Global Asset Allocation and Alternative Investments
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How will the crisis change markets?

- The financial crisis will affect market structure and pricing **for at least a decade**.
- After major crises, market participants focus intensely on **not making the same mistakes again**.
- The **crisis zone becomes lower-risk** for a long time, even as investors **move leverage elsewhere** — such as EM and commodities.
- The current crisis results from 3 sources of excessive risk taking — **credit** in housing, **leverage**, and **maturity transformation**.
- Maturity transformation outside the US regulated banking world reached **$5.9 trillion** last year, or 40% of total bank deposits.
- Central banks' extension of liquidity to broker-dealers and securitised world is permanent, and will **be followed by regulatory control**.
- Bank incentives to get assets off their balance sheet will be weakened, leading to **larger and safer banks, and reduced securitization**.
- But the **economic benefits of securitization** and CDOs — creating choice in investable assets and avoiding double taxation — **remain in place**. The economics of short-dated funding of CDOs are dead.
- **CDOs to limit themselves to corporate credit** and not ABS as the latter's correlations are too high during crises.
- The **new securitised market** place will be **smaller, less leveraged, better disclosed**, and will depend on risk distribution rather than maturity transformation.
- **Hedge funds to consolidate** to gain access to longer-dated funding.
- **Term, liquidity, and credit premia will be higher** on average over the next cycle.

We received valuable input from many colleagues, including Eric Beinstein, Michael Feroli, Chris Flanagan, Jonny Goulden, Bruce Kasman, Grace Koo, Joe Lupton, Robert Mellman, Nikolaos Panigirtzoglou, Peter Rappoport, and Alex Roever.

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A global financial crisis

The financial crisis that erupted in the US this summer, and then spread across much of the world, owes its severity and persistence to its roots in **three different crises** that each were capable of severe damage in their own right. Each relates to a particular type of risk. The crisis started as a basic **credit shock** in the US subprime mortgage market, resulting from a loosening of lending standards, amplified by heavy balance sheet **leverage** in the asset securitization markets, and then turned into a global liquidity crisis by their increased reliance on **short-dated funding**. It is impossible to segregate the impact or assign relative responsibility to each of these sources of risk taking. On their own, each was probably manageable. But their combination and interplay produced a lethal cocktail that is still playing havoc with world markets.

The dramatic losses to investors and the banking industry are forcing market participants and regulators to review **what lessons can be learned from the crisis and what should be done differently** in the future. This paper investigates how this crisis will change the financial industry in coming years. Our interest is to look beyond current conditions to gauge what new products, practices, regulations and market structures will emerge from the ashes of the current crisis. We make no recommendations on what should happen, as there is already a growth industry in that, focusing instead on what is likely to happen.

Three crises in one — credit, leverage and funding

In a nutshell, market participants and regulators will focus intensely on controlling the risks that were at the core of the crisis — lending standards in mortgages, leverage in the funding of securitised products, and the growth of bank-like maturity transformation outside the central bank supported world. Banks will become bigger, safer and somewhat less profitable. Securitization will return as its economics are intact, but will be smaller and funded differently. Hedge funds will become larger.

Determined not to make the same mistake again

In the following, we analyse the 3 distinct sources of risk taking that led to the crisis — credit, leverage and liquidity. Next we show how this crisis is not the first, but one in a series of boom-bust cycles over the past three decades of open financial markets. Each of these crises changed market behavior and structure for a long time. We use these to gauge how the current one will change central banks, regulations, securitization, market pricing, and the competitive landscape in finance.

It all started with subprime mortgages

The **subprime crisis**, as it will likely be known in the future, started as a credit problem in the lower-quality section of the market for US housing finance. It was triggered by a combination of rising borrowing costs and falling housing prices, themselves brought on by overbuilding, with rising levels of consumer leverage.

Subprime started as a very small market

Through the early years of this decade, the subprime mortgage market was a relatively small and well disciplined corner of the overall US credit market. As the economic expansion unfolded, however, conditions became increasingly favorable for supporting greatly increased subprime borrowing and lending. And as this market boomed, the **discipline eroded.**

In the years following the 2001 recession, the combination of relatively low and falling unemployment rates and low and falling mortgage rates provided a very supportive environment for the housing market in general and the subprime mortgage market in particular. In addition, and especially important to the surge in subprime mortgage activity, this entire decade has been characterized by relatively **rapid house price appreciation** (Chart 1). Rapid price gains allowed potential home buyers the

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opportunity for capital gains from home ownership. Moreover, in the case homeowners had difficulty making their monthly mortgage payments, house price appreciation allowed a ready source of funds via cash-out refinancing. House price appreciation steadily reduced the loan-to-value of outstanding loans and, in the case of foreclosure, increased recovery rates.

Self-reinforcing cycle of lending and price gains

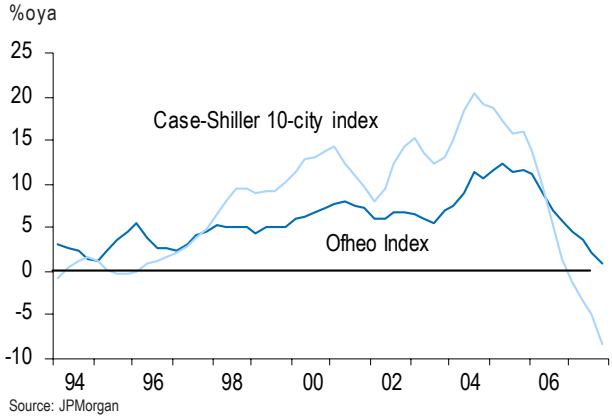
By the middle of the decade, a **self-reinforcing cycle of surging subprime lending and increasing home sales and price appreciation** was under way. This process was occurring at a time when credit spreads for other debt products were declining to unusually narrow levels. Securitized subprime mortgage issuance exploded, from about $60 billion per year in the late 1990s to over $200 billion in 2003 and over $450 billion in both 2005 and 2006 (Chart 2).

Loosening of lending standards

In the process, **lending standards were becoming easy** and, in hindsight, dangerously easy. Standards on FICO scores and down payments were maintained. But the share of subprime loans financed with a silent second that lent all or part of the down payment exploded from 6.8% in 2003 to 24.6% in 2005 and 33.2% in 2006. The share of subprime mortgage loans with stated documentation, for which there was no verification of borrower income or other key information increased from an already high 27.7% in 2003 to 33.2% by 2006. There were also widespread allegations that property appraisals for subprime loans were inflated in many instances.

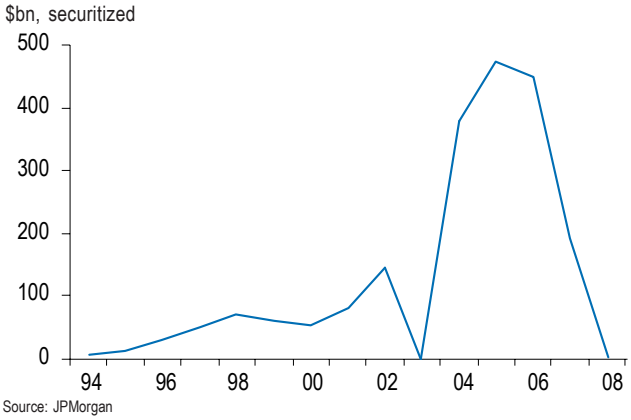
Lenders were not alone in creating the housing bubble. US households themselves eagerly used the easy credit availability to pile on the debt. Chart 3 shows how in

Chart 1: US house prices



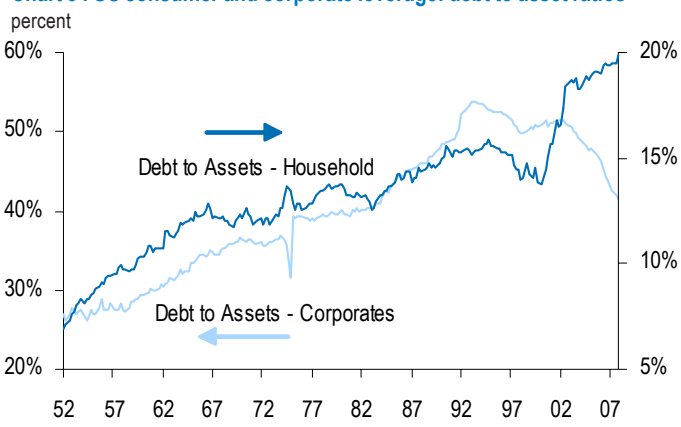
Source: JPMorgan

Chart 2: Subprime mortgage issuance



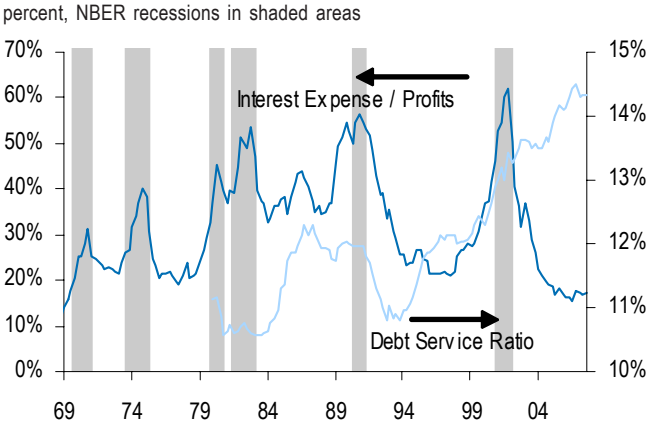
Source: JPMorgan

Chart 3 : US consumer and corporate leverage: debt to asset ratios



Source: JPMorgan

Chart 4: Debt servce ratios by US households and corporations



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Household leverage was increasing significantly ...

