entry barriers have fallen substantially so that competition has or will soon become fiercer.*

*The RBV view - Each firm brings its own distinct capabilities to its product design, which appeals to different segments of the market. Apple is known for aesthetics of their products, Google is known for its ability to manage information effectively, and Blackberry is known for its more secure data network. Each of these distinct capabilities is likely to be sustainable for some time and will be the sources of competitive advantage for each. The fringe firms do not appear to be able to replicate these capabilities and thus are more homogeneous and are more likely to compete on price.*

## 10-6 Salons and Teeth Whitening

Salon owners have recently started offering teeth whitening services to clients in addition to their more standard services. In a number of states, regulators have ordered the salon owners to stop, claiming that this service constitutes the practice of illegal dentistry. What group would you expect to be behind the state**’**s efforts to ban salons from providing teeth whitening services? Why?

*Dentists because it restrains competition; indeed this practice has been opposed by the American Dental Association. See* [*http://news.moneycentral.msn.com/provider/providerarticle.aspx?feed=AP&date=20090225&id=9641264*](http://news.moneycentral.msn.com/provider/providerarticle.aspx?feed=AP&date=20090225&id=9641264)

# Chapter 11

## 11-1 The Carry Trade

In 2014, the euro was trading at $1.35 on the foreign exchange market. By 2015, the rate had fallen to $1.10, due to falling European interest rates. Explain the fall in the price of a euro using supply and demand curves, and in words.

*A decline in European interest rates reduces the cost of borrowing in the EU. This increases the “carry trade” where US consumers or businesses borrow euros from EU banks, sell euros to buy dollars, and spend or invest the dollars in the US. This increases demand for dollars which increases the price of a dollar. The dollar appreciates against the euro.*

*You can do the equivalent analysis in euros and say that this increases the supply of euros, which decreases the price of a euro. The euro depreciates against the dollar.*

## 11-2 Brexit Fears

When Great Britain voted to leave the Eurozone, the pound depreciated 17% against the dollar. It also raised fears that the Eurozone would fall apart. Explain how this fear would affect the dollar/euro exchange rate.

*The fear of uncertainty causes a flight to safety, so Europeans sell euros to buy dollars. This increases demand for dollars which increases the price of a dollar. The dollar appreciates against the euro.*

*You can do the equivalent analysis in euros and say that this increases the supply of euros, which decreases the price of a euro. The euro depreciates against the dollar.*

## 11-3 Effects of the Pound Devaluation on Tourism and Bank Profits

Explain the effects of the pound devaluation on:

(1) imports and tourism to Great Britain; and

(2) profits of US banks with European trading subsidiaries in London (which earn profit in pounds).

1. *A currency devaluation hurts foreign suppliers because it makes foreign goods (exports from foreign countries imported to Great Britain) more expensive to domestic consumers. The quantity of exports falls. This hurts domestic consumers and foreign suppliers but helps domestic suppliers and foreign consumers.*

*Tourism can be thought of as an “export” in that tourists are foreign consumers, who have a demand for a domestic product (goods and services produced in Great Britain). A currency devaluation helps foreign consumers and domestic suppliers.*

*2) Profits for US banks with trading operations in London earn profit in pounds and then sell pounds to buy dollars to pay shareholders in the US. A pound devaluation would reduce the dollar profit of the Bank’s London trading operation.*

## 11-4 The Effects of a Pound Depreciation on Whirlpool

Most of the appliances that Whirlpool sells in the UK are built in the EU. What is the effect of a pound depreciation on Whirlpool’s profit margin?

*Whirlpool incurs costs in euros but earns revenue in pounds. A currency devaluation would reduce revenue relative to cost so its profit margin would decrease.*

*[note to instructors: the following three problems are mis-numbered in the text]*

## 11-5 Domestic Content

Explain the effect of a dollar depreciation on domestic firms and domestic consumers for goods with less than 100% domestic content.

*Domestic firms would still benefit on the whole, and domestic consumers would be harmed on the whole, but not as much as if the goods contained 100% domestic content. This is because firms that export heavily tend to import heavily as well. A devaluation would increase export demand but also increase the price of imported parts.*

## 11-6 Dollar Devaluation

How will a dollar devaluation affect businesses and consumers in the twin cities of El Paso, the United States, and Juarez, Mexico?

*A dollar devaluation will increase the demand from Mexican consumers for US goods and services, raising the US price and quantity. This will benefit US producers, but hurt US consumers. A dollar devaluation will also reduce export demand for Mexican goods and services, reducing the Mexican price and reducing quantity. This will hurt Mexican producers in Juarez, but benefit Mexican consumers.*

## 11-7 Effect of Expectations on the Exchange Rate

If market participants expect the krona to appreciate relative to the dollar, what will happen?

*They will accelerate purchases of the krona (an increase in demand for krona), and delay purchases of dollars (a decrease in demand for dollars). Both of these factors cause the price of a krona to increase, a kind of self-fulfilling expectation.*

# Chapter 12

## 12-1 Parking Lot Optimization

Suppose your elasticity of demand for your parking lot spaces is **–**2, and price is $8 per day. If your MC is zero, and your lot is 80% full at 9 A.M. over the last month, are you optimizing?

*Because demand is elastic, a decrease in price will likely increase revenues and (since marginal cost is zero) will increase profit. Therefore, it is unlikely that the lot is optimizing. However, one should investigate how variable is demand. If the lot is 80% full each day, then decreasing price will be optimal. On the other hand, if the 80% capacity figure is because the lot is at capacity on weekdays but nearly empty on weekends, then prices might actually be too low. A price reduction would not increase the number of customers on weekdays, and a price increase may nevertheless keep the lot at capacity.*

## 12-2 Parking at Cowboys Stadium

What would efficient revenue management imply for the pricing of the Cowboys Stadium parking lot on typical game days? How about for the Super Bowl? How about for the many smaller events that fill less than half the lot?

*The stadium parking lot has fixed capacity. This means that the marginal costs, after construction costs were sunk, are near zero up to capacity and extremely high once capacity is met. On typical game days, the marginal revenue at capacity is likely to be between these two values. This implies a simple strategy of pricing low enough to fill the lot but high enough that you do not have to turn away many customers.*

*For the Super Bowl, demand may be much higher as many fans will arrive to 'tailgate' during all of the planned activities with no intension of attending the game. The strategy is similar to game days, price low enough to fill the lot but high enough that very few people are turned away. However, the greater demand implies that this price is likely to be much higher than on regular game days.*

*For smaller events, demand will be so low that capacity will never be reached. Put differently, the only way to fill the lot is to set the price so low so that marginal revenue for the last few spots is likely to be negative. In this case, efficient yield management ignores the capacity constraint and focuses on equating marginal revenue with short-run marginal costs. Typically, this will mean that price is above short-run marginal costs.*

*One final consideration is that stadium parking and stadium tickets may be complements. That is, lower parking prices may increase demand for game tickets. If these are commonly owned, the optimal price for parking may be somewhat lower than indicated above.*

## 12-3 Product Store Locations

Some high-end retailers place their most expensive products right in the entryway of the store, where consumers will see them first, and place their more popular, better-selling items further back. Why?

*They are likely trying to take advantage of psychological pricing. Since managing price expectations is as important as managing price, focusing consumers on higher prices initially allows consumers to perceive a discount, or a “win,” when they later encounter the less expensive items. By setting the reference price higher, they are making consumers more likely to buy the items in the back when they do confront their prices.*

## 12-4 Macintosh Versus iPhone

When the Macintosh computer was introduced in 1982, Apple made it difficult for third party software developers to develop software for the platform. In contrast, Apple makes it relatively easy for third-party developers to make applications that run on the iPhone. Compare and contrast these two strategies.

