Stock Market Cross-Sectional Skewness and Business Cycle Fluctuations

Comments
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Overview

- Explore the extent to which skewness in returns matters for economic activity.
- Focus on skewness in returns on financial institutions.
- Results:
  - Prediction
  - Correlation
  - Identification (DSGE vs BVAR)

Results

- Financial skewness predicts large array of economic activity variables.
- Financial skewness correlated with indicators of bank health – ROA and lending standards to small firms.
- BVAR/DSGE implies financial skewness can account for large fraction of variation in economic activity over the business cycle.

Previous literature

- Lots of financial indicators out there – credit spreads in particularly do well at forecasting (Gilchrist et al)
- Higher moments seem to matter – dispersion in returns or other measures of uncertainty (Bloom et al.)
- Dispersion in returns only matters if it causes credit spreads to widen – suggests a financial mechanism (Caldara et al.)
- Risk shocks (variation in return dispersion) drive the business cycle in a DSGE model (Christiano et al.)

Measuring skewness

- This paper:

$$Skewness = (r_{95} - r_{50}) - (r_5 - r_{50})$$

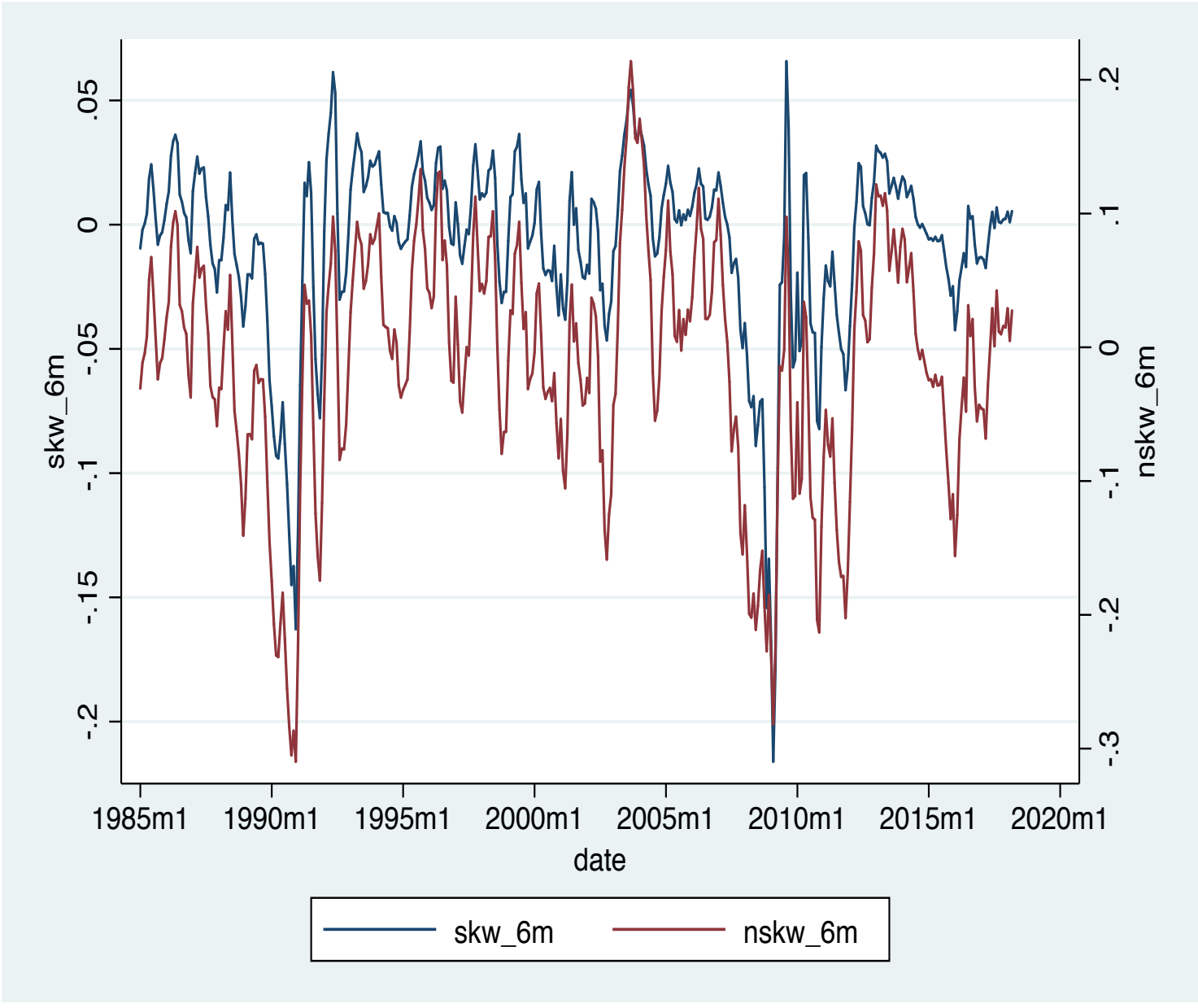
  Using percentiles is robust to outliers.

