Discussion of ‘Financial Frictions in Business Cycles’ by Christiano, Motto, and Rostagno

Bojan Markovic

Bank of England

Credit friction is just a wedge

But…
… a very specific wedge due to…

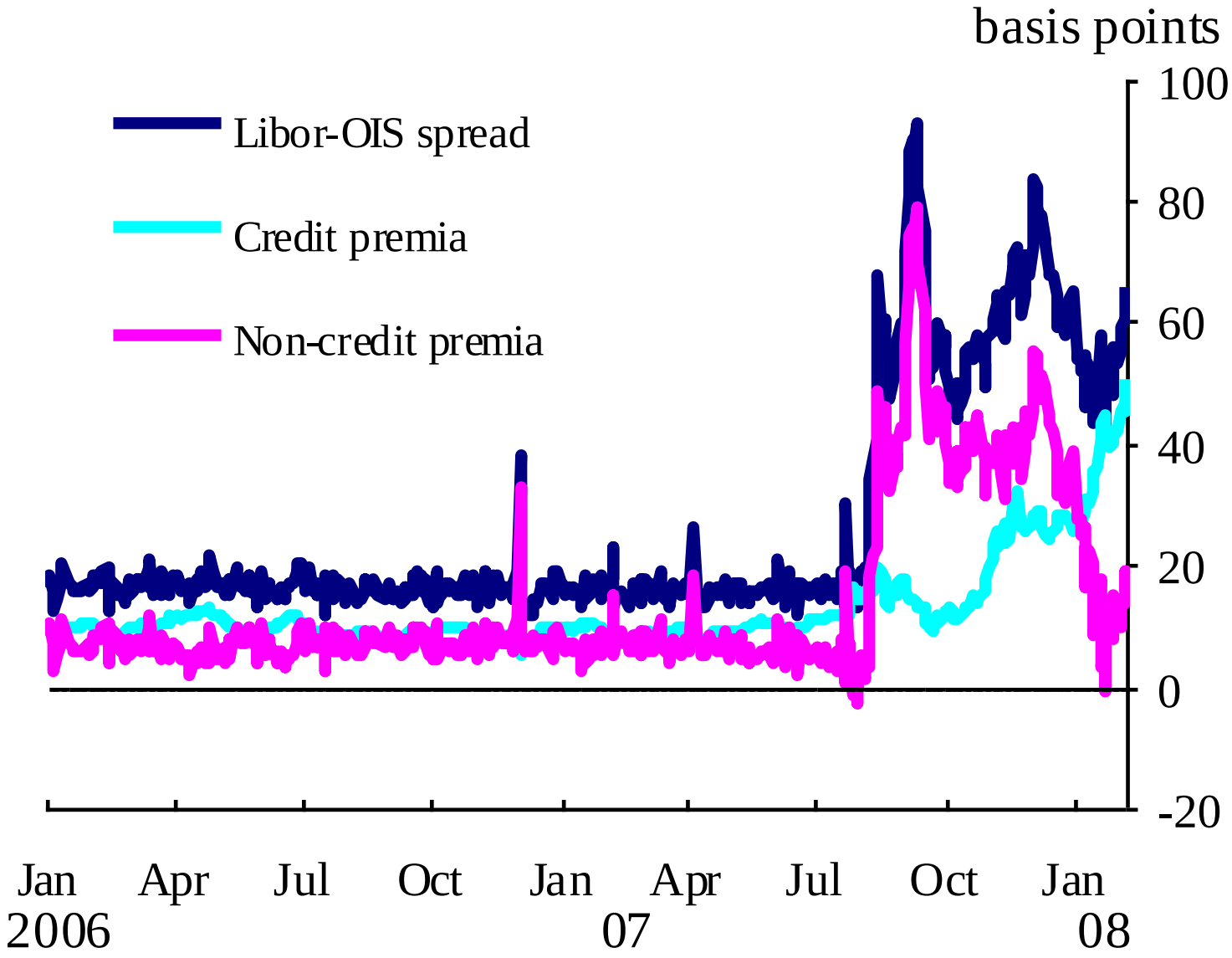
• a leveraged interaction with the rest of economy: information asymmetry (financial accelerator) or limited enforceability

