```
************************************
* A Practical Guide to Using Panel Data
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* ISER, University of Essex
* Chapter 14
************************************

-------------------------------------------------------------------------------------------------
      name:  <unnamed>
       log:  C:\My Documents\chapter14\Example_Chapter14.log
  log type:  text
 opened on:   1 Sep 2014, 15:37:28

.
. use DatasetR.dta, clear

.
. * 14.2. Tables of Descriptive Statistics
. *---------------------------------------
.
. * 14.2.1. Using the Collapse Command
. *---------------------------------------
.
. use DatasetR.dta, clear

.
. recode region2 (1/9 = 1) (10 = 2) (11 = 3) (12 = 4), gen(Country)
(13974 differences between region2 and Country)

. label var Country "Country of residence"

. label define Country 1 "England" 2 "Wales" 3 "Scotland" 4 "Northern Ireland"

. label value Country Country

.
. * Totals by row (country)
.
. bysort Country: egen X_NotMarried = total(Married==0)

. bysort Country: egen X_Married = total(Married==1)

. egen N_NotMarried = total(Married==0) if Country < .
(84 missing values generated)

. egen N_Married = total(Married==1) if Country < .
(84 missing values generated)

.
.
. keep Country X_* N_*

. bysort Country: keep if _n==1
(14414 observations deleted)

.
. generate T_NotMarried = X_NotMarried / N_NotMarried
(1 missing value generated)

. generate T_Married = X_Married / N_Married
(1 missing value generated)

.
. label var T_NotMarried ///
>         "Proportion of not married or cohabiting people living in country"

. label var T_Married ///
>         "Proportion of people married or cohabiting people living in country"

.
. drop if Country == .
(1 observation deleted)
```

```
. list

     +-------------------------------------------------------------------------------+
     |          Country   X_NotM~d   X_Marr~d   N_NotM~d   N_Marr~d   T_NotM~d   T_Marr~d |
     |-------------------------------------------------------------------------------|
  1. |          England       2330       4757       5128       9167   .4543682   .5189266 |
  2. |            Wales        944       1603       5128       9167   .1840874   .1748664 |
  3. |         Scotland        925       1533       5128       9167   .1803822   .1672303 |
  4. | Northern Ireland        929       1274       5128       9167   .1811623   .1389768 |
     +-------------------------------------------------------------------------------+


. * add one more line of observation and populate it
. set obs 6
obs was 4, now 6

. replace T_Married    = N_Married[1]    if _n==6
(1 real change made)

. replace T_NotMarried = N_NotMarried[1] if _n==6
(1 real change made)

. replace Country      = 6               if _n==6
(1 real change made)

. replace T_Married    = 1 if _n==5
(1 real change made)

. replace T_NotMarried = 1 if _n==5
(1 real change made)

. replace Country      = 5 if _n==5
(1 real change made)

. label define Country 5 "Total %" 6 "Observations", modify

. generate CountryString = "England"          if Country == 1
(5 missing values generated)

. replace  CountryString = "Wales"            if Country == 2
(1 real change made)

. replace  CountryString = "Scotland"         if Country == 3
CountryString was str7 now str8
(1 real change made)

. replace  CountryString = "Northern Ireland" if Country == 4
CountryString was str8 now str16
(1 real change made)

. replace  CountryString = "Total"            if Country == 6
(1 real change made)

. keep Country CountryString T_NotMarried T_Married

. order Country CountryString T_NotMarried T_Married

. save "$analysisdir\DescriptiveTableMethod1.dta", replace
file C:\My Documents\chapter14\DescriptiveTableMethod1.dta saved

. export excel using "$analysisdir\DescriptiveTableMethod1.xls", ///
>         replace firstrow(variable)
file C:\My Documents\chapter14\DescriptiveTableMethod1.xls saved

.
.
```

```
. * 14.2.2. Using the Saved Results
. *---------------------------------------
.
. use DatasetR.dta, clear

.
. recode region2 (1/9 = 1) (10 = 2) (11 = 3) (12 = 4), gen(Country)
(13974 differences between region2 and Country)

. label var Country "Country of residence"

. label define Country 1 "England" 2 "Wales" 3 "Scotland" 4 "Northern Ireland"

. label value Country Country

.
. generate Names = ""
(14419 missing values generated)

. replace Names = "England" in 1
Names was str1 now str7
(1 real change made)

. replace Names = "Wales" in 2
(1 real change made)

. replace Names = "Scotland" in 3
Names was str7 now str8
(1 real change made)

. replace Names = "Northern Ireland" in 4
Names was str8 now str16
(1 real change made)

. replace Names = "Total %" in 5
(1 real change made)

. replace Names = "Observations" in 6
(1 real change made)

.
. generate T_NotMarried = .
(14419 missing values generated)

. generate T_Married = .
(14419 missing values generated)

.
. tabulate Country Married, col matcell(Total)

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

                |  Whether married or
      Country of |      cohabiting
       residence |         0          1 |     Total
-----------------+----------------------+----------
         England |     2,330      4,757 |     7,087
                 |     45.44      51.89 |     49.58
-----------------+----------------------+----------
           Wales |       944      1,603 |     2,547
                 |     18.41      17.49 |     17.82
-----------------+----------------------+----------
        Scotland |       925      1,533 |     2,458
                 |     18.04      16.72 |     17.19
-----------------+----------------------+----------
Northern Ireland |       929      1,274 |     2,203
                 |     18.12      13.90 |     15.41
-----------------+----------------------+----------
```

```
           Total |     5,128      9,167 |    14,295
                 |    100.00     100.00 |    100.00


. matrix list Total

Total[4,2]
      c1    c2
r1  2330  4757
r2   944  1603
r3   925  1533
r4   929  1274


.
. local i = 1

. while `i' <= 4  {
  2.         replace T_NotMarried = Total[`i',1] in `i'
  3.         replace T_Married = Total[`i',2] in `i'
  4.         local i = `i' + 1
  5.         }
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)

. * browse Names T_*
.
. * Proportions by row
. *------------------
. *generate Percentage = .
. *generate Total = T_NotMarried + T_Married
. *foreach var of varlist T_NotMarried T_Married {
. *       replace `var' = `var' / Total in 1/4
. *       }
. *replace Percentage = T_NotMarried + T_Married
. * browse Names T_* Total Percentage
.
. * Proportions by column
. *------------------
. tab Country if Married == 0

      Country of |
       residence |      Freq.     Percent        Cum.
-----------------+-----------------------------------
         England |      2,330       45.44       45.44
           Wales |        944       18.41       63.85
        Scotland |        925       18.04       81.88
Northern Ireland |        929       18.12      100.00
-----------------+-----------------------------------
           Total |      5,128      100.00

. replace T_NotMarried = r(N) in 5/6
(2 real changes made)

. generate Tempo = r(N) in 1/5
(14414 missing values generated)

. replace T_NotMarried = T_NotMarried / Tempo in 1/5
(5 real changes made)

. drop Tempo

. tab Country if Married == 1

      Country of |
       residence |      Freq.     Percent        Cum.
