Discussion of
'Self-Fulfilling Credit Market Freezes'
by Lucian Bebchuk and Itay Goldstein

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International Monetary Fund, November 2009

Honestly, a great paper.

Rare combination of technical expertise, policy insight, and attention to current debate.

Model does exactly what a model should do:

- simplified not simplistic tool to think about issues in terms of first principles;

- intellectual stenography;

- synthetic representation of complex debate;

- lots of intuition provided, a pleasure to read.

Having said that, like all (successful) models, key results may need some filtering and caveats before application to policy analysis.

In fact, some of the conclusions are probably incomplete, if not misleading, when taken literally.

In what follows, a (personal) extra-simplified reading of the paper with sporadic comments and observations.

Frankly, no hope a 10-minutes discussion can go much below the surface.

Paper and literature

Key element: self-validating interplay between fundamentals and expectations/conjecture

If agents believe event X will occur, they behave in such a way that X ends up happening for real.

If they rather believe that Y is bound to occur, they behave in a different way, ultimately prompting Y to occur and validating initial conjecture.

In the paper, X is a sudden stop of credit from financial institutions to business firms. Y is a regime in which lending is profitable.

Circularity between expectations and fundamentals typically opens up possibility of multiple equilibria.

This would be a perfectly legitimate way to model the events of recent months, especially the aftermath of the Lehman shock: a self-validating shift in expectations (from good to bad equilibrium) leading financial intermediaries to deleverage abruptly, scramble for liquidity and limit access to credit.

(This would also leave open the question how what exactly triggered the expectations shift itself)

Rather than following the multiple equilibria path, model builds on global games approach (Carlsson-Can Damme 1993).

For a macro/international audience, possibly best known reference is work by Morris and Shin. (2003, 2004)

In the context of the literature on crises of the 1990s, quintessential "second" generation model.

Approach typically leads to unique equilibria characterized in terms of cut-off points: agents do X if state variable (fundamental) is below a certain threshold, do Y otherwise.

Interest is how to determine the threshold point.

Two words on the model

Return to a project:

$$
\begin{array}{lll}
1 + R & if & anK + \theta \geq b \\
0 & if & anK + \theta < b
\end{array}
$$

Success of a project (and return to a bank loan) depends on good luck and hard work (fundamentals θ) as well as ability of enough banks n to put up funds K to finance all projects in the economy; a and b are (uninteresting) parameters

Banks that choose not to lend to firms can guarantee to themselves a riskfree rate $1 + r$.

Premise: operating firms are interdependent, their ROC depends on ability of other firms to obtain financing from financial intermediaries.

This because projects require supply of inputs or demand of output from other firms to be profitable.

Maybe alternative ways to motivate this interplay. Maybe banks acquire securities backed by residential mortgages, and MBS are profitable only if aggregate households' incomes inclusive of house price capital gains, θ, plus bank lending is sufficiently high…

So a risk-neutral bank decides whether or not to fund a firm by comparing the riskfree rate vs. the expected return on the loan, which in turn depends on what all other banks are doing:

$$1 + r \qquad vs. \qquad (1+R)\left(1 - \Pr\left\{n < \frac{b-\theta}{aK}\right\}\right)$$

Lessons of global games literature (and more generally, second generation models of crises).

First, state variable (fundamentals) must be bad enough for self-validating conjectures to emerge in equilibrium. Crises do not come from nowhere.

In the paper, if fundamentals are good enough (more precisely if $\theta > b$), a bank never withdraws credit no matter what it expects other banks will do.

Second, if fundamentals are bad enough (or $\theta < b - aK$) a bank never extends credit no matter what it thinks other banks will do.

Of course, the story gets interesting when fundamentals are in some middle range (or $b - aK < \theta < b$), not too good not too bad.

Over this middle range: if fundamentals are good enough a bank can expect other banks to finance firms, which increases the probability of making a profitable loan, which increases the bank's incentive to finance firms (so the effects of relatively good fundamentals are magnified by the expected behavior of other agents).

Vice-versa if fundamentals are relatively bad, any bank has no reason to expect that other banks will put their money at risk and extend "countercyclical" credit, so that the bank expects n to be low, which magnifies the adverse impact of θ and reduces its willingness to finance firms.

Of course, if banks could be forced to sit together and coordinate their actions a positive solution would emerge (remember LTCM episode).

But agents are not naturally prone to coordinate their actions (even worthwhile agents with the best intentions: there is a reason why cardinals are locked in the Sistine Chapel for days until they reach a decision about the new Pope...).

In the benchmark version of the model (with infinitesimally accurate signals) there is a threshold for the fundamentals (and the signals about the fundamentals) θ^* such that if $b - aK < \theta < \theta^*$ all banks withdraw credit even if fundamentals are not really so bad to warrant it

This is an inefficient credit freeze. Inefficient because if banks were able to coordinate their actions they would lend, making the projects profitable, and ultimately guaranteeing a higher payoff to their loans.

