Econ 132 Fall 2018 FIRST MIDTERM EXAM (A): SOLUTIONS Cameron

Version A

1.(a)(i) HMO **(ii)** HMO

(b)(i) A deductible is an annual amount that needs to be paid by the insured person before insurance covers any expenses.

(ii).An actuarially fair premium is the price of an insurance policy equal to the expected value of losses.

(c)(i) To reduce welfare loss due to moral hazard.

(ii) A risk-averse person is someone with diminishing marginal utility.
More formally, U'(x) decreases as x increases (so U''(x) < 0).

2.(a) True From course notes it as around $10,800.

(b) False U.S. spends much more but given this spending has lower life expectancy and greater infant mortality.

(c) False It is hospitals.

(d) True Medicare is based on age (and/or disability). Medicaid is based on being poor.

(e) False People were randomly assigned to policy.

(f) True Decrease from around 15% of the population to around 10%.

3.(a) 95% confidence interval 630 +/- 2 × 29.0 = (572, 688).
[Or 630 +/- 1.96×29.0 = (573.2, 686.8)]

(b) Elasticity $= -\dfrac{(777 - 630) / [(777 + 630)/2]}{(0 - 16) / [(0 + 16)/2]} = \dfrac{147/703.5}{16/8} = \dfrac{0.209}{2} = 0.10.$

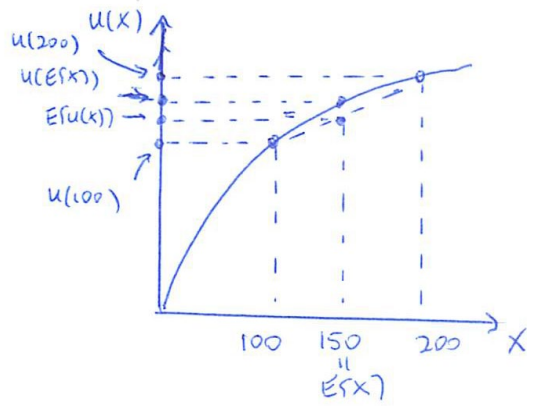
(c) $t = (777 - 534) / \text{sqrt}(32.8^2 + 27.4^2)$ $t = 147 / \text{sqrt}(1829) = 243 / 42.77 = 5.68.$
Reject H0: means are equal, as $|t| > 1.96$.
Conclude that the difference is statistically significant at significance level 5 percent.

4.(a)(i) Mean $E[X] = 0.8 \times 20 + 0.2 \times 70 = 16 + 14 = \underline{30}.$
Variance $V[X] = 0.8\times(20-30)^2 + 0.2\times(70-30)^2 = 0.8\times100 + 0.2\times1600 = 400.$
St. dev. $\text{St.dev.}[X] = \text{sqrt}(400) = 20.$

(ii) For average of 400 similar independent individuals
Mean of average loss = E[X] = 30.
Standard deviation of average loss = St.dev.[X] / sqrt(400) = 20 / 20 = 1.

(b) John's utility function is given:
- Expected utility $E[U(x)] = 0.5\times U(100) + 0.5\times U(200)$
- Utility of expected outcome $U(E[x]) = U(0.5\times100 + 0.5\times200) = U(150)$

Version A (continued)



4.(c) We move from (Q_50, P_50) to (Q_0, P_0).

(i) Change in health expenditure is D + G (equals P_100 × (Q_0 – Q_50)).
(ii) Moral hazard loss is D (difference between societal cost (P_100) and maximum willing to pay (given by the demand curve between P_50 and P_0).

5.(i) -475.04 (or 475.04) This is the slope coefficient from OLS regression on an intercept and binary regressor indicating insurance status.

(ii) (-619.54, -330.53)**.** The 95% confidence interval for the coefficient in part (a).

(iii) 1258.3 This is the intercept in the regression in part (a).

(iv) 783.26. First output: this is the mean when we restrict attention to those with coins95==1. (Alternatively use the second set of output: 1258.3 – 475.04 = 783.26).

(v) t = 783.26 / 56.04 = 13.97. Regression on an intercept only gives inference on the mean. By restricting to coins95==1 we have inference on the mean in the 95% coinsurance plan. From the first set of output the estimate is 783.26 with standard error 56.04 and the regression t-statistic will test H0: coefficient = 0.

(vi) t = -6.45 This is a test of difference in means that gives the same estimate and almost the same standard error (and hence t-statistic) as the second set of output using the regress command.

Multiple choice

Question	1	2	3	4	5	6
Answer	a	c	c	d	c	a

Scores out of 36

75th percentile 31.5 (88 %)
Median 27.5 (76 %)
25th percentile 22.5 (64 %)

Curve (Indication only: Course Grade is based on Total Score!)

(Ave GPA 2.68 on this curve)

A	32 and above	C+	24.5 and above
A-	30.5 and above	C	23 and above
B+	29 and above	C-	21.5 and above
B	27.5 and above	D+	20 and above
B-	26 and above	D	18.5 and above
		D-	17 and above