-----------------+-----------------------------------
         England |      4,757       51.89       51.89
```

```
          Wales |      1,603       17.49       69.38
       Scotland |      1,533       16.72       86.10
Northern Ireland |      1,274       13.90      100.00
-----------------+-----------------------------------
          Total |      9,167      100.00

. replace T_Married = r(N) in 5/6
(2 real changes made)

. generate Tempo = r(N) in 1/5
(14414 missing values generated)

. replace T_Married = T_Married / Tempo in 1/5
(5 real changes made)

. drop Tempo

. * browse Names T_*
.
. * Save into table *
. * If we computed proportions by row:
. * keep Names T_* Percentage Total
. * If we computed proportions by column:
. keep Names T_*

. keep in 1/6
(14413 observations deleted)

. rename Names Country

. order Country T_NotMarried T_Married

. export excel using "$analysisdir\DescriptiveTableMethod2", ///
>         firstrow(varlabels) replace
file C:\My Documents\chapter14\DescriptiveTableMethod2.xls saved

.
.
.
. * 14.2.3. Using the collapse command
. *----------------------------------------
. use DatasetR.dta, clear

.
. recode region2 (1/9 = 1) (10 = 2) (11 = 3) (12 = 4), gen(Country)
(13974 differences between region2 and Country)

.
. keep if Country<.
(84 observations deleted)

. save temp, replace
(note: file temp.dta not found)
file temp.dta saved

.
. tabstat Married, by(Country) s(mean n)

Summary for variables: Married
     by categories of: Country (RECODE of region2 (government office region))

 Country |      mean         N
---------+--------------------
       1 |   .671229      7087
       2 |  .6293679      2547
       3 |  .6236778      2458
       4 |  .5783023      2203
---------+--------------------
   Total |  .6412732     14295
-----------------------------

.
. use temp, clear
```

```
. collapse (mean) ProportionMarried=Married ///
>         (count) Number_Observations = Married, by(Country)

. list

     +------------------------------+
     | Country   Propor~d   Number~s |
     |------------------------------|
  1. |       1    .671229       7087 |
  2. |       2   .6293679       2547 |
  3. |       3   .6236778       2458 |
  4. |       4   .5783023       2203 |
     +------------------------------+

. save temp1, replace
(note: file temp1.dta not found)
file temp1.dta saved

.
. use temp, clear

. collapse (mean) ProportionMarried=Married ///
>         (count) Number_Observations = Married

. generate Country = 5

. append using temp1

.
. label var Country "Country of residence"

. label define Country 5 "UK" 1 "England" 2 "Wales" 3 "Scotland" ///
>         4 "Northern Ireland"

. label value Country Country

.
. list

     +---------------------------------------+
     | Propor~d   Number~s            Country |
     |---------------------------------------|
  1. | .6412732      14295                 UK |
  2. |  .671229       7087            England |
  3. | .6293679       2547              Wales |
  4. | .6236778       2458           Scotland |
  5. | .5783023       2203   Northern Ireland |
     +---------------------------------------+

.
. sort Country

. order Country ProportionMarried Number_Observations

. export excel using "$analysisdir\DescriptiveTableMethod3.xls", ///
>         replace firstrow(variable)
file C:\My Documents\chapter14\DescriptiveTableMethod3.xls saved

.
. erase temp.dta

. erase temp1.dta

.
.
. * 14.3 Graphs of Descriptive Statistics
. *----------------------------------------
.
. * 14.3.1 Bar Graphs
. *----------------------------------------
.
. graph bar ProportionMarried, ///
```

```
>   over(Country, label(angle(45))) ytitle("Proportion") ///
>   scheme(s1manual) title("Proportion married - UK countries") ///
>   note("Source: BHPS wave 18") ///
>   saving("$analysisdir\PropMarried1.gph", replace)
(file C:\My Documents\chapter14\PropMarried1.gph saved)

.
. graph export "$analysisdir\PropMarried1.pdf", replace
(file C:\My Documents\chapter14\PropMarried1.pdf written in PDF format)

.
.
. use DatasetR.dta, clear

. recode region2 (1/9 = 1) (10 = 2) (11 = 3) (12 = 4), gen(Country)
(13974 differences between region2 and Country)

. keep if Country<.
(84 observations deleted)

. keep if Female<.
(733 observations deleted)

.
. collapse (mean) ProportionMarried=Married, by(Country Female)

. label define Country 5 "UK" 1 "England" 2 "Wales" 3 "Scotland" ///
>         4 "Northern Ireland"

. label value Country Country

. label define Female 0 "Men" 1 "Women"

. lab value Female Female

. list

     +-------------------------------------+
     | Female            Country   Propor~d |
     |-------------------------------------|
  1. |    Men            England   .7023121 |
  2. |  Women            England   .6499442 |
  3. |    Men              Wales   .6792453 |
  4. |  Women              Wales   .5913571 |
  5. |    Men           Scotland   .6640927 |
     |-------------------------------------|
  6. |  Women           Scotland   .5987159 |
  7. |    Men   Northern Ireland   .6278118 |
  8. |  Women   Northern Ireland   .5387755 |
     +-------------------------------------+

.
. graph bar ProportionMarried, ///
>   over(Country, label(angle(45))) over(Female) ///
>   ytitle("Proportion") scheme(s1manual) ///
>   title("Proportion married across UK countries") ///
>   note("Source: BHPS wave 18") ///
>   saving("$analysisdir\PropMarried2.gph", replace)
(file C:\My Documents\chapter14\PropMarried2.gph saved)

.
.
. use DatasetR.dta, clear

. recode region2 (1/9 = 1) (10 = 2) (11 = 3) (12 = 4), gen(Country)
(13974 differences between region2 and Country)

. keep if Country<.
(84 observations deleted)

.
. collapse (mean) Q1 Q2 Q3 Q4 Q5 Q6, by(Country)
```

```
. label define Country 5 "UK" 1 "England" 2 "Wales" 3 "Scotland" ///
>         4 "Northern Ireland"

. label value Country Country

.
. graph hbar Q1 Q2 Q3 Q4 Q5 Q6, stack ///
>         over(Country, label(angle(45))) ///
>         ytitle("Proportion") ///
>         title("Composition across UK countries") ///
>         note("Source: BHPS wave 18") ///
>         scheme(s1manual) ///
>         legend(label(1 "1st or higher") ///
>              label(2 "HND,HNC,teaching") ///
>              label(3 "A level") ///
>              label(4 "O Level") ///
>              label(5 "CSE") ///
>                  label(6 "None")) ///
>         saving("$analysisdir\PropEdu1.gph", replace)
(file C:\My Documents\chapter14\PropEdu1.gph saved)

.
.
. use DatasetR.dta, clear

. recode region2 (1/9 = 1) (10 = 2) (11 = 3) (12 = 4), gen(Country)
(13974 differences between region2 and Country)

. keep if Country<.
