

Liquidity Crisis

What went wrong? Where should we go?

Gerhard Illing, University of Munich, September 21st 2007

Implementing monetary policy has been a pretty boring job during the last couple of years. This changed dramatically since August 9th 2007 when the ECB provided €95 billion (at that time \$131 billion) of additional funds to the money market, initially just for one day. That was even more than it had supplied on September 12th, 2001 in the aftermath of terrorist attacks. It followed this up with a further shot of €61 billion the next day. Since then, many other central banks followed the same procedure, except for the “Old Lady of Threadneedle Street,” the Bank of England. For quite some time, she refused to inject more liquidity.

Despite the massive injection of additional liquidity which is going on until now, money markets did not calm down during the last weeks. There has been an unprecedented freeze on the money markets worldwide, with Libor rates hiking up dramatically. At the same time, the effective Federal Funds Rate did undershoot the target rate quite dramatically. Over the last years, lots of people have talked a lot about excessive liquidity. Suddenly, liquidity dried out nearly completely.

What went wrong? What should be done?

How to get reliable background information

Many seem to have difficulties to understand what really happened and why it did happen. Even some of the [top people in macro](#) needed help to grasp what is currently going on. This website is set up to provide some information and some helpful links to get a better grasp of recent events.

If you are keen on reliable up to date analysis, I recommend my favourite blog sites:

- [Calculated Risk](#)
- [Econbrowser - Menzie Chinn and James Hamilton](#)

Both do an amazingly good job providing useful and reliable high quality information. If you have more time, you may also follow:

- [Mark Thoma at Economist's View](#)
- [Brad de Long](#)

For reliable news and background information, the best media (unfortunately subscription is required for some part) are:

- [The Economist](#)
- [Financial Times \(FT\)](#)
- [I recommend in particular reading Martin Wolf's blog with fascinating comments from lots of sedulous colleagues.](#)

Those who prefer reading German News may look at the website of the FAZ

- [FAZ](#)

There, you can also find excellent up to date contributions- just look at [my comment "Beitrag zur Liquiditätskrise"](#), FAZ vom 16.8.07

What is going on?

Why did the ECB inject massive amounts of liquidity on August 9th? Why do they need to continue these operations up to now? The exact details are not yet fully known (correctly so - in a crisis full transparency may have disastrous effects), but obviously liquid banks had no longer been willing to lend their excess funds on the money market to other banks.

The key reason was that lots of banks, and not just banks but also conduits and structured investment vehicles, borrowed short to lend long to finance attractive, high yield investments such as investment in AAA rated bonds issued on the US subprime mortgage markets. Suddenly, bankers realised that these investments may not be such a good deal. So they refused to refinance these long term loans. The issuing institutions, in urgent need to roll over their asset-backed commercial paper, got trapped. The price of many asset backed securities dropped dramatically. At the same time, the money market rates spiked up. There has been a run on markets, triggered by the fear of fire sales.

The best (and quite frightening) explanation is given by Gillian Tett in FT: [Why financiers have missed the new monster](#)

I like in particular the quote:

“But if this saga is striking, what is truly shocking is that the risks posed by this funding mismatch have gone so unnoticed, for so long. Never mind the fact that even a first year economics student could see that creating ABCP vehicles in this way looked a bit odd.”

For more details, see also her news on:

- [Structured investment vehicles’ role in crisis](#)
- [Sense of growing crisis over interbank deals](#)

See also this article in the Economist:

- [A spike through the heart](#)

Since the inter bank money market dried out, demand for central bank money held by banks as reserves (part of the monetary base) shot up. Central banks, trying to prevent disruption of financial markets, provided additional liquidity to the market – they acted as lender of last resort.

What about equilibrium on the money market? How does it work in a textbook model? One problem is that our textbooks usually do not cover central banking operation during crisis periods. This holds in particular for those modern graduate textbooks presenting monetary policy in a framework of perfect credit markets with no real role for money). You need detailed institutional background information which students usually find pretty boring most of the time. Still, it pays to first have a look in good old-fashioned textbooks (such as [Blanchard/Illing](#)) to get some basics on bank runs and on open market operations. (for the German edition, see on [page 122 \(PDF 43 KB\)](#) and [pages 750/51 \(PDF 85 KB\)](#))

A nice textbook explanation for the ECB intervention has been provided by [Mark Thoma at this link](#). His explanation is not quite correct, since it was not really the supply of reserves which had been fixed, rather the rate of interest. So the line R2 was not vertical; instead the horizontal line FF has been fixed (at around 4% by the ECB and 5.25 % in the US). Essentially, however, the effect is exactly the same as described by Mark.