... as corporates were deleveraging

recent years, debt rose significantly faster than US household assets, which consist largely of equities and residential real estate. By comparison, US non-financial corporates used the current decade to deleverage their balance sheets, after getting into trouble with the orgy of leverage of the 1990s. Higher debt loads by themselves don't do a lot of damage if one can pay the interest. But this situation was also worsening rapidly. Chart 4 shows how US consumers' **debt service ratio** (required interest and principal repayments) has **steadily increased**, from 11% of disposable income during the early 1980s, to 14% most recently. In addition, we know that consumers have in recent years increasingly made use of adjustable-rate mortgages, often with initial subsidized teaser rates, which increased their exposure to a rise in short rates. By comparison again, US non-financial corporates show no signs of stress here as interest expense has fallen to a 30-year low as a share of profits.

Subprime is dead now

The housing market continued to prosper so long as house prices were rising rapidly. Originations rose sharply, delinquencies declined, and home ownership rates in the US reached new highs. However, a slowing and eventual decline in house price appreciation showed just how much the success of the market depended on rising house prices. By the fall of 2006 it was clear that subprime mortgage delinquency rates were rising rapidly, and data on delinquency rates by vintage of loan showed sharply deteriorating loan quality for the recent vintage loans. Since 2006 delinquencies rates have continued to soar; foreclosure rates are rising rapidly, and the value of subprime mortgage paper has deteriorated sharply (Charts 5-6). As a consequence, the **subprime mortgage market has virtually disappeared**.

Leverage magnified the impact of the credit shock

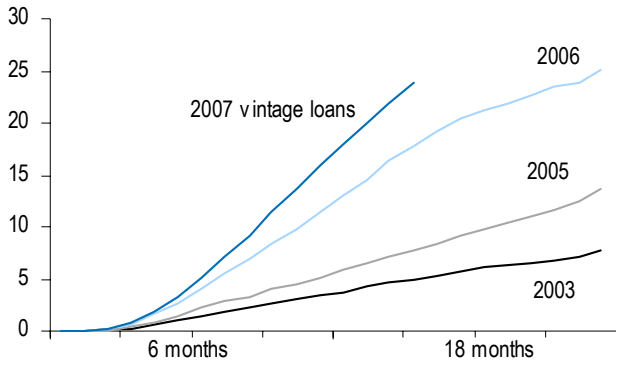
Leverage in finance amplified the impact of the subprime crisis

The impact of the loosening in credit standards and higher consumer leverage in the US mortgage markets and the resulting credit losses was amplified by the steady **rise in leverage in the financial system** in recent years. This was not so across the broad set of commercial banks and hedge funds, but more so in the functioning and funding of the securitised markets, outside the regulated world of banking.

1. Hedge fund leverage

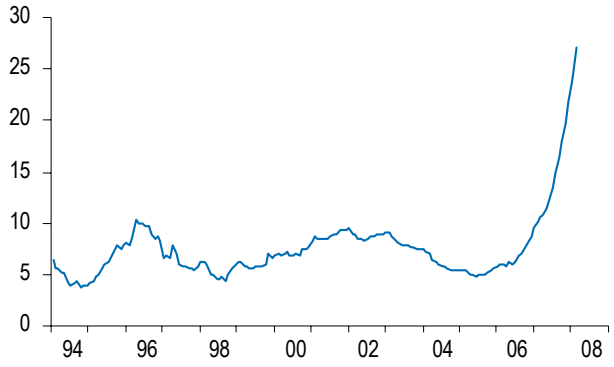
Hedge funds represent an important part of the investment universe as they account for a third or more of total trading volumes on some financial assets. They control more assets than the capital they receive as their leverage is subject to few regulatory restrictions. They can leverage up by either borrowing or using derivatives. Estimating hedge fund leverage is a difficult task as they have significant flexibility as to the exact assets they can invest in. We address this problem by establishing

Chart 5: Delinquency rate on subprime mortgages by age of loan and vintage
Percent 60 days or more delinquency, securitized mortgages



Source: JPMorgan

Chart 6: Delinquency rate for securitized subprime mortgages
Percent, 60 days past due through foreclosure



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benchmark asset classes for different types of hedge funds, through a style analysis, and then relating hedge funds' return volatility to the asset class volatility. The higher the ratio of these two, the higher the leverage of the funds must have been.

Overall hedge fund leverage, outside of credit, has remained under control

Chart 7 shows this proxy of hedge fund leverage averaged across types of funds and the volatility of the underlying asset classes. It shows a negative relation between market volatility and hedge fund leverage, as implied by value-at-risk targeting, but a **structural break in leverage at the start of this decade**. After the LTCM crisis found banks dangerously exposed to hedge funds, they tightened massively on lending to hedge funds, thus reducing their ability to leverage up. The very low volatility until the middle of last year induced again a rise in hedge fund leverage, but to well below the average of the 1990s. And remarkably, by the time of last summer's explosion in volatility, hedge funds as an industry had already reduced overall leverage. Credit hedge funds, which are near the epicentre of the current crisis, make up only a small part of the overall hedge funds industry.

2. Bank leverage

Leverage by commercial banks, or at least the amount of capital used to fund assets, is regulated strictly under international agreements that were originally negotiated under the auspices of the Bank for International Settlements in Basel. The original set of rules, known as Basel I, have since been extensively updated, and a new set of rules, Basel II, is now in the process of being implemented in major economies. Europe has started this year while the US is adopting it next year.

Bank leverage — on the balance sheet — has remained stable ...

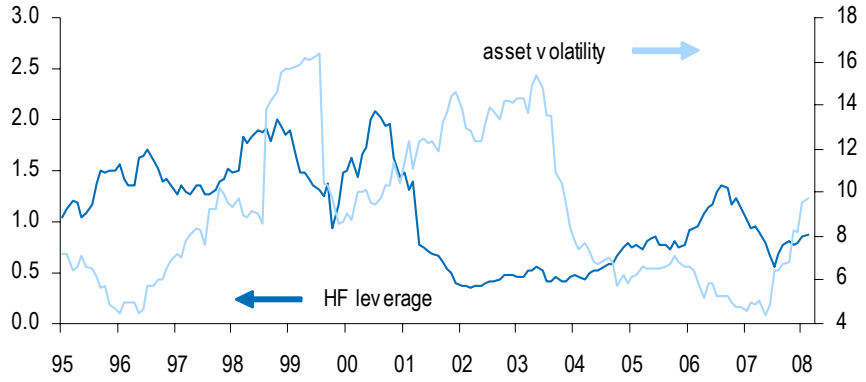
Charts 8-9 show how US commercial bank **capital ratios have been quite stable** in recent years, and have only fallen following the subprime crisis. This raises the issue whether commercial banks have just transferred leverage to the securitized world, in order to escape the scrutiny and control of the regulators.

3. Leverage through securitization

... as leverage moved off the balance sheet

Banks securitise loans in order to gain operational earnings leverage. That is, they try to gain fees from originating and then distributing loans, thus not locking capital up in holding the loans. The degree to which securitization increases overall leverage of the financial system depends partly on **how the loans are securitized, but mostly on how they are funded**.

Chart 7 : Hedge fund leverage



Source: CSFB/Tremont and JPMorgan Our measure of HF leverage is a weighted average of the estimated leverage for five HFR hedgefund styles: Equity long/short (37%), Equity short (1%), Macro (22%), Fixed Income arbitrage (8%), Convertible arbitrage (7%) and Emerging Markets (2%), Equity neutral (2%) and Event driven/Distressed debt (20%). For each style we divide the hedge fund index return volatility by asset return volatility which we proxy by S&P 500 returns for Equity long/short, Equity short and Equity neutral, Global bond index USD hedged returns for Macro and Fixed Income arbitrage, high yield returns for Convertible arbitrage and Event driven/Disstressed debt and EMBIG returns for Emerging Markets. The same pattern also arises if we adjust the hedge fund leverage proxy upwards by the steady rise in the number of hedge funds over the past decade (see *Have hedge funds eroded market opportunities?* Loeys and Fransolet, Oct 04).

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The real leverage in securitised products does not come from the products themselves ....

Chart 10 shows a set of skeleton **balance sheets** of the major players involved in the securitised world that allows us to follow how securitization and its funding determine overall balance sheet leverage in the system. **Banks** are shown on the top. If they hold on to the loans they originate, and fund them for 90% with deposits and 10% equity, as is typical, then they have produced 10x leverage. Hence, **the case of no securitization thus starts with 10x leverage**. Next on the left of Chart 10 are **three different types of securitization— pass-through, asset collateral, and tranching**— while the middle and right show how these are funded.

... but from how they are funded

Pass-throughs create little leverage

1. Pass-throughs, such as simple loan participations and mortgage-backed securities, do not directly create leverage, unless the investors themselves use debt to purchase the participation. A pass-through literally just passes through income and principal payments to the buyer. A fall in the value of the assets is just passed on to the participation without forced unwinding of the vehicle. If the pass-throughs are held by insurance companies, pension or hedge funds that are geared the same way as banks, then there is no increase in leverage. If they are held by hedge funds that in turn use more leverage than banks, then indeed there is an increase in balance sheet leverage, especially if the hedge funds are in turn funded by institutions, such as banks, who themselves apply leverage on their balance sheet.

Agencies do not produce that much extra leverage

2. Asset collateral involves an investment company — such as the GSE's — buying loans and issuing debt, with the loans becoming collateral to the debt, supported by a certain level of equity capital (third level of Chart 10). GSE's use less capital than commercial banks. If their bonds are bought by pension funds and insurers that also are funded with debt, then overall balance sheet leverage is increased significantly.

