Indian Institute of Technology, Patna

HS201 - Micro Economics

MID SEMESTER EXAMINATION
FALL 2020

INSTRUCTIONS TO CANDIDATES

a) This is an **open book** examination.
b) Write your **name and roll number on the answer sheet**
c) The question paper comprises 3 pages
d) Answer all questions. Upload your handwritten answers showing all steps and diagrams wherever necessary.
e) All questions have equal weight.
f) You will have to put your digital signature against the declaration below. Papers without the signatures will not be checked.

I, ……Tanishq Malu…… declare that I have not resorted to any unfair means in answering this paper. If found otherwise, I agree that my paper will be cancelled.

Name: Tanishq Malu **Signature:** 

This portion is for examiner's use only

	Marks	Remarks
1		
2		
3		
4		
Total		

1. Between 2008 and 2009, average circulation of U.S. newspapers fell by 7%. The *New York Times* suffered a relatively smaller decline, with weekday circulation falling 3.6% to 1,039,031. The *Times* announced a quarterly loss of $74 million with circulation revenue increase slightly due to a price increase in 2008 from $1.25 to $1.50. In early May 2009, it was reported that the *Times* would raise its weekday price from $1.50 to $2 and that the price increase would increase revenue by $40 million. (Source: "New York Times set to increase price", *Financial Times*, May 2, 2009). **10 marks**

a. Using the 2008 price and circulation information, calculate the price-elasticity of demand for the *New York Times* weekday edition.

b. At the current circulation of say 1.04 million and price of $1.50, and assuming 300 weekdays a year, what is the New York Times' current annual revenue from weekday sales?

c. Consider the expected 2009 price increase from $1.50 to $2. What is the percentage change in price?

d. Suppose that the expected 2009 price increase from $1.50 to $2 does indeed yield $40 million in incremental revenue. What is the percentage change in revenue over your answer in (b)?

e. Substitute the percentage changes from (c) and (d) into the following rule: percentage change in revenue = percentage change in price + (price-elasticity of demand x percentage change in price). (Note that this rule was not taught in the lecture on elasticity.) Calculate the price-elasticity of demand which would imply the $40 million increase in revenue.

f. Compare the elasticity from (e) at a price of $1.50 with the elasticity from (a) at a price of $1.25. Does the difference in elasticities seem reasonable?

2. In late 2005, software giant Microsoft announced that it would increase R&D spending by $2.6 billion the following year. Wall Street analysts worried that the increased investment would reduce earnings and shareholder return. However, Microsoft CEO Steve Ballmer suggested that Microsoft had delayed the update of Windows too long. "Windows is a product that has to be watered periodically … We've gone a bigger gap than I'd like to go [this time]" (Source: "Ballmer lobbies for Microsoft's R&D spending plan", *Computerworld*, January 6, 2006). **5 marks**

a. Referring to Table 8.6, calculate Microsoft's R&D-sales ratio for 2003-05.

Table 8.6 Microsoft ($ million)

Year	Sales (Revenue)	R&D Expenditure	R&D/Sales
2005	39,788	6,184	15.5%
2004	36,835	7,779	21.1%
2003	32,187	6,595	20.5%

b. If Microsoft predicted sales revenue to be the same in 2006 as 2005, with the increase in R&D spending, what would the R&D-sales ratio? Comment on this ratio in relation to previous years.

c. Relate Microsoft's plan to increase R&D expenditure to Mr Ballmer's remark that they had waited too long before updating Windows.

d. Did Microsoft under- or over-estimate the sensitivity of the demand for Windows to updating?

3. The administration of Prime Minister Lee Hsien Loong seeks to "re-make" Singapore as a travel destination. It has invited tenders for two integrated resorts, including casinos. One will be located in Marina South to attract the meetings and convention business, while the other will be located in Sentosa Island to attract tourists. Typically, Australian governments have auctioned casino licenses for a lump-sum fee. By contrast, European governments have charged casinos a gambling tax. **10 marks**

(a) Suppose that a lump sum fee of $100 million per year and a 25% betting tax would raise the same revenue for the government. Suppose that the casino applies uniform pricing and that marginal cost of operation is constant at $1 per bet. Compare the two policies in terms of (i) the price of betting, and (ii) the volume of betting.

(b) Would you recommend that the government use the lump-sum license fee or the betting tax?

(c) Whales are people who travel worldwide to gamble on a large scale. Casinos compete to attract whales with special facilities, free air travel and accommodation, and other perks. How should casinos adjust the odds to whales relative to small-scale gamblers?

