Homework 1
Managerial Economics
MBA, NCCU

1. In each of the following instances, discuss whether horizontal or vertical boundaries have been changed, and whether they were extended or shrunk.

(A) Taiwanese hardware maker Acer, the world's second largest PC manufacturer, has just joined the ranks of the sky-high elite, purchasing Silicon Valley-based iGware for $320 million. Acer's acquisition of the little-known cloud computing firm will reportedly allow it to launch a cloud product next year, and is seen as a long-term strategic move for the tech giant.

(B) HTC Corporation, a global designer of mobile phones and devices, announced the acquisition of all outstanding shares of S3 Graphics Co., Ltd. (“S3 Graphics”) for an aggregate consideration of US$300 million, payable in cash. The acquisition strengthens HTC’s technology leadership and extends its IP portfolio with the addition of 235 patents and the pending applications, including those related to graphics visualization technologies.

2. In 1998, the value of worldwide sales of recorded music in the form of singles, music cassettes, and CDs was $38.7 billion. Americans bought 3.1 CDs and 0.6 music cassette per capita, while Mexicans bought 0.5 CD and 0.3 music cassette per capita.

(A) Explain why per capita CD sales were relatively higher while per capita sales of music cassettes were relatively lower in the United States than in Mexico.

(B) On a suitable diagram, draw the U.S. demand for music CDs. Explain how the following changes would affect the demand curve: (i) increase in the price of CDs; (ii) rise in the ownership of CD players; and (iii) fall in the price of music cassettes.

(C) On another diagram, draw the demand for music CDs in Mexico. Explain how the following changes would affect the demand curve: (i) fall in advertising by music publishers such as Sony and Time Warner; (ii) reduction in the penalty for copyright infringement; and (iii) increase in the price of hamburgers.
3. The price of Chanel perfume is around $150 per fluid ounce, while the price of bottled water is $1 per gallon. Tiffany buys 2 fluid ounces of Chanel and 10 gallons of bottled water a month.

(A). Using relevant demand curves, illustrate Tiffany's choices. Illustrate how the following changes will affect Tiffany's demand for Chanel perfume: (i) price decreases to $140 per fluid ounce, and (ii) increase in price of another of Tiffany's favorite perfumes.

(B). Tiffany spends more money each month on perfume than bottled water. Does this necessarily mean that water gives her less total benefit than perfume? Use appropriate demand curves to address this question.

4. Suppose that a typical household's demand for long-distance call is represented by the equation

\[ D = 200 - 4p + 0.4Y, \]

where \( D \) is the quantity demanded in minutes a month, \( p \) is the price of calls in cents per minute, and \( Y \) is the household's income in thousands of dollars a year. Assume that \( Y=200 \).

(A) Draw the household's demand curve.

(B) How many minutes will the household buy at the price of 25 cents a minute?

(C) What is the maximum lump sum that a long-distance carrier can charge the household for a package of 140 minutes of calls?

(D) How can the long-distance carrier charge the household when it uses the two-part pricing method instead of package deal?

5. Barrick Gold owns the Bulyanhulu mine in Tanzania and the Karlgoolie mine in Australia. Table 1 reports information on selling prices and costs for the two mines. Barrick’s selling price of gold differs from the spot price as some production is sold through long-term contract and also owing to the company’s use of hedging. The “average cash cost”(average variable cost) includes operating cost, royalties, and taxes, while the “average cost” includes the cash cost as well as amortization.

(A) Suppose that the Bulyanhulu mine always produces at the scale where its marginal cost equals the selling price of gold. Its marginal cost curve, however, shifts with changes in electricity prices, wages, and other factors. Using the data from table 1, illustrate the shifts in Bulyanhulu’s marginal cost curve, the selling price, and profit-maximizing scale of production between 2002 and 2004.
In 2003, Barrick continued to produce from the Bulyanhulu mine even though the selling price of gold, $366 per ounce, was less than its average production cost of $369 per ounce. Was this a mistake?

Use Barrick’s 2004 data to compare the (i) short-run break even conditions for Bulyanhulu and Karlgoolie; and (ii) the long-run break even conditions for the two mines.

