Discussion of “Identifying Ambiguity Shocks in Business Cycle Models Using Survey Data” by Bhandari, Brovička, and Ho

Eric Sims

University of Notre Dame

June 2017
Very Brief Overview

- This is a very interesting and well-done paper that combines subjective survey expectations data with a structural macroeconomic model to study the effects of ambiguity shocks.

- Ambiguity shock in this model: time-variation in worst-case beliefs on which decisions are made. “Pessimism” = how concerned agents are about model mis-specification.

- Empirically exploit “wedges” between Michigan Survey data and SPF data on inflation, unemployment, and output to identifying time-varying ambiguity concerns.

- Document macroeconomic effects of common variation in these wedges.

- Build a NK model with a search-and-matching frictional labor market with robust preferences with time-variation in concern for worst-case model.
My Discussion

- I like the paper quite a bit
- My comments are going to focus mostly on the survey data wedges, what we learn from them, and how the model relates to the data
- In particular, I will focus on the inflation expectations series
  - Downside: their wedge factor (common factor of the three belief wedges) explains least of the inflation wedge – equivalently, the other two wedges which I’m not focusing on are more important for factor shock
  - Why do it this way? Because it’s easy – Michigan Survey and SPF give the same information. To get unemployment or GDP forecast wedges, need to work harder (and make stronger assumptions)
- Key questions:
  1. What can we learn from the survey data wedges?
  2. How important are ambiguity shocks (as specified and identified in this paper) for business cycles?
Belief Wedges

- The belief wedges are defined as the average forecast in the Michigan survey minus the average forecast in the SPF.
- For inflation expectations, this is easy to construct – one year ahead point estimate of inflation in the Michigan Survey minus one year ahead forecast for the CPI in the SPF.
- Idea is that the SPF forecasts are “rational” and Michigan forecasts are subjective.
- Difference is the degree of pessimism, or concern for worst case model. Basic argument:
  - Positive on average
  - Important time-variation
- Again, don’t have point estimates for unemployment forecasts or GDP growth forecasts in the Michigan survey. Have to make strong assumptions.
Some Facts About the Michigan Inflation Expectations Data

1. There are a good number of “crazy” right-tail answers
   - The number of right-tail answers spikes at beginning of recessions
2. A lot of disagreement
   - Disagreement is clearly countercyclical
3. Median always significantly below mean
4. Distribution of answers clearly not normal
   - Excess kurtosis and skewness in almost all of the sample
Crazy Answers

Percent Saying >= 10 % Inflation


Percent Saying >= 10 % Inflation
Dispersion of Michigan Inflation Forecasts
Inflation Wedge

Mean wedge (mean): 0.83
Mean wedge (median) = 0.00

1990-2017
Mean wedge (mean): 1.10
Mean wedge (median) = 0.38
Higher Moments

Skewness vs. Kurtosis over time from 1985 to 2015.
Observations

- Mean expectations are biased relative to SPF forecasts, but not so for median (crude way to eliminate crazy answers)
  - Of course, this masks a trend – wedge was negative early in sample, positive later in sample
- Wouldn’t be so dismissive of learning: wedge tends to be negative in high inflation period, and positive in low inflation period
  - Suggestive of sluggish adjustment of expectations to macroeconomic regime
- Heterogeneity is important:
  - Disagreement always positive, countercyclical, higher in a high inflation regime
- During recessions, some people clearly afraid of very high inflation
- Interesting behavior of higher moments, with a clear break around 1998. Suggests approximation of normal distribution for unemployment expectations could be problematic
Model

- Model has time-varying concerns for model mis-specification, captured by exogenous variable $\theta_{t}$
- Ends up distorting mean value of shocks. Cool interaction between $\theta_{t}$ and continuation utility value – shocks which impact the continuation utility more strongly end up more distorted
- Conduct a variance decomposition and impulse response analysis to look at how shocks to $\theta_{t}$, identified from belief wedges in data, affect macro variables
- These shocks are contractionary, and particularly so for labor market variables
Shock is contractionary for output and unemployment, but it is inflationary.

In other words, looks like a negative supply shock.
What is generating inflationary effect of shock is expectation of low expected future productivity (both neutral and IST)
How Important are These Shocks for the Business Cycle?

- In the data (1981-2017), inflation (CPI) and unemployment are uncorrelated. Since 1985, correlation is -0.15 (reasonably stable since)
- In other words, looks like “demand shocks” are driving short run movements in output
- But in model, ambiguity shock moves inflation and unemployment in same direction
- Since this is at odds with unconditional co-movement, ambiguity shock can’t be that important
- Post early 1980s recessions are deflationary, but inflationary pessimism at beginning of recessions
Something to Think About

- Is there a way to get the ambiguity shock in the model to be deflationary, while at the same time the inflation wedge goes up?
- I don’t know
- Model doesn’t have strong structural demand shocks (e.g. preference shock or marginal efficiency of investment shock, as opposed to IST)
- What would happen if you augmented the model with more demand shocks?