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

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)
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 straightforward 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.

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 \texttt{rO}-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 \texttt{estout} version is still available from ssc as \texttt{estout1}.

- \texttt{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\texttt{O} 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)
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 e()-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.)

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.)
Introduction

- To summarize, there seemed to be a need for
  
  (1) an easy-to-use version of `estout`,
  
  (2) a simplified procedure to hold on to estimates for tabulation.

- So I started working on wrappers for `estimates store` and `estout`, which first appeared on SSC in September 2006 as `esto` and `esta`. It turned out that names were not chosen very well. They were changed to `eststo` and `esttab` (May 2007).

Package overview

`estout`: Generic program to compile a table of coefficients, ‘significance stars’, summary statistics, standard errors, t- or z-statistics, p-values, confidence intervals, or other statistics for one or more models previously fitted and stored.

`esttab`: User-friendly command to produce publication-style regression tables that display nicely in Stata’s results window or, optionally, are exported to various formats such as CSV, RTF, HTML, or LaTeX.

`eststo`: Utility to store estimation results for later tabulation, as an alternative to official `estimates store`. The main advantages of `eststo` is that no name has to be provided for the stored estimation set and that it can be used as a prefix command.

`estadd`: Program to add extra results (such as e.g., beta coefficients) to the returns of an estimation command. This is useful to make the the results available for tabulation by `esttab` or `estout`. 
Basic usage of estout

Syntax:

\texttt{estout [ name\_list ] [ using \_filename ] [ , cells(array) stats(scalar\_list) style(style) more\_options ]}

where the amount of \texttt{more\_options} is considerable and many options also have suboptions (similar to \texttt{graph}'s syntax).

The basic procedure is to first estimate and store a bunch of models and then apply \texttt{estout} to tabulate them:

\begin{verbatim}
.sysuse auto
.regress price weight mpg
.estimates store m1
.regress price weight mpg foreign
.estimates store m2
.estout m1 m2 using example.txt
\end{verbatim}

\begin{verbatim}
 price | Coef.  Std. Err.       t    P>|t|     [95% Conf. Int.]
-------+--------------------------------------------------------
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
\end{verbatim}
The style() 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 style() 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>
```

<table>
<thead>
<tr>
<th>foreign</th>
<th>3673.06</th>
</tr>
</thead>
<tbody>
<tr>
<td>_cons</td>
<td>1946.069</td>
</tr>
</tbody>
</table>

```
end of do-file

.do_example do/0b.ihlp

.estout m1 m2, style(smcl)

```

```

<table>
<thead>
<tr>
<th>b</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight</td>
<td>1.746559</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51222</td>
</tr>
<tr>
<td>foreign</td>
<td>3673.06</td>
</tr>
<tr>
<td>_cons</td>
<td>1946.069</td>
</tr>
</tbody>
</table>

```
end of do-file

---more---
### 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:

```stata
estout m1 m2, cells(b se) style(smcl)
```

Other examples:

```stata
estout m2, cells("b se t p") style(smcl)
estout m1 m2, cells("b p" se) style(smcl)
```

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

```stata
estout m1 m2, cells(b(star fmt(3)) t(par fmt(2))) style(smcl)
```
end of do-file
. do_example do/0e.ihlp
   estout m1 m2, cells(b se) style(smcl)

<table>
<thead>
<tr>
<th></th>
<th>m1</th>
<th>m2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b/se</td>
<td>b/se</td>
</tr>
<tr>
<td>weight</td>
<td>1.746559</td>
<td>3.464706</td>
</tr>
<tr>
<td></td>
<td>.6413538</td>
<td>.630749</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51222</td>
<td>21.8536</td>
</tr>
<tr>
<td></td>
<td>86.15604</td>
<td>74.22114</td>
</tr>
<tr>
<td>foreign</td>
<td>3673.06</td>
<td>683.9783</td>
</tr>
<tr>
<td>_cons</td>
<td>1946.069</td>
<td>-5853.696</td>
</tr>
<tr>
<td></td>
<td>3597.05</td>
<td>3376.987</td>
</tr>
</tbody>
</table>

end of do-file

--more--

. do_example do/0f.ihlp
   estout m2, cells("b se t p") style(smcl)

<table>
<thead>
<tr>
<th></th>
<th>m2</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>weight</td>
<td>3.464706</td>
<td>.630749</td>
<td>5.493003</td>
<td>5.99e-07</td>
</tr>
<tr>
<td>mpg</td>
<td>21.8536</td>
<td>74.22114</td>
<td>.2944391</td>
<td>.7692938</td>
</tr>
<tr>
<td>foreign</td>
<td>3673.06</td>
<td>683.9783</td>
<td>5.370142</td>
<td>9.72e-07</td>
</tr>
<tr>
<td>_cons</td>
<td>-5853.696</td>
<td>3376.987</td>
<td>-1.733408</td>
<td>.0874262</td>
</tr>
</tbody>
</table>

end of do-file

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

. do_example do/0g.ihlp

    estout m1 m2, cells("b p" se) style(smcl)

<table>
<thead>
<tr>
<th></th>
<th>m1</th>
<th></th>
<th>m2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b/</td>
<td></td>
<td>p</td>
<td>b/</td>
</tr>
</tbody>
</table>
| weight | 1.746559 | .0081298 | 3.464706 | 5.99e-07
|        | .6413538 | .630749  |          |          |
| mpg    | -49.51222| .5673237 | 21.8536  | .7692938 |
|        | 86.15604 | 74.22114 |          |          |
| foreign|          | 3673.06  | 9.72e-07 |
|        |          | 683.9783 |
| _cons  | 1946.069 | .5901886 | -5853.696| .0874262 |
|        | 3597.05  | 3376.987 |
```

