Credit Crunch: Where Do We Stand?

Thomas A. Russo

Group of Thirty, Washington, DC
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Group of Thirty Members

Group Of Thirty Publications Since 1990
### Acronyms and Abbreviations

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<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>ABCP</td>
<td>Asset-backed commercial paper</td>
</tr>
<tr>
<td>ABS</td>
<td>Asset-backed security</td>
</tr>
<tr>
<td>ABX</td>
<td>A series of credit default swap indices referencing deals in the home equity loan sector, issued half-yearly and broken down into sub-indices by rating buckets (AAA, AA, A, BBB and BBB-). Each ABX index references 20 home equity loan deals, and each sub index is composed of 20 equally weighted ABS credit default swaps referencing cash bonds, one from each deal (see also ABX.HE)</td>
</tr>
<tr>
<td>Alt-A</td>
<td>Mortgage loans for those with a good credit score, but who lack normal documentation</td>
</tr>
<tr>
<td>Alt-B</td>
<td>Mortgage loans that straddle the credit score spectrum between subprime and Alt-A mortgages. Typical borrowers have very little equity in their homes</td>
</tr>
<tr>
<td>ARM</td>
<td>Adjustable Rate Mortgage</td>
</tr>
<tr>
<td>bp or bps</td>
<td>Basis points</td>
</tr>
<tr>
<td>bn</td>
<td>Billion</td>
</tr>
<tr>
<td>CCMP</td>
<td>Nasdaq composite index</td>
</tr>
<tr>
<td>CDO</td>
<td>Collateralized debt obligation</td>
</tr>
<tr>
<td>CIA</td>
<td>Central Intelligence Agency</td>
</tr>
<tr>
<td>DPI</td>
<td>Disposable personal income</td>
</tr>
<tr>
<td>ECB</td>
<td>European Central Bank</td>
</tr>
<tr>
<td>EEM</td>
<td>iShares MSCI Emerging Markets Index Fund</td>
</tr>
<tr>
<td>FHA</td>
<td>Federal Housing Administration</td>
</tr>
<tr>
<td>FX</td>
<td>Foreign exchange</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross domestic product</td>
</tr>
<tr>
<td>HUD</td>
<td>U.S. Department of Housing and Urban Development</td>
</tr>
<tr>
<td>HY</td>
<td>High yield</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>LIBOR</td>
<td>London Interbank Offered Rate</td>
</tr>
<tr>
<td>LHS</td>
<td>Left-hand scale</td>
</tr>
<tr>
<td>LTV</td>
<td>Loan-to-value</td>
</tr>
<tr>
<td>M&amp;A</td>
<td>Mergers and acquisitions</td>
</tr>
<tr>
<td>MBS</td>
<td>Mortgage-backed securities</td>
</tr>
<tr>
<td>NAFTA</td>
<td>North American Free Trade Agreement</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OFHEO</td>
<td>Office of Federal Housing Enterprise Oversight</td>
</tr>
<tr>
<td>OPEC</td>
<td>Organization of the Petroleum Exporting Countries</td>
</tr>
<tr>
<td>PCE</td>
<td>Personal consumption expenditures</td>
</tr>
<tr>
<td>pp</td>
<td>Percentage point</td>
</tr>
<tr>
<td>Q</td>
<td>Quarter</td>
</tr>
<tr>
<td>q-o-q</td>
<td>Quarter-over-quarter</td>
</tr>
<tr>
<td>RHS</td>
<td>Right-hand scale</td>
</tr>
<tr>
<td>S&amp;P</td>
<td>Standard &amp; Poor’s</td>
</tr>
<tr>
<td>SAAR</td>
<td>Seasonally adjusted annualized rate</td>
</tr>
<tr>
<td>SIVs</td>
<td>Structured investment vehicles</td>
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<tr>
<td>SWFs</td>
<td>Sovereign wealth funds</td>
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<tr>
<td>tr</td>
<td>Trillion</td>
</tr>
<tr>
<td>VIX</td>
<td>Volatility index</td>
</tr>
<tr>
<td>y-o-y</td>
<td>Year-over-year</td>
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</table>
Introduction

This paper was presented by Thomas A. Russo1 on November 30, 2007, during the Group of Thirty’s 58th plenary on a panel entitled: “Credit Crunch: Where Do We Stand?” The paper was updated as of January 17, 2008, in preparation for the World Economic Forum Annual Meeting 2008 in Davos, Switzerland.

In the paper, Mr. Russo weaves together a narrative of the interrelated forces that are unfolding in the current economic environment. To begin, he focuses on the U.S. consumer, who has been crucial to economic growth and yet now finds himself increasingly levered and under duress. Mr. Russo explains how the declining housing market, exacerbated by stress in the mortgage market, has left consumers unable to borrow from their homes to finance consumption. He then details the increasing signs of contagion from mortgage-backed securitizations to other markets such as credit cards and auto loans, as general uneasiness grows and as challenged consumers begin to struggle to pay other debts. As nervousness spreads across markets, Mr. Russo describes a flight to quality and to hard assets, leading to rising prices for gold, fine art, oil, etc. The paper goes on to tackle the role of liquidity, questioning whether we are in the midst of a global liquidity bubble contributing to excess valuations of certain assets. Finally, Mr. Russo comes full circle to the U.S. financial “crisis” where bank balance sheets are backing up with assets, potentially further reducing credit creation, further pinching the consumer.

