

Monetary and Financial Stability

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Introduction

As recently as twenty-five years ago, monetary stability in the United States was based on the Federal Reserve System's control of the quantity of money. Financial stability was ensured by the comprehensive regulations of the Glass-Steagall act, which kept different types of financial institutions separate and dictated the activities they could and could not engage in. Today, these regulations are gone and a great wave of innovations has entirely changed the financial landscape. And we no longer know how one might define the 'quantity of money' for control purposes.

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With the demise of Monetarism, more and more central banks around the world have come to adopt a policy strategy known as 'inflation targeting.' This is the case, for example, with the European Central Bank, the Bank of England, and the Swedish Riksbank. The Central Bank of New Zealand was a pioneer in committing itself publicly to this policy. Some other important central banks, such as the Federal Reserve System of the United States and the Bank of Japan, have not officially declared inflation targeting as their strategy, but they have behaved as if it were, and the markets have believed that to be the case.

Many influential advocates of this policy have argued that keeping the inflation rate very low and maintaining it within a very narrow band of variation should be

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¹ I have learned much from many discussions with Christina Leijonhufvud. She is not implicated in my errors and omissions below.

a central bank's *exclusive* goal. If it is known that this is the Bank's exclusive objective, its policies will be *transparent* and, the proponents believe, as long as the markets understand clearly what the monetary policy is, they will take care of other matters, such as unemployment, as well as can be. If, on the other hand, the central bank from time to time trades off unemployment versus inflation, or one of the two versus the exchange rate, the private sector will not be certain what is going on and this will lead to various mistakes and inefficiencies.

I have a number of reservations concerning this fashionable policy doctrine. In particular, I maintain that stabilising the consumer price index (or its rate of growth) does not guarantee stability of the financial system. Moreover, under certain conditions, concentrating on year-to-year monetary stability, in the sense of keeping to a CPI inflation target, can lead you to follow policies that are inimical to financial stability over the longer run.

Japan

An example for the proposition that monetary stability does not guarantee financial stability is Japan up to the end of the 1980s. This was before the days when inflation targeting became a doctrine generally embraced by central banks. So one is not justified in attributing an explicit such policy to the Central Bank of Japan. The point, however, is that had it operated with an explicit inflation target in that decade, it would presumably not have been led to behave differently from how it in fact did behave. (Nor would more explicit constitutional guarantees of 'central bank independence' have made any difference).

Yet, two enormous asset price bubbles were steadily inflating during that decade – they burst, and the Bank of Japan has struggled mightily for a decade and a half to repair the financial damage.

The lesson to be drawn from this episode is simply that *inflation targeting cannot be the end-all of monetary policy*. Please note that this was a somewhat controversial statement only a couple of months ago. In

recent days and weeks, however, the Federal Reserve System, the Bank of England and the European Central Bank have been besieged by armies of bankers and commentators pleading and urging them *not* to take inflation stabilisation that seriously. I will have to come back to that point later.

Financial regulation and stability

Another aspect of the story does not have such an obvious moral. At the time of the Japanese crash, as I recall, commentators in the United States pointed out that its severity was due in large measure to the fact that Japanese banks had lent heavily against real estate collateral and also held equity interests in the manufacturing sector, activities that at that time were prohibited to American banks by the Glass-Steagal act which Congress had passed in the 1930s. That legislation was based on an interpretation of the decade antecedent to the Great Depression analogous to how we today view the Japanese 1980s². Glass-Steagal sought to make the financial system into an unsinkable ship by segmenting it into watertight compartments so as to preclude what actually happened in Japan 60 years later³.

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Shortly after the Japanese crash, however, the United States *dismantled* these particular regulatory structures. Lobbying by the financial industry was of course instrumental in the process. But it was also the case that economists had learned Tobin-Markowitz portfolio theory since the 1930s and were persuaded that Glass-Steagal prevented banks from diversifying risk. The watertight-compartments model of ensuring against a crash was seen as wrong-headed. So deregulation met with virtually no opposition from economists.