Table 1: Barrick Gold

<table>
<thead>
<tr>
<th></th>
<th>Bulyanhulu</th>
<th>Karlgoolie</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2002</td>
<td>2003</td>
</tr>
<tr>
<td>Production (thousand ounces)</td>
<td>356</td>
<td>314</td>
</tr>
<tr>
<td>Selling price ($ per ounce)</td>
<td>339</td>
<td>366</td>
</tr>
<tr>
<td>Average cash cost ($ per ounce)</td>
<td>198</td>
<td>246</td>
</tr>
<tr>
<td>Average cost ($ per ounce)</td>
<td>300</td>
<td>369</td>
</tr>
</tbody>
</table>

Source: Barrick Gold Corporation, Annual Reports

In January 2005, the world’s total supply of oil tankers amounted to 304.1 million deadweight tons (dwt). During 2005, 28.0 million dwt of new tankers were delivered into service, while 5.1 million dwt were scrapped or otherwise removed from service. Hence, at the end of the year, the world’s total supply was 326.9 million dwt. Among tankers and chemical carriers in operation of 200,000 dwt or larger, 60% by tonnage was less than 10 years old, 37% was 10–20 years old, and the remainder was more than 20 years old. (Source: Platou Report, 2006.) Typically, older tankers are more costly to operate.

(A). Identify the following as either a short- or long-run decision: (i) lay-up (idling the vessel); (ii) scrapping.

(B). Explain how the owner of a tanker should decide whether to continue to operate, lay-up, or scrap a vessel.

(C). The marginal cost of keeping a tanker in service (“lay-up equivalent”) is the tanker’s operating cost minus the cost of lay-up. When tanker rates fall, identify which tanker owners would first lay up.

(A) Using suitable diagrams, explain how each of the following would affect the market for tanker services: (i) a fall in oil prices; (ii) an increase in production by OPEC and the former Soviet Union; (iii) new tanker deliveries; and (iv) scrappage of older vessels.

(B) Suppose that the net effect is to increase tanker rates. Illustrate the net effect on a single diagram. Explain the impact on the quantity of tanker services used.

(C) In actuality, oil prices increased by 25% between 2003 and 2004 and OPEC and the former Soviet Union production increased by about 10%. Modify your analyses in (A) for these changes.

8. In 2002, Iraq’s Kirkuk region exported 0.5–0.8 million barrels of crude oil per day (mpd) by pipeline to the Turkish port of Ceyhan. Following the U.S.-led coalition attack against Iraq, the pipeline was sabotaged and Kirkuk oil exports were disrupted. Refineries in western Europe switched to buying oil from the Urals in Russia, which produce oil that is chemically similar to Kirkuk. Urals oil is shipped to western Europe by tanker from the Black Sea through the Bosporus and Dardanelles. However, by early 2004, the surge in European demand and congestion in the Bosporus and Dardanelles had lifted spot tanker rates to €39,000 per day (Source: “Bosporus Tanker Congestion Threatens Shortage of Oil,” Financial Times, January 12, 2004).

(A) Using suitable demand and supply curves, illustrate the short-run effects of pipeline disruption on the tanker services market.

(B) Using your diagram for (A), illustrate the long-run effects of the pipeline disruption.

(C) When political conditions in Iraq are restored to normal, exports by pipeline will resume, and the demand for tanker services will fall. With lower charter rates, the owner of a tanker must decide whether to continue operating, temporarily lay up, or scrap the vessel. Explain how the owner should choose among these alternatives.
9. Typical real-estate broker: "In California, the seller always pays the broker's commission, so, buyers get brokerage services free."

    MBA: "If the custom were for the buyer to pay the commission, then would sellers get brokerage services free?"

    Real-estate broker, clearly losing patience: "That is a purely hypothetical scenario, but if that situation were to arise, yes, I guess you're right."

(A) Assume that each seller pays a brokers' commission of $18,000. Then, the supply of houses includes the cost of brokerage. Illustrate the market equilibrium with a price of $310,000 per house and sale of 200,000 houses a year.

(B) Now suppose that buyers rather than sellers pay the $18,000 commission. Using your figure, illustrate the following: (i) shift the supply curve down by $18,000 since sellers do not pay the commission, and (ii) shift the demand curve down by $18,000 since buyers now pay the commission.

(C) Compare the market equilibria of (A) and (B) in terms of (i) the net price received by sellers, and (ii) the net price paid by buyers. (Net prices are net of brokerage commission, if any).

10. E-commerce is predicted to reduce the cost of intermediary services such as those of travel agencies, real-estate brokers, and investment advisors. Consider the market for air travel. Suppose that, with conventional travel agencies, the market equilibrium price is $300 per ticket, including a $15 intermediation cost. The quantity bought is 2 million tickets a year. With e-commerce, however, the intermediation cost falls to $2 per ticket.

(A) Using suitable demand and supply curves, illustrate the original equilibrium with conventional travel agencies. Represent the intermediation cost by shifting the supply curve.

(B) Illustrate the new equilibrium with e-commerce.

(C) What factors determine the extent to which consumers will benefit from e-commerce? Explain your answer with demand and supply curves.