(84 observations deleted)

.
. graph hbar Q1 Q2 Q3 Q4 Q5 Q6, stack ///
>         over(Country, relabel(1 "England" 2 "Wales" 3 "Scotland" ///
>         4 "Northern Ireland") label(angle(45))) ///
>         ytitle("Proportion") ///
>         title("Composition across UK countries") ///
>         scheme(s1manual) ///
>         note("Source: BHPS wave 18") ///
>         legend(label(1 "1st or higher") ///
>              label(2 "HND,HNC,teaching") ///
>              label(3 "A level") ///
>              label(4 "O Level") ///
>              label(5 "CSE") ///
>                  label(6 "None")) ///
>         saving("$analysisdir\PropEdu2.gph", replace)
(file C:\My Documents\chapter14\PropEdu2.gph saved)

.
.
. label define Female 0 "Men" 1 "Women"

. lab value Female Female

.
. graph hbar Q1 Q2 Q3 Q4 Q5 Q6, stack ///
>         over(Country, ///
>                 relabel(1 "England" 2 "Wales" 3 "Scotland" 4 "Northern Ireland") ///
>                 label(angle(45))) ///
>         by(Female) ytitle("Proportion") ///
>         scheme(s1manual) ///
>         note("Source: BHPS wave 18") ///
>         legend(label(1 "1st or higher") ///
>              label(2 "HND,HNC,teaching") ///
>              label(3 "A level") ///
>              label(4 "O Level") ///
>              label(5 "CSE") ///
>                  label(6 "None")) ///
>                    saving("$analysisdir\PropEdu3.gph", replace)
(file C:\My Documents\chapter14\PropEdu3.gph saved)

.
.
```

```
. * 14.3.2 Time Series Graphs
. *----------------------------------------
.
. use DataFile.dta, clear

.
. recode region (1/16 = 1) (17 = 2) (18 = 3) (19 = 4), gen(Country)
(232312 differences between region and Country)

. * Note that this is region, not region2 as in the previous data file
. label var Country "Country of residence"

. label define Country 1 "England" 2 "Wales" 3 "Scotland" 4 "Northern Ireland"

.
. recode mastat (1 2 7 = 1) (3/6 8/10 = 0), gen(Married)
(110579 differences between mastat and Married)

.
. * Totals and proportions by row (i.e. country)
. bysort Country wave: egen T_NotMarried = total(Married==0)

. bysort Country wave: egen T_Married = total(Married==1)

.
. * Collapse
. collapse T_*, by(Country wave)

.
. generate PropNotMarried = T_NotMarried / (T_NotMarried + T_Married)

. generate PropMarried = T_Married / (T_NotMarried + T_Married)

.
. label var PropNotMarried "Proportion of people not married or cohabiting"

. label var PropMarried "Proportion of people married or cohabiting"

.
. keep wave Country PropNotMarried PropMarried

. drop if Country == .
(13 observations deleted)

.
. label value Country Country

. * We have already defined the label above,
. * here we only need to attach it to this new variable
.
. generate year = wave + 1990

.
. tsset Country year, yearly
       panel variable:  Country (unbalanced)
        time variable:  year, 1991 to 2008
                delta:  1 year


.
. twoway (tsline PropMarried, lcolor(black)) ///
>         (tsline PropNotMarried, lpattern(dash))         ///
>         if Country == 1,                                                  ///
>         ytitle(Proportion) ytitle(, size(medsmall))     ///
>         ttitle(Year) ttitle(, size(medsmall))           ///
>         scheme(s1manual) ///
>         legend(cols(1) nobox region(lpattern(blank)))
>

. graph save Graph "$analysisdir\Graph1.gph", replace
(file C:\My Documents\chapter14\Graph1.gph saved)

.
.
```

```
. * 14.4. Saving Regression Results
. *---------------------------------------
.
. * 14.4.1. Saving Results of a Linear Regression
. *---------------------------------------
.
. use DatasetR.dta, clear

.
. regress LnW age age2 Female Married Q1-Q5, vce(robust)

Linear regression                                       Number of obs =    6985
                                                        F(  9,  6975) =  429.22
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.3777
                                                        Root MSE      =  .63928

------------------------------------------------------------------------------
             |               Robust
         LnW |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .1270167   .0042615    29.81   0.000     .1186627    .1353706
        age2 |  -.0014477   .0000521   -27.76   0.000      -.00155   -.0013455
      Female |  -.5163072   .0152177   -33.93   0.000    -.5461385   -.4864758
     Married |   .0832343   .0178122     4.67   0.000     .0483169    .1181517
          Q1 |   .7241378   .0294961    24.55   0.000     .6663164    .7819593
          Q2 |   .5051909    .036249    13.94   0.000     .4341319    .5762499
          Q3 |   .2988562   .0289995    10.31   0.000     .2420083    .3557042
          Q4 |   .1945445   .0288056     6.75   0.000     .1380767    .2510123
          Q5 |   .1258957   .0374377     3.36   0.001     .0525064    .1992851
       _cons |   4.573313   .0816424    56.02   0.000     4.413269    4.733357
------------------------------------------------------------------------------

. estimates store R_OLS1

.
. regress LnW age age2 Female Married Q1-Q5 R1-R6 R8-R12, vce(robust)

Linear regression                                       Number of obs =    6933
                                                        F( 20,  6912) =  199.52
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.3867
                                                        Root MSE      =  .63613

------------------------------------------------------------------------------
             |               Robust
         LnW |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .1277878   .0042482    30.08   0.000     .1194601    .1361156
        age2 |  -.0014583   .0000519   -28.11   0.000      -.00156   -.0013566
      Female |  -.5173127   .0151984   -34.04   0.000    -.5471062   -.4875193
     Married |   .0835274   .0177792     4.70   0.000     .0486747    .1183801
          Q1 |   .7055081   .0295252    23.90   0.000     .6476296    .7633866
          Q2 |   .5010076   .0362811    13.81   0.000     .4298855    .5721297
          Q3 |   .2901391   .0289532    10.02   0.000     .2333821    .3468962
          Q4 |   .1872705   .0287069     6.52   0.000     .1309963    .2435448
          Q5 |   .1165528   .0373302     3.12   0.002     .0433741    .1897315
          R1 |  -.2786627   .0536325    -5.20   0.000    -.3837988   -.1735266
          R2 |  -.3066754   .0464689    -6.60   0.000    -.3977687   -.2155822
          R3 |  -.2909338   .0466247    -6.24   0.000    -.3823325   -.1995351
          R4 |  -.3418577   .0483738    -7.07   0.000    -.4366852   -.2470301
          R5 |  -.3572488   .0509676    -7.01   0.000     -.457161   -.2573366
          R6 |   -.258527   .0514016    -5.03   0.000      -.35929    -.157764
          R8 |  -.2885082   .0464486    -6.21   0.000    -.3795616   -.1974547
          R9 |  -.3170754   .0474077    -6.69   0.000    -.4100092   -.2241417
         R10 |  -.3830289   .0417081    -9.18   0.000    -.4647895   -.3012682
         R11 |  -.3182777    .040951    -7.77   0.000    -.3985543   -.2380012
         R12 |  -.3309315    .041912    -7.90   0.000    -.4130919   -.2487711
       _cons |   4.878964    .089349    54.61   0.000     4.703812    5.054115
------------------------------------------------------------------------------

. estimates store R_OLS2
```

```
.
