

Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

From estimation output to document tables:

A long way made short

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outline

- Introduction
- A primer on **estout**
- Easy-peasy: **eststo** and **esttab**
- Advanced examples
- Discussion

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Introduction

- Output from statistical estimation routines contains all sorts of details and it is often sensible to display only selected and rearranged results in form of "regression tables".

Regression tables are useful

- to get an overview of results when analyzing data,
- for results presentation in reports and publications.

- Various user commands have been around to compile regression tables (and export them to other formats). Examples are:

- **outreg** (John Luke Gallup)
- **outtex** (Antoine Terracol)
- **est2tex** (Marc Muendler)
- **mktab** (Nicholas Winter)
- **parmest** (Roger Newson)

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Introduction

- Stata Corp then came out with their own tool called **estimates table** in Stata 8.

estimates table was a relief because it was so much more straight forward to use than the other packages. Especially the concept of first storing a bunch of models and not worry about tabulation until later, appealed to me.

However, **estimates table** does have some serious limitations:

- It is only intended for displaying the models in the Results window or the log.
- It has only very limited functionality in terms of formatting. For example, is not possible to place standard errors or t-statistics in parentheses, which makes the tables very unreadable.

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Introduction

- I liked **estimates table**, but it was not flexible enough, so I started working on a wrapper that runs **estimates table**, grabs the results (an r-matrix containing point estimates and variances), puts together an improved table, and exports it to a tab-delimited or LaTeX-formatted file (that's what I needed at that time; this was around June 2004).

This first **estout** version is still available from SSC as **estout1**.

- **estout** was easy to use but it had the limitation that only point estimates and one of t-stats, standard errors, p-values or CIs could be printed. So I came up with the **cells** option, allowing to freely specify and arrange the contents of the table.

Furthermore, this guy came along, Ian Watson, and pushed me to implement all sorts of LaTeX related things. The number of options grew and grew ...

(July–August 2004)

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Introduction

- **estout** then remained pretty much as it was until today, with some new options every now and then. One notable event was the addition of **estadd**, a tool to compute an add extra statistics to a model's eO-results, in November 2004.
- Many people were using **estout** and I had lots of positive responses. However, people kept complaining that **estout** was too complicated to use.

The motivational orientation of **estout** towards functionality rather than ease-of-use and towards exporting tables for use with LaTeX brought with it some limitations:

- **estout** tables usually do not display well in Stata's results window.
- **estout**'s syntax is not as intuitive and user-friendly as it could be.
- The amount of typing required to compile even a simple table can be considerable. (There are "defaults files" to pre-specify options, but I think hardly anyone uses them.)

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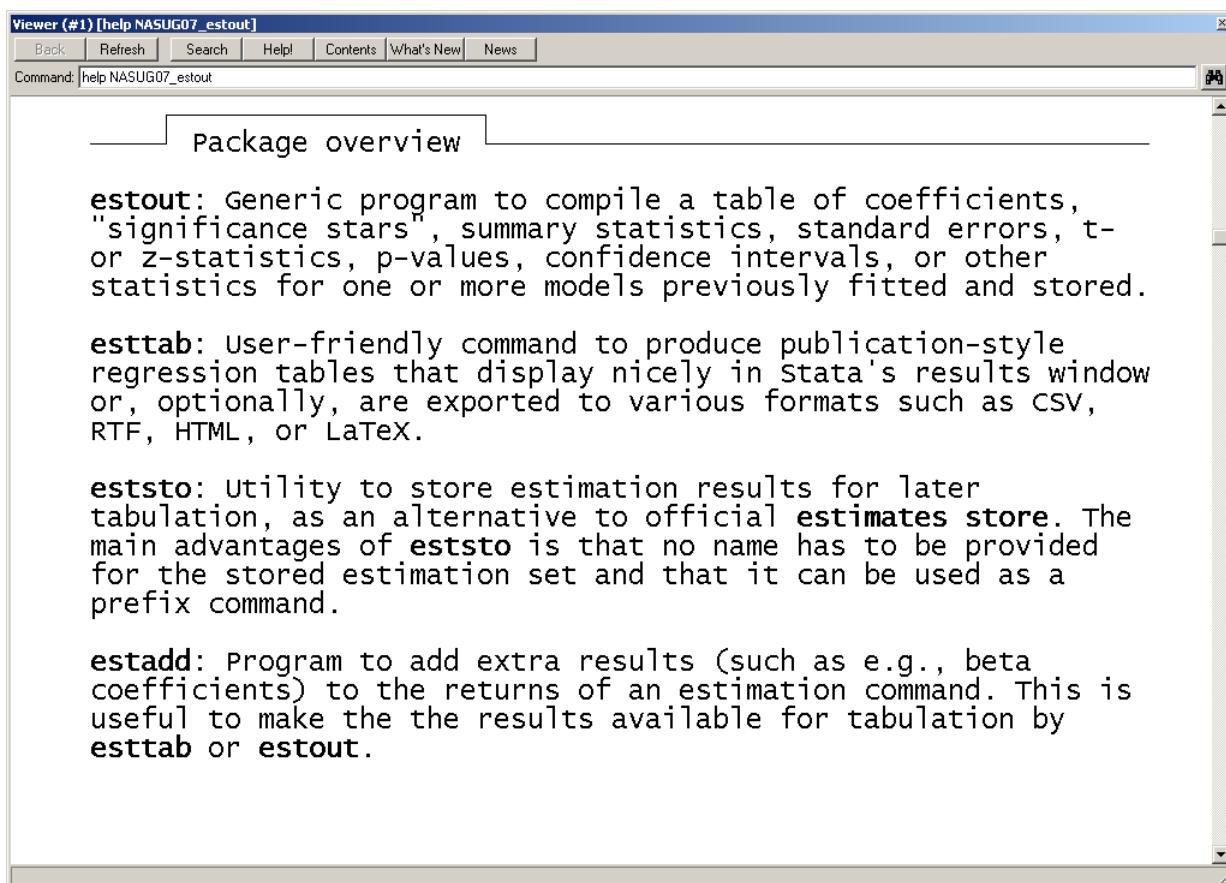
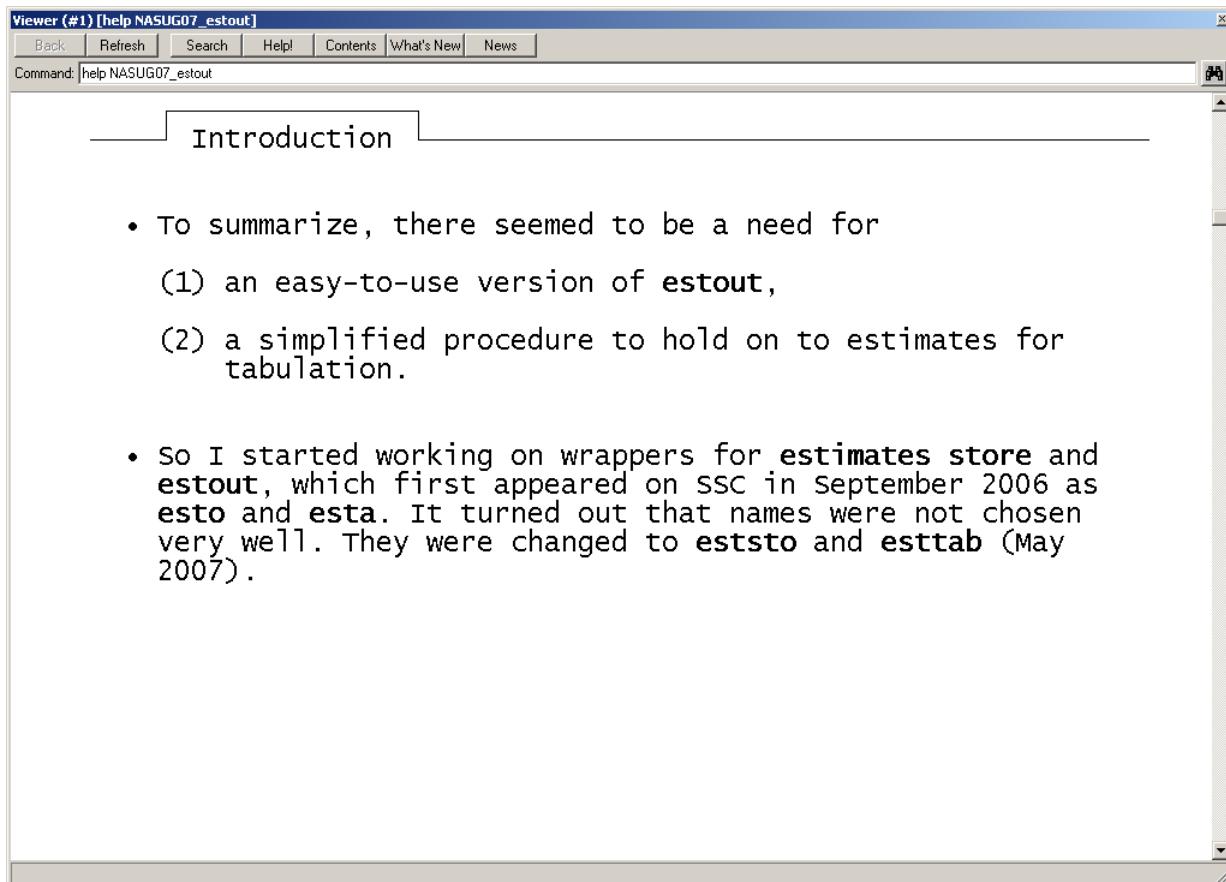
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- An additional issue with **estout** is that the estimation sets have to be stored using official Stata's **estimates store** before they can be tabulated.

