Financial Intermediation and Credit Policy in Business Cycle Analysis

Gertler and Kiyotaki

Discussion by

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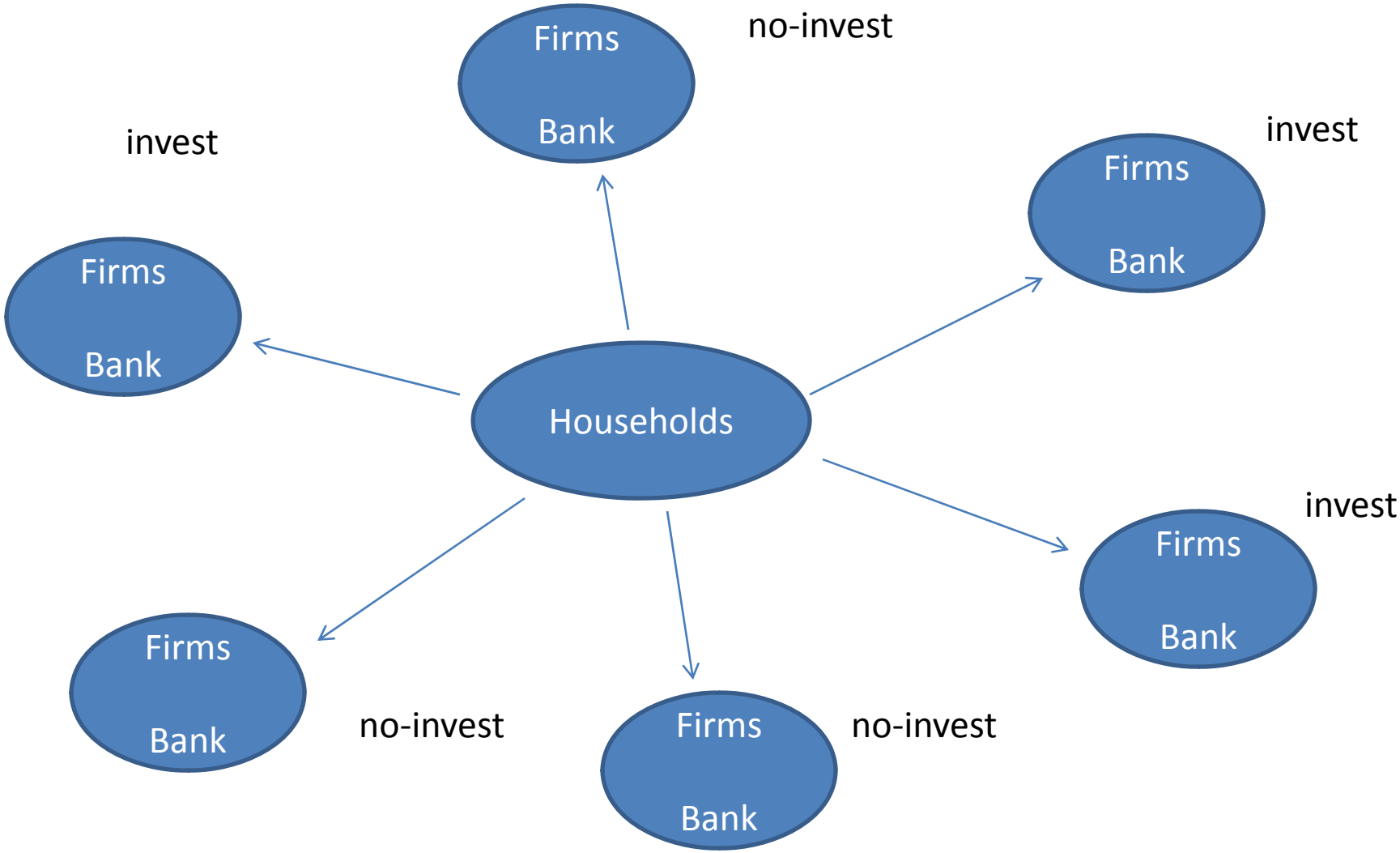
Very Ambitious Paper

- Create an environment that mimics the circumstances in the recent crisis.
  - High interest rate spreads. Seem so large, they 'ought' to be arbitraged away.
  - Apparent fall in lending generally, and interbank loans specifically.

