sem and gsem option from() — Specifying starting values

Description

See [SEM] Intro 12 for a description of starting values.

Starting values are usually not specified. When there are convergence problems, it is often necessary
to specify starting values. You can specify starting values by using

1. suboption init() as described in [SEM] sem and gsem path notation, or by using
2. option from() as described here.

Option from() is especially convenient for using the solution of one model as starting values for
another.

Syntax

\{sem|gsem\} ... [ , ... from(matname[, skip]) ] ... \\
\{sem|gsem\} ... [ , ... from(svlist) ] ...

where matname is the name of a Stata matrix and
where svlist is a space-separated list of the form

eqname:name = #

Option

skip is an option of from(matname). It specifies to ignore any parameters in matname that do not
appear in the model being fit. If this option is not specified, the existence of such parameters
causes sem (gsem) to issue an error message.

Remarks and examples

Remarks are presented under the following headings:

Syntax 1, especially useful when dealing with convergence problems
Syntax 2, seldom used

Option from() can be used with sem or gsem. We illustrate below using sem.
Say you are attempting to fit

\[ \texttt{. sem your\_full\_model, ...} \]

and are having difficulty with convergence. Following the advice in \texttt{SEM Intro 12}, you have simplified your model,

\[ \texttt{. sem your\_simple\_model, ...} \]

and that does converge. You now want to use those values as starting values for the full model. Let's imagine that there are 47 estimated parameters in the simple model.

Using the standard \texttt{init()} method for specifying starting values, you now have a real job in front of you. You have to type your full model, find all the places where you want to add starting values, and add an \texttt{init()} suboption. Just a piece of your full model might read

\[ ... (y<-L1 L2) (L1->x1 x2) (L2->x3 L4) ... \]

and you need to modify that to read

\[ ... (y<-(L1, init(14.283984)) L2) /// \]
\[ (L1->(x1, init(2.666532)) (x2, init(-6.39499))) /// \]
\[ (L2->x3 L4) ... \]

That change handles 3 of the 47 parameters you need to specify.

There is an easier way. Type

\[ \texttt{. sem your\_simple\_model, ...} \]
\[ \texttt{. matrix b = e(b)} \]
\[ \texttt{. sem your\_full\_model, ... from(b)} \]

Here is how this works:

1. You fit the simple model. \texttt{sem} stores the resulting parameters in \texttt{e(b)}.
2. You store the fitted parameters in Stata matrix \texttt{b}.
3. To fit your full model, type the model just as you would usually, and add option \texttt{from(b)}. That option tells \texttt{sem} to get any starting values it can from Stata matrix \texttt{b}. \texttt{sem} does that and then follows its usual logic for producing starting values for the remaining parameters.

Just because you use \texttt{from(b)} does not mean you cannot specify starting values with \texttt{init()}. You can even specify starting values for some of the same parameters. Starting values specified by \texttt{init()} take precedence over those obtained from \texttt{from()}.

**Syntax 2, seldom used**

In syntax 2, you specify

\[ \texttt{. sem ..., ... from(eqname:eqname = # eqname:eqname = # ...)} \]

For instance, you could type

\[ \texttt{. sem ..., ... from(var(X):_cons=10)} \]

or you could type

\[ \texttt{. sem ..., ... var(X, init(10))} \]

It is usually easier to type the second. See \texttt{SEM sem and gsem path notation}. 
You may combine the two notations. If starting values are specified for a parameter both ways, those specified by \texttt{init()} take precedence.

\textbf{Also see}

[SEM] \texttt{sem} — Structural equation model estimation command
[SEM] \texttt{gsem} — Generalized structural equation model estimation command
[SEM] \texttt{sem and gsem path notation} — Command syntax for path diagrams
[SEM] \texttt{gsem model description options} — Model description options
[SEM] \texttt{sem model description options} — Model description options
[SEM] \texttt{gsem estimation options} — Options affecting estimation
[R] \texttt{Maximize} — Details of iterative maximization