outreg help pages

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help for **outreg** (revision 14 May 2002)   STB-46 sg97, STB-49, STB-58

Write formatted regression output to a text file

After any estimation command:

> **outreg** [varlist] **using** filename [**,**

(Text-related options)

>> **nol**abel **ti**tle**(**textlist**) ct**itle**(**textlist**)**
>> **nonot**es **addn**ote**(**textlist**)**

(Coefficient options)
>> **bd**ec**(**numlist**) bf**mt**(**textlist**) coe**fastr

(Options for t statistics, standard errors, etc.)
>> {**se**|**p**value|**ci**| **beta**} **l**evel**(**#**) td**ec**(**#**) nopa**ren
>> **br**acket {**noas**ter|**3aster**|**10pct**} **si**gsymb**(**textlist**)**

(Statistics options)

>> **nocon**s **nonob**s **noni nor**2 **ad**jr2 **rd**ec**(**#**)**
>> **adds**tat**("**text**",** #[**,"** text**",** #...]**) ade**c**(**numlist**)**
>> **ef**orm margin[**(**{u|c|p}**)**] **o**necol **x**stats

(Other options)
>> **com**ma **replace ap**pend]

outreg is available after any estimation command. A textlist (my own term) is a list of text separated by commas, i.e. "text" [, "text" ...]. It is similar to a numlist or a varlist, but commas are required. Each text element in the list does not need to be enclosed in quotation marks unless the text contains commas.

Description

outreg formats regression output as it is presented in most documents. The ultimate purpose of most estimation is to present the results in tables quite different from those displayed within Stata. **outreg** automates the process of converting the regression results to most of the standard presentation formats by creating a text file for inclusion in a word processing table.

outreg should work after any estimation command in Stata (see [R] estimation commands for a complete list). Like `predict`, **outreg** makes use of internally saved estimation results, so it should be invoked immediately after the estimation. In addition to coefficient estimates, by default **outreg** will report t statistics with asterisks for standard significance levels (1% and 5%), number of observations, true R-squareds (no pseudo R-squareds), and the number of groups in panel estimation. The user can add their own chosen titles (**title** and **ctitle**), statistics (**addstat**), and notes (**addnote**) to the table, and change many aspects of the output. The t statistics under the coefficients can be replaced by standard errors, p values of t statistics, confidence intervals, or normalized beta coefficients.

outreg creates an ASCII text file with columns separated with tab characters. The file can be converted automatically to a table in word processors and spreadsheets. For example, the process in Microsoft Word is simple: Open or Insert the file created by **outreg**. Select the estimation output text that is in columns (not the notes at the bottom of the table or the title at the top, if any), and choose Table, Convert Text to Table. With some adjustment of the column widths, fonts, etc. the final table is ready.

In Excel, open the file created by **outreg** and follow the default choices in the Text Import Wizard (note that when loading the output into a spreadsheet, the parentheses around the t statistics may convert to negative numbers). Other word processors and spreadsheet software should be similar.

Successive estimation results, possibly with different variables, can be combined by **outreg** in a single table with the variable coefficients lined up properly using the **append** option. Multivariate regression commands like `sureg`, `mvreg`, and `reg3` are formatted equation by equation, and can be appended.

outreg rewards the use of variable `label`s (and value labels for `mlogit`, `svymlog`, and `dmlogit2`). The variable labels are used in the output table (unless **nolabel** is chosen), providing more intelligible variable descriptions than 8-letter names. Note that if different variables are assigned the same variable label (not usually done intentionally), and more than one regression is appended together, the coefficients and t statistics will not be properly ordered. The solution is to use distinct variable labels or the **nolabel** option.

If filename is specified without an extension, .out is assumed.

If a varlist is specified, only the regression coefficients corresponding to the variables in varlist will be included in the table. The dependent variable name should not be included in the varlist since it has no regression coefficient. With an explicit varlist the intercept coefficient will still be included unless the

nocons option is chosen. An explicit varlist is useful, for example, for excluding numerous dummy variable coefficients.

