Statistics/Data Analysis

```
      name:  <unnamed>
       log:  C:\Users\eaj628\Documents\hwk5.smcl
  log type:  smcl
 opened on:   7 Nov 2016, 20:33:38

1 . /*
  >         Assignment 5
  >
  >         Evan Johnston
  > */
2 .
3 . set more off

4 . cd "\\tsclient\Stat Apps Server\hwk5"
  \\tsclient\Stat Apps Server\hwk5

5 .
6 . * problem 1
7 . use "\\tsclient\Stat Apps Server\Data Sets- STATA\kielmc.dta", clear

8 .
9 . * part 1.b
10. regress lprice ldist y81 y81ldist, robust

Linear regression                               Number of obs     =        321
                                                F(3, 317)         =      82.51
                                                Prob > F          =     0.0000
                                                R-squared         =     0.3958
                                                Root MSE          =      .3422

------------------------------------------------------------------------------
             |               Robust
      lprice |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ldist |    .316689   .0375356     8.44   0.000     .2428386    .3905395
         y81 |  -.0113101   .7619982    -0.01   0.988    -1.510523    1.487903
    y81ldist |   .0481862   .0765747     0.63   0.530    -.1024727     .198845
       _cons |   8.058468   .3747943    21.50   0.000     7.321069    8.795866
------------------------------------------------------------------------------

11.
12. * part 1.c
13. regress lprice ldist y81 y81ldist age agesq rooms baths lintst lland larea, robust

Linear regression                               Number of obs     =        321
                                                F(10, 310)        =     130.95
                                                Prob > F          =     0.0000
                                                R-squared         =     0.7870
                                                Root MSE          =      .20545

------------------------------------------------------------------------------
             |               Robust
      lprice |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ldist |   .0009226   .0461654     0.02   0.984    -.0899147    .0917598
         y81 |  -.2254466   .5031352    -0.45   0.654    -1.215439    .7645454
    y81ldist |   .0624668   .0505522     1.24   0.218     -.037002    .1619355
         age |  -.0080075   .0016001    -5.00   0.000    -.0111559    -.004859
       agesq |   .0000357   .0000107     3.35   0.001     .0000147    .0000567
       rooms |   .0461389   .0174623     2.64   0.009     .0117792    .0804986
       baths |   .1010478   .0277474     3.64   0.000     .0464508    .1556448
      lintst |  -.0599757   .0372422    -1.61   0.108    -.1332553    .0133038
       lland |   .0953425   .0334785     2.85   0.005     .0294687    .1612163
       larea |   .3507429   .0630758     5.56   0.000     .2266321    .4748538
       _cons |   7.673854    .533431    14.39   0.000      6.62425    8.723457
------------------------------------------------------------------------------
```

```
14.
15. * problem 2
16. use "\\tsclient\Stat Apps Server\Data Sets- STATA\children_sample.dta", clear

17. keep if white & male
  (1,023 observations deleted)

18.
19. * part 2.a
20. tabstat bmi, statistics(mean p10 p25 p50 p75 p90)
```

variable	mean	p10	p25	p50	p75	p90
bmi	**24.91896**	**20.2**	**21.7**	**24**	**27.4**	**30.95**

```
21.
22. * part 2.b
23. histogram bmi, title("Prob 2.b Histogram of BMI") xtitle("BMI")
  (bin=27, start=18, width=.81481481)

24. graph export bmi_hist.png, replace
  (file bmi_hist.png written in PNG format)

25.
26. * part 2.c
27. regress bmi educ age mombmi dadbmi, robust

  Linear regression                               Number of obs     =        770
                                                  F(4, 765)         =      28.24
                                                  Prob > F          =     0.0000
                                                  R-squared         =     0.1393
                                                  Root MSE          =     4.1536
```

