Discussion of: “Financial Factors in Economic Fluctuations” by Christiano, Motto, and Rostagno

Guido Lorenzoni

Bank of Canada-Minneapolis FED Conference, October 2008

This paper

Rich DSGE model with:

- financial frictions a la Bernanke-Gilchrist-Gertler
- explicit model of the banking sector a la Chari-Christiano-Eichenbaum
- nominal rigidities
- nominal debt contracts and a Fisher effect
- rich structure of shocks

This paper (continued)

State of the art Bayesian estimation

Very rich set of findings, here I will focus on one in particular:

Important role for “risk shock”: a shock that increases the variance in the distribution of idiosyncratic shocks to entrepreneurial firms.

Risk Shocks

- This paper: “We identify a new shock - a shock to ‘risk’ - which emanates from the financial sector and which represents a significant source of economic fluctuations.”
- Chari-Kehoe-McGrattan: “These findings together imply that existing models of financial frictions in which the distortions primarily manifest themselves as investment wedges can account, at best, for only a small fraction of the fluctuations in the Great Depression or more typical U.S. downturns.”
- ...

Stripped down model

Consumers ∞-lived, risk neutral:

$$E\sum \beta^t \left(c_t - \frac{1}{1+\eta} l_t^{1+\eta} \right)$$

Technology

$$y_t = k_{t+1}^{\alpha} l_{t+1}^{1-\alpha}$$

Optimality for investment:

$$1 = \alpha\beta k^{*\alpha-1} l^{*1-\alpha},$$

Wedge

Take any allocation $\{k_t, l_t, c_t\}$

Compare it to the frictionless benchmark computing the *investment wedge* τ_t:

$$1 + \tau_t = \alpha\beta E_t \left[k_{t+1}^{\alpha-1} l_{t+1}^{1-\alpha} \right]$$

Financial frictions

Consumers cannot invest in capital

Entrepreneurs live 2 periods:

- young: born with wealth e_t random and 'small'
- cannot borrow, invest all wealth

$$k_{t+1} = e_t$$

- old: produce with tech

$$k_{t+1}^{\alpha} l_{t+1}^{1-\alpha}$$

and consume

Financial frictions (continued)

The equilibrium wedge is:

$$1+\tau_t = \beta\,\alpha\,(1-\alpha)^{\frac{1}{\alpha+\eta}}\; e_t^{\alpha-1+\frac{\alpha}{\alpha+\eta}}$$

where

$$\alpha - 1 + \frac{1+\alpha}{\alpha+\eta} < 0$$

and falls with e_t

Financial frictions + nominal rigidities

Real wages fixed at w

$$(1-\alpha)\, e_t^{\alpha} l_t^{-\alpha} = w$$

Now the ratio e_t/l_t is constant: investment wedge is constant

$$1+\tau_t = \beta\alpha(1-\alpha)^{(1-\alpha)}\, w^{-(1-\alpha)/\alpha}$$

even though all cycles are generated by e_t shocks!

Feedback from low investment to low real activity may hide the wedge

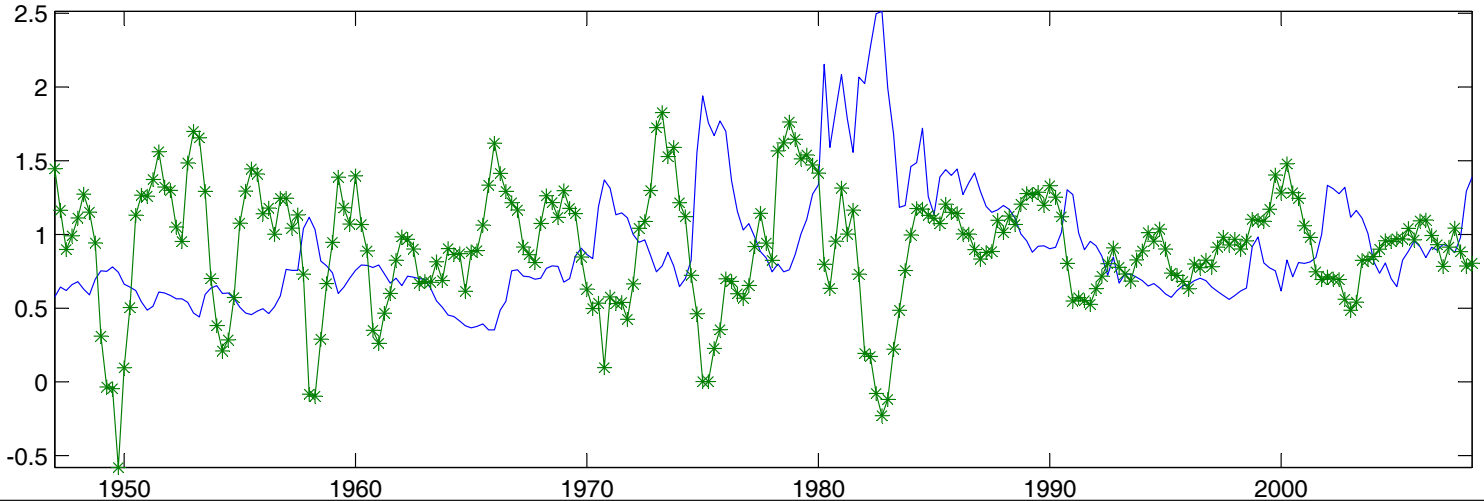
Symptoms of financial factors at work

What in the data can tell us that it is indeed e_t shocks?

E.g. model above observationally equivalent to model with no financial frictions and labor wedge shocks.

Important empirical finding: Baa-Aaa spread lead business cycles.

Baa-Aaa spreads and GDP (US)



Notes: Premium is measured by the difference between the yield on the lowest rated corporate bonds (Baa) and the highest rated corporate bonds (Aaa). Bond rate data obtained from St. Louis Fed website. GDP data obtained from Balke and Gordon (1986). Filtered output data are scaled so that their standard deviation coincide with that of the premium data.

Financial factors or financial frictions?

- model with BGG beats model with no financial frictions in RMSE
- but model with no financial frictions has no spread
- no chance of exploiting forecasting power of spread

A frictionless model of bankruptcy

- three periods: $1, 2, 3$
- in period 1 invest k in a set of identical 'firms' on [0,1] (k for each firm)
- in period 2 they require extra investment k per project
- projects pay $(a+\omega)k$ in period 3
- at 1 uncertainty about both aggregate shock a and individual shocks ω, both realized in period 2

A frictionless model of bankruptcy (continued)

Preferences

$$c_0 + u(c_1 + c_2)$$

- projects with $a + \omega < 1$ discontinued
- projects with $a + \omega \geq 1$ continue

discontinued="bankruptcy"

Another risk shock

Optimality

$$1 = E\left[\int_{a+\omega\geq 1}(a+\omega-1)\,dF(\omega)\,u'\left(e+\int_{a+\omega\geq 1}(a+\omega-1)\,dF(\omega)\,k\right)\right]$$

Suppose variance of a increases and agents sufficiently risk averse

- $P[a+\omega<1]$ increases
- k falls

higher probability of default because of common risk factor

Investment and bond prices

This paper: channel between bond spreads and investment potentially very important for quantitative DSGE

Recent empirical work on bond prices and investment: Gilchrist and Zakrajsek (2007), Philippon (2008)

Challenges for DSGE: incorporate uncertainty and risk aversion (beyond linearization)