end of do-file

```
end of do-file

. do_example do/0h.ihlp

    estout m1 m2, cells(b(star fmt(3)) t(par fmt(2))) style(smcl)

<table>
<thead>
<tr>
<th></th>
<th>m1</th>
<th></th>
<th>m2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b/t</td>
<td>b/t</td>
<td>b/t</td>
<td>b/t</td>
</tr>
<tr>
<td>weight</td>
<td>1.747**</td>
<td>.465***</td>
<td>3.465***</td>
<td>(2.72)</td>
</tr>
<tr>
<td></td>
<td>(2.72)</td>
<td>(5.49)</td>
<td>(5.49)</td>
<td></td>
</tr>
<tr>
<td>mpg</td>
<td>-49.512</td>
<td>21.854</td>
<td>(0.29)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.57)</td>
<td>(0.29)</td>
<td>(0.29)</td>
<td></td>
</tr>
<tr>
<td>foreign</td>
<td></td>
<td>3673.060***</td>
<td></td>
<td>5.37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5.37)</td>
<td>(5.37)</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>1946.069</td>
<td>-5853.696</td>
<td>(1.73)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.54)</td>
<td>(-1.73)</td>
<td>(-1.73)</td>
<td></td>
</tr>
</tbody>
</table>
```

end of do-file

```
The \texttt{stats()} option

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

\begin{verbatim}
estout m1 m2, stats(r2 bic N) style(smcl)
\end{verbatim}

Actually, the newest addition to \texttt{estout} is the ability to tabulate string \texttt{e()-}macros in the table footer:

\begin{verbatim}
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(smcl)
estimates clear
\end{verbatim}

\begin{verbatim}
dc_example do/01.ihlp

    . estout m1 m2, stats(r2 bic N) style(smcl)

    \begin{verbatim}
    \textbf{\begin{tabular}{lll}
    & m1 & m2 \\
b        & 1.746559 & 3.464706 \\
mpg       & -49.51222 & 21.8536 \\
foreign   & 3673.06   & 3673.06  \\
_cons     & 1946.069  & -5853.696 \\
\hline
r2        & .2933891  & .4995594  \\
bic       & 1378.64   & 1357.414  \\
N         & 74        & 74        \\
\end{tabular}}
\end{verbatim}

    . end of do-file
\end{verbatim}

\begin{verbatim}
\end{verbatim}

end of do-file

\begin{verbatim}
more
\end{verbatim}
estimates store m3

estout m1 m2 m3, cells(b se(par)) stats(N vcetype) ///
    style(smcl)

<table>
<thead>
<tr>
<th></th>
<th>m1</th>
<th>m2</th>
<th>m3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b/se</td>
<td>b/se</td>
<td>b/se</td>
</tr>
<tr>
<td>weight</td>
<td>2.044063</td>
<td>2.044063</td>
<td>2.044063</td>
</tr>
<tr>
<td></td>
<td>(.3768341)</td>
<td>(.3897465)</td>
<td>(.4378883)</td>
</tr>
<tr>
<td>_cons</td>
<td>-6.707353</td>
<td>-6.707353</td>
<td>-6.707353</td>
</tr>
<tr>
<td></td>
<td>(1174.43)</td>
<td>(1032.394)</td>
<td>(1195.078)</td>
</tr>
</tbody>
</table>

N    74    74    74
vcetype Robust Bootstrap

estimates clear

done

---

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 e0-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 snippet of the code that initializes the "string matrix":

```stata
local strscalars
foreach m=1/`nmodels' {
    local temp
    foreach i=1/`:list size of emptystats' {
        local temp `temp' "m`m's`i'
    }
    local strscalars ""`strscalars' "temp""
}
```
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)
- **keep()**, **drop()**, and **order()** 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.

---

Storing estimates simplified

Syntax:

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

options description

- `[no]sample` 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
```
Storing estimates simplified

Basic example:

sysuse auto, clear
regress price weight mpg
eststo

regress price weight mpg foreign
eststo
estout, style(smcl)
<run>

macro dir
<run>
eststo clear
<run>

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

(est2 stored)
estout, style(smcl)
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———
S_E_dep: 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

