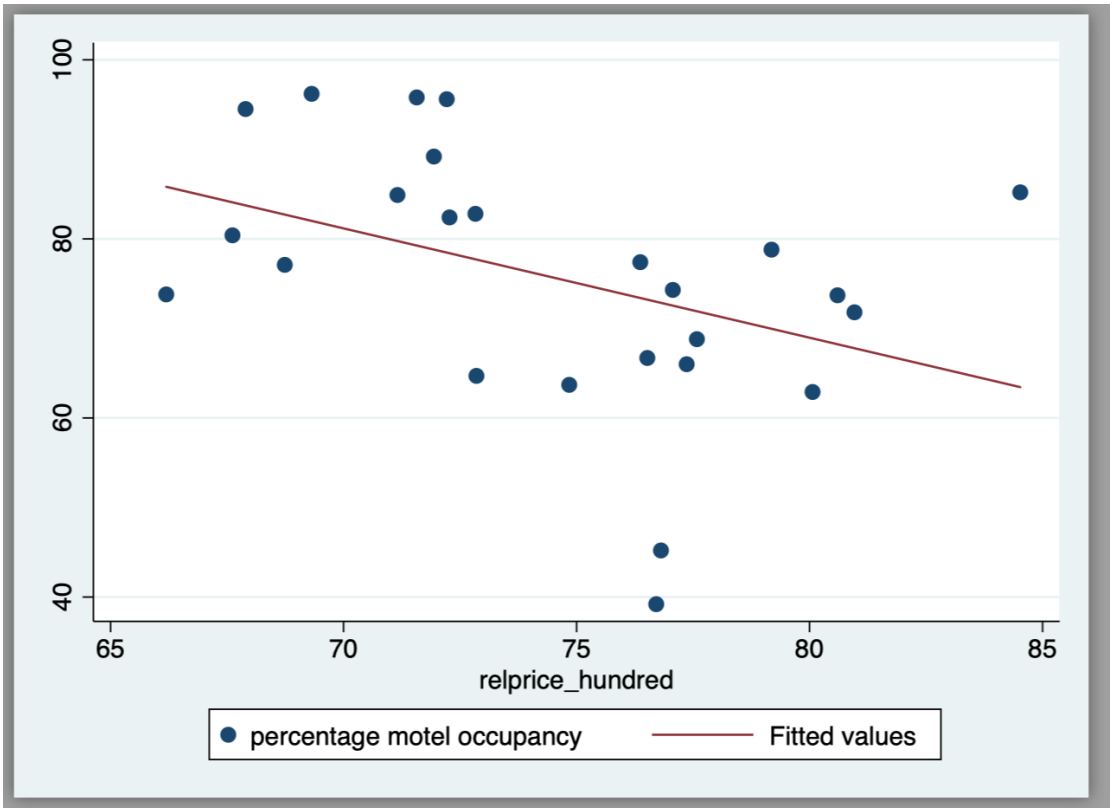
計量經濟__期中考（111.11.16）

1.

⑴如圖，以分佈來看，並沒有明顯的相關性，但以趨勢線來說有附相關的趨勢存在。



⑵以第一小題的散佈圖來看，我們能夠預測斜率可能會負數；如下圖之回歸統計圖可知，方程式之斜率符合預期為負數。

```
. eststo: reg motel_pct relprice_hundred
```

Source	SS	df	MS	Number of obs	=	25
				F(1, 23)	=	4.38
Model	800.091024	1	800.091024	Prob > F	=	0.0476
Residual	4201.35058	23	182.667416	R-squared	=	0.1600
				Adj R-squared	=	0.1234
Total	5001.4416	24	208.3934	Root MSE	=	13.515

motel_pct	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
relprice_hund~d	-1.221187	.5835027	-2.09	0.048	-2.428254	-.0141193
_cons	166.656	43.57095	3.82	0.001	76.52266	256.7894

(est2 stored)

(3)