. estout R_OLS*
>    ///
>         using "$analysisdir\Wages.out",                                        ///
>         keep (age age2 Female Married Q1 Q2 Q3 Q4 Q5)          ///
>         cells(b(star fmt(%9.3f)) se(par fmt(%9.3f)))           ///
>         style(tab) stats(r2 N, fmt(%9.3f %9.0g)                        ///
>         labels(R2 Observations)) label collabels(, none)       ///
>         starlevels(+ 0.05 * 0.01)                                              ///
>         postfoot("Robust std.err. in parenthesis + Sign. at 5% * Sign. at 1%") ///
>         replace
(output written to C:\My Documents\chapter14\Wages.out)


.
. * 14.4.2. Saving Marginal Effects
. *----------------------------------------
.
. recode jbstat (1 2 = 1) (3/10 = 0), gen(Employed)
(13412 differences between jbstat and Employed)

. label define Employed 1 "Employed/Self-Employed" 0 "Unemployed or Inactive"

. label value Employed Employed

.
. generate Variable = ""
(14419 missing values generated)

. replace Variable = "age" in 1
Variable was str1 now str3
(1 real change made)

. replace Variable = "age2" in 3
Variable was str3 now str4
(1 real change made)

. replace Variable = "Married" in 5
Variable was str4 now str7
(1 real change made)

. replace Variable = "Q1" in 7
(1 real change made)

. replace Variable = "Q2" in 9
(1 real change made)

. replace Variable = "Q3" in 11
(1 real change made)

. replace Variable = "Q4" in 13
(1 real change made)

. replace Variable = "Q5" in 15
(1 real change made)

. replace Variable = "Log likelihood" in 18
Variable was str7 now str14
(1 real change made)

. replace Variable = "Observations" in 19
(1 real change made)

. * We leave cells empty for the standard errors
.
. * Men
. probit Employed age age2 Married Q1-Q5 R1-R6 R8-R12 if Female == 0

Iteration 0:   log likelihood = -3903.5171
Iteration 1:   log likelihood = -2374.8328
Iteration 2:   log likelihood = -2338.7052
Iteration 3:   log likelihood = -2338.5193
Iteration 4:   log likelihood = -2338.5193
```

```
Probit regression                                 Number of obs   =       5940
                                                  LR chi2(19)     =    3130.00
                                                  Prob > chi2     =     0.0000
Log likelihood = -2338.5193                       Pseudo R2       =     0.4009

------------------------------------------------------------------------------
    Employed |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .2200136   .0075631    29.09   0.000     .2051902     .234837
        age2 |  -.0027216   .0000835   -32.58   0.000    -.0028853   -.0025578
     Married |   .4931326    .051643     9.55   0.000     .3919141    .5943511
          Q1 |   .7584157   .0735767    10.31   0.000      .614208    .9026235
          Q2 |   .5049339   .0898357     5.62   0.000     .3288591    .6810087
          Q3 |   .3788537   .0617057     6.14   0.000     .2579127    .4997948
          Q4 |     .46473   .0616138     7.54   0.000     .3439692    .5854907
          Q5 |    .545053   .1032919     5.28   0.000     .3426045    .7475015
          R1 |  -.3251041   .1685243    -1.93   0.054    -.6554057    .0051976
          R2 |  -.2565466   .1328258    -1.93   0.053    -.5168803    .0037872
          R3 |  -.1615072   .1388417    -1.16   0.245     -.433632    .1106176
          R4 |   -.207326    .140309    -1.48   0.140    -.4823266    .0676746
          R5 |   .0904659   .1482148     0.61   0.542    -.2000298    .3809616
          R6 |  -.0959101   .1397225    -0.69   0.492    -.3697611    .1779408
          R8 |   .0515328   .1336144     0.39   0.700    -.2103467    .3134123
          R9 |   .0260588   .1416574     0.18   0.854    -.2515846    .3037022
         R10 |  -.2158928   .1208026    -1.79   0.074    -.4526616    .0208759
         R11 |  -.1216355   .1211537    -1.00   0.315    -.3590923    .1158213
         R12 |  -.3415943   .1217306    -2.81   0.005    -.5801819   -.1030068
       _cons |  -3.651224   .1887046   -19.35   0.000    -4.021079    -3.28137
------------------------------------------------------------------------------
Note: 16 failures and 0 successes completely determined.

. margins, dydx(age age2 Married Q1 Q2 Q3 Q4 Q5)

Average marginal effects                          Number of obs   =       5940
Model VCE    : OIM

Expression   : Pr(Employed), predict()
dy/dx w.r.t. : age age2 Married Q1 Q2 Q3 Q4 Q5

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0487101   .0013236    36.80   0.000     .0461159    .0513044
        age2 |  -.0006025   .0000135   -44.55   0.000    -.0006291    -.000576
     Married |   .1091776   .0112132     9.74   0.000     .0872001     .131155
          Q1 |   .1679102   .0158738    10.58   0.000      .136798    .1990223
          Q2 |   .1117903   .0197372     5.66   0.000      .073106    .1504746
          Q3 |   .0838767    .013527     6.20   0.000     .0573643     .110389
          Q4 |   .1028893   .0134804     7.63   0.000     .0764682    .1293105
          Q5 |   .1206725   .0227323     5.31   0.000     .0761181     .165227
------------------------------------------------------------------------------


.
. generate Men = e(ll) in 18
(14418 missing values generated)

. mat R = r(table)

.
. local i = 1

. local j = 1

. while `i' <= 8  {
  2.         * Save the coefficient/marginal effect:
.         replace Men = R[1,`i'] in `j'
  3.         local j = `j' + 1
  4.         * Save standard error in row below marginal effect:
.         replace Men = R[2,`i'] in `j'
  5.         local j = `j' + 1
  6.         local i = `i' + 1
  7.         }
```

```
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)

. * Observations
. mat N = r(_N)

. replace Men = N[1,1] in 19
(1 real change made)

.