Before proceeding, I should note that it is not obvious that the faith of financial economists in portfolio diversification is altogether well-founded. It rests on the assumption that the risks of financial assets can be represented by a Gaussian probability distribution. This assumption is known to be false. In particular, events very far away from the mean occur more often than 'they should.' In a recent book which many economists would like to ignore – but one that is hard to ignore –

2 It is worth noting that it has remained the interpretation of the Austrian school.

3 Under Glass-Steagal, commercial banks were not to invest in mortgages or equities and were also prohibited from interstate banking. Home mortgages, for example, became the province of Savings and Loan Associations, an industry which functioned perfectly well until inflationary macropolicies in the 1970s made the extreme maturity mismatch between the two sides of its balance sheet fatal.

N.N. Taleb calls such events 'Black Swans'. A good Black Swan brings unexpected good fortune. A bad one is a disaster waiting to happen, and it will have more disastrous consequences than it should because, having seen lots of 'normal' white swans, we tend to ignore them before the fact and rationalise them away after the fact – so as to be equally unprepared next time.

Financial evolution

In the wake of deregulation, the financial system has evolved so very rapidly in the last twenty years that 1990 now seems a *very long time ago* – even though the consequences for Japan still linger. In what used to be called the 'leading industrialised countries' (some of which are leading 'deindustrialisers' today), the changes have been dramatic enough that it is not obvious what lessons from past experience still apply. A short list would have to include:

Changes in payments practices and in the monitoring of credit

These are the changes ordinary people are most aware of. They include ATM-machines, debit cards and payments made electronically over the Web. In the United States, in particular, a number of large national firms keep constant track of how well firms and individuals meet their payment obligations and furnish this information to financial institutions or other firms offering credit.

Deregulation of banking and the rise of financial conglomerates

The abandonment of the old model of regulation has caused boundaries between what used to be different types of financial institutions to be almost completely erased, so that institutions which were previously in separate 'watertight compartments' are now in direct competition, also across borders and, for the largest of them, around the world.

Securitisation of loans

Banks used to make loans to borrowers whose credit-worthiness they had carefully evaluated and then keep the loans on their books until they were paid off. Today, big banks in particular are almost entirely credit intermediaries. They make loans, bundle them together, and sell securities that are claims not on individual loans but on the bundle of loans. There are a variety of ways on which securitisation can be 'structured' to appeal to different investors, for example, by dividing the issue into different tranches, some of which will assume higher risk of default but earn correspondingly higher interest. This is an example of what is called 'structured instruments.'

The growth of the various derivatives markets

The structured instruments just mentioned are examples of 'derivatives'. They are not loans but 'derive' from the underlying bundle of loans. The types of derivatives offered have proliferated immensely in recent years. The volume traded has grown even more impressively. The type which is most relevant to today's topic are so-

called credit derivatives, also called risk transfer instruments. These allow the holder of a bond to buy default insurance for a periodic payment. The big banks operate on both sides of this market, both buying and selling, and hold derivative contracts on debts with a face value of many trillions of dollars.

Hedge funds, conduits, and SIVs

The innovations just mentioned do not exhaust the list. In recent weeks, hedge funds, conduits and special investment vehicles have been prominent in the news. I will return with some comments on them later.

Financial globalisation

The big banks operate in all the major financial centres in the world, and many of the new instruments are traded all over the world. As we have recently learned, for example, German banks held significant amounts of American subprime mortgages. To make that statement concrete – it means that a German bank in Leipzig, for example, holds an (indirect) claim on some poor fellow in California – half a world away – who had borrowed up to the hilt at a very low ‘starter rate’ and who could not possibly meet his mortgage payments when the rate was raised to market level, but lived on the vain hope that the value of the house would continue to appreciate indefinitely.

A safer world?

What are the implications of this gigantic wave of financial innovations for the stability of our economies? The conventional view has been that they have ‘made the (financial) world a safer place’, but to this view there have been at least a few dissenters throughout and recent events have made many more people far less confident of this optimistic view.

Historically, the major stages in the development of financial markets and institutions have created novel sources of instability and have ushered in prolonged periods of learning how to regulate and stabilise the system. It took us a long time, for instance, to learn how to live (relatively) safely with fractional reserve banking of the old-fashioned sort.