bmi	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
educ	**.003787**	**.1008632**	**0.04**	**0.970**	**-.1942145**	**.2017884**
age	**.2799552**	**.069457**	**4.03**	**0.000**	**.1436063**	**.4163041**
mombmi	**.18911**	**.0310735**	**6.09**	**0.000**	**.1281105**	**.2501095**
dadbmi	**.1728275**	**.0402927**	**4.29**	**0.000**	**.0937301**	**.2519249**
_cons	**9.045149**	**1.718142**	**5.26**	**0.000**	**5.672316**	**12.41798**

```
28.
29. * part 2.d
30. sqreg bmi educ age mombmi dadbmi, reps(500)
  (fitting base model)

  Bootstrap replications (500)
  ----+--- 1 ---+--- 2 ---+--- 3 ---+--- 4 ---+--- 5
  ..................................................    50
  ..................................................   100
  ..................................................   150
  ..................................................   200
  ..................................................   250
  ..................................................   300
  ..................................................   350
  ..................................................   400
  ..................................................   450
  ..................................................   500

  Simultaneous quantile regression                Number of obs =        770
    bootstrap(500) SEs                            .50 Pseudo R2 =     0.0796
```

bmi	Coef.	Bootstrap Std. Err.	t	P>|t|	[95% Conf.	Interval]
q50						
educ	**.053927**	**.095389**	**0.57**	**0.572**	**-.1333284**	**.2411824**
age	**.3358445**	**.0726578**	**4.62**	**0.000**	**.1932121**	**.4784769**
mombmi	**.1315307**	**.0299993**	**4.38**	**0.000**	**.07264**	**.1904215**
dadbmi	**.1777306**	**.0426278**	**4.17**	**0.000**	**.0940493**	**.2614119**
_cons	**7.681324**	**1.684589**	**4.56**	**0.000**	**4.374357**	**10.98829**

```
31. display _b[mombmi]+_b[dadbmi]
```
.30926135

```
32. display _b[mombmi]+_b[dadbmi] - 1.645*(_se[mombmi]^2+_se[dadbmi]^2)^(1/2)
```
.22351463

```
33. display _b[mombmi]+_b[dadbmi] + 1.645*(_se[mombmi]^2+_se[dadbmi]^2)^(1/2)
```
.39500808

```
34.
35. test [q50]_b[mombmi]+[q50]_b[dadbmi]=0
```

(1) **[q50]mombmi + [q50]dadbmi = 0**

F(1, 765) = **47.41**
Prob > F = **0.0000**

```
36. sqreg bmi educ age mombmi dadbmi, reps(500)
(fitting base model)
```

Bootstrap replications (**500**)
```
----+--- 1 ---+--- 2 ---+--- 3 ---+--- 4 ---+--- 5
..................................................   50
..................................................   100
..................................................   150
..................................................   200
..................................................   250
..................................................   300
..................................................   350
..................................................   400
..................................................   450
..................................................   500
```

Simultaneous quantile regression — Number of obs = **770**
bootstrap(**500**) SEs — .50 Pseudo R2 = **0.0796**

bmi	Coef.	Bootstrap Std. Err.	t	P>|t|	[95% Conf.	Interval]
q50						
educ	**.053927**	**.0953592**	**0.57**	**0.572**	**-.1332697**	**.2411237**
age	**.3358445**	**.0734154**	**4.57**	**0.000**	**.1917248**	**.4799641**
mombmi	**.1315307**	**.0289109**	**4.55**	**0.000**	**.0747766**	**.1882849**
dadbmi	**.1777306**	**.0411757**	**4.32**	**0.000**	**.0968999**	**.2585613**
_cons	**7.681324**	**1.732818**	**4.43**	**0.000**	**4.279682**	**11.08297**

```
37.
38. * part 2.e
39. sqreg bmi educ age mombmi dadbmi, q(0.1 0.25 0.5 0.75 0.9) reps(500)
  (fitting base model)

  Bootstrap replications (500)
  ----+--- 1 ---+--- 2 ---+--- 3 ---+--- 4 ---+--- 5
  ..................................................   50
  ..................................................  100
  ..................................................  150
  ..................................................  200
  ..................................................  250
  ..................................................  300
  ..................................................  350
  ..................................................  400
  ..................................................  450
  ..................................................  500

  Simultaneous quantile regression                    Number of obs =       770
    bootstrap(500) SEs                                .10 Pseudo R2 =    0.0478
                                                      .25 Pseudo R2 =    0.0771
                                                      .50 Pseudo R2 =    0.0796
                                                      .75 Pseudo R2 =    0.0755
                                                      .90 Pseudo R2 =    0.1118
```