Against this backdrop, the paper concludes with policy proposals aimed at ameliorating the current situation. Mr. Russo calls for broad-brush approaches to addressing subprime mortgages; an extension of the U.S. Department of Housing and Urban Development and Federal Housing Administration programs to keep borrowers in their homes; targeted tax incentives; discount window action; an expansion of volume caps of state housing authorities; and a lowering of the federal funds rates.

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1 Thomas A. Russo is Vice Chairman and Chief Legal Officer of Lehman Brothers.
Consumer spending as a share of GDP

**Consumer spending is the main driver of U.S. GDP**
- Consumer spending has been a rising share of GDP, currently accounting for about 70%.
- The health of the consumer is therefore a major driver of the overall economy.
- U.S. consumer spending is important to global growth. Exports to the U.S. account for 25% of Canada’s GDP, 22% of Mexico’s, and 8% of China’s (see appendix, page 27).

Real personal consumption and disposable income

Consumption is supported by income...
- The marginal propensity to spend out of a dollar of income is nearly 1, leaving the savings rate close to zero.
- Consumer spending virtually never falls outside of recessions. Even in periods of weak income growth, consumers will continue to spend by drawing down their savings.
- Even in recessions, spending on essentials such as medical and housing services virtually never turns negative.
- Healthy income gains over the past few years have underpinned consumer spending.

Household net worth

….and wealth
- Consumers respond with long and variable lags to changes in wealth.
- About 60% of household assets are financial, and roughly 30% are residential real estate.
- However, changes in financial wealth affect only a portion of the population since the majority is held by the top tier of the income distribution. In contrast, homeownership is spread more evenly across income levels.
- Household net worth will likely start to decline on a year-over-year basis in the first half of 2008.
UNEMPLOYMENT RATE AND AVERAGE HOURLY EARNINGS

Signs of a softer job market are starting to emerge...
- There is an inverse relationship between unemployment and earnings.
- Higher unemployment reduces employee bargaining power and as such leads to slower wage growth.
- The unemployment rate increased from 4.4% in March 2007 to 5.0% in December 2007.
- Higher unemployment leads not only to lower per capita wages, but it also hurts consumer confidence.

CONSUMER CONFIDENCE

...contributing to a decline in consumer confidence
- Consumer expectations of future financial and economic conditions trend with personal consumption.
- If consumers expect the economy to weaken, they may cut back spending and increase precautionary saving.
- Consumer confidence has been falling amid concerns about housing weakness, turbulence in financial markets and rising energy prices.

ENERGY “TAX” ON CONSUMER SPENDING

Higher energy prices add to the strain
- About 6% of consumption is directed toward energy.
- In periods of rising energy prices, a greater portion of consumer budgets must be used for energy consumption, causing consumers to cut back on discretionary spending.
- This is an energy “tax,” which equals change in energy prices weighted by the share of personal consumption.
- The latest increase in energy prices amounts to about a 1% “tax” on income.
Meanwhile, the consumer is very levered

- Total household debt has grown rapidly over the past five years, largely due to a jump in mortgage debt.
- The burden of servicing debt is at an all-time high.
- The financial obligations ratio, which estimates required payments on outstanding debt (including mortgages, consumer loans and auto loans), has been rising as a share of disposable income.

THE CONSUMPTION CHALLENGE

*Mortgage market problems and the contagion into credit markets and banks pose an additional challenge to consumers*

The housing boom, in its later stages, was supported by aggressive mortgage lending in an environment of lower underwriting standards

- Subprime mortgage origination surged in 2005 and 2006 in response to lower underwriting standards and higher home prices.
- In 2006, subprime loans accounted for just over 20% of total origination, up from 8.6% in 2001.
- Similarly, origination of Alt-A/Alt-B (near-prime) mortgages climbed.

MORTGAGES OUTSTANDING

Source: Lehman Brothers Mortgage Strategy; LoanPerformance; data through 3Q07.
**Non-Agency Mortgage Resets**

![Graph showing non-agency mortgage resets over time](image)

Source: Lehman Brothers Mortgage Strategy.

**Subprime ARMs originated in 2005–06 will reset to higher rates over the next several quarters**

- About two-thirds of subprime mortgages outstanding have adjustable rates.
- About $550bn or 2.8 million subprime loans will reset before 2009.
- On average, monthly payments will likely jump 20% to 25%, boosting average monthly payments by $300 a month.
- Given tight lending standards, weak demand, and falling home prices, it will be difficult to refinance or make a sale. As such, many borrowers will be forced to default on their mortgages.

**Subprime Mortgages 60-Day Delinquencies**

![Graph showing subprime mortgage delinquencies](image)

Source: Lehman Brothers Mortgage Strategy; LoanPerformance.

**The jump in subprime resets should add to already-high delinquency rates...**

- Early performance of 2006 and 1H07 loans has shown more than twice as many delinquencies as normal (e.g., 2002).
- Based on early performance, cumulative defaults of subprime loans originated in 2006 and 1H07 could be about 40%.
- The 2005 subprime vintage has performed better relative to 2006 and 2007. However, there have been recent signs of deterioration in the 2005 vintage.

**Foreclosure Forecasts**

![Graph showing foreclosure forecasts](image)

Note: The graph only measures foreclosures of single-family existing home sales. With condos/coops, foreclosures would likely be about 20% higher.

Source: Lehman Brothers Mortgage Strategy.

