

**Total \$3.6 Trillion Projected Loan and Securities Losses in the U.S.,  
\$1.8 Trillion of Which Borne by U.S. Banks/Brokers:  
Specter of Technical Insolvency for the Banking System Calls for Comprehensive  
Solution**

by

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**RGE Monitor**

**January 2009**

**Introduction**

Back in February 2008, we at RGE Monitor warned that that the credit losses of this financial crisis would amount to at least \$1 trillion and most likely closer to \$2 trillion.

At that time such estimates were derided as being exaggerated as the market consensus at that time was around \$200-300 billion of subprime mortgage related losses. But we pointed out that losses were not limited to subprime mortgages and would rapidly mount – following a severe US and global recession – to near prime and prime mortgages, commercial real estate loans, credit card loans, auto loans, student loans, leveraged loans, muni bonds, industrial and commercial loans, loans to real estate developers and contractors, corporate bonds, CDS and the securities (MBS, CDOs, CMOs, CPDOs, and the entire alphabet soup of derivative instruments) that – via securitization – represented claims on these underlying loans.

Soon enough, market estimates of loan and securities losses mounted: by April 2008 the IMF estimated them to be \$945 billion; then Goldman Sachs came with an estimate of

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\$1.1 trillion; the hedge fund manager John Paulson estimated them at \$1.3 trillion; then in the fall of 2008 the IMF increased its estimate to \$1.4 trillion; Bridgewater Associates came with an estimate of \$1.6 trillion; and most recently, in December 2008, Goldman Sachs cites some estimates close to \$2 trillion (and argues that loan losses alone may be as high as \$1.6 trillion and expects a further \$1.1 trillion of loan losses ahead).

In mid-November 2008, the threshold of \$1 trillion in global financial writedowns was finally reached. Thus, as we argued throughout 2008, our \$1 trillion estimate was only a floor - not a ceiling - for eventual losses and our upper range of \$2 trillion would become more likely.

We have now revised our estimates and we now expect that total loan losses for loans originated by U.S. financial institutions will peak at up to \$1.6 trillion out of \$12.37 trillion loans. Our estimates assume that national house prices will fall another 20% before they bottom out some time in 2010 and that the unemployment rate will peak at 9%. If we include then around \$2 trillion mark-to-market losses of securitized assets based on market prices as of December 2008 (out of \$10.84 trillion in securities), total losses on the loans and securities originated by the U.S. financial system amount to a figure close to \$3.6 trillion.

U.S. banks and broker dealers are estimated to incur about half of these losses, or \$1.8 trillion (\$1 - 1.1 trillion loan losses and \$600-700bn in securities writedowns) as 40% of securitizations are assumed to be held abroad. The \$1.8 trillion figure compares to banks and broker dealers capital of \$1.4 trillion as of Q3 of 2008, leaving the banking system borderline insolvent even if writedowns on securitizations are excluded.

Arguably, mark-to-market losses on private sector securitizations have so far been largely compensated for by increased activity in the government-sponsored sectors, but mark-to-market writedowns may become a more important factor going forward for bank capitalizations and credit provision to the private sector (see discussion in Hatzius (2008))

Moreover, even assuming that securitized assets may have fallen in value excessively because of a liquidity premium – rather than credit risk alone – we still get very large losses. Assume – generously – that securities are now underpriced because of illiquidity and that market losses will be eventually 20% lower than we currently estimate because of such temporary factors. Then writedowns on market securities would be \$1.6 trillion rather than \$2 trillion and total credit losses would be \$3.2 trillion rather than \$3.6 trillion.

In this paper we argue that, in order to restore safe credit growth, the U.S. banking system thus needs an additional \$1 – 1.4 trillion in private and/or public capital. These magnitudes call for a comprehensive solution along the lines of a ‘bad bank’, or

preferably a restructuring of the financial system through an RTC or our through our HOME proposal.