bmi	Coef.	Bootstrap Std. Err.	t	P>|t|	[95% Conf.	Interval]
q10						
educ	.0772834	.1235319	0.63	0.532	-.1652182	.3197851
age	.1946482	.0698067	2.79	0.005	.0576128	.3316836
mombmi	.0804205	.0360021	2.23	0.026	.0097458	.1510952
dadbmi	.1088267	.0330882	3.29	0.001	.0438723	.1737811
_cons	10.43543	1.715918	6.08	0.000	7.066968	13.8039
q25						
educ	.0720729	.1189237	0.61	0.545	-.1613827	.3055285
age	.2089615	.0760369	2.75	0.006	.0596957	.3582273
mombmi	.1358798	.0298638	4.55	0.000	.0772551	.1945046
dadbmi	.1055299	.0378546	2.79	0.005	.0312187	.1798411
_cons	10.02518	1.734198	5.78	0.000	6.620828	13.42953
q50						
educ	.053927	.0921823	0.59	0.559	-.1270333	.2348873
age	.3358445	.0688193	4.88	0.000	.2007473	.4709416
mombmi	.1315307	.0318739	4.13	0.000	.0689601	.1941014
dadbmi	.1777306	.0406823	4.37	0.000	.0978684	.2575928
_cons	7.681324	1.670466	4.60	0.000	4.402083	10.96056
q75						
educ	.042771	.1831741	0.23	0.815	-.3168125	.4023545
age	.3557238	.1102139	3.23	0.001	.1393662	.5720814
mombmi	.2982242	.0756404	3.94	0.000	.1497368	.4467117
dadbmi	.216229	.1031027	2.10	0.036	.0138312	.4186269
_cons	5.228177	3.170501	1.65	0.100	-.9957382	11.45209
q90						
educ	-.1577382	.2562945	-0.62	0.538	-.6608621	.3453857
age	.3642897	.1744791	2.09	0.037	.0217751	.7068044
mombmi	.3438461	.071468	4.81	0.000	.2035494	.4841428
dadbmi	.2529488	.0752656	3.36	0.001	.1051972	.4007003
_cons	8.846463	5.200795	1.70	0.089	-1.363061	19.05599

```
40.
41. test [q10]_b[age]=[q25]_b[age]=[q50]_b[age]=[q75]_b[age]=[q90]_b[age]

   ( 1)  [q10]age - [q25]age = 0
   ( 2)  [q10]age - [q50]age = 0
   ( 3)  [q10]age - [q75]age = 0
   ( 4)  [q10]age - [q90]age = 0

         F(  4,   765) =    0.96
              Prob > F =    0.4276

42.
43. test [q50=q90]:mombmi dadbmi

   ( 1)  [q50]mombmi - [q90]mombmi = 0
   ( 2)  [q50]dadbmi - [q90]dadbmi = 0

         F(  2,   765) =    5.76
              Prob > F =    0.0033

44.
45. predict q10_hat, eq(#1)
  (option xb assumed; fitted values)

46. predict q90_hat, eq(#5)
  (option xb assumed; fitted values)

47. sum q10_hat q90_hat

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
     q10_hat |        770    20.73985    .9711759   18.63854   24.17451
     q90_hat |        770    30.82972    2.633856    25.5187   39.47755

48.
49. * problem 4
50. use "\\tsclient\Stat Apps Server\Data Sets- STATA\loanapp.dta", clear

51.
52. * part 4.a
53. regress approve white, robust

  Linear regression                               Number of obs     =      1,989
                                                  F(1, 1987)        =      55.75
                                                  Prob > F          =     0.0000
                                                  R-squared         =     0.0489
                                                  Root MSE          =      .3201

------------------------------------------------------------------------------
             |               Robust
     approve |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       white |   .2005957   .0268651     7.47   0.000      .147909    .2532824
       _cons |   .7077922   .0259264    27.30   0.000     .6569465     .758638
------------------------------------------------------------------------------

54. predict phat_lpm
  (option xb assumed; fitted values)

55. probit approve white

  Iteration 0:   log likelihood = -740.34659
  Iteration 1:   log likelihood = -701.33221
  Iteration 2:   log likelihood = -700.87747
  Iteration 3:   log likelihood = -700.87744

  Probit regression                               Number of obs     =      1,989
                                                  LR chi2(1)        =      78.94
                                                  Prob > chi2       =     0.0000
  Log likelihood = -700.87744                     Pseudo R2         =     0.0533
```