Many Stata estimation commands make it possible to exponentiate the coefficients under the procedure-specific names of odds ratios, hazard ratios, relative risk ratios, etc. Since Stata leaves behind no evidence of whether the user has chosen to exponentiate the coefficients displayed by the original estimation, the user must re-specify this choice in **outreg** with the **eform** option. This is required even after the `stcox` command which by default reports coefficients in hazard ratio form.

A growing number of Stata commands, most of them STB additions, report the marginal effects of changes in the independent variables. For most of these commands (`dprobit`, `dlogit2`, `dprobit2`, and `dmlogit2`) **outreg** will automatically report the marginal effects. The commands `truncreg`, `marginal` and `dtobit` report both regression coefficients and marginal effects, though, so the user must specify the **margin** option for **outreg** to report the marginal effects.

Options

1. Text-related options
2. Coefficient options
3. Options for t statistics, standard errors, etc.
4. Other statistics options
5. Other options

1. Text-related options

nolabel specifies that variable names rather than variable labels be used to identify coefficients. It also suppresses the value labels of the dependent variable in `mlogit`, `svymlog`, and `dmlogit2`.

title(textlist) specifies a title or titles at the top of the regression table. The maximum title length is 80 characters. Additional characters will be cut off. Longer titles can be put in two or more title lines. When regression results are appended together, the table title(s) must be specified in the first **outreg** call; titles specified in subsequent **outreg** ... **append** calls will be ignored. Note that when converting the **outreg** text output to a table in a word processor or a spreadsheet, it is easier to leave out the title row out of the text selected for conversion.

ctitle(textlist) specifies the regression title above the coefficient column. By default if no column title is specified, the label or name of the dependent variable is displayed. Multiple column titles are only appropriate for multi-equation regressions, using one title per equation, and then only if not **onecol**.

nonotes specifies that notes explaining the t statistics (or standard errors, etc.) and asterisks not be included.

addnote(textlist) specifies user-added notes to be displayed in new lines at the bottom of the **outreg** table. When regression results are appended together, **addnote** must be specified in the first **outreg** call; **addnotes** specified in subsequent **outreg** ... **append** calls will be ignored. **addnote** is consistent with **nonotes**. A blank line can be inserted by including "" as a note (see example below).

Technical Note: Text which includes quotation marks within the text (by means of double quotation as in `"This is "quoted" text"') in **title**, **ctitle**, and **addnote** displays correctly in single regression tables, but does not display correctly when subsequent regressions are **append**ed.

2. Coefficient options

bdec(numlist) specifies the number of decimal places reported for coefficient estimates (the b's). It also specifies the decimal places reported for standard errors or confidence intervals if **se** or **ci** is chosen. The default value for **bdec** is 3. The minimum value is 0 and the maximum value is 11. If one number is specified in the numlist, it will apply to all coefficients. If multiple numbers are specified in the numlist, the first number will determine the decimals reported for the first coefficient, the second number, the decimals for the second coefficient, etc. If there are fewer numbers in the numlist than coefficients, the last number in the numlist will apply to all the remaining coefficients.

bfmt(textlist) specifies the format type for coefficient estimates (and standard errors or confidence intervals, if **se** or **ci** is chosen). Possible format types are
    e   - scientific notation; e.g. 1.00e+3
    f or fc - fixed format (with commas for thousands with fc)
    g or gc - general format (with commas for thousands with gc)
The default type for **bfmt** is fc. If multiple format types are specified, they are applied to the coefficients the way that multiple **bdec** parameters are applied. This option is mainly to allow scientific notation (e). For an explanation of Stata numeric formats, see [U] 15.5.1 Numeric formats.

nocons specifies that the intercept (constant) coefficient estimate not be reported. This is not needed when the preceding estimation has no intercept coefficient.

coefastr specifies that asterisks for significance levels are appended to regression coefficients rather than to t statistics or standard errors.

eform specifies that the exponentiated form of the coefficients be reported. This corresponds to the or option for logit, clogit, and glogit estimation, **irr** for poisson estimation, **rrr** for mlogit, **hr** for cox and stcox hazard models, and **eform** for xtgee, but it can be used to exponentiate the coefficients after any estimation. Exponentiation of coefficients is explained in [**R**] **maximize - methods and formulas**.