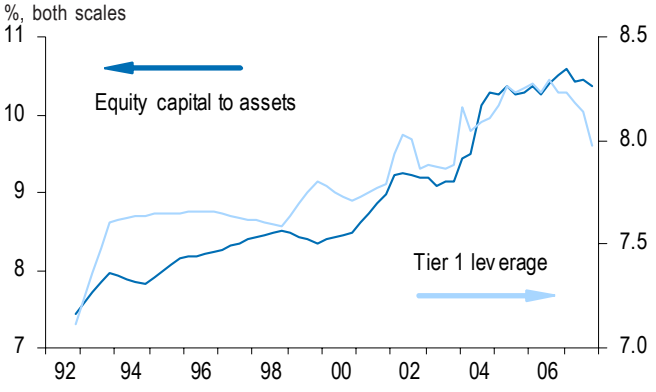
CDOs themselves merely redistribute risk ...

3. Tranches: In this case, loan originators issue extra risk tranches, in between debt and equity. They thus create a multi-tranched funding mechanism for the participations in the loans. In the most basic case, three tranches — senior, mezzanine, and junior — receive the cash flow emanating from the assets by seniority rules. The junior, or equity holder gets the residual cash flow and the senior and mezzanine receive cash flows on the basis of promised coupons (bottom in Chart 10).

... until you start funding them with massive leverage

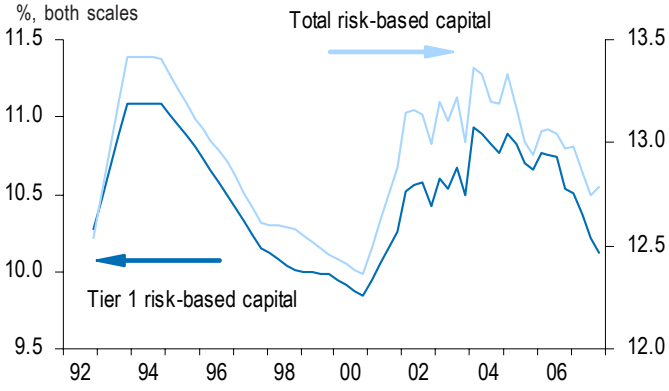
Clearly, the **equity tranche is a leveraged investment, but the senior tranche is an underleveraged investment**. CDOs by themselves create risk distribution, but not an increase in overall leverage by itself. Any such **rise in leverage comes from how the different tranches are funded**. If all tranches are bought by pension funds and insurance companies in the same proportion as the size of the tranches, then aggregate leverage has not increased relative to a simple MBS. However, the

Chart 8: US bank capital ratios



Source: JPMorgan

Chart 9: US bank capital ratios



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purpose of issuing many tranches is to meet the diverging needs of different types of institutional investors. Hence, they are each bought by very different types of investors. This "slicing and dicing" of risks and cash flows creates economic value to the extent that it better matches the objectives of investors than plain-vanilla pass-throughs, bonds or equities.

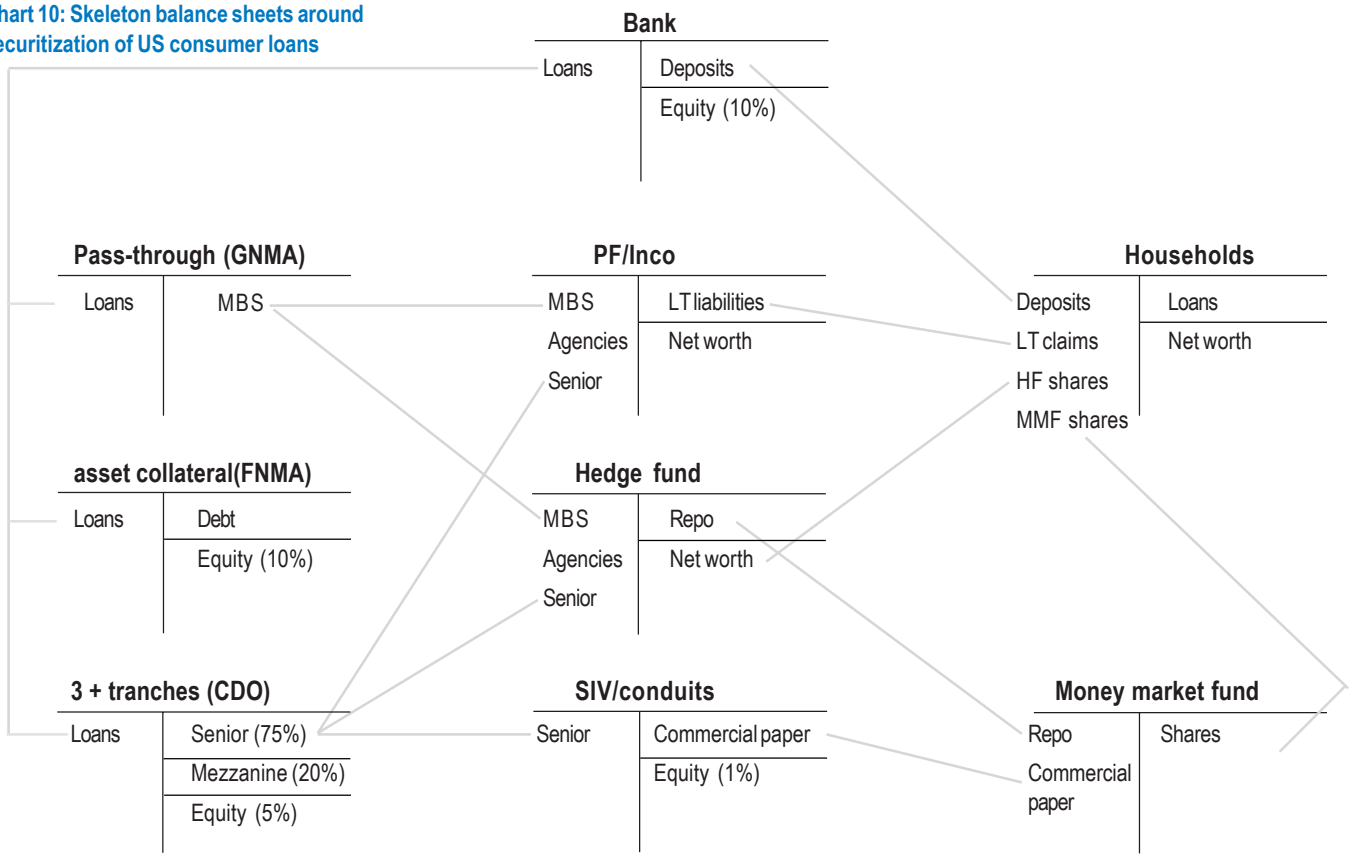
The first generation of CDOs had an investor base that lined up neatly by the riskiness and thus seniority of the tranches. Investors constrained to buy high-rated paper flocked to the senior tranches, while hedge funds and prop desks went for the equity tranches. Pension funds and insurers bought the mezzanine tranches.

Leverage came in the funding of AAA tranching and emerged to keep CDO/CLOs "economical"

As yield spreads came down in more recent years, it became harder to still offer attractive yields on the senior tranches and sponsors had to look for other ways to fund them. A solution was found by **wrapping them with cheap guarantees from monoline insurance companies**, thus permitting a AAA rating, and then selling them to conduits and structured investment vehicles that funded themselves largely with short-dated instruments that were bought in turn by money market funds.

Banks also bought them as the AAA rating on these tranches massively lowered the capital they were required to hold against them. Under Basel II, which banks were in the process of implementing, AAA investments on balance sheets require only 0.56% of capital (7% risk weight times 8% capital requirement). As a result, AAA tranches paying libor +10bp still produced an ROE of 20% on the sliver of capital used to cover the minimum regulatory capital requirement. **The overall impact was a significant impact in balance sheet leverage**. It is nearly impossible to neatly quantify this as it requires tracking the funding base of all the investors who bought CDOs, which is information we do not have.

Chart 10: Skeleton balance sheets around securitization of US consumer loans



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And the third crisis is a funding & liquidity crisis

The lack of sufficient capital support in the funding of securitised credit products was a major factor amplifying the impact of the subprime credit crisis. But the speed, breadth and magnitude of the original credit shock were also greatly amplified by a third vulnerability in the financial system — namely, the large **dependence of investors in structured products on short-dated funding**.

Increased reliance on short-dated funding

While balance sheet leverage by itself indeed magnifies credit losses on junior claimants and can thus bankrupt them, this would only manifest itself gradually if the senior claimants are locked in for a long time. It is instead the increased reliance in short-dated funding that allowed senior lenders to securitised vehicles to vote with their feet and to force a rapid fire sale of the assets. This in turn drove asset prices down rapidly.

Perfect conditions for a run — illiquid assets, maturity transformation, a shock, lack of transparency, and no lender of last resort

This chain of events has an eerie similarity with a classical bank run such as the US experienced during the 19th Century is chillingly close. **The essence of a bank run** is as follows. A bank holds illiquid loans funded by deposits on which it promises payment on demand. This promise of liquidity can be fulfilled as long as depositors do not all require repayment at the same time. The crisis erupts when an event or mere rumour puts the bank's credit quality in doubt. The bank cannot liquidate its illiquid assets in short time and thus defaults on its promise to repay deposits on demand. **As a result of such bank runs, central banks** were given the responsibility of functioning as lenders of last resort to create liquidity in times of crisis. To prevent the moral hazard of commercial banks taking too much risk, as they can always rely on central banks to provide liquidity, the latter regulate risk taking by commercial banks.