Can we expect this stage in financial evolution to be different? The errors in these trial-and-error learning processes have sometimes been huge. Recall that the first move by the American banks into unfamiliar ‘global’ territory led them into the Latin American crash of the early 1980s. Their losses were of a magnitude to make them technically bankrupt but the ‘forbearance’ of regulators and government help in the form of the Brady bonds allowed them to work their way back into solvency.⁴ Similarly, in 1989, six of the ten largest banks in the world were Japanese (if I recall correctly). They too were technically bankrupted by the crash and it took more than a decade for them to earn their way into the black, even with access to funds at a zero interest rate from the central bank. And even today none of them is back among the globally dominant institutions.

Some of the ‘errors’ made in novel, unfamiliar market

4 Cf. Christina Leijonhufvud (forthcoming).

contexts have also had truly enormous welfare consequences. For the emerging market economies which deregulated their financial systems and opened themselves to the free flow of capital in the 1990s, the old story was repeated. The East Asian crises of 1997, the Russian and Brazilian crises of 1998 and the Argentinean one of 2003 are all stories of ‘errors’ with huge costs for many millions of people. Several of these countries have since accumulated huge foreign exchange reserves hoping to avoid a recurrence of crisis – and to escape the tender-loving care of the IMF. Note that investing several percentage points of one year’s GNP is a costly thing to do when per capita real income of the population is low.

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The question, then, is whether the recent rapid evolution of financial institutions, instruments and markets has somehow made the leading capitalist economies exempt from serious calamities.⁵

So far from Ricardo, so close to Wicksell

Before turning to this question, let us consider how the problem of monetary stability has also changed in this new environment.

The book that all central bank economists have been studying of late is Michael Woodford’s *Interest and Prices*.⁶ It borrows its title from a famous work by Knut Wicksell, *Geldzins und Güterpreise* which is now more than 100 years old.⁷ The older work will however serve my purposes quite adequately. The financial evolution of recent years has invested it with renewed relevance.

Wicksell’s book contained two models, occupying two ends of an evolutionary spectrum of institutional alternatives. One was an old-fashioned Ricardian Quantity Theory model to which no one paid any attention. The money supply consisted of coins and notes convertible into gold which were issued by private sector banks. Denoting the public’s propensity to hold minted gold by g and the reserve ratio of the banks by r , the base-money multiplier would give us a money supply,

$$M = [(1 + g)/(g + r)]G$$

The price level is then determined by the quantity equation and Wicksell was satisfied that velocity had an

5 A second question, which cannot be considered here, then becomes whether the traditional powers and instruments of Central Banks are adequate to cope with potential financial instability, given these far-reaching changes that the system has undergone.

6 Michael Woodford, *Interest and Prices*, Princeton: Princeton University Press 2004 [here](#).

7 Knut Wicksell, *Geldzins und Güterpreise*, Jena: Fisher Verlag 1898. Woodford’s work is Wicksell ‘Taylorised’ to contemporary tastes.

upper bound. It was given by 'how fast a messenger boy can run.' That, unfortunately, is another one of these things that we cannot depend upon any longer.

But over the course of the 19th century, the banks had learned to economise more and more on the holding of gold reserves and the demand for minted gold by the non-bank public had essentially gone to zero. So Wicksell provided a second model – the famous one of the 'pure credit economy' in which both r and g had gone to zero in the limit.

In this second Wicksell model, M is demand-determined and the money stock and *the price level are therefore indeterminate*. Not all is lost, however, because the central bank can control *the direction of change* of the price level by use of its discount rate and might be able to keep it constant. But it will succeed in stabilising prices *if and only if* it manages to hit just the right interest rate, the rate that Wicksell called the 'natural rate'. This is not easy for no one knows very exactly what the 'natural rate' is at any particular point in time.

...‘credibility’ is steadily becoming more important as the monetary ‘anchor’ loses weight and the anchor cable becomes more rubbery.

Wicksell did not think that either of his models fit the monetary system of his time exactly. His point was that the 19th century had started close to the Ricardian model but that financial evolution had carried it ever closer to the pure inside money model. There was still *some* demand for outside money in the system but it was small and getting smaller.