ANSWERS

Q1 ans

(a) For New-York Times weekday edition

% change in quantity demanded = -3.6 %

% change in price = $\frac{1.5 - 1.25}{1.25}$ = 20%

Price elasticity = $\frac{\Delta Q}{\Delta P}$ = $\frac{-3.6}{20}$ = -0.18

ans => -0.18

(b) circulation = 1.04 million

Price = $1.50

No. of days = 300

Annual revenue = (1.04 x 1.50 x 300)

= $ 468 million

ans => $468 million

(c) Price increase in 2009 => $1.5 to $2

% change = $\frac{\text{Final price} - \text{initial price}}{\text{initial price}} \times 100$

= $\frac{2 - 1.5}{1.5} \times 100$ = 33.33%

ans => 33.33%

(d) Percentage change in revenue = $\frac{\$ 40 \text{ million}}{\$ 468 \text{ million}} \times 100$

ans = 8.547 %

(e) % change in revenue = percentage change in price + (price-elasticity of demand x percentage change in price)

(Let price-elasticity = x)

$$= 33.33 + (33.33 \times x)$$

$$8.547 = 33.33 \times (1 + x)$$

x = price-elasticity of demand = -0.74

(f) price-elasticity at 1.5 = -0.74

at 1.25 = -0.18

There is a reasonable difference in price elasticity however both are inelastic.

Q2

Ans In 2003,

R & D expenditure = $ 6595 million

R & D sales = $ 32187 million

$$\text{Ratio} = \frac{6595}{32187} = 0.205$$

In 2004,

R & D expenditure = $ 7779 million

Saless = $ 36835 million

$$\text{Ratio} = \frac{7779}{36835} = 0.211$$

In 2005,

R&D expenditure = $ 6184 million

Sales = $ 39788 million

$$\text{Ratio} = \frac{6184}{39788} = 0.155$$

Now R&D - sales ratio for 2003 - 2005 is

$$\frac{6184 + 7779 + 6595}{39788 + 36835 + 32187} = \frac{20558}{108810} \times 100 = 18.89\%$$

(b) Expected sales in 2006 = Sales in 2005

= $ 39788 million

Expenditure in 2006 = Expenditure in 2005 + $ 2.6 billion

= 6184 + 2600 million $

= $ 8784 million

$$\text{Ratio} = \frac{8784}{39788} = 0.22$$

The ratio is greater than previous 3 years.

(c) Microsoft envisioned the long term view for company's success. The ever-growing competition in market with Apple launching the powerpc intel in Chips, in 2006 required increased R&D from Microsoft.

There was no major development in Windows xp 2003, which Steve Ballmer clearly highlighted in his remark.

Increasing the R&D expenditure by $2.6 billion, Microsoft was getting ready for its next update (Windows Vista, launched in 2007).

Ballmer, in his speech to analysts at Bernstein's strategic decision conference, pointed out company's huge cash balance and previous experience to clarify Wall streets economic apprehensions.

Mr Ballmer, thus set the company's goal for long run and invested heavily in R&D to cope with the market's competition and ensuring greater returns in future.

(d) Inspite of the economic apprehensions; of the analysts of Wall street, of lower earnings and lessers return; Company did not hesitate to increase its R&D expenditure byalmost 40% (2.6 billion$)

It clearly tells us that microsoft over estimated the sensitivity of the demand. Based on the remark and decision of Mr. Ballmer it can be reasonably assumed that company was excessively confident about consumer response towards its newer product version despite warnings from wall streets

Q3

a (i) Price of betting

betting tax ⇒ 25% on bets

lump-sum fee ⇒ 100 million dollar

Since, given, both policies will generate $100 million.

lump-sum fee:- Since the tax would be paid at the beginning only there would be a pressure to recover this amount so the price of bet needs to be kept higher but the consumer turnout will influence this decison

Betting tax :- 25% on bets will be used to generate $400 mn so as to pay $100 mn tax. So prices can be kept high in accordance to huge tax, also seasonal changes in cost can be done easily and once the 400mn mark is reached more profit and revenue can be earned both by casino and gov.

Price in betting tax will be higher to ensure earning $400mn instead of lump sum fee where crossing 100mn mark would be easier.

Volume of betting

Betting tax ⇒ No pressure of volume of betting as such as they are liable to pay 25% of what they earn. Discounts and other strategies can be used to attract more customers

lump-sum fee ⇒ Recovering the $100 mn would result in extra pressure to attract customer to cross certain threshold amount.

In both cases volume of betting would be very much dependent on marketing strategies and price of betting.

(P.T.O.)

3. b I would suggest betting tax to be more favorable keeping the demands and needs of both gov. and casinos.

In the off-season when casino business is usually, tax on basis of income earned will be more comfortable to casinos while if the business goes very well, the revenue earned from tax will also increase for the government. In fact lump sum fee puts an additional burden to recover the amount.

Lump-sum fee may sound more revenue earning at the beginning but betting tax would be comfortable and beneficial for both gov. and casino owner

3. C Whales are the major source of income for casinos. Whales lose big amount of money and hence provide significant revenue To casino while winning huge chunk of money bring them into limelight and act as a source of worldwide advertising. Thus casinos definitely try hard to ensure their regular visits at casinos.

Casino managers develop strategies to maintain a proper win-lose ratio with whales to ensure adequate interest and maintain transparency in the games

Strategies like :- free hotel stays, trips and other perks like host of the event etc.

Casino should form proper strategy as per the attitude and gaming style of individual whale to earn higher revenues.

The END