approve	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
white	.7839465	.0867118	9.04	0.000	.6139946	.9538985
_cons	.5469463	.075435	7.25	0.000	.3990964	.6947962

```
56. predictnl phat_prob=normal(xb(#1))

57. sum phat_lpm phat_prob if white
```

Variable	Obs	Mean	Std. Dev.	Min	Max
phat_lpm	1,681	.9083878	0	.9083878	.9083878
phat_prob	1,681	.9083878	0	.9083878	.9083878

```
58. sum phat_lpm phat_prob if !white
```

Variable	Obs	Mean	Std. Dev.	Min	Max
phat_lpm	308	.7077922	0	.7077922	.7077922
phat_prob	308	.7077922	0	.7077922	.7077922

```
59.
60. * part 4.b
61. regress approve white hrat obrat loanprc unem male married dep sch cosign ///
  >         chist pubrec mortlat1 mortlat2 vr, robust
```

Linear regression

Number of obs	= 1,971
F(15, 1955)	= 14.98
Prob > F	= 0.0000
R-squared	= 0.1656
Root MSE	= .30208

approve	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
white	.1288196	.0258693	4.98	0.000	.0780852	.179554
hrat	.001833	.001467	1.25	0.212	-.0010441	.0047101
obrat	-.0054318	.001331	-4.08	0.000	-.0080421	-.0028215
loanprc	-.1473001	.0378351	-3.89	0.000	-.2215013	-.0730988
unem	-.0072989	.0037122	-1.97	0.049	-.0145792	-.0000187
male	-.0041441	.0193044	-0.21	0.830	-.0420035	.0337152
married	.0458241	.0172374	2.66	0.008	.0120186	.0796296
dep	-.0068274	.0069038	-0.99	0.323	-.0203669	.0067122
sch	.0017525	.017146	0.10	0.919	-.0318739	.0353789
cosign	.0097722	.0395825	0.25	0.805	-.0678561	.0874005
chist	.1330267	.0246202	5.40	0.000	.0847421	.1813114
pubrec	-.2419268	.0427922	-5.65	0.000	-.3258498	-.1580037
mortlat1	-.0572511	.0662234	-0.86	0.387	-.1871269	.0726247
mortlat2	-.1137234	.0910697	-1.25	0.212	-.2923274	.0648806
vr	-.0314408	.0144855	-2.17	0.030	-.0598493	-.0030322
_cons	.9367312	.0593886	15.77	0.000	.8202595	1.053203

```
62. probit approve white hrat obrat loanprc unem male married dep sch cosign ///
  >         chist pubrec mortlat1 mortlat2 vr

Iteration 0:   log likelihood = -737.97933
Iteration 1:   log likelihood =  -603.5925
Iteration 2:   log likelihood = -600.27774
Iteration 3:   log likelihood = -600.27099
Iteration 4:   log likelihood = -600.27099
```

