



University of Toronto, Department of Economics, ECO 204 2009 - 2010. Ajaz Hussain
Test 1

FILL OUT INFORMATION AS IT APPEARS IN ROSI

LAST NAME:	FIRST NAME:
MIDDLE NAME:	U TORONTO ID #:
SIGNATURE:	

SCORES

Question	Points	Score
1	20	
2	10	
3	25	
4	45	
Bonus Question	5	
TOTAL SCORE OUT OF 100		

YOU MUST STAY SEATED DURING THE LAST 10 MINUTES OF THE TEST -- WAIT UNTIL ALL TESTS ARE COLLECTED

ALL PARTS ARE WORTH 5 POINTS. ONLY AID ALLOWED: A CALCULATOR.

FOR YOUR CONVENIENCE, THERE IS A WORKSHEET AT THE END OF THIS TEST

KEEP ANSWERS BRIEF. TO EARN CREDIT, SHOW CALCULATIONS AND GIVE ARGUMENTS TO SUPPORT YOUR ANSWERS

Good luck!

Question 1

Please answer the questions following this article.

WALL STREET JOURNAL, OCTOBER 29TH, 2009

HIGH PRICE FOR IPHONE IN CHINA WILL TEST THE APPETITE FOR APPLE

By LORETTA CHAO



BEIJING—Apple Inc. is a master at creating buzz around its product launches. But as the popular iPhone approaches its official debut in China—the world's largest mobile-phone market—consumers here seem anything but excited.

The buzz-killer is price. China Unicom (Hong Kong) Ltd., which will start selling the device Friday, is offering a version of the 32-gigabyte iPhone 3GS for 6,999 yuan (\$1,024) without a service contract, which is the most popular way for people to purchase phones in mainland

China. That compares with about the \$800 consumers pay for the same product in nearby Hong Kong, which has different wireless carriers.

When wrapped together with a service plan, as is generally done in the U.S., the phone will cost Chinese subscribers at least \$3,120 over two years, compared with the roughly \$2,600 cost for the same period for customers in the U.S.

"It's too expensive," says Marco Bai, a teacher in Beijing. He currently uses a smart phone—a handset with souped-up functions like email and video—made by a Chinese domestic brand that cost him about \$205. "There are many smart phones with similar functions" to the iPhone in China, he says. "And they are all cheaper."

China has an estimated 710 million mobile-phone subscribers, according to government figures. But the average customer pays less than \$15 for monthly service and only 7.5% of the handsets sold in the country last year were smart phones like the iPhone. The average smart phone in China costs about \$350, estimates research firm IDC.

But China's smart-phone market is growing quickly, as all three Chinese carriers this year have deployed new third-generation, or "3G," networks. The higher transmission speeds of 3G enable functions like wireless video that are well suited for smart phones.

The market is also becoming more competitive, with a host of new devices being released, including several that run Google Inc.'s Android software. And Nokia Corp., which sells more than a third of all cellphones in China, has been focusing on making devices more affordable, an effort Nokia executives say is designed to "democratize" the smart-phone market.



A successful iPhone roll out would raise Apple's profile in China, where despite the market's enormity it has only one store and where its Macintosh computers make up less than 1% of all unit shipments. Unicom, long a laggard to rival China Mobile Ltd., is a less savvy marketer than many of the carriers Apple is used to dealing with, analyst say.

On Tuesday, Unicom ran a plain-text announcement in Chinese newspapers for its planned launch party Friday with black text under a red headline. The ad resembled the type of official government notice that many Chinese readers usually ignore.

Dennis Chen, chief executive of Shanghai-based dopod Communications Corp., which sells dopod branded smart phones made by [HTC Corp.](#), says the iPhone's entry won't roil the local market. The Unicom iPhone's "price is very high—higher than in many other places," he says. "It's a bit different from what consumers were hoping... It won't have a big impact on us."

China's three mobile operators, all of which are state-owned, don't control handset sales the way U.S. carriers do. Instead, users have typically been able to buy whatever phones they want, and use them with whichever service. That means that users can easily buy iPhones that are sold overseas and brought into China for resale, though not with 3G functions. Those gray-market devices sell for as much as 30% below the price Unicom plans to charge.

What's more, the Unicom iPhones have been modified to remove the Wi-Fi function to meet Chinese government regulations on wireless Internet technology in cellphones. Gray-market phones have Wi-Fi.

Already, an estimated two million iPhones are in use in China, according to analyst Fang Meiqin of BDA China Ltd. The research firm estimates that two million to three million more iPhones will be sold in 2010, including those from Unicom and those sold on the gray market. "Given the high prices of China Unicom's iPhone, I'm afraid the smuggled ones might still be very popular," she says.

It's unclear how much of the price Unicom is charging was decided by the Chinese company and how much by Apple. China Unicom didn't respond to requests for comment. Apple also didn't respond.

Many analysts had expected the iPhone to give Unicom a leg up on larger rival China Mobile in attracting customers. When Unicom announced the iPhone deal in August, its president, Lu Yimin, said the Chinese company aimed to take more than a third of China's 3G wireless market next year. But Unicom has revealed little about its strategy for the device.

Apple products have bucked normal price expectations before in other markets, although it has lowered prices on the iPhone several times since its U.S. debut in 2007. Analysts say Unicom may have decided to target the high end initially to gauge demand and avoid the risk Apple's supply can't meet local market demand.