Note that the default form of stcox output displayed by Stata is the hazard rate form, so to save the same numbers in **outreg** use the **eform** option.

margin[(u|c|p)] specifies that the marginal effects rather than the coefficient estimates are reported. It can be used after truncreg,marginal from STB 52 or dtobit from STB 56. One of the parameters u, c, or p is required after dtobit, corresponding to the unconditional, conditional, and probability marginal effects, respectively. It is not necessary to specify **margin** after dprobit, dlogit2, dprobit2, and dmlogit2.

3. Options for t statistics, standard errors, etc.

se specifies that standard errors rather than t statistics are reported. The decimal places displayed are those set by **bdec**.

pvalue specifies that p values (of t statistics) rather than t statistics are reported. The decimal places displayed are set by **tdec**.

ci specifies that confidence intervals of coefficients rather than t statistics are reported. The decimal places displayed are those set by **bdec**.

level(#) specifies the confidence level, in percent, for confidence intervals. The default is level(95) or as set by `set level`; see [U] 23.5. Specifying the width of confidence intervals. level does not affect the confidence levels of asterisks.

beta asks that normalized beta coefficients be reported rather than t statistics (see the beta option of `regress`). The decimal places displayed are those set by **bdec**.

tdec(#) specifies the number of decimal places reported for t statistics or for p values if **pvalue** is specified. It also specifies the decimal places reported for R-squared or adjusted R-squared if they are not specified in **rdec**. The default value for **tdec** is usually 2, but 3 if **pvalue** is specified. The minimum value is 0 and the maximum value is 11.

noparen specifies that no parentheses be placed around t statistics, standard errors, etc.

bracket specifies that square brackets [] be used rather than parentheses () around t statistics, standard errors, etc.

noaster specifies that no asterisks denoting 1% and 5% significance levels be reported.

3aster specifies 3 asterisks for 1%, 2 asterisks for 5%, and 1 asterisk for 10% significance levels.

10pct specifies a "+" for 10 significance levels in addition to the default 2 asterisks for 1%, 1 asterisk for 5% significance levels (unless **sigsymb** is specified - see below).

sigsymb(textlist) specifies symbols for 1% and 5% significance levels (and 10% significance level if **10pct** is also chosen). The specified symbols replace the asterisks ** and *. Quotation marks around the new symbols are optional if the characters "," and are avoided. Here are two examples:
```
. outreg using table1, sigsymb(++,+)
. outreg using table1, sigsymb( (1%), (5%), (10%)) 10pct
```
Omitting symbols will prevent the significance level from being labeled (see also **noaster**). The following example will display only 1% significance levels:
```
. outreg using table1, sigsymb(*)
```

4. Statistics options

nonobs specifies that the number of observations in the estimation not be reported.

noni specifies that the number of groups in a panel data regression not be reported (e.g. the number of groups specified by the i() variable in `xtreg`). This option has an effect only after xt regression commands.

nor2 specifies that no R-squared (or adjusted R-squared) be reported. This option has an effect only if Stata calculates a true R-squared.

adjr2 specifies that the adjusted R-squared be reported rather than the regular R-squared (in regressions where the adjusted R-squared is defined).

rdec(#) specifies the number of decimal places reported for the R-squared or adjusted R-squared. The default value for **rdec** is the value for **tdec**. The minimum value is 0 and the maximum value is 11.

addstat("text" **,** # [**,** "text"**,** # ...] **)** specifies user-added statistics to be displayed in new lines below the R-squared (if shown). The user must specify both a name and a value for the statistic. Users can report significance levels of test statistics as a second statistic to be shown on the line below the first statistic (see example below).

adec(numlist) specifies the number of decimal places reported for user-added statistics (in **addstat**). The default value for **rdec** is the value for **tdec**. The minimum value is 0 and the maximum value is 11. If one number is specified in the numlist, it will apply to all statistics. If multiple numbers are specified in the numlist, they are applied to the user-added statistics as in **bdec**.

onecol specifies that multiequation models (e.g. `mlogit`, `reg3`, `heckman`) be formatted in one column rather than the default of multiple columns, one column per equation. Extra statistics included in the e(b) vector are also reported. A varlist is not allowed when the **onecol** option is chosen.

xstats specifies that the extra statistics included in the e(b) matrix be reported. Extra statistics for multi-equation models (i.e. `heckman`, `heckprob`, and `biprobit`) are not reported - use **addstat** or **onecol**. If there are no extra statistics in the e(b) matrix, **xstats** is ignored. This option is largely superceded by **addstat**.