*When Apple made it difficult for third-party developers, it produced both hardware and software and profited both from the sale of the computers and from the sale of software for those computers. Since the hardware and software are complements, Apple priced each below its stand-alone profit-maximizing price.*

*With the iPhone, Apple encourages third party developers. As the software apps produced by these developers are complements to the iPhone, they make the iPhone more valuable, allowing Apple to raise its price.*

*The relative value of the two strategies depends on how complementary software is to the hardware and the relative ability of third-party developers relative to Apple.*

## 12-5 Concert Prices

Concert prices have increased coincidentally with illegal downloading of music off the Internet. Why?

*Before illegal downloading, concert prices were kept low to help sell recorded music; concerts and recorded music were jointly-priced complements in demand. After illegal downloading became more prevalent, profits from record sales fell dramatically, so performers’ profit calculus changed.  It was as if they were pricing concerts independently of their effect on recorded music sales.  Formally, the marginal revenue of concert sales fell due to illegal downloading, and concert prices increased in response.*

## 12-6 Radio Stations and Rock Concerts

In 2005, Clear Channel (an owner of multiple popular radio stations) spun off concert promoter Live Nation into an independent company. How would this affect prices for concert tickets or rates for radio programming?

*Music radio stations and concerts tend to be complements in consumption. The radio station can easily promote the concert and the concert venue will advertise the station. When a firm owns complements, it tends to reduce prices for both. In this case, after spinning off a complement, the opposite should happen, and the prices of each should rise.*

# Chapter (13)-14

## 14-1 Barbie Dolls and Accessories

Why might Mattel set a much lower margin on its Barbie dolls than on the accessories for the dolls?

*This is a form of metering or “giving away the razor to sell the blades.” Consumers differ in their willingness to pay for “the Barbie experience.” Those who value it a lot are probably going to purchase more accessories than those who value it less. Purchases of accessories ‘meter’ consumers’ willingness-to-pay for the experience. A higher margin for the accessories allows Mattel to extract more of the surplus from the high types without losing the low types.*

## 14-2 German Brothels

German brothels recently began offering a monthly subscription service for multiple purchasers If you wished to reduce the incidence of prostitution, would you consider this pricing plan to be a desirable change?

[*This is a bundling mechanism*](http://managerialecon.blogspot.com/2009/07/moral-hazard-in-german-brothels.html)*. Traditionally, prices include a profit margin and price exceeds marginal cost. This means that there are unconsummated transactions that represent a value-creating opportunity. By pricing each visit at marginal cost, you increase usage and, therefore, consumer surplus. The monthly subscription charge is meant to capture some of this additional consumer surplus.*

*The result of such a pricing scheme is that the patronage of prostitutes increases, so those wishing to minimize incidence of prostitution would not consider this desirable.*

## 14-3 Selling Salsa

Your family business produces a secret recipe salsa and distributes it through both smaller specialty stores and chain supermarkets. The chains have been demanding sizable discounts but you do not want to drop your prices to the specialty stores. When can you legally accommodate the chains without losing profits from the specialty stores?

*You wish to offer discounts to big supermarkets that you will not offer to smaller stores. This is precisely what the Robinson-Patman Act was enacted to prevent. But, the Act has several defenses that could apply. You can alter some aspect of the product so that there are cost differences between the versions offered to the two retailers. For example, since the larger customers likely purchase more units per week, you offer a volume discount for large pallet sized shipments that smaller stores cannot purchase. Thus, the smaller shipping and handling costs could potentially justify the price difference.*

## 14-4 Microwave Ovens

A manufacturer of microwaves has discovered that male shoppers, on average, have lower values for microwave ovens than female shoppers. Additionally, male shoppers attribute almost no extra value to an auto-defrost feature, while female shoppers, on average, value the auto-defrost feature. There is little additional cost to incorporating an auto-defrost feature. The manufacturer is considering introducing two different models. The manufacturer has determined that men value a simple microwave at $70 and one with auto-defrost at $80, while women value a simple microwave at $80 and one with auto-defrost at $150. If there is an equal number of men and women, what pricing strategy will yield the greatest revenue? What if women comprise the bulk of microwave shoppers?

*There are three possibilities. First, we can market a single microwave (with auto-defrost) to both men and women at $80. Second, we can market a single microwave (with auto-defrost) only to women at $150. Third, we can version by selling a simple microwave targeted to men for $70 and an auto-defrost version targeted to women for $140 ($70 + $150 - $80). The existence of a simple microwave constrains our pricing on the auto-defrost one. Women value the auto-defrost feature at $70 ($150-$80), and therefore its price cannot exceed that of the simple one by more than $70.*

*If there is an equal number of men and women (say 1 of each), the revenue from each of our three strategies, respectively, is $80x2=$160, $150x1=$150, and $70x1+$140x1=$210. Therefore, offering the two versions is best.*

*On the other hand, if almost all shoppers are women, the best strategy will be to sell only microwaves with auto-defrost feature at $150.*

## 14-5 Music Pricing

The pricing model for iTunes has been to price songs individually. Instead, Spotify opted to offer unlimited song playing for a monthly fee. Would Spotify’s pricing model likely yield more profit than pricing songs individually?

*The per-song pricing policy of iTunes does not capture the consumer surplus from people willing to pay more—sometimes much more—for some songs. It also does not capture the consumer surplus for songs that people value less than the price but more than marginal cost. Thus, this policy "leaves money on the table." It will leave more money on the table if the value that people attach to songs varies greatly across songs and people.*

*The monthly subscription fee pricing policy of Spotify is an example of bundling and has the potential to capture this "money left on the table." Spotify prices each song at $0, which is very close to the marginal cost. This means that subscribers listen to more songs than they would if it charged per song this generates more potential consumer surplus. Spotify can capture this surplus by charging a subscription fee of just under the sum of the surplus for all songs listened to. Of course, not all music lovers have the same demand curve for songs. What matters is if the value of the bundle is more homogeneous across consumers than the values of the individual songs. This is likely to be true in this case.*

## 14-6 Bundling

At a student café, there are equal numbers of two types of customers with the following values. The café owner cannot distinguish between the two types of students because many students without early classes arrive early anyway (i.e., she cannot price discriminate).

|  |  |  |
| --- | --- | --- |
|  | Students with Early Classes | Students without Early Classes |
| Coffee | $0.70 | $0.60 |
| Banana | $0.50 | $1.00 |

The marginal cost of coffee is $0.10. The marginal cost of a banana is $0.40. Is bundling more profitable than selling separately? If so, what price should be charged for the bundle?

*Mixed bundling is more profitable than only selling separately:*

*Mixed bundle: Price bundle at 160, earn 160-50=110; price coffee at 70, earn 70-10=60. Total Profit is 170.*

*Price separately only: price coffee at 60, earn 120-20=100; price bananas at 100, earn 100-40=60 Total profit is 160.*

*Bundle only: coffee + banana at 120, earn 240 – 100 = 140; Total profit is 140.*

# Chapter 15

## 15-1 To Vote or Not to Vote

Mr. and Mrs. Ward typically vote oppositely in elections and so their votes **“**cancel each other out.**”** They each gain two units of utility from a vote for their positions (and lose two units of utility from a vote against their positions). However, the bother of actually voting costs each one unit of utility. Diagram a game in which they choose whether to vote or not to vote.

|  |  |  |  |
| --- | --- | --- | --- |
|  | | *Mrs. Ward* | |
| *Vote* | *Don't Vote* |
| *Mr. Ward* | *Vote* | *-1, -1* | *1, -2* |
| *Don't Vote* | *-2, 1* | *0, 0* |

## 15-2 To Vote or Not to Vote Part II

Suppose Mr. and Mrs. Ward agreed not to vote in tomorrow**’**s election. Would such an agreement improve utility? Would such an agreement be an equilibrium?