. * Women
. probit Employed age age2 Married Q1-Q5 R1-R6 R8-R12 if Female == 1

Iteration 0:   log likelihood = -5008.2968
Iteration 1:   log likelihood = -3649.4265
Iteration 2:   log likelihood = -3533.4577
Iteration 3:   log likelihood =  -3532.244
Iteration 4:   log likelihood = -3532.2439

Probit regression                                 Number of obs   =       7228
                                                  LR chi2(19)     =    2952.11
                                                  Prob > chi2     =     0.0000
Log likelihood = -3532.2439                       Pseudo R2       =     0.2947

------------------------------------------------------------------------------
    Employed |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .1856723   .0067506    27.50   0.000     .1724414    .1989032
        age2 |  -.0022923   .0000768   -29.86   0.000    -.0024428   -.0021418
     Married |   .0948491   .0399136     2.38   0.017     .0166199    .1730783
          Q1 |   .9089129   .0610708    14.88   0.000     .7892164    1.028609
          Q2 |   .4857554   .0769195     6.32   0.000      .334996    .6365148
          Q3 |   .5182342   .0559559     9.26   0.000     .4085627    .6279057
          Q4 |   .5320633   .0505783    10.52   0.000     .4329317    .6311949
          Q5 |   .2542567   .0812635     3.13   0.002     .0949832    .4135303
          R1 |  -.0388104   .1374721    -0.28   0.778    -.3082507      .23063
          R2 |  -.0199035     .10588    -0.19   0.851    -.2274245    .1876176
          R3 |   .0021778   .1120191     0.02   0.984    -.2173756    .2217312
          R4 |  -.1015023   .1132758    -0.90   0.370    -.3235187    .1205142
          R5 |   .0051333   .1138275     0.05   0.964    -.2179645    .2282311
          R6 |    -.04238   .1100333    -0.39   0.700    -.2580413    .1732813
          R8 |   .1507979   .1041317     1.45   0.148    -.0532964    .3548923
          R9 |    .039735   .1113795     0.36   0.721    -.1785648    .2580349
         R10 |  -.1112129    .093777    -1.19   0.236    -.2950124    .0725866
         R11 |  -.0322538   .0942623    -0.34   0.732    -.2170044    .1524969
         R12 |  -.1716901   .0941983    -1.82   0.068    -.3563154    .0129352
       _cons |  -3.446174    .158072   -21.80   0.000     -3.75599   -3.136359
------------------------------------------------------------------------------
Note: 17 failures and 0 successes completely determined.

. margins, dydx(age age2 Married Q1 Q2 Q3 Q4 Q5)

Average marginal effects                          Number of obs   =       7228
Model VCE    : OIM

Expression   : Pr(Employed), predict()
dy/dx w.r.t. : age age2 Married Q1 Q2 Q3 Q4 Q5

------------------------------------------------------------------------------
```

```
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
         age |   .0514632    .001559    33.01   0.000     .0484076    .0545188
        age2 |  -.0006354   .0000171   -37.22   0.000    -.0006688   -.0006019
     Married |   .0262895   .0110497     2.38   0.017     .0046326    .0479464
          Q1 |   .2519252   .0161232    15.63   0.000     .2203244     .283526
          Q2 |   .1346378   .0211308     6.37   0.000     .0932222    .1760534
          Q3 |     .14364   .0152174     9.44   0.000     .1138145    .1734655
          Q4 |    .147473   .0136811    10.78   0.000     .1206587    .1742874
          Q5 |   .0704728     .02247     3.14   0.002     .0264324    .1145133
------------------------------------------------------------------------------

.
. generate Women = e(ll) in 18
(14418 missing values generated)

. mat R = r(table)

.
. local i = 1

. local j = 1

. while `i' <= 8  {
  2.          * Coefficients
.         replace Women = R[1,`i'] in `j'
  3.          local j = `j' + 1
  4.          * Standard errors
.         replace Women = R[2,`i'] in `j'
  5.          local j = `j' + 1
  6.          local i = `i' + 1
  7.          }
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)
(1 real change made)

. * Observations
. mat N = r(_N)

. replace Women = N[1,1] in 19
(1 real change made)

.
. * Save into table *
.
. keep Variable Men Women

. keep in 1/19
(14400 observations deleted)

. export excel using "$analysisdir\MarginalEffects", firstrow(varlabels) replace
file C:\My Documents\chapter14\MarginalEffects.xls saved

.
.
. * Using margins and estpost with estout and esttab
. use DatasetR.dta, clear

. recode jbstat (1 2 = 1) (3/10 = 0), gen(Employed)
```

```
(13412 differences between jbstat and Employed)

. label define Employed 1 "Employed/Self-Employed" 0 "Unemployed or Inactive"

. label value Employed Employed

.
. probit Employed age age2 Married Q1-Q5 R1-R6 R8-R12 if Female == 1

Iteration 0:   log likelihood = -5008.2968
Iteration 1:   log likelihood = -3649.4265
Iteration 2:   log likelihood = -3533.4577
Iteration 3:   log likelihood =  -3532.244
Iteration 4:   log likelihood = -3532.2439

Probit regression                                 Number of obs   =       7228
                                                  LR chi2(19)     =    2952.11
                                                  Prob > chi2     =     0.0000
Log likelihood = -3532.2439                       Pseudo R2       =     0.2947

------------------------------------------------------------------------------
    Employed |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .1856723   .0067506    27.50   0.000     .1724414    .1989032
        age2 |  -.0022923   .0000768   -29.86   0.000    -.0024428   -.0021418
     Married |   .0948491   .0399136     2.38   0.017     .0166199    .1730783
          Q1 |   .9089129   .0610708    14.88   0.000     .7892164    1.028609
          Q2 |   .4857554   .0769195     6.32   0.000      .334996    .6365148
          Q3 |   .5182342   .0559559     9.26   0.000     .4085627    .6279057
          Q4 |   .5320633   .0505783    10.52   0.000     .4329317    .6311949
          Q5 |   .2542567   .0812635     3.13   0.002     .0949832    .4135303
          R1 |  -.0388104   .1374721    -0.28   0.778    -.3082507      .23063
          R2 |  -.0199035     .10588    -0.19   0.851    -.2274245    .1876176
          R3 |   .0021778   .1120191     0.02   0.984    -.2173756    .2217312
          R4 |  -.1015023   .1132758    -0.90   0.370    -.3235187    .1205142
          R5 |   .0051333   .1138275     0.05   0.964    -.2179645    .2282311
          R6 |    -.04238   .1100333    -0.39   0.700    -.2580413    .1732813
          R8 |   .1507979   .1041317     1.45   0.148    -.0532964    .3548923
          R9 |    .039735   .1113795     0.36   0.721    -.1785648    .2580349
         R10 |  -.1112129    .093777    -1.19   0.236    -.2950124    .0725866
         R11 |  -.0322538   .0942623    -0.34   0.732    -.2170044    .1524969
         R12 |  -.1716901   .0941983    -1.82   0.068    -.3563154    .0129352
       _cons |  -3.446174    .158072   -21.80   0.000     -3.75599   -3.136359
------------------------------------------------------------------------------
Note: 17 failures and 0 successes completely determined.

. estpost margins, dydx(age age2 Married Q1 Q2 Q3 Q4 Q5)

Average marginal effects                          Number of obs   =       7228
Model VCE    : OIM

Expression   : Pr(Employed), predict()
dy/dx w.r.t. : age age2 Married Q1 Q2 Q3 Q4 Q5

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0514632    .001559    33.01   0.000     .0484076    .0545188
        age2 |  -.0006354   .0000171   -37.22   0.000    -.0006688   -.0006019
     Married |   .0262895   .0110497     2.38   0.017     .0046326    .0479464
          Q1 |   .2519252   .0161232    15.63   0.000     .2203244     .283526
          Q2 |   .1346378   .0211308     6.37   0.000     .0932222    .1760534
          Q3 |     .14364   .0152174     9.44   0.000     .1138145    .1734655
          Q4 |    .147473   .0136811    10.78   0.000     .1206587    .1742874
          Q5 |   .0704728     .02247     3.14   0.002     .0264324    .1145133
------------------------------------------------------------------------------

. estimates store employed

.