If it walks and talks like a bank run

The **sufficient conditions for a run are a negative credit shock, illiquid assets, lack of transparency on asset values, maturity transformation, and the lack of a lender of last resort**. Each of these had become present in the market for securitized mortgages. **The crisis can thus be seen also as a run on securitized credit**.

Short-dated funding via ABCP for SIVs and hedge fund repos ...

From Chart 10 and the discussions above, we see two basic forms of short-dated funding — structured investment vehicles (SIVs) and conduits issuing commercial paper, usually on the strength of monoline insurance and liquidity backups from banks; and repo funding by hedge funds investing in structured products. Chart 11 depicts the maturity transformation flows that are involved in this parallel banking system. This reliance on short-maturity funding allowed the structures to exploit the term structure both in the interest rate curve and in the credit maturity curve. In addition, it gave them access to faster growing markets for cash-like instruments.

... joined by broker dealer repos as well as ARS, TOBs, and VRDOs

In analysing the emergence of short-dated funding, we need to add also two other sources of maturity transformation that have grown at great pace outside the Fed-regulated banking system: **broker-dealers, and the world of auction-rate securities (ARS), tender-option bonds (TOBs), and variable rate demand obligations (VRDOs)**. US broker-dealers, the traditional investment banks have become massively dependent on short-dated funding[1]. Without going in detail, the alphabet soup of ARS, TOBs, and VRDOs consists of structured finance vehicles that transform long-term assets, such as municipal bonds, into assets that were considered to be short-term debt and thus eligible for cash investments[2].

1. See Michael Feroli and Bruce Kasman, *US broker-dealers fall into the Fed's net*, March 20.
2. See Alex Roever, *Parallel muni-verse*, Feb 1, for more details.

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The parallel banking system grew to $5.9trillion in the US last year ...

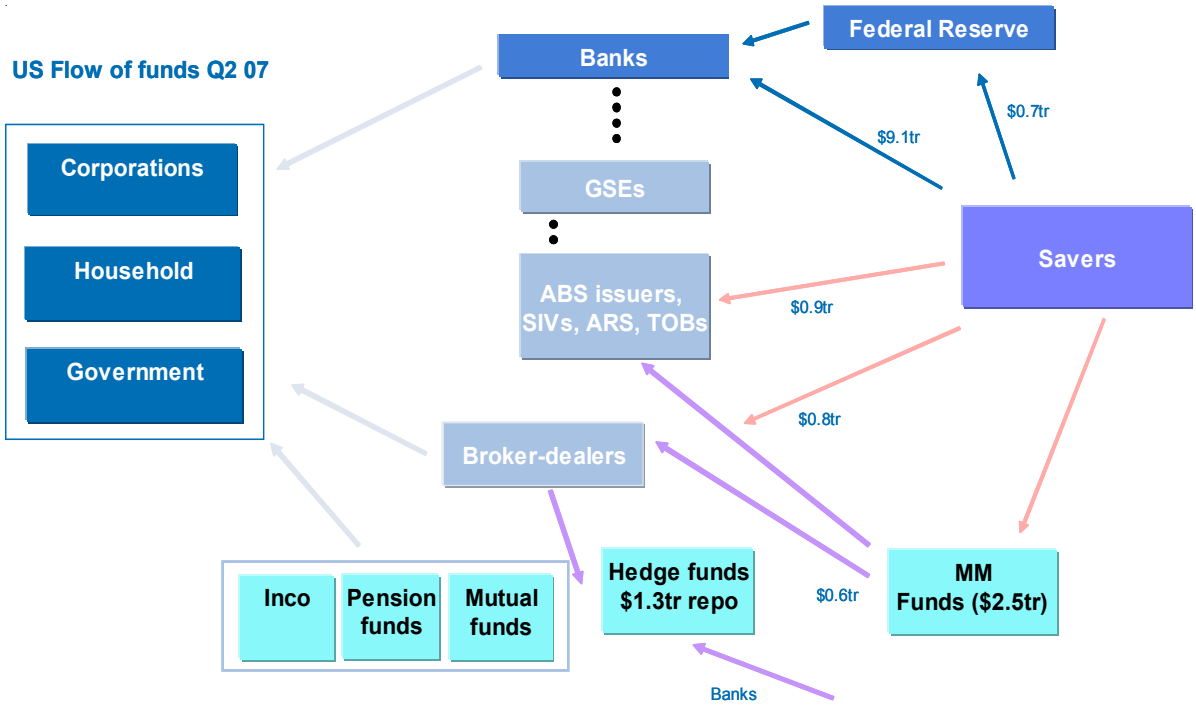
There are no clean data on the total magnitude of maturity transformation outside the Fed-regulated banking world. However, we have been able to combine a number of sources to gauge its size. Chart 12 identifies four sources of short-dated funding of longer-maturity assets outside the banking world. Data are for the middle of last year. We find at total of **$5.9 trillion**, coming from (1) broker-dealers funding through repos and customer deposits ($2.2tr); (2) commercial paper issued by ABS issuers, finance companies and funding corporations ($1.4tr); (3) auction rate securities, variable rate demand obligation, and tender-option bonds ($900 billion, by our estimates); and (4) some $1.3 trillion in repo funding by hedge funds. The latter is estimated by extrapolating results from a BMA survey of June 2004 on the basis of the 50% growth in overall hedge funds assets since then. Chart 13 also shows the ratio of two of these components — CP and broker-dealers funding via repo and other short-dated funds — for which we have time series, over bank deposits and repos. It highlights how maturity transformation outside the banking world has grown from negligible amounts 20 years ago to almost half of bank maturity transformation this past year.

... or 40% of short-dated funding by commercial banks

This $5.9 trillion in maturity transformation in what one could call the parallel banking world compares with $9.4 trillion in short-dated funding by the regulated world of banks, thrifts and credit unions ($7.9tr in checking, time and saving deposits, $1.4 trillion in repo funding, and just under $100 million in commercial paper issues). Overall thus, we find that **maturity transformation outside the banking world amounts to 40% of total maturity transformation in the US financial system**.

In sum, we have argued that the current financial crisis derives from the culmination of three different types of risk taking — mortgage credit, leverage in securitization, and a dependency on maturity mismatching in funding securitised products. We now investigate how markets will be different after the crisis has passed.

Chart 11: Stylised picture of US flow of funds. Focus on parallel banking system
Q2 2007 data



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Stylized facts on past financial crises

Given that the current financial crisis is not the first one we experience and that there have been plenty of other ones before, we can learn a lot from how market behavior and structures changed after these past crises. After each crisis we find that

Always fighting the last war

- After the crisis, market participants and regulators gain consensus on the cause of the crisis and commit **not to make the same mistake again**.
- **The crisis zone becomes a low-risk** area of investment through the next cycle as leverage is reduced, policy adjusted and the mistakes that are thought to have brought on the crisis are corrected.
- After the crisis, investors move to **new areas** where they again bid up the price and recreate **another boom/bust cycle**.

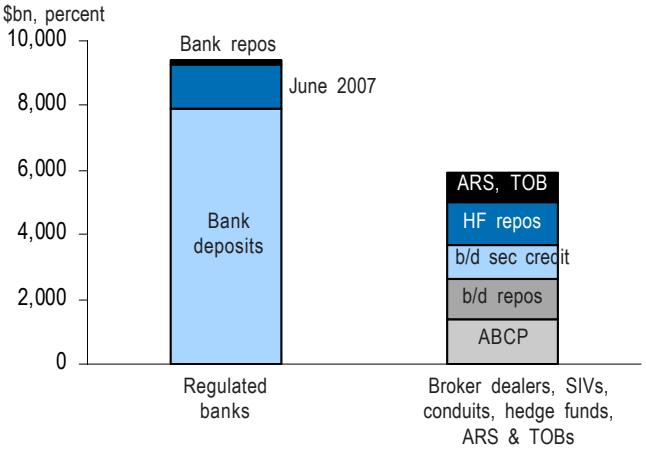
Following the **1980s broad-based default on banks loans to emerging sovereigns**, banks greatly reduced their direct lending and instead moved to underwriting bond issues they then sold in the open market (Chart 14). Similarly, after the **S&L** crisis of the 1980s, US banks moved aggressively into securitizing such mortgages, only holding a smaller part of them on their own balance sheets. Both crises induced global regulators to impose consistent minimum capital requirements on banks under the auspices of the BIS, henceworth known as the Basel rules.

Policies and practices changed for at least a decade after each major crisis

The **European ERM** crises of the late 1980s and early 1990's were one of the most important factors that convinced policy makers in many European Union nations that they needed to eliminate their currencies and move on to monetary union. Following the **EM crises of the 1990s**, which were effectively the result of rampant leveraging (short-dated borrowing in foreign currencies while fixing exchange rates), many emerging economies, especially in Asia, pursued competitive currencies, and built massive reserves to frighten away speculators. This in turn helped to push bond yields down in the major markets — Mr Greenspan's conundrum — contributing to excess mortgage borrowing in the US.