As authors emphasize, this is a run of financial sector on non-financial sector. this is not the usual "bank" run. Not even the "shadow banking system" run emphasized in the work by Gary Gorton.

Not sure if this is the most useful way to look at the recent events, where most of the action was in the interbank market among suppliers of credit themselves.

Chairman Bernanke quoted as suggesting that regardless of computerized financial engineering that preceded the meltdown, the recent episode resembles a classic 19th-century bank panic. (Investors thought their money was parked in securities that were as safe as bank deposits. When these securitized assets proved to be riskier than expected, investors panicked.) (quoted by David Ignatius, FT May 28, 2009)

Anyway. What is this level θ^*?

In the benchmark version of the model, turns out to be

$$\theta^* = b - aK\frac{R - r}{1 + R}$$

How do we get this cut-off point? By considering indifference between lending and not lending, or

$$1 + r = (1 + R)\left(1 - \Pr\left\{n < \frac{b - \theta^*}{aK}\right\}\right) = (1 + R)\left(1 - \frac{b - \theta^*}{aK}\right)$$

after observing that n is uniformly distributed.

Incidentally, the previous expression can be reinterpreted as the excess return on a loan (the LIBOR-OIS spread, if you want):

$$R - r \approx \frac{b - \theta^*}{aK}$$

suggesting a possible way to implement empirically the model (mapping from observable spreads into unobservable fundamentals)...

Summarizing: an inefficient credit freeze materializes when θ falls below θ^*.

So, if the distribution of fundamentals remains invariant, a government that wants to reduce the risk of inefficient credit freezes needs to lower θ^*.

Two obvious ways: cut interest rate r, or inject more capital K

$$\theta^* = b - a\overset{\uparrow}{K}\frac{R - \overset{\downarrow}{r}}{1 + R}$$

Consider first r.

Interest rate cuts work because they reduce the riskfree rate, thus the incentive to invest in safe assets and hoard liquidity.

Other things equal, they increase incentive to lend, thus reduce probability of credit freeze

But according to the paper they are ineffective because there is a limit on how this incentive structure works.

If lending to firms is expected to produce negative returns, even a barely positive return on the alternative bonds is preferred, and a cut does not produce a credit thaw.

Problem with this observation is that it may be a bit too literal.

In practice, the relevant comparison is between the real return on lending to nonfinancial firms and the opportunity cost of holding liquidity, which is affected by expected inflation.

If an accommodative path for the interest rate (interest rate cut + commitment to low interest rates for quite a while) is able to generate increased inflation expectations, the expected return on cash holdings can indeed become as negative as wanted.

Or from another point of view, the *real* interest rate in the model can be negative even if the *nominal* rate is bounded, thus providing a potentially effective disincentive to hoarding cash.

Pushing this story to its extreme consequences: if you want to use r to *completely* reduce the risk of inefficient credit freezes you need to push θ^* down until it gets to:

$$\theta^* = b - aK$$

but this requires

$$R - r = 1 + R \implies r = -1 \ \ !!$$

So not only you need to push r in real terms toward negative territory, you need to push it as down as possible regardless of the value of R!!!

Now consider the alternative approach and recapitalize banks by increasing K.

An infusion of capital creates externalities that make the projects of operating firms more profitable.

Suppose θ^* increases due to capital losses that reduce banking sector capital. The paper argues that even if the government covers all the losses that banks have accumulated, banks will still be reluctant to lend if they believe that other banks will not lend.

But government could recapitalize banks well beyond initial losses. In fact, if K is so large to push $b - aK$ and θ^* toward $-\infty$, an inefficient run never materializes!!

Point I want to make is that the model has nothing to say about the true limits to capital infusions, which need to be determined outside the model itself.

Within the model itself if the only objective of the government is to reduce an inefficient run this can be achieved. Just like in a traditional bank run setting, deposit guarantees and LLOR facility do pretty much the job.

The jury is still out on the events of recent months, but prima facie capital infusions with bells and whistles (stress tests...) seem may have helped...

Next, paper explores direct lending by the government to operating firms.

Problem here is that a new dimension (and trade-off) materializes: government cannot distinguish between good and bad firms, hence providing capital to firms without using the expertise of banks is socially wasteful.

Agreed. But no welfare metrics in the paper to pin down costs and benefits.

Creation of government funds managed by private agents, government guarantees, private/public program (in the slides, latest addition to the paper) etc. subject to similar considerations.

Authors acknowledge this.

E.g. in discussion of guarantees: "in principle it is tempting to conclude that the government should increase γ very close to 1, but this is not so easy. Essentially, while the mechanism does not lead to actual costs, its validity depends on the credibility of the government in providing the guarantees... Hence there is a budget constraint in the background that has to be considered" (p.31)

Conclusion

To make a long story short: this is a paper we will hear a lot about in the near future.

Great starting point toward a framework to interpret recent events and their policy implications.

Global games are baaaaaaaaaaaack...