GUI (power) — Graphical user interface for power and sample-size analysis

Description Menu Remarks and examples Also see

Description

This entry describes the graphical user interface (GUI) for the power command. See [PSS-2] **power** for a general introduction to the power command.

Menu

Statistics > Power, precision, and sample size

Remarks and examples

stata.com

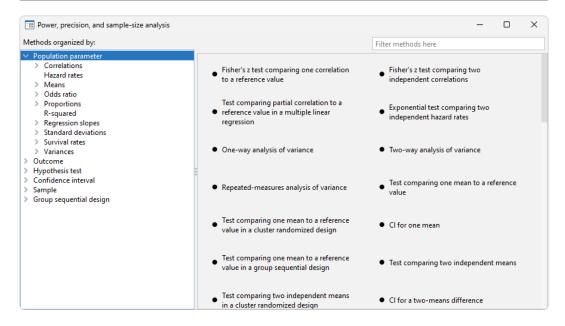
Remarks are presented under the following headings:

PSS Control Panel Example using PSS Control Panel

PSS Control Panel

You can perform PSS analysis interactively by typing the power command or by using a pointand-click GUI available via the PSS Control Panel.

The PSS Control Panel can be accessed by selecting **Statistics** > **Power, precision, and sample size** from the Stata menu. It includes a tree-view organization of the PSS, PrSS, and group sequential design methods.



The left pane organizes the methods, and the right pane displays the methods corresponding to the selection in the left pane. On the left, the methods are organized by the type of population parameter, such as mean or proportion; the type of outcome, such as continuous or binary; the type of analysis, such as hypothesis test or confidence interval; and the type of sample, such as one sample or two samples. You click on one of the methods shown in the right pane to launch the dialog box for that method.

By default, methods are organized by **Population parameter**. We can find the method we want to use by looking for it in the right pane, or we can narrow down the type of method we are looking for by selecting one of the expanded categories in the left pane.

For example, if we are interested in means, we can click on **Means** within **Population parameter** to see all methods for means in the right pane.

Power, precision, and sample-size analysis		– 🗆 ×
Methods organized by:		Filter methods here
Population parameter Correlations Hazard rates Means	 One-way analysis of variance 	• Two-way analysis of variance
Odds ratio Proportions R-squared Regression slopes Standard deviations Survival rates Variances Uarionces Hypothesis test	 Repeated-measures analysis of variance 	 Test comparing one mean to a reference value
	• Test comparing one mean to a reference value in a cluster randomized design	CI for one mean
 Confidence interval Sample Group sequential design 	Test comparing one mean to a reference value in a group sequential design	• Test comparing two independent means
	• Test comparing two independent means in a cluster randomized design	• CI for a two-means difference
	 Test comparing two independent means in a group sequential design 	Paired test comparing two correlated means, specify correlation between paired observations
	Paired test comparing two correlated means, specify standard deviation of the	 CI for a paired-means difference, specify correlation between paired observations

We can expand **Means** to further narrow down the choices by clicking on the symbol to the left of **Means**.

Power, precision, and sample-size analysis		- • ×
Methods organized by:	Filter methods here	
 Population parameter Correlations Hazard rates Means 	One-way analysis of variance	• Two-way analysis of variance
 ANOVA (multiple means) One sample Two independent samples Two paired samples 	• Repeated-measures analysis of variance	• Test comparing one mean to a reference value
 > Odds ratio > Proportions R-squared > Regression slopes 	Test comparing one mean to a reference value in a cluster randomized design	• CI for one mean
 Standard deviations Survival rates Variances Outcome 	 Test comparing one mean to a reference value in a group sequential design 	• Test comparing two independent means
 Hypothesis test Confidence interval Sample Group sequential design 	• Test comparing two independent means in a cluster randomized design	• CI for a two-means difference
	 Test comparing two independent means in a group sequential design 	Paired test comparing two correlated means, specify correlation between paired observations
	Paired test comparing two correlated means, specify standard deviation of the	CI for a paired-means difference, specify correlation between paired observations

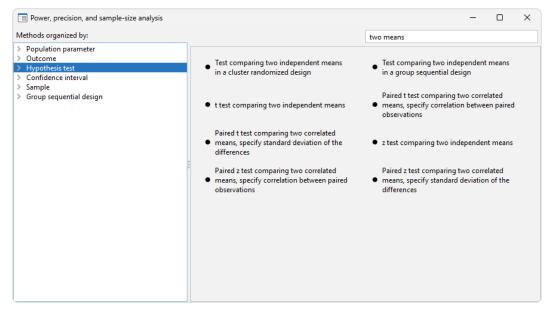
Or we can choose a method by the type of analysis by expanding **Hypothesis test** and selecting, for example, **t tests**:

Power, precision, and sample-size analysis		= U	×
ethods organized by:		Filter methods here	
Hypothesis test > ANOVA Binomial test > Chi-squared tests > Cluster randomized design Cochran-Armitage trend test Cochran-Amtel-Haenszel test > Contingency tables Cox model > Exact tests Exponential test > F tests Fisher's exact test > Group sequential design Likelihood-ratio test > Linear regression Log-rank test Matched case-control data McNemar's test Partial-correlation test Pearson's chi-squared test R-squared test Stratified 2x2 tables > tests Wald test	 t test comparing one mean to a reference value Paired t test comparing two correlated means, specify correlation between paired observations 	 t test comparing two independent means Paired t test comparing two correlated means, specify standard deviation of the differences 	

We can also locate methods by searching the titles of methods. You specify the search string of interest in the *Filter* box at the top right of the PSS Control Panel. For example, if we type "mean" in the *Filter* box while keeping the focus on **Hypothesis test**, only test methods with a title containing "mean" will be listed in the right pane.

Power, precision, and sample-size analysis		×						
Methods organized by:		mean						
 Population parameter Outcome Hypothesis test Confidence interval Sample Sample Group sequential design 	 Test comparing one mean to a reference value in a cluster randomized design Test comparing one mean to a reference value in a group sequential design t test comparing one mean to a reference value Paired t test comparing two correlated means, specify correlation between paired observations z test comparing one mean to a reference value Paired z test comparing two correlated means, specify correlation between paired observations 	 Test comparing two independent means in a cluster randomized design Test comparing two independent means in a group sequential design t test comparing two independent means Paired t test comparing two correlated means, specify standard deviation of the differences z test comparing two independent means Paired z test comparing two correlated means, specify standard deviation of the differences 						

We can specify multiple words in the *Filter* box, and only methods with all the specified words in their titles will appear. For example, if we type "two means", only methods with the words "two" and "means" in their titles will be shown:

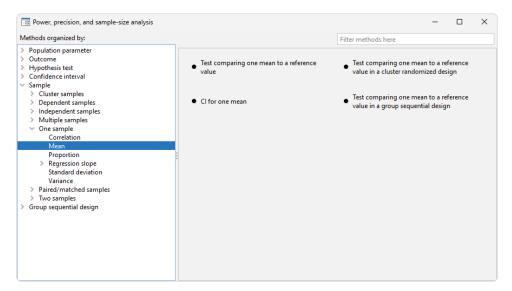


The search is performed within the group of methods selected by the choice in the left pane. In the above example, the search was done within **Hypothesis test**. When you search all methods, whether you select **Population parameter**, **Outcome**, or **Sample** in the left pane, the same set of methods appears in the right pane but in the order determined by the selected category.

Example using PSS Control Panel

In An example of PSS analysis in Stata in [PSS-2] Intro (power), we performed PSS analysis interactively by typing commands. We replicate the analysis by using the PSS Control Panel and dialog boxes.

We first launch the PSS Control Panel from the **Statistics** > **Power**, **precision**, **and sample size** menu. We then narrow down to the desired dialog box by first choosing **Sample** in the left pane, then choosing **One sample** within that, and then choosing **Mean**. In the right pane, we see methods for testing the one-sample mean. We are interested in the **Test comparing one mean to a reference value**.



We invoke the dialog box by clicking on the corresponding method title in the right pane. The following appears:

😑 pow	er oneme	an - Pow	er analysis for a one-samp	ole mean test			-		Х
Main	Table	Graph	Iteration						
Comp	ute: le size			~		* Acce	pts numli	st (Exam	ples)
	probabili	tier							
0.05			* Significance level	0.8		* Pow	/er	\sim	
	ple size llow fract	ional sam	ple size						
	t size eans		* Null * Alternative	1	ard deviation		ndard dev d deviatio		
None Sides: Two-s	sided test	~	tion:	el					
? C					ОК	С	ancel	Subi	mit

Following the example from An example of PSS analysis in Stata in [PSS-2] Intro (power), we now compute sample size. The first step is to choose which parameter to compute. The Compute drop-down box specifies Sample size, so we leave it unchanged. The next step is to specify error probabilities. The default significance level is already set to our desired value of 0.05, so we leave it unchanged. We change power from the default value of 0.8 to 0.9. We then specify a null mean of 514, an alternative mean of 534, and a standard deviation of 117 in the Effect size group of options. We leave everything else unchanged and click on the Submit button to obtain results.

∃ pov	/er onem	ean - Pow	er analysis for a one-samp	e mean test —	×
Main	Table	Graph	Iteration		
Comp	ute:			* Accepts numlist (Exa	mples
Samp	le size			~	
Error	r probabil	ities			
0.0	5		* Significance level	0.9 * Power ~	
Sam	ple size				
	•	tional sam	iple size		
Effec	t size				
Me	eans			Standard deviation	
5	14		* Null	117 * Standard deviation	
5	34		* Alternative ~	Assume a known standard deviation	
			Alternative		
* Einit	o nonulat	ion correc	tion		
None		ion conec	~		
Sides:	sided test				
Iwo-	sided test	~			
Tre	at numbe	er lists in s	tarred(*) options as paralle		
C				OK Cancel Su	ıbmit

The following command is displayed in the Results window and executed:

```
. power onemean 514 534, power(0.9) sd(117)
Performing iteration ...
Estimated sample size for a one-sample mean test
t test
HO: m = mO versus Ha: m != mO
Study parameters:
        alpha =
                 0.0500
        power =
                 0.9000
        delta =
                  0.1709
          m0 = 514.0000
          ma = 534.0000
           sd = 117.0000
Estimated sample size:
            N =
                      362
```

We can verify that the command and results are exactly the same as what we specified in *An example* of *PSS analysis in Stata* of [PSS-2] **Intro (power)**.

