

Estimating Dynamic Models in Corporate Finance

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Many Ways to do Empirical Work

- Describe the data: Smith and Warner (1979).
- Clever identification of causal effects: Bannedsen, Nielsen, Perez-Gonzalez, and Wolfenzon (2007)
- Estimating parameters of economic optimization models: Hennessy and Whited (2005).

It is Good to Have Both Hammers and Screw Drivers in your Toolbox

- Recent methodological debates are too “black and white.”
- Different techniques are useful for answering different questions.
- My goals:
 - **Briefly** explain which techniques are good for which questions.
 - Talk in nontechnical terms about the advantages and disadvantages of structural estimation.

What is Structural Estimation?

- Structural estimation is an attempt
 - to fit economic optimization models directly to data
 - to assess the quality of the fit
 - to identify parameters that govern technology, preferences, and (thus far in corporate finance) largely time-invariant institutional features.
- Structural estimation ascertains whether optimal decisions implied by a model resemble actual decisions by firms.

What Kinds of Questions Can Different Techniques Answer?

- Structural estimation tends to ask different types of questions than either reduced form regressions or quasi-experimental techniques.
- Reduced form techniques examine the sign of the magnitude of an effect of one variable on another.
 - **Not causal:** Which kinds of firms have which kinds of bond covenants, and what do these covenants look like?
 - **Causal:** Does CEO succession within a family help or hurt firm performance?

What Kinds of Questions Can These Different Techniques Answer?

- Structural estimation is better at examining economic mechanisms.
 - How badly do simple models fit the data? What kinds of model features help the model and data get along?
 - What do boards value when they decided to fire CEOs? (Taylor, 2010)
- Parameter estimates can be used to analyze counterfactuals, which are causal statements.

One Important Advantage of Structural Estimation

- It is sometimes useful to go after similar questions in different ways.
- DeAngelo, DeAngelo, and Stulz (2010) and Warusawitharana and Whited (2011).

Non-Issues with Structural Estimation

- The models have never been tested out of sample.
- The models fail the data badly.
- There is a big gap between the model variables and observable variables.
- How do we know that another model would not do a better job of fitting the data?

Genuine Issues with Structural Estimation

- The models need to be better.
- Some of the parameters in the models are not “deep.”
- What is “deep?” Invariant relative to a given policy experiment.
- The counterfactuals one can do are limited. Not a fatal flaw.

Genuine Issues with Structural Estimation

- IDENTIFICATION
- Only one set of model parameters should be able give you the maximized likelihood.
- Forming a likelihood or moment conditions from a model is like picking instruments. You have to understand the economics.

Genuine Issues with Structural Estimation

- The question is more important than the technique.
- The barriers to entry are many, not large, but many.

Conclusion

- Debates about economic questions are more interesting than methodological debates.
- If you want to make a causal statement about the effect of one variable on another, go find an instrument.
- If you collected an interesting data set, describe it in a theory-informed way.
- If you want to see whether models fit the data, estimate one.