--------------

storing estimates simplified

Use eststo as a prefix command:

```
eststo: regress price weight mpg
eststo: regress price weight mpg foreign
estout, style(smcl)
```

Drop the e(sample):

```
eststo, nosample: reg price weight mpg
_eststo: reg price weight mpg
estimates dir
describe _est*
eststo clear
```

<run>
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
```

```
storing estimates simplified

Add additional results while storing:

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

use with by:

    by foreign: eststo: quietly reg price weight mpg
    estout, style(smcl)
    eststo clear
    <run>
```
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(smcl) stats(p_diff)

<table>
<thead>
<tr>
<th></th>
<th>est1</th>
<th>est2</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight</td>
<td>1.746559</td>
<td></td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51222</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>1946.069</td>
<td></td>
</tr>
<tr>
<td>p_diff</td>
<td>.5513822</td>
<td></td>
</tr>
</tbody>
</table>

by foreign: eststo: quietly reg price weight mpg

-> Domestic
(est1 stored)

-> Foreign
(est2 stored)

estout, style(smcl)

<table>
<thead>
<tr>
<th></th>
<th>est1</th>
<th>est2</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight</td>
<td>4.415037</td>
<td>5.155842</td>
</tr>
<tr>
<td>mpg</td>
<td>237.691</td>
<td>-19.77737</td>
</tr>
<tr>
<td>_cons</td>
<td>-13285.44</td>
<td>-5065.841</td>
</tr>
</tbody>
</table>

eststo clear
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.

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 compressed plain
- label title(string) mtitles(list) nomtitles [no]depvars
- [no]numbers coeflabels(list) [no]notes addnotes(list)
- smcl | fixed | tab | csv | sscsv | rtf | html | tex | booktabs
- fragment page[packages] alignment(string) width(string)
- replace append type nostyly
- drop(list) keep(list) order(list) equations(list)
- eform margin unstack other_estout_options
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>
```

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>price</td>
<td></td>
<td></td>
</tr>
<tr>
<td>weight</td>
<td>1.747**</td>
<td>3.465***</td>
</tr>
<tr>
<td></td>
<td>(2.72)</td>
<td>(5.49)</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51</td>
<td>21.85</td>
</tr>
<tr>
<td></td>
<td>(-0.57)</td>
<td>(0.29)</td>
</tr>
<tr>
<td>foreign</td>
<td></td>
<td>3673.1***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5.37)</td>
</tr>
<tr>
<td>_cons</td>
<td>1946.1</td>
<td>-5853.7</td>
</tr>
<tr>
<td></td>
<td>(0.54)</td>
<td>(-1.73)</td>
</tr>
<tr>
<td>N</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001
esttab, se ar2 nostar

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>price</td>
<td>1.747</td>
<td>3.465</td>
</tr>
<tr>
<td></td>
<td>(0.641)</td>
<td>(0.631)</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51</td>
<td>21.85</td>
</tr>
<tr>
<td></td>
<td>(86.16)</td>
<td>(74.22)</td>
</tr>
<tr>
<td>foreign</td>
<td>3673.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(684.0)</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>1946.1</td>
<td>-5853.7</td>
</tr>
<tr>
<td></td>
<td>(3597.0)</td>
<td>(3377.0)</td>
</tr>
<tr>
<td>N</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>adj. R-sq</td>
<td>0.273</td>
<td>0.478</td>
</tr>
</tbody>
</table>

Standard errors in parentheses

end of do-file

do_example do/9.ihlp

   esttab, beta not

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>price</td>
<td>0.460**</td>
<td>0.913***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mpg</td>
<td>-0.097</td>
<td>0.043</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.573***</td>
</tr>
<tr>
<td>foreign</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

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

end of do-file
Tabulating estimates using \texttt{esttab}

Wide format:

\texttt{esttab, wide compress}

\texttt{<run>}

Labels and titles:

\texttt{esttab, se ar2 nostar brackets label ///
    title(This is a regression table) ///
    nonumbers mtitles("Model A" "Model B") ///
    addnote("source: auto.dta")}

\texttt{<run>}

Plain table:

\texttt{esttab, plain}

\texttt{<run>}

---

end of do-file

. \texttt{do_example do/10.ihlp}

. \texttt{esttab, wide compress}

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>price</td>
<td>price</td>
</tr>
<tr>
<td>-----</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>weight</td>
<td>1.747**</td>
<td>3.465***</td>
</tr>
<tr>
<td>mpg</td>
<td>(2.72)</td>
<td>(5.49)</td>
</tr>
<tr>
<td>foreign</td>
<td>-49.51</td>
<td>21.85</td>
</tr>
<tr>
<td></td>
<td>(-0.57)</td>
<td>(0.29)</td>
</tr>
<tr>
<td>_cons</td>
<td>1946.1</td>
<td>3673.1***</td>
</tr>
<tr>
<td></td>
<td>(0.54)</td>
<td>(5.37)</td>
</tr>
</tbody>
</table>