Continuing our PSS analysis, we now want to compute power for a sample of 300 subjects. We return to the dialog box and select Power under *Compute*. The only thing we need to specify is the sample size of 300:

Main	Table	Graph	Iteration	
Comp	oute:			* Accepts numlist (Examples
Powe	er			\sim
Erro	r probabil	ities		
0.0)5		* Significance level	
Sam	ple size			
300			* Sample size	
	ct size			Standard deviation
	eans		7	
5	514		* Null	117 * Standard deviation
5	534		* Alternative ~	Assume a known standard deviation
* Finit	e populat	ion corre	ction:	
None	e		\sim	
Sides:				
Two-	sided test	~		
-	eat numbe	er lists in s	tarred(*) options as paralle	1
Tre				
Tre				

The following command is issued after we click on the Submit button:

```
. power onemean 514 534, n(300) sd(117)
Estimated power for a one-sample mean test
t test
HO: m = mO versus Ha: m != mO
Study parameters:
        alpha =
                 0.0500
            N =
                      300
        delta =
                 0.1709
          m0 = 514.0000
          ma =
                 534.0000
           sd =
                117.0000
Estimated power:
                   0.8392
        power =
```

To compute effect size, we select Effect size and target mean under *Compute*. All the previously used values for power and sample size are preserved, so we do not need to specify anything additional.

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/lain	Table	Graph	Iteration	
Comp	ute:			* Accepts numlist (Example
Effect	size and	target me	ean	\sim
Error	probabil	ities		
0.0	5		* Significance level	0.9 * Power ~
Sam	ple size			
300			* Sample size	
5	14		* Null	117 * Standard deviation Assume a known standard deviation
Finite None	e populati	ion corre	ction:	
Sides:				Direction of the effect:
Two-s	ided test	~		Upper 🗸
Tre	at numbe	r lists in s	starred(*) options as parallel	

We click on the **Submit** button and get the following:

```
. power onemean 514, power(0.9) n(300) sd(117)
Performing iteration ...
Estimated target mean for a one-sample mean test
t test
HO: m = mO versus Ha: m != mO; ma > mO
Study parameters:
        alpha =
                  0.0500
        power =
                 0.9000
           N =
                      300
          m0 = 514.0000
           sd = 117.0000
Estimated effect size and target mean:
        delta =
                  0.1878
          ma = 535.9671
```

To produce the graph from An example of PSS analysis in Stata, we first select Power under Compute. Then we specify the *numlists* for sample size and alternative mean in the respective edit boxes:

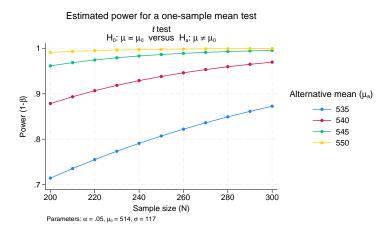
pow	ver oneme	an - Pow	er analysis	for a one-sample	mean test			-		×
Main	Table	Graph	Iteration							
Comp							* Acce	pts numl	ist (Exam	nples)
Powe	r				\sim					
Error	r probabili	ties								
0.0	5		* Significa	nce level						
Sam	ple size									
200	(10)300		* Sample s	ize						
F#	t size									
	eans				Standa	rd deviation				
_	14		* Null		117	iu ueviation	* \$4-1	ndard dev	intion	
	14						Juli	idard de	lation	
5	35(5)550		* Altern	iative 🗸	Ass	ume a known s	tandard	l deviatio	n	
None Sides: Two-s	sided test	~	~	stions as parallel						
∟ Tre	at numbe	r lists in s	tarred(*) op	ntions as parallel						

We also check the *Graph the results* box on the **Graph** tab:

power onemean - Power analysis for a one-sample mean test	-		×
Main Table Graph Iteration			
Graph the results			
Graph properties			
? С 🗈 ОК С.	ancel	Subm	it

We click on the Submit button and obtain the following command and graph:

. power onemean 514 (535(5)550), n(200(10)300) sd(117) graph



Also see

[PSS-2] power — Power and sample-size analysis for hypothesis tests

[PSS-2] Intro (power) — Introduction to power and sample-size analysis for hypothesis tests

[PSS-5] Glossary

[ADAPT] GSD intro — Introduction to group sequential designs

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