Drawbacks of **estimates store** are:

- The user is required to specify names under which to store the estimation sets. This can be distracting.
- The stored estimates consume a considerable amount of memory. (In order to preserve functionality of postestimation commands, an estimation sample indicator variable is stored for each estimation set. These indicators may greatly enlarge the dataset if it contains a many of observations or if many estimation sets are stored. Additionally, storing the estimation samples has the side effect of slowing down cycling through the stored sets, which also slows down tabulation programs such as **estout** or official Stata's **estimates table**.)



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Basic usage of estout

Syntax:

```
estout [ nameList ] [ using filename ] [ , cells(array)  

stats(scalarList) style(style) more_options ]
```

where the amount of *more_options* is considerable and many options also have suboptions (similar to **graph**'s syntax).

The basic procedure is to first estimate and store a bunch of models and then apply **estout** to tabulate them:

```
sysuse auto

regress price weight mpg
estimates store m1

regress price weight mpg foreign
estimates store m2

estout m1 m2 using example.txt
<run>
```

Stata/SE 9.2 - [Results]

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Review Variables

	price	Coef.	Std. Err.	t	P> t	[95% Conf.]
weight	3.464706	.630749	5.49	0.000	2.206717	
mpg	21.8536	74.22114	0.29	0.769	-126.1758	
foreign	3673.06	683.9783	5.37	0.000	2308.909	
_cons	-5853.696	3376.987	-1.73	0.087	-12588.88	

```
.
estimates store m2

.
estout m1 m2 using example.txt

m1      m2
b        b
weight  1.746559    3.464706
mpg     -49.51222   21.8536
foreign  3673.06
_cons   1946.069   -5853.696

.
end of do-file
more
```

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The styleO option

The table looks messy in Stata's results window or the Stata log because the columns are tab-separated (note that tab characters are not preserved in the results window or the log). However, the stored example.txt would look tidy if it were opened in a spreadsheet program.

To compile a table that looks good in Stata's results window, the styleO option can be used. It provides a style called smcl (Stata Markup and Control Language):

```
estout m1 m2, style(smcl)
<run>
```

Other predefined styles are **tab** (the default), **fixed**, **tex**, and **html**, and it is also possible to define one's own styles. The **tex** style, for example, modifies the output table for use with LaTeX's tabular environment:

```
estout m1 m2, style(tex)
<run>
```

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```
foreign      3673.06
_cons    1946.069   -5853.696

.
end of do-file
.
do_example do/0b.ihlp
.
estout m1 m2, style(smcl)

m1          m2
b            b
-----
```

weight	1.746559	3.464706
mpg	-49.51222	21.8536
foreign		3673.06
_cons	1946.069	-5853.696

```
.
end of do-file
more
```

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```

weight          1.746559    3.464706
mpg            -49.51222   21.8536
foreign         3673.06
_cons          1946.069   -5853.696

.

end of do-file

. do_example do/0c.ihlp

.      estout m1 m2, style(tex)

      &           m1&
      &           b&
      weight     & 1.746559& 3.464706\\
      mpg        & -49.51222& 21.8536\\
      foreign    &           & 3673.06\\
      _cons      & 1946.069& -5853.696\\

.

end of do-file
more

```

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The cells() option

The `cells()` option is used to determine the primary contents of the table and its arrangement. For example, to report point estimates and standard errors, type:

```

estout m1 m2, cells(b se) style(smc1)
<run>

```

other examples:

```

estout m2, cells("b se t p") style(smc1)
<run>

estout m1 m2, cells("b p" se) style(smc1)
<run>

```

Formatting is done via suboptions within `cells()` (this is the part where most people get lost):

```

estout m1 m2, cells(b(star fmt(3)) t(par fmt(2))) style(smc1)
<run>

```

do_example do/0c.ihlp

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```
end of do-file
. do_example do/0e.ihlp
. estout m1 m2, cells(b se) style(smc1)

      m1          m2
      b/se        b/se
-----
```

	m1 b/se	m2 b/se
weight	1.746559 .6413538	3.464706 .630749
mpg	-49.51222 86.15604	21.8536 74.22114
foreign		3673.06 683.9783
_cons	1946.069 3597.05	-5853.696 3376.987

```
end of do-file
more
```

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```
3597.05    3376.987
```

```
end of do-file
. do_example do/0f.ihlp
. estout m2, cells("b se t p") style(smc1)

      m2
      b          se          t          p
-----
```

	m2 b	m2 se	m2 t	m2 p
weight	3.464706	.630749	5.493003	5.99e-07
mpg	21.8536	74.22114	.2944391	.7692938
foreign	3673.06	683.9783	5.370142	9.72e-07
_cons	-5853.696	3376.987	-1.733408	.0874262

```
end of do-file
more
```

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```

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end of do-file
. do_example do/0g.ihlp
. estout m1 m2, cells("b p" se) style(smc1)

m1          m2
b/se          b/se
-----  -----
weight      1.746559   .0081298   3.464706   5.99e-07
           .6413538
mpg        -49.51222   .5673237   21.8536   .7692938
           86.15604
foreign     3673.06    683.9783
           9.72e-07
_cons       1946.069   .5901886   -5853.696   .0874262
           3597.05
-----  -----
```

```

end of do-file
more
```

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```

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end of do-file
. do_example do/0h.ihlp
. estout m1 m2, cells(b(star fmt(3)) t(par fmt(2))) style(smc1)

m1          m2
b/t          b/t
-----  -----
weight      1.747**   3.465***  

           (2.72)   (5.49)
mpg        -49.512    21.854  

           (-0.57)   (0.29)
foreign     3673.060***  

           (5.37)
_cons       1946.069   -5853.696  

           (0.54)   (-1.73)
-----  -----
```

```

end of do-file
more
```

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The stats() option

The `stats()` option specifies the scalar statistics to be displayed for each model in the table footer. Example:

```
estout m1 m2, stats(r2 bic N) style(smc1)
<run>
```

