

example 11 — estat framework

Description Remarks and examples Also see

Description

To demonstrate `estat framework`, which displays results in Bentler–Weeks form, we continue where [\[SEM\] example 10](#) left off:

```
. use http://www.stata-press.com/data/r15/sem_mimic1
. ssd describe
. notes
. sem (SubjSES -> s_income s_occpres s_socstat)   ///
      (SubjSES <- income occpres)
. estat residuals, normalized
. estimates store mimic1
. sem (SubjSES -> s_income s_occpres s_socstat)   ///
      (SubjSES <- income occpres)               ///
      (s_income <- income)                       ///
      (s_occpres <- occpres)
. lrtest mimic1 .
```

See *Structural models 10: MIMIC models* in [\[SEM\] intro 5](#) for background.

Remarks and examples

[stata.com](#)

If you prefer to see SEM results reported in Bentler–Weeks form, type `estat framework` after estimating with `sem`. Many people find Bentler–Weeks form helpful in understanding how the model is fit.

[\[SEM\] example 10](#) ended by fitting

```
. sem (SubjSES -> s_income s_occpres s_socstat)   ///
      (SubjSES <- income occpres)               ///
      (s_income <- income)                       ///
      (s_occpres <- occpres)
```

In Bentler–Weeks form, the output appears as

```
. estat framework, fitted
Endogenous variables on endogenous variables
```

	observed	s_income	s_occpres	s_socstat	latent
Beta					SubjSES
observed					
s_income	0	0	0	0	1
s_occpres	0	0	0	0	.783781
s_socstat	0	0	0	0	1.195539
latent					
SubjSES	0	0	0	0	0

Exogenous variables on endogenous variables

Gamma	observed	
	income	occpres
observed		
s_income	.0532425	0
s_occpres	0	.0045201
s_socstat	0	0
latent		
SubjSES	.0538025	.0034324

Covariances of error variables

Psi	observed			latent
	e.s_inc~e	e.s_occ~s	e.s_soc~t	e.SubjSES
observed				
e.s_income	.2292697			
e.s_occpres	0	.2773786		
e.s_socstat	0	0	.1459009	
latent				
e.SubjSES	0	0	0	.1480275

Intercepts of endogenous variables

alpha	observed			latent
	s_income	s_occpres	s_socstat	SubjSES
_cons	.8825314	1.06586	1.07922	0

Covariances of exogenous variables

Phi	observed	
	income	occpres
observed		
income	4.820021	
occpres	13.62431	451.6628

Means of exogenous variables

kappa	observed	
	income	occpres
mean	5.04	36.698

Fitted covariances of observed and latent variables

	observed			latent	observed
Sigma	s_income	s_occpres	s_socstat	SubjSES	income
observed					
s_income	.4478609				
s_occpres	.1614446	.4086519			
s_socstat	.225515	.1738222	.392219		
latent					
SubjSES	.1886304	.1453924	.2060311	.1723333	
observed					
income	.5627232	.3014937	.3659463	.3060932	4.820021
occpres	3.008694	3.831184	2.729776	2.283302	13.62431

	observed
Sigma	occpres
observed	
occpres	451.6628

Fitted means of observed and latent variables

	observed	s_occpres	s_socstat	latent	observed
mu	s_income			SubjSES	income
mu	1.548	1.543	1.554	.3971264	5.04

	observed
mu	occpres
mu	36.698

Notes:

1. Bentler–Weeks form is a vector and matrix notation for the estimated parameters of the model. The matrices are known as β , Γ , Ψ , α , Φ , and κ . Those Greek names are spelled out in the labels, along with a header stating what each contains.
2. We specified `estat framework fitted`. That caused `estat framework` to list one more matrix and one more vector at the end: Σ and μ . These two results are especially interesting to those wishing to see the ingredients of the residuals reported by `estat residuals`.
3. One of the more useful results reported by `estat framework`, `fitted` is the Σ matrix, which reports all estimated covariances in a readable format and includes the model-implied covariances that do not appear in `sem`'s ordinary output.
4. `estat framework` also allows the `standardized` option if you want standardized output.

Also see

[SEM] [example 10](#) — MIMIC model

[SEM] [estat framework](#) — Display estimation results in modeling framework