Introduction to the Stata -margins- Command

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CFDR Workshop Series
June 3, 2019
Overview

• What is the Stata -margins- command?
• Steps of using the -margins- command
• Factor variables in the analysis command
• Syntax of the -margins- command
• Stata examples
• Conclusions
What Is the Stata -margins- Command?

- The -margins- command is a post-estimation technique that generates predicted margins and estimates marginal effects, using estimated coefficients and estimated variance of the residual from the previously estimated model.

- The -marg- command is especially useful with the analysis involved categorical dependent variable, the squared term of a predictor, or the interaction of predictors.

- The -margins- command works after most Stata estimation command except those that use the alternative-specific estimation commands (e.g., generalized method of moments estimation), that organize data differently (e.g., alternative-specific conditional logit, nested logit regression), or that do not produce full variance matrices (e.g., exact logistic regression or exact poisson regression).

- The -margins- command can be applied to the data that are collected with the complex survey design or from multiple imputation.
Steps of Using the -margins- Command

• Analysis part:
  – Decide the research question which dictates the predictor(s), the outcome, and control variables
  – Specify and estimate the analysis model

• -margins- part:
  – Consider how each control variable should be adjusted, whether the predicted margins or marginal effects will be estimated, and whether plotting the margins is needed
  – Specify the -margins- command that uses information from the analysis part to generate, test, or plot the predicted margins of the responses
Factor Variables in the Analysis Command

• Why is it necessary to use factor variables in the analysis command?
  – It provides the information on the attribute of a predictor and allows the -margins- command treats categorical predictors and continuous predictors differently
  – It allows Stata to recognize whether a predictor is a function of other variables, for example, an interaction term is the product of two variables

• How to specify factor variables?
  – i for indicator variables, binary variables, dummies
  – c for continuous variables
  – # for the squared term of a predictor or the interaction term between two predictors.
  – ## for both main effects and interaction of the predictors in the analysis model
### Syntax of the -margins- Command

<table>
<thead>
<tr>
<th>Command</th>
<th>The predictor of interest</th>
<th>predicted margins or the marginal effect</th>
<th>Adjustment of other variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>margins</td>
<td>[marginlist]</td>
<td>, [blank]</td>
<td>[blank]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>, dydx(varlist)</td>
<td>atmeans</td>
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<td></td>
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<td>at(atspec)</td>
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<td>atmean</td>
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<tr>
<td></td>
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<td></td>
<td>at(at(spec)</td>
</tr>
</tbody>
</table>

**Note:**
1. These six combinations correspond to what researchers called (1) Average Adjusted Predictions, (2) Adjusted predictions at the Means; (3) Adjusted Predictions at Representative values; (4) Average Marginal Effects; (5) Marginal Effects at the Means; (6) Marginal Effects at Representative values.
2. Only factor variables and their interactions are allowed in the marginlist.
3. The pound sign "#" in the marginlist means the combinations of two predictors even when the analysis does not have the interaction term of these two variables in the data.
Stata Examples

• The Stata command file has six sets of commands

• Five of them show how to the -margins- command is used for a continuous dependent variable, a binary dependent variable, a nominal dependent variable, when data are collected with a complex survey design, and imputed data

• One shows how to plot the results from the -margins- command
Conclusions

• The -margins- command is a post-estimation method and needs to be used right after an analysis is conducted. Therefore, the accuracy of the analysis model determines the accuracy of the results from the -margins- command.

• The -margins- command helps better interpret the analysis results, especially when the analysis involves interaction terms among variables, squared terms of predictors, and non-linear regression models.

• When conducting the analysis, researchers need to indicate predictors and their interactions using the notation of factor variables; otherwise, the -margins- command will produce error message.

• The -margins- command estimates the margins of responses for factor variables, so if you have continuous predictors, you need to categorize them or use them as control variables.

• Always check the margins output and see if the -margins- command is specified correctly.