Don Patinkin in a paper that is by now almost half as old as Wicksell's book (Patinkin 1961) demonstrated that for the price level to have a determinate equilibrium under the control of a central bank, it was sufficient that the central bank could control (a) one interest rate, and (b) the volume of one nominal asset *for which the private sector was not able to produce a perfect substitute*.⁸

Patinkin's theorem is a proposition about static equilibria. In principle, the theorem does not depend on the size of the volume of that nominal asset relative to the size of the economy whose price level you want to control. So the question naturally arises: Will it suffice to control, say, the copper coinage (as long as the private sector is not allowed to produce a perfect substitute)?

At least we know the answer to that one: you cannot make an economy deflate by cutting the supply of coins, but only cause a coin shortage. For quantity control, you need more leverage than that. You need control of a money stock for which there is a reasonably stable demand function on part of the private sector (including the banks). Larger money aggregates, however, are likely to be subject to [Goodhart's Law](#). Not only

is the relationship between that stock and nominal aggregate demand likely to be quite 'elastic', depending on rates of return on non-money assets but, says that 'Law', it is also likely to shift as the private sector finds new ways to substitute for the controlled aggregate. Still, as long as there is some tendency for the price level to gravitate towards equilibrium, mean-reverting expectations on the part of the public will be an aid to monetary policy even as the outside money stock that it controls directly is shrinking in relation to the overall size of the financial system. In that process, obviously, 'credibility' is steadily becoming more important as the monetary 'anchor' loses weight and the anchor cable becomes more rubbery.

Monetary theory and institutional change

Wicksell's famous model did not have much influence on central bank practice in his time. It lost its relevance because of regulatory changes which in effect moved national monetary systems back towards the Ricardian end of Wicksell's spectrum. Private note issues were abolished and note issue made a government monopoly. In some countries, reserve requirements were imposed on banks as well.⁹ As long as a good measure of control of the base could be assumed, the money stock would then be supply-determined. This made the US system sufficiently Ricardian that Monetarism could dominate thinking in matters monetary as late as the 1970s, and by and large well into the 1980s.

...we find ourselves faced with the task of controlling the rate of change of prices in a system where the price level has no determinate equilibrium.

Today, reserve requirements are allowed to be circumvented where they have not been abolished and the private sector is busily producing steadily more convenient substitutes for paper currency. *So, 100 years later, we find ourselves very close to Wicksell's world and very far from Ricardo's*, which is to say, faced with the task of controlling the rate of change of prices in a system where the price level has no determinate equilibrium. This is what *inflation targeting* is supposed to do for us.

It is interesting to reflect that *this is a task which seems far more difficult in theory than it appears to have been in practice*. Economists tend always to clamour for more flexible prices, even though they lack any criteria for what might be 'rational' or 'optimal' price adjustment speeds. In a Wicksellian world, one has to be careful what one wishes for. If there were not to be much friction in price adjustment, any little 'error' by the central bank in matching its market rate to the *unobservable* 'natural' rate would result in the price level taking off, up or down, at terrifying speed. And that would spell the end of any hope for financial stability.

⁸ Patinkin, D. (1961). Financial Intermediaries and the Logical Structure of Monetary Theory, a Review Article. *American Economic Review*, LI: 95-116.

⁹ With reserve requirements imposed and a stable propensity to hold currency, the money supply would be determined in the manner made familiar by decades of *Money & Banking* texts: $M[(1 + c)/(c + r)]$.

Powers of central banks

Abundant compliments and congratulations have been exchanged among academic economists and central bankers over the apparent successes of inflation targeting in recent years.¹⁰ Are these well-deserved? Or have we benefited from what may turn out to be a historically unique conjuncture?

For years on end, the world has been awash in liquidity, most of it dollar-denominated. Yet, we have had no dollar inflation. How do we explain this?

