A Skeptical Appraisal of Frictions in the Financial Crisis

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1 Overview

These are notes for a class on financial crisis and regulation given to Ph.D. students at the University of Chicago, September 2010, as part of the Deutsche Bank Ph.D. symposium

I'm going too review the chronology and events of the financial crisis, and the emerging conventional wisdom on financial frictions that caused and propagated the crisis. We'll then analyze critically the logic and evidence for that conventional wisdom, and try to figure out which frictions are central to the financial crisis, and which are overblown. Since much current research work involves building models with frictions in them, figuring out which frictions are and are not really important, and which mechanisms for frictions are and are not plausible, is an important backdrop to future research on financial crises, regulation, and risk management.

1.1 Readings:

Click on the hyperlinks to see each document

The pictures accompanying this talk are in a separate powerpoint file

Brunnermeier, Markus, 2009, "Deciphering the Liquidity and Credit Crunch 2007-2008" *Journal of Economic Perspectives* 23 77-100.

This is a very good source for outlining the chronology, and it sets forth much of "conventional wisdom" I will disagree with.

Duffie, Darrell, 2009, "The Failure Mechanics of Dealer Banks" *Journal of Economic Perspectives* 24, 51–72.

This gets in to the mechanics of just how Lehman and Company got in trouble, and what a "run on the shadow banking system" means. Read p. 51-54 for sure. Then you won't be able to put it down.

Cochrane, John H, 2010, "Lessons from the financial crisis" *Regulation* 32(4), 34-37.

Where we're going with financial regulation and some basic problems.

Cochrane, John H. and Luigi Zingales, 2009, "Lehman and the Financial Crisis" Wall Street Journal (September 15 2009)

No, it's not all Lehman brothers. It's just as plausible that the government's TARP speeches ignited the run.

Of course, my webpage has all sorts of great stuff on the crisis, the recession, and so forth!

2 The new conventional view

(Read Brunnermeier introduction)

Banks lose money, run into capital requirements. They sell assets / don't lend. Asset "fire sale" "liquidity spiral" means assets worth even less....

"housing bubble"

"low interest rates" " saving glut"

"internet bubble"

"credit expanson to feed the boom in housing prices"

Questions.

What's a bubble? Definition? Evidence

How does a low funds rate lead to a low risk premium?

Saving glut? "Global imbalances?" For years we thought there wasn't enough trade (S/I puzzle) and international risk sharing.

A very important point Why do small losses lead to large dislocation? There is an important friction here!

My view: We had a bank run. brokerage, repo, derivative market, causing a big "flight to quality." That's the central event to model, understand, and think about regulating.

Let's get some facts behind the stories people pass around. People pass around all sorts of stories that are simply not true.

3 Bubbles and time varying expected returns

Bubbles as fact?

Definition?

Fact 1: return predictability

FACT: high prices correspond to low returns.

Fact: high prices/x do not correspond to higher future x

Regression	b	t	$R^2(\%)$	$\sigma(b\ D/P)(\%)$
$R_{t+1} = a + b(D_t/P_t) + \varepsilon_{t+1}$	3.39	2.28	5.8	4.9
$D_{t+1}/D_t = a + b(D_t/P_t) + \varepsilon_{t+1}$	0.07	0.06	0.0001	0.001

Horizon k	$R^e_{t\to t+k} = a + b\frac{D_t}{P_t} + \varepsilon_{t+k}$			$\frac{D_{t+k}}{D_t} = a + b\frac{D_t}{P_t} + \varepsilon_{t+k}$		
(years)	b	t(b)	R^2	b	t(b)	R^2
1	4.0	2.7	0.08	0.07	0.06	0.0001
2	7.9	3.0	0.12	-0.42	-0.22	0.001
3	12.6	3.0	0.20	0.16	0.13	0.0001
5	20.6	2.6	0.22	2.42	1.11	0.02

$\sigma(x)/\sigma(E)$ is a better measure of "economic significance" So are the long horizon results, though you'll see why in a minute

Connection to bubbles:

$$R_{t+1} = \frac{D_{t+1} + P_{t+1}}{P_t} = \frac{(P_{t+1}/D_{t+1} + 1)(D_{t+1}/D_t)}{P_t/D_t}$$

$$r_{t+1} \approx (d_t - p_t) - \rho(d_{t+1} - p_{t+1}) + \Delta d_{t+1}$$

$$p_t - d_t \approx E_t \sum_{j=1}^{k} \rho^{j-1} \Delta d_{t+j} - \sum_{j=1}^{k} \rho^{j-1} r_{t+j} + \rho^k (p_{t+k} - d_{t+k})$$

$$var\,(pd_t) \approx cov\left(pd_t, \sum_{j=1}^{\infty} \rho^{j-1} \Delta d_{t+j}\right) - cov\left(pd_t, \sum_{j=1}^{\infty} \rho^{j-1} r_{t+j}\right) + \rho^k cov\,[pd_t, pd_{t+k}]$$

$$1 \approx b^{lr}_{r,k} - b^{lr}_{d,k} \; + \rho^k b_{pd,k}$$

$$\sum_{j=1}^{k} \rho^{j-1} \Delta d_{t+j} = b^{lr}_{d,k}\,(d_t - p_t) + \varepsilon$$

These are identities! Just breaking up "lr" return to "lr" dividend growth and price growth

Fact 2 Which is forecastable?. Answer (see graph)

1. $p - d$ variation is almost all due to expected returns. It has nothing to do with expected dividend growth
2. 100% cash flow / 0% returns has become 0%cash flow /100% expected returns
3. THIS is why long horizon was important
4. Volatility = expected return, it's not a different kind of efficiency test.
5. Bubbles? *All we can argue about is the source of slow-moving time-varying expected returns.* "Rational bubbles" are not present.