Probit regression

Number of obs	= 1,971
LR chi2(15)	= 275.42
Prob > chi2	= 0.0000
Log likelihood = -600.27099	Pseudo R2 = 0.1866

approve	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
white	.5202525	.0969588	5.37	0.000	.3302168	.7102883
hrat	.0078763	.0069616	1.13	0.258	-.0057682	.0215209
obrat	-.0276924	.0060493	-4.58	0.000	-.0395488	-.015836
loanprc	-1.011969	.2372396	-4.27	0.000	-1.47695	-.5469881
unem	-.0366849	.0174807	-2.10	0.036	-.0709464	-.0024234
male	-.0370014	.1099273	-0.34	0.736	-.2524549	.1784521
married	.2657469	.0942523	2.82	0.005	.0810159	.4504779
dep	-.0495756	.0390573	-1.27	0.204	-.1261266	.0269753
sch	.0146496	.0958421	0.15	0.879	-.1731974	.2024967
cosign	.0860713	.2457509	0.35	0.726	-.3955917	.5677343
chist	.5852812	.0959715	6.10	0.000	.3971805	.7733818
pubrec	-.7787405	.12632	-6.16	0.000	-1.026323	-.5311578
mortlat1	-.1876237	.2531127	-0.74	0.459	-.6837153	.308468
mortlat2	-.4943562	.3265563	-1.51	0.130	-1.134395	.1456823
vr	-.2010621	.0814934	-2.47	0.014	-.3607862	-.041338
_cons	2.062327	.3131763	6.59	0.000	1.448512	2.676141

```
63. dprobit approve white hrat obrat loanprc unem male married dep sch cosign ///
  >         chist pubrec mortlat1 mortlat2 vr

Iteration 0:   log likelihood = -737.97933
Iteration 1:   log likelihood = -604.00737
Iteration 2:   log likelihood = -600.29775
Iteration 3:   log likelihood =   -600.271
Iteration 4:   log likelihood = -600.27099

Probit regression, reporting marginal effects           Number of obs =   1971
                                                        LR chi2(15)   = 275.42
                                                        Prob > chi2   = 0.0000
Log likelihood = -600.27099                             Pseudo R2     = 0.1866
```

approve	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
white*	.105747	.0238572	5.37	0.000	.846271	.058988	.152506
hrat	.0012721	.001125	1.13	0.258	24.8001	-.000933	.003477
obrat	-.0044726	.0009767	-4.58	0.000	32.3898	-.006387	-.002558
loanprc	-.1634429	.0377172	-4.27	0.000	.770431	-.237367	-.089519
unem	-.005925	.0028221	-2.10	0.036	3.88853	-.011456	-.000394
male*	-.0058835	.0172023	-0.34	0.736	.813293	-.039599	.027832
married*	.045491	.0170053	2.82	0.005	.659564	.012161	.078821
dep	-.0080069	.0062996	-1.27	0.204	.771689	-.020354	.00434
sch*	.0023787	.0156447	0.15	0.879	.770167	-.028284	.033042
cosign*	.0131566	.0354702	0.35	0.726	.028919	-.056364	.082677
chist*	.1213625	.0241973	6.10	0.000	.836631	.073937	.168788
pubrec*	-.1867903	.0401938	-6.16	0.000	.068493	-.265569	-.108012
mortlat1*	-.0341006	.0512925	-0.74	0.459	.01928	-.134632	.066431
mortlat2*	-.1075809	.0898849	-1.51	0.130	.010654	-.283752	.06859
vr*	-.0333289	.0138068	-2.47	0.014	.407915	-.06039	-.006268
obs. P	.876205						
pred. P	.910656	(at x-bar)					