In the United States, we have had the Alan Greenspan cult. It has had adherents also abroad. A magazine cover had him as ‘the most powerful man in the world.’ (Not bad for an economist!)¹¹ The trouble with this appellation, as I see it, is this: If you hike bank rates 13 or 14 times – I lost count – and the market pays not the slightest attention but leaves the long rate flat, *how powerful are you really?* Or does Greenspan’s Fed deserve credit for superb skill in matching its market rate to the Wicksellian natural rate, step by quarter-point step, so as to keep on the low inflation target?¹²

Easy money and no inflation

The next problem is this. For years on end, the world has been awash in liquidity, most of it dollar-denominated. Yet, we have had no dollar inflation. How do we explain this? The popular answer is: cheap Chinese imports. It stands to reason that when hundreds of millions of people are pulled into the global division of labour, *real* prices and some *real* wages will be squeezed. But, as Milton Friedman steadfastly maintained, ‘inflation is always and everywhere a monetary phenomenon.’ In the present context, we may add as a lemma to the Friedman theorem that the *absence of inflation* is also a monetary phenomenon.

It is mostly the willingness of a number of central banks to accumulate enormous dollar reserves which explains the absence of inflation. The motives vary. China takes in dollars as a tonic for exports, Russia as medicine against Dutch disease, while a number of others are doing the same on the principle that ‘a few million a day, keeps the (IMF) doctors away!’ These exchange-rate policies keep American import prices from rising, and competition from imports keeps

American consumer prices in check.

But this may not be the whole explanation. There is also the fact that the Federal Reserve, like the Bank of Japan, was facing a threatening *deflation* after the collapse of the IT bubble. Greenspan’s Fed was successful in averting this threat and deserves much of the praise that it has received. But the 13 or 14 rate hikes show that it went too far – far enough to lose all contact with the markets. There were a total of 17 if we include Bernanke’s, who had to take two of them back two weeks ago.

The next question then becomes: Suppose you conduct a very expansionary monetary policy and for one reason or another you do not experience inflation? Then what do you get? The answer is, on the one hand, *inflation of asset prices* and, on the other, a *general deterioration of credit standards*. This is the legacy with which we are now struggling to cope.

The trouble with inflation targeting

In modern theory, the central bank is supposed to solve a complex dynamic stochastic general equilibrium problem in order to find the right intertemporal path for the interest rate. But in practice interest targeting has to be *adaptive*, as in old Wicksell.¹³ The policy maker never knows the value of the natural rate. He discovers whether his market rate is too low or too high – whether monetary policy is too expansionary or too restrictive – by the price level starting to rise or fall, and he can then adjust Bank rate accordingly. The problem is that *this crucial feedback loop has been short-circuited* by the exchange-rate policies of the other countries, discussed above, which allows the global financial imbalances to grow without end.

So the trouble with inflation targeting in present circumstances is that a constant inflation rate gives you absolutely no information about whether your monetary policy is right. To the extent that the Federal Reserve was focused on an inflation target, the behaviour of the price level would have provided no clue whatsoever that their policy put them more than a dozen quarter-point hikes below the market.

This complication for inflation targeting regimes is, I believe, quite critical. It would not have occurred to Wicksell who lived (in 1898) in a world of fixed exchange rates unlikely to be seriously misaligned by vast flows of portfolio capital. So, although I think of our present system as ‘close to Wicksell,’ it is even farther away from Ricardo than he was.

Financial Instability

It is a simple observation that the experience of Japan shows that inflation targeting will not by itself protect you against financial instability. The present criticism goes a step further. Inflation targeting might *mislead you* into pursuing a policy that is actively damaging to financial stability.

The legacy of the American monetary policy of recent

¹⁰ See CEPR *Policy Insight* No. 1 by Andrew Rose, ‘Are International Financial Crises a Relic of the Past? Inflation Targeting as a Monetary Vaccine.’

¹¹ A *Time* magazine cover, however, demoted him to no better than member of a trioka with Robert Rubin and Lawrence Summers nominating them ‘The Committee to Save the World.’ Now the *Financial Times*, in reviewing Greenspan’s just-published book (Sept. 22, 2007) has put him back in what is apparently his just place. The review appears under a large photo and a fat headline: ‘Master of the Universe (Retired).’

¹² There is a subsidiary riddle: Why, all along, was there so much speculation in the market, in the press, on TV about what the Fed might do to the federal funds rate in its next meeting?