- But skewness is defined by normalizing so measure has natural units between -1 and 1:

$$Skewness = \frac{(r_{95} - r_{50}) - (r_5 - r_{50})}{r_{95} - r_5}$$

  Does this matter?

Skewness: Normalized vs Non-Normalized



Forecasting Comparison

- Compare Financial Skewness to Excess Bond Premium.
  - EBP measures willingness of financial sector to bear risk in corporate bond market.
  - Skewness measures downside risk of financial sector.
- Regression (1973-2018)

$$\Delta^{12} log(Y_{t+12}) = \alpha \Delta^{12} log(Y_t) + \beta SKW_t + \gamma EBP_t + \varepsilon_t$$

Industrial Production

skws		1.348			0.929	
		(0.280)			(0.260)	
nskws			1.343			0.935
			(0.301)			(0.282)
ebps				-1.831	-1.463	-1.475
				(0.513)	(0.506)	(0.504)
R-sq	-0.000	0.089	0.088	0.120	0.157	0.158

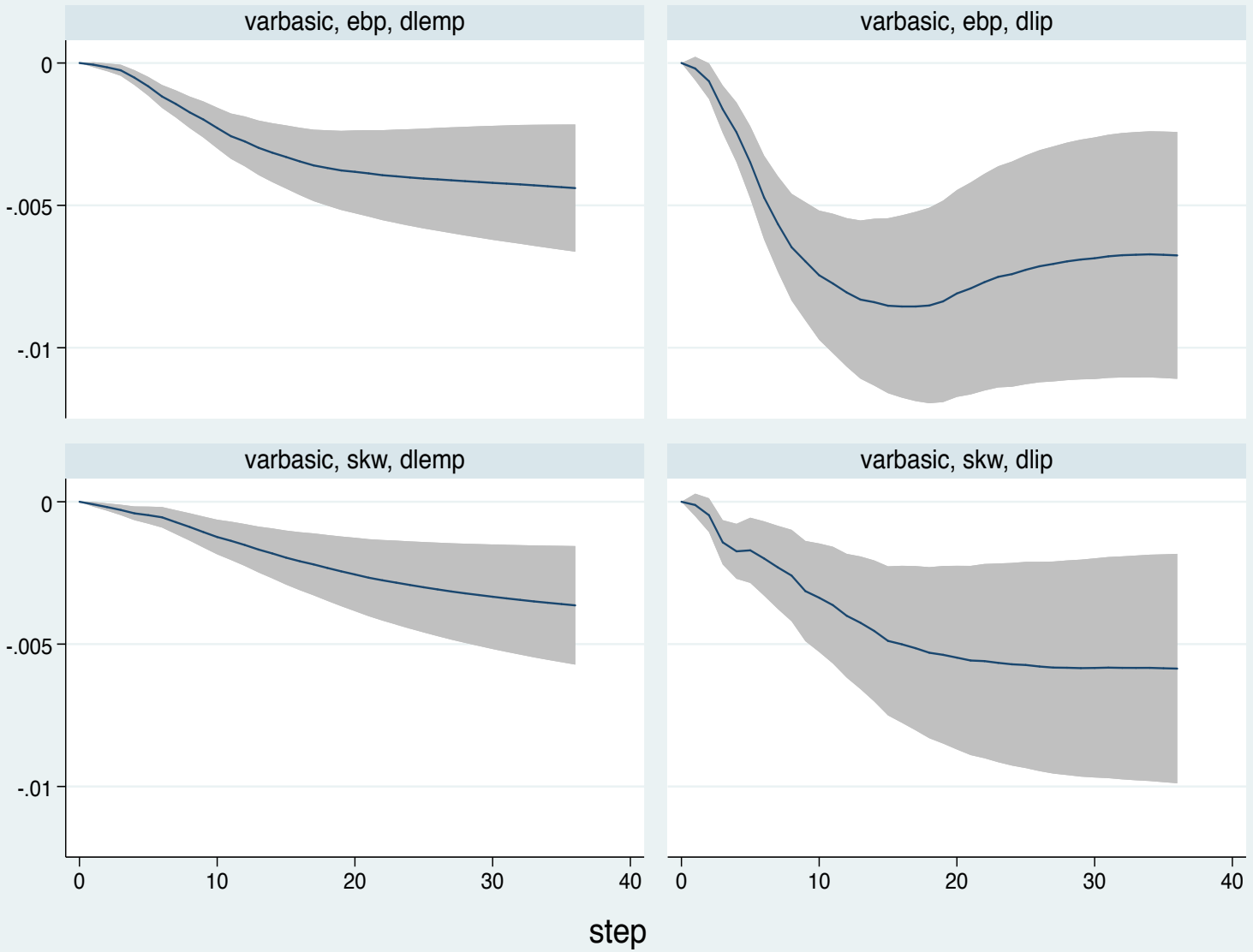
Employment

skws		0.561			0.375	
		(0.103)			(0.093)	
nskws			0.519			0.344
			(0.112)			(0.102)
ebps				-0.807	-0.682	-0.702
				(0.181)	(0.176)	(0.177)
R-sq	0.181	0.272	0.258	0.336	0.372	0.367

