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Morgan Stanley Australia Limited+ **Gerard Minack**
Gerard.Minack@morganstanley.com
+61 2 9770 1529

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Losses and Leverage

Financial institutions' investment losses matter not only for shareholders, but also because those losses (and the institutions' response to them) can clog the transmission of easier monetary policy to the non-financial sector. The losses and their impact are the focus of a paper from a group of financial market experts, including Morgan Stanley's David Greenlaw.[*] Here are highlights from the paper:

Exhibit 1 provides an overview of the US mortgage market. US financial institutions (*aka* 'leveraged institutions') hold almost exactly half of the US$11 trillion stock of outstanding mortgages. Sub-prime mortgages account for around $1.4 trillion of the total. (In 2006, when $3 trillion of new mortgages were written, sub-prime accounted for 20.1%; conforming mortgages 33.2%; jumbo 16.1%; Alt-A 13.4%; and home equity loans 14.4%.)

Exhibit 2 shows an estimate of who holds the sub-prime mortgages. They are shared 50:50 between US financial institutions and others. Insurance companies, for example, are estimated to have a similar exposure to sub-prime mortgages as US commercial and investment banks combined.

Exhibit 3 shows estimated losses on sub-prime mortgages, marked-to-market using the ABX indices. Based on prices on 21 February, the estimated loss is $371 billion. There are several caveats to this estimate, one of which is that the ABX indexes may now be over-estimating eventual losses. However, as the authors note, the US mortgage market is now in territory rarely seen before, with a significant proportion of homeowners in negative equity. Exhibit 4 shows an estimate of households' equity in their homes as at end-2006. The Case-Shiller house price index has fallen almost 10% since then.

[*] David Greenlaw, Jan Hatzius, Anil Kashyap, and Hyon Song Sun; *Leveraged Losses: Lessons from the Mortgage Market Meltdown,* US Monetary Policy Forum Conference. Available at http://www.chicagogsb.edu/usmpf/docs/usmpf2008confdraft.pdf

Exhibit 1

Mortgages Outstanding

Home Mortgage Debt	Billion ($)
Total	**11,028**
US Leveraged Institutions	**5,591**
Commercial banks	**2,881**
Direct	1,935
RMBS	946
Savings Institutions	**1,148**
Direct	895
RMBS	253
Credit Unions	**361**
Direct	300
RMBS (estimate)	61
Brokers and Dealers	**213**
Direct	0
RMBS (estimate)	213
Government-Sponsored Enterprises	**987**
Direct	457
RMBS (estimate)	530

Source: David Greenlaw, Jan Hatzius, Anil Kashyap, Hyun Song Shin, *Leveraged Losses: Lessons from the Mortgage Market Meltdown*; FDIC, Federal Reserve; Morgan Stanley Research

Exhibit 2

Who's Got the Sub-prime

	Total reported sub-prime exposure	Percent of reported exposure
US Investment Banks	75	5%
US Commercial Banks	250	18%
US GSEs	112	8%
US Hedge Funds	233	17%
Foreign Banks	167	12%
Foreign Hedge Funds	58	4%
Insurance Companies	319	23%
Finance Companies	95	7%
Mutual and Pension Funds	57	4%
US Leveraged Sector	671	49%
Other	697	51%
Total	1,368	100%

Note: The total for US commercial banks including US$95bn of mortgage exposures by Household Finance, the US sub-prime subsidiary of HSBC. Moreover, the calculation assumes that US hedge funds account for four-ffifths of all hedge fund exposures to sub-prime mortgages.
Source: David Greenlaw *et al*, *Leveraged Losses: Lessons from the Mortgage Market Meltdown*; Goldman Sachs; Morgan Stanley Research

Moreover, there are likely to be losses on other mortgage products. Prime mortgage delinquency and foreclosure rates are already higher than seen in the prior recession. The prospect of job losses and shrinking homeowners' equity points to material losses across all mortgages.

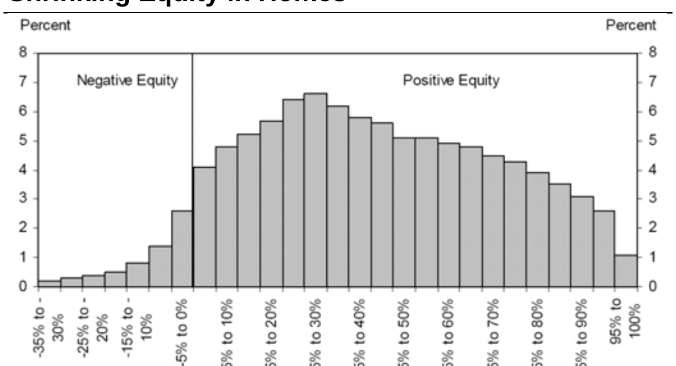
Exhibit 3
Marked-to-market Sub-prime Losses

