

**RISK TRANSPARENCY IN THE
AFTERMATH OF THE CREDIT CRISIS »»**

White paper

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INTRODUCTION

To quote John Maynard Keynes:

“The market can stay irrational longer than you can stay solvent.”

Liquidity crises are a recurring feature of every financial market and in 2007 it was the turn of the credit markets.

The ‘Credit Crunch’, also known as the sub-prime mortgage crisis, banking crisis or liquidity crisis, exhibits similarities to and also differences from previous crises.

The market impact is substantial, with losses from sub-prime loans and instruments structured around the loans, now estimated between 150-300 billion US Dollars (USD). This paper explores some of the underlying factors which led to the credit crisis and identifies steps that banks can take to better manage a similar crisis in the future.

1 CONTEXT

1.1 PREVIOUS FINANCIAL CRISES

In recent years there have been a number of financial crises. Although they were triggered by different events, the end result was the same – a collapse in market confidence and a subsequent liquidity crisis.

Foreign Exchange (FX) – Considered one of the deepest and most liquid markets, the FX market had a crisis of illiquidity following the closure of Bank Herstatt in 1974. The insolvency of the Bank caused three days of disruption in foreign exchange transactions in New York.

Equities – On 19 October 1987, the Dow Jones Industrial Average fell nearly 23%, mainly due to selling by programme traders. In the wake of the crash, markets were put on restricted trading, which gave the Federal Reserve Bank and other Central Banks time to pump liquidity into the system.

Bonds – In 1998, financial crises in East Asia and Russia led to a ‘flight to liquidity’ in the international bond markets and ultimately, the collapse of the Long-Term Credit Management (LTCM) hedge fund. The Federal Reserve Bank of New York organised a bail-out of USD3.625 billion by the major creditors to avoid a wider collapse in the financial markets.

Derivatives – The collapse of Barings in 1995 was not due to derivatives per se, but the quality of management and control. A single rogue trader accumulated losses of USD1.4 billion (twice the Bank’s available trading capital), which resulted in the insolvency of the Bank.

Enron – In 2001 Enron revealed that its reported financial condition was sustained mostly by accounting fraud. It subsequently filed for bankruptcy.

1.2 DRIVERS FOR CHANGE IN THE DEVELOPMENT OF CREDIT INSTRUMENTS

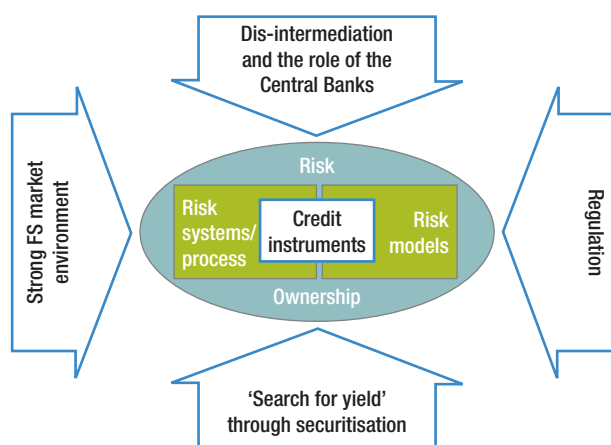
There have been no major liquidity crises since the failure of Enron. The past few years have seen considerable changes in the financial markets and there have been a number of factors directly influencing the growth and development of credit instruments.

Financial Services environment

The Financial Services environment has experienced minimal credit losses, stable economic growth, low expected volatility in asset prices and confidence in the economic strength of banks. This market strength means that banks’ credit products have developed during a period of economic stability, rather than turmoil.

Banks have been involved in a ‘search for yield’ which has led to them assuming higher levels of risk and securitisation has enabled them to shift this risk off the balance sheet. Although systems for calculating on-balance sheet exposures are relatively mature, the growth of off-balance sheet finance has not always been matched by the development of underlying systems and processes.

FIGURE 1: DRIVERS FOR CHANGE IN THE DEVELOPMENT OF CREDIT INSTRUMENTS



Regulation

This move towards off-balance sheet funding has been encouraged by changes in regulation.

The 1988 Basel Accord (Basel I) provided a ‘one-size-fits-all’ risk weighting of 50% for residential mortgages. Banks securitising their residential mortgage portfolios typically retained a portion of the portfolio exposure through holding subordinated (‘junior’) portions of the securitisation, which would have received a risk weighting of 100% and a capital charge of 8%, irrespective of the probability of loss or ‘loss given default’.