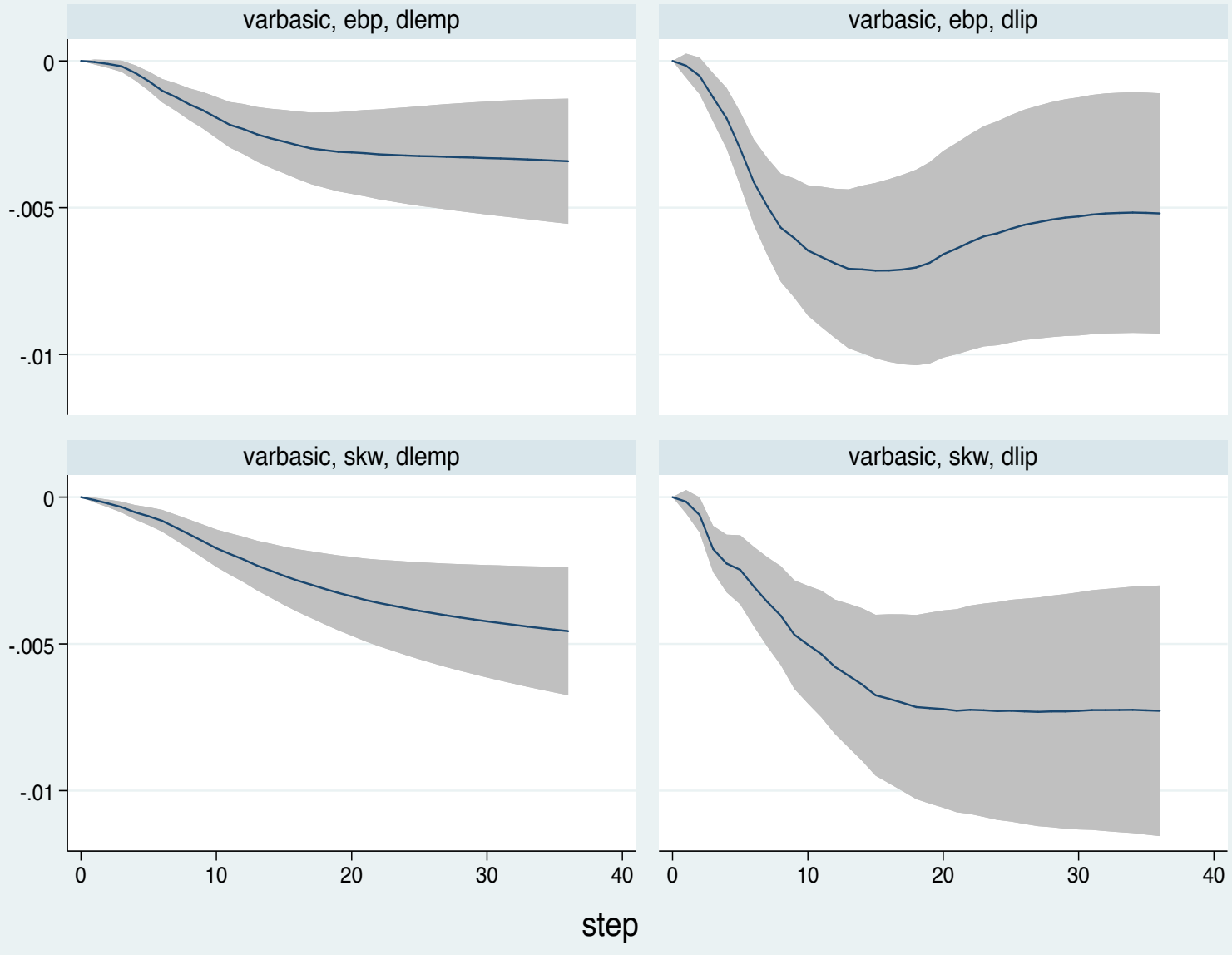
Unemployment

skws		-0.304			-0.152	
		(0.067)			(0.056)	
nskws			-0.284			-0.143
			(0.073)			(0.061)
ebps				0.542	0.494	0.501