**...and ultimately to foreclosures given the weak housing market and reduced availability of mortgage credit**

- Based on early performance and subprime resets, Lehman Brothers mortgage strategists estimate there will be a total of 2 million homes foreclosed over the next two years.
- This is about 3 times the normal foreclosure rate.
- Foreclosures will add to already-bloated inventory and sell at discounted prices, putting downward pressure on home prices.
Stress in the mortgage market has exacerbated the huge imbalance between housing demand and supply, further depressing home prices

- National home prices will most likely fall by the most since the Great Depression.
- Expect the Case-Shiller index to fall 15% from peak to trough and OFHEO to fall 10%, with risks to the downside.
- Case-Shiller is likely a better representation of actual home prices since it tracks homes with all types of mortgages, unlike OFHEO which is limited to agency (conforming).

Falling home prices and tighter credit should restrain consumer spending

- The literature on the “wealth effect” suggests consumers boost spending anywhere from 2 to 8 cents on every dollar of perceived permanent gains in housing wealth.
- Given easy credit and financial innovation, the upper end of this range probably applies.
- Using a 6 cents wealth effect and assuming home prices fall 10% over the next 2 years, the housing wealth effect on consumption has swung from an estimated 1.4pp to -0.4pp by end of 2009.

One of the major channels to realize changes in housing wealth is mortgage equity extraction

- Mortgage equity extraction is one way to realize changes in housing wealth (in addition to changing savings patterns or other borrowing).
- Net equity extraction has tumbled from a peak of an annualized $989bn, or 10% of disposable income, in 1Q06 to $436bn in 3Q07.
- There are likely lags between changes in equity extraction and consumption.
- See appendix (page 28) for uses of cash-out refinancing.
In response to rising delinquencies and weak housing fundamentals, mortgage lenders have aggressively tightened lending standards

- Lending standards have tightened for all types of mortgages.
- Lending standards for subprime loans started to tighten markedly in the beginning of 2007, virtually eliminating the space.
- Subprime originators have left the market or have laid off people.
- In contrast, we have just started to witness tighter lending standards for prime mortgages, which is largely driven by jumbo loans.

Financial markets have responded in a similar fashion—demand for mortgage-backed securities has plunged, pushing up spreads and dragging down prices

- We have witnessed a jump in even highly rated subprime securities in response to both poor remittance performance and risk aversion.
- The market is pricing about a 25% loss in pools of mortgages underlying subprime MBS, which translates into an assumption of a 50% default rate.
- By way of example, the ABX market for single-A bonds is assuming 100% principal loss on these bonds and receipt of interest only.
- 6 months ago, before the turmoil, the market was pricing about 8% to 9% losses, and 1 year ago it was pricing 4% to 5% losses.
The challenge to liquidate money from home equity has left consumers to finance spending through other sources (e.g., credit cards and anticipation of increased wages)

- During the housing boom consumers could clean up their credit card problems by taking money out of their homes.
- Over the past year, credit card debt has been growing at a faster pace than it has in the previous 4 years.
- However, year-over-year growth in credit card debt is still below the 10% average growth rate of the past decade.

There are signs of stress in the credit card sector

- Credit card delinquencies have started to pick up for the major issuers.
- It is likely that credit card delinquencies will increase further with a lag as consumer budgets become stretched and mortgage delinquencies continue to rise.

Lenders are tightening standards for non-credit card debt, and further tightening in the coming quarters is expected

- Banks have started to tighten lending standards for consumer loans (such as auto and other big-ticket items) with the exception of credit cards.
- Loose lending standards for credit cards suggests consumers can boost credit card borrowing to finance consumption.
- However, anecdotal evidence suggests banks are starting to grow increasingly concerned, which will likely encourage banks to ultimately tighten lending standards.
CREDIT CARD FIXED-RATE SPREADS OVER SWAP RATES

Source: LehmanLive; data through January 10, 2008.

The market is already anticipating credit problems
- A jump in spreads likely reflects both averse market sentiment and concern about credit card loan performance.

SUBPRIME AUTO ABS 60-DAY DELINQUENCIES

Early signs of credit problems in the auto loan market are starting to emerge...
- Delinquencies have started to pick up in the recent vintages for subprime, particularly 2007.
- Similar signs of deterioration are appearing in the prime sector.

PRIME AUTO FIXED-RATE SPREADS OVER SWAP RATES

...which are also seemingly priced into financial markets
- The rise in spreads reflects both increasing concerns about future performance and overall market sentiment.

Source: LehmanLive; data through January 10, 2008.
SECURITIZATIONS

Parts of the securitization markets are frozen, and parts are still functioning at higher spreads

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Value ($bn)</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autos</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autos Total</td>
<td>$73</td>
<td>$99</td>
<td>$85</td>
<td>$69</td>
<td></td>
</tr>
<tr>
<td>Prime</td>
<td>29</td>
<td>58</td>
<td>54</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Nonprime</td>
<td>34</td>
<td>28</td>
<td>25</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Floorplan</td>
<td>10</td>
<td>13</td>
<td>6</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Credit Cards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit Cards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$61</td>
<td>$72</td>
<td>$66</td>
<td>$93</td>
<td></td>
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<tr>
<td>MBS</td>
<td>$743</td>
<td>$1,069</td>
<td>$1,063</td>
<td>$620</td>
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</tr>
<tr>
<td>Prime</td>
<td>395</td>
<td>591</td>
<td>584</td>
<td>404</td>
<td></td>
</tr>
<tr>
<td>Nonprime</td>
<td>349</td>
<td>478</td>
<td>479</td>
<td>216</td>
<td></td>
</tr>
</tbody>
</table>

- Mortgage issuance has fallen sharply, while auto securitizations are down less than mortgages, and credit cards were actually up through 2007.
- August was a very low issuance month because of the spread increase in securitized products and broader market volatility.
- Credit cards and auto securitizations rebounded in the fall, but spreads remain high.
- At a minimum, 2008 credit card and auto securitizations will only get done at higher spreads.