## Loss Estimates

Our data on outstanding loan and securities amounts are as in IMF [Global Financial Stability Report](#), Table 1.1, as well as the weights in assigning loss shares to banks and non-banks (see data in Appendix 1). Different from the IMF which focuses on charge-offs only, we look at both charge-off and delinquency rates as we assume a high proportion of delinquent loans will turn bad in this cycle, especially as financial institutions have thin capital bases inadequate to deal with unexpected losses.

Compared to the IMF we estimate for loan losses based not on current default/delinquencies rates but rather what those losses will be when such default and delinquencies will reach their peak some time in 2010. Our calculations are assume a further 20% fall in house prices (Case/Shiller) and unemployment peaking at 9% during this cycle as discussed in the [RGE 2009 Global Economic Outlook](#)

With respect to credit losses on unsecuritized loans, recent research by the Federal Reserve Board (Sherlund (2008)) using comparable house price assumptions (but assuming high oil prices) concludes that over half of 2006-2007 **subprime** mortgage originations are set to default (i.e. \$150bn out of \$300bn in our data). The loss trajectories for **Alt-A** loans are similar, resulting in a 25% default rate (\$150bn out of \$600bn). Even **prime** mortgage delinquencies display a very high correlation with subprime loan delinquencies (Doms/Furlong/Krainer (2008), implying an approximate 7% default rate when the potential for 'jingle mail' is taken into account (\$266bn out of \$3,800bn). Our dollar losses for the subprime and Alt-A categories (incl. RMBS) are broadly in line with similar estimates in the literature.

The cycle has also turned in the **commercial real estate (CRE)** area with the traditional lag of around 2 years. Current serious delinquency plus default rates of 5.9% of CRE loans (Fed data) are projected to increase to up to 17% by industry experts cited in a Fitch study referring to CMBS data and assuming a 25% fall in prices (\$408bn out of \$2.4 trillion.) This compares with a 1991 peak charge-off plus delinquency rate of 14.5%. In the **consumer loan** area, we estimate credit card charge-off rates could increase to 13% in the worst case scenario. Adding a typical 4% delinquency rate during recessions, the total loan losses on unsecuritized consumer loans are projected to increase to \$238bn out of \$1.4 trillion (see [A Forecast of Writedowns On U.S. Credit Card Debt in 2009](#), by RGE's Mathias Kruettli).

The IMF warned that **commercial and industrial loans (C&I)** losses are likely to climb to historical peaks and potentially beyond in this cycle. Compared to past C&I loan loss

rates, we project charge-off and delinquencies to reach 10% or \$370bn out of \$3.7 trillion of unsecuritized C&I loans. With regard to **leveraged loans**, the latest research by Boston Consulting/IESE Business School based on the 100 largest PE firms engaged in LBOs calculates an expected book loss from default of about 30%. This translates into \$51bn in losses out of \$170bn unsecuritized leverage loans.

Based on these calculations, **RGE now expects total loan losses to the financial system to reach about \$1.6 trillion out of \$12.37 trillion of unsecuritized loans** alone, implying an aggregate default rate of over 13%. Applying IMF weights, **the U.S. banking system** (commercial banks and broker dealers) **carries about 60-70% of unsecuritized loan losses, or around \$1.1 trillion.**

**Total mark-to-market (mtm) writedowns** on a further \$10.8 trillion of U.S. originated securities outstanding reached about **\$2 trillion by the end 2008** based on cash bond and derivatives prices. In particular, applying Markit ABX prices to \$1.1 trillion of outstanding **subprime RMBS** results in a mtm loss rate of 50%, or \$550bn. Markit TABX prices also show that \$400 billion **ABS CDOs** consisting of mostly junior subprime RMBS tranches are all but worthless by now and expected to remain that way (95% or 380bn mtm loss.)