Actually, the newest addition to `estout` is the ability to tabulate string eO-macros in the table footer:

```
regress price weight
estimates store m1
regress price weight, robust
estimates store m2
regress price weight, vce(bootstrap)
estimates store m3
estout m1 m2 m3, cells(b se(par)) stats(N vcetype) ///
style(smc1)
estimates clear
<run>
```

do_example do/0i.ihlp

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```
end of do-file
. do_example do/0i.ihlp
. estout m1 m2, stats(r2 bic N) style(smc1)
```

	m1 b	m2 b
weight	1.746559	3.464706
mpg	-49.51222	21.8536
foreign		3673.06
_cons	1946.069	-5853.696
r2	.2933891	.4995594
bic	1378.64	1357.414
N	74	74

```
. end of do-file
more
```

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```

. estimates store m3
. estout m1 m2 m3, cells(b se(par)) stats(N vcetype) ///
  style(smc1)

      m1          m2          m3
      b/se        b/se        b/se
weight    2.044063    2.044063    2.044063
           (.3768341)   (.3897465)   (.4378883)
_cons     -6.707353   -6.707353   -6.707353
           (1174.43)   (1032.394)   (1195.078)

N          74          74          74
vcetype    Robust      Robust      Bootstrap

```

```

. estimates clear
.
end of do-file
more

```

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Technical note

This point was bothering me since long. The problem was that Stata has no string matrices and so I could not come up with a good approach to collect the eO-macros.

But then, last week, it occurred to me that it is real easy. Just set up a virtual matrix of string scalars and then fill it up. Here's a snip of the code that initializes the "string matrix":

```

local strscalars
forv m=1/`nmodels' {
  local temp
  forv i=1/`list sizeof emptystats' {
    tempname m `m's`i'
    local temp `temp' `m`m's`i''
  }
  local strscalars `""`strscalars' ""`temp'"""
}

```

do_example do/0j.ihlp

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Other estout options

estout has tons of other options to achieve all sorts of effects. For example,

- **label** uses variable labels instead of names,
- **eform** reports exponentiated results (odds ratio, hazard ratio)
- **keepO**, **dropO**, and **orderO** select and order the coefficients to be included in the table,
- and **margin** can be used to report marginal effects after **mfx**.

Syntax can get complicated, especially when it comes to suboptions, and that's what many users have trouble with.

I will therefore not go into detail here and now present **eststo** and **esttab**, which are supposed make things easier.

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Storing estimates simplified

Syntax:

```
eststo [ name ] [ , options ] [: command ]
eststo drop {#|name} [...]
eststo clear

options          description
[no]esample      do not/do store e(sample)
title(string)    specify a title for the stored set
addscalars(...)  add scalar statistics
...
```

_eststo is short for **eststo**, **noexample**

by is allowed with **eststo** if **eststo** is used as a prefix command:

```
by ... : eststo ... : estimation_command
```

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Storing estimates simplified

Basic example:

```

sysuse auto, clear

regress price weight mpg
eststo

regress price weight mpg foreign
eststo

estout, style(smc1)
<run>

macro dir
<run>

eststo clear
<run>

```

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Command

	foreign	3673.06	683.9783	5.37	0.000	2308.909
_cons	-5853.696	3376.987	-1.73	0.087	-12588.88	

```

eststo
(est2 stored)

estout, style(smc1)

est1      est2
b          b

weight    1.746559   3.464706
mpg       -49.51222  21.8536
foreign   3673.06
_cons    1946.069  -5853.696

end of do-file
more

```

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Review Variables Command

```
S_E_depv:      price
S_E_cmd:       regress
eststo_counter: 2
eststo:         est1 est2
S_FNDATE:     13 Apr 2005 17:45
S_FN:          C:\Program Files\Stata9\ado\base/a/auto.dta
S_1:           weight
F5:            do D:\Home\Stata\winedt\_temp;
S_level:      95
F1:            help
F2:            #review;
F3:            describe;
F7:            save
F8:            use
S_ADO:         UPDATES;BASE;SITE;.;PERSONAL;PLUS;OLDPLACE
S_StataSE:    SE
S_FLAVOR:     Intercooled
S_OS:          Windows
S_MACH:        PC

.
end of do-file
more
```

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Command: help NASUG07_estout

Storing estimates simplified

Use **eststo** as a prefix command:

```
eststo: regress price weight mpg
eststo: regress price weight mpg foreign
estout, style(smc1)
<run>
```

Drop the **e(sample)**:

```
eststo, noesample: reg price weight mpg
.eststo: reg price weight mpg
estimates dir
describe _est*
eststo clear
<run>
```

do_example do/3.ihlp

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Review Command

Variables

model	command	depvar	npar	title
est1	regress	price	3	
est2	regress	price	4	
est3	regress	price	3	
est4	regress	price	3	

```

. describe _est*
      storage   display      value
variable name    type    format    label      variable label
_<est>_est1      byte    %8.0g      esample○ from estimates
_<est>_est2      byte    %8.0g      esample○ from estimates
.
. eststo clear
.
end of do-file
more

```

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Storing estimates simplified

Add additional results while storing:

```

regress price weight mpg
test weight = mpg
eststo, add(p_diff r(p))
estout, style(smc1) stats(p_diff)
eststo clear
<run>

```

Use with by:

```

by foreign: eststo: quietly reg price weight mpg
estout, style(smc1)
eststo clear
<run>

```

do_example do/6.ihlp

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```

. test weight = mpg
( 1)  weight - mpg = 0
      F(  1,    71) =     0.36
                  Prob > F =  0.5514

. eststo, add(p_diff r(p))
(e(p_diff) = .55138216 added)
(est1 stored)

. estout, style(smc1) stats(p_diff)

est1
b

weight          1.746559
mpg            -49.51222
_cons         1946.069
p_diff          .5513822

```

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```

. by foreign: eststo: quietly reg price weight mpg
-> Domestic
(est1 stored)

-> Foreign
(est2 stored)

. estout, style(smc1)

est1          est2
b            b

weight        4.415037   5.155842
mpg           237.691   -19.77737
_cons        -13285.44  -5065.841

```

. eststo clear

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Tabulating estimates

My recommendation is to use **esttab** in most situations.

- It's syntax is much simpler than that of **estout**.
- It has better defaults (publication-style table that displays nicely in Stata's results window).
- It provides full **estout** functionality (all **estout** options are allowed).
- And, to some degree, it extends functionality (e.g. Word RTF and Excel CSV output modes, improved LaTeX support).

Basic syntax:

```
esttab [ name-list ] [ using filename ] [, options ]
```

If *name-list* is omitted, **esttab** tabulates the estimation sets stored by **eststo**.

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overview of esttab options

```
b(fmt) beta[(fmt)] main(name [fmt]) t(fmt) abs not  
se[(fmt)] p[(fmt)] ci[(fmt)] aux(name [fmt]) [no]constant  
[no]star[(list)] staraux  
r2[(fmt)] ar2[(fmt)] pr2[(fmt)] aic[(fmt)] bic[(fmt)]  
scalars(list) sfmt(fmt [...]) noobs obslast  
wide [no]parentheses brackets [no]gaps [no]lines noeqlines  
compress plain  
label title(string) mtitles(list) nomtitles [no]depvars  
[no]numbers coeflabels(list) [no]notes addnotes(list)  
smcl | fixed | tab | csv | scsv | rtf | html | tex | booktabs  
fragment page[packages] alignment(string) width(string)  
replace append type noisily  
drop(list) keep(list) order(list) equations(list)  
eform margin unstack other_estout_options
```

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Tabulating estimates using esttab

Default table:

```
sysuse auto, clear
eststo: regress price weight mpg
eststo: regress price weight mpg foreign
esttab
<run>
```

Display standard errors and add some summary statistics:

```
esttab, se ar2 nostar
<run>
```

Display beta coefficients:

```
esttab, beta not
<run>
```

Stata/SE 9.2 - [Results]

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Review

Variables

	(1)	(2)
	price	price
weight	1.747*** (2.72)	3.465*** (5.49)
mpg	-49.51 (-0.57)	21.85 (0.29)
foreign		3673.1*** (5.37)
_cons	1946.1 (0.54)	-5853.7 (-1.73)
N	74	74
t statistics in parentheses		
* p<0.05, ** p<0.01, *** p<0.001		