N     | 74            | 74            |

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

end of do-file
This is a regression table

<table>
<thead>
<tr>
<th></th>
<th>Model A</th>
<th>Model B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (lbs.)</td>
<td>1.747</td>
<td>3.465</td>
</tr>
<tr>
<td></td>
<td>[0.641]</td>
<td>[0.631]</td>
</tr>
<tr>
<td>Mileage (mpg)</td>
<td>-49.51</td>
<td>21.85</td>
</tr>
<tr>
<td></td>
<td>[86.16]</td>
<td>[74.22]</td>
</tr>
<tr>
<td>Car type</td>
<td>3673.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[684.0]</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1946.1</td>
<td>-5853.7</td>
</tr>
<tr>
<td></td>
<td>[3597.0]</td>
<td>[3377.0]</td>
</tr>
<tr>
<td>Observations</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.273</td>
<td>0.478</td>
</tr>
</tbody>
</table>

Standard errors in brackets

Source: auto.dta
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 `esttab` 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
```

Specifying alternative formats:

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

```
do_example do/13_ihlp
    esttab, p r2 nostar wide
```

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>price</td>
<td>price</td>
</tr>
<tr>
<td>weight</td>
<td>1.747</td>
<td>3.465</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51</td>
<td>21.85</td>
</tr>
<tr>
<td>foreign</td>
<td>1946.1</td>
<td>3673.1</td>
</tr>
<tr>
<td>_cons</td>
<td>0.008</td>
<td>0.000</td>
</tr>
</tbody>
</table>

N     | 74     | 74     |
R-Sq  | 0.293  | 0.500  |

p-values in parentheses

```
end of do-file
```

```
```
```stata
end of do-file

do_example do/14.ihlp

esttab, b(%9.0g) p(4) r2(4) nostar wide

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>price</td>
<td>1.746559</td>
<td>3.464706</td>
</tr>
<tr>
<td></td>
<td>(0.0081)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>price</td>
<td>-49.51222</td>
<td>21.8536</td>
</tr>
<tr>
<td></td>
<td>(0.5673)</td>
<td>(0.7693)</td>
</tr>
<tr>
<td>foreign</td>
<td>3673.06</td>
<td>-5853.696</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0874)</td>
</tr>
<tr>
<td>cons</td>
<td>1946.069</td>
<td>-5853.696</td>
</tr>
<tr>
<td></td>
<td>(0.5902)</td>
<td>(0.0874)</td>
</tr>
<tr>
<td>N</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>R-sq</td>
<td>0.2934</td>
<td>0.4996</td>
</tr>
</tbody>
</table>

p-values in parentheses

end of do-file
```

---

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`
Use with Word, Excel, LaTeX, etc.

Excel: csv or scsv
    esttab using example.csv
    \begin{verbatim}
    <run>
    \end{verbatim}
    esttab using example.csv, scsv replace
    \begin{verbatim}
    <run>
    \end{verbatim}

Use the \texttt{plain} option if you intend to do additional computations in Excel:
    esttab using example.csv, replace wide plain
    \begin{verbatim}
    <run>
    \end{verbatim}

(No Excel XML support. Sorry.)

<table>
<thead>
<tr>
<th></th>
<th>price</th>
<th>price</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight</td>
<td>1.746559</td>
<td>3.464706</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51222</td>
<td>21.8536</td>
</tr>
<tr>
<td>foreign</td>
<td></td>
<td>3673.06</td>
</tr>
<tr>
<td>_cons</td>
<td>1946.069</td>
<td>-5853.696</td>
</tr>
<tr>
<td>N</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>R-sq</td>
<td>0.2934</td>
<td>0.4996</td>
</tr>
</tbody>
</table>

\textit{p-values in parentheses}

. end of do-file
. do_example do/15.ihlp
. esttab using example.csv
  (output written to \texttt{example.csv})
. end of do-file
### Table 1: Model Results

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>price</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>weight</td>
<td>1.747**</td>
<td>3.465***</td>
<td>(2.72)</td>
<td>(5.49)</td>
</tr>
<tr>
<td>mpg</td>
<td>-48.51</td>
<td>21.85</td>
<td>(-0.57)</td>
<td>(0.29)</td>
</tr>
<tr>
<td>foreign</td>
<td></td>
<td></td>
<td></td>
<td>3673.1***</td>
</tr>
<tr>
<td>cons</td>
<td>1946.1</td>
<td>-5953.7</td>
<td>(0.54)</td>
<td>(-1.73)</td>
</tr>
</tbody>
</table>

N = 74

**t-statistics in parentheses**

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

### Table 2: Model Results

<table>
<thead>
<tr>
<th></th>
<th>est1</th>
<th></th>
<th>est2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>weight</td>
<td>1.746659</td>
<td>2.723238</td>
<td>3.464706</td>
<td>5.483003</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51222</td>
<td>-0.5746808</td>
<td>21.85396</td>
<td>0.2944391</td>
</tr>
<tr>
<td>foreign</td>
<td>1946.089</td>
<td>0.541018</td>
<td>-5953.696</td>
<td>-1.733408</td>
</tr>
<tr>
<td>cons</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>74</td>
<td></td>
<td>74</td>
<td></td>
</tr>
</tbody>
</table>
Use with Word, Excel, LaTeX, etc.

Word: rtf