Writedowns in the **prime MBS** universe are primarily driven by jumbo mortgages which we assume to trade at 97% based on the record 3% spread between the 30-year jumbo mortgage and the 10-year Treasury yield with comparable average maturity. Mtm losses on prime MBS are therefore assumed to be \$114bn out of \$3.8 trillion outstanding. **CMBX** spreads spiked up implying a mtm writedown of about \$282bn out of \$940bn outstanding.

The aggregate **consumer debt ABS** price index across all ratings trades at 80% thus implying \$130bn in mtm writedowns out of \$650bn outstanding. The **high-yield corporate debt** index traded at 75% (mtm \$150bn out of \$600bn), whereas **high-grade corporate debt** traded at 95% before moving back to 100%: we assume a writedown of \$190bn out of \$3.8 trillion. Derivatives indices for securitized leveraged loans implied a mtm loss of 123bn by the end of 2008 out of \$350bn in **CLOs** outstanding.

Flow of funds data show that **40% of U.S. originated securitizations are held abroad**, leaving U.S. institutions with 60% of m-t-m writedowns, and U.S. banks in particular with a share of 50-60% thereof, i.e. \$600 –700bn, when applying IMF weights.

Expected U.S. banks loan losses of about \$1.1 trillion out of a total \$1.6 trillion, plus bank mtm writedowns of \$600 - \$700bn on securities based on December 2008 prices amount to about \$1.8 trillion. Compared with a total bank capitalization of \$1.4 trillion

(incl. FDIC insured plus investment banks as of Q3), the estimated **capital shortfall amounts to around \$400bn in the worst case scenario before recapitalization.**<sup>3</sup>

Even including the TARP 1 injection of capital of \$230 billion into the banking system and the further \$200 billion of capital injected by private investors and sovereign wealth funds since the start of the crisis, the overall banking system would still be borderline insolvent.

Moreover, in order to restore the capital of the banking system to the previous level of \$1.4 trillion (a level close to the 8% capital requirement of Basel II) an additional \$1.4 trillion of private and public/government capital would have to be injected in the banking system to restore safe credit growth. If a reform of the regime of regulation of banking institutions were to argue that banks and broker dealers need more than the Basel II 8% criteria to operate safely even more than \$1.4 trillion of new capital will have to be injected in the banking system.

Thus, even the release of TARP 2 (another \$350 billion) and its use to recapitalize banks only would not be sufficient to restore the capital of banks and broker dealers to internationally accepted capital ratios. A TARP 3 and 4 of up to \$1.05 trillion (assuming generously that all of TARP 2 goes to banks and broker dealers) may be needed to restore capital ratios to adequate levels.

Even assuming that private and foreign capital would contribute to 50% of this additional required recapitalization an additional TARP 3-4 of \$560 billion may be needed in the form of public capital injections in banks and broker dealers alone. This would leave out the insurance companies, finance companies and other financial institutions (the GMAC, GE Capital, etc.) which may also need further public capital.

Our estimates may turn out to be too pessimistic as the current illiquidity premium in prices of securities may disappear over time and a faster than expected growth recovery may reduce the expected losses on loans. But even in that case the current shortfall of capital in the banking system would be close to a staggering \$1 trillion rather than an even bigger \$1.4 trillion.

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<sup>3</sup> Our colleague Christopher Whalen of Institutional Risk Analytics – one of the leading experts of U.S. banking - has long predicted that peak charge-offs for the US banking industry will reach 2x 1990 levels during 2009, which would mean 4% charge-offs against total loans and leases for all FDIC insured banks or some \$800 billion in realized losses. In reviewing a draft of our paper, Chris noted that the Q4 2008 results from Citi, JPMorgan, Bank of America show that charge-offs were running at a rate roughly double 2007 levels and that he expects charge-offs for these larger banks to double again by Q2 2009 and to continue rising through the second half of 2009. He thinks that our “\$1.1t loss estimate is very reasonable for the financials in terms of charge-offs”. The total accumulated loss for all FDIC insured banks will depend upon how long the industry remains at this peak level of loss experience; thus, our loss estimates for U.S. banks losses could be conservative and losses may end up being much larger than we predict.