An intriguing question is why the ECB did not just offer additional base money via its [Marginal-Lending-Facility](#) which provides overnight liquidity to banks from the Eurosystem at a rate which is usually one percentage point higher than the Main refinancing rate. During a crisis, central banks have to make tough decisions within very short time. They have to decide against what type of collateral to lend: Should you accept just AA rated securities, or should you extend lending by also accepting junk bonds or even [toxic waste](#) as collateral; should you lend at a penalty rate; should you allow just for overnight borrowing or extend lending to longer periods, and many other tough questions.

In the US, operating procedures are quite a bit different than in the Euro area, but the key mechanisms are very similar. The Fed calls the Marginal-Lending-rate the Discount rate. [On August 17, the Fed cut its rate](#) for its Discount Window by 50 basis points to encourage borrowing. At the same time, loans have been allowed for a term up to 30 days (not just overnight). Finally, the Fed emphasized that a wide-range of collateral will be accepted (in particular mortgage-backed securities).

Stephen Cecchetti from Brandeis International Business School had been working at the Fed in New York during the LTCM crisis, so he has inside knowledge to evaluate what happened. At the ECB watchers conference in Frankfurt organized by the CFS (Centre for Financial Studies) he gave an excellent [account of what was going on during August at the Fed \(PDF 124 KB\)](#).

Why did it happen? What went wrong?

Why did the liquidity crisis happen? Some people claim to have been taken some by surprise by the eruption in credit market turmoil. [Alan Greenspan](#), former Chairman of the US Fed, [asked at a meeting](#) of the Brookings Papers on Economic Activity on September 7th “*I ask you if anybody in early June could contemplate what we are now confronted with?*” referring to the eruption in credit market turmoil and risk aversion that originated with rising delinquencies on subprime mortgages.

At another occasion, trying to sell his new book, [Greenspan](#) claimed he “[really didn’t get it](#) (the severe economic consequences posed by questionable subprime lending tactics) until very late in 2005 and 2006.” So maybe he was not so surprised any more in June this year. We really don’t know – no surprise for us. There is his famous quote:

“Since I have become a central banker, I have learned to mumble with great incoherence. If I seem unduly clear to you, you must have misunderstood what I said.”

But at least Ben Bernanke, Chairman of the US Fed, did not seem to realise. Indeed, mid of May, at the Annual Conference on Bank Structure and Competition in Chicago, [he stated firmly](#):

“We believe the effect of the troubles in the subprime sector on the broader housing market will likely be limited, and we do not expect significant spillovers from the subprime market to the rest of the economy or to the financial system.”

On June 5, 2007, he again [reassured the markets](#):

“At this point, the troubles in the subprime sector seem unlikely to seriously spill over to the broader economy or the financial system.”

In contrast, others, observing first the amazing boom in mortgage loan originations and then the meltdown in the US subprime sector, have been puzzled that it really took so long to trigger fire sales. Tons of facts have been consistently provided on blogs like [CALCULATEDRISK](#) and in the weekly magazine [Economist](#).

[Raghu Rajan](#), now Graduate School of Business at the University of Chicago, at that time research director at the IMF (now back at Chicago Business School) presented a sceptical view at a [speech at Jackson Hole \(PDF 332 KB\)](#) in September 2005 "Has Financial Development Made the World Riskier?".

Claudio Borio from [Bank for International Settlements \(BIS\)](#) has consistently warned for a long time that large swings in asset prices figure prominently in many accounts of financial instability. See his paper "[Towards a Macroprudential Framework for Financial Supervision and Regulation?](#)"

Hyun Shin, initially at LSE, London, now at [Princeton University](#), frequently warned against the risk of fire sales in the real estate market. Just as an example, have a look at his paper "[Risk and Liquidity in a System Context](#)"

In a research paper last year on "[Risk Transfer with CDOs and Systemic Risk in Banking](#)" Jan Pieter Krahnert and Christian Wilde from the CFS in Frankfurt argued that credit securitizations contribute to an increase in the systematic risk of banks.

