

Econ 132 Fall 2016 SAMPLE FIRST MIDTERM EXAM: SOLUTIONS Cameron

1.(a)(i) HMO has least choice, followed by PPO and then FFS with most choice.
(ii) From insurance view a large insurance pool combined good and bad risks and has economies of scale.
 (Or from regional view this allows insurers to contract with doctors and hospitals in the region).

(b) Several answers are possible.
 Medicare is for all people (over 65) whereas Medicaid is for the poor.
 Medicare is solely funded by the Federal government while Medicaid is joint federal and state.

(c) Elasticity = $\frac{(4000 - 6000) / [(4000 + 6000)/2]}{(60 - 0) / [(60+0)/2]} = \frac{-2000/5000}{60/30} = \frac{-0.4}{2} = -0.2$.

- 2.(a)** True Roughly half of 17%.
- (b)** True Roughly half of 17%.
- (c)** False It is hospital, physicians, pharmaceutical
- (d)** False It was around 15% and is now around 10% with Obamacare introduction.
- (e)** True The most common form of health insurance is a PPO.
- (f)** True There was an initial slowdown but then back on same growth path.

3.(a)(i) Expected loss = $0.2 \times 15,000 + 0.8 \times 5,000 = \underline{\$7,000}$. This is the actuarially fair premium.

(ii) Load factor = $100 \times (8,000 - 7,000) / 7,000 = 14.2\%$.

(b) Individual variance = $0.2 \times (15,000 - 7,000)^2 + 0.8 \times (5,000 - 7,000)^2$
 $= 0.2 \times 64,000,000 + 0.8 \times 4,000,000 = 16,000,000$.

Variance of group average = $16,000,000 / 400 = \underline{40,000}$.

Standard deviation of average loss = $\text{sqrt}(40,000) = \underline{\$200}$.

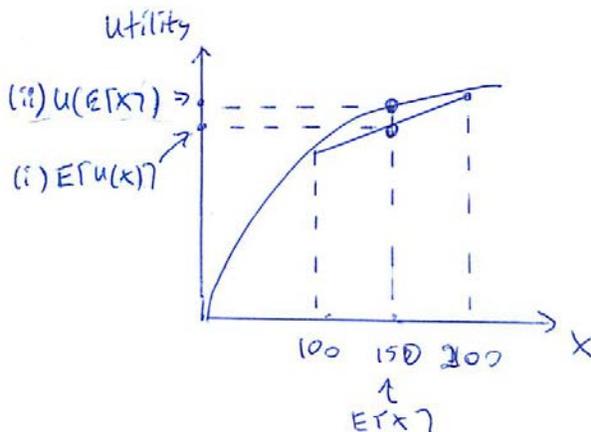
With probability .95 within two stand. deviations of mean = $7,000 \pm 2 \times 200 = (6,600, 7,400)$.

(c)(i) Health company pays $0.7 \times (5000 - 1000) = 0.7 \times 4000 = \$2,800$.

(ii) 40% (The 60 in Bronze 60 is the proportion paid by the insurer (and Silver 70 is 30%).

4.(a)(i) Expected utility $E[U(x)] = 0.5 \times U(100) + 0.5 \times U(200)$

(ii) Utility of expected outcome $U(E[x]) = U(0.5 \times 100 + 0.5 \times 200) = U(150)$ is higher



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4.(b)(i) Both have the same expected outcome (of \$100), but policy 2 insures against greater variability. So more likely to take policy 2 (it has potential greater utility improvement with certainty.) e.g. If the “uncertain” event was 100 for sure there is no way we would buy it for 110.

(ii) With more curvature of the utility function consumer B is more risk-averse so more likely to get insurance.

(c) $E[X] = 70$ as uniform on (50, 90) has mean 70.

$E[U(X)] = 1.5 \times E[X] = 1.5 \times 70 = 105$. Since this is greater than the price of 90, do buy.

5.(i) Directly from output average outpatient spending is \$400.47 higher in the free plan.

(ii) Directly from output a 95% confidence interval for the difference between the two plans is (\$140.87, \$660.07).

(iii) Yes. We reject the null hypothesis at level 0.05. The test is $t = 3.0323$ with $p = 0.0026 < 0.05$.

(Alternatively, yes as the 95% confidence interval (\$140.87, \$660.07) does not include 0).

(iv) The 95% confidence for μ is estimate $\pm 1.96 \times$ standard error = $743.66 \pm 1.96 \times 106.32 = 743.66 \pm 208.39 = (535.27, 952.05)$.

(v) In general **regress y** gives the sample average of variable **y**.

So **regress out_infl** gives the sample average of **out_infl** which from output is \$1,011.73.

(vi) In general **regress y x** where **x takes only values of 0 or 1** gives slope coefficient equal to the average of **y** when **x=1** less the the average of **y** when **x=0**.

So **regress out_infl coins95** gives estimated coefficient of **coins95** of 400.47.

Multiple choice

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

The following curve was from Fall 2016 Midterm which was not the same as this sample exam.

Scores out of 36	Curve (Indication only: Course Grade is based on Total Score!)
75 th percentile 29 (81 %)	(Ave GPA 2.70 on this curve) C+ 24 and above
Median 25.5 (71 %)	A 30 and above C 22 and above
25 th percentile 23 (64 %)	A- 29 and above C- 21 and above
	B+ 28 and above D+ 20 and above
	B 26 and above D 18 and above
	B- 25 and above D- 17 and above