Comments on "Credit Risk and the Macroeconomy: Evidence from an Estimated DSGE Model" by Gilchrist, Ortiz, and Zakrajsek

Todd Clark

Federal Reserve Bank of Kansas City

May 27, 2009

Broad Goals of this Paper and Antecedents:

Improve measures of financial frictions for forecasting economic activity

Improve understanding (models) of the role of frictions in the economy

Quantifies the role of the financial accelerator in 1973-2008 U.S. data
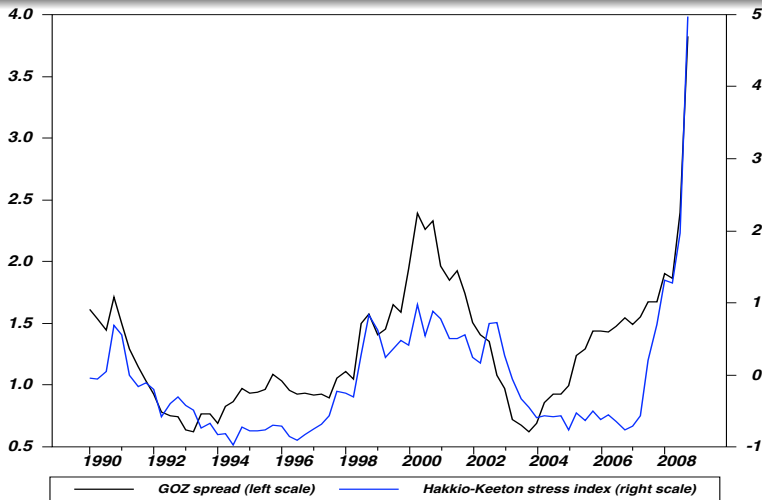
- Extends authors' prior work to provide a (longer) 1973-2008 time series on the GOZ spread.
- Provides evidence of reduced-form predictive content of the GOZ spread for economic activity in the longer sample.
- Incorporates the GOZ spread in an estimated DSGE model, as a measure of the external finance premium (EFP).
  - Model with financial accelerator of Bernanke, Gertler, and Gilchrist (1999).
    - Asymmetric information $\Rightarrow$ premium on external financing
    - Accelerator: feedback between net worth and premium
  - Most studies have treated the EFP as unobserved.
    - De Graeve (2008) and Christensen and Dib (2008)

Comments on Empirical Work: (1) Measurement

The GOZ spread has a high correlation with a broader index of financial stress. So is the GOZ spread a better measure of the EFP, or a broader correlate of financial stress?

GOZ spread (left scale) ——— Hakkio-Keeton stress index (right scale)

Model stability deserves a closer look, but the GOZ spread looks relatively good (stable).

- Most spreads have proven to be unstable predictors: paper-bill spread (Friedman and Kuttner 1999), term spread (Estrella, et al. (2003))
- Break tests considered by the authors generally indicate the models to be stable.
- But these tests often have poor power (Cogley and Sargent 2005).
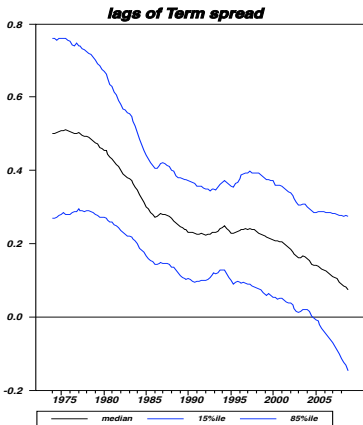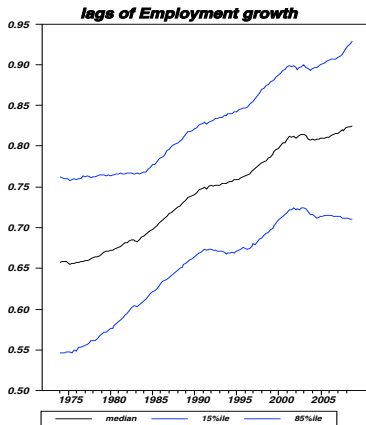- Shouldn't the term spread make the models unstable?