Much of the decline in mortgage issuance has been over the past 6 months. Autos have shown signs of a decline in volume, and for now credit cards have remained somewhat stable

<table>
<thead>
<tr>
<th>Credit Cards</th>
<th>Value ($bn)</th>
<th># of deals</th>
<th>Autos</th>
<th>Value ($bn)</th>
<th># of deals</th>
<th>Prime MBS</th>
<th>Value ($bn)</th>
<th># of deals</th>
<th>Subprime MBS</th>
<th>Value ($bn)</th>
<th># of deals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov-06</td>
<td>$5</td>
<td>8</td>
<td>$13</td>
<td>9</td>
<td>$42</td>
<td>52</td>
<td>$41</td>
<td>44</td>
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<tr>
<td>Dec-06</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>45</td>
<td>53</td>
<td>35</td>
<td>39</td>
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<tr>
<td>Jan-07</td>
<td>5</td>
<td>9</td>
<td>3</td>
<td>4</td>
<td>44</td>
<td>57</td>
<td>27</td>
<td>34</td>
<td></td>
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<tr>
<td>Feb-07</td>
<td>11</td>
<td>17</td>
<td>8</td>
<td>8</td>
<td>60</td>
<td>68</td>
<td>35</td>
<td>40</td>
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<td>Mar-07</td>
<td>9</td>
<td>14</td>
<td>2</td>
<td>4</td>
<td>50</td>
<td>62</td>
<td>28</td>
<td>33</td>
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<td>Apr-07</td>
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<td>57</td>
<td>36</td>
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<td>May-07</td>
<td>9</td>
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<td>Jun-07</td>
<td>8</td>
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<td>66</td>
<td>24</td>
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<td>Jul-07</td>
<td>8</td>
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<td>3</td>
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<td>30</td>
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<td>7</td>
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<tr>
<td>Sep-07</td>
<td>11</td>
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<td>6</td>
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<td>Oct-07</td>
<td>16</td>
<td>19</td>
<td>9</td>
<td>8</td>
<td>15</td>
<td>20</td>
<td>7</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov-07</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>10</td>
<td>17</td>
<td>1</td>
<td>3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Dec-07</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td></td>
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</table>

Source: Intex (as of January 10, 2008; final ’07 volumes may adjust higher); Lehman Brothers’ Public and Private Issues ABS Database.
CREDIT CARD SECURITIZATIONS

Credit card securitizations are less likely to have the same performance deterioration as mortgages

- Credit card securitizations use a revolving master trust that purchases new receivables monthly.
- Credit card issuers can more easily alter the quality of the credit card receivables sitting in the trust.
- However, those credit card issuers would have to warehouse higher credit risk receivables on their balance sheets.
- Plus, spreads have widened, indicating nervousness.
- Recent unemployment data, together with growing recession concerns, will translate into higher charge-offs and losses on credit card portfolios.
- We have already started to see credit card issuers react by increasing their loss reserves.

AUTO SECURITIZATIONS

Auto securitizations also have some characteristics that may insulate the market relative to mortgages

- The payment size (approximately $300/month on average) is smaller, and since the loans are fixed rate, there is no reset/payment shock.
- But auto loans are sensitive to unemployment levels; if unemployment keeps rising, auto loan performance could deteriorate significantly.
- Already, delinquencies are rising as consumers get stretched, which can restrain auto sales, ultimately lowering securitization volumes.
- For domestic captive/quasi-captive issuers (Ford, GMAC, and Chrysler), this is important since securitization is core to their funding strategies.
- Spreads have widened (BBBs by about 400 bps), and issuers are retaining lower-rated assets as demand has dried up for risky assets.
- Coming full circle, as ABS markets tighten, credit to consumers to purchase autos is restricted, further reducing auto sales, which further hurts the economy.

S&P 500 IMPLIED VOLATILITY (VIX)

The “fixed income infection” is impacting the equity markets

- The S&P is about 13% off of its highs.
- There are other factors such as expectations of future corporate profits; however, it all becomes somewhat circular in nature since credit impacts future profitability.
- Nevertheless, volatility is rising, scaring many “committers of capital.”
This is creating a flight to quality and away from credit extension...

- Treasuries are rallying, while swap spreads are widening, reflecting a willingness to hold only the highest quality counterparty risk (i.e., not financial institution risk).
- Long-term U.S. government bonds are relatively scarce as well; perhaps this is why U.S. term rates appear to have lost their link with domestic economic fundamentals.

This is creating a flight to quality and away from credit extension...

- Treasuries are rallying, while swap spreads are widening, reflecting a willingness to hold only the highest quality counterparty risk (i.e., not financial institution risk).
- Long-term U.S. government bonds are relatively scarce as well; perhaps this is why U.S. term rates appear to have lost their link with domestic economic fundamentals.

Gold and oil prices have risen dramatically since the market troubles began.
- Even fine art, an asset with a finite supply, has appreciated dramatically in the face of the global liquidity glut.
- The rally in commodities reflects a safe-haven investment, but it also reflects excess global liquidity.