- *corporate borrowing (BGG, CMR, GIMF)*
- *household borrowing (Iacoviello & Neri, Aoki et al.)*
- *bank borrowing - raising both capital & deposit (CMR)*

• a life-of-its-own: high non-linearity

- *shocks on the supply side of the credit market, i.e. in the bank balance sheets (bank capital channel, capital requirement, NPLs)*
- *interbank market accelerating effects*
- *explosive effects (contagion, firesales)*

Interbank rate spreads in the UK...



CMR model

- DSGE model with many standard nominal and real rigidities
- incorporates a large number of shocks in the spirit of Smets and Wouters
- includes the financial sector

The value of this paper goes much beyond the financial sector consideration solely. For example:

- estimating a large model
- estimates of price and wage rigidities
- very interesting and useful historical decomposition of shocks

Here I'll concentrate on the financial sector in the model…

CMR model

The main findings from the financial sector:

- BGG frictions (corporate balance sheets effect) account for a significant portion of business cycle fluctuations
- The banking sector (bank balance sheets effect) plays a less substantial role, unless we have monetary policy shocks
- Paper provides some insight into inflation-output trade-off when policy reacts to stock market or a broad money measure, finding that reacting to the latter can stabilise output at the expense of higher inflation volatility, but does not provide a final recommendation of which monetary policy would be optimal.

Ideal model

- dynamic
- general equilibrium
- role for nominal and real variables
- have a role for shocks on the supply side of the credit market
- feature an interaction between the supply and the demand side effects
- have optimising agents
- have heterogeneous agents
- have asymmetric / non-linear effects

CMR model

The model includes the interaction of the financial sector with the rest of economy through:

1.BGG interaction between banks and the corporate sector

2.Banks interaction with households (supply side of credit)

But no interaction between the two frictions…

Banks have the ability to convert their labour and capital into deposit services. Deposits can be time or saving deposits – depending on the preference function. A technology shock to the banking sector will change the ability of banks to offer deposit services.

But, corporate loans are orthogonal to this shock. Banks always break even on these, and there is no spillover from corporate balance sheets to banks balance sheets. So the interaction between two effects not modelled.

CMR model

One of the main results is that the corporate effect is important in explaining the business cycle, but not the banking effect.

Identification of the corporate and the banking effect.

The gamma friction (asset valuation shock)

$$R_{t+1}^{K} = \Psi\left(\frac{N_{t+1}}{Q_t K_{t+1}}\right) R_t + \gamma_t$$

Gamma here considered the corporate effect but can easily be the banking effect.

Bank capital in banks' balance sheets...

Assets	*Liabilities*
Loans	Deposits
	Bank capital

$$\underset{\bar{\omega},K}{MAX}\ E_t\left\{\int_{\bar{\omega}^j}^{\infty}\omega R_{t+1}^K Q_t K_{t+1}^j dF(\omega) - \left[1-F(\bar{\omega}^j)\right]\left(R_{t+1}^L\right)^j L_{t+1}^j\right\}$$

Subject to bank's participation constraint

$$\underbrace{\left[1-F(\bar{\omega}^j)\right]\left(R_{t+1}^L\right)^j L_{t+1}^j}_{\text{income from loans in good state}} + \underbrace{(1-\mu_{ac})\int_0^{\bar{\omega}^j}\omega R_{t+1}^K Q_t K_{t+1}^j dF(\omega)}_{\text{income from loans in bad state}} =$$

