In the spotlight: Export tables to Excel®

A new feature in Stata 13, `putexcel`, allows you to easily export matrices, expressions, and stored results to an Excel file. Combining `putexcel` with a Stata command’s stored results allows you to put the table displayed in your Stata Results window in an Excel file. Let me show you.

A stored result is simply a scalar, macro, or matrix stored in memory after you run a Stata command. The two main types of stored results are e-class (for estimation commands) and r-class (for general commands). You can list a command’s stored results after it has been run by typing `ereturn list` (for estimation commands) or `return list` (for general commands). Let’s try a simple example by loading the auto dataset and running `correlate` on the variables `foreign` and `mpg`:

```
. sysuse auto
   (1978 Automobile Data)
. correlate foreign mpg
    (obs=74)
    foreign      mpg
    -------------+------------------
    foreign |   1.0000
    mpg |   0.3934   1.0000
```

Because `correlate` is not an estimation command, we use `return list` to see its stored results.

```
. return list
    scalars:
         r(N) =  74
         r(rho) =  .39339742
    matrices:
        r(C) :  2 x 2
```

Now we can use `putexcel` to export these results to Excel.

The basic syntax of `putexcel` is

```
putexcel excel_cell=(expression) ...  
   using filename [, options]
```

If you are working with matrices, the syntax is

```
putexcel excel_cell=matrix(expression) ...  
   using filename [, options]
```

It is easy to build the above syntax in the `putexcel` dialog. We have a helpful video on our YouTube channel about the dialog (`stata.com/videos13/saving-estimation-results-to-excel`). Let’s list the matrix `r(C)` to see what it contains.

```
. matrix list r(C)
    symmetric r(C)[2,2]
     foreign        mpg
     foreign          1
    mpg  .39339742          1
```

To re-create the table in Excel, we need to export the matrix `r(C)` with the matrix row and column names. In your Stata Command window, type

```
   . putexcel A1=matrix(r(C), names) using corr
```

To export the matrix row and column names, we used the `names` option after we specified the matrix `r(C)`. When we open the file `corr.xlsx` in Excel, the table below is displayed.

![Excel table](image)
Next let’s try a more involved example. Reload the auto dataset, and run a tabulation on the variable foreign. Because tabulate is not an estimation command, we use return list to see its stored results.

```
. sysuse auto, clear
(1978 Automobile Data)
. tabulate foreign

Car type |      Freq.     Percent        Cum.
------------+-----------------------------------
Domestic |         52       70.27       70.27
Foreign |         22       29.73      100.00
------------+-----------------------------------
Total |         74      100.00

. return list
scalars:
   r(N) =  74
   r(r) =  2
```

`tabulate` is different from most commands in Stata: it does not automatically save all the results we need in the stored results. We need to use the `matcell()` and `matrow()` options of `tabulate` to save its results into two Stata matrices.

```
. tabulate foreign, matcell(freq) matrow(names)

Car type |      Freq.     Percent        Cum.
------------+-----------------------------------
Domestic |         52       70.27       70.27
Foreign |         22       29.73      100.00
------------+-----------------------------------
Total |         74      100.00

. matrix list freq
freq[2,1]
c1
r1  52
r2  22

. matrix list names
names[2,1]
c1
r1  0
r2  1
```

You probably noticed that this table does not include cumulative percentages or the total number of cars. Moreover, our “Car type” column contains the numeric values of the foreign variable rather than the value labels Domestic and Foreign.

With a bit of programming, you can overcome these limitations. On the Stata Blog, I have posted a short do-file that exports the table by `tabulate` exactly as it appears in the Stata Results window. Go to blog.stata.com/2013/09/25/export-tables-to-excel to get it. With that program, we get this Excel spreadsheet:

You can also learn how to quickly export estimation results at stata.com/stata13/create-word-and-excel-files.

—Kevin Crow
Senior Software Developer
In the spotlight: Double-robust treatment effects
(two wrongs don’t make a right, but one does)

If you ever wanted an extra shot at getting your treatment-effects model right, \texttt{teffects} can help you.

\texttt{teffects} allows you to write a model for the treatment and a model for the outcome. We will show how—even if you misspecify one of the models—you can still get correct estimates using doubly robust estimators.

In experimental data, the treatment is randomized so that a difference between the average treated outcomes and the average nontreated outcomes estimates the average treatment effect (ATE).