The Standardised Approach under Basel II weighs AAA-rated securities at 20% or 1.6% capital charge i.e. about one-fifth of the capital requirements compared to Basel I. Under Basel II, banks are able to reduce their capital requirements by packaging up assets, securitising them and holding investment-grade rated tranches 'slices' of the securitisation rather than the whole loans.

Disintermediation and the role of the Central Banks

Securitisation and the subsequent 'slicing and dicing' of assets prior to distribution has led to an increase in the number and type of players in the credit market. Credit instruments are traded not only by banks, but also by brokers, specialised lenders, hedge funds Special Investment Vehicles¹ and diversified national lenders. Previously, the credit market could be regulated and controlled, with the Central Banks acting as 'lender of last resort' and effectively ensuring unlimited liquidity. The increasing level of disintermediation means that the role of the Central Banks is no longer clearly defined. Central Banks are not responsible for overseeing new non-bank players; designed to act as market-makers for distressed asset classes or responsible for ensuring depth in capital markets.

Responsibility for managing risk

Traditionally, credit relationships were bilateral and the lender had an interest in the borrower remaining solvent. Documentation was drawn up accordingly and covenants were monitored closely. However, the rapid growth in instruments for risk transfer and risk management has meant that the relationship between lenders and borrowers is now multilateral: debt obligations are on-sold, re-packaged, collateralised and distributed throughout a wide investor base. As the relationship between borrower and lender becomes more 'arms-length', the responsibility for owning, managing and monitoring the associated risk has become less clear.

Models

As credit instruments become increasingly sophisticated and tailored to meet specific clients' needs, their liquidity in secondary markets decreases accordingly. Instead of relying on the market to price credit instruments,

banks have built sophisticated pricing models and have 'marked-to-model'. The 2007 crisis highlights some fundamental flaws in these models:

- > As similar risk management and hedging strategies were employed both within and across banks. Asset classes, previously thought to be uncorrelated demonstrated a high degree of correlation, under stress conditions when the models were recommending a 'sell' strategy across the board.
- > In theory, stress testing and scenario analysis enables banks to assess the potential impact of a crisis and plan the right level of resources to withstand it. However, as models were developed during a period of strong economic growth with few real 'stress' scenarios, they underestimated both the initial impact of the credit crisis and also the ongoing implications of an illiquid market on prices. The lessons learned from the 2007 liquidity crisis should be incorporated into the models.

Risk systems

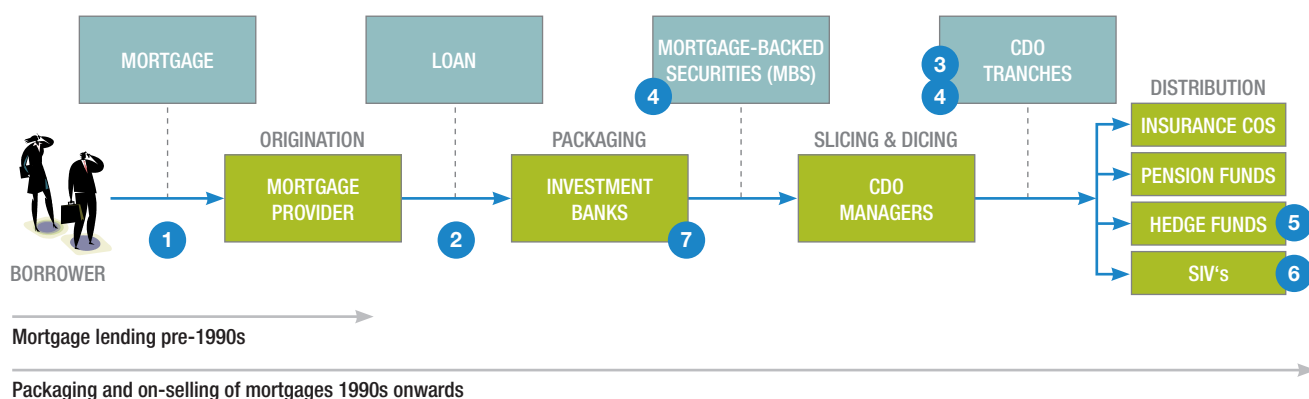
Banks usually have different risk systems for asset classes and risk types and it is difficult to establish and maintain links between these systems. The growth in volume and sophistication of credit instruments has not been matched by spending on risk systems for these products:

- > SIV valuations are performed on spreadsheets and the assets are usually valued by the people who created them
- > Issuer risk systems often have no linkage to, or consistency with, other risk systems. For example, rather than build a feed from the 'golden source' of asset or client data, issuer risk departments construct their own databases and often rely on manual pricing of reference assets to calculate exposures
- > Issuer risk systems have in-built correlation matrices which were based on data gathered during a period of strong economic growth, and therefore underestimated the level of correlation.