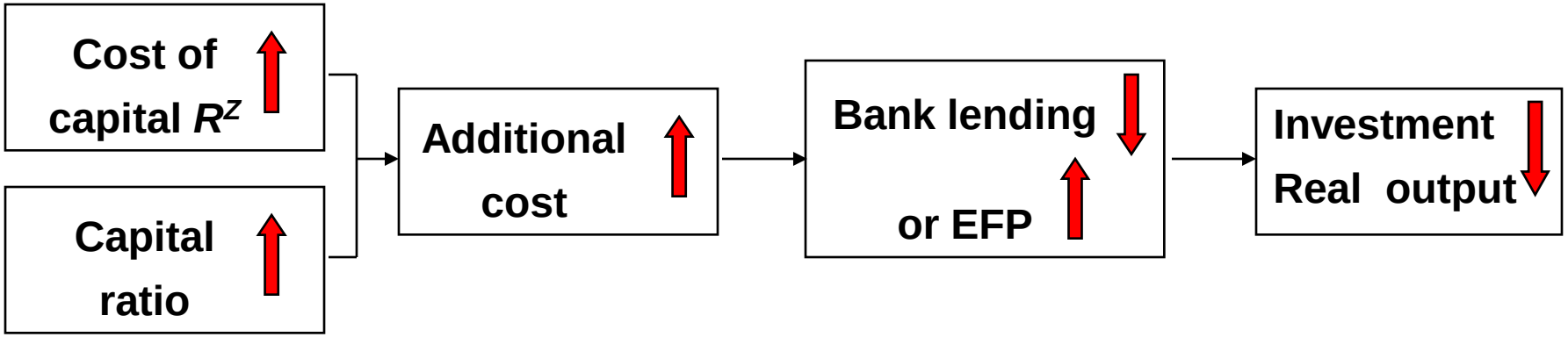
$$= \underbrace{R_{t+1}D_{t+1}^j + R_{t+1}^Z P_{t+1}^Z Z_{t+1}^j}_{\text{cost of liabilities}}$$

Bank capital in banks' balance sheets...

Solution for the financial contract in GIMF

$$R^K_{t+1} = \Psi\left(\frac{N_{t+1}}{Q_t K_{t+1}}\right) R_t \xi_t$$

$$\xi_t = 1 + \frac{R^Z_t - R_t}{R_t} \frac{P^Z_t Z_t}{L_t}$$



Non-performing loans in banks' balance sheets...

Assets	*Liabilities*
Loans	Deposits
NPB	

$$\underset{\overline{\omega},K}{MAX}\; E_t\left\{\int_{\overline{\omega}^j}^{\infty} \omega R_{t+1}^K Q_t K_{t+1}^j dF(\omega) - \left[1 - F(\overline{\omega}^j)\right]\left(R_{t+1}^L\right)^j L_{t+1}^j\right\}$$

Subject to bank's participation constraint

$$\underbrace{\left[1 - F(\overline{\omega}^j)\right]\left(R_{t+1}^L\right)^j L_{t+1}^j}_{\text{income from loans in good state}} + \underbrace{(1-\mu_{ac})\int_0^{\overline{\omega}^j} \omega R_{t+1}^K Q_t K_{t+1}^j dF(\omega)}_{\text{income from loans in bad state}} + \underbrace{NPB}_{\text{income from NPB}}$$

$$= \underbrace{R_{t+1} D_{t+1}^j}_{\text{cost of liabilities}}$$

Non-performing loans in banks' balance sheets...

Solution for the financial contract in GIMF

$$R^K_{t+1} = \Psi\left(\frac{N_{t+1}}{Q_t K_{t+1}}\right) R_t \xi_t$$

$$\xi = 1 + \frac{R-1}{R}\frac{NPB}{B}$$

Long run

Explosive character of the wedge...

Very good model, but perhaps not best suited to capture the issues from the current crises (at least in the UK), such as the liquidity risk or the bank credit premia.

- **Liquidity effects**

  Northern Rock out => quantity constraint on the interbank market

- **Contagion effect: firesales**

  Bear Stearns out => Lehman down 19%, UBS 10%...

To capture this, we probably need…

Ideal model

- dynamic
- general equilibrium
- role for nominal and real variables
- have a role for shocks on the supply side of the credit market
- feature an interaction between the supply and the demand side effects
- have optimising agents
- have heterogeneous agents
- have asymmetric / non-linear effects