- Monumental paper (92 pages!!).

- Lots of useful information for practitioners, forecasters, and graduate students.

- Mostly a review article (which makes life difficult for a discussant); some new material (that is were I am going to focus the discussion).

- Very careful work.
Quick review

- Paper takes 3 DSGE models and compares forecasting performance against Blue Chip, Greenbook, AR(2) models in real time.

- Adds expectations (inflation, output growth and interest rate) and nowcasts to the data used for estimation.

- Shows how to do forecasts conditional on interest rate paths in models with unanticipated and anticipated shocks.

- Evaluate forecasting performance on average and in the 2008-2009 recession.

- Plus much more.... (calibration of predictive densities, shock decompositions, etc.)
Punchline

- DSGEs augmented with expectations and nowcasts have reasonably performance on average. Do as well as competitors in 2008-2009 recession.

- DSGE models can be used for things other than forecasting (identify structural shocks, policy analyses, etc.). Thus, the overall the balance is in favor of DSGEs.

Del Negro-Schorfheide (p. 79):

"While a successful decathlete may not be the fastest runner or the best hammer thrower, she is certainty a well rounded athlete"
Discussion focuses on two points:

1) Forecasting performance of DSGE in short and medium run?

- We know that even plain vanilla DSGEs better than time series models at 4-8 quarters horizon (consistency conditions imposed by budget and resource constraints and general equilibrium setup make forecast better behaved).

- Here the conclusion is confirmed when compared with Blue Chips and Greenbook forecasts.
Figure 2: RMSEs for SW Model

DSGE vs Blue Chip (1992-2011)

Output Growth

Inflation

Interest Rates


Output Growth

Inflation

Interest Rates
- When (non-structural) information forecasters employ is added to the estimation, performance improves also short run.

- Good to know. Poor short performance not an intrinsic failure of the class of models. It is due to the use of a subset of the available information.
- Good (at least comparable) performance also in 2008-2009 when external info is used.
Waggoner- Zha (2010) have similar result (Basic DSGE vs. VAR)

- Having the right information set is more important than adding theoretical features (e.g. financial accelerator, housing, etc.) when forecasting.
2) How to incorporate external information into DSGE estimation?

Log-linear decision rules:

\[ x_t = A(\theta)x_{t-1} + B(\theta)e_t \]  \hspace{1cm} (1)
\[ y_t = C(\theta)x_{t-1} + D(\theta)e_t \]  \hspace{1cm} (2)

where \( y_t \) are the controls, \( x_t \) the states (predetermined and exogenous), \( e_t \) the shocks, \( \theta \) the structural parameters.

i) Adding long term expectations (call them \( w_t, u_t \) additional structural shocks).

\[ x_t = A(\theta)x_{t-1} + B(\theta)e_t \]  \hspace{1cm} (3)
\[ y_t = C(\theta)x_{t-1} + D(\theta)e_t + F(\theta)u_t \]  \hspace{1cm} (4)
\[ w_t = G(\theta)u_t + \frac{1}{k} \sum_{k} E_t y_{t+k,j} \]  \hspace{1cm} (5)
ii) Adding nowcasts (call them $z_t$)

\begin{align*}
x_t & = A(\theta)x_{t-1} + B(\theta)e_t \\
y_t & = C(\theta)x_{1t-1} + D(\theta)e_t \\
z_{t+1} & = y_{t+1,j} + u_{t+1,j}
\end{align*}

Noise assumption: $y_{t+1,j}, u_{t+1,j}$ orthogonal.

News assumption: $z_{t+1}, u_{t+1,j}$ orthogonal (Sargent, 1989).

Estimation procedure seems complicated because external variables assumed to provide information about controls (rather than states).
iii) Factor model setup (a-la Boivin and Giannoni, 2005)

\[
\begin{align*}
  x_t &= A(\theta) x_{t-1} + B(\theta) e_t \\
  y_t &= C(\theta) x_{1t-1} + D(\theta) e_t \\
  q_t &= \lambda x_t + u_t
\end{align*}
\]

(9)

(10)

(11)

$q_t$ includes all info available to the forecaster (nowcasts, expectations, confidence indicators, etc.).

Simpler because KF estimates of $x_t$ obtained using the $(y_t, q_t)$ directly.

- Why should nowcasts give info about the observables (controls) and not the states?