				(0.101)	(0.100)	(0.100)
R-sq	0.117	0.191	0.182	0.353	0.369	0.367

Impulse Response (Ordering: EBP,SKW)



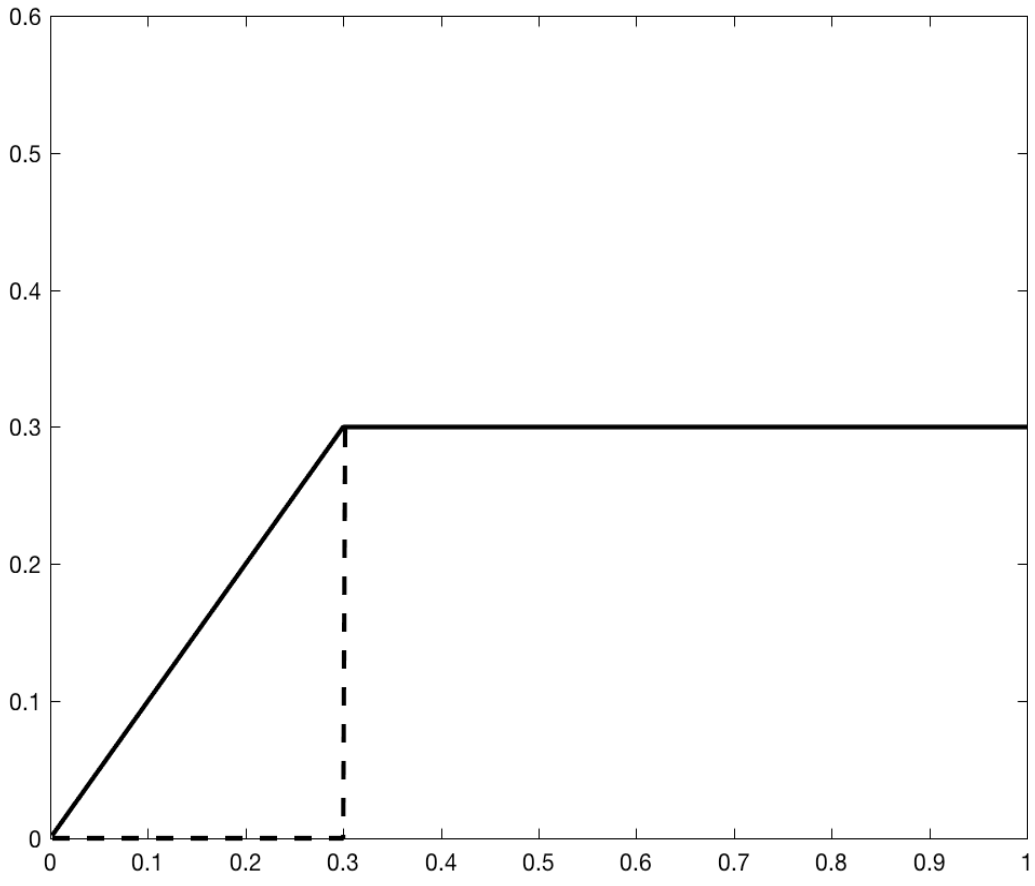
Impulse Response: (Ordering SKW,EBP)



