

1.(a) Year	1	.....	4	5	....	8	9	10	40
GP income	-40,000	.....	-40,000	80,000	....	80,000	240,000	240,000	240,000
Non-GP	60,000	.....	66,000	68,000	....	74,000	76,000	78,000	138,000
Income diff	-100,000	.....	-106,000	12,000	....	6,000	164,000	162,000	102,000

(b) One way to do this:

$$\text{GP Income} = 4 \times -40,000 + 4 \times 80,000 + 32 \times 240,000 = \$7,840,000.$$

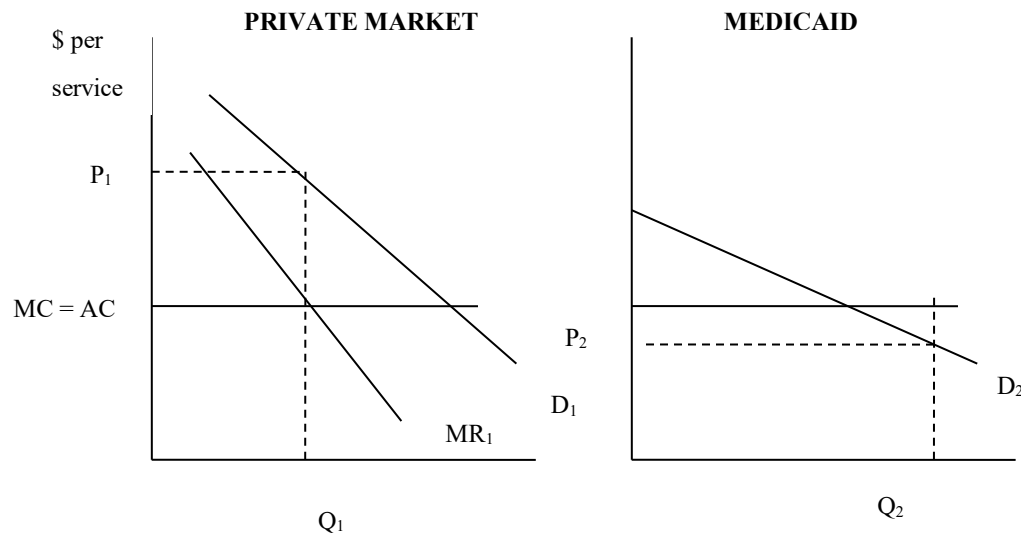
$$\text{Non GP income} = 60,000 + 62,000 + \dots + 138,000 = 40 \times 99,000 = \$3,960,000.$$

$$\text{Difference} = \$7,840,000 - \$3,960,000 = \$3,880,000$$

(c) Clearly between 0.15 and 0.20. By interpolation 0.17. Around 17%.

2.(a) No. It has some monopoly power in pricing to private patients. This allows it to make an above normal profit. This can be used to cross-subsidize losses on Medicaid patients.

(b)



3.(a) $MR = P \times (1 + 1/\eta) = P \times (1 + (1/-1.5)) = P \times (1 - 0.667) = 0.333 \times P.$

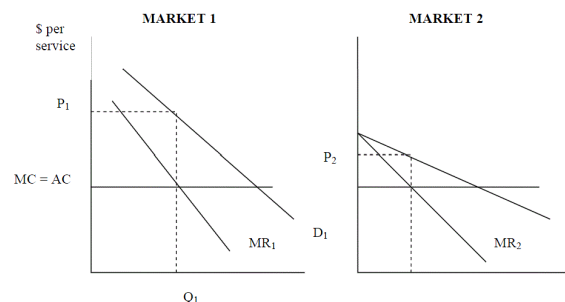
At profit maximum $MR = MC \implies 0.333 \times P = MC \implies P = 3 \times MC.$

Price is three times marginal cost.

(b) To push out the demand curve and make demand less responsive to price, so that can sell more at a higher price.

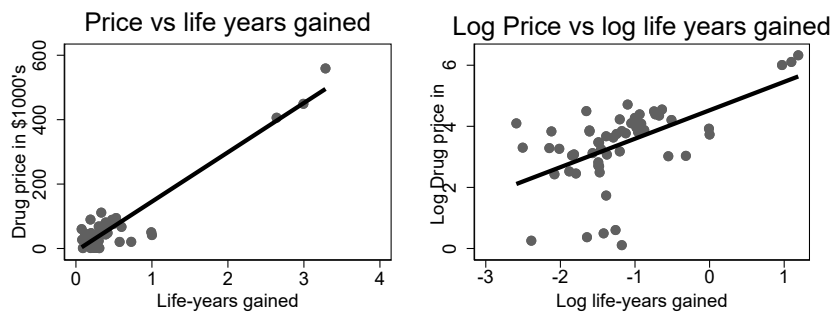
(c) The potential of monopoly profits encourages R&D to create the drugs in the first place.

(d) As drawn higher price in Market 1.