Credit creation = LQ + Bc + Lc, where LQ equals liquidity, Bc equals borrowers’ confidence, and Lc equals lenders’ confidence... So how does credit creation slow?
- Liquidity is driving technicals and perhaps even fundamentals, not the other way around.
- Liquidity glut leads to artificially tight spreads and high valuations.
- This sends incorrect signals to real economy operators.
- In search of returns, lenders misprice risk.
- This leads to too much debt creation with not enough collateral value.
- Disequilibria and asset bubbles result.
**U.S. M&A TRANSACTION VALUE**

![Graph showing U.S. M&A transaction value over time]

Note: 60-day average of announced M&A deals (sum of mergers, acquisitions, divestitures, self-tenders, and spinoffs).
Source: Bloomberg; data through January 11, 2008.

**Tighter spreads drove transaction volume to cyclical highs**
- Like residential real estate, the M&A wave appears to have collapsed under its own weight.
- In both cases, it was lenders’ confidence that disappeared—not liquidity.

**THE FED’S GLOBAL REACH**

<table>
<thead>
<tr>
<th>Country</th>
<th>Share of U.S. Trade Deficit '07</th>
<th>Currency Regime</th>
<th>Share of Non-U.S. Global GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>31.4%</td>
<td>managed</td>
<td>7.5%</td>
</tr>
<tr>
<td>Nigeria</td>
<td>3.4%</td>
<td>managed</td>
<td>0.3%</td>
</tr>
<tr>
<td>Venezuela</td>
<td>3.2%</td>
<td>pegged</td>
<td>0.5%</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>2.9%</td>
<td>pegged</td>
<td>1.0%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>2.7%</td>
<td>managed</td>
<td>0.4%</td>
</tr>
<tr>
<td>Algeria</td>
<td>2.2%</td>
<td>managed</td>
<td>0.3%</td>
</tr>
<tr>
<td>Russia</td>
<td>1.6%</td>
<td>managed</td>
<td>2.8%</td>
</tr>
<tr>
<td>India</td>
<td>1.5%</td>
<td>managed</td>
<td>2.5%</td>
</tr>
<tr>
<td>Angola</td>
<td>1.5%</td>
<td>managed</td>
<td>0.1%</td>
</tr>
<tr>
<td></td>
<td>50.4%</td>
<td></td>
<td>15.6%</td>
</tr>
</tbody>
</table>

Note: Trade deficit through 2Q07; GDP as of 2006, current US$. Source: International Monetary Fund; International Trade Administration / Commerce Department.

**Today’s discussions of the appropriateness of Fed policy do not reflect the Fed’s global reach...The Fed heavily influences monetary policy for much of the world by virtue of pervasive managed currency regimes**
- Global GDP is about $48tr and the U.S. makes up about $13tr (27%).
- Together, the U.S. and countries that “shadow” the dollar represent nearly 40% of global GDP.
- While many countries are dramatically different from the U.S. and need their own policy mechanisms, mercantilist proclivities leave them constrained by generic managed currency regimes.
- All else being equal, rates are too low, and growth is too hot and not in equilibrium.

**U.S. TRADE POSITION WITH EUROPE, CANADA, OPEC, CHINA**

<table>
<thead>
<tr>
<th>US Dollar</th>
<th>Trade deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Nov 06/Nov 07</td>
<td>% Nov 06/Nov 07</td>
</tr>
<tr>
<td>$ / Euro</td>
<td>(10.50%)</td>
</tr>
<tr>
<td>$ / Canada</td>
<td>(12.50%)</td>
</tr>
<tr>
<td>$ / China</td>
<td>(5.50%)</td>
</tr>
<tr>
<td>$ / OPEC</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Note: Dollar change is November month-end; trade deficit is 12 months ending November. Source: Commerce Department; Bloomberg.

**When markets are free to set policy based on fundamentals, things tend to balance**
- The U.S. trade position with Europe and Canada has improved as the dollar weakened, as one would expect.
- However, when a currency is pegged to the dollar, trade balances are not allowed to correct and things can even get worse, such as with China and OPEC.
Large and growing capital flows to developing countries are largely the result of undervalued currencies

- Ongoing trade deficits that are not allowed to self-correct lead to massive build-ups of official foreign currency reserves.
- Global FX reserves have grown 168% since January 2003 compared to global GDP, which has grown by about 20% over the same time.
- In addition, sovereign wealth funds (SWFs) are conservatively estimated to have about $2tr–$2.5tr in assets and are rapidly growing—assuming SWF assets get levered, it is clear SWFs will become very influential on markets (see appendix, page 28).

When will it end?

- So far, strong global growth, led by exploding liquidity has continued, while the U.S. financial sector has tried to feel for a bottom.
- Blue chip emerging market stocks (shown by IShares-EMG on the graph, ticker EEM) demonstrate this.
- Ultimately, the question is whether the global liquidity dynamic is so great that the growing U.S. financial “crisis” can unfold in a vacuum.
If history is any guide, the “liquidity bubble” has room to run…this may continue to underpin strong global asset markets in 2008

- Asset bubbles typically experience three stages: (1) denial, (2) conventional wisdom, and (3) speculative frenzy.
- Below (in quadrants #1 – #3) are three asset bubbles:
  - The gold bubble in the late 1970s in which prices rose about 6.5 times over about 3.5 years.
  - The tech bubble in the late 1990s in which prices rose about 6.7 times over 5 years.
  - The recent housing bubble where major homebuilder stocks rose about 7.8 times over about 5.5 years.
- Is excess global liquidity the next bubble?
  - Quadrant #4 shows an emerging market index (EEM) that is up about 4.1 times in about 4.5 years.
  - EEM is a possible proxy for a liquidity bubble since it is liquid, big, and popular, but one could also look at charts for fine art, gold, and oil, which can also be driven by global liquidity.