*The Nash equilibrium of this game is for both to vote. This is the worst of all possibilities as total payoffs are minimized here (this game is a prisoners’ dilemma). In fact, the outcome with the highest total payoffs is for the couple not to vote. Therefore, an agreement not to vote would improve utility. However, because cheating on the agreement is so hard to detect, it is easy to cheat and thus difficult to maintain the agreement.*

## 15-3 Compatibility

Microsoft and a smaller rival often have to select from one of two competing technologies. The rival always prefers to select the same technology as Microsoft (because compatibility is important), while Microsoft always wants to select a different technology from its rival. Describe the equilibrium of this game.

*This is a two-player, two-strategy, simultaneous move game. The actual payoffs could differ for different students but the game should look something like this one:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | | *Microsoft* | |
| *A* | *B* |
| *Rival* | *Technology A* | *1,-1* | *-1, 1* |
| *Technology B* | *-1, 1* | *1, -1* |

*There is no equilibrium in pure strategies. Therefore we expect that both the Microsoft and the rival will randomize.*

## 15-4 Salary Negotiation

The below figure represents the potential outcomes of your first salary negotiation after graduation:

Assuming that this is a sequential-move game with the employer moving first, indicate the most likely outcome. Does the ability to move first give the employer an advantage? If so, how? As the employee, is there anything you could do to realize a higher payoff?

*Outcome = Low salary offer and employee accepts*

*Employer has a first mover advantage; can force movement down low salary offer side.*

*Employee strategy: communicate a clear, credible commitment to walking if salary offer is low.*

## 15-5 Renegotiating Employment Contracts

Every year, management and labor renegotiate a new employment contract by sending their proposals to an arbitrator who chooses the best proposal (effectively giving one side or the other $1 million). Each side can choose to hire, or not hire, an expensive labor lawyer (at a cost of $200,000) who is effective at preparing the proposal in the best light. If neither hires lawyers or if both hire lawyers, each side can expect to win about half the time. If only one side hires a lawyer, it can expect to win three-quarters of the time.

a. Diagram this simultaneous-move game.

b. What is the Nash equilibrium of the game?

c. Would the sides want to ban lawyers?

1. *You have to think in terms of expected payoffs. If neither side hires a lawyer, they each have a 50% chance of "winning" the $1 million yielding an expected payoff of $500,000. If they both hire lawyers, they have the same chance of winning the $1 million but they are each out $200,000 for a net of $300,000. However, if only one side hires a lawyer, its expected payoff is 75%($1million) - $200,000 or $550,000 and the non-hirer earns an expected $250,000.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | | *Management* | |
| *No Lawyer* | *Lawyer* |
| *Labor* | *No Lawyer* | *$500,000, $500,000* | *$250,000, $550,000* |
| *Lawyer* | *$550,000, $250,000* | *$300,000, $300,000* |

1. *This is a prisoner's dilemma game. Each side individually sees that hiring a lawyer dominates not hiring the lawyer and so they both do. Neither side would individually move aware from a strategy of hiring a lawyer.*
2. *If they could set up rules that forbid the use of lawyers, both sides would be better off in the long run. This means that both would prefer changing the game to ban lawyers, perhaps through arbitration, or to make lawyers more costly.*

## 15-6 Entry Game with Withdrawal

In the text, we considered a sequential-move game in which an entrant was considering entering an industry in competition with an incumbent firm (Figure 15-1). Consider now that the entrant, if fought, has the possibility of withdrawing from the industry (at a loss of 1 for the entrant and a gain of 8 for the incumbent), or staying (at a loss of 5 for each player). What is the equilibrium of this game? Discuss if the entrant is better off with or without the ability to withdraw.

*In the game represented in Figure 15.1, the equilibrium has the monopolist accommodate and therefore has the entrant choose “In.” This question adds an option following Fight in which the entrant can withdraw at a loss of 1 rather than lose 5 by staying. Clearly, the entrant would choose to withdraw. But then, the monopolist would not choose to accommodate since accommodation yields the monopolist 5 while fighting (after the entrant withdraws) yields the monopolist 8. Knowing this, the entrant chooses to stay out in the first place. Thus, the entrant is not better off with the ability to withdraw. In the original game, it is the fact that the monopolist cannot drive the entrant out that gives the monopolist incentive to accommodate.*

# Chapter 16

## 16-1 Newspaper Bargaining

Two equal-sized newspapers have overlap circulation of 10% (10% of the subscribers subscribe to both newspapers). Advertisers are willing to pay $10 to advertise in one newspaper but only $19 to advertise in both, because they**’**re unwilling to pay twice to reach the same subscriber. What**’**s the likely bargaining negotiation outcome if the advertisers bargain by telling each newspaper that they**’**re going to reach agreement with the other newspaper, so the gains to reaching agreement are only $9? Suppose the two newspapers merge. What is the likely post-merger bargaining outcome?

*The Nash bargaining outcome tells us that parties split the gains from agreement.  Pre-merger, each newspaper splits the gains to agreement, which are $9.  So each newspaper receives $4.50.  After the merger, the newspapers bargain together and split $19.  So the merged newspaper gets $9.50, an increase of $0.50.*

## 16-2 Airline Merger

American Airlines and British Airways are proposing to merge. If British pilots and American pilots are represented by different unions, how would this merger affect airline costs?

*After the merger, the airline could staff some flights with pilots from either union. That means that the disagreement value for management negotiating with any one union is higher. As a consequence, each union is in a worse negotiating position and we would expect salaries to fall thus reducing airline costs.*

## 16-3 House Closing

You**’**ve entered into a contract to purchase a new house, and the closing is scheduled for next week. It**’**s typical for some last-minute bargaining to occur at the closing table, where sellers often try to tack on extra fees. You have three options for the closing: (1) attend yourself, (2) send an attorney authorized to close only per the previously negotiated terms, or (3) pre-sign all the closing documents per the current terms and not attend the closing. Which of these would be most advantageous from a bargaining position?

*Attending the closing yourself would probably be the least attractive option. The sellers would know that you have the authority to bargain over terms of the deal. Sending the attorney would be a better option serving as your commitment that you would walk away from the deal unless it is closed per the current terms. Pre-signing the papers would likely be the best option, as it is the most credible commitment to your unwillingness to negotiate the terms (the sellers might believe that the attorney would have some bargaining authority; pre-signed papers with no personal representative leaves little ambiguity regarding your commitment).*

## 16-4 A City and Its Unions

Robert G. Flanders Jr., the state-appointed receiver for Central Falls, RI, said his city**’**s declaration of bankruptcy had proved invaluable in helping it cut costs. Before the city declared bankruptcy, he said, he had found it impossible to wring meaningful concessions out of the city**’**s unions and retirees who were being asked to give up roughly half of the pensions they had earned as the city ran out of cash. Why does bankruptcy give the city bargaining power against its unions?