¹Banks have created off-balance sheet separate legal entities called 'Special Purpose Vehicles' to remove loans from their balance sheets. Cash flow from these assets is used as backing for an issue of bonds. A special class of conduit known as a Special Investment Vehicle (SIV) exists for the issue of both Commercial Paper (CP) and Medium-Term Notes (MTNs), and which are usually credit arbitrage vehicles. These conduits are guaranteed by their parent company and are graded by the rating agencies. SIV-lites are a relatively recent market development. These are essentially Collateralised Debt Obligations (CDOs) which pool together bonds backed by mortgages and other asset-backed debt. The main difference is that other CDOs sell long-term senior debt to fund their assets while SIV-lites raise senior debt in the short-term Asset-Backed Commercial Paper (ABCP) markets.

2 2007 CREDIT CRUNCH

FIGURE 2: SUB-PRIME DEBT IS PACKAGED AND SOLD THROUGHOUT THE FINANCE INDUSTRY



Chain of events that led to the credit crisis:

1. Increase in defaults from sub-prime borrowers.
2. Trustees of Mortgage-Backed Securities (MBS) pools exercise options to return non-performing sub-prime mortgages to originators. Some originators were unable to buy these back and went bankrupt.
3. CDO over collateralisation cushions wiped out.
4. Fall in MBS and CDO valuations.
5. Some hedge funds failed after they were called on to make good on the credit guarantees they provided to buyers of MBSs and CDOs.
6. SIVs were unable to replace their short-term CP funding as their portfolio valuations fell and had to call on their banks to provide liquidity.
7. Banks had to provide liquidity to the SIVs thereby moving funding back onto the balance sheet and absorbing bank capital.

Source: U.S. Chartbook: Bank Balance Sheets Tested – Zoltan Pozsay October 2007

2.1 CHAIN OF EVENTS

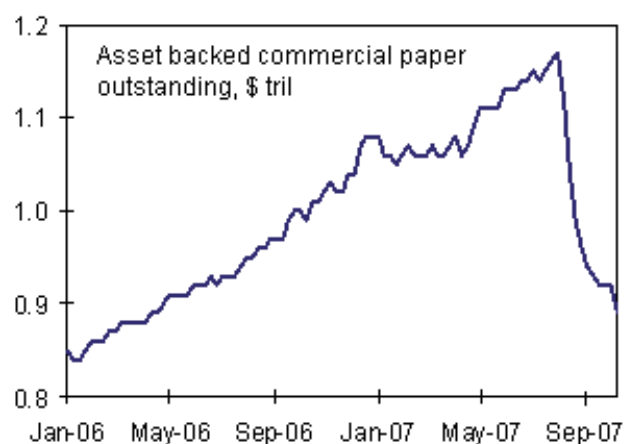
During spring 2007, there was a slow-down in the United States housing market. The number of people defaulting on their mortgages increased, particularly in the 'sub-prime' sector. Following the down-grading of a number of mortgage-backed securities and the losses sustained on sub-prime-backed securities by some hedge funds, liquidity began to dry up.

The SIVs which relied on the sub-prime assets to back bond issues, were suddenly in trouble. They could not sell their paper and as the value of their portfolio dropped, and therefore they were unable to fund it in the short-term commercial paper market.

The SIVs turned to their parent banks for funds, As a consequence and to not risk their reputation by refusing to support their SIVs, the parent banks provided liquidity and effectively brought the loans back onto the balance sheet. This used up capital and limited the amount of funds available to other counterparties.

Banks were reluctant to lend to each other as they did not know which counterparties may prove to be bad credit risks. Judging by the fall in commercial paper outstanding, approximately USD600 billion assets were taken back onto banks' balance sheets.