. estout employed using "$analysisdir\MarginalEffects2.txt", replace
(output written to C:\My Documents\chapter14\MarginalEffects2.txt)
```

```
. esttab employed using "$analysisdir\MarginalEffects3.txt", replace cell("b se")
(output written to C:\My Documents\chapter14\MarginalEffects3.txt)

.
.
.
. * 14.5 Graphs of Regression Results
. ******************************
.
. * 14.5.1 The Command parmest
. *--------------------------
.
. use DatasetR.dta, clear

.
. regress LnW age age2 Female Married Q1-Q5, vce(robust)

Linear regression                                      Number of obs =    6985
                                                       F(  9,  6975) =  429.22
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3777
                                                       Root MSE      =  .63928

------------------------------------------------------------------------------
             |               Robust
         LnW |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .1270167   .0042615    29.81   0.000     .1186627    .1353706
        age2 |  -.0014477   .0000521   -27.76   0.000      -.00155   -.0013455
      Female |  -.5163072   .0152177   -33.93   0.000    -.5461385   -.4864758
     Married |   .0832343   .0178122     4.67   0.000     .0483169    .1181517
          Q1 |   .7241378   .0294961    24.55   0.000     .6663164    .7819593
          Q2 |   .5051909    .036249    13.94   0.000     .4341319    .5762499
          Q3 |   .2988562   .0289995    10.31   0.000     .2420083    .3557042
          Q4 |   .1945445   .0288056     6.75   0.000     .1380767    .2510123
          Q5 |   .1258957   .0374377     3.36   0.001     .0525064    .1992851
       _cons |   4.573313   .0816424    56.02   0.000     4.413269    4.733357
------------------------------------------------------------------------------

. parmest, format(estimate min95 max95)  ///
>         label saving("$analysisdir\RegGraph", replace)
file C:\My Documents\chapter14\RegGraph.dta saved

.
. use "$analysisdir\RegGraph", clear

. drop if parm == "_cons"
(1 observation deleted)

. * Otherwise the graph would look too small
.
. sencode parm,gen(parmid)

. eclplot estimate min95 max95 parmid, ///
>         horizontal xline(0) scheme(s1manual)  ///
>         ylabel(1 "age" 2 "age square" 3 "female" ///
>                 4 "married" 5 "Q1" 6 "Q2" 7 "Q3" 8 "Q4" ///
>                 9 "Q5", labsize(small)) ///
>         title(Wage Regression)

.
.
. * 14.5.2 The Command marginsplot
. *--------------------------
.
. use DatasetR.dta, clear

.
. recode jbstat (1 2 = 1) (3/10 = 0), gen(Employed)
(13412 differences between jbstat and Employed)

. label define Employed 1 "Employed/Self-Employed" 0 "Unemployed or Inactive"
```

```
. label value Employed Employed

.
. rename qfachi edu

.
. label define Female 1 "Women" 0 "Men"

. label value Female Female

.
.
. * Models with polynomials
. probit Married c.age##c.age i.Female ib7.edu ib7.region2 nchild i.Employed ///
>         if age>=18 & age<60, vce(robust)

Iteration 0:   log pseudolikelihood = -5633.5166
Iteration 1:   log pseudolikelihood = -4336.7666
Iteration 2:   log pseudolikelihood = -4317.5251
Iteration 3:   log pseudolikelihood = -4317.5033
Iteration 4:   log pseudolikelihood = -4317.5033

Probit regression                                 Number of obs   =       9004
                                                  Wald chi2(21)   =    2047.81
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -4317.5033                 Pseudo R2       =     0.2336

------------------------------------------------------------------------------
             |               Robust
     Married |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .1185262   .0098212    12.07   0.000      .099277    .1377755
             |
 c.age#c.age |  -.0010021   .0001286    -7.79   0.000    -.0012541   -.0007501
             |
      Female |
       Women |  -.0789265   .0303249    -2.60   0.009    -.1383621   -.0194908
             |
         edu |
 1st degree  |   .1175335   .0576188     2.04   0.041     .0046028    .2304642
hnd,hnc,teaching |   .1572488   .0729227     2.16   0.031     .0143229    .3001748
      a level |    .043391   .0528341     0.82   0.411    -.0601619    .1469438
      o level |   .0037955   .0520534     0.07   0.942    -.0982272    .1058183
      cse     |  -.0674319   .0740653    -0.91   0.363    -.2125972    .0777334
             |
       region2 |
 north east  |   .2271438   .1176049     1.93   0.053    -.0033577    .4576452
 north west  |   .2596182   .0928368     2.80   0.005     .0776613     .441575
yorkshire & humber |   .3490141   .0994705     3.51   0.000     .1540556    .5439727
 east midlands |   .3982539   .1024628     3.89   0.000     .1974305    .5990773
 west midlands |   .2912722   .1036068     2.81   0.005     .0882065    .4943378
 east of england |   .3941984   .0996757     3.95   0.000     .1988377    .5895592
 south east  |   .3280349   .0920249     3.56   0.000     .1476693    .5084004
 south west  |   .3530615   .0986217     3.58   0.000     .1597665    .5463566
       wales |   .1998676   .0842167     2.37   0.018      .034806    .3649292
 scotland    |   .1520642   .0834303     1.82   0.068    -.0114563    .3155846
northern ireland |  -.0310677   .0845886    -0.37   0.713    -.1968583    .1347229
             |
      nchild |   .5539079   .0262005    21.14   0.000     .5025559      .60526
             |
    Employed |
Employed/Self-Employed |   .4336978   .0369437    11.74   0.000     .3612895    .5061061
       _cons |  -3.275382   .1899553   -17.24   0.000    -3.647688   -2.903076
------------------------------------------------------------------------------

.