*Remember that the alternatives to agreement determine the terms of agreement. Bankruptcy gives cities a much better alternative—they can abrogate pension obligations in bankruptcy—and this alternative allows them to gain a more favorable split of the proverbial pie, by extracting concessions from Unions. Cities without this outside option have a more difficult time extracting concessions from Unions. [*[*link*](http://managerialecon.blogspot.com/2012/04/bankruptcy-gives-cities-bargaining.html)*].*

## 16-5 Entering International Markets

Your pharmaceutical firm is seeking to open up new international markets by partnering with various local distributors. The different distributors within a country are stronger with different market segments (hospitals, retail pharmacies, etc.) but also have substantial overlap.

* 1. In Egypt, you calculate that the annual value created by one distributor is $60 million per year, but would be $80 million if two distributors carried your product line. How much of the value can you expect to capture?
  2. Argentina also has two distributors with values similar to those in Egypt, but both are run by the government. How does this affect the amount you could capture?
  3. In Argentina, if you do not reach an agreement with the government distributors, you can set up a less efficient Internet-based distribution system that would generate $20 million in value to you. How does this affect the amount you could capture?

1. *While two distributors allow you to reach more final customers, the marginal value of the second is less than the first. When negotiating with either, the assumption is that you already have the other. Therefore, they only add $20 million in value. In the non-strategic view, parties tend to split the value that they bring to the negotiation. In this case, this means that each distributor gets about $10 million and you get $60 million.*
2. *As before, the second distributor adds a smaller marginal value. However, since they are run by the government, you must negotiate with both simultaneously. It is both or none. Now the margin is $80 million and you split it, keeping $40 million.*
3. *Now your alternatives are contracting with the government or going alone. This raises your disagreement value from zero to $20 million. The marginal value of the government contract is now $80 million - $20 million or $60 million. You offer half, $30 million, and keep the remainder, $50 million. The Internet threat helps your bargaining position.*

## 16-6 PBMs

Pharmaceutical Benefits Managers or PBMs are intermediaries between upstream drug manufacturers and downstream insurance companies. They design formularies (list of drugs that insurance will cover) and negotiate prices with drug companies. PBMs want a wider variety of drugs available to their insured populations, but at low prices. Suppose that a PBM is negotiating with two nondrowsy allergy drugs, Claritin and Allegra, for inclusion on the formulary. The **“**value**”** or **“**surplus**”** created by including one nondrowsy allergy drug on the formulary is $100, but the value of including a second drug is only $30.

* 1. What**’**s the likely bargaining negotiation outcome if the PBM bargains by telling each drug company that they**’**re going to reach agreement with the other drug company?
  2. Now suppose the two drug companies merge. What is the likely post-merger bargaining outcome?

1. *The payoffs are $100 to the PBM, $15 to one drug company, and $15 to the other.*
2. *The payoffs are $65 to the PBM, $65 to the merged drug company.*

# Chapter 17

## 17-1 Global Expansion

You’re the manager of global opportunities for a U.S. Manufacturer, who is considering expanding sales into Asia. Your market research has identified the market potential in Malaysia, Philippines, and Singapore as described next:

Success Level **Malaysia Philippines Singapore**

Probability Units Probability Units Probability Units

**Big** 0.3 1,200,000 0.3 1,000,000 0.7 700,000

**Mediocre** 0.3 600,000 0.5 320,000 0.2 400,000

**Failure** 0.4 0 0.2 0 0.1 0

The product sells for $10 and has unit costs of $8.

If you can enter only one market, and the cost of entering the market (regardless of which market you select) is $250,000, should you enter one of these markets? If so, which one? If you enter, what is your expected profit?

*Yes, you should enter. The market you should enter is Singapore. The expected profit is $890,000.*

*Malaysia: Expected unit sales = 0.3\*1,200,000+0.3\*600,000+0.4\*0 = 540,000*

*Philippines: Expected unit sales = 0.3\*1,000,000+0.5\*320,000+0.2\*0 = 460,000*

*Singapore: Expected unit sales = 0.7\*700,000+0.2\*400,000+01\*0 = 570,000*

*Expected profit of entering Singapore: 570,000\*($10-$8) - $250,000 = $890,000*

## 17-2 Game Show Uncertainty

In the final round of a TV game show, contestants have a chance to increase their current winnings of $1 million dollars to $2 million dollars. If they are wrong, their prize is decreased to $500,000. The contestant thinks his guess will be right 50% of the time. Should he play? What is the lowest probability of a correct guess that would make playing profitable?

*You should play the game.*

*You have a 50% chance of winning $1 million dollars and a 50% chance of losing $500,000. ($1,000,000\*0.5 = 500,000). (0.5\*$1,000,000 + 0.5\*-$500,000) = $250,000*

*Alternative way to look at the problem: It costs $1 million to play; if you are right, you win $2 million, if you are wrong, you win $500,000. Expected value of playing is $1 million (0.5\*2000000 + 0.5\*500000) = $1,250,000 which is higher than the cost of playing*

*The minimum probability of a guess to make playing still profitable is 33.3%.*

*$1,000,000(x) + (-$500,000)(1-x) = 0*

*$1,000,000x -$500,000 + $500,000x = 0*

*$1,500,000x = $500,000*

*X = ($500,000/$1,500,000)*

*X = 1/3 = 33.3%*

## 17-3 Ad Agencies

To test the effectiveness of a two Web advertising agencies, you increase your ad purchase with agency A by 50% without changing your purchase through agency B. The referrals to your website from agency A increased by only 34% but the referrals from agency B fell by 21%. Why might the difference-in-difference estimate of the referrals per dollar through agency A be biased?

*To construct a "difference-in-difference" estimate of referrals per dollar, you measure the change in referrals from Agency A (+34%) relative to the control group of Agency B (less -21%), for an estimate per dollar of ((55%) change in referrals/(50%) change in dollars) or 1.1. However, in this case, there may be some “leakage” since customers may have seen both ads laced by both agencies. The referral may be the result of the cumulative views a customer sees from both agencies but the referral comes from the last ad seen.*

## 17-4 Disposing of Used Assets

Your company has a customer who is shutting down a production line, and it is your responsibility to dispose of the extrusion machine. The company could keep it in inventory for a possible future product and estimates that the reservation value is $250,000. Your dealings on the secondhand market lead you to believe that there is a 0.4 chance a random buyer will pay $300,000, a 0.25 chance the buyer will pay $350,000, a 0.1 chance the buyer will pay $400,000, and a 0.25 chance it will not sell. If you must commit to a posted price, what price maximizes profits?

|  |  |  |
| --- | --- | --- |
| Price | Prob. of sale | Expected profit |
| $400,000 | 10% | .1(400-250)=$15,000 |
| $350,000 | 35% | .35(350-250)=$35,000 |
| **$300,000** | **75%** | **.75(300-250)=$37,500** |

*A price of $300,000 yields the highest expected profit.*

## 17-5 Saint Petersburg Gambles

You are offered the following gamble based on coin flips. If the first heads occurs on the first flip, you get $2. If the first heads occurs on the second flip you get $4, and so on so that if the first head is on the Nth flip, you get $2N. The game continues until there is a heads. What is the expected value of this gamble? When offered, most people say they would only pay less than $10 to play this game. What are two reasons why people are willing to pay so much less than the expected value?

*In this case, the expected monetary value of this gamble is infinite;*

*(1/2)($2) + (1/4)($4) + (1/8)($8)…… = Σ (1/2N)(2N).*

*Individuals may be willing to pay so little for two reasons. 1) There may be diminishing utility to monetary winnings (you “value” $2 billion in winnings less than twice as much as $1 billion). 2) Individuals correctly deduce that the game will not actually pay off for high enough values. For example, for N>30 the actual probability is likely to be 0 not the 1/N claimed. After all, the one making the offer does not have the infinite dollars required to run the game.*

## 17-6 Hiring

The HR department is trying to fill a vacant position for a job with a small talent pool. Valid applications arrive every week or so, and the applicants all seem to bring different levels of expertise. For each applicant, the HR manager gathers information by trying to verify various claims on resumes, but some doubt about fit always lingers when a decision to hire or not is to be made.

