Discussion of Hassan and Mertens "Information Aggregation in a DSGE Model"

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Key contribution(s) of the paper

- a method for embedding Grossman-Stiglitz in a large class of DSGE models
- a first pass on quantitative implications within RBC model

My comments

- solution method
- strengths vs limitations
- what do we learn for macro / asset pricing

Solution Method

1. perfectly revealed history $\Rightarrow$ no dynamic learning
2. ex post risk-sharing $\Rightarrow$ no wealth heterogeneity
3. uncertainty only about η $\Rightarrow$ no speculation or HOB

   $\Longrightarrow$ static info-aggregation / signal-extraction problem

4. reverse-engineer noise-trader demand so as to preserve Gaussian structure

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Solution method

- there is a lot of mastery in what HM do...
- ...and in what follows I will not do justice to it

Illustration

- rational traders: $D(\bar{E}, Q; S)$
- noise traders: $T(\tau, ?)$
- market clearing: $D(\bar{E}, Q; S) + T(\tau, ?) = 0$
- key modeling problem: choose T such that

$$Q = \text{monotone transformation of a linear combination of } \bar{E} \text{ and } \tau$$

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Case 1: textbook example

- mean-variance preferences imply

$$D = \frac{\bar{E} - Q}{v}$$

- if $T = \tau$, then market clearing gives

$$Q = \bar{E} + v\tau$$

which is a Gaussian signal of $\bar{E}$ and hence of η

[to simplify, think of $v = 1$ in what follows]

Case 2: general linear demand

- now suppose

$$D = \beta(Q,S)\bar{E} + Z(Q,S)$$

  where Z decreasing in Q

- to preserve Gaussian, now it suffices to set

$$T = \delta(Q,S)\tau$$

- how do we chose δ?
  - HM: set $\delta(Q,S) \sim \beta(Q,S)$
  - but, different $\delta(Q,S) \Rightarrow$ different positive implications

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Case 3: non-linear example

- non-linear case

$$D = \bar{E} + \bar{E}^2 + Z(Q, S)$$

- to preserve Gaussian, we now set

$$T = \delta\tau(1 + \delta\tau + 2\bar{E})$$

- but again: how do we chose δ?
- and: how do we interpret the dependence of T on $\bar{E}$?

Bottom line (so far)

- cleaver trick, but raises questions
- problem endemic to "noise traders"
- HM's preferred resolution (in companion work):
  replace "noise traders" with "near rationality"

Limits of the solution method

- key limitations
  - no dynamic learning
  - no persistent "pricing mistakes"
  - no "speculation" or rich HOB
  - no wealth heterogeneity
- fine for pedagogical reasons, but not if the goal is quantitative asset pricing

What have we learned? What is the ultimate goal?

- quantitative asset pricing?
- quantitative macro?
- interaction of macro and asset pricing?

Asset pricing?

- findings:
  - modest equity premium
  - can't match measured cross-sectional dispersion in beliefs
- how much does the macro/DSGE part add?
- perhaps drop DSGE and focus on learning/persistence/heterogeneity?
- perhaps drop info-aggregation and focus on belief heterogeneity?

Business cycles?

- effectively an RBC model with
  - "noisy news" (=price signal)
  - "government spending shocks" (=resource effect of noise traders)
- we already know how this kind of models works;
  not clear how much we gain from endogenizing the "news"

Feedback from macro to info aggregation

- in my view, strength of approach rests on helping answer the following question:

  how does macro activity and/or macro policy affect the aggregation of information in (and the informational efficiency of) financial markets?

- to answer this question, one *has* to use a framework like the one by Hassan and Mertens

Side comment: what kind of uncertainty (or news) are we after?

- uncertainty about "payoffs" (TFP, dividends)
- uncertainty about "actions" (aggregate demand, future prices)

Conclusion

- smart and elegant approach
- has important limitations, but also potential
- focus: feedback from macro to info aggregation