(4)線性估計迴歸如下圖。

```
. eststo: reg motel_pct repair
```

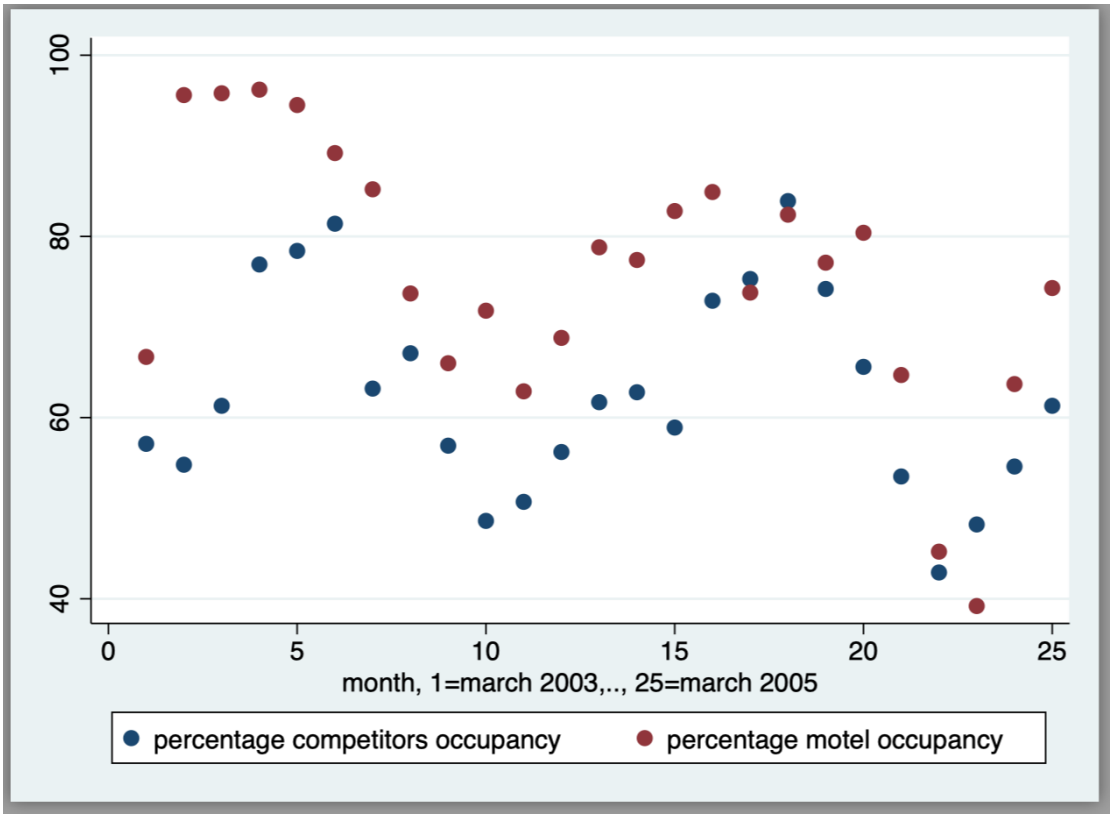
Source	SS	df	MS	Number of obs	=	25
				F(1, 23)	=	4.93
Model	882.928029	1	882.928029	Prob > F	=	0.0365
Residual	4118.51357	23	179.065807	R-squared	=	0.1765
				Adj R-squared	=	0.1407
Total	5001.4416	24	208.3934	Root MSE	=	13.382

motel_pct	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
repair	-13.23571	5.960615	-2.22	0.037	-25.56619	-.9052429
_cons	79.35	3.154061	25.16	0.000	72.82533	85.87467

(est3 stored)

2.

(1)如下圖，競爭對手的入住率略低於某該旅館的入住率；參數β_2的區間估計落於[0.4453, 1.2840]之間。




```
. eststo: reg motel_pct comp_pct
```

Source	SS	df	MS	Number of obs	=	25
				F(1, 23)	=	18.19
Model	2208.92033	1	2208.92033	Prob > F	=	0.0003
Residual	2792.52127	23	121.413968	R-squared	=	0.4417
				Adj R-squared	=	0.4174
Total	5001.4416	24	208.3934	Root MSE	=	11.019

motel_pct	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
comp_pct	.8646393	.2027119	4.27	0.000	.4452978	1.283981
_cons	21.39999	12.90686	1.66	0.111	-5.299896	48.09987

```
(est1 stored)
```