* What are the Type I and II decision error costs?
* Which decision error is more likely to be discovered by the CEO?
* How does this affect the HR manager’s hiring decisions?

*There are two types of errors you can make when hiring applicants: Type I: you can hire a bad worker; or Type II: you can fail to hire a good worker. The Type I error is more likely to be recognized and discovered, so the HR manager will “shade” his decisions, to try to avoid hiring bad workers. This will likely cause him to commit more Type II errors, failing to hire good applicants.*

# Chapter 18

## 18-1 Effects of Collusion

You hold an auction among three bidders. You estimate that each bidder has a value of either $16 or $20 for the item, and you attach probabilities to each value of 50%. What is the expected price? If two of the three bidders collude, what is the price?

*There are eight possible value combinations for the three bidders, and each is equally likely. These are given in the first three columns of the table below. The fourth column (equal to the second highest value) is the resulting auction price without collusion. The expected price is (4/8)$16+(4/8)$20=$18.*

*Imagine that bidders 1 and 2 collude. They would be willing to bid up to the maximum of either of their values, but will not bid against each other. Effectively, the auctioneer faces two bidders represented in the right three columns of the table below. The only time the collusion impacts price is when the two colluding bidders have the two highest values ($20 and $20) and both are higher than the next highest value ($16). In this case, by not competing against each other, they drive the price down from $20 to $16. The expected price is (5/8)$16+(3/8)$20=$17.50*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Bidder 1* | *Bidder 2* | *Bidder 3* | *Price* |  | *Maximum of 1 and 2* | *Bidder 3 Value* | *Collusion Price* |
| *$16* | *$16* | *$16* | *$16* |  | *$16* | *$16* | *$16* |
| *$16* | *$16* | *$20* | *$16* |  | *$16* | *$20* | *$16* |
| *$16* | *$20* | *$16* | *$16* |  | *$20* | *$16* | *$16* |
| *$16* | *$20* | *$20* | *$20* |  | *$20* | *$20* | *$20* |
| *$20* | *$16* | *$16* | *$16* |  | *$20* | *$16* | *$16* |
| *$20* | *$16* | *$20* | *$20* |  | *$20* | *$20* | *$20* |
| *$20* | *$20* | *$16* | *$20* |  | *$20* | *$16* | *$16* |
| *$20* | *$20* | *$20* | *$20* |  | *$20* | *$20* | *$20* |

## 18-2 Reserve Prices

A reserve price is a minimum price set by the auctioneer. If no bidder is willing to pay the reserve price, the item is unsold at a profit of $0 for the auctioneer. If only one bidder values the item at or above the reserve price, that bidder pays the reserve price. An auctioneer faces two bidders, each with a value of either $30 or $80, with both values equally probable. What reserve price should the auctioneer set, and what is the expected revenue from auctioning the item with and without a reserve price?

*If bidders have values of either $30 or $80, a reserve price below $30 would have no effect (the bidders will always bid the price up to at least $30), and a reserve price between $30 and $80 makes little sense. Therefore, we need to compare the auction without a reserve price to one with an $80 reserve price. The table below shows the possible values and outcomes. Without a reserve price, the auction yields expected revenues of ($30+$30+$30+$80)/4=$42.50. With a reserve price, the auctioneer earns $80 whenever either bidder values the good at least $80, but does not sell if neither bidder does. The expected revenue is $80x3/4=$60.*

|  |  |  |  |
| --- | --- | --- | --- |
| *Bidder 1* | *Bidder 2* | *Price without Reserve* | *Price with $80 Reserve* |
| *$30* | *$30* | *$30* | *$0* |
| *$30* | *$80* | *$30* | *$80* |
| *$80* | *$30* | *$30* | *$80* |
| *$80* | *$80* | *$80* | *$80* |

## 18-3 Reserve Prices II

Consider the problem above, but now each bidder has a value of either $60 or $80. What reserve price should the auctioneer set, and what is the expected revenue from auctioning the item with and without a reserve price?

|  |  |  |  |
| --- | --- | --- | --- |
| *Bidder 1* | *Bidder 2* | *Price without Reserve* | *Price with $80 Reserve* |
| *$60* | *$60* | *$60* | *$0* |
| *$60* | *$80* | *$60* | *$80* |
| *$80* | *$60* | *$60* | *$80* |
| *$80* | *$80* | *$80* | *$80* |

*Without a reserve price, the expected revenue is ($60+$60+$60+$80)/4=$65. With a reserve price, the expected revenue is $80x3/4=$60. In this case, a reserve price is not desirable as the cost of no sale is too high relative to the higher price obtained when only one bidder values the good at $80.*

## 18-4 Asset Auctions in Sweden

In Sweden, firms that fail to meet their debt obligations are immediately auctioned off to the highest bidder. (There is no reorganization through Chapter 11 bankruptcy.) The current managers are often the high bidders for the company. Why?

*An auction for a company is often a common-value auction, where bidders have similar values for the company but do not have perfect information about its value. Current company managers are likely to have better information about the company than other bidders. This keeps other bidders out of the market (or unwilling to bid high) since outbidding existing managers is bad news: it indicates that they think the company is worth less than you do!*

## 18-5 Art Auctions

When a famous painting becomes available for sale, it is often known which museum or collector will be the likely winner. Yet, representatives of other museums that have no chance of winning are actively wooed by the auctioneer to attend anyway. Why?

*One of the maxims of the chapter is that “strong losing bidders lead to higher winning bids.” In fact, it is usually the bidder with the second-highest value who has the greatest impact on price. Even when the identity of the eventual winner is known, competition determines the price that the winner will pay.*

## 18-6 Contractor Bidding

Moe Green estimates the cost of future projects for a large contracting firm. Mr. Green uses precisely the same techniques to estimate the costs of every potential job, and formulates bids by adding a standard profit markup. For some companies to whom the firm offers its services, no competitors exist, so they are almost certain to get them as clients. For these jobs, Mr. Green finds that his cost estimates are right, on average. For jobs where competitors are also vying for the business, Mr. Green finds that they almost always end up costing more than he estimates. Why does this occur?

*This is precisely the winner’s curse. When no competition exists, Moe receives every job and his estimates can average out. The estimates that are a little high offset those that are a little low. When competition exists, Moe is more likely to win the jobs that he underestimates (since he will likely be the lowest-cost bidder) and is less likely to win the jobs that he overestimates (since a rival bidder likely bids less). Thus, the fact that he wins suggests that he likely underestimated the true cost of the job.*

# Chapter 19

## 19-1 Leasing Residuals

In the late 1990s, car leasing was very popular in the United States. A customer would lease a car from the manufacturer for a set term, usually two years, and then have the option of keeping the car. If the customer decided to keep the car, the customer would pay a price to the manufacturer, the **“**residual value,**”** computed as 60% of the new car price. The manufacturer would then sell the returned cars at auction. In 1999, the manufacturer lost an average of $480 on each returned car (the auction price was, on average, $480 less than the residual value).

