

## **Bonus note on the use of FIML:**

The **advantage** of using a “system” approach to fitting our SOE models, using FIML (or 3SLS, which generalizes the 2SLS by accounting for the correlations between equations in the SOE) over a “single equation estimator technique” such as 2SLS (which would also help solve our implicit simultaneity problem in a system of equations model), is that it is more efficient than 2SLS (in general) as it accounts for the presence of other equations in the model as well.

This follows as there is a contemporaneous covariance structure between the error terms of the different structural equations (as discussed in the VAR session) that is accounted for using FIML or 3SLS – which the 2SLS approach ignores.

The downside, is that if one of your equations is misspecified, this error permeates through your entire system, whereas with the less efficient 2SLS approach, this would be contained simply to the misspecified equation itself.

There is a wide literature on the asymptotic nature of these estimations, c.f.:

- Sargan, J. D., 1970. The finite sample distribution of FIML estimators. Econometric Society World Congress, Cambridge.
- Sargan, J. D., 1988. The existence of the moments of estimated reduced form coefficients. Chapter 6 in J. D. Sargan, *Contributions to Econometrics*, (ed., E. Maasoumi), Cambridge University Press, Cambridge, 133-157.