5. Other options

comma specifies that the ASCII file output be separated by commas rather than by tabs. This can cause problems if any of the user-defined text has commas in it (such as variable labels, title, **ctitle**, **addstat**, or **addnote**). If that is the case, consider using **quote** as well.

replace specifies that it is okay to replace filename if it already exists.

append specifies that new estimation output be appended to an existing output file. In general, the same **outreg** options should be used in the original regression output and each appended regression. The notes at the bottom of the table explaining the t statistics or standard errors and asterisks are correct for the first estimation in the output file. If subsequently appended estimation results use different options (such as a switch to **noaster**, or change the estimation's **robust** option), the notes will not be appropriate for all the columns. This problem can be addressed with a combination of **nonotes** and **addnote**.

Examples

outreg defaults

outreg is used after an estimation command (similar to `predict`). Take a simple regression using Stata's auto.dta dataset.

```
. use c:\stata\auto, clear
(1978 Automobile Data)

. regress mpg foreign weight

  Source |       SS       df       MS                  Number of obs =      74
---------+------------------------------                F(  2,    71) =   69.75
   Model |  1619.2877       2  809.643849               Prob > F      =  0.0000
Residual |  824.171761      71   11.608053              R-squared     =  0.6627
---------+------------------------------                Adj R-squared =  0.6532
   Total |  2443.45946      73  33.4720474              Root MSE      =  3.4071


------------------------------------------------------------------------------
     mpg |      Coef.   Std. Err.       t     P>|t|      [95% Conf. Interval]
---------+--------------------------------------------------------------------
 foreign |  -1.650029   1.075994      -1.533   0.130      -3.7955    .4954421
  weight |  -.0065879    .0006371     -10.340   0.000     -.0078583   -.0053175
   _cons |    41.6797   2.165547      19.247   0.000      37.36172    45.99768
------------------------------------------------------------------------------
```

The simplest form of outreg just requires an output file name, in this case "auto1".

```
. outreg using auto1
```

Usually one would load the output file auto1.out into a word processor as a table. We can see the results of **outreg** within Stata using the `type` command. **outreg** output files ordinarily look jumbled when displayed using `type` so to improve the readability of these examples we have added spaces to make the columns line up properly.

```
. type auto1.out
                   Mileage (mpg)
Car type            -1.650
                    (1.53)
Weight (lbs.)       -0.007
                    (10.34)**
Constant            41.680
                    (19.25)**
Observations          74
R-squared            0.66
Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%
```

Note that **outreg** uses the variable labels in place of variable names so that the independent variable mpg listed above the column of regression coefficients uses the label "Mileage (mpg)", the variable

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foreign uses its label "Car type", etc. The user can change the variable labels before invoking outreg to provide the desired captions for the **outreg** results table.

Decimal places of coefficients; column titles

By default the regression coefficients are shown with three decimal places, but this isn't very satisfactory for the weight variable in the regression above. The weight coefficient is statistically significant, but only one non-zero digit is displayed. We could use the option **bdec(5)** to display 5 decimal places for all the coefficients, but we can do better. To display five decimal places of the weight coefficient only and two decimal places of the other coefficients, we use **bdec(2,5,2)**. We also add a column title "Base case (mpg)" to distinguish this regression from a second regression we will append to the table in the next example below. Quotation marks are not required around the column title because it the text does not contain commas.

```
. outreg using auto2, bdec(2,5,2) ctitle(Base case (mpg))
. type auto2.out
                 Base case (mpg)
Car type              -1.65
                      (1.53)
Weight (lbs.)         -0.00659
                     (10.34)**
Constant              41.68
                     (19.25)**
Observations            74
R-squared              0.66
Absolute value of t-statistics in parentheses
* significant at 5%; ** significant at 1%
```