(*) dF/dx is for discrete change of dummy variable from 0 to 1
    z and P>|z| correspond to the test of the underlying coefficient being 0

```
64. margins, dydx(white obrat)

  Average marginal effects                        Number of obs     =      1,971
  Model VCE    : OIM

  Expression   : Pr(approve), predict()
  dy/dx w.r.t. : white obrat
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf.	Interval]
white	.0863868	.015954	5.41	0.000	.0551176	.117656
obrat	-.0045983	.0010014	-4.59	0.000	-.0065611	-.0026355

```
65. margins, at(obrat=(10 20 30 40 50))

  Predictive margins                              Number of obs     =      1,971
  Model VCE    : OIM

  Expression   : Pr(approve), predict()

  1._at        : obrat           =          10

  2._at        : obrat           =          20

  3._at        : obrat           =          30

  4._at        : obrat           =          40

  5._at        : obrat           =          50
```

	Margin	Delta-method Std. Err.	z	P>|z|	[95% Conf.	Interval]
_at						
1	.9557235	.0115005	83.10	0.000	.9331829	.9782641
2	.9301198	.0103502	89.86	0.000	.9098337	.9504058
3	.8937073	.0071577	124.86	0.000	.8796784	.9077362
4	.8443558	.0113796	74.20	0.000	.8220523	.8666593
5	.780819	.0274912	28.40	0.000	.7269372	.8347008

```
66. marginsplot

    Variables that uniquely identify margins: obrat

67. graph export obrat_margins.png, replace
  (note: file obrat_margins.png not found)
  (file obrat_margins.png written in PNG format)

68.
69. margins, dydx(obrat) at(obrat=(10 20 30 40 50))

  Average marginal effects                        Number of obs     =      1,971
  Model VCE    : OIM

  Expression   : Pr(approve), predict()
  dy/dx w.r.t. : obrat

  1._at        : obrat           =          10

  2._at        : obrat           =          20

  3._at        : obrat           =          30

  4._at        : obrat           =          40

  5._at        : obrat           =          50
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf.	Interval]
obrat						
_at						
1	**-.0021007**	**.0001253**	**-16.76**	**0.000**	**-.0023463**	**-.0018551**
2	**-.0030611**	**.0003848**	**-7.95**	**0.000**	**-.0038154**	**-.0023068**
3	**-.0042579**	**.0008586**	**-4.96**	**0.000**	**-.0059407**	**-.0025751**
4	**-.0056343**	**.0014612**	**-3.86**	**0.000**	**-.0084982**	**-.0027703**
5	**-.0070696**	**.0020794**	**-3.40**	**0.001**	**-.0111452**	**-.0029939**

```
70. marginsplot

    Variables that uniquely identify margins: obrat

71. graph export obrat_APEs.png, replace
  (note: file obrat_APEs.png not found)
  (file obrat_APEs.png written in PNG format)

72.
73. * part 4.c
74. probit approve white hrat obrat loanprc unem male married dep sch cosign ///
  >         chist pubrec mortlat1 mortlat2 vr

  Iteration 0:   log likelihood = -737.97933
  Iteration 1:   log likelihood =  -603.5925
  Iteration 2:   log likelihood = -600.27774
  Iteration 3:   log likelihood = -600.27099
  Iteration 4:   log likelihood = -600.27099

  Probit regression                                 Number of obs     =      1,971
                                                    LR chi2(15)       =     275.42
                                                    Prob > chi2       =     0.0000
  Log likelihood = -600.27099                       Pseudo R2         =     0.1866
```

