國立中央大學 111 學年度碩士班考試入學試題

所別： 產業經濟研究所 碩士班 產經組(一般生)　　

科目： 經濟學

1. **30 points**. Consider an individual with the following utility function,

$$u(x_1, x_2) = \min(\alpha x_1, x_2)$$

where $\alpha > 0$ measures the individual's preference of good 1 to good 2. When $\alpha > 1$ ($\alpha < 1$), the individual derives more (less) utility from the consumption of good 1 relative to good 2. The individual is, in addition, subject to the following budget constraint,

$$x_1 + px_2 = w$$

where $p > 0$, and for simplicity, we normalize the price of good 1 to \$1.

(a) Find the Walrasian demand of good 1 and good 2.

(b) Does the individual consume more units of good 1 or good 2? Explain.

(c) How is the Walrasian demand affected by α? Interpret.

2. **30 points.** According to the Federal Communications Commission, the market share of mobile network operators in 2016 is distributed as follows.[1]

Operator	Market share
Verizon	36.8%
AT&T	32.8%
Sprint	13.4%
T-Mobile	15.4%
US Cellular	1.6%

Table I. Market share of mobile network operators in the U.S.

(a) Find the 4-firm concentration ratio and the Herfindahl-Hirschman Index (HHI). (Hint: HHI is defined as the sum of squares of all firms' market shares.)

(b) Consider now that T-mobile merges with Sprint. Find the HHI after the merger.

(c) Does the market become more concentrated after the merger? Explain.

[1]Federal Communications Commission (2017). *Twentieth Mobile Wireless Competition Report* (WT Docket No. 17-69). Retrieved from https://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0907/DOC-346595A1.pdf

注意:背面有試題

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3. **40 points**. Consider the St. Petersburg Paradox, as follows. Simon plays the coin-flipping game at the casino, and has equal probability to obtain a head and a tail every time he flips the coin. If it turns out to be the head for the first time, Simon obtains \$1 and the game ends. However, if he realizes the tail, he flips the coin again, and obtains \$2 if the head appears but flips again otherwise. In general, Simon continues flipping the coin until the head first appears, and obtains $\$2^{k-1}$ in the k^{th} trial where he first realizes the head.

   (a) What is the probability that Simon obtains the head in the k^{th} trial?

   (b) Suppose the coin is flipped for a maximum of k times, how much is Simon willing to pay for the gamble?

   (c) What happen if the game is played infinitely? Does that happen in practice?

   (d) Suppose Simon obtains \$$x$ whenever he realizes the head, and once the head appears, the game ends. How much is Simon willing to pay for this gamble? Explain.

注意:背面有試題