Appending two regression tables together; number formats for coefficients

Researchers presenting their results commonly combine several related estimations in the same table. **outreg** combines results with the **append** option. First we add a quadratic term for the weight variable in a new regression.

```
. gen weightsq = weight^2
. label var weightsq "Weight squared"
. regress mpg foreign weight weightsq
```

```
  Source |       SS       df       MS              Number of obs =      74
---------+------------------------------              F(  3,    70) =   52.25
   Model | 1689.15372      3   563.05124              Prob > F      = 0.0000
Residual |  754.30574     70  10.7757963              R-squared     = 0.6913
---------+------------------------------              Adj R-squared = 0.6781
   Total | 2443.45946     73  33.4720474              Root MSE      = 3.2827

------------------------------------------------------------------------------
     mpg |     Coef.   Std. Err.       t     P>|t|     [95% Conf. Interval]
---------+--------------------------------------------------------------------
 foreign |   -2.2035   1.059246    -2.080    0.041     -4.3161    -.0909003
  weight | -.0165729   .0039692    -4.175    0.000    -.0244892    -.0086567
```

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```
weightsq |   1.59e-06    6.25e-07       2.546   0.013        3.45e-07    2.84e-06
   _cons |   56.53884    6.197383       9.123   0.000        44.17855    68.89913
---------------------------------------------------------------------------------
```

The weightsq coefficient is so small that it is difficult to display without scientific notation (as displayed in the regress output). By default, **outreg** displays coefficients in fixed format. We can change the weightsq coefficient numeric format to scientific (while keeping the rest fixed) with the **bfmt(f,f,e,f)** option. To specify the decimal places for the coefficients, we could use the option **bdec(2,5,2,2)**, but the last 2 is unnecessary because the last decimal place value applies to all the rest of the coefficients. We now **append** the results of the new regression to the previous regression results.

```
. outreg using auto2, bdec(2,5,2) bfmt(f,f,e,f) ctitle(Quadratic (mpg)) append
. type auto2.out
                         (1)                 (2)
                  Base case (mpg)    Quadratic (mpg)
Car type              -1.65              -2.20
                      (1.53)             (2.08)*
Weight (lbs.)         -0.00659           -0.01657
                      (10.34)**          (4.18)**
Weight squared                           1.59e-06
                                         (2.55)*
Constant              41.68              56.54
                      (19.25)**          (9.12)**
Observations          74                 74
R-squared             0.66               0.69
Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%
```

Technical Note: Originally I created an example where the "Base case" regression was **regress mpg weight foreign** and the "Quadratic" regression was **regress mpg weight weightsq foreign**. The **outreg** table ordered the coefficients:

    weight   foreign   weightsq

because all the regressors in the first estimation are listed before any new regressors in the appended estimation. Most people would prefer to list the weightsq coefficient immediately after the weight coefficient since they are related. There are three ways to get this result. The first is shown in the example above: make weight the last regressor in the first estimation and weightsq the first new regressor in the second estimation. The second way is to keep the order of the regressors unchanged in the estimation but include a varlist in the first **outreg** to reorder the coefficients:

    . outreg foreign weight using auto2, bdec(2,5,2) title(base case (mpg))

The third way and the only way to obtain the coefficient ordering

    weight   weightsq   foreign

in the **outreg** table (given that weightsq is not include in the first estimation) is to reorder the rows by hand after the table is created by **outreg**.

Typical format for economics journals: standard errors, brackets, and no asterisks

Economics journals often prefer standard errors to t statistics and don't use asterisks to denote statistical significance. The **se** option replaces t statistics with standard errors, the **bracket** option replaces parentheses with brackets, and the **noaster** option suppresses asterisks. The **title** option adds a title at the top of the **outreg** table. The title requires quotation marks because it contains a comma. Note that the decimal places specified by the **bdec** option apply to both the coefficients and the standard errors.