```
esttab using example.rtf
```

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

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

Including RTF literals:

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

```
esttab using example.rtf, replace
   cells(b(fmt(a3)) t(par(\{1(\}))
```

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>price</td>
<td>price</td>
</tr>
<tr>
<td>weight</td>
<td>1.747**</td>
<td>3.465***</td>
</tr>
<tr>
<td></td>
<td>(2.72)</td>
<td>(5.49)</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51</td>
<td>21.85</td>
</tr>
<tr>
<td></td>
<td>(-0.57)</td>
<td>(0.29)</td>
</tr>
<tr>
<td>foreign</td>
<td>3673.1***</td>
<td>(5.37)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cons</td>
<td>1946.1</td>
<td>-5853.7</td>
</tr>
<tr>
<td></td>
<td>(0.54)</td>
<td>(1.73)</td>
</tr>
<tr>
<td>N</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

*p < 0.05, **p < 0.01, ***p < 0.001
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Price</strong></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Weight (lbs.)</td>
<td>1.747**</td>
<td>3.465***</td>
</tr>
<tr>
<td>Mileage (mpg)</td>
<td>-49.51 (-0.57)</td>
<td>21.85 (0.29)</td>
</tr>
<tr>
<td>Car type</td>
<td></td>
<td>3673.1*** (5.37)</td>
</tr>
<tr>
<td>Constant</td>
<td>1946.1 (0.54)</td>
<td>-5853.7 (-1.73)</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

Table 1: This is a bold title

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Price</strong></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>weight</td>
<td>1.747**</td>
<td>3.465***</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51 (-0.57)</td>
<td>21.85 (0.29)</td>
</tr>
<tr>
<td>foreign</td>
<td></td>
<td>3673.1*** (5.37)</td>
</tr>
<tr>
<td>_cons</td>
<td>1946.1 (0.54)</td>
<td>-5853.7 (-1.73)</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

If statistics in parentheses:

* p < 0.05, ** p < 0.01, *** p < 0.001
<table>
<thead>
<tr>
<th>term</th>
<th>(1) price</th>
<th>(2) price</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight</td>
<td>1.747 (2.723)</td>
<td>3.465 (5.493)</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51 (-0.575)</td>
<td>21.85 (0.294)</td>
</tr>
<tr>
<td>foreign</td>
<td>3673.1 (3.370)</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>1946.1 (0.541)</td>
<td>-5853.7 (-1.733)</td>
</tr>
<tr>
<td>N</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

---

Use with Word, Excel, LaTeX, etc.

LaTeX: `tex`

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

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

LaTeX: `booktabs`

```latex
esttab using example2.tex, label nostar replace booktabs
   title(Regression table\label{tabl}) page
<run>

!texify.exe --pdf example2.tex
winexec $AcroRd example2.pdf
<run>
```
Table 1: Regression table

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (lbs.)</td>
<td>1.747</td>
<td>3.465</td>
</tr>
<tr>
<td>Mileage (mpg)</td>
<td>-49.51</td>
<td>21.85</td>
</tr>
<tr>
<td>Car type</td>
<td>3673.1</td>
<td>5.37</td>
</tr>
<tr>
<td>Constant</td>
<td>1946.1</td>
<td>-5853.7</td>
</tr>
<tr>
<td>Observations</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price</td>
<td>Price</td>
</tr>
<tr>
<td>Weight (lbs.)</td>
<td>1.747</td>
<td>3.465</td>
</tr>
<tr>
<td></td>
<td>(2.72)</td>
<td>(5.49)</td>
</tr>
<tr>
<td>Mileage (mpg)</td>
<td>-49.51</td>
<td>21.85</td>
</tr>
<tr>
<td></td>
<td>(-0.57)</td>
<td>(0.29)</td>
</tr>
<tr>
<td>Car type</td>
<td>3673.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.37)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1946.1</td>
<td>-5853.7</td>
</tr>
<tr>
<td></td>
<td>(0.54)</td>
<td>(-1.73)</td>
</tr>
<tr>
<td>Observations</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses

---

Use with Word, Excel, \LaTeX{}, etc.

Improved \LaTeX{} table using the `dcolumn` package:

```latex
\begin{tabular}{D{.}{.}{-1}ll}
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price</td>
<td>Price</td>
</tr>
<tr>
<td>Weight (lbs.)</td>
<td>1.747</td>
<td>3.465</td>
</tr>
<tr>
<td></td>
<td>(2.72)</td>
<td>(5.49)</td>
</tr>
<tr>
<td>Mileage (mpg)</td>
<td>-49.51</td>
<td>21.85</td>
</tr>
<tr>
<td></td>
<td>(-0.57)</td>
<td>(0.29)</td>
</tr>
<tr>
<td>Car type</td>
<td>3673.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.37)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1946.1</td>
<td>-5853.7</td>
</tr>
<tr>
<td></td>
<td>(0.54)</td>
<td>(-1.73)</td>
</tr>
<tr>
<td>Observations</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>
\end{tabular}
```

!texify.exe --pdf example3.tex
winexec $AcroRd$ example3.pdf

<run>
Table 1: Regression table

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>1.747**</td>
<td>3.465***</td>
</tr>
<tr>
<td>Weight (lbs.)</td>
<td>(2.72)</td>
<td>(5.49)</td>
</tr>
<tr>
<td>Mileage (mpg)</td>
<td>-49.51</td>
<td>21.85</td>
</tr>
<tr>
<td></td>
<td>(-0.57)</td>
<td>(0.29)</td>
</tr>
<tr>
<td>Car type</td>
<td>3673.1***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.37)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1946.1</td>
<td>-5853.7</td>
</tr>
<tr>
<td></td>
<td>(0.54)</td>
<td>(-1.73)</td>
</tr>
<tr>
<td>Observations</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

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

Get the estout code

esttab's noisily option shows the issued estout command:

```
esttab, noisily
<run>
return list
<run>
`r(estout)'
eststo clear
<run>
```
esttab, noise
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(""")
smcitags
prehead("{hline @width}{"}")
posthead("{hline @width}{"}")
prefoot("{hline @width}"")
postfoot("{hline @width}"")  " t statistics in parentheses"  @starlevels
varlabels(, end("""""""""" no last)
mlabels(_, depvar)
numbers
collabels(_, none)
eqlabels(_, begin("{hline @width}"") no first)
level(95)

---

Advanced examples

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

(est2 stored)

    . esttab, eform(0 1)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>foreign</td>
<td>foreign</td>
</tr>
<tr>
<td>weight</td>
<td>-0.00588***</td>
<td>0.994***</td>
</tr>
<tr>
<td></td>
<td>(-3.46)</td>
<td>(-3.46)</td>
</tr>
<tr>
<td>price</td>
<td>0.000930**</td>
<td>1.001**</td>
</tr>
<tr>
<td></td>
<td>(3.10)</td>
<td>(3.10)</td>
</tr>
<tr>
<td>_cons</td>
<td>9.000***</td>
<td>8106.9***</td>
</tr>
<tr>
<td></td>
<td>(3.43)</td>
<td>(3.43)</td>
</tr>
<tr>
<td>N</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001
Log restricted-likelihood = -1015.4214

| weight | Coef.  | Std. Err. | z    | P>|z| | [95% Conf.] |
|--------|--------|-----------|------|-----|----------------|
| week   | 6.209896 | 0.0578669 | 107.31 | 0.000 | 6.096479 |
| _cons  | 19.35561  | 0.6493996 | 29.81  | 0.000 | 18.08281 |

Random-effects Parameters

<table>
<thead>
<tr>
<th>_all: Identity</th>
<th>Estimate</th>
<th>Std. Err.</th>
<th>[95% Conf.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>sd(R.id)</td>
<td>3.892648</td>
<td>0.4141707</td>
<td>3.15994</td>
</tr>
<tr>
<td>sd(R.week)</td>
<td>0.3337581</td>
<td>0.1611824</td>
<td>0.1295268</td>
</tr>
<tr>
<td>sd(Residual)</td>
<td>2.072917</td>
<td>0.0755915</td>
<td>1.929931</td>
</tr>
</tbody>
</table>

LR test vs. linear regression: chi2(2) = 476.10 Probs. > chi2

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

(1)
weight

       weight
week    6.210***
         (107.31)

       _cons
   19.36***
       (29.81)

lns1_1

       _cons
   3.893***
       (12.77)

lns1_2

       _cons
   0.334*
       (-2.27)

lnsig_e

       _cons
   2.073***
```
Stacking models

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

Example: Include a table column containing the bivariate effects.

```stata
    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 : eql
            mat `tmp' = `tmp'[1,"eq1":] /*
            local cons = colnumb(`tmp',"_cons")
            if `cons'< & `cons'>1 {
                mat `tmp' = `tmp'[1,1..`cons'-1]
            }*/
        }
        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' , (rowsof(`v'),colsof(`tmp'),0) ) \ ///
                ( (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
```
sysuse auto, clear
eststo b1: regress price weight
eststo b2: regress price mpg
eststo b3: regress price foreign
eststo b: appendmodels b1 b2 b3
eststo multi: regress price weight mpg foreign
esttab multi bi, nodepvar
eststo clear
<run>

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>multi</td>
<td>3.465***</td>
<td>2.044***</td>
</tr>
<tr>
<td>weight</td>
<td>(5.49)</td>
<td>(5.42)</td>
</tr>
<tr>
<td>mpg</td>
<td>21.85</td>
<td>-238.9***</td>
</tr>
<tr>
<td></td>
<td>(0.29)</td>
<td>(-4.50)</td>
</tr>
<tr>
<td>foreign</td>
<td>3673.1***</td>
<td>312.3</td>
</tr>
<tr>
<td></td>
<td>(5.37)</td>
<td>(0.41)</td>
</tr>
<tr>
<td>_cons</td>
<td>-5853.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.73)</td>
<td></td>
</tr>
</tbody>
</table>

N 74

* p<0.05, ** p<0.01, *** p<0.001
Some advanced \LaTeX

Example: Arrange models in groups.