¹³ “... a policy based on correcting short-term inflation misses is the key to avoiding sustained periods of high inflation.” (Woodford, CEPR *Discussion Paper* No. 6211).

years is some asset price inflation¹⁴ and a quite considerable lowering of credit standards. How dangerous is this legacy? The sanguine view has been that securitisation and risk transfer contracts have made the world of finance a safer place than it used to be and that, besides, liquidity has been ample all around. A number of very large failures – LTCM, Enron, Amaranth among them – had occurred with nary a macroeconomic ripple and this was frequently cited as proof of the resilience that recent financial innovations had imparted to the system. The summer of 2007 has shown this sanguine view to be too simple.

Some elements of the ongoing crisis

No big shock triggered the crisis. The problems in the American subprime mortgage market had been simmering since last autumn. It took months and months to come to a boil. Three Bear Stearns funds failed in June without causing much alarm. The announcement by BNP Paribas that the bank was freezing access to two of its funds *because market values for the assets could not be ascertained* was another matter. We had gone through several years when almost any kind of instrument seemed marketable at a moments notice, if not in New York, London or Frankfurt, then in Tokyo, Hong Kong or Singapore. Now, the commercial paper market suddenly froze up, the interbank market froze up and the major central banks had to channel massive amounts of cash into the money market. Meanwhile, the ‘smart money’ piled into US Treasury bills. On August 21, the yield on the 3-month bill dropped briefly to 2.35%. It had hovered around 4.5% the week before and had been well over 5% a month earlier. The American Administration, which can always use some money, was happy to relieve that problem by a very much larger issue of bills than normal.

The trouble with inflation targeting in present circumstances is that a constant inflation rate gives you absolutely no information about whether your monetary policy is right.

Securitisation and credit derivatives had allowed risk to be dispersed through the economy and away from banks where it used to be concentrated. But by the same token, the system as a whole had taken on more risk. And two old verities about risk have not changed. First, the financial system as a whole will always have a maturity mismatch, borrowing short and lending long. Second, leverage can be dangerous as well as profitable.

Securitisation had moved risk away from the banks. But where was it now located? Central bankers and regulators had been scrambling for years trying to keep up with the evolution of the system but remained highly uncertain about where dangerous risk-concentrations

might be located. Ever since the spectacular collapse of Long-Term Capital Management, suspicions had focused on hedge funds, thousands of which would appear and disappear annually. Hedge funds have failed in this crunch. We do not know how many or how big. But the banks learned from LTCM not to get too heavily into the get-rich-quick schemes of the funds and their involvement with the funds this time is apparently mostly limited to their prime brokerage units. The more serious trouble lies with the *contingent liabilities* that have been hidden by the banks *off-balance sheet*.

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The banks have created separate entities, known as ‘conduits’ or ‘special investment vehicles’ (SIVs), usually located offshore in Cayman Islands or some such place where regulators are not much in evidence.¹⁵ The securitised loans of the banks are off-loaded onto these conduits who finance their holdings by issuing asset-backed commercial paper. The SIVs may also convert the loans into various ‘structured instruments.’ These entities have allowed the banks to circumvent the Basel rules¹⁶ (which dictate a relationship between bank assets and their capital) since the assets of the conduits do not appear on the balance sheets of the banks.

Many of these conduits or SIVs were, like hedge funds, highly-leveraged. The new techniques for dispersing risks had already reduced market risk premia. As risk premia shrank, however, many entities had to take on more leverage if they wanted to make the high returns on equity that the market increasingly came to expect from the new finance wizardry. This, of course, compressed spreads even more until, just before the crisis developed, they were at historically unparalleled lows. Thus these entities became very speculative businesses.

Since a conduit was a legally separate entity, the parent bank was supposedly insulated from its possible failure. However, a conduit would normally have a ‘backstop’ agreement with the bank, guaranteeing support from the bank should the conduit run into problems rolling over the short-term paper with which its longer-term assets were financed. Since these backstop provisions were known to the market, they also helped ensure that the conduit could raise funds at a reasonably favourable rate. This contingent liability meant that the banks were not protected from the failure of their conduits after all.