approve	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
white	**.5202525**	**.0969588**	**5.37**	**0.000**	**.3302168**	**.7102883**
hrat	**.0078763**	**.0069616**	**1.13**	**0.258**	**-.0057682**	**.0215209**
obrat	**-.0276924**	**.0060493**	**-4.58**	**0.000**	**-.0395488**	**-.015836**
loanprc	**-1.011969**	**.2372396**	**-4.27**	**0.000**	**-1.47695**	**-.5469881**
unem	**-.0366849**	**.0174807**	**-2.10**	**0.036**	**-.0709464**	**-.0024234**
male	**-.0370014**	**.1099273**	**-0.34**	**0.736**	**-.2524549**	**.1784521**
married	**.2657469**	**.0942523**	**2.82**	**0.005**	**.0810159**	**.4504779**
dep	**-.0495756**	**.0390573**	**-1.27**	**0.204**	**-.1261266**	**.0269753**
sch	**.0146496**	**.0958421**	**0.15**	**0.879**	**-.1731974**	**.2024967**
cosign	**.0860713**	**.2457509**	**0.35**	**0.726**	**-.3955917**	**.5677343**
chist	**.5852812**	**.0959715**	**6.10**	**0.000**	**.3971805**	**.7733818**
pubrec	**-.7787405**	**.12632**	**-6.16**	**0.000**	**-1.026323**	**-.5311578**
mortlat1	**-.1876237**	**.2531127**	**-0.74**	**0.459**	**-.6837153**	**.308468**
mortlat2	**-.4943562**	**.3265563**	**-1.51**	**0.130**	**-1.134395**	**.1456823**
vr	**-.2010621**	**.0814934**	**-2.47**	**0.014**	**-.3607862**	**-.041338**
_cons	**2.062327**	**.3131763**	**6.59**	**0.000**	**1.448512**	**2.676141**

```
75. estimates store A
```

```
76. test _b[hrat]=_b[male]=_b[dep]=_b[sch]=_b[cosign]=_b[mortlat1]=_b[mortlat2]=0

   ( 1)  [approve]hrat - [approve]male = 0
   ( 2)  [approve]hrat - [approve]dep = 0
   ( 3)  [approve]hrat - [approve]sch = 0
   ( 4)  [approve]hrat - [approve]cosign = 0
   ( 5)  [approve]hrat - [approve]mortlat1 = 0
   ( 6)  [approve]hrat - [approve]mortlat2 = 0
   ( 7)  [approve]hrat = 0

           chi2(  7) =    6.80
         Prob > chi2 =    0.4497

77.
78. * make sample sizes equal
79. keep if hrat!=. & male!=. & dep!=. & sch!=. & cosign!=. & mortlat1!=. & mortlat2!=.
  (18 observations deleted)

80. probit approve white obrat loanprc unem married chist pubrec vr

  Iteration 0:   log likelihood = -737.97933
  Iteration 1:   log likelihood = -606.68163
  Iteration 2:   log likelihood =   -603.616
  Iteration 3:   log likelihood = -603.61093
  Iteration 4:   log likelihood = -603.61093

  Probit regression                                 Number of obs     =      1,971
                                                    LR chi2(8)        =     268.74
                                                    Prob > chi2       =     0.0000
  Log likelihood = -603.61093                       Pseudo R2         =     0.1821

------------------------------------------------------------------------------
     approve |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       white |   .5308174   .0956405     5.55   0.000     .3433654    .7182693
       obrat |  -.0236467   .0046837    -5.05   0.000    -.0328266   -.0144669
     loanprc |  -.9740448   .2327635    -4.18   0.000    -1.430253   -.5178366
        unem |  -.0413479   .0170407    -2.43   0.015     -.074747   -.0079488
     married |   .2124122   .0827187     2.57   0.010     .0502865    .3745378
       chist |   .5968342   .0949918     6.28   0.000     .4106537    .7830148
      pubrec |  -.8021824   .1257496    -6.38   0.000    -1.048647   -.5557177
          vr |  -.1909832   .0808906    -2.36   0.018    -.3495259   -.0324406
       _cons |   2.060327   .2852939     7.22   0.000     1.501161    2.619493
------------------------------------------------------------------------------

81. estimates store B

82. lrtest A

  Likelihood-ratio test                             LR chi2(7)  =      6.68
  (Assumption: B nested in A)                       Prob > chi2 =    0.4630

83.
84. log close
       name:  <unnamed>
        log:  C:\Users\eaj628\Documents\hwk5.smcl
   log type:  smcl
  closed on:   7 Nov 2016, 20:35:23
```