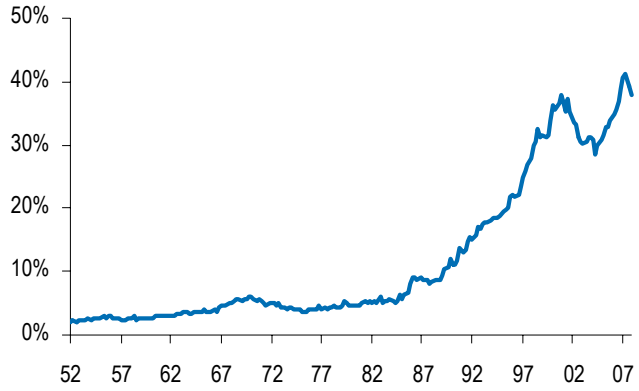
The **LTCM** crisis of 1998 induced banks to impose greater leverage constraints on the hedge funds they dealt with (see Chart 7). The **Nasdaq** crash induced investors to become more cautious on equities and prevented equity prices from rising faster than earnings growth, thus inducing a steady decline in earnings multiples during the current decade.

Chart 12: Maturity transformation by US banks and non-Fed regulated intermediaries



Source: Federal reserve, JPMorgan, Bond Market Association

Chart 13: Ratio of broker dealer repo and short funds + CP issued by non-bank financials over bank deposits and repos



Source: JPMorgan

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What will change?

These stylised facts on past crises give us some guidance on how the current crisis will change markets. The essence is that market participants are all trying to gauge what went wrong and will **change behaviour and institutions in order to prevent a recurrence of the crisis**.

Each of the 3 crises — credit, leverage, and liquidity — will leave a footprint on future market practices and regulations

A debate is raging on whether the crisis is primarily a credit, leverage, or liquidity crisis. The credit view dictates changing lending practices and regulations in the mortgage market. The leverage view implies bringing in more capital into the securitised world. And the liquidity view will force central banks as lenders of last resort to widen their field of operation and regulation to the securitised world. We guess that a consensus is likely to emerge that all three crises were present and that each needs to be dealt with. In the following, we list a number of likely changes, based on efforts to deal with each of these three crises. This is not to say that we consider these changes desirable, or that we believe they will fix the problem. We are trying to **forecast what will happen, not what we think should happen**.

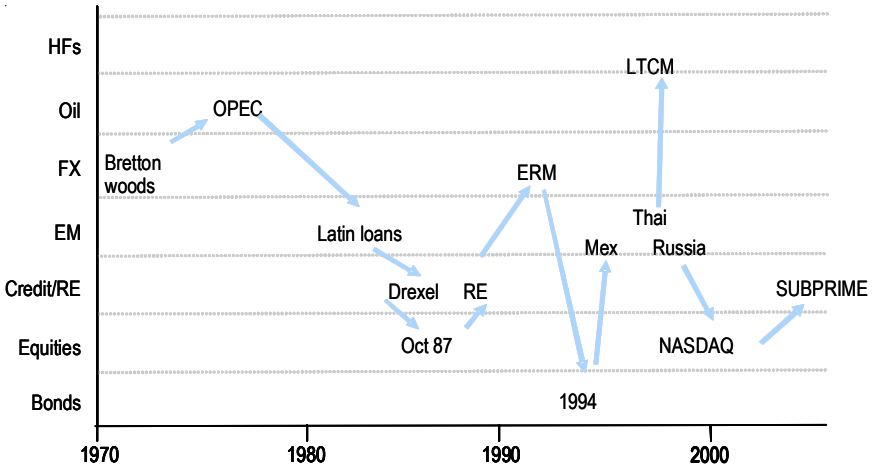
1. Central banks as lenders of last resort

The cat is out of the bag: monetary policy is changed forever

Central banks initially assumed that last summer's sell off in markets was a basic liquidity problem in the banking sector, a mini-version of the LTCM crisis. They thus initially reacted by making more liquidity available to banks, without lowering interest rates, holding on to the view that inflation was a bigger macroeconomic risk. The steady widening and deepening of the liquidity crisis then forced major central banks to inject more liquidity, **widen the type of collateral accepted**, cut interest rates, and, in the case of the US Federal Reserve, **extend the type of borrowers at the discount window to broker-dealers** that function as primary dealers.

The actions of central banks could be considered emergency actions that will be turned off once the crisis abates. Rate cuts can indeed be reversed easily. However, a significant part of the structural changes in monetary policy in terms of **the type of collateral accepted, the maturity of the loans extended, and the type of borrowers to have access to the central banks will likely become permanent**. This is because central banks will have come to the conclusion that at the core of the current crisis is a bank run on the securitized asset world, a world to which they had little access[3].

Chart 14: A cycle of financial crises



Source: JPMorgan

3. For more details, see Michael Feroli and Bruce Kasman, *The Fed's big bang*, April 11, 2008

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But central banks are unlikely to start targeting asset prices

Will central banks start targeting asset prices? The US housing crisis has induced a barrage of criticism at the Federal Reserve for having caused the housing boom and excess leverage itself by keeping rates too low for too long, just as it was criticised for not having prevented the 1990s equity market bubble. This issue will be debated hotly in coming years. Our view is that central banks will stay with the Greenspan doctrine that it is impossible to identify asset bubbles while they emerge, that asset prices are not part of their legal mandate, but that they will, as before, take all drivers of economic activity into account when setting monetary policy.

2. New regulation

It is a safe bet that bank regulators will tighten regulations on risk taking in the financial system. Most likely, regulators in the US and Europe will **tighten rules where they believe gaps and weaknesses contributed to the current financial crisis**. We distinguish here between regulations on lending standards; maturity transformation; incentives to push assets off the balance sheets; the role of ratings agencies in capital requirements; and the lack of coordination between regulators across markets and products. Some of the changes will emerge naturally as new industry practices evolve, while others would involve changes in outright rules and regulations.

2.1. Lending standards

Tighter lending standards on mortgages, both by regulation and industry practice

It is widely believed that excessive borrowing by US consumers is more the result of loose lending standards by banks and mortgage brokers, than of a sudden desire by households to leverage up their financial conditions. As a result, we have already seen a significant tightening of lending standards in the retail mortgage sectors in both North America and Europe. This will likely not stop at a mere change in industry practice, but will probably be reinforced by regulatory fiat, if not legal action.

2.2. Securitizing loans

Reduced regulatory incentive to move assets off the balance sheet

One of the arguments put forward for the excessive loosening of lending standards in the mortgage sector is that banks and non-bank brokers had little retained interest in subprime mortgage loans as they were only interested in selling them on in securitized form. A number of regulatory, legislative, and business practice measures are likely to be taken to reduce the agency problem in the origination and distribution of retail loans. Some of these will likely involve having lenders **retain a more significant economic interest** in individual loans. Others will involve making sure that lender/distributors **disclose** to the buyer of the loans a higher level of relevant and standardized information on the credit quality of the borrower.

More broadly, we will likely see some reduction in the incentives of banks to move assets off their balance sheet. Some of these will likely involve retaining some **capital** against assets that are securitized and pushed off balance sheet, but where regulators and central banks figure the originating banks retains a broad business interest.

2.3. Liquidity creation

Increased regulatory scrutiny of liquidity provision by banks

Increased leverage, both at the household level and among securitized products, clearly raised the vulnerability of the financial system to a credit shock. We have argued above that it was the increased use of short-dated funding among conduits, SIVs, TOBs, auction-rate securities, and broker-dealers that really escalated a credit and leverage crisis into a global financial liquidity crisis. It is this added element of illiquidity, in an area where no lender of last resort existed, that led to fire-sales in securitized assets and that pushed a number of hedge funds, SIVs and banks into bankruptcy. As central banks extend their liquidity provision to brokers-dealers and the securitized world through wider collateral acceptances, they are likely to exert

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greater regulatory control over financial institutions that promise to provide liquidity to their clients. At the same time, buyers of non-bank assets will likely now think twice about accepting cheaply the assurances of counterparties that they will provide liquidity when this is not also backed up by the latter's access to a lender of last resort. In section 9 below on higher term premia, we speculate that the amount of short-dated funding outside the commercial banking world could easily fall by a third from the peak before the crisis.

2.4. Commercial and investment banks and the US Glass Steagall Act

US broker-dealers to eventually fall under Fed's regulatory umbrella

In the aftermath of the Crash of 1929 and during the following Great Depression, US Congress passed a number of legislative measures, one of which included a legal and regulatory separation of commercial banking (lending and deposit taking) from investment banking (underwriting equities and corporate bonds). The Federal Reserve, OCC, and state bank regulators thus became regulators of commercial banks while the SEC regulated investment banks and other broker/dealers.

Difference between commercial and investment bank to fade into insignificance

This separation stayed in place until the late 1980's when large commercial banks started making the case to enter investment banking as their large corporate clients migrated from obtaining bank loans to issuing bonds, underwritten by the investment banks. Constraints on commercial banking were gradually removed until the Act was largely repealed in 1999. Since then, commercial banks have been able to enter investment banking fully. The reverse is the case also, but most investment banks elected not to, as that would have made them subject to regulation by the Fed. The Fed's current widening of its liquidity provision and lender of last resort function to major primary dealers who are broker dealers and not legally a commercial bank will require it to now also extend its regulatory reach to the so-called investment banks, if only to prevent moral hazard. Hence, any remaining significant **differences in regulation between US commercial and investment banks are likely to fade in the future**.

2.5. Basel II

Following the banking crises of the late 1980s, regulators across the world worked together to arrive at a common set of minimum capital requirements for banks in major economies. These were agreed under the auspices of the BIS in Basel and were thus called the Basel Agreements. In recent years, a new set of rules were devised — called Basel II — to fix weaknesses in the first set and to update them for new risk management practices. The new rules make extensive use of credit ratings from the major **rating agencies** as a measure of credit risk. Given a wide perception that there were major flaws in the ratings on asset-backed securities, it is highly likely that regulators will revise the rules in order to downgrade the role that such ratings play in setting bank capital requirements.