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Review Variables

```
esttab, se ar2 nostar
```

	(1)	(2)
	price	price
weight	1.747 (0.641)	3.465 (0.631)
mpg	-49.51 (86.16)	21.85 (74.22)
foreign		3673.1 (684.0)
_cons	1946.1 (3597.0)	-5853.7 (3377.0)
N	74	74
adj. R-sq	0.273	0.478

Standard errors in parentheses

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Review Variables

```
end of do-file
do_example do/9.ihlp
esttab, beta not
```

	(1)	(2)
	price	price
weight	0.460**	0.913***
mpg	-0.097	0.043
foreign		0.573***
N	74	74

Standardized beta coefficients
 * p<0.05, ** p<0.01, *** p<0.001

```
end of do-file
more
```

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Tabulating estimates using esttab

wide format:

```
esttab, wide compress
<run>
```

Labels and titles:

```
esttab, se ar2 nostar brackets label
      title("This is a regression table") ///
      nonumbers mtitles("Model A" "Model B") ///
      addnote("Source: auto.dta")
<run>
```

Plain table:

```
esttab, plain
<run>
```

do_example do/9.ihlp

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Review Variables

Command

```
end of do-file
. do_example do/10.ihlp
. esttab, wide compress
```

	(1)		(2)	
	price		price	
weight	1.747**	(2.72)	3.465***	(5.49)
mpg	-49.51	(-0.57)	21.85	(0.29)
foreign			3673.1***	(5.37)
_cons	1946.1	(0.54)	-5853.7	(-1.73)
N	74		74	

t statistics in parentheses
 * p<0.05, ** p<0.01, *** p<0.001

```
. end of do-file
—more—
```

d:\Home\NASUG07\estout

Stata/SE 9.2 - [Results]

File Edit Prefs Data Graphics Statistics User Window Help

Review Variables

Command

```
> addnote("Source: auto.dta")
This is a regression table
```

	Model A	Model B
weight (lbs.)	1.747 [0.641]	3.465 [0.631]
Mileage (mpg)	-49.51 [86.16]	21.85 [74.22]
Car type		3673.1 [684.0]
Constant	1946.1 [3597.0]	-5853.7 [3377.0]
Observations	74	74
Adjusted R-squared	0.273	0.478

Standard errors in brackets
Source: auto.dta

d:\Home\NASUG07\estout

Stata/SE 9.2 - [Results]

File Edit Prefs Data Graphics Statistics User Window Help

Review Variables

Command

```
. end of do-file
. do_example do/12.ihlp
. esttab, plain
```

	est1 b/t	est2 b/t
weight	1.746559 2.723238	3.464706 5.493003
mpg	-49.51222 -.5746808	21.8536 .2944391
foreign		3673.06 5.370142
_cons	1946.069 .541018	-5853.696 -1.733408
N	74	74

```
. end of do-file
more
```

d:\Home\NASUG07\estout

Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

Display formats

Numerical display formats may be specified as:

- official Stata's display formats such as `%9.0g` or `%8.2f`
- integer values such as 0, 1, 2, etc. for fixed formats
- `a1, a2, ..., or a9` to cause `esta` choose a reasonable display format depending on the scale of the displayed number (the # in `a#` is the minimum number of significant digits)

The default display format depends on type of displayed statistic (e.g. `a3` for point estimates and fixed format 3 for p-values and the R-squared):

```
esttab, p r2 nostar wide
<run>
```

Specifying alternative formats:

```
esttab, b(%9.0g) p(4) r2(4) nostar wide
<run>
```

Stata/SE 9.2 - [Results]

File Edit Prefs Data Graphics Statistics User Window Help

Review Variables Command

```
end of do-file
. do_example do/13.ihlp
. esttab, p r2 nostar wide
```

	(1) price	(2) price
weight	1.747	(0.008)
mpg	-49.51	(0.567)
foreign		21.85
_cons	1946.1	(0.590)
N	74	3673.1
R-sq	0.293	(0.000)
		-5853.7
		(0.087)
		74
		0.500

p-values in parentheses

```
. end of do-file
more
```

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Stata/SE 9.2 - [Results]

File Edit Prefs Data Graphics Statistics User Window Help

Review Variables Command

```
end of do-file
. do_example do/14.ihlp
. esttab, b(%9.0g) p(4) r2(4) nostar wide
```

	(1)	(2)	
	price	price	
weight	1.746559	(0.0081)	3.464706
mpg	-49.51222	(0.5673)	21.8536
foreign			(0.0000)
_cons	1946.069	(0.5902)	-5853.696
N		74	(0.0874)
R-sq	0.2934		0.4996

p-values in parentheses

```
. end of do-file
more
```

d:\Home\NASUG07\estout

Viewer (#1) [help NASUG07_estout]