FIGURE 3: THE DECLINE IN ABCP OUTSTANDING = THE INCREASE IN BANK CREDIT EXPOSURE



Source: U.S. Chartbook: Bank Balance Sheets Tested – Zoltan Pozsny October 2007

2.2 IMPLICATIONS

There were a number of implications in the three months following the credit crisis, although it has to be said that there are still ongoing repercussions.

According to Mervyn King, Governor of the Bank of England (6 November 2007):

[“We have several more months to get through before the banks have revealed all the losses that have occurred, and have taken measures to finance their obligations that result from that, but we’re going in the right direction.”](#)

De-leveraging

The banking system is built upon the principle of leveraging, which in turn is built on the presumption of liquidity. The increasing sophistication of credit instruments have enabled banks to aggressively leverage over the past five years. The credit crisis meant that markets rejected many structured instruments and forced assets back onto banks’ books. Banks have therefore been forced to de-leverage significantly and the price of the assets held in such structures has fallen, imposing large mark-to-market losses on the system.

Back to basics

The liquidity crisis exposed the fact that a number of market players (hedge funds; SIVs even banks such as Northern Rock) contravened a fundamental banking tenet of matching borrowing and lending maturities. Although funding long-term assets with short-term borrowing works well during a bullish market, it is inherently risky and as soon as the market turns and liquidity dries up, the costs of funding soar.

Regulation

Basel II effectively encourages banks to package and re-sell assets in order to get them off the balance sheet and minimise capital requirements. In the light of the credit crunch, regulators may find it necessary to revisit Basel II.

Securitisation obscures the impact of asset write-downs and spreads risk throughout the financial system. Under current regulations, banks have to disclose very little information about off-balance sheet items. Following the credit crisis, regulators will have to consider addressing this lack of transparency.

Role of the Central Banks

Central Banks will need to consider broadening the scope of their action in times of stress. In addition to acting in the role as ‘lender of last resort’, they may also be asked to ensure fluidity throughout the system by introducing liquidity buffers or automatic stabilisers (lowering capital cushions during the boom times and increasing them in down-turns).

Alternatively, the UK could implement a system used in the US and Canada, whereby the Central Bank has the power to intervene ‘pre-emptively’ by transferring retail accounts out of ailing banks allowing them to fail.

However, the question over the role of the Central Bank and if it is really its responsibility to underwrite the entire financial system has been raised. Surely that will only encourage more risky behaviour, with participants safe in the knowledge that the Central Bank will bale them out if their risk decisions prove to be flawed.

3 MINIMISING IMPACT

3.1 BETTER QUANTIFICATION OF RISKS

Although we don't know when the next financial crisis will occur or which market segment will be affected, we can be certain that it will happen sooner or later. Banks cannot necessarily avoid the next crisis, but they can take steps to understand and minimise the impact.

A recurring issue for many banks has been the quantification of exposures and risks once a crisis occurs. For example some banks took hours, if not days, rather than seconds to quantify their total exposure (counterparty and issuer risk) to Enron, following its collapse.

Consistency

At a basic level, there needs to be consistency across risk systems. All assets should be priced from a consistent data source. Where asset valuations are manually calculated, there should be some external verification of pricing, for example by the auditor and/or rating agencies. Consistency across systems should enable easier aggregation of risk across products, allowing banks to quickly quantify their exposure.

Valuation models

The liquidity crisis highlighted a number of issues with valuation models:

- > Models traditionally use normal distribution curves, based on quantified, known factors. However, the models have been mainly developed during a period of strong economic growth. There has been a lot of recent discussion which suggests that a more appropriate curve is likely to be skewed or 'fat tail'. or even a series of overlapping curves to take into account the random nature of 'shock' events.
- > Models are based on an assumption that risk can be transferred at a price. Where there is no liquidity, there can be no market price.
- > Assets which were previously thought to be uncorrelated demonstrated a high degree of correlation when the markets were diving.

Valuation models and stress testing should be updated to reflect this new information.

Transparency

The complexity of credit instruments and the fact they were off-balance sheet means that there was minimal transparency around both the assets and their underlying risks. Banks need to be able to break down these complex assets into their constituent parts and fully understand the risk they are assuming. This risk should be more transparent to shareholders, clients and regulators. In the wake of the crisis, regulators will probably insist on a fuller disclosure of credit instruments and their associated risks.