. margins, at(age = (25(1)45))

Predictive margins                                Number of obs   =       9004
Model VCE    : Robust

Expression   : Pr(Married), predict()
```

```
1._at        : age             =          25

2._at        : age             =          26

3._at        : age             =          27

4._at        : age             =          28

5._at        : age             =          29

6._at        : age             =          30

7._at        : age             =          31

8._at        : age             =          32

9._at        : age             =          33

10._at       : age             =          34

11._at       : age             =          35

12._at       : age             =          36

13._at       : age             =          37

14._at       : age             =          38

15._at       : age             =          39

16._at       : age             =          40

17._at       : age             =          41

18._at       : age             =          42

19._at       : age             =          43

20._at       : age             =          44

21._at       : age             =          45

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |   .4837026   .0077887    62.10   0.000      .468437    .4989681
          2  |   .5068019   .0073882    68.60   0.000     .4923214    .5212824
          3  |    .529253   .0071567    73.95   0.000     .5152261      .54328
          4  |   .5509836    .007073    77.90   0.000     .5371207    .5648465
          5  |   .5719337   .0071025    80.53   0.000      .558013    .5858544
          6  |   .5920557   .0072057    82.16   0.000     .5779327    .6061786
          7  |   .6113134   .0073454    83.22   0.000     .5969166    .6257101
          8  |   .6296813   .0074908    84.06   0.000     .6149996    .6443631
          9  |   .6471439   .0076188    84.94   0.000     .6322114    .6620765
         10  |   .6636945   .0077134    86.04   0.000     .6485765    .6788124
         11  |    .679334   .0077646    87.49   0.000     .6641156    .6945523
         12  |   .6940701   .0077672    89.36   0.000     .6788467    .7092936
         13  |   .7079164   .0077195    91.70   0.000     .6927864    .7230465
         14  |    .720891   .0076227    94.57   0.000     .7059508    .7358311
         15  |   .7330157   .0074797    98.00   0.000     .7183557    .7476757
         16  |   .7443153   .0072955   102.02   0.000     .7300164    .7586141
         17  |   .7548167    .007076   106.67   0.000     .7409479    .7686854
         18  |    .764548   .0068287   111.96   0.000      .751164    .7779321
         19  |   .7735384   .0065622   117.88   0.000     .7606767    .7864002
         20  |    .781817   .0062868   124.36   0.000     .7694952    .7941388
         21  |   .7894127   .0060143   131.26   0.000     .7776249    .8012005
------------------------------------------------------------------------------

. marginsplot, scheme(s1manual) xlabel(25(5)45) ///
>   xtitle("Age as of date of interview") ///
```

```
>   note("Source: BHPS wave 18") ///
>   saving("$analysisdir\predprob_age", replace)

  Variables that uniquely identify margins: age
(file C:\My Documents\chapter14\predprob_age.gph saved)

.
.
. margins, dydx(age) at(age = (25(1)45))

Average marginal effects                        Number of obs   =       9004
Model VCE    : Robust

Expression   : Pr(Married), predict()
dy/dx w.r.t. : age

1._at        : age             =          25

2._at        : age             =          26

3._at        : age             =          27

4._at        : age             =          28

5._at        : age             =          29

6._at        : age             =          30

7._at        : age             =          31

8._at        : age             =          32

9._at        : age             =          33

10._at       : age             =          34

11._at       : age             =          35

12._at       : age             =          36

13._at       : age             =          37

14._at       : age             =          38

15._at       : age             =          39

16._at       : age             =          40

17._at       : age             =          41

18._at       : age             =          42

19._at       : age             =          43

20._at       : age             =          44

21._at       : age             =          45

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
age          |
         _at |
          1  |   .0233961   .0013147    17.80   0.000     .0208194    .0259729
          2  |   .0227883   .0012417    18.35   0.000     .0203546     .025222
          3  |   .0221018   .0011579    19.09   0.000     .0198323    .0243714
          4  |   .0213493   .0010666    20.02   0.000     .0192588    .0234398
          5  |    .020543   .0009708    21.16   0.000     .0186403    .0224457
          6  |   .0196949   .0008736    22.54   0.000     .0179827    .0214072
          7  |   .0188162   .0007781    24.18   0.000     .0172911    .0203413
          8  |   .0179171   .0006873    26.07   0.000     .0165701    .0192641
          9  |    .017007   .0006041    28.15   0.000      .015823     .018191
```

```
         10  |   .0160942   .0005318    30.26   0.000     .0150519    .0171366
         11  |    .015186   .0004736    32.07   0.000     .0142578    .0161142
         12  |   .0142886   .0004322    33.06   0.000     .0134414    .0151358
         13  |   .0134071   .0004094    32.75   0.000     .0126046    .0142095
         14  |   .0125457   .0004045    31.02   0.000     .0117529    .0133385
         15  |   .0117078   .0004146    28.24   0.000     .0108952    .0125205
         16  |   .0108959   .0004358    25.00   0.000     .0100418      .01175
         17  |   .0101116    .000464    21.79   0.000     .0092022     .011021
         18  |    .009356   .0004962    18.85   0.000     .0083835    .0103286
         19  |   .0086296   .0005304    16.27   0.000       .00759    .0096692
         20  |   .0079324   .0005653    14.03   0.000     .0068244    .0090403
         21  |   .0072637   .0006003    12.10   0.000     .0060872    .0084403
-------------------------------------------------------------------------------

. marginsplot, scheme(s1manual) xlabel(25(5)45) ///
>   xtitle("Age as of date of interview") ///
>   note("Source: BHPS wave 18") ///
>   saving("$analysisdir\ame_age", replace)

  Variables that uniquely identify margins: age
(file C:\My Documents\chapter14\ame_age.gph saved)

.
. quietly margins Female#Employed, at(age = (25(5)45))

. marginsplot, scheme(s1manual) xlabel(25(5)45) ///
>   legend(row(4)) xtitle("Age as of date of interview") ///
>   note("Source: BHPS wave 18") ///
>   title("Predicted probability of being married with 95% CIs") ///
>   saving("$analysisdir\predprob_sexempage1", replace)

  Variables that uniquely identify margins: age Female Employed
(file C:\My Documents\chapter14\predprob_sexempage1.gph saved)

.
.
.
. * 14.5.3 The Command marginsplot and interaction effects
. *-------------------------------------------------------
. * models with interaction effects: one continuous and one categorical variables
.
.