I myself [expressed concern \(PDF 698 KB\)](#) about the risk that financial fragility may have caught the Fed in an interest rate trap back in June 2004 at a Bundesbank Conference. The [Economist followed](#) 1st of July 2004. No surprise now to see that John Taylor [finds \(PDF 321 KB\)](#) the actual Fed rate has been below what a Taylor rate would have suggested during that period. Last November, at a conference on Central Banks as Economic Institutions at the Centre Cournot in Paris, I again [pointed to the moral hazard issue](#) involved. For a long time, the economist warned against the [Greenspan put](#).

Some dismissed that as cheap finance talk. After all, our models do tell us that we are now closer to the wonderful efficient world of globalised financial markets, spreading risks to those who are most able to bear it. But you should have a careful look at the assumptions of such models. If you really need a model to be convinced about the moral hazard problem, click my recent paper with Jin Cao on [Liquidity Shortages and Monetary Policy \(PDF 442 KB\)](#) and Stephan Sauer's paper on [Liquidity Risk and Monetary Policy](#).

Sound economic theory has been interested in fire sales for quite a long time. In 1997, Andrei Shleifer and Robert W. Vishny (1997) published a famous paper on "[The Limits of Arbitrage](#)" in the Journal of Finance, 52:1, pp. 35-55

Unfortunately, economists have not written many papers providing ex ante a sound theory predicting something which did not yet happen at that time but later indeed turned out to become reality. Most economists are better in explaining ex post what happened in the past. Edmund Phelps and Milton Friedman did predict the breakdown of the Phillips curve end of the 60's. They have been confirmed by the great inflation during the 70s. Both deserved to get the Nobel price. In their paper on Limits of Arbitrage, Shleifer and Vishny analysed the breakdown of arbitrage during periods of market turmoil. At that time, hardly anybody thought this strange model could ever turn into reality. But it was the perfect model to predict the LTCM crisis in September 1998. I strongly recommend reading the bestseller by Roger Lowenstein "[When Genius Failed. The Rise and Fall of Long Term Capital Management](#)".

It gives a fascinating account of the personalities and academic expertise behind the failure of the hedge fund Long-Term Capital Management, having been advised by the two Nobel price winners Robert C. Merton and Myron Scholes. You will notice frightening parallels to the recent events.

Referring to that paper was exactly the reason why Brad de Long boasted on August 10 on his blog: "[Today Is a Great Day in Finance!](#)" I don't think he is right. I think it was a sad day for finance, showing that we did not draw the right lessons from former experience. The more so since, recently, there indeed has been lots of research in this area. One of the most interesting recent papers on liquidity freezes is the work by Markus Brunnermeier and Lars Pedersen (2007), "[Market Liquidity and Funding Liquidity](#)" NBER Working Papers 12939.

So the real puzzle is why it all happened in slow motion, rather than as speedy as the theory of fire sales would have predicted. It took amazingly long from Bear Stern's [hedge funds collapsing](#) till the breakdown of the markets for CDO's. One reason may be that there have been a few key players with market power being well aware about these risks, trying to sort them out in a different way. It was fascinating to see a US state secretary running to Beijing mid of July [urging China's central bank](#) to buy more government-backed mortgage bonds in an effort to sustain financing for U.S. home loans.

Another reason may be that markets relied on central banks acting as needed.

Lender of Last Resort Policy – The Risks Involved

What will be the impact of the recent liquidity operations? What are the problems of central banks acting as lender of last resort?

Essentially, there are two key problems:

- 1) Potential trade-offs with other central bank objectives
- 2) The moral hazard effect

Note: A thorough, detailed account of the problems involved can be found in the book "[Financial Crises, Contagion, and the Lender of Last Resort](#)". A Reader, edited by Charles Goodhart and myself.