When the extent of the subprime mortgage problems gradually became clearer, the market for asset-backed commercial paper began to dry up. Conduits had prob-

¹⁴ We have Greenspan’s word for it. The decline in house prices ‘is going to be larger than most people expect’, Greenspan told the *Financial Times* (Sept. 16, 2007).

¹⁵ On the role of conduits, see also the recent VoxEU.org commentary “Subprime Crisis and Credit Risk: Something Amiss,” by Luigi Spaventa.

¹⁶ In this regard the Basel rules have had a perverse incentive effect.

lems rolling over their liabilities. The banks were now under threat to have to make good on their contingent liabilities. The situation was made worse by the commitments already made to finance some large leveraged buyouts by private equity firms which would normally have been done by the banks issuing commercial paper. In this situation, the banks had to hoard all possible cash. So the interbank market totally disappeared. Even today, six weeks later, it is operating at no more than 10% of normal volume and smaller banks find no access to it. The market is operating on the old banker's adage: 'Never loan money to someone who needs it!'

Meanwhile various institutions tried to improve their liquidity by selling whatever assets still had a market. Thus markets were affected that had nothing to do with subprime mortgages or with real estate in general. At one point, even the East Asian stock markets fell in this manner. This, again, is one of the ways in which portfolio theory fails us. It assumes that the returns on the various assets are independently distributed. But in a liquidity crisis, they are instead all correlated. The independence assumption fails and the investor lands on his 'fat tail.'¹⁷

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How does the story end? We do not know. At the beginning of October, the markets are still described as 'fragile'. The quarterly reports by the investment banks a few days ago showed aggregate losses on the order of US\$200 billion. One's first reaction is: 'It could have been worse.' Trouble is, it probably is worse, perhaps much worse. In these reports, many assets were not MTM ('marked to market') either because there simply was no market quotation at all or because the bank would rather attach a 'fair value' to the asset than its current market value. So the losses are probably underestimated.

The deposit-taking banks will only report at the end of this month. So far, the British who stick to tradition in all things are alone showing us an old-fashioned bank run with long lines of people queuing to get their money out. If the banks report very large losses, the Northern Rock show may still come to your neighbourhood (well, probably not to Trento, but...)¹⁸

Some tentative conclusions

(1) We see much written and hear much talk to the effect that the 'real economy' is still going strong and that we may get through these financial troubles without a recession. I would be quite surprised if that were to be so. Finance is not just

some froth on the surface of the real economy. It is now more than just likely that the financial sector will have to go through a process of substantial de-leveraging. It is, I believe, a fallacy of composition to think that this can be done without going through a recession. The way to reduce one's debt is to buy less and try to sell more. If we all try to do this at the same time, the result is general excess supply of goods and services, falling prices and unemployment.

(2) Central banks are in a difficult situation of asymmetrical political pressures today. Low inflation does not prove that they are doing the right thing. They may be aiding and abetting the build-up of an asset-price bubble. But they have no 'scientific' way of determining what is and what is not a bubble – except after the fact. If they threaten to act against what they judge to be a bubble, all the institutions and individuals who see themselves getting rich will be up in arms against them and there will be no countervailing interest group of political consequence. Recall how quickly Greenspan backed off his famous 'Irrational Exuberance' speech! The 'domestic carry-trade' that the Fed created with its extreme low-interest policy *did* make lots of bankers rich. The Greenspan cult on Wall Street is understandable. After a bubble has burst, however, all the people who previously wanted no government interference with 'free markets' are clamouring for the central bank to pick up the pieces. First, damned if you do; then, damned if you don't. This political asymmetry is all the worse because of the asymmetry in the economy's asymmetric response to policy. It is all too easy to feed a bubble but hard and sometimes well-nigh impossible to reflate once it has burst. Greenspan managed to do what the Bank of Japan did not, but his problem was much less severe. And Bernanke will not have the options that Greenspan exercised.

(3) Something similar is going on within the large private sector financial institutions.¹⁹ Just as rational expectations macro-theory fails to support central bank action against asset price inflation, so Gaussian portfolio theory fails to provide risk managers with a solid basis for reining in traders who are making 'big money' for the bank (and for themselves) when the going is good. More ad hoc limits on positions taken are hard to sustain. Losses incurred in crises lend renewed credence, for example, to stress tests of exposure, but memories on Wall Street tend to fade quickly and so then does the influence of risk managers.