Let's reconsider stability using bivariate VARs allowing time-varying parameters and error variances....

- Models use one-quarter growth rates and four lags.

Relationship of activity to term spread looks unstable.

TVP-VAR: sums of coefficients, equation for Employment growth

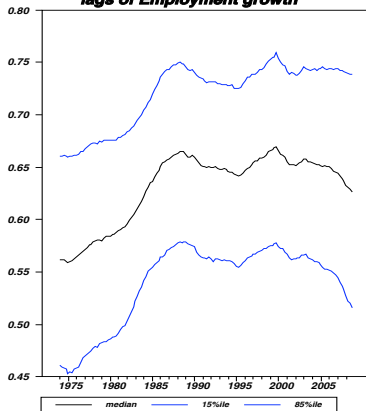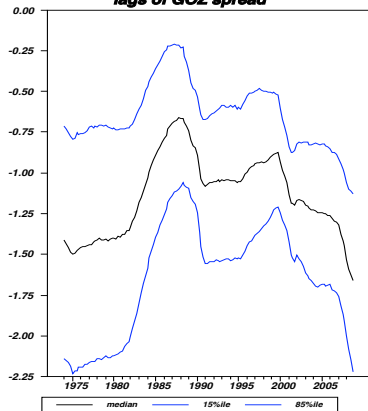Relationship of activity to GOZ spread looks relatively stable.

TVP-VAR: sums of coefficients, equation for Employment growth

Does the GOZ spread help forecast out of sample?

- In-sample predictive content often fails to apply out of sample, due to overfitting or instabilities.
- Prior paper shows GOZ spread to improve out-of-sample forecasts, but over a very short sample.
- OOS results for the longer sample of this paper?
  - Compare to AR model benchmarks, in light of instabilities with term spread.
- Results for real-time forecasts?
  - AR model benchmarks
  - Could the spread have improved forecasts from Greenbook or the Survey of Professional Forecasters?

A preliminary check for a few variables suggests the GOZ spread does help forecast out of sample.

- Forecasts of four-quarter growth rates, 1986:Q3-2008:Q4
- Benchmark AR model (3 lags) versus model adding one lag of GOZ spread
- Statistical significance evaluated with new, improved testing approach of Clark and McCracken (2009).

	MSE: AR / MSE: with spread	*p*-value
employment (private)	0.997	.287
GDP	1.157	.059
business fixed investment	1.176	.055

One outstanding concern: potential impacts of data mining/specification search

- From a range of spreads, the GOZ spread has been selected to maximize predictive content in the available sample.
- Conventional *p*-values fail to capture search/maximization and understate uncertainty.
- There is some risk the GOZ spread could not predict as well in the future.

Does the financial accelerator (FA) significantly affect the dynamics of GDP, or just investment?

- Useful to show results from model with and without FA.
- In Christensen and Dib (2008), the FA affects investment, but not GDP much.
- Is the sensitivity driven by adjustment costs on capital rather than investment (De Graeve 2008)?

Are results stable over subsamples?

- Significant changes over time in shock variances (Primiceri, et al.)
- Significant changes over time in monetary policy

What do we get out of including a measure of the EFP in the model?

- Should the model include measurement error in the EFP?
- How does the GOZ spread compare to the model-inferred series of De Graeve (2008)?
- Does the implied response of monetary policy to a credit supply shock seem plausible?
- Does incorporating data on the EFP in the model estimation yield a better description of macro data?
    - Is the Bayesian measure of model fit — the marginal likelihood — higher when the GOZ spread is included than when it is not?
    - Does the DSGE model forecast better with the GOZ spread included?

This is a very useful line of research.

- Provides a relatively long time series on a credit spread with significant predictive content.
- Provides a better assessment of the role of financial frictions in DSGE models.
- Future: could assess optimal monetary policy responses to shocks to credit supply.

Suggestions for empirical work

- Give more consideration to measurement.
- Give more consideration to possible instabilities.
- Examine out-of-sample forecasting.

Suggestions for DSGE analysis

- Consider some of the issues identified by prior work on the FA in DSGE models.
- Establish the benefits of including the GOZ spread in the model estimation.