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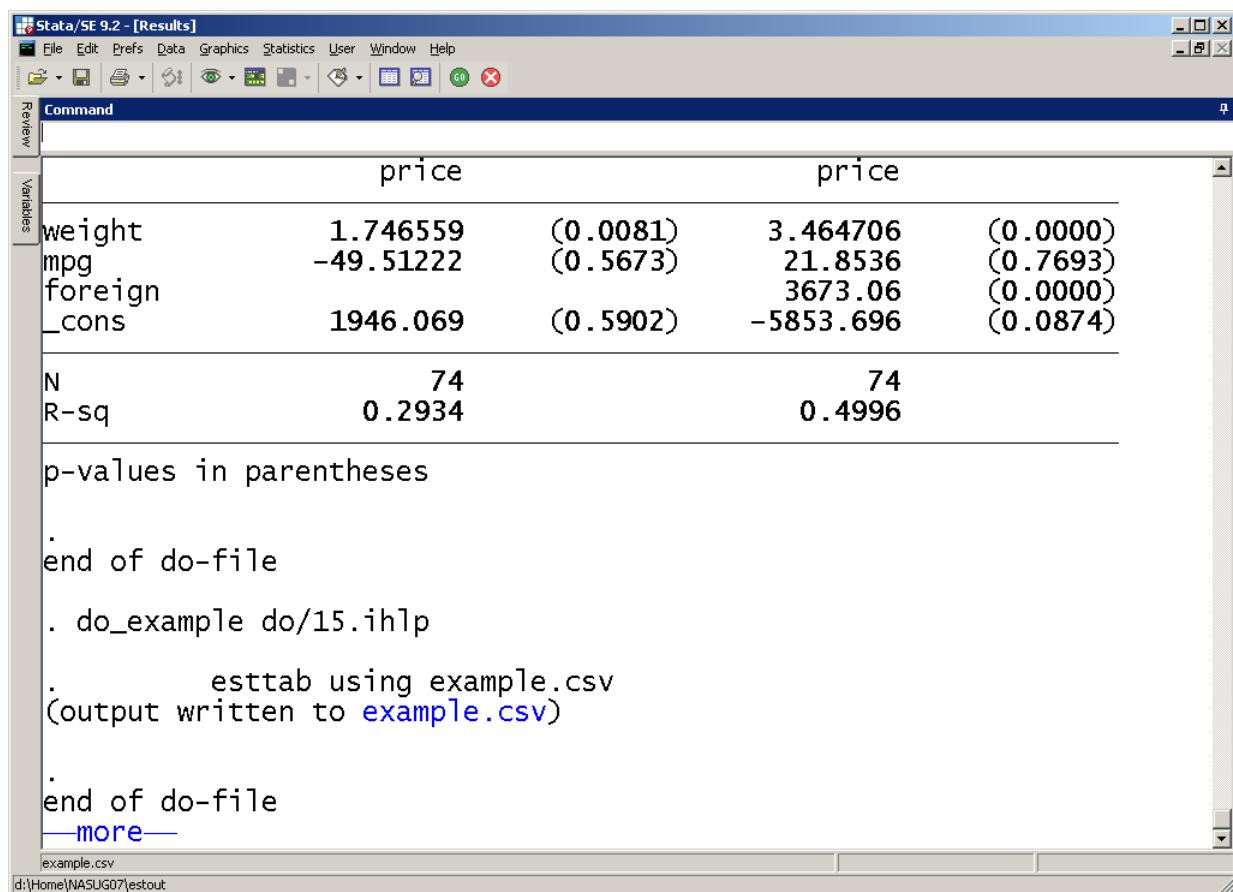
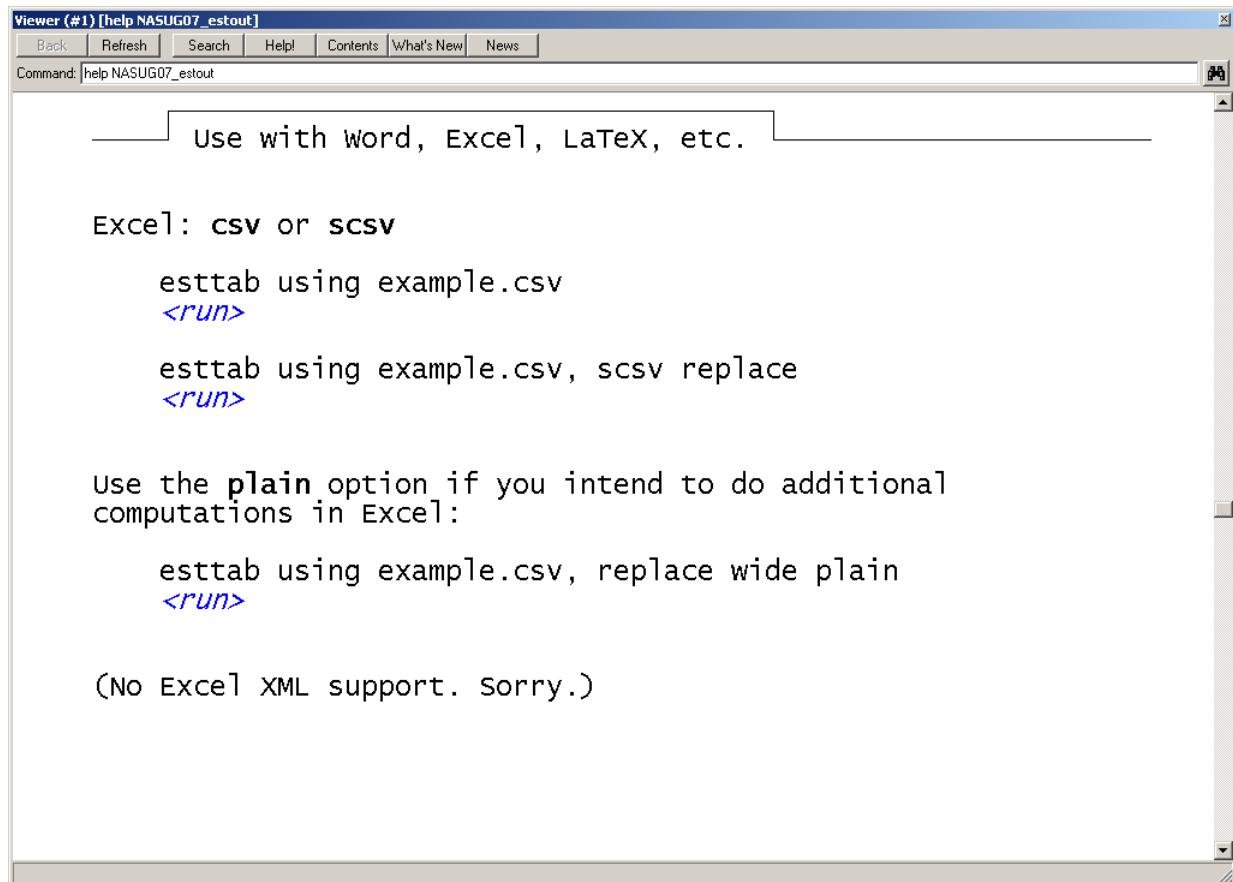
Command: help NASUG07_estout

use with Word, Excel, LaTeX, etc.

esttab features a variety of output formats:

- **smcl**: SMCL formatted (default unless **using** is specified)
- **fixed**: fixed-format ASCII (default if **using** is specified)
- **tab**: tab-delimited ASCII
- **csv**: CSV (Comma Separated Value format) for use with Excel
- **scsv**: "German" version of csv (semicolon instead of comma)
- **rtf**: Rich Text Format for use with word processors
- **html**: HTML-formatted
- **tex**: LaTeX-formatted
- **booktabs**: LaTeX-formatted for use with *booktabs*

do_example do/14.ihlp



Microsoft Excel - example.csv

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2		(1)	(2)									
3		price	price									
4												
5	weight	1.747**	3.465***									
6		(2.72)	(5.49)									
7												
8	mpg	-49.51	21.85									
9		(-0.57)	(0.29)									
10												
11	foreign		3673.1***									
12			(5.37)									
13												
14	_cons	1946.1	-5853.7									
15		(0.54)	(-1.73)									
16												
17	N	74	74									
18												
19	t statistics in parentheses											
20	*	p<0.05,	** p<0.01,	*** p<0.001								
21												
22												
23												
24												

Microsoft Excel - example.csv

	A	B	C	D	E	F	G	H	I	J	K
1		est1		est2							
2		b	t	b	t						
3	weight	1.746559	2.723238	3.464706	5.493003						
4	mpg	-49.51222	-0.5746808	21.8536	0.2944391						
5	foreign			3673.06	5.370142						
6	_cons	1946.069	0.541018	-5853.696	-1.733408						
7	N		74		74						
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											

Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

Use with Word, Excel, LaTeX, etc.

Word: rtf

```
esttab using example.rtf
<run>
```

Appending is possible. Furthermore, use **varwidth(#)** and **modelwidth(#)** to change column widths:

```
esttab using example.rtf, append wide label modelwidth(8)
<run>
```

Including RTF literals:

```
esttab using example.rtf, replace
    title({\b Table 1: This is a bold title})      ///
<run>
```

```
esttab using example.rtf, replace
    cells(b(fmt(a3)) t(par(\i( ))))           ///
<run>
```

example.rtf - Microsoft Word

Frage hier eingeben

Standard Times New Roman 12 F K U

Table 1: This is a bold title

	(1)	(2)
	price	price
weight	1.747** (2.72)	3.465*** (5.49)
mpg	-49.51 (-0.57)	21.85 (0.29)
foreign		3673.1*** (5.37)
_cons	1946.1 (0.54)	-5853.7 (-1.73)
N	74	74

t statistics in parentheses
 * p < 0.05, ** p < 0.01, *** p < 0.001

example.rtf - Microsoft Word

Frage hier eingeben

Standard Times New Roman 12 F K U

(-0.37) (0.29)

foreign		3673.1***
		(5.37)
_cons	1946.1	-5853.7
	(0.54)	(-1.73)
N	74	74

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

	(1)		(2)	
	Price		Price	
Weight (lbs.)	1.747**	(2.72)	3.465***	(5.49)
Mileage (mpg)	-49.51	(-0.57)	21.85	(0.29)
Car type			3673.1***	(5.37)
Constant	1946.1	(0.54)	-5853.7	(-1.73)
Observations	74		74	

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Seite 1 Ab 1 1/1 Bei 72pt Ze 1 Sp 1 MAK AND ERW ÜB Englisch (US)

example.rtf - Microsoft Word

Frage hier eingeben

Standard + Fet Times New Roman 12 F K U

(-0.37) (0.29)

foreign		3673.1***
		(5.37)
_cons	1946.1	-5853.7
	(0.54)	(-1.73)
N	74	74

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

	(1)		(2)	
	price		price	
weight	1.747**		3.465***	
	(2.72)		(5.49)	
mpg	-49.51		21.85	
	(-0.57)		(0.29)	
foreign		3673.1***		
		(5.37)		
_cons	1946.1	-5853.7		
	(0.54)	(-1.73)		
N	74	74		