#1 GOLD BUBBLE (GOLD SPOT PRICES)

Source: Bloomberg.

#2 TECH BUBBLE (NASDAQ COMPOSITE INDEX – CCMP)

Source: Bloomberg.

#3 HOUSING BUBBLE (S&P SUPER COMPOSITE HOMEBUILDING INDEX – S15HOME)

Source: Bloomberg.

#4 GLOBAL LIQUIDITY BUBBLE? (ISHARES MSCI EMERGING MARKET INDEX – EEM)

Source: Bloomberg.
Bank balance sheets are backing up with assets...

- As of end-December, Lehman Brothers estimated that about $250bn in unanticipated assets ($120bn of HY Bonds/Loans and $130bn in ABCP Assets, including SIVs) had been brought onto bank balance sheets.

- Risk-weighted assets were estimated to be $186bn.

- In addition, losses are estimated at about $65bn–$115bn ($10bn due to HY Bonds/Loans, $15bn in ABCP Assets, $15bn in ABS CDOs, and $25bn–$75bn in mortgage losses).

- This significantly reduces banks’ capital ratios relative to June-07 (prior to the market troubles), assuming they had raised no fresh capital.

- To the extent securitization markets are closed or too pricey, banks will be forced to keep additional assets on balance sheets.

...which could lead to a reduction in credit creation further pinching the consumer

- Prior to recent events, Lehman Brothers Equity Research forecast $685bn in asset growth for 2008.

- If banks want to bring Tier-1 capital ratios back to 8% in a year, they would need to reduce asset growth by anywhere from $160bn to $540bn.

- Banks have other options such as reducing buybacks and dividends, or raising fresh capital (into a difficult market) as Citi has just done, which could bias the slowdown in asset growth to the lower end of the range.

- In either event, asset growth (i.e., credit extension) could slow between $160bn–$540bn, compared with average annual credit growth over recent years of $2tr for the entire economy.

- Demand for credit will slow, too, given the slowing economy; however, non-bank supply of credit will also slow, given stress in securitization markets. These two effects likely offset each other, thus the slowing in bank asset growth is still relevant.

- Stress on bank balance sheets not only affects consumers, but it also impacts lending to foreign banks that depend on dollar lending.
Conclusion

In the next year or two:

• Pressure on the consumer grows as:
  o Home prices fall, reducing the wealth effect.
  o Energy tax weighs heavily.
  o Credit conditions tighten.
  o Unemployment rate edges higher.
• Consumers need their incomes to grow or to seek additional sources of credit to consume, or otherwise slow consumption
  o Problems in one market can spread to other markets, further damaging access to credit.
  o Rising delinquencies from levered consumers exacerbate the credit problem.
  o This is causing pressure on asset-backed securities and indexes…
  o Resulting in pressure on balance sheets and funding vehicles…
  o SIVs that cannot finance themselves will sell the assets.
  o Mortgage and bond insurers own these assets. Their balance sheets deteriorate.
  o This creates pressure on what they guarantee.
  o Counterparty risk of these institutions grows…Liquidity continues to dry up in the mortgage space.
  o Capital needs to be raised, but the market is concerned about the underlying assets…Consequently, the cost to raise capital becomes high and for some prohibitive.
  o Some bleed into other consumer credit assets creates more fear.
  o Hence, the willingness to lend becomes extraordinarily constrained.
  o All of this lowers consumption, unless incomes rise to make up for it.
  o However, higher unemployment will cause further problems through loss of jobs and more generally through a loss of confidence.
  o If consumer spending falls, it can lead to falling corporate profits, which leads to falling equity markets, which reduces wealth, and leads to falling consumption, etc.
• Liquidity in general will continue to grow in countries through reserves and sovereign wealth funds
  o This will lead to increased prices where investor confidence is present, particularly for assets with finite supplies.
  o A weakened dollar will lead to more investment in the U.S., but only in areas with a perception of value and investor confidence.
  o This liquidity could find its way into mortgage markets once there is an understanding of the value proposition—at that point the short side will add upward pressure as it unwinds.
  o Mortgage losses will be indirectly financed through capital infusions in financial institutions primarily through sovereign wealth funds (see appendix, page 29).
• Severe losses in the mortgage market lower consumer confidence, which coupled with a weaker economy, will lead to greater government involvement both fiscally and monetarily
  o The Federal Reserve will most likely continue to lower interest rates and adopt various methods to add liquidity to the market. So will other central banks, including, most importantly, the ECB.
  o The U.S. Congress will move forward with fiscal stimuli aimed at the economy and perhaps targeted to the housing market.
  o The combination of strong monetary and fiscal policy will be an important factor in reversing the trend.

In the long run:

• Lower home prices spur sales recovery.
• Securitization returns for less exotic products.
• A broader array of mortgage credit returns.
• Liquidity growth rates through reserves will slow since countries with pegged currencies will need to use monetary policy to be able to manage growth and fight inflation.
• Like all cycles, this too will come to an end.
Recommendations

Something needs to be done

- The recent market has been, in many respects, worse than it was in August
  - The lack of confidence in pricing has led most buyers away from mortgage products, and there are few buyers in the market with both the balance sheet and expertise to understand any "bargains."
  - Such players are currently dealing with the less risky assets in the mortgage asset class (particularly agencies).
  - Directed liquidity is needed to restore confidence.