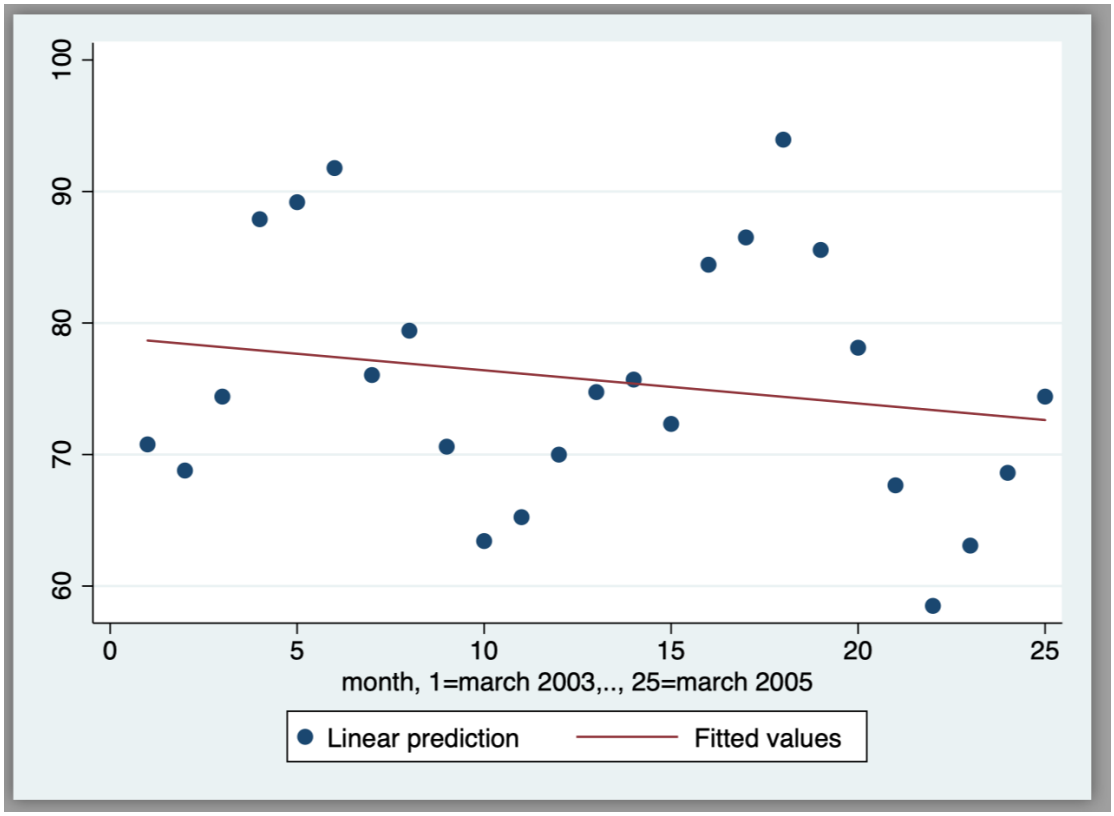
(2)

(3)如上圖，在 99%的顯著水準之下，p 值<0.01，能夠顯著拒絕虛無假設，即β_2顯著大於零；檢定統計量=0.86464/0.20271=4.2654。

(4)如上圖，迴歸模型說明了當競爭對手入住率每變動一單位而造成該旅館的入住率變動 0.8646 單位；而在 99%的顯著水準之下，p 值<0.01，所以能夠顯著拒

絕虛無假設，即係數顯著大於零。

(5)如下圖，斜率呈現負號關係。



3.

(1)如下圖，

Food: 平均值=114.4431、中位數=、最小值=9.63、最大值=476.67、標準差

=72.6575。

income: 平均值=72.14264、中位數=、最小值=10、最大值=200、標準差

=41.65228。

```
. sum food
```

Variable	Obs	Mean	Std. Dev.	Min	Max
food	1,200	114.4431	72.6575	9.63	476.67

```
. sum income
```

Variable	Obs	Mean	Std. Dev.	Min	Max
income	1,200	72.14264	41.65228	10	200

(2)

```
. reg food income
```

Source	SS	df	MS		
				Number of obs	= 1,200
				F(1, 1198)	= 52.89
Model	267625.41	1	267625.41	Prob > F	= 0.0000
Residual	6062029.78	1,198	5060.12503	R-squared	= 0.0423
				Adj R-squared	= 0.0415
Total	6329655.19	1,199	5279.11192	Root MSE	= 71.135

food	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
income	.3586867	.049321	7.27	0.000	.2619215	.455452
_cons	88.5665	4.108188	21.56	0.000	80.50646	96.62654