Conversely, credit losses may turn out to be even larger than we estimate: if instead of a U-shaped recession that is over by the end of 2009, the US recession were to last well into 2010 and turn out to be a Japanese style L-shaped recession, total loan and especially securities losses would end up being much larger than our benchmark of \$3.6 trillion, potentially as high as \$5 trillion.

Thus, the release of TARP 2 is welcome news for the banking sector but the prospect of further mtm losses and feedback loops that are not yet priced in calls for a more comprehensive solution for toxic assets along the lines of the proposed ‘aggregator bank’ or preferably an outright restructuring of the banking system a la RTC. Moreover, in order to address the root causes of the financial crisis in the mortgage and the household sectors, we proposed recently the “[HOME \(Home Owners’ Mortgage Enterprise\): A 10 Step Plan to Resolve the Financial Crisis](#)” that includes an RTC to deal with toxic assets, a HOLC to reduce homeowner mortgage debt, and an RFC to refinance viable banking institutions.

The US banking system is borderline insolvent in the aggregate and it will take a huge amount of public financial resources and complex and time-consuming work-out of insolvent institutions to restore its financial health and allow it to lend again in ways that support sustained economic growth.

## Appendix 1:

Estimates of Unsecuritized Loan Losses (in billions of U.S. dollars)									
Out-standing		IMF October GFSR est. losses	Current loan losses (seriously delinquent + foreclosed/ charged-off)		RGE total estimated loan losses		Share of Losses Borne By U.S. Banks and Broker-Dealers (weights as in IMF table 1.1)		Data Source /Assumptions
			%	bn	%	bn	%	bn	
Subprime	300	50	13.57+ 5.53=19	57	50	150	70-80	120	OCC seriously delinquent loans+ foreclosures in process
Alt-A	600	35	7.05+3.64 = 10.7	64	25	150	57-70	105	Ibid.
Prime	3800	85	1.67+1.08 = 2.75	105	7	266	29-35	95	Ibid.
Commercial real estate	2400	90	4.73+1.11 =5.9	142	17	408	67-70	285	Fed SA delinquency + charge-off rates (net recovery)
Consumer loans	1400	45	3.69+3.54 =7.3	102	13+4= 17	238	67-75	180	Ibid. RGE est.: Kruettli (2008)
Corporate loans (C&I)	3700	110	1.6+0.99 = 2.59	96	10	370	72-80	295	Ibid.
Leveraged loans	170	10	3.3	6	30	51	50- 100	35	RGE est: Boston Cons./IESE:
<b>Total loans</b>	<b>12370</b>	<b>425</b>	4.6%	<b>572</b>	<b>13.1</b>	<b>1633</b>	60-70	<b>1115</b>	

Estimates of Mark-To-Market Losses on Related Securities (in billions of U.S. dollars)							
Outstanding		IMF October GFSR est. losses	RGE: MTM Losses, as of December 2008		60% = Share of Losses in U.S. 40% = Share of securitizations held abroad (flow of funds data)		Data Source
			%	bn	Share of U.S. writedown borne by U.S. banks/brokers, (IMF weights) in %	bn	
ABS	1100	210	50	550	0.6*0.52=31%	<b>171</b>	<a href="#">Markit ABX</a> prices
ABS CDO	400	290	95	380	0.6*0.55=33%	<b>125</b>	<a href="#">Markit TABX</a> prices
Prime MBS	3800	80	3	114	0.6*0.31=19%	<b>22</b>	<a href="#">Fig.1.9: Jumbo price index</a>
CMBS	940	160	30	282	0.6*0.56=33%	<b>93</b>	<a href="#">Markit CMBX</a>
Consumer ABS	650	0	20	130	0.6*0.55=33%	<b>43</b>	Aggregate ABS index
High-grade corporate debt	3800	130	5	190	0.6*0.6=36%	<b>70</b>	iBoxx investment grade ETF
High-yield corporate debt	600	80	25	150	0.6*0.63=38%	<b>57</b>	iBoxx high-yield ETF
CLOs	350	30	35	123	0.6*0.65=39%	<b>48</b>	S&P LCD index
<b>Total for securities</b>	<b>10840</b>	<b>980</b>	17.6%	<b>1919</b>	30-35%	<b>629 or 600-700</b>	