Some things that might be done are:

1. We need legal clarity that the fundamental policy for dealing with the subprime issue should involve broad-brush approaches rather than traditional loan-by-loan analyses
   - Servicers are reluctant to implement innovative loan modification protocols because of perceived litigation exposure.
   - The Paulson/HOPE NOW initiative reflects the need for formulaic approaches that insulate servicers from liability.
   - Regulators and legislators alike should consider granting servicers comfort if they act in “good faith” based on homeowner payment history.

2. Develop and expand the reach of programs to keep at-risk borrowers in their homes. HUD and FHA have shown great leadership, and we need to consider ways of developing new programs and scaling programs like FHASecure
   - Programs should be targeted to homeowners (not investors) with ARMs who are or will become delinquent as a result of resets and are unable to refinance because of credit issues or property value declines.

For example:
   - Loan servicers could offer a new FHA-insured fixed-rate amortizing loan at 90% of the current appraised value of the home.
   - The insuring agency would receive a percentage (e.g., 75%) of the home appreciation between the new and old loan balances to compensate for its guarantee.
   - Combination of reduced LTV and the appreciation share enables more affordable loan terms for borrowers to keep them in their homes.
   - Agency insurance would enable securitization and enhanced liquidity for the program to enable it to reach more at-risk borrowers.
   - If the new cash payment is lower than the original, a floor could be created at the original cash payment to prevent a windfall.
   - Congress has appropriated funds to be made available through HUD to non-profits to help homeowners modify or refinance their mortgages. Conceivably, some of such money might be used as seed money for the development of such programs.

3. Since the U.S. housing stock is worth about $23tr (or about $10tr more than annual U.S. GDP) a drop of 15% would reduce wealth by about $3.5tr. Policymakers should carefully evaluate opportunities to reverse the trend in this diminution of wealth and, thereby, also stimulate all the by-products of the housing industry. One such idea directed at the epicentre of the credit crunch is to consider targeted tax incentives to stimulate single-family home purchase activity. This would help reduce inventories that are dragging down the housing market and reduce future problems due to the overhang of scheduled resets. It would also liquify many of the mortgages that are in present securitized products thereby giving greater certitude to their value. The following program should be considered:
   - Borrowers would receive an income tax credit in lieu of the interest deduction equal to a designated percentage of the interest they pay on a mortgage loan used to purchase a home they will use continuously as a principal dwelling.
RECOMMENDATIONS CONTINUED

- The credit would be reduced as the value of the dwelling increases. For example, the credit would equal 100% of the interest on the first $400K of purchase price. On the next $200K, the credit would fall (on a straight-line basis) from 100% to 80%. There would be no credit for any home bought in excess of $600K.

- The $400K/$600K numbers are not magic, but rather were selected as a starting point for discussions. In addition, the duration of the tax credit need not extend forever and policymakers could set the duration as appropriate, keeping in mind the need for it to be enticing enough to create buyers (demand).

- The home must be the borrower’s primary residence.

- Borrowers would be required to have made a 20% down payment. To preserve equity, subordinate financing that resulted in a combined LTV in excess of 80% would be prohibited at any time.

- The borrower’s ability to repay the loan would have to have been fully documented.

- This program would apply only for single-family homes purchased in 2008.

- Such a program would need to have an anti-abuse provision similar to the learning experience from rent-controlled apartments.

- To further increase liquidity, FHA could develop a program to insure loans meeting these parameters.

- Such loans should have natural buyers such as pension funds because of the long-dated nature of the product, thereby minimizing the need to put such loans on bank balance sheets. In addition, aside from the tax credit it does not require government support.

4. Broaden access to the discount window for financial institutions that are significant players in this market

- The assumption would be that the utilization of the discount window would be for purposes of adding liquidity to the mortgage market.

- The vehicles for this could be the primary bond dealers or depository institutions owned by them.

- Consideration should also be given to lowering the discount rate to coincide with the federal funds rate.

- These measures could be done on a temporary basis.

5. Expand volume caps of various state housing authorities to issue loans to first-time buyers and expand the limitation on such loans to cover refinancing for such buyers

- This will enable the utilization of the tax-exempt market to help, in particular, the refinancing of first-time buyers.

- Such loans would be under the same credit limitations that currently exist but with expanded volume caps.

6. Sharply lower the federal funds rate

- This could negatively affect the dollar and inflation, but must be considered given the high possibility that markets will get worse and could dramatically affect the economy as a whole.

- Measures 1–5 are more surgical in nature.

A lot is at stake for the economy, and all actions that add liquidity or help prevent distressed sales that exacerbate the problem, are worthy of consideration (even if they are somewhat “out of the box”). Emphasis should be placed on developing a portfolio of actions, some of which could be temporary in nature, rather than finding a magic bullet!
APPENDIX:

CONTRIBUTION TO GDP GROWTH FROM NET EXPORTS

![Graph showing the contribution to GDP growth from net exports from Mar-00 to Mar-09.](image)

Source: Commerce Department; Lehman Brothers Economics.

- Trade made a positive contribution on growth in 2007 for the first time in nearly a decade.
- Exports have been underpinned by a weaker US$. From its peak in 2002, the US$ has fallen roughly 35% from the Federal Reserve’s major basket of currencies.
- In addition, buoyant growth in the Euro Area, Canada, Mexico and Emerging Asia has led to healthy demand for U.S. exports.
- Net exports are expected to improve further in 2008 and 2009 in response to both stronger exports and weaker imports.