(3)

```
. reg ln_food ln_income
```

Source	SS	df	MS		
				Number of obs	= 1,200
				F(1, 1198)	= 41.18
Model	16.9590002	1	16.9590002	Prob > F	= 0.0000
Residual	493.406139	1,198	.411858213	R-squared	= 0.0332
				Adj R-squared	= 0.0324
Total	510.365139	1,199	.425658999	Root MSE	= .64176

ln_food	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ln_income	.1863054	.0290335	6.42	0.000	.1293432	.2432675
_cons	3.778932	.1203492	31.40	0.000	3.542814	4.015051

(4)

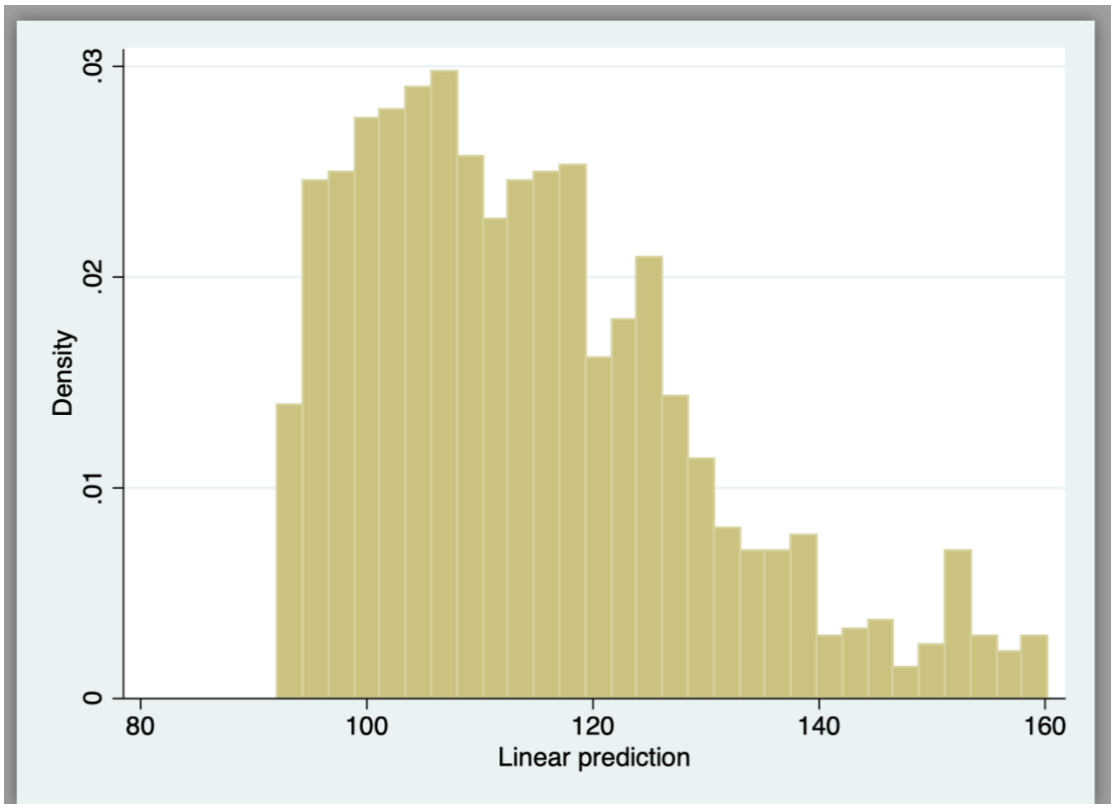
```
. reg food ln_income
```

Source	SS	df	MS	Number of obs	=	1,200
				F(1, 1198)	=	47.32
Model	240525.871	1	240525.871	Prob > F	=	0.0000
Residual	6089129.32	1,198	5082.74568	R-squared	=	0.0380
				Adj R-squared	=	0.0372
Total	6329655.19	1,199	5279.11192	Root MSE	=	71.293

