

Global: Financial Services

US commercial real estate: High losses, slow burn

Commercial real estate defaults driven by price declines

Price declines have been the single most important driver of defaults in commercial real estate (CRE) historically. Our analysis suggests a 21%-26% fall in prices through 2009. CRE-related losses are also likely to be compounded by a sharp increase in interest-only loans coupled with declining loan/value ratios and debt service coverage ratios.

Near-term impact from CRE losses

We estimate the mark-to-market hit arising from CRE lending for the global bank sector at US\$20 bn, versus intrinsic subprime mark-to-market losses of US\$63 bn. We believe that 81% of subprime losses are likely to be crystallized as mark-to-market losses compared with only 47% for commercial real estate, reflecting the lower levels of securitization of commercial real estate loans compared with subprime.

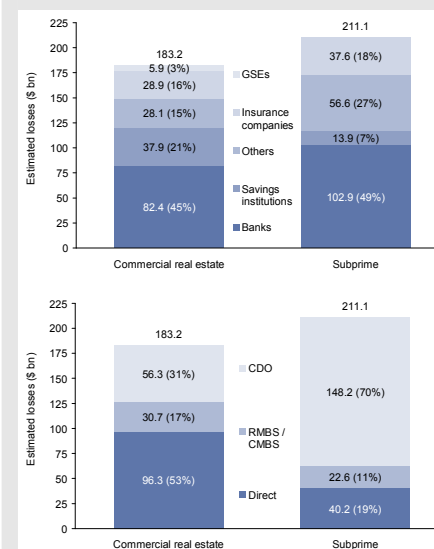
CRE losses should broadly equal subprime but with a slower burn

Over the longer term, we expect total CRE-related losses of US\$183 bn, with global banks taking losses of US\$82 bn. This compares to CMBX implied losses of around US\$199 bn. While the magnitude of the losses is similar to subprime, defaults are likely to be spread over a longer time frame, which should limit the short-term capital strain. We estimate that 95% of subprime defaults will be realized within five years of origination, compared with 38% for commercial real estate. Hence, a more aggressive stance by the Fed is likely to have a more pronounced impact on CRE losses than subprime losses.

Best sell ideas

In the US, we add First Horizon to the Americas Conviction Sell List and downgrade REIT Camden Property Trust to Sell (from Neutral) to reflect our cautious view of US CRE credit quality. In Europe, we highlight Credit Suisse (Conviction Sell List), and Barclays (Conviction Sell List), both of which have exposure to US CMBS.

EXPECTED US CRE AND SUBPRIME LOSSES



Source: Goldman Sachs Research estimates.

Related research:

The next "subprime"? Quantifying expected losses from CRE, Alt-A, HELOCs, Option ARMS, January 31, 2008

The subprime issue: A global assessment of losses, contagion and strategic implications, November 20, 2007

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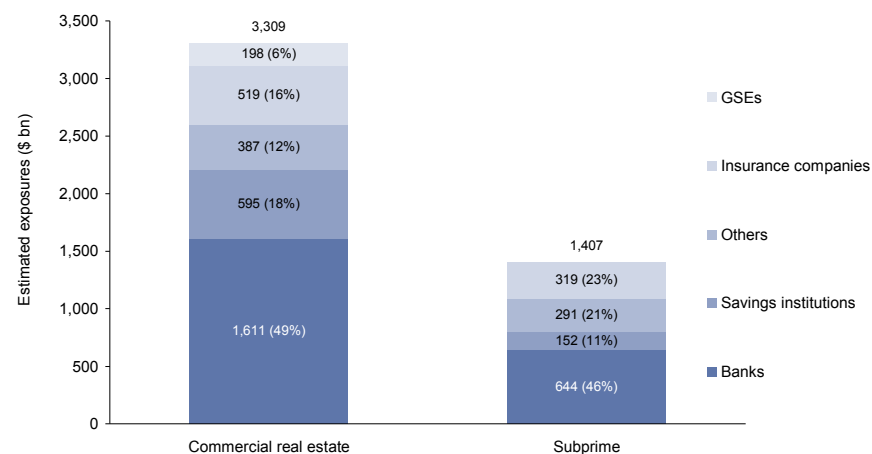
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The prices in the body of this report are based on the market close of January 30, 2008.