Suppose you want to estimate the ATE of a mother’s smoking on her baby’s birthweight. The ethical impossibility of asking a random selection of pregnant women to smoke mandates that these data be observational. Which women choose to smoke while pregnant almost certainly depends on observable covariates, such as the mother’s age.

We use a conditional model to make the treatment as good as random. More formally, we assume that conditioning on observable covariates makes the outcome conditionally independent of the treatment. Conditional independence allows us to use differences in model-adjusted averages to estimate the ATE.

The regression-adjustment (RA) estimator uses a model for the outcome. The RA estimator uses a difference in the average predictions for the treated and the average predictions for the nontreated to estimate the ATE. Below we use \texttt{teffects ra} to estimate the ATE when conditioning on the mother’s marital status, her education level, whether she had a prenatal visit in the first trimester, and whether it was her first baby.

```
webuse cattaneo2

teffects ra (bweight mmarried prenatal1 fbaby medu) (mbsmoke)
```

```
Iteration 0:   EE criterion =  4.582e-24
Iteration 1:   EE criterion =  5.097e-26

Treatment-effects estimation
Estimator : regression adjustment
Outcome model : linear
Treatment model: none

|            | Robust Coef. | Std. Err. | z    | P>|z|   | [95% Conf. Interval] |
|-------------|--------------|-----------|------|-------|----------------------|
|              |              |           |      |       |                      |
| bweight      |              |           |      |       |                      |
| ATE          |              |           |      |       |                      |
| mbsmoke (smoker vs nonsmoker) | -230.9541 | 24.34012 | -9.49 | 0.000 | -278.6599 -183.2484 |
| POmean       |              |           |      |       |                      |
| mbsmoke nonsmoker | 3402.548 | 9.546721 | 356.41 | 0.000 | 3383.836 3421.259    |
```

Mothers’ smoking lowers the average birthweight by 231 grams.

The inverse-probability-weighted (IPW) estimator uses a model for the treatment instead of a model for the outcome; it uses the predicted treatment probabilities to weight the observed outcomes. The difference between the weighted treated outcomes and the weighted nontreated outcomes estimates the ATE. Conditioning on the same variables as
Mothers' smoking again lowers the average birthweight by 231 grams.

We could use both models instead of one. The shocking fact is that only one of the two models must be correct to estimate the ATE, whether we use the augmented-IPW (AIPW) combination proposed by Robins and Rotnitzky (1995) or the IPW-regression-adjustment (IPWRA) combination proposed by Wooldridge (2010).

The AIPW estimator augments the IPW estimator with a correction term. The term removes the bias if the treatment model is wrong and the outcome model is correct, and the term goes to 0 if the treatment model is correct and the outcome model is wrong.

The IPWRA estimator uses IPW probability weights when performing RA. The weights do not affect the accuracy of the RA estimator if the treatment model is wrong and the outcome model is correct. The weights correct the RA estimator if the treatment model is correct and the outcome model is wrong.

We now use `teffects aipw` to estimate the ATE:

```bash
.teffects aipw (bweight mmarried prenatal1 fbaby medu) (mbsmoke mmarried prenatal1 fbaby medu)
```

Mothers' smoking again lowers the average birthweight by 231 grams.

```bash
Iteration 0:   EE criterion =  1.701e-23
Iteration 1:   EE criterion =  4.947e-27
Treatment-effects estimation             Number of obs      =      4642
Estimator : inverse-probability weights
Outcome model : weighted mean
Treatment model: logit

|             | Robust Coef. | Std. Err. | z    | P>|z|  | [95% Conf. Interval] |
|-------------|--------------|-----------|------|------|---------------------|
| ATE         |              |           |      |      |                     |
| mbsmoke     |              |           |      |      |                     |
| smoker (     | -231.1516    | 24.03183  | -9.62|  0.000| -278.2531 -184.0501 |
| vs nonsmoker)|              |           |      |      |                     |
| Pmean       |              |           |      |      |                     |
| mbsmoke     | 3402.219     | 9.589812  | 354.77|  0.000| 3383.423  3421.015  |
| nonsmoker   |              |           |      |      |                     |
```

We now use `teffects ipw` to estimate the ATE:

```bash
.teffects ipw (bweight) (mbsmoke mmarried prenatal1 fbaby medu)
```