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Seite 1 Ab 1 1/1 Bei 72pt Ze 1 Sp 1 MAK AND ERW ÜB Englisch (US)

example.rtf - Microsoft Word

Frage hier eingeben

Standard Times New Roman 12 F K U

130% Legen

36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

108 110 112 114 116 118 120 122 124 126 128 130 132 134 136 138 140 142 144 146 148 150 152 154 156 158 160 162 164 166 168 170 172 174 176 178 180 182 184 186 188 190 192 194 196 198 200 202 204 206 208 210 212 214 216 218 220 222 224 226 228 230 232 234 236 238 240 242 244 246 248 250 252 254 256 258 260 262 264 266 268 270 272 274 276 278 280 282 284 286 288 290 292 294 296 298 300 302 304 306 308 310 312 314 316 318 320 322 324 326 328 330 332 334 336 338 340 342 344 346 348 350 352 354 356 358 360 362 364 366 368 370 372 374 376 378 380 382 384 386 388 390 392 394 396 398 400 402 404 406 408 410 412 414 416 418 420 422 424 426 428 430 432 434 436 438 440 442 444 446 448 450 452 454 456 458 460 462 464 466 468 470 472 474 476 478 480 482 484 486 488 490 492 494 496 498 500 502 504

weight mpg foreign _cons N

(1) (2)

	(1)	(2)
price	price	
b/t	b/t	
weight	1.747 (2.723)	3.465 (5.493)
mpg	-49.51 (-0.575)	21.85 (0.294)
foreign		3673.1 (5.370)
_cons	1946.1 (0.541)	-5853.7 (-1.733)
N	74	74

example.rtf: 165 Zeichen. (ein ungefährer Wert)

Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

use with word, Excel, LaTeX, etc.

LaTeX: tex

```
esttab using example1.tex, label nostar
    title(Regression table\label{tab1}) page      ///
<run>

!texify.exe --pdf example1.tex
winexec $AcroRd example1.pdf
<run>
```

LaTeX: booktabs

```
esttab using example2.tex, label nostar replace booktabs ///
    title(Regression table\label{tab1}) page

!texify.exe --pdf example2.tex
winexec $AcroRd example2.pdf
<run>
```

do_example do/18c.ihlp

```

example1.tex - Editor
Datei Bearbeiten Format Ansicht 2
% 16 Aug 2007 01:12:33
\documentclass[article]{article}
\begin{document}

\begin{table}[htbp]\centering
\caption{Regression table}\label{tab1}
\begin{tabular}{l*{2}{c}}
\hline\hline
&\multicolumn{1}{c}{(1)}&\multicolumn{1}{c}{(2)}\\
&\multicolumn{1}{c}{Price}&\multicolumn{1}{c}{Price}\\
\hline
Weight (lbs.) & 1.747& 3.465\\
& (2.72)& (5.49)\\
\hline
Mileage (mpg) & -49.51& 21.85\\
& (-0.57)& (0.29)\\
\hline
Car type & & 3673.1\\
& & (5.37)\\
\hline
Constant & 1946.1& -5853.7\\
& (0.54)& (-1.73)\\
\hline
Observations & 74& 74\\
\hline\hline
\multicolumn{3}{l}{\footnotesize \textit{t} statistics in parentheses}\\
\end{tabular}
\end{table}
\end{document}

```

Adobe Reader - [example1.pdf]

Datei Bearbeiten Anzeige Dokument Werkzeuge Fenster Hilfe

Seiten

Table 1: Regression table

	(1)	(2)
	Price	Price
Weight (lbs.)	1.747 (2.72)	3.465 (5.49)
Mileage (mpg)	-49.51 (-0.57)	21.85 (0.29)
Car type		3673.1 (5.37)
Constant	1946.1 (0.54)	-5853.7 (-1.73)
Observations	74	74

t statistics in parentheses

Adobe Reader - [example2.pdf]

Datei Bearbeiten Anzeige Dokument Werkzeuge Fenster Hilfe

Seiten

Mitteilungen

Anlagen

Kommentare

210 x 297 mm

1 von 1

Table 1: Regression table

	(1)	(2)
	Price	Price
Weight (lbs.)	1.747 (2.72)	3.465 (5.49)
Mileage (mpg)	-49.51 (-0.57)	21.85 (0.29)
Car type		3673.1 (5.37)
Constant	1946.1 (0.54)	-5853.7 (-1.73)
Observations	74	74

t statistics in parentheses

Viewer (#1) [help NASUG07_estout]

Back Refresh Search Help Contents What's New News

Command: help NASUG07_estout

Use with Word, Excel, LaTeX, etc.

Improved LaTeX table using the *dcolumn* package:

```
esttab using example3.tex, label replace booktabs ///
    alignment(D{.}{.}{.}{-1}) ///
    page(dcolumn) ///
    title(Regression table\label{tab1})
```

```
!texify.exe --pdf example3.tex
winexec $AcroRd example3.pdf
<run>
```

Adobe Reader - [example3.pdf]

Datei Bearbeiten Anzeige Dokument Werkzeuge Fenster Hilfe

Seiten

Kommentare Anlagen

Table 1: Regression table

	(1) Price	(2) Price
Weight (lbs.)	1.747** (2.72)	3.465*** (5.49)
Mileage (mpg)	-49.51 (-0.57)	21.85 (0.29)
Car type		3673.1*** (5.37)
Constant	1946.1 (0.54)	-5853.7 (-1.73)
Observations	74	74

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

210 x 297 mm | 1 von 1 |

Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

Get the estout code

esttab's **noisily** option shows the issued **estout** command:

```
esttab, noisily
<run>

return list
<run>

`r(estout)'

eststo clear
<run>
```

Stata/SE 9.2 - [Results]

File Edit Prefs Data Graphics Statistics User Window Help

Review Command Variables

```

. esttab, noisily
estout,
cells(b(fmt(a3) star) t(fmt(2) par("{ralign 12:{txt:{} \"{txt:}\}}")))
stats(N, fmt(%18.0g) labels(`"N"'))
starlevels(* 0.05 ** 0.01 *** 0.001)
varwidth(12)
modelwidth(12)
abbrev
delimiter(" ")
smcltags
prehead(`"\nline @width"')
posthead(`"\nline @width"')
prefoot(`"\nline @width"')
postfoot(`"\nline @width"'" `t statistics in parentheses'" @starlevels)
varlabels(, end("") nolast)
mlabels(, depvar)
numbers
collabels(, none)
eqlabels(, begin(`"\nline @width"'"') nofirst)
level(95)

```

d:\Home\NASUG07\estout

Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

Advanced examples

- Transformations
- Stacking models
- Some advanced LaTeX
- Rearranging statistics in the table footer
- Include results from LR-Tests
- Writing one's own estadd subcommands
- Table of descriptives
- Tabulating t-tests
- SPost and estout

do_example do/26.ihlp

Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

Transformations

Example 1: Exponentiation (odds ratio, hazard ratio, incidence-rate ratio, relative risk ratio)

```

logistic foreign weight price
eststo
eststo

esttab, eform(0 1)
eststo clear
<run>

```

Example 2: transform() and xtmixed

```

Syntax: transform(fx dfx)
        transform(coefs fx dfx [ ... [coefs] fx dfx ])

use pig, clear
xtmixed weight week || _all: R.id || _all: R.week

esttab, transform(ln*: exp(@) exp(@))
<run>

```

Stata/SE 9.2 - [Results]

File Edit Prefs Data Graphics Statistics User Window Help

Review Variables Command

```
(est2 stored)

.

esttab, eform(0 1)

(1)          (2)
foreign      foreign

weight       -0.00588***      0.994***  

             (-3.46)           (-3.46)

price        0.000930**      1.001**  

             (3.10)            (3.10)

_cons       9.000***       8106.9***  

             (3.43)            (3.43)

N            74              74

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001
```