. probit Married c.age##i.Female i.Employed ib7.edu ib7.region2 nchild ///
>         if age>=18 & age<60, vce(robust)

Iteration 0:   log pseudolikelihood = -5633.5166
Iteration 1:   log pseudolikelihood = -4365.6223
Iteration 2:   log pseudolikelihood = -4342.1457
Iteration 3:   log pseudolikelihood = -4342.1252
Iteration 4:   log pseudolikelihood = -4342.1252

Probit regression                                 Number of obs   =       9004
                                                  Wald chi2(21)   =    1871.73
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -4342.1252                 Pseudo R2       =     0.2292

------------------------------------------------------------------------------
                             |               Robust
                     Married |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----------------------------+------------------------------------------------------------------
                         age |   .0462258   .0019408    23.82   0.000     .0424219    .0500296
                             |
                      Female |
                       Women |   .1833708   .0981743     1.87   0.062    -.0090472    .3757889
                             |
                Female#c.age |
                       Women |  -.0070576   .0025548    -2.76   0.006     -.012065   -.0020503
                             |
                    Employed |
     Employed/Self-Employed  |   .4885556   .0359413    13.59   0.000     .4181118    .5589993
                             |
                         edu |
            1st degree       |   .1635816    .057888     2.83   0.005     .0501231      .27704
```

```
hnd,hnc,teaching         |   .2016169   .0733991     2.75   0.006     .0577573    .3454764
               a level   |   .0554689   .0531162     1.04   0.296     -.048637    .1595747
               o level   |    .031306   .0523094     0.60   0.550    -.0712186    .1338306
               cse       |  -.0254127   .0734757    -0.35   0.729    -.1694224    .1185971
                         |
                region2  |
        north east       |   .2355428   .1177345     2.00   0.045     .0047874    .4662982
        north west       |   .2493057   .0938455     2.66   0.008     .0653719    .4332396
yorkshire & humber       |   .3493115   .1001849     3.49   0.000     .1529527    .5456702
        east midlands    |   .3837416   .1034594     3.71   0.000      .180965    .5865183
        west midlands    |   .2744295   .1041066     2.64   0.008     .0703843    .4784747
        east of england  |   .3736476   .1004263     3.72   0.000     .1768157    .5704795
        south east       |   .3142991   .0928158     3.39   0.001     .1323835    .4962147
        south west       |   .3216568     .09938     3.24   0.001     .1268755    .5164381
               wales     |   .1770075   .0850868     2.08   0.037     .0102405    .3437745
        scotland         |   .1430473   .0844399     1.69   0.090    -.0224519    .3085464
northern ireland         |  -.0391007    .085597    -0.46   0.648    -.2068678    .1286664
                         |
                 nchild  |   .6112445    .024755    24.69   0.000     .5627256    .6597633
                  _cons  |  -2.192637   .1193622   -18.37   0.000    -2.426583   -1.958692
------------------------------------------------------------------------------------------

. quietly margins Female, at(age = (25(5)45))

. marginsplot, scheme(s1manual) xlabel(25(5)45) ///
>   xtitle("Age as of date of interview") ///
>   note("Source: BHPS wave 18") ///
>   title("Predicted prob. of being married with 95% CIs") ///
>   saving("$analysisdir\predprob_sex", replace)

  Variables that uniquely identify margins: age Female
(file C:\My Documents\chapter14\predprob_sex.gph saved)

.
.
. * models with interaction effects: two categorical variables
. probit Married c.age##c.age i.Female##i.Employed ib7.edu ib7.region2 nchild ///
>         if age>=18 & age<60, vce(robust)

Iteration 0:   log pseudolikelihood = -5633.5166
Iteration 1:   log pseudolikelihood =  -4330.575
Iteration 2:   log pseudolikelihood = -4312.1588
Iteration 3:   log pseudolikelihood = -4312.1385
Iteration 4:   log pseudolikelihood = -4312.1385

Probit regression                                 Number of obs   =       9004
                                                  Wald chi2(22)   =    2077.79
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -4312.1385                 Pseudo R2       =     0.2346

------------------------------------------------------------------------------------------
                         |               Robust
                 Married |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------------------+----------------------------------------------------------------
                     age |   .1179834    .009836    12.00   0.000     .0987052    .1372615
                         |
             c.age#c.age |   -.000996   .0001287    -7.74   0.000    -.0012483   -.0007436
                         |
                  Female |
                  Women  |   .1096632   .0616326     1.78   0.075    -.0111345    .2304608
                         |
                Employed |
 Employed/Self-Employed  |   .5913918   .0560948    10.54   0.000      .481448    .7013355
                         |
         Female#Employed |
                  Women #|
 Employed/Self-Employed  |  -.2447854   .0718643    -3.41   0.001    -.3856368   -.1039339
                         |
                     edu |
        1st degree       |   .1191997   .0576358     2.07   0.039     .0062356    .2321638
hnd,hnc,teaching         |   .1578266    .073091     2.16   0.031     .0145709    .3010823
               a level   |   .0467934   .0529263     0.88   0.377    -.0569402    .1505271
               o level   |   .0050769   .0521358     0.10   0.922    -.0971074    .1072613
```

```
               cse      |  -.0698534   .0741471    -0.94   0.346    -.2151791    .0754723
                        |
                region2 |
        north east      |   .2310263   .1177535     1.96   0.050     .0002337    .4618189
        north west      |   .2602359   .0929847     2.80   0.005     .0779892    .4424826
yorkshire & humber      |   .3528018    .099712     3.54   0.000     .1573699    .5482336
        east midlands   |   .4018641   .1026229     3.92   0.000     .2007268    .6030013
        west midlands   |   .2916109    .103769     2.81   0.005     .0882274    .4949945
        east of england |   .3935588   .0997624     3.94   0.000      .198028    .5890896
        south east      |    .332049    .092138     3.60   0.000     .1514618    .5126361
        south west      |   .3539439   .0988095     3.58   0.000     .1602808    .5476069
                wales   |   .2029088   .0843843     2.40   0.016     .0375186    .3682991
        scotland        |   .1554803   .0836059     1.86   0.063    -.0083841    .3193448
northern ireland        |  -.0257976   .0847681    -0.30   0.761      -.19194    .1403449
                        |
                nchild  |   .5473584   .0262558    20.85   0.000     .4958979    .5988189
                 _cons  |  -3.393767   .1930128   -17.58   0.000    -3.772065   -3.015469
------------------------------------------------------------------------------------------

. quietly margins, at(age = (25(5)45)) over(Female Employed)

.
. marginsplot, scheme(s1manual) ///
>   legend(row(4)) xtitle("Age as of date of interview") ///
>   note("Source: BHPS wave 18") ///
>   title("Predicted probability of being married" "with 95% CIs") ///
>   saving("$analysisdir\predprob_sexempage2", replace)

  Variables that uniquely identify margins: age Female Employed
(file C:\My Documents\chapter14\predprob_sexempage2.gph saved)

.
.
.
. * 14.5.4 Combining multiple graphs
. *-------------------------------
.
. quietly margins Female if Employed==0, at(age = (25(5)45))

. marginsplot, scheme(s1manual) name(gr1) ///
> yscale(r(.3(.2).9)) ylabel(.3(.2).9) title("Not employed")

  Variables that uniquely identify margins: age Female

.
. quietly margins Female if Employed==1, at(age = (25(5)45))

. marginsplot, scheme(s1manual) name(gr2) ///
> yscale(r(.3(.2).9)) ylabel(.3(.2).9) title("Employed")

  Variables that uniquely identify margins: age Female

.
.
. graph combine gr1 gr2, ///
> title("Prediced Prob. of Being Married", size(medium)) ///
> scheme(s1manual) note("Source: BHPS wave 18") ///
> saving("$analysisdir\predprob_sexempage3", replace)
(file C:\My Documents\chapter14\predprob_sexempage3.gph saved)

.
. grc1leg gr1 gr2, ///
> title("Predictive Probability of Being Married with 95% CIs", size(medium)) ///
> scheme(s1manual) note("Source: BHPS wave 18") ///
> saving("$analysisdir\predprob_sexempage4", replace)
(file C:\My Documents\chapter14\predprob_sexempage4.gph saved)

.
. graph drop _all

. log close
      name:  <unnamed>
       log:  C:\My Documents\chapter14\Example_Chapter14.log
```

```
  log type:  text
 closed on:   1 Sep 2014, 15:39:48
-------------------------------------------------------------------------------------------------
```