1. Why was the manufacturer losing money on this program?
2. What should the manufacturer do to stop losing money?
   1. *Adverse selection [not necessary to use the jargon]. Customers are keeping the good cars (those worth more than the residual value) and returning the bad cars (those worth less than the residual value).*
   2. *Set a more accurate residual value. The company hired an appraiser to set the residual value two weeks before the car was returned. By setting a more accurate residual value (closer to the car’s value), most consumers were indifferent between returning and keeping their cars. The value of the returned cars was very close to the auction price.*

## 19-2 College Degrees Required for Police Officers

Many police officer positions require the applicant to have a college degree even though the tasks of a police officer rarely call upon college course material. Why don**’**t police departments increase their applicant pool by dropping this requirement?

*The college degree may serve as a screening device. Police departments make considerable investments in officers and so want to avoid high turnover. The college degree requirement means that applicants will have to make a considerable investment before being considered. This eliminates casual applicants who may not be committed to policing as a career.*

## 19-3 Bicycle Insurance and Information Asymmetry

You sell bicycle theft insurance. If bicycle owners do not know whether they are high- or low-risk consumers, is there an adverse selection problem?

*No. Since consumers are all willing to purchase insurance at some average price, say $35, the insurance company can offer a single policy to all consumers, and they will all purchase. There is no information asymmetry in this case, so the problem disappears.*

## 19-4 Job Auction

When China reformed state-owned enterprises, it tried a new approach to choosing managers: it put managerial jobs up for auction. The bids for the jobs consisted of promises of future profit streams that the managers would generate and then deliver to the state. In cases where the incumbent manager was the winning bidder, firm productivity tended to increase dramatically. When outside bidders won, there was little productivity improvement. If incumbent managers were not generally more qualified, how can you explain this result?

*Adverse selection: Outside bidders will win only when the informed bidders (incumbent managers) think the job is not worth very much. Thus winning is really bad news. This is analogous to the winner’s curse—in fact the winner’s curse can be thought of as a type of adverse selection.*

## 19-5 “Soft Selling” and Adverse Selection

Soft selling occurs when a buyer is skeptical of the usefulness of a product and the seller offers to set a price that depends on realized value. For example, suppose you**’**re trying to sell a company a new accounting system that will reduce costs by 10%. Instead of naming a price, you offer to give them the product in exchange for 50% of their cost savings. Describe the information asymmetry, the adverse selection problem, and why soft selling is a successful signal.

*The seller of the product knows whether the product works; the buyer does not. The buyer is worried that the seller has an incentive to lie—to tell him that the product will reduce costs regardless of whether they will. The buyer “signals” the quality of his product by offering to be paid only if it works. A seller who knew his product didn’t work would not find it profitable to offer this kind of contract.*

## 19-6 Hiring Employees

You need to hire some new employees to staff your start-up venture. You know that potential employees are distributed throughout the population as follows, but you can**’**t distinguish among them:

Employee Value Probability

$50,000 0.25

$60,000 0.25

$70,000 0.25

$80,000 0.25

What is the expected value of five employees you hire?

*Expected value = $50,000*

*Without adverse selection, you would expect to hire an equal number of each type of employee and your expected value would be $65,000 (E(v) = .25(50,000) + .25(60,000) + .25(70,000) + .25(80,000) = $65,000)*

*But with adverse selection, you will not realize this value. If you initially assume an expected value of $65,000 and therefore offer that as your salary, only the $50,000 and $60,000 employees will accept. This drives your expected value down to $55,000. If you lower your offer to $55,000, only the $50,000 employees will accept.*

*The only reasonable offer you can make is $50,000.*

# Chapter 20

## 20-1 Extended Warranties

Your product fails about 2% of the time, on average. Some customers purchase the extended warranty you offer in which you will replace the product if it fails. Would you want to price the extended warranty at 2% of the product price? Discuss both moral hazard and adverse selection issues.

*Your product fails about 2% of the time but this probability rate is probably affected by user care. You could face adverse selection in that those who tend to use the product inappropriately are more likely to purchase. You could face moral hazard in that, once users know they are insured, they will tend to use the product less carefully. In either case, the claim rate will exceed 2% and you will lose money.*

## 20-2 Business Loan

A colleague tells you that he can get a business loan from the bank, but the rates seem very high for what your colleague considers a low risk loan.

1. Give an adverse selection explanation for this, and offer advice to your friend on how to solve the problem.
2. Give a moral hazard explanation for this, and offer advice to your friend on how to solve the problem.
3. *Consider two types of borrowers, ones likely to pay back loans and ones less likely to pay back. If the bank cannot tell them apart, the bank can only attract bad borrowers. Your friend must signal that he is a good borrower, and is likely to pay back the loan. To do this, he has to do something that a bad borrower would be unwilling to do, like pledge his personal property, or house, as collateral on the loan.*
4. *Once you have a loan, you are more likely to engage in risky behavior, and banks probably offer loans anticipating that you will engage in risky behavior. Your friend must show the bank that he is unlikely to engage in risky behavior. To do this, he can sign contracts limiting his behavior after getting the loan.*

## 20-3 Locator Beacons for Lost Hikers

Lightweight personal locator beacons are now available to hikers that make it easier for the Forest Service**’**s rescue teams to locate those lost or in trouble in the wilderness. How will this affect the costs that the Forest Service incurs?

*Without the locator beacons, hikers did not deviate much from well-worn paths in the deep woods for fear of getting stranded if injured. With the beacon, in the event that they are injured or just lost, they can signal the rangers to come rescue them. Knowing this, they tend to chance getting lost or injured in the back woods more often. Forest Service has ended up mounting more rescue operations that increase its costs.*

## 20-4 Auto Insurance

Suppose that every driver faces a 1% probability of an automobile accident every year. An accident will, on average, cost each driver $10,000. Suppose there are two types of individuals: those with $60,000 in the bank and those with $5,000 in the bank. Assume that individuals with $5,000 in the bank declare bankruptcy if they get in an accident. In bankruptcy, creditors receive only what individuals have in the bank. What is the actuarially fair price of insurance? What price are individuals with $5,000 in the bank willing to pay for the insurance? Will those with $5,000 in the bank voluntarily purchase insurance? What is the effect of state laws forcing individuals to purchase auto liability insurance?

*The actuarially fair price of insurance is 1% x $10,000=$100. Individuals with only $5,000 in the bank are only willing to pay 1% x $5,000=$50 for the insurance. They have fewer assets to protect, and therefore have lower demand for insurance. At the actuarially fair price of $100, they will not voluntarily purchase insurance.*

## 20-5 BPO Services

BPO Services is in the business of digitizing information from forms that are filled out by hand. In 2006, a big client gave BPO a distribution of the forms that it digitized in house last year, and BPO estimated how much it would cost to digitize each form.

FORM TYPE Mix of Forms Form Cost

A 25% $0.25

B 25% $0.10

C 25% $0.15

D 25% $0.50

1. Compute the average cost of digitizing a form.
2. The client agreed to pay the average cost computed in A for each form that BPO processed, but BPO lost money on the contract. How much did BPO lose, on average, for each form that it processed?
3. *$0.25*
4. *The client outsourced only Forms A and D (Average cost=$0.375, average loss=$0.125), and decided to digitize Forms B and C in house. BPO lost money on the contract by not anticipating moral hazard (post contractual change in behavior). [Note, some students may not anticipate that Form A would be outsourced, but the client’s costs are likely higher than BPO’s.]*

## 20-6 Frequent Flyers

Frequent flyer programs are targeted more toward business travelers (who do not pay for their own tickets) than leisure travelers (who do). Explain their effect on each type of traveler. Why is there a difference?