DSGE Model

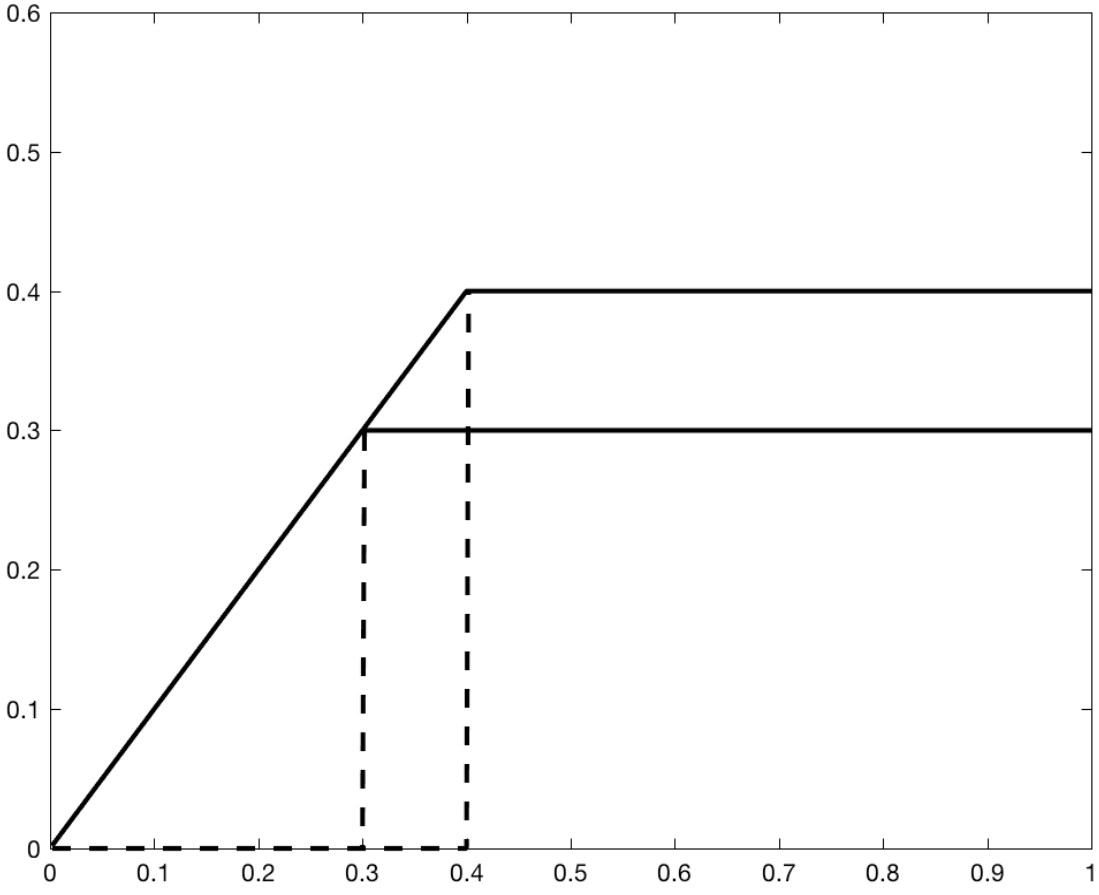
- Model is Christiano et al. augmented to allow for shock to skewness in idiosyncratic project returns.
- Intuition for higher moments:
  - Payoff function to standard debt contract is concave.
  - Increase in dispersion reduces expected payment to lender holding default point fixed.
  - Required payment in non-default states must rise – this increases default region and deadweight loss in contract.
- Is there more to the story with skewness?

Standard Debt Contract



- Standard debt contract is a concave payoff to lender.
- Increase in uncertainty reduces expected payout for a given non-default payment.

Standard Debt Contract



- Increasing payment in non-default raises default threshhold and debt-weight loss of default.
- Cost of capital increases and investment falls.

Log-linearized model:

- In log-linear form BGG specifies a wedge between return on capital and household savings:

$$s_t = r_t^K - r_t = \chi(q_t + k_t - n_t) + \varepsilon_t$$

- Exogenous variation in higher moments imply shocks ε_t
  - To a first-order a skewness shock is the same as a dispersion shock.
  - So results are driven by shock processes rather than model structure – skewness does better than dispersion since it covaries more strongly with real variables.
- Question – how does estimate χ vary across model specifications?

Interpretation of skewness

- Provides a signal regarding return distribution of borrowers.
  - But why is return distribution of lenders more relevant – almost all of investment is done by publicly traded firms.
- Alternative interpretation: skewness in financial sector indicates a larger fraction of banks coming close to capital constraints.
- This makes banks risk averse and less likely to lend.
- This story justifies focusing on financial returns rather than non-financial returns!

Summary

- Rich paper with interesting new measure of financial conditions (available over a long time series)
- Paper convincingly argues financial skewness has predictive power.
- More work to be done mapping financial skewness into a DSGE model with a financial sector!