1) The Risk of Inflation

First of all, there can be a conflict between financial stability and price stability. To see that, it is helpful to look at episodes in the past. Stephan Sauer, one of my PhD students, analysed three liquidity crises during the Greenspan era in his paper "[Three Liquidity Crises in Retrospective: Implications for Central Banking Today.](#)"

Stephan presents evidence that emergency liquidity assistance implies risks to price stability when it is not focused on the inter bank market and quickly sterilised. He shows that the rescue operations after September 11th, 2001 have been quickly sterilised (taken back) and so had no impact on inflation. In contrast, the aggressive cuts in interest rates after the stock market crash in 1987 and the LTCM crisis in 1998 causes inflation to rise. At these events, US interest rates had been set lower than what the Taylor rule suggests.

Now we could say the heck with a little bit more of inflation. We enjoyed enough price stability during the last 15 years, and there are definitely worse things than 2 percent more inflation. From time to time we have to face them. That is a good point. For the US, it may indeed be the individually rational strategy to inflate away part of its nominal debt, as a substantial part is now

owned by foreigners. But if inflationary expectations rise and the dollar is falling, the US (or the world economy) may fall into a vicious circle - as has been [pointed out by Calculated Risk](#).

For the US, this may not be so disastrous. A falling dollar increases the Dollar value of those assets owned by US firms and citizens abroad, as long as these are denominated in foreign currency. If Uncle Sam has bought some Eurobonds, he can enjoy capital gains from a rising Euro. Not bad for the US Net Investment Position. There is a famous quote by John Connally, Secretary of the US Treasury under Richard Nixon, who once (1971) told a couple of Bundesbankers worried about exchange rate fluctuations: "*The dollar is our currency, but your problem.*" People have been surprisingly honest at that time – a year before Watergate.

2) The Moral Hazard Issue

The moral hazard involved is the second serious problem. Frequently, the lender of last resort activity of central banks is seen as a free lunch: In a systemic crisis, so the argument, injecting liquidity to support illiquid yet solvent banks works as a public good, providing insurance against otherwise uninsurable exogenous risks. This improves the efficiency of financial markets: trusting that they will be rescued in times of a systemic crisis, financial institutions are encouraged to undertake more risky, but profitable investment. Thus, society is allowed to enjoy higher real rates of return on average.

But this argument ignores that there is an economic need for liquid investments. Systemic risk is not exogenous. In a [joint paper with Jin Cao \(PDF 442 KB\)](#) at the University of Munich, I have shown that providing a put option against systemic events dampens the incentives for prudent behaviour. Instead, free riding on the liquidity supplied by other, more prudent institutions is encouraged. The price for liquidity provision will be distorted. This will result in insufficient supply of real liquidity, raising the likelihood of a systemic crisis.

Concern about that issue has indeed been the main reason why many central banks have been so reluctant to act more aggressively. *Central banks should not rescue fools*. I recommend reading [Martin Wolf in the FT](#) and [Raghu Rajan, again in the FT](#).

Providing central bank insurance to those institutions that have engaged in reckless lending poses enormous hazards. Mervyn King, Bank of England governor, just hit the nail by pointing out ([FT, Sept. 12 2007](#)): "The provision of large liquidity facilities penalises those financial institutions that sat out the dance, encourages herd behaviour and increases the intensity of future crises."

It is amazing that the moral hazard issue has not been taken more seriously by leading US economists. The [story about Harvard Economists Divided Over Fed's Next Move](#) before the recent Fed meeting is quite telling. Usually, people on the right side are very much concerned about the risks involved in bailing out the poor. Now, when it comes to bailing out the poor finance industry, sides change quickly. Economics is indeed all about incentives.

The tragic is that during a crisis, there is no way to escape. Central banks are trapped in a dilemma of the proportions of a [Greek tragedy](#). If they try to abstain, they risk triggering a crisis. If they give in (as they eventually have to anyway), they will increase the intensity of future crises. It may well be that [Mervyn King's letter \(PDF 84 KB\)](#) to the chancellor reconfirming his brave statements was the trigger for the [run on the mortgage bank Northern Rock](#) the next day. The reckless lender Northern Rock (what an apposite name) smashed the credibility of the Bank of England.

Obviously, there is a serious dynamic consistency problem. Ex ante, you might want to commit not to intervene. Ex post, there are strong incentives to renege on such a commitment. Of course, clever financial market participants notice that commitment problem right from the start.