GDP SHARE OF EXPORTS TO U.S.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Euro Area</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Japan</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>UK</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Canada</td>
<td>15</td>
<td>16</td>
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<tr>
<td>Mexico</td>
<td>5</td>
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<tr>
<td>Korea</td>
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<tr>
<td>Australia</td>
<td>2</td>
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<tr>
<td>India</td>
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<tr>
<td>China</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>8</td>
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<tr>
<td>G10 ex-US</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: OECD; Datastream; Lehman Brothers Economics.

SHARE OF GROWTH DUE TO EXPORTS TO U.S.

![Graph showing the share of growth due to exports to U.S. from 2000 to 2006.](image)

Source: OECD; Datastream; Lehman Brothers Economics.

- Three economies stand out as having benefited from U.S. demand: Canada, Mexico and China.
- The former two are easily explained by these countries’ proximity to the U.S. and, perhaps, from an effect from NAFTA membership.
- China’s contribution probably reflects its export-led growth strategy, epitomized by its managed exchange rate policy against the dollar.
- There are also linkages between countries, which adds to the impact from U.S. growth.
USES OF CASH-OUT REFINANCING

- Consumers use the equity extracted in a variety of ways. The majority is spent to repay other debts and home improvement.
- Some of the money is spent on consumer expenditures including vehicles, education, medical expenses, living expenses, and consumer purchases.

Source: Federal Reserve Survey of Consumers.

SIZE OF SOVEREIGN WEALTH FUND MARKET

- Accurate information regarding the size of some sovereign wealth funds (SWFs) is hard to obtain.
- $2.0tr is a very conservative estimate excluding diversified monetary authorities.
- $2.5tr is a conservative estimate including estimated excess reserves of diversified monetary authorities.

Note: Diversified monetary authorities are select central banks/monetary authorities that have significantly diversified their assets and investment objectives beyond traditional reserve management, but not exclusively through a separate SWF entity.
Source: Central Banking Publications; Lehman Brothers; IMF; CIA data; Bloomberg.
## RECENT SWF INVESTMENTS IN BANKS / INVESTMENT BANKS

<table>
<thead>
<tr>
<th>Date</th>
<th>Target</th>
<th>Investors</th>
<th>Estimated Value ($bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Jan-08</td>
<td>Citigroup</td>
<td>Government of Singapore Investment Corporation (GIC), Kuwait Investment Authority (KIA), Prince Alwaleed bin Talal, et al.</td>
<td>$12.5</td>
</tr>
<tr>
<td>15-Jan-08</td>
<td>Merrill Lynch</td>
<td>KIA, Korea Investment Corp (KIC), et al.</td>
<td>$6.6</td>
</tr>
<tr>
<td>24-Dec-07</td>
<td>Merrill Lynch</td>
<td>Temasek</td>
<td>$4.4</td>
</tr>
<tr>
<td>19-Dec-07</td>
<td>Morgan Stanley</td>
<td>China Investment Corporation (CIC)</td>
<td>$5.0</td>
</tr>
<tr>
<td>10-Dec-07</td>
<td>UBS</td>
<td>GIC, Middle East investor</td>
<td>$11.5</td>
</tr>
<tr>
<td>26-Nov-07</td>
<td>Citigroup</td>
<td>Abu Dhabi Investment Authority (ADIA)</td>
<td>$7.5</td>
</tr>
<tr>
<td>22-Oct-07</td>
<td>Bear Stearns</td>
<td>Citic Securities Company</td>
<td>$1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>$48.5</strong></td>
</tr>
</tbody>
</table>

Note: Deal sizes and stakes estimated and could change due to changes in FX rates, share prices, and deal terms.

Source: News reports; Dealogic; company press releases.

- Since the market turmoil, SWFs and other investors have made a number of investments to shore up capital in banks and investment banks.
- The adjacent table does not include the additional investments SWFs have made in alternative investment managers (e.g., Blackstone) or in banks for other strategic purposes (e.g., Barclays).
Group of Thirty Members

Paul A. Volcker
Chairman of the Board of Trustees, Group of Thirty
Former Chairman, Board of Governors of the Federal Reserve System

Jacob A. Frenkel
Chairman, Group of Thirty
Vice Chairman, American International Group
Former Governor, Bank of Israel

Montek S. Ahluwalia
Deputy Chairman, Planning Commission of India
Former Director, Independent Evaluation Office, International Monetary Fund

Abdulatif Al-Hamad
Chairman, Arab Fund for Economic and Social Development
Former Minister of Finance and Minister of Planning, Kuwait

Leszek Balcerowicz
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Jaime Caruana
Counsellor and Director, MCM Department, International Monetary Fund
Former Governor, Banco de España
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Chairman and CEO, DFC Associates, LLC
Former Minister of Economy, Argentina

E. Gerald Corrigan
Managing Director, Goldman Sachs & Co.
Former President, Federal Reserve Bank of New York

Andrew D. Crockett
President, JP Morgan Chase International
Former General Manager, Bank for International Settlements

Guillermo de la Dehesa Romero
Director and Member of the Executive Committee, Grupo Santander
Former Deputy Managing Director, Banco de España
Former Secretary of State, Ministry of Economy and Finance, Spain

Mario Draghi
Governor, Banca d'Italia
Member of the Governing and General Councils, European Central Bank
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