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Stata/SE 9.2 - [Results]

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Review Variables

Command

		wald chi2(1)	=		
Log restricted-likelihood = -1015.4214		Prob > chi2	=		
weight	Coef.	std. Err.	z	P> z	[95% Conf.]
_week	6.209896	.0578669	107.31	0.000	6.096479
_cons	19.35561	.6493996	29.81	0.000	18.08281
Random-effects Parameters		Estimate	std. Err.	[95% Conf.]	
_all: Identity	sd(R.id)	3.892648	.4141707	3.15994	
_all: Identity	sd(R.week)	.3337581	.1611824	.1295268	
	sd(Residual)	2.072917	.0755915	1.929931	
LR test vs. linear regression:		chi2(2) = 476.10	Prob > chi2		

d:\Home\NASUG07\estout

Stata/SE 9.2 - [Results]

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Review Variables

Command

```
. esttab, transform(ln*: exp(@) exp(@))
```

		(1)
		weight
weight		
week	6.210***	(107.31)
_cons	19.36***	(29.81)
lns1_1_1		
_cons	3.893***	(12.77)
lns1_2_1		
_cons	0.334*	(-2.27)
lnsig_e		
_cons	2.073***	

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Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

Stacking models

estout cannot stack models. The solution is to stack the models in advance and save in eO.

Example: Include a table column containing the bivariate effects.

```

capt prog drop appendmodels
program appendmodels, eclass
    // using models' first equations
    version 8
    syntax namelist
    tempname b v tmp
    foreach name of local namelist {
        qui est restore `name'
        mat `tmp' = e(b)
        local eq1: coleq `tmp'
        gettoken eq1 : eq1
        mat `tmp' = `tmp'[1,"`eq1':"]
        local cons = colnumb(`tmp','_cons')
        if `cons'<. & `cons'>1 {
            mat `tmp' = `tmp'[1,1..`cons'-1]
        }
    }

```

Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

```

mat `b' = nullmat(`b') , `tmp'
mat `tmp' = e(v)
mat `tmp' = `tmp'["`eq1':","`eq1':"]
if `cons'<. & `cons'>1 {
    mat `tmp' = `tmp'[1..`cons'-1,1..`cons'-1]
}
capt confirm matrix `v'
if _rc {
    mat `v' = `tmp'
}
else {
    mat `v' = ///
    (`v', j(rowsof(`v'),colsof(`tmp'),0)) \ ///
    (j(rowsof(`tmp'),colsof(`v'),0), `tmp')
}
local names: colfullnames `b'
mat coln `v' = `names'
mat rown `v' = `names'
eret post `b' `v'
eret local cmd "whatever"
end

```

Viewer (#1) [help NASUG07_estout]
Back Refresh Search Help Contents What's New News
Command: help NASUG07_estout

```
sysuse auto, clear
eststo b1: regress price weight
eststo b2: regress price mpg
eststo b3: regress price foreign

eststo bi: appendmodels b1 b2 b3
eststo multi: regress price weight mpg foreign

esttab multi bi, nodepvar
eststo clear

<run>
```

Stata/SE 9.2 - [Results]

File Edit Prefs Data Graphics Statistics User Window Help

Review Variables Command

.

.

esttab multi bi, nodepvar

	(1)	(2)
	multi	bi
weight	3.465*** (5.49)	2.044*** (5.42)
mpg	21.85 (0.29)	-238.9*** (-4.50)
foreign	3673.1*** (5.37)	312.3 (0.41)
_cons	-5853.7 (-1.73)	
N	74	

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

d:\Home\NASUG07\estout

Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

Some advanced LaTeX

Example: Arrange models in groups.

```

sysuse auto

eststo: reg weight mpg
eststo: reg weight mpg foreign

eststo: reg price weight mpg
eststo: reg price weight mpg foreign

esttab using example4.tex, booktabs replace label
    mgroups(A B, pattern(1 0 1 0)
        prefix(\multicolumn{@span}{c}{}) suffix({})
        span erepeat(\cmidrule(lr){@span}))
        alignment(D{.}{.}{-1}) page(dcolumn) nonumber
eststo clear

!texify.exe --pdf example4.tex
winexec $AcroRd example4.pdf

```

<run>

Adobe Reader - [example4.pdf]

Datei Bearbeiten Anzeige Dokument Werkzeuge Fenster Hilfe

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A

	Weight (lbs.)	Weight (lbs.)	Price	Price
Mileage (mpg)	-108.4*** (-11.60)	-91.22*** (-10.34)	-49.51 (-0.57)	21.85 (0.29)
Car type		-550.1*** (-4.96)		3673.1*** (5.37)
Weight (lbs.)			1.747** (2.72)	3.465*** (5.49)
Constant	5328.8*** (25.85)	5125.7*** (27.93)	1946.1 (0.54)	-5853.7 (-1.73)
Observations	74	74	74	74

t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Viewer (#1) [help NASUG07_estout]

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Command: help NASUG07_estout

Rearranging statistics in the table footer

Example 1:

```

regress price weight foreign
estout, stats(F p N, layout("@ @" @) fmt(a3 3 a3)
               labels("F statistic" "Observations")) ///
               cells("b(fmt(a3)) p(fmt(3))") label style(smc1)
eststo clear
<run>

```

Example 2:

```

eststo: logit foreign weight mpg
eststo: logit foreign weight mpg turn displ
esttab, stats(chi2 df_m r2_p N, layout(```@ `@``` @ @))
eststo clear
<run>

```

Stata/SE 9.2 - [Results]

File Edit Prefs Data Graphics Statistics User Window Help

Review Variables Command

```

estout, stats(F p N, layout("@ @" @) fmt(a3 3 a3)
               labels("F statistic" "observations")) ///
               cells("b(fmt(a3)) p(fmt(3))") label style(smc1)

b          p
Weight (lbs.)      3.321    0.000
Car type           3637.0   0.000
_cons             -4942.8   0.000
F statistic        35.35    0.000
Observations       74

eststo clear

end of do-file
more

```

d:\Home\NASUG07\estout

Stata/SE 9.2 - [Results]

File Edit Prefs Data Graphics Statistics User Window Help

Variables

Review

Command

weight	-0.00391*** (-3.86)	0.00239 (0.99)
mpg	-0.169 (-1.83)	-0.196* (-2.07)
turn		-0.502* (-2.28)
displacement		-0.0769* (-2.06)
_cons	13.71** (3.03)	26.95** (3.00)
chi2 (df_m)	35.72 (2)	55.82 (4)
r2_p	0.397	0.620
N	74	74

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

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Command: help NASUG07_estout

Include results from LR-Tests

estadd has a **lrtest** subcommand that can be used as follows:

```
eststo A: quietly logit foreign weight
eststo B: quietly logit foreign weight mpg price
estadd lrtest A
esttab, scalars(lrtest_chi2 lrtest_df lrtest_p)
eststo clear
<run>
```

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Review Command

Variables

	(1)	(2)
	foreign	foreign
weight	-0.00259*** (-4.25)	-0.00685*** (-3.43)
mpg		-0.121 (-1.27)
price		0.000926** (3.01)
_cons	6.283*** (3.92)	14.42** (2.66)
N	74	74
lrtest_chi2		23.78
lrtest_df		2
lrtest_p		0.00000684

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

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Command: help NASUG07_estout

writing one's own estadd subcommands

Example 1: Report the multiple correlation (square root of the R-squared).