Reliance on central banks coming to rescue as lender of last resort is bound to encourage higher risk taking. As shown in [my joint paper with Jin Cao](#), surprisingly, even for the case of pure illiquidity risk, central bank intervention increases the incentive of financial intermediaries to free ride on liquidity provision. The commitment not to intervene, however, is not credible.

What should be done? According to the "[Austrian hangover theory](#)," creating a recession is the only way to purge the excesses of previous booms, leaving the economy in a healthier state. The "winds of creative destruction" would cause healthy pain. I don't think this is a sensible solution. As [Paul Krugman puts it](#): "Bad investments in the past should not require the unemployment of good workers in the present."

It is no surprise that Wall Street Journal now supports my view - despite its old obsession about moral hazard created by the IMF in bailing out emerging market countries – see [Has Fed Risked Creating Moral Hazard?](#)

It is no surprise, but pretty funny that Jim O'Neill, Goldman Sachs Global Head of Research, "comments" [discovered his compassion](#) with millions of people in the US who are going to suffer from large negative equity from their houses losing value – this indeed was the best way to justify his call for a rate cut. Similarly, it was pretty clever from [Jan Hatzius, again Goldman Sachs New York, to argue](#) that the damage to financial markets is likely to be contained since the Fed will lower interest rates when necessary. Why not base my investment strategy on that insight?

What should be done?

Central banks really do not have many options at that stage. But for exactly that reason the moral hazard problem needs to be addressed in other ways – by stronger regulation or some alternative instruments. At a Bundesbank Conference on Financial Stability and Globalisation back in June 2004 I gave a talk on [How to escape contagion \(PDF 698 KB\)](#) in the interest rate trap. I concluded:

"Central banks... should not prevent an orderly unwinding of imbalances – in contrast, they should contribute to make the unwinding orderly. But this strategy poses a serious risk: a policy limited trying to soften ex post the impact of negative systemic shocks may contribute itself to building up new structural imbalances. If that is the case, the solution of the underlying problems would simply be postponed in the future. Even worse: It may encourage building up even more serious imbalances, thus aggravating the underlying risks. So the challenge for policy and for future research is to try to identify instruments for economic policy which help to prevent the building up of imbalances right from the beginning."

Just as in standard dynamic consistency problems, the right approach is to tackle the externalities directly. It was a humiliating experience to see the credibility of the Bank of England being smashed by a Northern rock. It would be disastrous if Mervyn King would be forced to quit after giving in.

This year at Jackson Hole, [James Hamilton](#) joined in for the call for regulatory and supervisory reforms, pointing to significant negative externalities that have been created. The key question, of course, is how to design adequate mechanisms to address the underlying externalities. Within Europe, there has been an urgent call for regulatory and supervisory reforms for quite some time. Driven by the fear of the LTCM crisis, Hans Tietmeyer, at that time president of the Deutsche Bundesbank, suggested establishing the [Financial Stability Forum](#) as a base for reforms. This spring, the German Finance Minister [Peer Steinbrück](#) tried to push for more

transparency in the global hedge funds industry at this year's G8 meeting in Heiligendamm. The simple idea was to reduce risk by forcing hedge funds to adhere to stricter reporting requirements - see [Wolfgang Münchau](#) or [Ken Rogoff](#).

All these initiatives hit upon strong resistance within the financial community. Resistance has been particularly strong in the US. The reason is presumably the bad experience with hasty changes in legislation under urgent political pressure. After the depression, crazy regulations have been imposed on the US banking industry, limiting sound banking activities across states for quite a long time. The Sarbanes-Oxley Act of 2002 imposed by Congress after the Enron scandal gave Wall Street the feeling that it is losing part of its business to other financial centres abroad.

Such fears have to be taken seriously. The more so, it is crucial to design clever changes in the regulatory framework, creating efficient incentive schemes. The challenge is to provide adequate incentives to internalise the externalities created by recent innovations in financial markets, but at the same time make sure that the benefits of these innovation will not be lost.

