Econ 132 Fall 2016   FIRST MIDTERM EXAM (A): SOLUTIONS   Cameron

Version A

1.(a)(i) Expected loss = 0.2×20,000 + 0.8×5,000= $8,000. This is the actuarially fair premium.

(ii) Loading factor = 100×(8,000 – 8,000) / 8,000 = 0.0%.

(b) Individual variance = $0.2 \times (20,000 - 8,000)^2 + 0.8 \times (5,000 - 8,000)^2$
                = $0.2 \times 144,000,000 + 0.8 \times 9,000,000 = 36,000,000$.

  Variance of group average = 36,000,000/100 = 360,000.
  Standard deviation of average loss = sqrt(360,000) = $600.
  With probability .95 within two stand. deviation of mean = 8,000 ± 2x600 = (6,800, 9,200).
  (or if use within 1.96 standard deviations of mean = 8,000 ± 1.96x600 = (6,824, 9,176)

(c)(i) John pays 1000 + 0.2 × (4000 – 1000) = 1000 + 600 = $1,600.

(ii) This was similar to assignment 1 exercise (except lower income here) where found that there was a subsidy (a monthly premium assistance (tax credit)).

2.(a) True   Roughly $3 billion.

(b) True   Roughly two-thirds.

(c) False   It is a bit over one-half.

(d) True   Medicare is for old and doesn't cover everything, Medicaid is for poor and one can be old and poor.

(e) False   False. Virtually all old people are covered by Medicare.

(f) True   From 3% of GDP to 17% of GDP.

3.(a) HMO has a gatekeeper physician, FFS does not.
HMO restricts one to network doctors while FFS allows wider range of doctors.
(Other answers may also be possible).

(b) Elasticity = $\dfrac{(2000 - 3000) / [(2000 + 3000)/2]}{(100 - 50) / [(100+50)/2]} = \dfrac{-1000/2500}{50/75} = \dfrac{-0.4}{2/3} = -0.6.$
        (you can also multiply by minus one, in which case the answer is 0.6).

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(c)(i) Require people to purchase on the exchange if they do not have health insurance through other sources such as employer or Medicaid. (Other answers may also be possible).

(ii) Make it easier to qualify for Medicaid. OR Require employers (other than those with few employees) to provide health insurance. (Other answers may also be possible).

4.(a)(i) Risk averse as there is diminishing marginal utility.
E.g. When income increases by 10 from 0 to 10 utility increases by 180, but when income increases by 10 from 40 to 50 utility increases by only 20 (= 500 – 480).,

(i) Expected utility E[U(x)] = 0.2 × U(0) + 0.8 × U(50) = 0.2 × 0 + 0.8 × 500 = 400.

**(b)(i)** Insurer pays out 0 with probability 0.8 and 50 with probability 0.2.
Expected payout = 0.8 × 0 + 0.2 × 50 = 20. Actuarially fair premium = 10.

(ii) Ann has income after insurance of 50 – 20 = 30. U(30) = 420 exceeds expected utility without insurance of 400. Since she is risk averse she will definitely get the insurance.

Version A (Continued)

4.(c)

Net price to the consumer

P_noins

P_ins

Q_noins   Q_ins   Health care at gross price
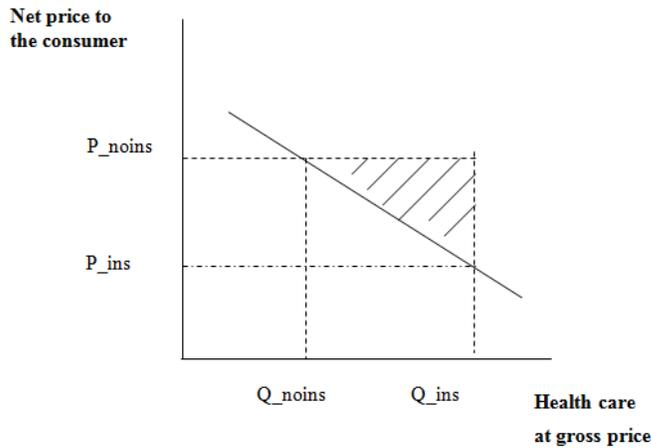
5.(i) Directly from first output $1026.13 \pm 1.96 \times 1729.41/\mathrm{sqrt}(251) = 1026.13 \pm 1.96 \times 109.16 = 1026.13 \pm 213.95 = (812.18, 1340.8)$
(or $1026.13 \pm 2 \times 1482.23/\mathrm{sqrt}(229) = 1026.13 \pm 2 \times 109.16 = (807.81, 1.244.36)$).

(ii) Directly from regression output spending in 25% plan is -522.01 lower than in 0% plan.

(iii) Directly from regression output a 95% confidence interval for the difference between the two plans is (-888.73, -155.28) or (155.28, 888.73 is also okay.

(iv) Yes. This is a t-test on coins25 in the regression output. Reject H0 at level 0.05 as p=0.005 < 0.05. (Or t = -2.79 has $|t| > 1.96$ so reject H0 at level 0.05).

(v) In general **regress y** gives the sample average of variable **y.**
So **regress out_infl if coins25 == 0** gives the sample average of **out_infl when coins25 == 0** which from output is $1548.13.

(vi) No. the histogram from assignment is very right skewed. So not normal.

Multiple choice

Question	1	2	3	4	5	6
Answer	b	b	d (or a)	c	a	b

Scores out of 36　　　　　**Curve (Indication only: Course Grade is based on Total Score!)**

75th percentile 30.5 (85 %)	(Ave GPA 2.72 on this curve)	C+ 25 and above
Median 28.5 (79 %)	A 31.5 and above	C 24 and above
25th percentile 24.5 (68 %)	A- 30.5 and above	C- 22.5 and above
	B+ 29 and above	D+ 21 and above
	B 28 and above	D 19.5 and above
	B- 26.5 and above	D- 18 and above

On question 5 (the Stata question) out of six the scores were
75th percentile 5   Median 4   25th percentile 3   (13 students got 2 or less).