```
    . regress mpg foreign weight
  (output omitted)

    . outreg using auto3, se bdec(2,5,2) bracket noaster /*
  >  */ title("Please, no t statistics - we're economists")

    . type auto3.out
      Please, no t statistics - we're economists
                  Mileage (mpg)
  Car type             -1.65
                      [1.08]
  Weight (lbs.)       -0.00659
                      [0.00064]
  Constant            41.68
                      [2.17]
  Observations          74
  R-squared            0.66
  Standard errors in brackets
```

Using a varlist, no constant, and adding an explanatory note

Specifying a varlist in **outreg** can be convenient to limit the output table to only the essential coefficients. For example, we may want to control for the influence of dummy variables, but not report their estimated coefficients. As an example, we create categorical dummy variables for the five repair scores in the auto.dta dataset and add them to our simple regression above.

```
    . tab rep78, gen(repair)
  (output omitted)

    . regress mpg foreign weight repair1-repair4
  (output omitted)
```

If the only coefficients of interest are those of foreign and weight, they can be specified in the varlist. The constant in the regression will still be reported in the **outreg** table unless suppressed with the **nocons** option. The constant coefficient is not very meaningful in this case when dummy variables are included in the regression but their coefficients are not reported, so we suppress it. We also add a note to the bottom of the table explaining that the dummy variable coefficients are not shown, using the **addnote** option. Note that since the text in **addnote** does not contain parentheses or commas it does not need quotation marks. The **outreg** command is too long for one line, so it uses the Stata

comment symbols (/* ... */) to comment out the end of the line and continue the command syntax on the next line.

```
. outreg weight foreign using auto4, nocons /*
>   */ addnote(Coefficients for repair dummy variables not shown)


. type auto4.out
                Mileage (mpg)
 Weight (lbs.)        -0.006
                      (9.16)**
 Car type             -2.923
                      (2.18)*
 Observations            69
 R-squared             0.69
 Absolute value of t statistics in parentheses
 * significant at 5%; ** significant at 1%
 Coefficients for repair dummy variables not shown
```

Added statistics and notes

outreg allows for a number of statistics besides coefficients to be included in output tables (number of observations, R-squared, etc.). Users may nevertheless want to add a range of additional statistics to their estimation tables at different times, so the **addstat** option allows the inclusion of arbitrary user-specified statistics below the estimated coefficients (and below number of observations and R-squared, if reported). Say we wanted to test the equality of two of the estimated coefficients and report the results in the table. After a simple regression, the `test` command will report an F statistic and the associated p value in the macros r(F) and r(p).

```
. regress mpg foreign weight length
```
(output omitted)
```
. test foreign length
```
(output omitted)

addstat can report include multiple statistics, each one of which is displayed on a separate line. The arguments for each statistic are a text string (the name of the statistic) and number (the statistic value). To report just the F statistic the **addstat** option might be **addstat(F test: Car type=Length=0, r(F))**. Below we include the p value of the F statistic as a second statistic. The **adec** option specifies the reported decimal places for each statistic.

The **outreg** command below also includes another example of the **addnote** option, first inserting a blank line after the rest of the table output with an empty string (""), followed by the time the program was run (from the built-in Stata functions $S_TIME and $S_DATE), and the dataset used by the estimation (from the Stata function $S_FN).

```
. outreg using auto5, /*
>   */ addstat(F test: Car type=Length=0, r(F), Prob > F, r(p)) adec(2,3) /*
>   */ addnote("", "Run at $S_TIME, $S_DATE", Using data from $S_FN)


. type auto5.out
                     Mileage (mpg)
```

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```
Car type                    -1.708
                            (1.60)
Weight (lbs.)               -0.004
                            (2.73)**
Length (in.)                -0.083
                            (1.51)
Constant                    50.537
                            (8.09)**
Observations                  74
R-squared                    0.67
F test: Car type=Length=0   2.34
Prob > F                     0.104
Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%


Run at 23:23:08, 17 Nov 2000
Using data from c:\stata\auto.dta
```

Stata return value macros r(), e(), or s() can be included directly in the **addstat** option in place of statistic values as shown above. Another example would be to report a pseudo R-squared after a logit estimation, which **outreg** does not otherwise report. The **addstat** option could be **addstat(Pseudo R-squared, e(r2_p))**. To see all the statistics available in memory after an estimation command, type estimates list or **est li**, and after an r-class command (notably most tests and summarize), type return list or **ret li**.