What about the benefits? Securitisation is said to allow more efficient spreading of risks to those who are most able to bear it. But we need to take a closer look whether this is indeed true. In a couple of papers, my colleague Jan Pieter Krahen from Center for Financial Studies at Goethe University Frankfurt has shown that empirically, credit securitizations tend to go hand in hand with an increase in the issuer's systematic risk. At first sight, this seems puzzling: Collateralized debt obligations (CDOs) allow the issuing banks to shift credit risk to other investors, so it is supposed to decrease its exposure to systematic risk. In order to provide sufficient monitoring incentives for the issuer, the first loss piece with the highest risk should be retained by the issuing institution, whereas the senior, less risky tranches are sold to the market.

The idea is that senior tranches will go sour only in extreme cases, when really bad, macro driven shocks happen. So securitisation seems to allow to separate idiosyncratic from systemic risks in an elegant way, indexing debt contracts against macro shocks: Rare systemic macro shocks can be transferred to the market, whereas idiosyncratic risk is borne by the issuing bank. In order to avoid taking excessive risks, the bank should take all efforts to carefully monitor its own loans.

As Jan has shown, alas in reality this turns out not to be true. The basic mechanism is pretty straightforward: First, idiosyncratic risk is highly correlated with macro shocks – much more subprime loans turn sour when the economy is tumbling. Second, those firms engaging in securitizations in order to circumvent regulatory pressure are likely to reinvest the funds obtained by selling their loans. By investing these funds again they issue even more credit, thus raising systemic exposure. Obviously, these effects will be compounded if – as seems to be the case in the US subprime market - even the first loss piece is sold to the market to institutions highly leveraged at banks. Even first year students should realise that such an arrangement is just the opposite of an optimal second best incentive contract.

Evidently, unregulated markets seem to have a tendency to engage in trading strategies creating high systemic risk exposure. It is a daunting challenge to design optimal second best arrangements. But it is naïve to trust that free markets will sort out the adequate arrangements on their own. Turbulence having spread world wide now there seems to be a unique chance to implement some serious changes in the international financial architecture. In my view, the BIS and the IMF deserve to play the decisive role in that process.

Some - as [James Hamilton](#) - suggest that the Fed should play the key role. There are very clever people working at the Fed – some of the best economists worldwide. But looking at their recent track record, I have serious doubt that they are really up to the challenge. My impression is that

they screwed it up, blinded by fascination about the new age of financial innovation, driving markets closer to the wonderful world of an Arrow Debreu economy. Just before he raised interest rates, Alan Greenspan gave the best ad for mortgage brokers of subprime loans in his speech [Understanding household debt obligations](#) on February 23, 2004:

American consumers might benefit if lenders provided greater mortgage product alternatives to the traditional fixed-rate mortgage. To the degree that households are driven by fears of payment shocks but are willing to manage their own interest rate risks, the traditional fixed-rate mortgage may be an expensive method of financing a home.

In an economy with incentive and commitment problems, you will never come close to an Arrow Debreu economy. If you don't get used to think about second best outcome, you are likely to screw it up. For some mysterious reasons, people at the Fed seem to have an obsessive aversion against any sensible form of regulation. The real danger is that, once central banks start cutting interest rates, everything will look bright and sunny again, and financial markets will claim that the current crisis has simply been caused by irrational exuberance. Strange that you are not able to notice exuberance on the way up, but it seems so easy to smell it on the way down. If the Fed lowers interest rates sufficiently, even toxic waste may turn into gold again. If that will indeed be the outcome, convergence arbitrage on risk spreads promises to be even more fun. Since central banks cannot commit to take away the punch bowl when the party is going, we need other means to stop getting the party out of control.

In my hometown Munich, around 1870 Adele Spitzeder promised poor farmers amazingly high returns. Initially, she indeed paid out, financed by tons of money flooding in. Finally, she ended up in prison, having caused the big Munich banking scandal in 1872. She wrote her [memoirs](#) in prison, explaining the soundness of her strategy. Charles Ponzi was just one of many others who repeated her strategy. He did it in Boston around 1920. Again, the guy ended in prison, but at least he really became famous: Today, a reference to Ponzi schemes can be found in nearly any textbook. The No Ponzi game condition is taught in all advanced macro PhD courses. Nevertheless, nowadays it somehow seems as if investment bankers playing similar schemes (willing to finance fat private equity deals without any covenant), rather than ending up in prison end up getting additional money from the Fed.

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