(4) The most important lesson from the crisis of 2007 stems from the fact that no big exogenous shock set it in motion. What this almost certainly means is that the occurrence of crises is an

¹⁷ On 'fat tails' in financial theory see, e.g. Campbell, Rachel A.J., Forbes, Catherine S., Koedijk, Kees C.G. and Kofman, Paul, 'Diversification Meltdown or Just Fat Tails?' (June 2006). EFA 2006 Zurich Meetings.

¹⁸ This lecture was given at the University of Trento, October 1, 2007.

¹⁹ On this matter, see Christina Leijonhufvud (forthcoming).

endogenous property of the world financial system as we have let it evolve. Since the big stock market crash of 1987, we have had crises of one sort or another about every 3–4 years on average. We will now tinker with the system and make some regulatory changes and perhaps the big institutions will revamp their accounting systems and compensation practices (although of that one cannot be confident). But these will be superficial changes and the problems are deep-seated. It is a complex dynamical system and it would be folly to think that we understand it very well. We have other crises coming down the road towards us. The present crisis is not over and how serious it will end up being we do not yet know. But the chances are that, sooner or later, one will come along that will be much bigger than this one.

Mid-October Postscript: The Superfund

For a week, the press has reported fragmentary information about plans for a 'superfund.' Treasury Secretary Hank Paulson has called representatives of the biggest banks to Washington to pressure them to contribute to a fund, the proposed size of which is variously reported as US\$ 100, 80 or 60 billion. The twin aim of the fund would be to prevent disorderly liquidation of mortgage backed securities from unduly depressing their prices and at the same time to revive the market for asset-backed commercial paper.²⁰ The first objective would be pursued by the fund buying assets being sold by distressed funds and the second by providing commercial paper backed by the credit of the nation's biggest and most prestigious financial institutions.

While the Treasury is taking the lead with this initiative and the Federal Reserve keeping itself discreetly in the background, the plan has obviously parallels with the 1998 take-over of Long-Term Capital Management's assets by the major banks which was engineered by the New York Fed under its then President, William K. McDonough. The earlier episode involved extremely complicated and contentious negotiations among the banks²¹. It may be presumed that the superfund is not much easier to bring into being for it is less than obvious that the interests of the major banks are well aligned. Citicorp controls seven major conduits with assets thought to be on the order of US\$ 80 billion. Three Citi conduits make it onto a list of the world's ten biggest. JP Morgan, Bank of America, and Wachovia apparently are not engaged to a similar extent.

The Superfund project and the LCTM take-over nine years earlier suggest an answer to the question whether the traditional instruments of monetary policy are fully

²⁰ The large accounting firms gave the banks added incentive to avoid such liquidation by signaling that their auditors would insist on actually "marking assets to market" and not to more or less arbitrary "models."

²¹ A very good account is given by Roger Lowenstein (2001, Chapter 10).

adequate to ensure stability of the financial system that has evolved over the last twenty-some years. The suggested answer is: NO.

...when we find the government repeatedly aiding and abetting the collusion of these financial behemoths, which we have allowed to grow 'too big to fail', some rethinking of the relationship between government and big finance would seem to be in order.

It is something quite extraordinary to see first the Federal Reserve and then the US Treasury actively engaged in organizing the collusion of the banking oligopolies. With the demise of Glass-Steagall fell the last bastion of Western populist opposition to the concentration of moneyed power in New York. (There is a bit of irony in the fact that a senator from Texas was the point man in the venture). The banking mergers of recent years have increased this concentration tremendously and the political as well as economic power wielded by Wall Street is more palpable than ever. The Greenspan carry-trade years enriched these institutions and the people running them greatly. Nowhere has the upper tail of the income distribution been extended as far as in the financial industry. In both the Superfund case and the LCTM debacle, the objective of preventing a deviation-amplifying financial collapse would admittedly seem to be in the public interest. But when we find the government repeatedly aiding and abetting the collusion of these financial behemoths, which we have allowed to grow 'too big to fail', some rethinking of the relationship between government and big finance would seem to be in order.

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