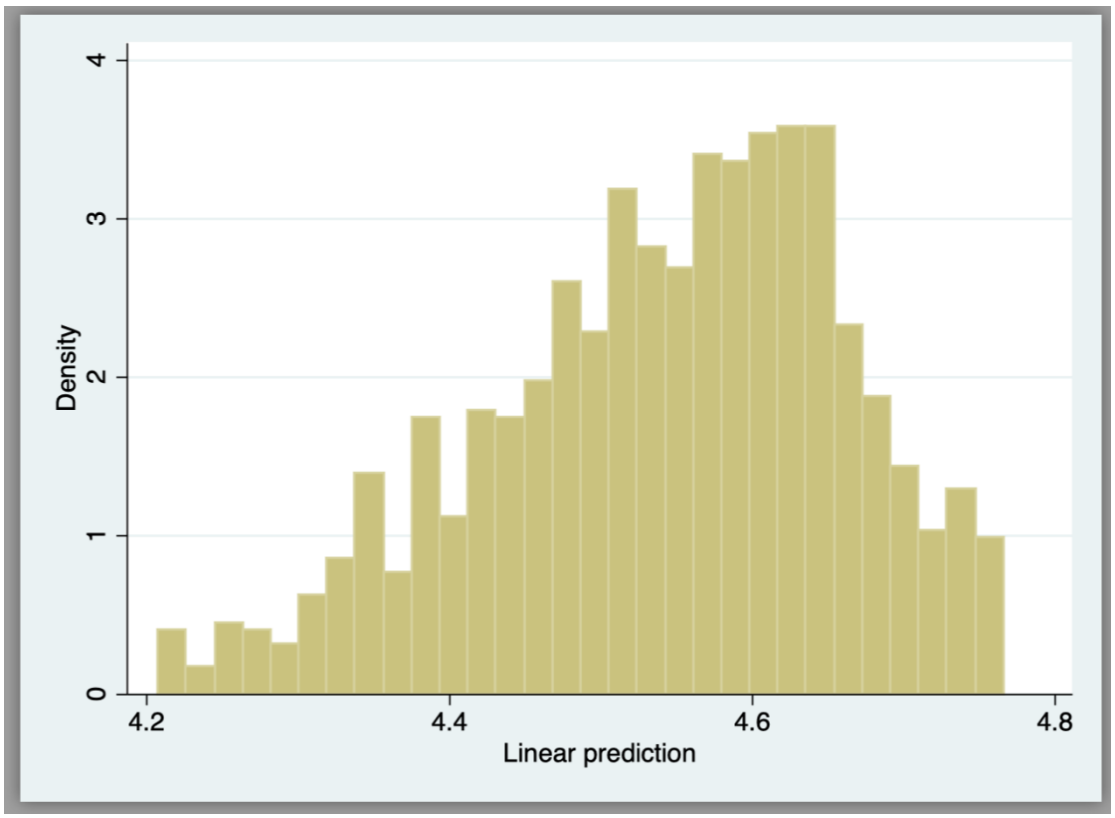
food	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ln_income	22.18738	3.225332	6.88	0.000	15.85946	28.51531
_cons	23.56848	13.3696	1.76	0.078	-2.661956	49.79892

(5)