The Unicom iPhone "is a device that is aimed at people who absolutely must have an iPhone here," said David Wolf, chief executive of Wolf Group Asia, a Beijing-based marketing strategy firm. "I think they're counting on the fact there's enough pent-up demand."

(a) What is the cost of a 2 year service plan for a 32-GB iPhone 3GS phone?

(b) What is the cost of a 2 year service plan for an average Chinese smart phone?

(c) Suppose all Chinese consumers have the utility function:

$$U = \alpha Q_1 + \beta Q_2$$

Here good 1 is iPhone handsets and good 2 is Chinese smart phone handsets. What is a utility function of a consumer who buys an iPhone handset *instead* of a Chinese smart phone handset? Explain using graphs if necessary.

(d) Now suppose all Chinese consumers have the utility function:

$$U = \alpha Q_1 + \beta Q_2$$

Here good 1 is iPhone handsets plus 2 year service plan, and good 2 is Chinese smart phone handsets plus 2 year service plan. What is a utility function of a consumer who buys an iPhone with a 2 year service plan? Explain using graphs if necessary.

Question 2

Suppose a consumer has the following utility function:

$$U = \min(E_1, 2E_2, E_3)$$

Here E_1 is the expenditure on good 1, E_2 is the expenditure on good 2, and E_3 is the expenditure on good 3. The consumer has (exogenously given) income Y .

(a) Is it possible to solve for the optimal expenditures on goods 1, 2 and 3 by the Lagrangean approach? If you say yes, explain why. If you say no, explain why not.

(b) Solve for the optimal expenditures on goods 1, 2 and 3. Show all steps.

Question 3

A consumer has the utility function:

$$U = \max\left(Q_1, \frac{1}{2} Q_2\right)$$

(a) Graph the indifference curves for $U = 1$ and $U = 2$.

(b) Consider the bundle $A = (1, 4)$ and the bundle $B = (2, 2)$. What is bundle C , the 60:40 combination of bundles A and B ? Graph bundles A, B, C below (not above).

(c) Does this consumer have convex preferences? Prove your answer graphically and numerically.

(d) Suppose $P_1 = \$20$, $P_2 = \$5$, $Y = \$20$. What are this consumer's optimal good 1, optimal good 2 and optimal utility?

(e) Is it possible that at any one time, the consumer can either buy good 1 or good 2? Give a brief explanation using graphs to illustrate your answer.

Question 4

There are two parts to this question: in part A you will analyze a consumer and in part B you will analyze a company.

PART A

A price taking consumer has the utility function:

$$U = Q_2 - \frac{(Q_1 - \alpha)^2}{2\beta}$$

The parameters $\alpha, \beta > 0$. Suppose goods 1 and 2 have uniform prices P_1, P_2 respectively and the consumer has (exogenously given) income Y .

(a) What type of utility function is this? A one sentence explanation suffices.

(b) Assuming the consumer's expenditure equals her income, solve for the optimal choice of Q_1 . Show all steps. Note: Do not solve for Q_2 and you don't have to check if this consumer has monotonic preferences.

(c) For this part only, assume that $P_2 = 1$. For what values of P_1 is the demand for good 1 elastic? Show all calculations.

(d) What is change in the consumer's optimal utility if her income increases by \$0.50? For this part assume $P_2 = \$1$.

(e) Without solving the UMP, briefly explain whether the optimal choices from the UMP:

$$\max_{Q_1, Q_2} U = \ln Q_2 - \ln \frac{(Q_1 - \alpha)^2}{2\beta} \text{ s.t. } P_1 Q_1 + P_2 Q_2 = Y$$

will coincide with (i.e. be identical to) the optimal choices from the UMP:

$$\max_{Q_1, Q_2} U = Q_2 - \frac{(Q_1 - \alpha)^2}{2\beta} \text{ s.t. } P_1 Q_1 + P_2 Q_2 = Y$$

PART B

For Part B, assume $P_2 = 1$. Suppose there's one company selling good 1. The following table gives price and sales data for August 2009 - November 2009:

Price and Sales Figures for Good 1			
	August 2009	September 2009	October 2009
Price	\$1	\$2	\$3
Quantity Sold	90	80	70

(f) Compute the price elasticity between *any* two adjacent periods (i.e. either between August-September or September-October). Do not use the demand curve in this question and show all steps.

(g) Derive this company's demand curve (price on the y-axis and quantity on the x-axis). Show all steps.

(h) Suppose the company's customers can be represented by a single "representative" consumer who has the utility in Part A. What is the "representative consumer's" utility function?

(i) Suppose the company chooses the September price to:

$$\max_{Q_1} R = P_1 Q_1 \text{ subject to } Q_1 = \text{Capacity} = c$$

If you solve this problem by the Lagrangean method, for what value of capacity will the Lagrange multiplier equal 0? That is, when will $\lambda = 0$? Show all steps and explain your answer briefly.

Bonus Question

Suppose a large number of Ontarians are (psychologically) addicted to nicotine and/or gambling. What can the government of Ontario do to “cure” addiction? Hint: how can the government encourage addicts to consume a *combination* of nicotine and gambling?

THE END. NICE!



WORKSHEET