- manual approach:

```
eststo: quietly regress price weight mpg
estadd scalar R = sqrt(e(r2))

eststo: quietly regress price weight mpg foreign
estadd scalar R = sqrt(e(r2))

estout, stats(r2 R) style(smc1)
eststo clear
<run>
```

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Command: help NASUG07_estout

writing one's own estadd subcommands (continued)

- approach using a subroutine:

```

capture program drop estadd_R

program estadd_R, eclass
    ereturn scalar R = sqrt(e(r2))
end

eststo: quietly regress price weight mpg
eststo: quietly regress price weight mpg foreign

estadd R : *

estout, stats(r2 R) style(smc1)
eststo clear
<run>

```

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```

estadd R : *

estout, stats(r2 R) style(smc1)



|         | est1<br>b | est2<br>b |
|---------|-----------|-----------|
| weight  | 1.746559  | 3.464706  |
| mpg     | -49.51222 | 21.8536   |
| foreign |           | 3673.06   |
| _cons   | 1946.069  | -5853.696 |
| r2      | .2933891  | .4995594  |
| R       | .5416541  | .7067952  |



eststo clear

end of do-file
more

```

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Command: help NASUG07_estout

writing one's own estadd subcommands (continued)

Example 2: Report y-standardized coefficients.

```

capture program drop estadd_bstdy

program estadd_bstdy, eclass
    tempfile bstdy
    matrix `bstdy' = e(b)
    quietly summarize `e(depvar)' if e(sample)
    matrix `bstdy' = `bstdy' / r(sd)
    ereturn matrix bstdy = `bstdy'
end

eststo: quietly regress price weight mpg
eststo: quietly regress price weight mpg foreign

estadd bstdy : *
estout, cells(b bstdy(par)) style(smc1)
eststo clear
<run>

```

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Review Variables Command

```

. estout, cells(b bstdy(par)) style(smc1)

      est1          est2
      b/bstdy      b/bstdy

weight        1.746559      3.464706
              (.0005922)  (.0011747)
mpg           -49.51222     21.8536
              (-.0167867)  (.0074093)
foreign        3673.06
              (1.245318)
_cons         1946.069     -5853.696
              (.659797)   (-1.984643)

. eststo clear

. end of do-file
more

```

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Command: help NASUG07_estout

Table of descriptives

The trick is to regress a fake variable on all variables including the dependent variable.

```
generate y = uniform()
regress y price weight mpg foreign, noconstant
estadd summ
estout, cells("mean sd min max") style(smc1)
<run>
```

using **by: eststo:** and **estadd** to get descriptives by subgroups:

```
by foreign: eststo: regress y price weight mpg, nocons
estadd summ :*
esttab, main(mean) aux(sd) label nodepvar nostar nonote
eststo clear
<run>
```

Stata/SE 9.2 - [Results]

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Review Variables Command

	price	- .0000105	.0000155	-0.68	0.500	- .0000414
weight	.0000764	.0000446	1.71	0.091	- .0000125	
mpg	.0167459	.0042136	3.97	0.000	.0083421	
foreign	.0809191	.0953486	0.85	0.399	- .1092476	

```
.
estadd summ
.
estout, cells("mean sd min max") style(smc1)
```

	mean	sd	min	max
price	6165.257	2949.496	3291	15906
weight	3019.459	777.1936	1760	4840
mpg	21.2973	5.785503	12	41
foreign	.2972973	.4601885	0	1

```
.
end of do-file
more
```

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Review Variables Command

```

estadd summ : *
esttab, main(mean) aux(sd) label nodepvar nostar nonote

(1)          (2)
Domestic    Foreign

Price        6072.4   6384.7
             (3097.1)  (2621.9)

weight (lbs.) 3317.1   2315.9
             (695.4)   (433.0)

Mileage (mpg) 19.83    24.77
             (4.743)  (6.611)

Observations 52       22

```

```

eststo clear

```

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Command: help NASUG07_estout

Tabulating t-Tests

Basically anything can be tabulated by **estout** or **esttab** once it is posted in eO. Here is an example with t-tests:

```

capt prog drop myttests
program myttests, eclass
    version 8
    syntax varlist [if] [in], by(varname) [*]
    marksample touse
    markout `touse' `by'
    tempname mu_1 mu_2 d d_se d_t d_p
    foreach var of local varlist {
        qui ttest `var' if `touse', by(`by') `options'
        mat `mu_1' = nullmat(`mu_1'), r(mu_1)
        mat `mu_2' = nullmat(`mu_2'), r(mu_2)
        mat `d' = nullmat(`d'), r(mu_1)-r(mu_2)
        mat `d_se' = nullmat(`d_se'), r(se)
        mat `d_t' = nullmat(`d_t'), r(t)
        mat `d_p' = nullmat(`d_p'), r(p)
    }
    foreach mat in `mu_1' `mu_2' `d' `d_se' `d_t' `d_p' {
        mat coln `mat' = `varlist'
    }

```

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Command: help NASUG07_estout

```

tempname b v
mat `b' = `mu_1'*0
mat `v' = `b'`*`b'
eret post `b' `v'
eret local cmd "myttests"
foreach mat in mu_1 mu_2 d d_se d_t d_p {
    eret mat `mat' = ``mat'
}
end

myttests price weight mpg, by(foreign)
estout, style(smc1) ///
    cells("mu_1(fmt(a3)) mu_2 d(star pvalue(d_p))")
<run>

```

(An alternative approach would be to save three sets of estimates, one for each group, and one for the differences.)

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Review Variables Command

```

24.         }      eret mat `mat' = ``mat'
25.     end
26.

.

.

myttests price weight mpg, by(foreign)
estout, style(smc1) ///
    cells("mu_1(fmt(a3)) mu_2 d(star pvalue(d_p))")


```

	mu_1	mu_2	d
price	6072.4	6384.7	-312.3
weight	3317.1	2315.9	1001.2***
mpg	19.83	24.77	-4.946***

```

end of do-file
more

```

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Command: help NASUG07_estout

SPost and estout

Example 1: fitstat

```
eststo: logit foreign weight mpg
eststo: logit foreign weight mpg turn displ
estadd fitstat: *
esttab, scalars(r2_mf r2_ml r2_cu r2_ef)
<run>
```

Example 2: listcoef

```
estadd listcoef: *
estout, cell("b_fact b_facts") drop(_cons) style(smc1)
<run>
```

Example 3: prchange

```
estadd prchange: *
estout, cell("dcminmax dcstd") drop(_cons) style(smc1)
<run>
```

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Review Command Variables

	(-3.86)	(0.99)
mpg	-0.169 (-1.83)	-0.196* (-2.07)
turn		-0.502* (-2.28)
displacement		-0.0769* (-2.06)
_cons	13.71** (3.03)	26.95** (3.00)
N	74	74
r2_mf	0.397	0.620
r2_ml	0.383	0.530
r2_cu	0.544	0.752
r2_ef	0.411	0.636

t statistics in parentheses
 * p<0.05, ** p<0.01, *** p<0.001

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Review Variables

```

.
end of do-file

. do_example do/41.ihlp

. estadd listcoef: *

. estout, cell("b_fact b_facts") drop(_cons) style(smc1)



|              | est1<br>b_fact | b_facts  | est2<br>b_fact | b_facts  |
|--------------|----------------|----------|----------------|----------|
| weight       | .9961009       | .048014  | 1.002392       | 6.401684 |
| mpg          | .8448578       | .3770566 | .8220819       | .3219149 |
| turn         |                |          | .6052757       | .1098336 |
| displacement |                |          | .9259888       | .0008574 |



.
end of do-file
more

```

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Review Variables

```

.
end of do-file

. do_example do/42.ihlp

. estadd prchange: *

. estout, cell("dcminmax dcstd") drop(_cons) style(smc1)



|              | est1<br>dcminmax | dcstd     | est2<br>dcminmax | dcstd     |
|--------------|------------------|-----------|------------------|-----------|
| weight       | -.9622371        | -.4207634 | .3229343         | .0129412  |
| mpg          | -.4656343        | -.1303092 | -.0366136        | -.0072707 |
| turn         |                  |           | -.3217601        | -.0162399 |
| displacement |                  |           | -.9821618        | -.1738952 |



.
end of do-file
more

```

d:\Home\NASUG07\estout