**Appendix 2:**

**U.S. Bank Financing Requirements:** **in billion USD**

Total U.S. equity capital of FDIC-insured banks, as of Q3	1307
Total investment bank equity capital, as of Q3	+110
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<b>Total U.S. bank capitalization as of Q3</b>	<b>1400</b>

60-70% loss share carried by U.S. banks out of total \$1.6 trillion in <u>future unsecuritized loan losses</u> :	1100
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30-35% loss share out of \$2 trillion in <u>current mark-to-market losses</u> :	+700
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<b>Total expected bank losses</b>	<b>./1800</b>
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<b>Capital Short-fall</b> (negative net worth)	<b>-400</b>
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TARP 1 Capital injected into banks (excluding AIG, GMAC, Amex)	+230
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Total private capital raised since start of crisis (=430bn total – 230 TARP)	+200
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<b>Expected U.S. Bank Capitalization at current mtm prices and future loan losses</b>	<b>+30 to 130</b>
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**→ U.S. Banking system is still borderline insolvent even after TARP 1**

**→ Banking system may need another \$1 - 1.4 trillion of capital injections to return to pre-crisis capital levels**

## Literature:

Bryan Keogh, Bloomberg.: [Speculative-Grade Distress Ratio Rises to 85 Percent](#); December 29.

Charge-off and Delinquency Rates on Loans and Leases at Commercial Banks. Federal Reserve Board

<http://www.federalreserve.gov/releases/chargeoff/delallsa.html>

Daniel O. Beltran, Laurie Pounder, and Charles Thomas (2008) [Foreign Exposure to Asset-Backed Securities of U.S. Origin](#); Federal Reserve Board.

Daniel Pimlott, Financial Times: [Real estate sector fears rise in CMBS defaults](#); August 1, 2008.

Doms/Furlong/Kraimer (2007), [Subprime Mortgage Delinquency Rates](#); Federal Reserve Bank of San Francisco.

Edward Altman, Brenda Karlin (2008); [Special Report on Defaults and Returns in the High-Yield Bond Market: The Year 2007 in Review and Outlook](#); NYU Stern School of Business

Eileen Fahey et al (2008); [Securities Firms: 3Q08 Peer Data; Rating Outlook Remains Negative](#); Fitch Ratings

FDIC [Q3 Quarterly Banking Profile](#)

Greenlaw/Shin/Hatzius/Kashyap (2008): [Leveraged Losses: Lessons from the Mortgage Market Meltdown](#); Morgan Stanley, Goldman Sachs, Chicago University, Princeton University.

Heino Meerkatt, Heinrich Liechtenstein (2008); [Get ready for the private equity shake-out: Will this be the next shock to the global economy?](#); Boston Consulting/IESE Group.

[IMF Global Financial Stability Report](#), October 2008

Jan Hatzius (2008); [Beyond Leveraged Losses: The Balance Sheet Effects Of the Home Price Downturn](#), Brookings Conference Paper

Lisa Pendergast (2008); [The Mystery of CMBX](#); RBS Greenwich Capital.

Mathias Kruettli (2008), [A Forecast of Write-Downs on U.S. Credit Card Debt in 2009](#); RGE Monitor



Office of the Comptroller of the Currency (OCC); [Agencies Release Joint Mortgage Metrics Report For the Third Quarter of 2008](#)

Shane Sherlund (2008); [The Past, Present, and Future of Subprime Mortgages](#); Federal Reserve Board

SIFMA [Q3 2008 Quarterly Research](#), November 2008