In some cases it is better to save the value of a previously calculated statistic in a local macro and then put the macro value into **addstat**. This would be the case, for example, if after a regression two test commands were run which return r() values, both of which are to be reported with the regression results in **outreg**. The second test command would wipe out the r() values from the first test command. Say both test commands (called test1 and test2) created F statistics, then the user could save the first F statistic in a local macro:

```
. regress y x1 x2
. test1 x1
. local F1 = r(F)
. test2 x2
. outreg using 2test, addstat(Test1 F, `F1', Test2 F, r(F))
```

Multiequation models and column titles

The creation of output tables for multiequation models is straightforward with **outreg**. Each equation has its own column in the table. To label the equation column headings with something other than the dependent variable labels, the user chooses the **ctitle** option with multiple text strings, as many strings as equations. The example below uses the reg3 three-stage least squares estimation of the Klein macro model (see [R] reg3).

```
. reg3 (c p p1 w) (i p p1 k1) (wp y y1 yr), endog(w p y) exog(t wg g)

(output omitted - see [R] reg3, p. 148 for output)

. outreg using multieq, ctitle(Consumption Equation, Investment Equation, Wage
```

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```
> Equation)

. type multieq.out
                       (1)                    (2)                (3)
              Consumption Equation   Investment Equation  Wage Equation
profits           0.125                    -0.013
                 (1.16)                    (0.08)
profits1          0.163                     0.756
                 (1.62)                    (4.94)**
wagetot           0.790
                (20.83)**
capital1                                   -0.195
                                           (5.99)**
totinc                                                        0.400
                                                            (12.59)**
totinc1                                                       0.181
                                                             (5.31)**
year                                                          0.150
                                                             (5.36)**
Constant         16.441                    28.178          -287.223
                (12.60)**                  (4.15)**          (5.37)**
Observations      21                        21                21
                    Absolute value of z statistics in parentheses
                     * significant at 5%; ** significant at 1%
```

If the user prefers an **outreg** table with all the equations' coefficients in a single column after a multiequation estimation, the **onecol** option provides this.

Exponential transformations of coefficients

As noted above, there is no way of knowing after an estimation command if the user chose to report the exponentiated form of coefficients. The user must choose the **eform** option in **outreg** to get the same form of the coefficients.

For duration models, the exponential form is known as the hazard ratio. For other models it is known as odds ratio, relative risk ratio, or incidence rate ratio.

The example here uses the panel Cox regression shown in [R] stcox.

```
    . stcox load bearings, nolog

            failure _d:  1 (meaning all fail)
      analysis time _t:  failtime


    Cox regression -- Breslow method for ties

    No. of subjects =            12              Number of obs   =         12
    No. of failures =            12
    Time at risk    =           896
                                                 LR chi2(2)      =     23.39
```

```
     Log likelihood  =    -8.577853                        Prob > chi2    =    0.0000


     ----------------------------------------------------------------------------
         _t |
         _d |  Haz. Ratio   Std. Err.      z     P>|z|      [95% Conf. Interval]
     ---------+------------------------------------------------------------------
       load |    1.52647    .2188172     2.951   0.003      1.152576    2.021653
     bearings |   .0636433    .0746609    -2.348   0.019      .0063855    .6343223
     ----------------------------------------------------------------------------
```

By default, stcox reports coefficients in hazard ratio form. However, **outreg** without the **eform** option will report the coefficients in unexponentiated form, not in hazard ratios.

```
. outreg using bearing
. type bearing.out
                  _t
load            0.423
               (2.95)**
bearings       -2.754
               (2.35)*
Observations     12
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%
```

outreg can create an output file with coefficients in hazard ratio form with the addition of the **eform** option. Since stcox does not tell us the name of the duration variable, we also add a column title **ctitle**(failtime).