*A leisure traveler must weigh the benefits of flying on a preferred airline and receiving frequent flyer credit with the costs of the ticket. If another airline is sufficiently less expensive for a particular flight, the leisure traveler might decide that the frequent flyer benefits are not worth it. Conversely, a business traveler has only the benefits of being loyal to a single airline but not the costs, since the ticket price is not paid by the traveler. Therefore, the business traveler’s decision is an example of moral hazard. The flight decision is made comparing only airline frequent flyer benefits without regard for the ticket prices.*

# Chapter 21

## 21-1 Real Estate Agents

When real estate agents sell their own, rather than clients**’**, houses, they leave the houses on the market for a longer time (10 days longer on average) and wind up with better prices (2% higher on average). Why?

*This is a classic principal-agent conflict. Real estate agents are compensated with a percentage of the purchase price, typically three percent. Waiting longer for a better offer will result in a higher price, but the bulk of this additional gain goes to the owner of the house (97%), while the costs of additional selling effort fall on the real estate agent. When the real estate agent sells his own house, he gets all of the extra profit from waiting, so he waits longer.*

## 21-2 Airline Departures

Planes frequently push back from the gate on time, but then wait 2 feet away from the gate until it is time to queue up for take-off. This increases fuel consumption, and increases the time that passengers must sit in a cramped plane awaiting take-off. Why does this occur? What can be done to fix it?

*Consider the incentives of the pilots who decide whether to wait at the gate or 2 feet away from the gate. Pilot wages vary depending on whether the plane is parked at the gate or if the flight is “underway.” Holding pay for a representative airplane captain is about $20 per hour while flight pay, which starts once the plane pushes back from the gate, is $184 per hour. This represents a principal (airline)-agent (pilot) conflict. Another reason is to game on-time departure stats if they depend on pushback rather than takeoff.*

*Fixing the problem could involve changing decision rights or changing incentives. One solution would be to no longer allow the captain to decide when to push back. Alternatively, one could re-design the way the captain is paid.*

## 21-3 Incentive Conflicts

Which of the following are characteristic of principal-agent conflicts that often exist in a firm?

1. Managers do not always operate in the best interest of owners because owners are generally more risk averse than managers.
2. Managers generally have a shorter time horizon than owners; thus, managers do not fully take into account the future long-run profitability of the firm.
3. Managers do not always operate in the best interest of owners because managers care about the noncash benefits of their jobs.
4. Firms can usually find solutions that reduce agency costs without increasing monitoring or incentive costs.

*b. and c. are correct*

## 21-4 Public School Principals

Each year, public schools are rewarded with bigger budgets for achieving a rating of **“**excellent**”** or **“**recommended**”** and are punished for rating **“**needs improvement.**”** These ratings are based on meeting thresholds on a broad set of measures such as attendance rates, graduation rates, standardized test scores, SAT scores, and so on. Discuss the incentives for school principals (who are the agents, in this case) under this scheme and how you might improve them.

*The effect of stronger incentives to meet benchmarks is that principals now work harder to achieve these goals. Ideally, this would mean improving teaching methods so that students learn more. However, the predominant fear seems to be “teaching to the test” at the expense of actual learning. This is a bigger problem when benchmarks are poorer measures of actual learning. This scheme also incentivizes principals to alter the composition of the school’s students. Principals now have an incentive to avoid enrolling poor performing students and to seek out better performing students. The consequence may be that the poorer performing students become less well served.*

## 21-5 Venture Capital

Venture capital (VC) firms are pools of private capital that typically invest in small, fast-growing companies, which usually can**’**t raise funds through other means. In exchange for this financing, the VCs receive a share of the company**’**s equity, and the founders of the firm typically stay on and continue to manage the company.

1. Describe the nature of the incentive conflict between VCs and the managers, identifying the principal and the agent.
2. VC investments have two typical components: (1) managers maintain some ownership in the company and often earn additional equity if the company performs well; (2) VCs demand seats on the company**’**s board. Discuss how these two components help address the incentive conflict.
3. *The incentive conflict is between the venture capitalists (the principals) and the managers (agents). The VCs want the manager to take actions to increase firm value while the manager is more likely concerned with taking actions that increase personal well-being.*
4. *Manager ownership is a form of incentive compensation that helps align the incentives of the agent with the principal. As owners of the firm, managers become more concerned with taking actions that increase firm value. Board representation serves two functions. First, it is a form of monitoring where the VCs are able to watch managers’ actions more closely. Second, it centralizes decision-making authority for certain high-level decisions at the principal (VC) level.*

## 21-6 Meeting Milestones

A convenience store manager earns a base salary plus small bonuses for each of ten different possible monthly milestones he meets. Typical managers can meet half of these milestones. Do they miss the others by a little or a lot?

*For any one task, there is a lump-sum payment upon completion. Accomplishing 99% of the task has the same reward as accomplishing 1%. But accomplishing each task might take effort away from other tasks. The manager earns no bonus for accomplishing 50% of all milestones but earns multiple bonuses from fully meeting the milestones on 50% of the tasks. They have an incentive to ignore some tasks so as to assure that that would complete others. On the ignored tasks, they will miss by a lot. (Also, for the tasks they complete, they should not waste their time by greatly exceeding the goal.)*

# Chapter 22

## 22-1 Transfer Pricing

Suppose that a paper mill **“**feeds**”** a downstream box mill. For the downstream mill, the marginal profitability of producing boxes declines with volume. For example, the first unit of boxes increases earnings by $10, the second $9, the third $8, and so on, until the tenth unit increases profit by just $1. The cost the upstream mill incurs for producing enough paper to make one unit of boxes is $3.50.

1. If the two companies are separate profit centers, and the upstream paper mill sets a single transfer price (the price the box company pays the paper mill), what price will it set, and how much money will the company make?
2. If the paper mill were forced to transfer at marginal cost, how much money would the company make?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Price*** | ***Quantity*** | ***Revenue*** | ***MR*** | ***MC*** | ***Profit*** |
| *10* | *1* | *10* | *10* | *3.5* | *6.50* |
| *9* | *2* | *18* | *8* | *3.5* | *11.00* |
| *8* | *3* | *24* | *6* | *3.5* | *13.50* |
| *7* | *4* | *28* | *4* | *3.5* | *14.00* |
| *6* | *5* | *30* | *2* | *3.5* | *12.50* |
| *5* | *6* | *30* | *0* | *3.5* | *9.00* |
| *4* | *7* | *28* | *-2* | *3.5* | *3.50* |
| *3* | *8* | *24* | *-4* | *3.5* | *-4.00* |
| *2* | *9* | *18* | *-6* | *3.5* | *-13.50* |
| *1* | *10* | *10* | *-8* | *3.5* | *-25.00* |

*[note that the marginal profitability of boxes represents the price that the box division would be willing to pay the paper division for boxes; this allows the creation of the above chart from the paper division perspective; paper division will set price where MR>MC]*

*The upstream paper mill will price at $7, sell four units and earn $14. Company-wide profits are (10+9+8+7)-4\*3.50 = 34-14 =20.*

*If the upstream firm transfers at marginal cost, then the downstream box plant will consume seven units, and company-wide profit is (10+9+8+7+6+5+4)-7\*3.50 = 49-24.50 = 24.50.*

## 22-2 Transfer Prices Set by Headquarters

List three reasons why might it be a bad idea to have corporate headquarters set transfer prices.

*Three reasons why it may be a bad idea:*

* *Corporate managers may not have good information about the best transfer price.*
* *It may lead division managers to provide misinformation about costs related to the transfer price.*
* *It distracts corporate managers from concentrating on larger problems.*
* *(could also mention costs associated with division managers lobbying HQ for favorable transfer price)*

## 22-3 Chargebacks

Your local fast food chain with two dozen stores uses the company**’**s internal corporate marketing department to produce signage, print ads, in-store displays, and so forth. When placing an order, store managers are assessed a chargeback (transfer price) that reduces store profitability but increases marketing department profitability. Lately, the store managers have been ordering more and more marketing services; the marketing department is swamped, and it cannot afford to hire more staff. What does this indicate about the chargeback rates?