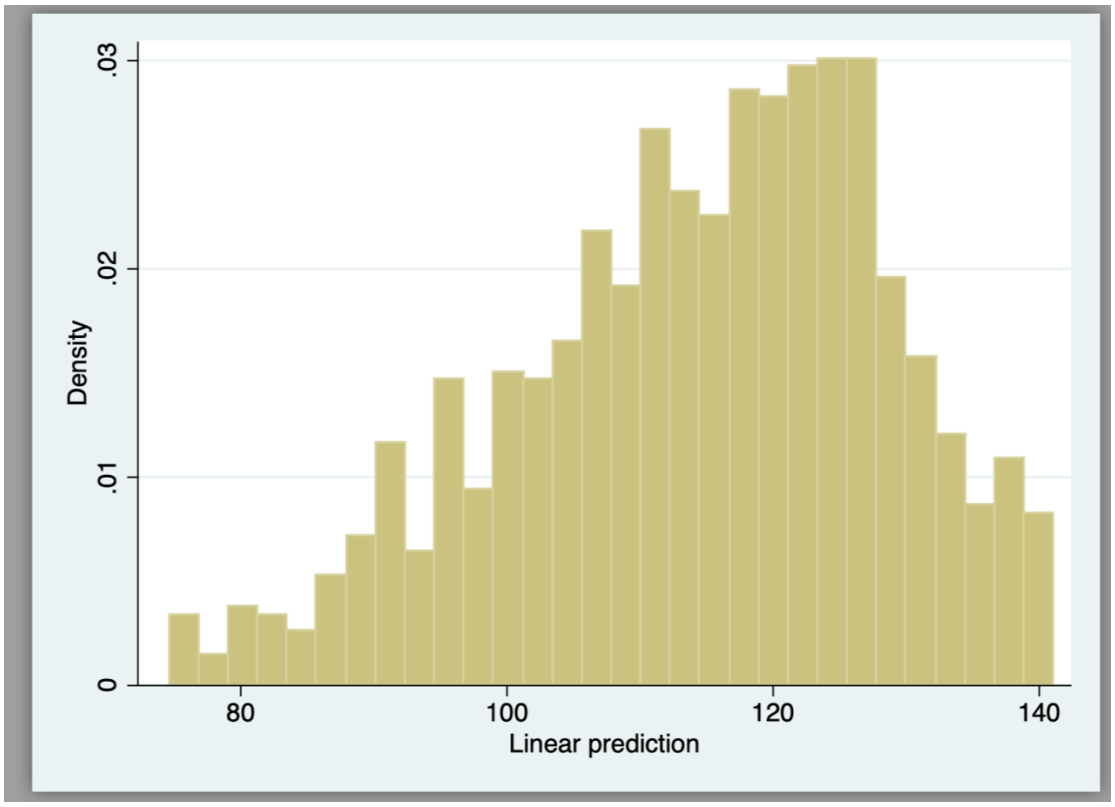
food_income



lnfood_lnincome



food_lnincome



(6)

4.

(1)

```
. eststo: reg crmrte prbarr prbpris prbconv polpc

      Source |       SS           df       MS      Number of obs   =       630
-------------+----------------------------------   F(4, 625)       =     68.73
       Model |  .06309754         4  .015774385   Prob > F        =    0.0000
    Residual |  .143444525      625  .000229511   R-squared       =    0.3055
-------------+----------------------------------   Adj R-squared   =    0.3011
       Total |  .206542066      629  .000328366   Root MSE        =    .01515

------------------------------------------------------------------------------
      crmrte |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      prbarr |  -.0501874   .0037177   -13.50   0.000    -.0574882   -.0428867
     prbpris |   .0239855   .0069494     3.45   0.001     .0103385    .0376324
     prbconv |  -.0032234   .0004027    -8.01   0.000    -.0040141   -.0024327
       polpc |   3.077274   .2599489    11.84   0.000     2.566795    3.587753
       _cons |   .0331286   .0032961    10.05   0.000     .0266559    .0396012
------------------------------------------------------------------------------
(est1 stored)
```

(2)

(3)如下圖，加入三變數後，與第一小題相比解釋能力由 30%提高 60%；而在 95%的顯著水準下，有兩變數無法拒絕虛無假設。

```
.  eststo: reg crmrte prbarr prbpris prbconv polpc prbarr2 density urban

      Source |       SS           df       MS      Number of obs   =       630
-------------+----------------------------------   F(7, 622)       =    149.84
       Model |  .129654337        7  .018522048   Prob > F        =    0.0000
    Residual |  .076887729      622  .000123614   R-squared       =    0.6277
-------------+----------------------------------   Adj R-squared   =    0.6235
       Total |  .206542066      629  .000328366   Root MSE        =    .01112

------------------------------------------------------------------------------
      crmrte |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      prbarr |  -.0433483    .005209    -8.32   0.000    -.0535776    -.033119
     prbpris |   .0071444   .0051866     1.38   0.169     -.003041    .0173298
     prbconv |  -.0022698   .0002992    -7.59   0.000    -.0028573   -.0016823
       polpc |   2.561623   .1925237    13.31   0.000     2.183548    2.939698
     prbarr2 |   .0070065   .0026173     2.68   0.008     .0018667    .0121462
     density |   .0075495   .0005619    13.44   0.000      .006446     .008653
       urban |  -.0012126   .0027188    -0.45   0.656    -.0065518    .0041266
       _cons |    .027301   .0026512    10.30   0.000     .0220947    .0325074
------------------------------------------------------------------------------
(est2 stored)
```