FACT: This is Pervasive in stocks, government, corporate bonds, currencies, houses. *high prices (relative to x, includinng rents) imply low returns.*

Interpretations

- Waves of irrational optimism and pessimism.
- Business-cycle related variation in risk premium TIMES, STORIES
- Issue? Are risk premia in asset markets correctly connected to risk premia in the economy?
- MODEL the variation in risk premium/irrational optimism = f(x).

4 Pervasive rise in risk premium

Risk premiums rose in all assets.

NON Intermediated assets. Bonds, Muni bonds, Stocks. These are held directly. You can't blame intermediaries for them, we could all buy!

BAA graph

1. Not intermediated!
2. Everyone really is "marginal" (warning on the marginal investor fallacy)
3. Private didn't go up so much as government went down. (except heart of the crisis late 08)
4. "Lower interest rates so people can borrow cheaper" Macro, hello – IT's ALL risk premium!

5 Macro and asset pricing

Is old fashioned macro asset pricing hopeless?

Consumption

Habits: a model of time-varying risk aversion

$$\max E \sum \beta^t (C_t - X_t)^{1-\gamma}$$

$$\begin{aligned} u_c &= (C_t - X_t)^{-\gamma} \\ u_{cc} &= -\gamma (C_t - X_t)^{-\gamma-1} \\ \frac{-C u_{cc}}{u_c} &= \gamma \frac{1}{(C_t - X_t)} \end{aligned}$$

Model: People are more risk averse if consumption falls relative to recent past.

Investment

- Model: firms invest more when cost of capital is low. $I/K = f(Q)$ Notice the tech bubble too!

Bottom line.

1. The connection of asset markets to the real economy seems about right or at least not hopeless, consumption and investment.
2. A large common risk premium in all assets.

6 "Arbitrages?"

Fascinating!

Many of these were known before. On the run vs. off the run. Treasury vs. agency. RDS vs. Shell. But they were a) small b) unexploitable.

They got much bigger! Typical examples

1. CDS-Bond. a) buy bond b) buy treasury, write CDS. In the crisis, you can't fund a – but look at the joint movement!
2. Covered interest parity. But look at the overall movement!
3. US treasuries!

Bottom line – yes, arbitrage from large leveraged intermediaries is missing. But there are no big opportunities for long only players. And the *level* is much bigger than the arbitrage *differences*.

Interpretations

1. The arb drives the level
2. Basic macro risk premium drives the level. The differences are interesting, but not very revealing about the levels.

7 Financial frictions, banking, capital requirements

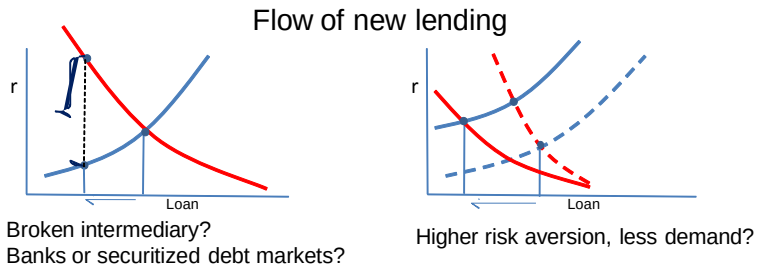
7.1 Commercial banks

The focus of all the attention. Why?

Why does lending go down so much?

Story: Losses, up against capital constraints, sell assets to fire sale, lose more, no lending to preserve capital.

Answer "recapitalize the banks' and they will lend again.



Remember, all change in quantity not from less supply!

Facts:

1) Overall borrowing DID decrease, hugely.

2) Commercial bank lending DID NOT fall in financial crisis

3) Banks recapitalized by TARP, did not start lending. They paid dividends, bought other banks and parts. They did not act capital constrained.

4) Banks always on regulatory capital

5) Banks can and do raise capital. Of course they can! They're not that stupid. If every loss meant "debt overhang" and a constraint, they'd have a much bigger buffer, or buy put options, etc.

6) Banks do fail (same thing) and continue operations

Claim: It was secretly really bad, internal models, they kept paying dividends to try to look good.

7.2 So what happened?

ABS issue

CP issue

"Shadow bank" fell apart

Bank of America story. "We lend to sell, not to hold"

Banks are correctly intermediating a much higher risk premium from investors to borrowers?

Flight from shadow bank **to** banks

8 The run in the shadow banking system

Duffie: Read the introduction.

Run of "shadow banking system" of broker dealers.

News: overnight debt, brokerage contract, derivatives have run-like qualities

1. First out gets more money
2. Taking money out hurts the institution
3. Institution's failure has socially inefficient consequences (inefficient liquidation of real projects in Diamond/Dybvig)

You need *all three. 1&2 are clear in Bear, Lehman, etc. 3?*

Recession? "Flight to quality" everyone wants to hold government bonds.

9 Regulation

The big idea currently:

1. "Systemic" designation and more supervision
2. "Resolution authority" in place of bankruptcy court or other rules-based procedure.

Objections:

Understand why SPV was created to avoid capital requirements. This was easy.

Think about how "resolution authority" will work.

10 Questions?

Many!

I hoped to get you away from the simple "leveraged intermediary" story.

Runs in shadow banks?

How does a flight to quality cause a recession?

Why did it show up in a risk premium?