Capital requirements to rise

Overall, Basel II would have reduced capital needs for large complex financial institutions. Given a perception, rightly or wrongly, that banks had leveraged up too much by moving assets off their balance sheet, and had been gaming the system, it is likely that bank regulators will want to **raise overall capital levels among banks**. Similarly, there is a strong perception that capital requirements were the first reason for banks to move assets off their balance sheets. Subsequent reabsorption by banks of their off-balance sheet vehicles contradicted the assumption that these assets were really "off" their balance sheet and hence will likely induce regulators to introduce some capital charge against some of these securitized vehicles. Some of this could be imposed relatively quickly within the context of Pillar II (supervisory) level of Basel II which allows supervisors to top up requirements if they believe this appropriate.

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2.6. Regulatory coordination

Regulators have not grown with sophistication and globalisation of international finance

The financial industry has seen over the past two decades the emergence of 1-2 dozen large complex financial institutions that operate worldwide across all financial products. The regulatory community, in contrast, has seen no such growth and remains Balkanised by product and national market. There have been efforts to exchange information and to coordinate actions across border and product areas, but such efforts remain very weak. The global, cross-product nature of the current financial crisis has put in stark contrast the weaknesses of the current divided regulatory system and will likely exert pressure for regulator consolidation. This will likely show up first within countries, with central banks, who have monopoly power over liquidity, taking a more leading role. The Paulson plan (see Box) already suggests such integration within the US, and US and UK authorities have announced the setting up of a joint working group to develop new proposals in this area.

Integration between regulators, with central banks taking the lead, is likely at national level ...

... but unlikely across borders

A full-fledged international authority with real authority is quite unlikely as national authorities tend to guard their mandates quite jealously, and efforts of countries to work together in other areas – such as monetary policy, taxation, security and military affairs – have made only modest progress. In general, the worse the crisis, the greater the reform movement. The founding of NATO, the IMF and the UN all required a war the world had never seen. The current crisis does not measure up to that, fortunately. But there will be action. The last major banking and housing crisis led to the Basel I capital requirements. Most likely, the current crisis will lead to greater international coordination of rules, without the creation of new international regulatory bodies.

2.7. Marking-to-market (MTM) and disclosure

The steady move to marking to market makes sense from micro point of view, but can be destabilizing at macro level

The marking-to-market of financial assets and disclosure are generally seen as necessary requirements of proper risk management. It makes 100% sense from a micro point of view, but is no panacea at an aggregate level as it tends to **reinforce the amplitude of the credit cycle**. The forced selling of assets to below their fundamental value during a liquidity crisis creates contagion if other investors are then also forced to mark their holdings to these new prices, even if there is no real market for them, forcing further selling and again lower asset price levels. This typically stops only with the emergence of long-only investors with deep pockets. Such investors are more likely to be found among those who can hold the assets on an accrual basis (historic cost, held to maturity). Regulators and accounting standard boards should probably start raising the issue of whether they should slow down the steady broadening in MTM accounting to a wider set of market participants.

A movement away from MTM is not imminent, though

We are not optimistic, as regulators tend to look at risk management from the micro point of view, and will see marking-to-market in the context of the increased need for disclosure that is indeed needed to re-establish investor interest in securitized vehicles.

3. Securitization market: smaller and different, but coming back

Securitization may look dead, but will return, though with less leverage and little dependency on short-dated funding

The securitization market has shrunk significantly since the onset of the crisis last summer. Aside from GSE-backed MBS, US ABS issuance is now limited to those backed by car loans, credit car receivables and student loans with home-equity and other subprime based issuance shrunk to zero. CDOs issuance has also fallen massively to 10% of pre-crisis levels in the US and is now largely limited to CLOs.

The future structure of the market depends on how market participants take on board the **lessons learned during the crisis**. These lessons are

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BOX: The Paulson proposals for a new U.S. Regulatory Framework

The Paulson plan — a sensible start

On March 31, U.S. Treasury Secretary Paulson announced a series of recommendations relating to the US regulatory framework for financial institutions that are in line with the projections made above. Some of these proposals had been under discussion for many years, while others arise out of the recent financial crisis. The intention is to implement them in stages, with many subject to review by the new administration when it comes into office in January 2009.

In the short term, Secretary Paulson's changes aim to strengthen, streamline and centralize regulatory authority at the federal level.

A working group is not a merger

President's Working Group. Secretary Paulson proposes establishing the President's Working Group (PWG), originally conceived with a limited charter in 1988, as the federal government's primary means for inter-agency coordination and communication of financial policy in all matters relating to systemic risk, market integrity, investor and consumer protection and market competitiveness. The working group now includes Treasury, the Fed, SEC and CFTC. By including also the FDIC, OCC and OTS in the President's Working Group, it can speak for the federal government as a true inter-agency body. This marks a substantial change in the way the Federal government plans to regulate financial institutions as the PWG can work with separate agencies to speak with one voice.

In another effort to frame regulation around a wider body of financial institutions, Treasury recommended specific enhancements to the process of **expanding access to Federal Reserve** lending channels, including lending to non-depository institutions.

Mortgage Origination Commission

Secretary Paulson suggested the creation of a **Mortgage Origination Commission** to evaluate, rate and report on the adequacy of each state's system for licensing and regulating participants in the mortgage origination process. He also mentioned a series of sweeping changes to be implemented over the **intermediate term**, each focused on attaining a more efficient and less duplicative regulatory system, with greater powers at the Federal level. These include:

- eliminating the **thrift** charter in favor of a national bank charter;
- rationalizing direct **federal supervision of state-chartered banks**;
- establishing **oversight** responsibility for payment and settlement systems at the **Federal Reserve**;
- creating a federal insurance regulatory structure to provide for the creation of an **Optional Federal Charter**, similar to the current dual-chartering system for banks;
- **merging the SEC and the Commodities Future Trading Corporation (CFTC)**, in recognition of the convergence of securities and futures markets and the need for reform and unified oversight and regulation of the these industries.

Longer term, a move to objectives based regulation

Over the longer term, Treasury wishes to change the current system of functional regulation, which maintains separate regulatory agencies across segregated functional lines of banking, insurance, securities and futures, and put in its place **objectives based regulation** focused on market stability (Federal Reserve), prudential financial regulation with regard to overseeing the soundness of firms with government guarantees, and business conduct regulation including consumer protection and business practices and chartering/licensing of certain types of financial firms.

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The lessons that participants believe they have learned

- Mortgages are riskier than you thought before.
- Correlations among different mortgage pools are extremely high during crises.
- Do not rely on rating agencies to tell you about the risk of asset-backed products.
- Avoid instruments that are highly leveraged.
- Insurance is only as good as the insurer's balance sheet.
- Liquidity is not a free good. Do not buy securities where tranches rely on short-dated funding, unless the organiser has easy access to central bank funding.

These lessons will become hard-coded in risk management of both the investment and the regulatory community. What does it mean for the future of securitization?

Economic benefits of securitization — avoid double taxation at bank level and create greater choice for institutional investors — remain in place

1. One positive result is that these lessons do **not destroy the basic economics of securitization**. They are the creation of investment products that (1) eliminate the double taxation of investing directly via a bank's balance sheet, and (2) create a diversity of risk-return and cash-flow profiles that is better suited to meet the diverging needs of institutional investors than those offered by combinations of simple bonds, equities, and bank deposits. The old perceived benefit of securitised products escaping the regulatory cost of bank balance sheets will likely disappear under the onslaught of new regulations and supervisory scrutiny.

But the economics of short-dated funding of structured products are dead

2. The economics of securitization remain in place, but the **economics of leveraged, short-dated funding of ABS and CDOs are dead**. This leverage emerged as a "solution" to the steady tightening of spreads in recent years and **assumed that liquidity was a free good** — an assumption that turned out **erroneous**. In the future, a combination of central bank regulation and changed market practices will raise the price of liquidity. As a result, CDO/CLO that depend on leveraged, short-dated financing of the senior, AAA tranches, would have to pay investors such a liquidity premium as to make the structure uneconomical against simple loan participations or high-yield bond issuance.

GSE's to gain market share

3. We are likely to see **a larger market share for government sponsored securitization,** i.e., the **GSEs**. The government sponsored enterprises – such as Fannie Mae and Freddie Mac – have not escaped the carnage in the US mortgages, but have been much less affected as they are not dependent on short-dated funding and do not securitize subprime mortgages. Nevertheless, the overall fall in house pricing and the onset of recession have imposed substantial losses on the GSEs. It is highly likely that following the crisis, the GSEs will have a larger share of the mortgage securitization market. Congress had imposed restrictions on their expansion in recent years as the private sector had complained the GSEs were too leveraged and their government sponsored dominance slowed down product innovation. The current subprime crisis is clearly taking the political wind out of these arguments. Together with the political need to support the housing market urgently, we are likely to see at least a partial unleashing of the GSE's on the mortgage securitization market.

Consumer loans other than mortgages will continue to be securitised, but are unlikely to enter CDOs

4. Wariness of mortgage risk means that for a long time, investors will prefer assets backed by other consumer debt — such as **car loans, credit card receivables, and student loans** — for no other reason than that they are not mortgages. It is unlikely that subprime securitization will return anytime soon as it is too identified with the current crisis, and banks themselves or unlikely to generate many subprime loans.