3.2 REINFORCE A RISK MANAGEMENT CULTURE

The ability of a bank to fully quantify its risk exposure will be irrelevant if it is not underpinned by a strong risk management function. Cultivating a proactive risk culture is essential in enabling an institution to prevent or manage future 'shock' events.

Senior Management

This 'risk' culture needs to start at the top and permeate throughout the organisation. Senior Management must signal strong public support for risk management in order to ensure its credibility within the organisation. Given the complexity of credit instruments, risk information should be modelled and presented to Senior Management in an accessible form, so that the risks can be thoroughly understood. Regulations such as the Sarbanes-Oxley Act have been instrumental in driving this forward.

Risk management function

Risk Managers need the technical competence, business and authority to fully engage with the business decision-making process. Risks should be communicated and understood not only by Risk Managers but by the business unit and Senior Management. Risk Committees, and the individuals serving on these committees, need to be incentivised to make appropriate business decisions which are conducive to the long-term benefit of the bank. Best practice places a Chief Risk Officer at the most senior level within an organisation with direct reporting to Board members.

If nothing else the credit crisis has reinforced the requirement for qualitative judgement and prudent risk management, based on previous bitter experience, to supplement quantitative analysis. Business decisions should be challenged by people with risk experience asking the right questions both at Committee and Board level.

Culture

Having risk policies and procedures in place is simply not enough: they need to be underpinned by a strong, ethical risk management culture.

Case example

Enron is a good example of the consequences of not having ethics within the risk management function. Although they maintained a risk management function with seemingly competent people and policies:

- > Mark-to-market valuations were subject to adjustment by both managers and the traders who did the deals (whose bonuses depended on deal profitability)
- > Enron maintained a fluid workforce. Knowing their position was only temporary, some risk managers were keen not to alienate their potential next boss by erring on the side of caution when authorising risky transactions.

In an environment of rising markets, the heroes of an organisation have tended to be traders who have generated exceptional margins, often side-stepping or bending the internal policies and procedures. These 'Masters of the Universe' have been rewarded accordingly with large annual bonuses, whilst the Risk Management function has been viewed simply as an overhead who threaten to rain on their parade.

Following the down-fall of the would-be heroes in the aftermath of the crisis, banks need to:

- > Ensure that risk management is perceived to be a business-critical unit which exists to maximise return on a firm's economic capital
- > Take more of a long-term view. Traders tend to change jobs relatively frequently (compared with other banking units). Their behaviour is driven by their opportunity for short-term personal gain, rather than the long-term health of the organisation.

Tools such as Denison's cultural profile have been used successfully in the public and private sector to examine sub-cultures within the organisation and determine organisational development and training needs necessary for culture change. These types of tools are also relevant in investment banking. Other means of reinforcing a strong risk culture are regular risk awareness activities, formal and informal risk forums, education, open communication lines among all parties concerned, and continuous interaction with Senior Management.

3.3 CONFIDENCE

Ultimately, this crisis has been a crisis of confidence. Lack of transparency led to a fall in liquidity and subsequently a failure in confidence. This was symptomatic of previous crises, for example, to quote Franklin D. Roosevelt, on the bank crisis (12 March 1933):

"After all there is an element in the readjustment of our financial system more important than currency, more important than gold, and that is the confidence of the people. Confidence and courage are the essentials of success in carrying out our plan. You people must have faith; you must not be stampeded by rumors or guesses. Let us unite in banishing fear."

Banks need to work out how to restore the confidence of their clients and their shareholders. This will be achieved through:

- > Ensuring valuation models do not underestimate risks
- > Demonstrating an integrated view of credit, market and operational risk
- > Ensuring that risks are fully understood and effectively challenged by Senior Management before they are accepted
- > Ensuring more transparency around off-balance sheet financing so that shareholders are aware of the total risks faced by the organisation
- > Re-enforcing a strong risk culture throughout the organisation.

CONCLUSION

The 2007 'Credit Crunch' exhibited similarities to, and differences from, previous crises.

Changes in the Financial Services environment led to a surge in the growth of credit instruments. This was driven by an ongoing 'search for yield' and assisted by the fact that securitisation enabled banks to transfer their risk off their books.

The liquidity crisis forced assets back onto the balance sheet and raised questions around whether risks, and their ownership, were ever fully understood.