	ABX Prices by Vintage						MtM Loss ($Bn) based on ABX Pricing					
Year	ABX Index *100%*	AAA *80.8%*	AA *9.6%*	A *5.0%*	BBB *3.5%*	BB/ Other *1.1%*	Sub-prime *100%*	AAA *80.8%*	AA *9.6%*	A *5.0%*	BBB *3.5%*	BB/ Other *1.1%*
2005	ABX 06-1	93.54	78.08	50.46	26.45	20.39	83	33	13	15	16	5
1Q06	ABX 06-2	79.81	51.22	24.44	15.24	13.53	40	23	7	5	4	1
2Q06		79.81	51.22	24.44	15.24	13.53	47	27	8	6	5	2
3Q06	ABX 07-1	66.46	32.89	15.24	12.58	12.10	67	43	10	7	5	2
4Q06		66.46	32.89	15.24	12.58	12.10	56	37	9	6	4	1
1Q07	ABX 07-2	63.53	33.17	22.75	16.97	15.97	41	27	6	4	3	1
2Q07		63.53	33.17	22.75	16.97	15.97	24	17	4	2	2	1
3Q07		63.53	33.17	22.75	16.97	15.97	12	8	2	1	1	0
							371	**214**	**58**	**46**	**39**	**13**

Note: Prices as at 21 February 2008
Source: David Greenlaw *et al*, *Leveraged Losses: Lessons from the Mortgage Market Meltdown*; Inside Mortgage Finance, Markit; Morgan Stanley Research

It is not only the direct investment losses that make this an important macro issue. Financial sector leverage tends to be pro-cyclical; that is, it rises when asset prices rise, and falls when asset prices fall. This is partly because, in the expansion phase, financial institutions often increase their lending to achieve a target degree of leverage, but the additional credit helps lift asset prices, and hence bank assets, so leverage is less than expected or desired. Thus, credit is again expanded… Exhibit 5 shows the relationship between quarterly changes in leverage and asset prices for US investment banks. A similar relationship exists for other lenders.

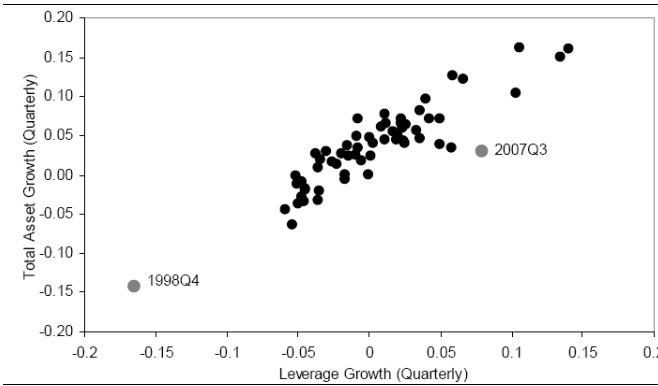
Exhibit 4
Shrinking Equity in Homes



Note: All data as of December 2006.
Source: David Greenlaw *et al*, *Leveraged Losses: Lessons from the Mortgage Market Meltdown*; First American CoreLogic; Morgan Stanley Research

The sting in the tail, of course, is that the relationship between changing assets and changing leverage works in reverse also. A targeted reduction in leverage can be thwarted by falling asset prices. These institutions are highly leveraged (Exhibit 6), so a small change in the equity base can have a big impact on balance sheet leverage ratios.

Exhibit 5
Quarterly Change in Assets and Leverage



For US investment banks. Growth rates are asset-weighted.
Source: David Greenlaw *et al*, *Leveraged Losses: Lessons from the Mortgage Market Meltdown*; Morgan Stanley Research

How much will assets have to contract due to the sub-prime losses? That will depend on the extent of the losses, on how much replacement capital is raised, and how much leverage is allowed to fall. If half the losses are covered by fresh equity, and leverage falls by 5%, then total assets will have to fall by almost $2 trillion – or almost 10% of the current stock of assets. Even if leverage is unchanged, the losses point to a $1 trillion fall in assets.

Exhibit 6
Financial Institution Leverage

	Assets ($bn)	Liabilities ($bn)	Capital ($bn)	Leverage
Commercial banks	10793	9693	1100	9.8
Savings Inst	1914	1687	227	8.4
Credit Unions	748	659	89	8.4
Brokers/hedge funds	5397	5226	171	31.6
GSEs	1633	1567	66	24.7
Leveraged Sector	**20485**	**18804**	**1681**	**12.2**

Source: David Greenlaw *et al*, *Leveraged Losses: Lessons from the Mortgage Market Meltdown*; Morgan Stanley Research

The likely fall in institutions' desired asset levels will likely part-block an important transmission mechanism for monetary policy. Lower interest rates may not, at least for a while, increase availability of credit because lenders will aim to reduce the supply. That is a big macro problem.

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Underweight/Sell	**356**	**15%**	**100**	**14%**	**28%**
Total	**2,369**		**722**		

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Morgan Stanley

MORGAN STANLEY RESEARCH

The Americas
1585 Broadway
New York, NY 10036-8293
United States
Tel: +1 (1) 212 761 4000

Europe
25 Cabot Square, Canary Wharf
London E14 4QA
United Kingdom
Tel: +44 (0) 20 7 425 8000

Japan
4-20-3 Ebisu, Shibuya-ku
Tokyo 150-6008
Japan
Tel: +81 (0) 3 5424 5000

Asia/Pacific
Three Exchange Square
Central
Hong Kong
Tel: +852 2848 5200