4.(a) Includes

```
. desc price lyg plyg
Variable name      name
price              Drug price at launch per treatment-episode 2012 $1000's
lyg                Life-years gained
plyg               Price per life-year gained 2012 $1000's
. sum price lyg plyg
      price |           56          62.298          102.8726          1.1154          559.1501
      lyg  |           56          .4565565          .6359973          .075          3.283785
      plyg |           56          148.4726          129.1387          3.617515          802.3897
```

(b),(d) Scatterplots with fitted regression lines

(c) Drug prices rise by \$153,180. This seems on the high side, especially as there is no adjustment for quality of life.

```
. regress price lyg, vce(robust)
```

	price	Coefficient	Robust std. err.	t	P>|t|	[95% conf. interval]	
lyg	|	153.1825	9.227612	16.60	0.000	134.6823	171.6828
_cons	|	-7.638462	4.797486	-1.59	0.117	-17.25684	1.979919

(e) The elasticity is 0.9316

```
. regress lnprice lnlyg, vce(robust)
```

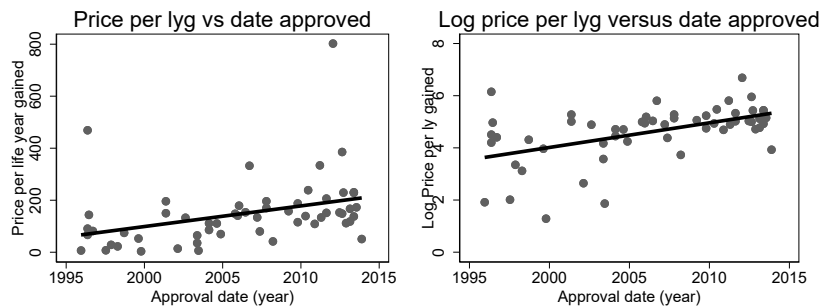
	lnprice	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
lnlyg	|	.9316121	.1688754	5.52	0.000	.5930373	1.270187
_cons	|	4.525284	.200218	22.60	0.000	4.123871	4.926697

(f) Yes, might expect price to double as benefit doubles.

(g) Either $t = (.9316121 - 1) / .1688754 = -.4049607$ has $|t| < 1.96$ so do not reject H_0 : elasticity = 1
Or do not reject H_0 : elasticity = 1 since $p = 0.6871 > 0.05$ from the following test

```
. test lnlyg = 1
( 1)  lnlyg = 1
      F( 1, 54) =      0.16
      Prob > F =      0.6871
```

5.(a),(c) Scatterplots with fitted regression lines



(b) Drug prices per life year gained rise by \$7,927 per year.

```
. regress plyg year, vce(robust)
```

		Robust				
	plyg	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
	year	7.927525	3.283616	2.41	0.019	1.344272 14.51078
	_cons	-15756.17	6584.819	-2.39	0.020	-28957.94 -2554.401

(d) Drug prices per life year gained rise by $100 \times 0.094456 = 9.45\%$ per year.

(More precise is $100 \times (\exp(0.094456) - 1) = 9.91\%$ per year.

This may not be reasonable. It is much higher than economy-wide inflation of 2-3% per year.

```
. regress lnplyg year, vce(robust)
```

		Robust				
	lnplyg	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
	year	.094456	.0259569	3.64	0.001	.0424156 .1464964
	_cons	-184.8963	52.15227	-3.55	0.001	-289.4553 -80.33724

6. (a) `. regress lnplyg year gi, vce(robust)`

		Robust				
	lnplyg	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
	year	.0925475	.0239908	3.86	0.000	.044428 .1406669
	gi	1.703316	.6656082	2.56	0.013	.3682753 3.038357
	_cons	-181.602	48.29034	-3.76	0.000	-278.4602 -84.74383

(b) This is a very large effect. From summary statistics, the standard deviation of **gi** is 0.1870 so a one standard deviation change in **gi** is associated with a $100 \times 1.703316 \times 0.1870 = 31.8\%$ increase in price.

It is statistically significant at level 0.05 since $p = 0.013 < 0.05$.

No. I would have expected a lower price given worse side effects, though we are not controlling for the specific types of cancer being treated.

Econ 132 – Ass 5 Solutions

(c) This leads to 5 observations dropped. There is relatively small change in results.

```
. regress lnplyg year gi if gi != 0, vce(robust)
```

lnplyg	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
year	.0914873	.0246695	3.71	0.001	.0418859	.1410887
gi	1.827485	.8986196	2.03	0.048	.0206888	3.63428
_cons	-179.5275	49.68173	-3.61	0.001	-279.4193	-79.63566

(d) . regress lnplyg year lncomp, vce(robust)

lnplyg	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
year	.0976796	.023398	4.17	0.000	.0507491	.1446101
lncomp	-.6346103	.192554	-3.30	0.002	-1.020825	-.2483959
_cons	-189.9579	46.84398	-4.06	0.000	-283.915	-96.00076

(e) It is a large effect. E.g. a 10% rise in competitors is associated with a 6.35% decrease in price. The effect is statistically significant at level 0.05 since $p = 0.002 < 0.05$.

Yes, we expect that with more competition the price is lower.

(f) Key conclusions include

- (1) Drug prices increase in effectiveness (life years gained);
- (2) But there is a very high price per life year gained; and
- (3) This price is increasing by around 9% per year.