

Discussion of 'Financial Innovation, the
Discovery of Risk, and the U.S. Credit Crisis'
by Emine Boz and Enrique Mendoza

Paolo Pesenti

Federal Reserve Bank of New York, NBER and CEPR
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Ambitious, original paper. Both sophisticated and well-focused, nice combination. A pleasure to read and discuss.

Aims to explain both boom and bust phase of credit cycles, in contrast with usual emphasis on credit frictions to amplify downturns.

From viewpoint of this audience, not a lot of "international" economics.

However, to some extent related to great tradition of "Neo-Alexandrian" models of currency and banking crises.

Two words of explanation here.

Different from many other branches of economics, literature on financial crises cannot quite rely on a “Neo-Classical” theoretical core, that is, on widely accepted, formally elegant paradigm based on rigorous choice-theoretic behavioral microfoundations.

But in the absence of a “Neo-Classical” synthesis, recent models of financial (and banking, and currency) crises as we have seen year after year at the NBER SI can be appropriately labeled as “Neo-Alexandrian” or - better - “Neo-Alejandrian”.

The “Alejandro” here is, of course, Carlos Diaz-Alejandro, author among many other things of the classic article “Good-bye financial repression, hello financial crash” on financial crisis experienced in Chile during its own process of deregulation and liberalization in early 1980’s.

Mother of all papers on crises

Substantially, the “Neo-Alejandrian” paradigm relies on three building blocks.

1) Some form of over-optimistic expectations.

Usually related to presumption that corporate and financial investment is guaranteed, so that return on assets is implicitly insured against bad shocks.

Quoting Diaz-Alejandro directly, “whether or not depositors are explicitly insured, the public expects governments to intervene to save most depositors from losses when financial intermediaries run into trouble. Warnings that intervention will not be forthcoming appear to be simply not believable.”

In this paper over-optimistic expectations stem from uncertainty about new financial regime (securitization).

2) Role of financial liberalization and innovation prior to adoption of adequate mechanisms of supervision and regulation of financial intermediaries.

Allows distortions as in 1) to have pervasive effects.

Large-scale short term borrowing to finance long term projects.

Mismatch in the maturity of assets and liabilities. Mismatch, in currency denomination.

In this paper, financial liberalization is represented by introduction of securitization and relaxation of credit constraints.

3) Overborrowing/overlending/overinvestment syndrome, that is, role of lending booms associated with 1) and 2) in the build-up of a financial turmoil.

To the extent that domestic and foreign creditors are willing to lend against expected future revenue, unprofitable projects, excessively risky investments, and cash shortfalls keep being refinanced and rolled over.

In the case of foreign borrowing and evergreening, this translates into unsustainable path of current account deficits.

In this paper, overborrowing is crucial. Assessed relative to Rational Expectation equilibrium.

The story of the paper

Agents face credit constraints that limit their debt/income (leverage).

New financial instruments are introduced since the 1980s and especially over last decade. CDOs, CMOs, CDSs etc.

Financial innovation modeled as structural reform that relaxes credit constraints and increases potential borrowing as fraction of income ("High securitization" state).

However, this reform is not forever. Reversal to regime in which debt is limited to smaller fraction of income ("Low securitization") can occur.

There is some transition matrix determining transitions from High to Low and Low to High, as well as persistence of each regime.

Agents are able to observe the current regime.

However, because of novelty of reform, true riskiness of new financial environment is initially unknown.

Agents have initial beliefs about transition matrix, that they update and revise over time (Bayesian learning) as they process additional information.

Over time their beliefs converge to the true matrix.

Initially, information about new environment is positive. Initial realizations of securitization regime are all "High".

Agents get increasingly optimistic (overestimate probability of persistence of High regime) and disregard possibility of crash (underestimate probability of transition to Low regime).

Agents borrow and increase their leverage above the Rational Expectation optimal plan. Credit boom.

At some point in time, the first realization of Low occurs.

Agents are dumbfounded.

Respond with sharp downward adjustment in credit and consumption. Credit bust.

Three issues for discussion, each related to a part of the title

Financial Innovation, ...

...The Discovery of Risk,...

...And the U.S. Credit Crisis

Financial Innovation...

Where are the new instruments?

In a paper that stresses the role of new securities, their absence is rather conspicuous.

A different model based on standard portfolio analysis would have modeled uncertainty associated with new securities in terms of dispersion of beliefs about risk-return characteristics of new assets, or their covariance matrix.

But these assets never appear in the paper.

Not as securities in agents' portfolios (the only asset is debt)

Not even as eligible collateral pledged by borrowers (the only collateral is income).

The assets appear implicitly through the "securitization regime" κ .

What exactly is κ ? The idea is that κ is everything that relaxes the borrower constraint. Let's spend a few minutes on this.

Like most crisis models, at the center of this paper is a borrowing/leverage constraint, related to risk of borrower default, inability to commit to repayment.

Let's think about general form of such credit constraint

$\text{Credit} \leq (1 - \text{Haircut}) * \text{Price(s) of collateral} * \text{Volume and varieties of collateral}$

Collateral involves a haircut or margin. A borrower can borrow \$95 for each \$100 pledged as collateral, haircut of 5%.

Haircut protects the depositors against the risk of borrower default. Reflects credit risk of borrower and riskiness of pledged collateral.

A relaxation of the credit constraint can occur because:

- 1) The haircut required by the creditor falls.
- 2) The price of available collateral increases (if my house appreciates in value it is easier to get a home equity loan)
- 3) The range of securities that can be pledged as eligible collateral is extended.