Mothers' smoking again lowers the average birthweight by 231 grams.

```bash
Iteration 0:   EE criterion =  2.153e-23
Iteration 1:   EE criterion =  1.802e-26
Treatment-effects estimation             Number of obs      =      4642
Estimator : augmented IPW
Outcome model : linear by ML
Treatment model: logit

|             | Robust Coef. | Std. Err. | z    | P>|z|  | [95% Conf. Interval] |
|-------------|--------------|-----------|------|------|---------------------|
| ATE         |              |           |      |      |                     |
| mbsmoke     |              |           |      |      |                     |
| smoker (     | -229.7809    | 24.96839  | -9.20|  0.000| -278.718  -180.8437 |
| vs nonsmoker)|              |           |      |      |                     |
| Pmean       |              |           |      |      |                     |
| mbsmoke     | 3403.122     | 9.564165  | 355.82|  0.000| 3384.376  3421.867  |
| nonsmoker   |              |           |      |      |                     |
```
Mothers’ smoking lowers the average birthweight by 230 grams.

Finally, we use `teffects ipwra` to estimate the ATE:

```stata
. teffects ipwra (bweight mmarried prenatal1 fbaby medu) ///
   > (mbsmoke mmarried prenatal1 fbaby medu)
```

Iteration 0: EE criterion = 3.901e-22
Iteration 1: EE criterion = 1.373e-25

```
Treatment-effects estimation
Estimator : IPW regression adjustment
Outcome model : linear
Treatment model : logit
```

```
|                  | Coef.  | Std. Err. |     z  | P>|z|  |  [95% Conf. Interval] |
|------------------|--------|-----------|--------|------|----------------------|
| **ATE**          |        |           |        |      |                      |
| mbsmoke (smoker  | -227.4408 | 25.62591  | -8.88  | 0.000 | -277.6667                   |
| vs nonsmoker)    |        |           |        |      | -177.215                     |
| **POmean**       |        |           |        |      |                      |
| mbsmoke nonsmoker| 3403.027  | 9.56025   | 355.96 | 0.000 | 3384.289                   |

Mothers’ smoking lowers the average birthweight by 227 grams.

All of these results tell a similar story, so we assume that both the outcome and the treatment models are correct. When both models are correct, the AIPW estimator is more efficient than either the RA or the IPW estimator. We started off in search of robustness and ended up with extra efficiency.

**References**


—David M. Drukker
Director of Econometrics

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■ Estimating Average Treatment Effects Using Stata
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■ Structural Equation Modeling Using Stata
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Dates: October 10–November 28, 2014  
Cost: $295

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April 3–6 in Chicago, Illinois
Attending: Kristin MacDonald, Senior Statistician

AERA 2014 Annual Meeting
American Educational Research Association
April 3–7 in Philadelphia, Pennsylvania
Attending: Chuck Huber, Senior Statistician

APS 2014 Annual Convention
Association for Psychological Science
May 22–25 in San Francisco, California
Attending: Chuck Huber, Senior Statistician

JSM 2014 Annual Meeting
Joint Statistical Meetings
August 2–7 in Boston, Massachusetts
Attending: Kristin MacDonald, Senior Statistician; Yulia Marchenko, Director of Biostatistics; and Bill Rising, Director of Educational Services

APA 2014 Annual Convention
American Psychological Association
August 7–10 in Washington, DC
Attending: Chuck Huber and Kristin MacDonald, Senior Statisticians

ASA 2014 Annual Meeting
American Sociological Association
August 16–19 in San Francisco, California
Attending: Rose Medeiros, Senior Statistician

APSA 2014 Annual Meeting
American Political Science Association
August 28–31 in Washington, DC
Attending: Kristin MacDonald, Senior Statistician

APHA 2014 Annual Meeting
American Public Health Association
November 15–19 in New Orleans, Louisiana
Attending: Chuck Huber, Senior Statistician, and Bill Rising, Director of Educational Services

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stata.com/news/conferences
Biostatistics Decoded

Author: A. Gouveia Oliveira
Publisher: Wiley
Copyright: 2013
Price: $54.50

*Biostatistics Decoded* is an introduction to biostatistics for medical professionals and clinical researchers. Oliveira emphasizes concepts and basic calculations that will provide the reader with a foundation for understanding the study designs and statistical methods reported in the scientific literature.

The book is comprehensive and includes basic descriptive and inferential statistics as well as advanced topics such as the analysis of longitudinal studies, survival analysis, factor analysis, and meta-analysis. A variety of study designs are also covered, including stratified and multistage sampling designs and modern experimental designs such as adaptive clinical trials and noninferiority trials.