5. **Leverage in securitization.** Some securitised products contained massive leverage, such as in CPDOs. Given the crisis, these are not likely to return. However, as argued above, **most of the leverage in securitisation came from how they were**

funded. And this leverage, as well as short-dated funding, were largely a reaction to the fall in spreads and a desire to keep the show going. Hence, the massive spread widening of recent months means that **CDOs are again economical without a reliance on leveraged, short-dated funding**. That is the basis for confidence that **CDO/CLOs will return in decent force**. The natural candidates for these are corporate bonds and loans, not ABS (see below). Admittedly, the stigma attached on CDOs, and the lack of confidence in official ratings means the market will remain smaller than before for quite some time.

CDOs and CLOs will return, but without the short-dated funding

Main buyer of CDOs and CLOs will again be funds with long-term liabilities and, ideally, accrual accounting

6. **The main buyer** of CDO/CLOs will be those with long-dated funding such as endowments, pension funds and insurance companies. These investors were primarily buyers of mezzanine tranches, suggesting that sponsors will raise the capital share of mezzanine. Hedge funds and SIVs relying on repos have disappeared as buyers and will not return as they will not receive much repo funding from banks. But leveraged players who have long-dated funding are set to return, though with less leverage than before. They were the buyers of low-yielding AAA tranches and thus needed leverage to make these worthwhile holding. Without short-dated leverage, spreads will have to be higher to convince investors to buy the senior tranches — another argument to expect credit spreads not to tighten in to the 2006 lows during the next cycle (see below of risk premia).

CDOs of ABS are unlikely to return due to high correlations between loan pools during crises

7. **CDOs based on consumer loans, including non-mortgage loans, are unlikely to return**. The economics of tranching requires a low correlation in defaults within the loan pool. The high correlation during the crisis — in the extreme either all or none of the loans default — means there is no risk differentiation between senior and junior tranches and thus obviates the whole reason for tranching.

Increased disclosure is hard to disagree with, but a sideshow as information was there all along, if you cared to look for it

8. It is frequently claimed that the post-crisis securitization world will be more **simple**, that is, will only contain products that are easy to understand for investors. It may be hard to disagree with this broad statement. Concretely, it may just mean that products will come with **more disclosure** on the underlying credits, that will make the due diligence process much easier. We believe, though, that disclosure and transparency, hard as they are to object to, **are a sideshow**. All during the boom in credit securitization, the relevant information to make credit judgements was available. The reality is that few investors bothered to look at it. Disclosing more information does not mean that people will look at it, given how information overloaded every one is to start with.

4. Banks

Banks to be larger, safer, and probably less profitable

The increased regulatory costs of pushing loans in securitised forms off the balance sheet and reduced demand for such assets mean that banks will make fewer loans and hold a larger share of these loans on the balance sheet. Investors in securitised products will likely demand that originating banks retain a risk share in the loans. In combination, this likely implies that **bank balance sheets will be larger** than they would have been otherwise. To fund these holdings, banks will intensify the competition for retail deposits, a market where they have lost market share to money market funds (see below).

Increased regulation and capital requirements should make **banks safer**, but probably also somewhat **less profitable**. This will be especially so for the so-called US broker-dealers — the pure investment banks — that are likely to come under the regulatory scrutiny of the Federal Reserve. Over time, the **Glass-Steagall era distinction between commercial and investment banks is set to fade**.

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5. Money market funds (MMFs)

The growth of money market funds was a big driver in the growth of securitised products

Money market funds have seen massive growth in recent years and have taken market share away from bank deposits. Large banks became less interested to compete as they moved from a lend-and-hold to a lend-and-securitise strategy. Money market funds, in turn, have been seeking out riskier assets in order to offer higher yields. Many such funds pitched themselves as Libor plus funds, arguing they used innovative techniques to deliver excess returns. A minority bought direct stakes in subprime CDOs. A much larger number bought commercial paper issued by structured investment vehicles (SIVs) backed by AAA-rated CDOs and ABS.

Money market funds to lose market share as they will have problems finding enough cash-like instruments

As shown earlier, both of these investments in short-dated instruments depended on maturity transformation in the securitized world that is unlikely to return in size. In what will money markets instead invest in the future? Massive inflows into these funds in recent months have been funnelled into banks through the repo market. At some point in the future, these banks will wonder whether they should continue to use money market funds to intermediate between them and retail clients. At that point, banks will likely start trying to disintermediate this middle man and pay this interest directly to retail clients through improved deposit rates instead of to MMFs. This will **reduce the market share of money market funds**.

6. Hedge funds and other asset managers

Need to obtain longer-dated funding will contribute to further consolidation among hedge funds

Two forces will change this industry — the reduced value of ratings and the reduced availability of short-dated funding. The first favors **large sophisticated managers**, and the latter favours **long-only investors that use accrual accounting**, such as pension funds and insurance companies. Expect renewed consolidation.

Credit hedge funds have been hurt by the crisis as most were leveraged buyers of credit. To remain in business, they will need to switch to longer-dated funding, and focus on the higher-yielding part of the market. To obtain longer-maturity non-collateralised funding, hedge funds likely need to **grow in size** as few lenders will be willing to extend money for a long time to smaller companies. The crisis is thus set to **accelerate the ongoing pace of consolidation in the hedge fund industry**.

7. The credit rating agencies

The role of credit rating agencies (CRAs) has become a central issue in the subprime debacle, following the massive downgrades last year on structured products backed by subprime mortgages. At issue is whether investors will reduce reliance on ratings, and what they will do instead; whether CRAs can salvage their role by providing more information and different ratings with greater transparency for structured products; whether regulators and supervisors give CRAs too big a role; and whether any conflict of interest between CRAs and underwriters can be resolved.

Reform Act of 2006 was too late and too little to make a difference

These issues are not new, and came up last during the dot.com crisis at the start of the decade. It then led to the **Credit Rating Agency Reform Act of 2006**. Under the Act, the SEC qualifies CRAs as Nationally Recognized Statistical Ratings Organizations. To date, the SEC has qualified seven different companies as NRSROs — Standard & Poor's, Moody's, DBRS, Japan Credit Rating Agency, A.M. Best, Fitch, and Rating and Investment Information.

This new oversight, which was designed to encourage agencies to make their ratings methodologies transparent and to avert conflicts, clearly did not prevent the apparent mis-rating of subprime ABS. As a result, regulatory and legislative scrutiny is set to re-intensify. As mentioned above, regulators are set to downgrade the role of ratings

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in Basel II. More under the radar, supervisors will similarly reduce reliance on ratings.

Different rating codes for structured products do not go to the core of the problem

A debate is going on whether the CRAs should **differentiate the denomination of structured product ratings** from those on corporate bonds. To us, this is more a marketing gimmick, as it does not by itself change the rating methodology. The CRAs have announced changes in methodology. Time will tell how effective they will be.

Investors themselves are reviewing whether they are **relying too much on ratings**. We find this discussion is only taking place around structured products with little change in the way investors rely in corporate bond ratings. Most likely, investors will use ratings on structured products with a lot more scepticism. This means, though, that investors will have been forced to do more of their own due diligence. As this is a fixed cost, it will create pressure to create economies of scale through consolidation.

8. Monoline insurers

One of the unintended consequences of the current crisis has been the impact on monoline insurers. Monoline insurers, created by commercial banks thirty years ago to facilitate retail investment in municipal bonds, have been hard hit by the current crisis. Municipal bond investments in the US are tax exempt and, as a result, make excellent investment vehicles for high-net-worth individuals. Monolines used their higher credit ratings to "wrap" or guarantee the payment of principal and interest on the part of US municipalities which on a stand-alone basis might not be highly rated themselves or might be too small to do sufficient investment analysis.

At some point, however, AMBAC and MBIA, among others, were spun off from the financial institutions that conceived them and became public companies themselves. They began to look for growth businesses to help support their stock prices. They focused on a new and growing business — using their strong credit ratings to wrap and enhance the credit ratings of CDO and like securities. The downgrades of these CDOs have left the monoline portfolios in shambles, resulting in potential downgrades to the institutions. As a result, each of the major firms has had to engage in extensive capital raising to preserve its high rating.

Monolines are out of the structured products business and will stick to municipals

Going forward, it is **unlikely that the monolines will continue to insure CDO or any other complex instruments**, even if CDOs themselves continue to exist as a financial instrument. It is not unlikely that as they stop doing this business, they will allow these securities portfolios simply to mature.

While it could be several years before the municipals market regains confidence in the monoline insurers as a means to help them sell their debt, a smaller, simpler monoline insurance business, focused on providing wraps for municipal issuers, seems the likely outcome of the current crisis.

9. Higher term, liquidity, and credit risk premia

The massive **rise in uncertainty** during the crisis led to a huge rise in risk premia in the fixed income world. Spreads of bonds issued by financials rose to 35-year highs (Chart 15). Swap spreads over government debt similarly widened dramatically, especially at the short end of the curve, reflecting not only increased credit risk but also higher liquidity premia. Term premia, or the excess yield on longer- over shorter-maturity instruments which compensate for duration risk, also rose significantly. The steepening of curve likely contains a higher term premium, although we only have direct evidence for term premia at the shorter end of the curve.

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Table 1: Estimated term premia and implied vol on libor, 12 months out

bp

period	US		EU/GE		UK	
	TP	Impl. Vol	TP	Impl. Vol	TP	Impl. Vol
1991-99	37	7.3	30	5.7	33	7.8
2000-08	10	5.9	8	4.1	13	4.9

Source: JPMorgan, Blue-Chip Forecasts. Term premium is difference between 12-month out 3-month forward libor and consensus view on that rate.