- Provide a framework for analyzing the various kinds of financial market interventions implemented by the Fed during the recent crisis.
  - Direct lending to private firms.
  - Lending to banks.
  - Injections of equity into banks.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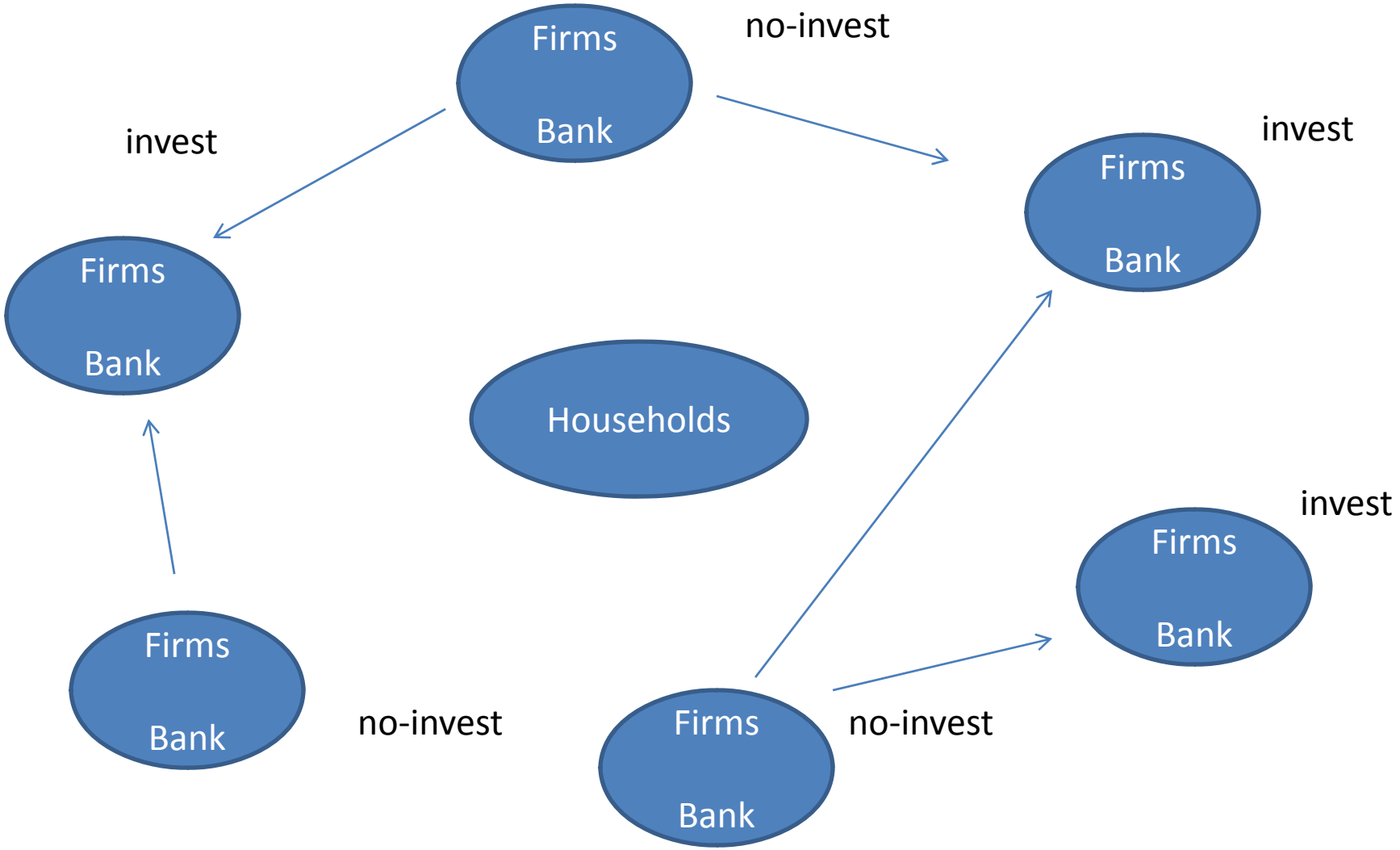
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Fits nicely with picture from flow of funds

Flow of Funds Matrix, 2007, non-financial business, trillions of $		
	Use of Funds	Source of Funds
Gross saving (i.e., undistributed profits)		1.3
Capital expenditures	1.4	
Sales of financial assets		1.4
Purchases of financial assets	1.4	

- Understanding G-K framework and tinkering with it will be on the agenda for years.

- Virtue of the model is that, like the real world, it has lots of moving parts.
  - Many periods
  - Some firms constrained, some not.

- A first approach to understanding the paper may be to break the parts into little pieces.