```
. outreg using bearing, eform ctitle(failtime) replace
. type bearing.out
               failtime
load             1.526
               (2.95)**
bearings         0.064
               (2.35)*
Observations     12
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%
```

Marginal Effects

A number of Stata commands (mostly STB additions) report the estimated marginal effects of coefficients. Most of the commands only report marginal effects, and the user need not do anything special when invoking **outreg**. Two recent STB commands, truncreg,marginal and dtobit, though, report both the coefficients and the marginal effects, so the user must tell **outreg** whether to report the marginal effects with the **margin** option. After truncreg,marginal, the user specifies the **margin** option without arguments in **outreg**. dtobit, on the other hand, calculates three different marginal effects. The user must specify which marginal effect **outreg** will report using the **margin** option with the argument u, c, or p for the unconditional, conditional, or the probability uncensored, respectively.

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We use Stata's auto dataset again to estimate a `tobit` model and calculate the marginal effects with `dtobit`.

```
. use c:\stata\auto, clear
(1978 Automobile Data)

. tobit mpg trunk weight, ll(17)
```
(output omitted)
```
. dtobit
```

Marginal Effects: Latent Variable
```
------------------------------------------------------------------------
variable |     dF/dx    Std. Err.       z    P>|z|     X_at    [    95% C.I.    ]
---------+--------------------------------------------------------------
   trunk | -.1487203   .1477163    -1.01   0.314   13.7568  -.438239   .140798
  weight | -.0063328   .0008709    -7.27   0.000   3019.46   -.00804  -.004626
   _cons |  41.90603   2.094632    20.01   0.000   1.00000   37.8006   46.0114
------------------------------------------------------------------------
```

Marginal Effects: Unconditional Expected Value
```
------------------------------------------------------------------------
variable |     dF/dx    Std. Err.       z    P>|z|     X_at    [    95% C.I.    ]
---------+--------------------------------------------------------------
   trunk | -.1243259   .1234866    -1.01   0.314   13.7568  -.366355   .117703
  weight |  -.005294   .0007281    -7.27   0.000   3019.46  -.006721  -.003867
   _cons |  35.03223   1.751052    20.01   0.000   1.00000   31.6002   38.4642
------------------------------------------------------------------------
```

Marginal Effects: Conditional on being Uncensored
```
------------------------------------------------------------------------
variable |     dF/dx    Std. Err.       z    P>|z|     X_at    [    95% C.I.    ]
---------+--------------------------------------------------------------
   trunk | -.0926812   .0920555    -1.01   0.314   13.7568  -.273107   .087744
  weight | -.0039465   .0005428    -7.27   0.000   3019.46   -.00501  -.002883
   _cons |  26.11546   1.305356    20.01   0.000   1.00000    23.557   28.6739
------------------------------------------------------------------------
```

Marginal Effects: Probability Uncensored
```
------------------------------------------------------------------------
variable |     dF/dx    Std. Err.       z    P>|z|     X_at    [    95% C.I.    ]
---------+--------------------------------------------------------------
   trunk |  -.009621   .0095561    -1.01   0.314   13.7568  -.028351   .009109
  weight | -.0004097   .0000563    -7.27   0.000   3019.46   -.00052  -.000299
   _cons |  2.710991   .1355063    20.01   0.000   1.00000    2.4454   2.97658
------------------------------------------------------------------------
```

The following **outreg** command will report the unconditional marginal effects.

```
. outreg using auto6, margin(u)
```

```
. type auto6.out
                          Mileage (mpg)
Trunk space (cu. ft.)      -0.124
                           (1.01)
Weight (lbs.)              -0.005
                           (7.27)**
Constant                   35.032
                           (20.01)**
Observations                  74
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%
```

Although the user can only choose a single kind of marginal effect to include in each **outreg** command after the dtobit command, the user could use **outreg** several times with different marginal effects and append the results together into a single table.

Author

John Luke Gallup
developIT.org
john_gallup@alum.swarthmore.edu

Also see

STB: sg97 (STB-46, STB-49, STB-58)
Manual: [U] 23 Estimation and post-estimation commands
         [U] 29 Overview of model estimation
         [R] estimation commands
On-line: help for est, postfile, outfile, outsheet, save, modltbl;