Financial crises and liquidity shocks a bank-run perspective

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Motivation

- financial frictions not as a central cause of the macroeconomic meltdown.

- fractional-reserve banking may give rise to multiple equilibria.

- shadow banks do not have an automatic Lender of Last Resort (LOLR)

- collapse of Lehman Brothers spread like wildfire

Main Question

Most of the paper will focus on the case in which moneyness of land is exogenous and explore the impact of (1) changes in moneyness of land and (2) monetary policy in that context. Furthermore, the last part of the paper will discuss the issue of endogenizing moneyness of land in the special case in which economic agents do not anticipate a financial meltdown.

Results

1. The development of new liquid financial instruments linked to the real estate sector may raise relative real estate prices.

- Explain the recent housing boom in advanced economies

- Explain a collapse in housing prices

4. Preventing deflation may be useful and it may not be a solution to the liquidity/credit problem if real assets become illiquid

5. liquidity enhancement can lead to higher output

The basic model

- Consider a standard infinitely-lived, representative-individual model with time-separable utility

- The instant utility function depends on consumption c and liquidity

- liquidity is produced by m and pk

- liquidity (in terms of consumption)= $m + \theta pk, \quad 0 \leq \theta < 1$

The basic model

At time 0, the utility function of the representative individual takes the following form:

$$\int_0^\infty [u(c_t) + v(m + \theta p_t k_t)]e^{-\delta t} dt$$

utility indexes u and v are twice-differentiable, strictly concave and increasing over the positive interval, and $\delta > 0$ stands for the constant subjective rate of discount.

The basic model

At time t the individual's financial wealth in terms of consumption, a, satisfies:

$$a_t = m_t + p_t k_t + b_t$$

Production function is linear and satisfies $y = \rho k$

The evolution of financial wealth a satisfies:

$$\dot{a}_t = (\rho + \dot{p}_t)k_t + r_t b_t - c_t - \pi_t m_t + \sigma_t$$

The basic model

intertemporal budget constraint:

$$\int_0^\infty c_t e^{-\int_0^t r_s ds} dt = a_0 + \int_0^\infty [(\rho + \dot{p}_t - r_t p_t)k_t + \sigma_t - (\pi_t + r_t)m_t]e^{-\int_0^t r_s ds} dt$$

The basic model

first-order conditions:

[c]:

$$u'(c_t) = \lambda D_t$$

[m]:

$$v'(m_t + \theta p_t k_t) = \lambda(\pi_t + r_t)D_t$$

[k]:

$$v'(m_t + \theta p_t k_t)\theta p_t = -\lambda(\rho + \dot{p}_t - r_t p_t)D_t$$

$$D_t = e^{-\int_0^t (\delta - r_s)ds}$$

The basic model

Steady state:

- the supply of land is constant overtime

- $r = \delta = \rho$

- nominal money supply is constant over time

- $\pi = 0$

- $\dot{p} = 0$

$$p = \frac{1}{1-\theta} \qquad 0 \le \theta < 1$$

The basic model

Consequently, this model can explain higher land's relative price as a result of financial engineering that makes land or derivatives associated with land (e.g., CDOs) more liquid.

Preventing price deflation may not save the economy from financial turmoil associated with the collapse of some key relative price.

Extensions of the basic model

Interest rate policy

first-order conditions:

[c]:

$$u'(c_t) = \lambda D_t$$

[m]:

$$v'(m_t + \theta p_t k_t) = \lambda(\pi_t + r_t - i_m)D_t$$

[k]:

$$v'(m_t + \theta p_t k_t)\theta p_t = -\lambda(\rho + \dot{p}_t - r_t p_t)D_t$$

Interest rate policy

Steady state:

$$\theta(\rho + \pi - i_m) = \rho(1 - \frac{1}{p})$$

helicopter-type monetary expansion:

$$\theta(\rho + \mu) = \rho(1 - \frac{1}{p})$$

Capital accumulation

Suppose that variable k stands for physical capital

$$y = f(k)$$

where f is a standard strictly concave neoclassical production function

Steady state:

$$f'(k) = \delta(1 - \theta)$$

increase in the liquidity of capital, θ, will induce capital accumulation and higher steady-state welfare.

Endogenizing θ

$\phi(0) = \phi'(0) = 0$

$\phi''(\theta) > 0$

$\phi'(\theta) = v'(m + \theta k) = \delta - i_m$

- low interest rates after 2001 induced the development of new financial instruments, like CDOs.

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