We may well see regulators and the Central Banks taking steps to ensure that a similar situation does not re-occur. These steps could include: changing Basel II to encourage a greater commitment by asset originators to ensure ongoing asset quality, even where there is no direct financial recourse; increasing disclosure of off-balance sheet assets and / or redefining the role of the Central Banks.

Whatever advances technology brings, it will not be able to forecast the next crisis. Banks therefore not only need to understand quickly the extent of their exposure, but also to establish good risk principles which enable them to respond to the crisis in an optimal manner.

The public need to regain their confidence in the financial services market as a whole. Adherence to good banking practice and greater transparency of off-balance sheet funding will be reinforced over the next few months, either on a voluntary basis or imposed by the regulators.

Once the risks around off-balance sheet assets are more transparent, liquidity will be restored and market confidence will be restoreduntil the next time.

APPENDIX A

INVESTMENT BANKS' THIRD-QUARTER LOSSES AND WRITE-DOWNS

INSTITUTION	COMMENTS
BANK OF AMERICA	<ul style="list-style-type: none"> > Losses from bad loans, trading and write-downs exceeded USD3.7bn in the third-quarter. > Suffered a USD717m net loss in its credit products and equity business (USD1.4bn in trading losses overall), wrote down USD2bn for credit losses and USD247m on its LBO portfolio. > Investment banking profits fell from USD1.4bn to just USD100m.
BEAR STEARNS	<ul style="list-style-type: none"> > Third quarter profits shrunk 61% to USD171.3m, the firm's biggest earnings decrease in a decade. > USD700m in asset write-downs (USD450m in mortgage-backed securities and CDOs, USD250m in commitments to finance LBOs).
CITIGROUP	<ul style="list-style-type: none"> > Third quarter profits fell 57% to USD2.38bn. > USD12bn in write-downs, including USD1.56bn for sub-prime mortgages, USD1.35bn pre-tax for leveraged loans and USD636m in fixed income trading. > Profits over at the corporate and investment bank fell 74% to USD446m. > Charles Prince, Head of Citigroup resigns.
DEUTSCHE BANK	<ul style="list-style-type: none"> > Confirmed that third-quarter write-down will total around USD3.1bn (USD1bn for LBO debt and USD2.1bn in other assets, including mortgage-backed securities). > Expects the corporate & investment bank to post a third-quarter loss of USD500m.
GOLDMAN SACHS	<ul style="list-style-type: none"> > Third-quarter profits rose an impressive 79% to USD2.8bn, despite writing-down the value of leverage loan commitments by USD1.5bn (net of fees and hedging).
JPMORGAN CHASE	<ul style="list-style-type: none"> > Third-quarter earnings came in up 2.3% to USD3.37bn, despite a USD2bn write-down from leveraged loans and credit-related losses. > Profits at the investment bank fell 70% to just USD296m.
LEHMAN BROTHERS	<ul style="list-style-type: none"> > The firm wrote down USD700m on the mortgage market, as well as loans to private equity firms. Fixed income revenues fell 47% in the third-quarter.
MERRILL LYNCH	<ul style="list-style-type: none"> > The firm originally announced that it will write-down USD5.5bn in the third-quarter on collateralised debt obligations and US subprime mortgages and leveraged finance-related transactions. On 24 October, this figure was increased by a further USD2.5bn. > Stanley O'Neal, CEO Merrill Lynch resigns. > Merrill Lynch will post a loss in the third-quarter, its first quarterly loss since 2001.
MORGAN STANLEY	<ul style="list-style-type: none"> > Third-quarter profits at the firm's institutional securities division fell 49% from Q2, after USD940m in write-downs to LBO-related loans and other assets. > 300 fixed income staff have been made redundant.
UBS	<ul style="list-style-type: none"> > USD5bn in fixed income losses, mostly related to US subprime lending assets. > The firm is likely to post a third-quarter loss of between USD511m – USD683m, its first quarterly loss in 9 years. 1,500 investment banking jobs will go. > Peter Wuffli, CEO of UBS resigns.
WACHOVIA CORP.	<ul style="list-style-type: none"> > Net income fell 10% in the third-quarter to USD1.69bn (this is the bank's first earnings decline in six years). > USD1.3bn was written-down related to leveraged buyouts and mortgage-backed securities. > Profits over at the corporate and investment bank fell 80% in the period, as revenue plunged 51%.

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