Term premia had fallen to almost zero

Chart 16 shows the excess of 3-month USD libor rates, 12 months forwards over the consensus view on that rate from economists' forecasts. This premium averaged 37bp during the 1990s but fell to only 10bp during the current decade. Part of the fall in term premia can be attributed to arbitrage by hedge funds and prop desks, as the premium was probably too high during the 1990s[4]. Another part is due to the global savings glut that emanated from corporate profits and emerging economies[5]. And again another part probably came from the more predictable and steady-as-she-goes policy of the Fed during the early 2000s. Indeed, implied vol on libor one year out was lower in the current decade but by much less than the drop in term premia.

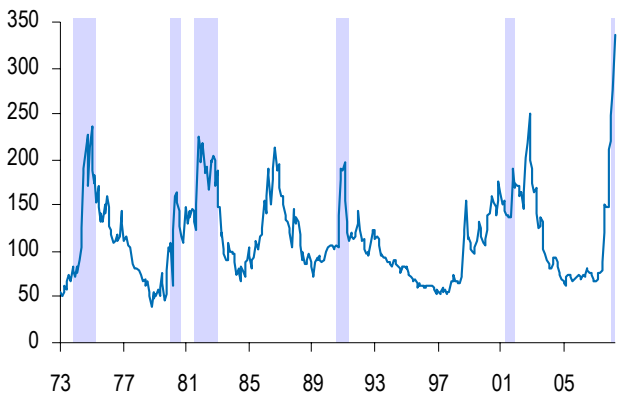
Reduced maturity transformation outside regulated banking world to again create a proper term along the curve

However, some part must also be due to the **increased use of short-dated funding outside the regulated banking world**. As argued above, by the middle of last year, about one third of this maturity transformation — or $5 trillion — took place outside the Fed-protected and regulated banking world. Deleveraging since then has likely reduced this amount already by some $400bn, mostly as the ABCP market has shrunk by this much. Going forward, we expect a combination of greater regulatory control and changed investment practices to reduce this amount of maturity transformation outside the banking sector.

The **change in investment behaviour** reflects an increased wariness of investing in instruments that are marketed as cash-like assets but that are issued by entities that do not have access to central banks. Cash investors have become aware that only a central bank, and those with access to it, can make reliable promises of liquidity.

Chart 15: Credit spread of US Financials over USTs

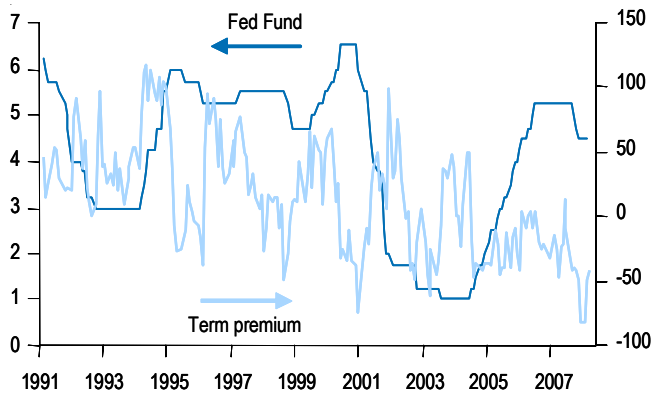
bp



Source: JPMorgan. Lehman

Chart 16: Estimated term premium and official rates in the US

% lhs, bp rhs



Source: JPMorgan, Blue-Chip Forecasts. Term premium is difference between 12-month out 3-month forward libor rate and the consensus view on that rate.

4. See Loeys and Fransolet, *Have hedge funds eroded market opportunities?*, Oct 05.
5. See Mackie, Loeys et al, *Corporates are driving the global savings glut*, June 05.

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This new wariness is unlikely to fade soon. We are now already seeing the sudden death of the **ARS, TOB and VRDO** market, which was $900bn in size only a few months ago. The **broker-dealers** — the traditional investment banks — should have continued access to short-dated funding, via repos and cash deposits and collateral from savers, but only because they now have direct access to the Federal Reserve. Nevertheless, the experience of recent months will likely induce them to reduce their reliance on short-dated funding. **Hedge funds**, which we guess have at least $1 trillion in repo funding, are deleveraging at the moment, especially in the credit and fixed income relative value space. Money market funds have already reduced their holdings of **asset backed commercial paper** by $400bn.

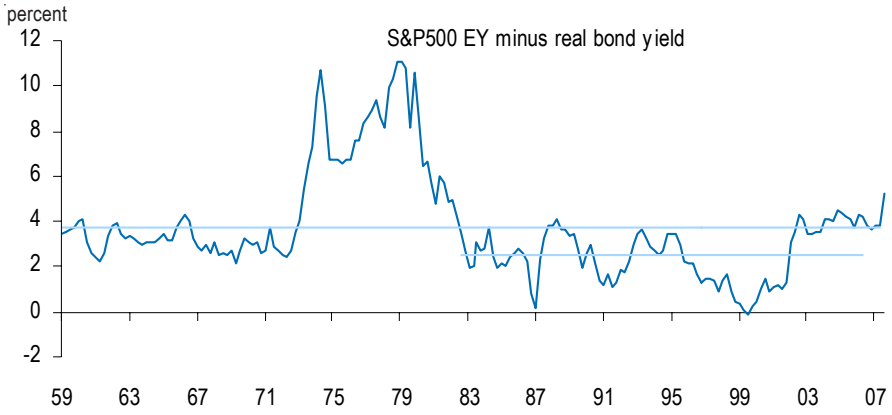
Most likely, **scrutiny by regulators and risk managers** of the current liquidity crisis will lead to higher costs of liquidity provision by the banking system. This could be merely in the form of higher liquidity reserves against various forms of liquidity promises that banks are making. At the same time, it is certain that central banks will be intensely reviewing the crisis and any mistakes they have made. This should improve systematic liquidity management by central banks and by itself could be construed as improving overall liquidity. However, this is likely to come at the cost of increased regulatory scrutiny and thus costs of bank provision of liquidity.

In short, as the crisis eventually fades, risk premia will again come down. At issue is whether they will again fall to the lows seen before the crisis. A case can be made that they will not, as a major factor bringing risk premia down then was the increase in leverage and short-maturity funding in the securitized world. Investor awareness of the liquidity risk in short-maturity funding, and increased regulatory costs should combine to reduce leverage and short-maturity funding of spread product in the fixed income world, even after the crisis has faded.

Nasdaq crash also led to high equity risk premia all through the rally in equities

There is some **empirical support** for our argument that after a severe financial crisis, market participants are more sensitised, possibly excessively so, of the risk factors that created the largest losses during the cycle, therefore possibly turning a blind eye to other risk factors which henceforth become overpriced. During the 1990s equity market bubble, investors started believing that equities were a lot less risky than had been assumed before. It was argued at times that over a longer holding period — 5 to 10 years — equities rarely underperformed bonds and thus should be considered much riskier than bonds. The growing literature in the Finance literature on the equity risk premium puzzle — arguing the past equity risk premia were too

Chart 17: Equity risk premium: S&P500 earnings yield minus real 10-year USTs



Source: JPMorgan

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high relative to economic fundamentals — similarly led to the ultimate fall of this risk premium to zero at the end of the bubble (see Chart 17).

Following the equity market crash at the start of this decade, investors moved to the opposite extreme, avoiding equity exposures and instead moving into credit and alternatives as offering better risk adjusted returns. The equity risk premium, by our measures, then rose to two-decade highs and stayed cheap all through the 2003-07 rally. Stock prices rose at a slower pace than profits, pushing earnings multiples down steadily during the rally.

The market learns many lessons after each crisis, but not one that prevents a new boom/bust cycle elsewhere

Whereto the next leverage cycle?

The current financial crisis has already been called the worst since the depression of the 1930s. This is an exaggeration, reflecting the heat of the moment, but can only help to boost efforts to change market practices that led to the current crisis. Generally, **the worse the crisis, the stronger the reaction** and changes it induces and the longer it should take before we again get in trouble. But the history of the past 30 years of liberalised capital markets does show that **we eventually do again commit the sins of leverage and overconfidence** and produce the next boom-bust cycle.

Avoidance of the crisis area moves capital to other markets with better "fundamentals", creating the risk of a renewed boom and bust cycle

The main question is where the next leverage cycle will erupt. The temptation exists to look at Chart 14 depicting the cycle of crises to detect a certain "cadence" that goes, starting with the Latin problems of the 1980s: EM-EQ-CR-FX-EM-HF-EQ-CR. On that basis, one might think it is the time for **emerging markets** to produce the next boom-bust cycle. This sequence is now without its logic. It is quite likely that as one boom bursts under to the weight of leverage, **risk capital moves to the asset class where the memory of the last blow-up has receded the most**. The Nasdaq crash remains in most investors's memories is barely 5 years old and thus remains a vivid memory.

EM has great fundamentals and is everyone's favorite investment. Bust is not imminent as leverage has not increased that much, yet.

We know that booms always starts with strong positive fundamentals that are just taken to their extreme through the forces of momentum and leverage. And the fundamentals behind the rally in emerging economies are strong indeed — disciplined macro policies, cheap currencies, trade liberalisation, and the migration of millions of Chinese and Indians from the countryside to the cities. But the **signs of an imminent EM crisis are not in place**. For that, we need a massive increase in leverage and assets prices at levels that are expensive by any measure[6]. Overall, we do not find such evidence of leverage. We know it exists in **commodities**, whose rally is linked with that of EM, and there are indications that domestic investors in China are discovering the joys of trading the market, but overall, the inflow into the EM asset class is mostly long-only money or domestic savings. Most likely, any serious boom and bust in EM is several years away.

6. See Loeys and Panigirtzoglou, *Are Alternatives the next bubble?*, Sep 06, for more details on how bubbles form and burst.

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