\verb|sysuse auto|
\verb|eststo: reg weight mpg|
\verb|eststo: reg weight mpg foreign|
\verb|eststo: reg price weight mpg|
\verb|eststo: reg price weight mpg foreign|
\verb|esttab using example4.tex, booktabs replace label ///|
\verb|   mgroups(A B, pattern(1 0 1 0) ///|
\verb|   prefix(\multicolumn{1}{c}{}) suffix({}) ///|
\verb|   span erepeat(\cmidrule{1r}{span})) ///|
\verb|   alignment(D{.}{.}{-1}) page(dcolumn) nonumber|
\verb|eststo clear|
\verbatim\texttt{!texify.exe --pdf example4.tex}
\verbatim\texttt{winexec $AcroRd example4.pdf}

\texttt{<run>}

\begin{table}
\centering
\begin{tabular}{ccc}
\hline
 & A & B \\
\hline
Weight (lbs.) & -108.4*** & -91.22*** \\
 & (-11.60) & (-10.34) \\
Car type & -550.1*** & 3673.1*** \\
 & (-4.96) & (5.37) \\
Weight (lbs.) & 1.747*** & 3.465*** \\
 & (2.72) & (5.49) \\
Constant & 5328.8*** & 5125.7*** \\
 & (25.85) & (27.93) \\
Observations & 74 & 74 & 74 & 74 \\
\hline
\end{tabular}
\end{table}

$ t $ statistics in parentheses

* $ p < 0.05 $, ** $ p < 0.01 $, *** $ p < 0.001 $
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(smcl)
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>
```

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

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (lbs.)</td>
<td>3.321</td>
<td>0.000</td>
</tr>
<tr>
<td>Car type</td>
<td>3637.0</td>
<td>0.000</td>
</tr>
<tr>
<td>_cons</td>
<td>-4942.8</td>
<td>0.000</td>
</tr>
<tr>
<td>F statistic</td>
<td>35.35</td>
<td>0.000</td>
</tr>
<tr>
<td>Observations</td>
<td>74</td>
<td></td>
</tr>
</tbody>
</table>
```

```
eststo clear
.end of do-file
```
<table>
<thead>
<tr>
<th>Command</th>
<th>Weight</th>
<th>MPG</th>
<th>Turn</th>
<th>Displacement</th>
<th>Constant</th>
<th>Chi2 (DF_m)</th>
<th>R2_p</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0.00391***</td>
<td>0.00239</td>
<td>(-3.86)</td>
<td>(-0.99)</td>
<td></td>
<td>35.72 (2)</td>
<td>0.397</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>-0.169</td>
<td>-0.196*</td>
<td>(-1.83)</td>
<td>(-2.07)</td>
<td></td>
<td>55.82 (4)</td>
<td>0.620</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.502*</td>
<td></td>
<td>(-2.28)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.0769*</td>
<td></td>
<td>(-2.06)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13.71**</td>
<td>26.95**</td>
<td>(3.03)</td>
<td>(3.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