Oliveira avoids mathematical proofs, instead using diagrams, graphs, and simulations to illustrate ideas. Familiarity with basic arithmetic, square roots, and logarithms is sufficient, and no knowledge of calculus is necessary. All examples are worked using Stata.

Read more or order online at stata.com/bookstore/biostatistics-decoded.

The Stata Bookstore offers a wide variety of titles on statistics and Stata that our development staff feels may be of interest to Stata users.

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Epidemiology: Study Design and Data Analysis, Third Edition

Author: Mark Woodward
Publisher: Chapman & Hall/CRC
Copyright: 2013
Price: $84.75

Woodward’s third edition of *Epidemiology: Study Design and Data Analysis* has two target audiences: researchers who need statistical solutions to epidemiology problems and statisticians who wish to learn how their science applies to epidemiology. This book successfully presents statistical principles in epidemiology in a manner that is neither too theoretical nor too replete with medical jargon. It provides complete treatment of the topic, from simple contingency tables to meta-analysis. The book uses real data throughout—more than 20 large datasets are cataloged for download—and the end of each chapter has exercises. Woodward makes Stata code for working many of the examples available for download.

Topics include basic terminology, causality, descriptive statistics, testing of means, relative risks versus odds ratios, exact tests based on tables, tests for linear and nonlinear trends, confounding and interaction, direct and indirect standardization, cohort designs, case-control studies, intervention studies, power and sample size, linear models (including analysis of variance), logistic and other models for binary responses, survival analysis (including Cox regression), and meta-analysis. The third edition has been expanded to include risk scores and clinical decision rules, bootstrapping, multiple imputation, binomial regression models, competing risks, propensity scoring, and splines.

Read more or order online at stata.com/bookstore/epidemiology-sdda.

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Come join us in historic Boston, home to Fenway Park and the Harvard Museum of Natural History, for two days of networking and Stata exploration. Don’t miss this opportunity to connect with colleagues and fellow researchers as well as Stata developers.

<table>
<thead>
<tr>
<th>When</th>
<th>July 31–August 1, 2014</th>
</tr>
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<tbody>
<tr>
<td>Where</td>
<td>Omni Parker House</td>
</tr>
<tr>
<td></td>
<td>60 School Street</td>
</tr>
<tr>
<td></td>
<td>Boston, Massachusetts</td>
</tr>
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<td>Who</td>
<td>Stata 13 developers</td>
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<tr>
<td></td>
<td>You and Stata users</td>
</tr>
<tr>
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<td>from around the world</td>
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**Come early, stay late**

Whether you stay for the JSM or just to relax, be sure to enjoy what Boston has to offer. Take a cruise in Boston Harbor, walk the Freedom Trail, visit Fenway Park, and have a bowl of “chowdah”. Boston is a great city with plenty to do and see.

**Scientific committee**

- Stephen Soldz (Chair)
  Boston Graduate School of Psychoanalysis
- Kit Baum
  Boston College
- Marcello Pagano
  Harvard University

**Accommodations**

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(617) 227–8600

Visit stata.com/boston14 for web reservation information.

Register online:

stata.com/boston14
Save the date

The 12th German Stata Users Group meeting will be held at the University of Hamburg on Friday, June 13, 2014. Everyone who is interested in using Stata is invited.

Registration is now open. Visit stata.com/meeting/germany14 for details.

The final program, cost, and venue will be circulated in April 2014.

Scientific committee

- Dirk Enzmann
  University of Hamburg
- Johannes Giesecke
  University of Bamberg
- Ulrich Kohler
  University of Potsdam
- Kai-Uwe Schnapp
  University of Hamburg

Find more details online at stata.com/meeting/germany14.

Save the date

The 2014 UK Stata Users Group meeting is a two-day international conference where the use of Stata is discussed across a wide-ranging breadth of fields and environments. The meeting is open to everyone.

If you are interested in giving a presentation, feel free to contact the scientific organizers now.

Scientific committee

- Nicholas J. Cox
  Durham University
- Patrick Royston
  MRC Clinical Trials Unit at UCL

Find more details online at stata.com/meeting/uk14.

<table>
<thead>
<tr>
<th>Date</th>
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<td>Venue</td>
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</table>

More dates and locations available soon

stata.com/meeting
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