When we think of securitization as financial innovation, we mostly think in terms of 3): securitized tranches (MBS...) pledged as collateral

Evidence that growth of securitized products over last decade related to increasing need for collateral in repo banking system.

"New" forms of collateral somewhat linked to fundamentals (incomes, mortgages), but complex packaging (what is referred to as securitization) reduced link between cash flows from original assets and security itself.

Also, when we think of uncertainty associated with securitization, we have in mind uncertainty in the price of collateral, or 2).

These dimensions are ignored in the paper: income is the only source of collateral, and we are in a one-good world without (relative) prices.

So what the paper really stresses (what I think the paper is all about) is 1), or what we can interpret as haircuts or margins.

Story of paper essentially about low haircuts at the root of the U.S. credit boom (including mortgage-related aspects, think of low downpayments for housing), and uncertainties associated with this regime. Plausible, although a bit reductive.

...The Discovery of Risk ...

In the model, agents learn true transition probabilities over time.

After a relatively long sequence of "High" realizations, agents are unable to rule out the possibility that "High" is an absorbing barrier and they will never return to the bad old days of "Low".

This leads to over-optimistic beliefs (relative to Rational Expectations equilibria).

Of course, if realizations of "High" and "Low" were 50/50, the flames of over-optimism would extinguish very rapidly, and agents would converge to "true beliefs" quite quickly.

Point is: in order to have over-optimistic beliefs, you need a transition matrix that allows relatively long sequences of "High" to occur with relatively high probability.

But if this is the case, over-optimistic beliefs are not so unjustified... Deviations from RE equilibria not too big "in practice".

Interesting aspect of paper: if I observe long sequence of "High", I may learn something about low probability of transition to "Low" and relatively high probability of staying at "High". But I learn nothing about what happens at "Low".

If "Low" occurs, I have no idea where I will be stuck there forever or I will revert quickly to "High" and enjoy years of unconstrained borrowing.

This explains why the first realization of "Low" is so devastating: it is a brand new world I have to deal with.

Quibble 1: Why are agents so confident about the accuracy of their beliefs?.

I would expect that following the securitization reform, agents would be very reluctant to trust their opinions, whatever they are.

I observe High and think things look great, but I know I know too little, so shouldn't I think twice before borrowing too much relying on my "beliefs" ?

Even after a long sequence of " High" , even after we get a good feel we will never go to " Low" , we still know nothing about what will happen in the " Low" regime if we ever get there. It may last forever. It may last one quarter. Considerable fat tail for downside risks.

Quibble 2: why is there uncertainty about κ in the first place?

This is not uncertainty about the structural reform (securitization is here to stay)

It is not uncertainty about the price of collateral, as in standard models with credit externalities.

Enforcement/monitoring costs? Any reason to expect much variation here?

Animal spirits of creditors? This is perhaps more plausible, but not very satisfactory.

...And the U.S. Credit Crisis.

Is this a model of the crisis?

It is a model of a credit boom/bust following the introduction of new asset classes, with magnification effects related to informational frictions.

For a model of the 2007-2008-2009-... crisis we probably need more. Confidence crisis in interbank markets and collapse of worldwide credit. Rapid transmission from financial to real sector.

Let me attempt a possible Neo-Alexandrian interpretation of the crisis after stretching this paper a bit. Heavy borrowing from work by Gary Gorton.

Think of the economy as participating in a large, interconnected, global repo market.

Think of savers/lenders as "depositors" (firms seeking a safe place to save cash in the short term): money market funds, corporations, insurance companies, pension funds, hedge funds.

Depositors lend funds (the $-B$ of the model) in the repo market and receive collateral for their deposits. Think of borrowers as "banks" (shadow banking system). Leveraged financial intermediaries.

Eligible collateral includes securitized tranches. New financial products.

Not a lot known. But deemed to be informationally-insensitive=immune to adverse selection by privately informed agents (senior, backed by portfolios, high credit ratings... perceived as almost as good as traditional insured deposits)

"Depositors" can withdraw their funds by not rolling over their repo agreements and returning the collateral, or by increasing the haircut.

Like demand deposits at regulated commercial banks, this system is vulnerable to panic.

Global shadow banking system resembles pre-FDIC U.S. banking system.

Run on shadow banking system when "depositors" require increasing haircuts due to concern about value and liquidity of the collateral should the counterparty fail.

After years of "High" realizations, κ falls sharply (average repo haircuts on structured debt are zero until August 2007, 10% end of 2007, 40% after Lehman).

In interconnected credit market, shock is global in nature. Worldwide freeze of credit market.

LIBOR-OIS spread jump. Borrower default not key element: creditors' reluctance to lend is key, confidence crisis in global interbank market, credit lines dry up.

Correction in asset values somewhere (sub-prime crisis, fall in housing prices) transmits to other asset classes everywhere else through margin calls and widespread deleveraging.

Collateral securities that used to be perceived as informationally insensitive (good as insured deposits) suddenly become informationally sensitive (toxic assets).

It becomes profitable to produce information and speculate on the value of these securities.

Uncertainty about valuations (lemons market) makes them illiquid.

Devastating regime switch, worldwide flight to quality.

Transmission to real economy immediate.

No resources available to fund consumption/investment decisions.

Simultaneous wealth and demand shock worldwide.

Conclusion

Elegant representation of how information frictions can lead to overoptimistic / overpessimistic beliefs.

Building block of "Neo-Alexandrian" interpretation of boom/bust episodes.

More to go before can provide compelling framework to interpret recent crisis.