---

Include results form 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_ch2 lrtest_df lrtest_p)
eststo clear
<run>
```
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>foreign</td>
<td>foreign</td>
</tr>
<tr>
<td>weight</td>
<td>-0.00259*** (-4.25)</td>
<td>-0.00685*** (-3.43)</td>
</tr>
<tr>
<td>mpg</td>
<td>-0.121 (-1.27)</td>
<td></td>
</tr>
<tr>
<td>price</td>
<td></td>
<td>0.000926** (3.01)</td>
</tr>
<tr>
<td>_cons</td>
<td>6.283*** (3.92)</td>
<td>14.42** (2.66)</td>
</tr>
</tbody>
</table>

N: 74

_test_chisq: 23.78
_test_df: 2
_test_p: 0.00000684

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

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(smcl)
eststo clear
<run>
Writing one's own estadd subcommands (continued)

- approach using a subroutine:

  capture program drop estadd_R
  program estadd_R, eclass
      return 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(smcl)
  eststo clear
  <run>

  . estadd R : *

  . estout, stats(r2 R) style(smcl)

<table>
<thead>
<tr>
<th></th>
<th>est1</th>
<th>est2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>b</td>
</tr>
<tr>
<td>weight</td>
<td>1.746559</td>
<td>3.464706</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51222</td>
<td>21.8536</td>
</tr>
<tr>
<td>foreign</td>
<td>3673.06</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>1946.069</td>
<td>-5853.696</td>
</tr>
<tr>
<td>r2</td>
<td>0.2933891</td>
<td>0.4995594</td>
</tr>
<tr>
<td>R</td>
<td>0.5416541</td>
<td>0.7067952</td>
</tr>
</tbody>
</table>

  . eststo clear
  .
  end of do-file
  —more—
Example 2: Report y-standardized coefficients.

capture program drop estadd_bstdy

program estadd_bstdy, eclass
tempname 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(smcl)
eststo clear
<run>

<table>
<thead>
<tr>
<th></th>
<th>est1</th>
<th>est2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b/bstdy</td>
<td>b/bstdy</td>
</tr>
<tr>
<td>weight</td>
<td>1.746559</td>
<td>3.464706</td>
</tr>
<tr>
<td></td>
<td>(.0005922)</td>
<td>(.0011747)</td>
</tr>
<tr>
<td>mpg</td>
<td>-49.51222</td>
<td>21.8536</td>
</tr>
<tr>
<td></td>
<td>(-.0167867)</td>
<td>(.0074093)</td>
</tr>
<tr>
<td>foreign</td>
<td>3673.06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.245318)</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>1946.069</td>
<td>-5853.696</td>
</tr>
<tr>
<td></td>
<td>(.659797)</td>
<td>(-1.984643)</td>
</tr>
</tbody>
</table>

eststo clear

end of do-file
The trick is to regress a fake variable on all variables including the dependent variable.

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

Using by: `eststo:` and `estadd` to get descriptives by subgroups:

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

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

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

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>Foreign</td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>6072.4</td>
<td>6384.7</td>
</tr>
<tr>
<td></td>
<td>(3097.1)</td>
<td>(2621.9)</td>
</tr>
<tr>
<td>Weight (lbs.)</td>
<td>3317.1</td>
<td>2315.9</td>
</tr>
<tr>
<td></td>
<td>(695.4)</td>
<td>(433.0)</td>
</tr>
<tr>
<td>Mileage (mpg)</td>
<td>19.83</td>
<td>24.77</td>
</tr>
<tr>
<td></td>
<td>(50.74)</td>
<td>(6.612)</td>
</tr>
<tr>
<td>Observations</td>
<td>52</td>
<td>22</td>
</tr>
</tbody>
</table>

eststo clear

Tabulating t-Tests

Basically anything can be tabulated by estout or esttab once it is posted in e\theta. Here is an example with t-tests:
capt prog drop mytstests
program mytstests, 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 test \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\"
}

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(smcl) //
  cells("mu_1(fmt(a3)) mu_2 d(star pvalue(d_p)))")

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

<table>
<thead>
<tr>
<th></th>
<th>mu_1</th>
<th>mu_2</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>price</td>
<td>6072.4</td>
<td>6384.7</td>
<td>-312.3</td>
</tr>
<tr>
<td>weight</td>
<td>3317.1</td>
<td>2315.9</td>
<td>1001.2***</td>
</tr>
<tr>
<td>mpg</td>
<td>19.83</td>
<td>24.77</td>
<td>-4.946***</td>
</tr>
</tbody>
</table>

end of do-file

---more---
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)
    \textit{<run>}

Example 2: listcoef

    estadd listcoef: *
    estout, cell("b_fact b_facts") drop(_cons) style(smcl)
    \textit{<run>}

Example 3: prchange

    estadd prchange: *
    estout, cell(\text{"dcm inmax dcsd"}) drop(_cons) style(smcl)
    \textit{<run>}

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| mpg            | -0.169 | -0.196*  
|                | (-1.83) | (-2.07) |
| turn           | -0.502*  
|                | (-2.28) |
| displacement   | -0.0769*  
|                | (-2.06) |
| _cons          | 13.71**  
|                | (3.03)   | 26.95**  
|                | (3.00)   |

\text{N} | 74       | 74
---|----------|
\text{r2_mf} | 0.397   | 0.620
\text{r2_ml} | 0.383   | 0.530
\text{r2_cu} | 0.544   | 0.752
\text{r2_ef} | 0.411   | 0.636

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001
end of do-file

do_example do/41.ihlp

    estadd listcoef: *

    estout, cell("b_fact b_facts") drop(_cons) style(smcl)

<table>
<thead>
<tr>
<th></th>
<th>est1</th>
<th>b_fact</th>
<th>b_facts</th>
<th>est2</th>
<th>b_fact</th>
<th>b_facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight</td>
<td>.9961009</td>
<td>.048014</td>
<td>1.002392</td>
<td>6.401684</td>
<td></td>
<td></td>
</tr>
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</table>

end of do-file

---more---

end of do-file

do_example do/42.ihlp

    estadd prchange: *

    estout, cell("dcmminmax dcstd") drop(_cons) style(smcl)

<table>
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<td>-.9821618</td>
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</tbody>
</table>

end of do-file

---more---
Thank you for listening!

References


http://repec.org/bocode/e/estout

<clean-up>