Two-period Version of GK Model

- Many identical households, each with a unit measure of members:
  - Some members are ‘bankers’
  - Some members are ‘workers’
  - Perfect insurance inside households…workers and bankers consume same amount!
- Period 0
  - Workers endowed with *y* goods, household makes deposits in a bank
  - Bankers endowed with *N* goods, take deposits and purchase securities from a firm.
  - Firm issues securities to finance capital used in production in period 1.
- Period 1
  - Household consumes earnings from deposits plus profits from banker.
  - Goods consumed are produced by the firm.

Problem of the Household		
	period 0	period 1
budget constraint	$c + d \leq y$	$C \leq R^d d + \pi$
problem	$\max_{d,c^h,c^H}[u(c) + \beta u(C)]$	

Solution to Household Problem	
$\frac{u'(c)}{\beta u'(C)} = R^d$	$c + \frac{C}{R^d} \leq y + \frac{\pi}{R^d}$
$u(c) = \frac{c^{1-\gamma}}{1-\gamma}$	$c = \frac{y+\frac{\pi}{R^d}}{1+\frac{\left(\beta R^d\right)^{\frac{1}{\gamma}}}{R^d}}$

Efficient Benchmark

Problem of the Bank	
period 0	period 1
take deposits, d	pay dR^d to households
buy securities, $s = N + d$	receive sR^k from firms
problem: $\max_d [sR^k - R^d d]$	

Properties of Efficient Benchmark

Equilibrium: R^d, c, C, d, π

(i) household problem solved

(ii) bank problem solved

(iii) market clearing

- Properties:
  - Household faces true social rate of return on saving:

$$R^k = R^d$$

  - Equilibrium is 'first best', i.e., solves

$$\max_{c,C,k,} u(c) + \beta u(C)$$

$$c + k \leq y + N,\ C \leq kR^k$$

Friction

- bank combines deposits, *d*, with net worth, *N*, to purchase *N+d* securities from firms.

- bank has two options:
  - ('no-default') wait until next period when $(N+d)R^k$ arrives and pay off depositors, $R^d d$, for profit:

$$(N+d)R^k - R^d d$$

  - ('default') take $\theta(N+d)$ securities, leave banking forever, refuse to pay depositors and wait until next period when securities pay off:

$$\theta(N+d)R^k$$

Incentive Constraint

- Bank will choose 'no default' iff

$$\overbrace{(N+d)R^k - R^d d}^{\text{no default}} \quad \geq \quad \overbrace{\theta(N+d)R^k}^{\text{default}}$$

- With time, condition is:

$$\sum_{j=0}^{\infty} \lambda_{t,j}\left[(N_{t+j}+d_{t+j})R^k_{t+j} - R^d_{t+j}d_{t+j}\right] \;\geq\; \theta(N_t+d_t)R^k_t$$

- Bank will never contemplate a *d* that violates incentive constraint because it understands households would make zero deposits.

- For some parameters, banks constrained, others not.
  - When constrained, there is premium, $R^k > R^d$, that market will not arbitrage away.

Properties of Equilibrium with Financial Friction

- Equilibrium deposits, *d*, higher with *N*.
  - Low net worth of bankers reduces intermediation below first-best.
  - Redistribution from workers to bankers increases welfare.
- Can study:
  - direct govt lending financed by taxes
  - govt taking equity stake in banks.
  - lending to banks.

Questions

- How to interpret the financial friction?
  - Literal? Can people really just not pay liabilities?
  - Is it a metaphor for something?

- One might be tempted to think of it as a stand-in for a model with hidden information, but,
  - there is no hidden information in the model.
  - there are alternative models with hidden information (Holmstrom-Tirole)

Other Comments

- How important is the pecuniary externality channel in the analysis?

- Direct Fed lending creates a pecuniary externality:
  - Fed is like a rich person who comes to town, raises the price of real estate by buying (or, helping others buy), and improves everyone's balance sheets.
  - How important is this channel in the model? But, is this the best way to get price of capital up?
  - What about investment tax credit or some alternative?

- What about the shock that created the crisis?
  - Hard to interpret the one used in the model.
  - Isn't a spontaneous Kiyotaki-Moore/Moore crisis possible in this model? Wouldn't that be the perfect shock?

Conclusion

- My comments are in the nature of my suggestions for ‘tinkering’ with the framework.
  - The two period model may be useful for thinking about aspects of the model in isolation.

- This paper sets an important agenda for research on interface between central banking and the economy.