*“Customers” of the marketing department want to "buy" ever more services at the current transfer price. This indicates the transfer price is below the alternative, ordering these services from outside from an outside vender. This might be OK because the optimal transfer price equals the marginal cost, which could be below the market price if there is a margin in place. Yet, the additional transfers to the marketing department are not sufficient to cover the additional costs of fulfilling the orders. This indicates that the transfer price is set below the marginal cost in the marketing department. The transfer price is too low.*

## 22-4 Divisional Profit Measure

Discuss the advantages and disadvantages of using divisional profit as the basis of incentive compensation for division managers compared to using company profit as the basis.

* *Divisional profit – focuses division managers on divisional performance (advantage) but perhaps at the expense of overall company performance (disadvantage)*
* *Company profit – focuses division managers on overall corporate performance (advantage) but exposes them to a lot of uncontrollable risk, for which they must be compensated (disadvantage); also may lead to some free-riding (disadvantage)*

## 22-5 Furniture Forecasting

Futura Furniture Products manufactures upscale office furniture for the **“**Office of the Future.**”** The sales division comprises regionally based sales offices made up of sales representatives and regional managers. Sales representatives**—**who report to the regional managers**—**conduct direct sales efforts with customers in their regions. As part of the sales process, representatives gather information about likely future orders and convey that information back to the regional managers. Regional managers use that information to create sales forecasts, which are then used as the basis for manufacturing schedules. Sales representatives and regional managers are both compensated on a salary plus commission (percentage of revenue as pricing is centrally controlled). However, a regional manager**’**s commission is adjusted based on regional sales that exceed the forecasted budget. Corporate managers are concerned with one of Futura**’**s key products, the **“**DeskPod.**”** They worry that DeskPod forecasts are inaccurate, causing extreme havoc in the manufacturing process. How are the forecasts likely to be inaccurate? What do you think is driving this inaccuracy? How might this problem be solved?

*Sales forecasts are most likely understated. This is driven by the compensation structure of the regional managers, who are compensated for exceeding budget. Their incentive is to understate forecasts to ensure they can exceed budget.*

*A number of solutions are possible. The compensation scheme could be changed so regional sales managers are not paid simply for exceeding budget (institute compensation without kinks). Information could be transferred to corporate managers to allow them to set budgets. Finally, part of the sales managers’ compensation could be based on the accuracy of forecasts.*

## 22-6 Jet Turbine Design

This problem is mentioned in the text (see the section on “Organizational Alternatives”). Your task is to propose an organizational solution. To briefly recap, a manufacturer is trying to design the next generation of turbine engines for jet airplanes. The company is divided along functional lines. Engineering designs the engine, production manufactures it, and finance figures out how much to charge for it. The engineers invented a radical new design that used hollow fan blades. The award-winning design used less fuel than conventional engines, but the hollow fan blades were very difficult to build. When the Finance Division computed the marginal cost of an engine, it discovered that the new engines were much more expensive than rival engines, even accounting for the expected fuel savings. No one purchased the engine. How would you make sure that this problem does not recur?

*Use the three questions:*

* *The problem is that engineering made a poor decision to build hollow fan blades.*
* *They had information about the feasibility of different types of designs.*
* *They were not compensated based on whether designs were profitable to build.*

*The firm changed its organizational architecture to:*

* *Reorganize the firms around the process of creating a new turbine engine. This meant replacing the functional divisions with a turbine division that included engineers, manufacturing; and finance capability.*
* *Compensate the turbine division according to the profitability of engine sales.*
* *Evaluate individuals according to their contribution to division profitability.*

# Chapter 23

## 23-1 Local Phone Companies

State utility commissions typically regulate local phone companies, but local phone companies also offer long-distance service to their customers. Rival long-distance carriers also connect to local phone lines to provide long-distance service to customers. Recently, the rival long-distance carriers have complained that the local phone company repair persons have put peanut butter on rival long-distance carriers’ phone lines to encourage rats to eat through the lines. If true, why is this a profitable strategy?

*If the local phone company can exclude rival long distance carriers from the market, it can evade local phone regulation by charging more for long distance service. This allows it to realize some of the profit in long distance that it could have earned on local service, but for the regulated local phone rates.*

## 23-2 Integration of Physician Groups and Testing Services

Under a proposed healthcare reform, doctors’ fees will be capped at 80% of their current rate, but doctors can order blood tests that will be reimbursed at 90% of the current rate. How does vertical integration of physician groups into testing services increase profits?

*With different reimbursement rates, doctors can cross-subsidize the more severe regulation of their fees with less severely regulated testing services. Vertically integration into testing services facilitates this strategy.*

## 23-3 Online Cosmetics

Australian cosmetics maker, Eternal Beauty Products, pressures online retailers to either sell goods at prices charged by brick and mortar stores or risk being cutoff. If online retailers are paying the same wholesale prices, why would Eternal not want online retailers to charge lower prices?

*Cosmetic sales benefit from point-of-sales services for a customer to determine the best product for her and how to apply it most effectively. Brick & mortar stores offer these services and set retail prices high enough over wholesale prices to cover these costs. Online retailers do not and so prefer lower prices that do not cover these costs. However, if they did, customers would get the point-of-sale services from brick & mortar stores and make purchases online. If this happened, it would undermine the delivery of the point-of-sale services by the brick & mortar stores.*

## 23-4 Wedding Dresses

Stores that sell wedding dresses do not typically permit photos, and do not have tags in the dresses that would identify the manufacturer and style type. What is the purpose of these rules? Suggest one other way of accomplishing the same objective.

*These*[*retail stores want to prevent customers*](http://www.bridaltweet.com/forum/topics/do-you-allow-brides-to-take?page=1&commentId=3145964%3AComment%3A288027&x=1#3145964Comment288027) *from "free riding" on their fitting and display services.  Here is an example of such free riding:*

*“I just spoke with someone who had all her bridesmaids sized in the store only to go online and buy them from a discount site. I would assume many of the brides are doing this as well.”*

## 23-5 Herbicide Integration

Suppose the herbicide manufacturer mentioned in the chapter can vertically integrate only into home gardening retailing. Would this allow the manufacturer to price discriminate?

*Enter the low value business, farming. To see why this allows price discrimination, consider the alternative, entering the high value business of home gardening. If you continue to sell 200 liter barrels to a rival downstream retailer of farming pesticide for $3/liter, what would prevent the farming retailer from trying to enter the home gardening business and undercut your $5/liter price?*

## 23-6 Loyalty Payments

Intel made large loyalty payments to HP in exchange for HP buying most of their chips from Intel instead of rival AMD. AMD sued Intel under the antitrust laws, and Intel settled the case by paying $1.25 billion to AMD. What incentive conflict was being controlled by these loyalty payments? What advice did Intel ignore when they adopted this practice?

*If you have some significant market power, consider the effect on competitors of any planned action. If the planned action is likely to hurt your competitors badly, be sure that such harm is a byproduct of moves that have a sound business justification.*

*[extra credit if they get the reason why] In this case, even though Intel had some justifications for the loyalty payments, the loyalty payments also reduced demand for AMD chips, which drove them up their average cost curve (chip manufacturers exhibit economies of scale) which made it difficult for them to compete.*