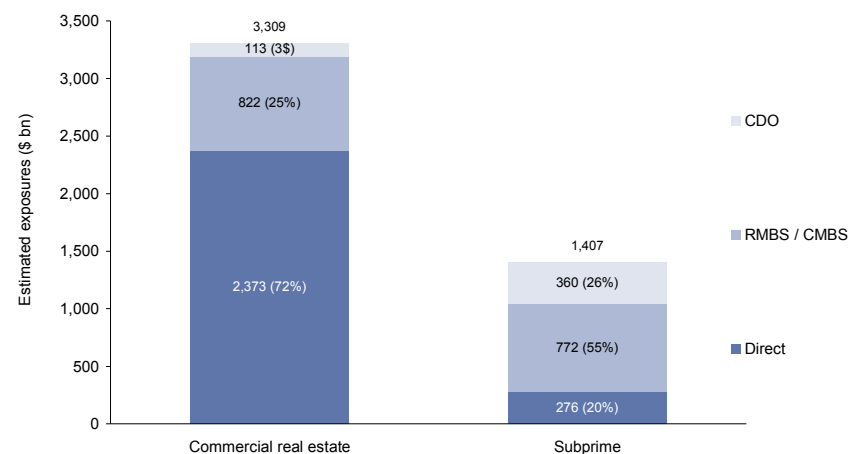
A comparison of US subprime and commercial real estate

Our conclusions on the likely size, distribution and timing of subprime and commercial real estate losses can be summarized as follows:

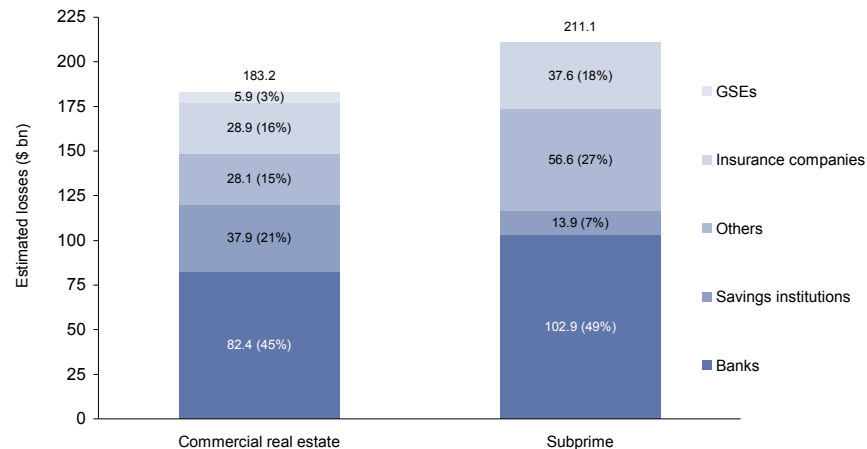
- **We expect aggregate losses from commercial real estate loans to be US\$183 bn, versus expected subprime losses of US\$211 bn.** The expected loss rate on subprime mortgages is 15.0%, compared with 5.5% on commercial real estate. We estimate the banking sector's share of commercial real estate losses across all products (direct loans, CMBS and CDOs) at US\$82 bn (or 45%) compared with US\$103 bn (49%) for subprime. This is predominantly a reflection of the lower proportion of securitized CRE loans held by banks (23%) compared with subprime (33%). Savings institutions (such as pension funds) account for 21% of the losses that we expect and insurance companies 16%. Relative to our expectations for global banks, 91% of subprime losses have been recognized, compared with only 17% of commercial real estate losses. **We recognize that in our estimates of losses, downgrades of monolines present an additional risk. We do not believe that our total estimates of losses will change materially, but the distribution of losses, as well the timing of loss recognition, could be affected. Specifically, we believe that the banking sector could carry a higher proportion of losses and be forced to recognize these losses sooner than our analysis implies.**

Exhibit 1: Estimated CRE and subprime exposures – by investor type

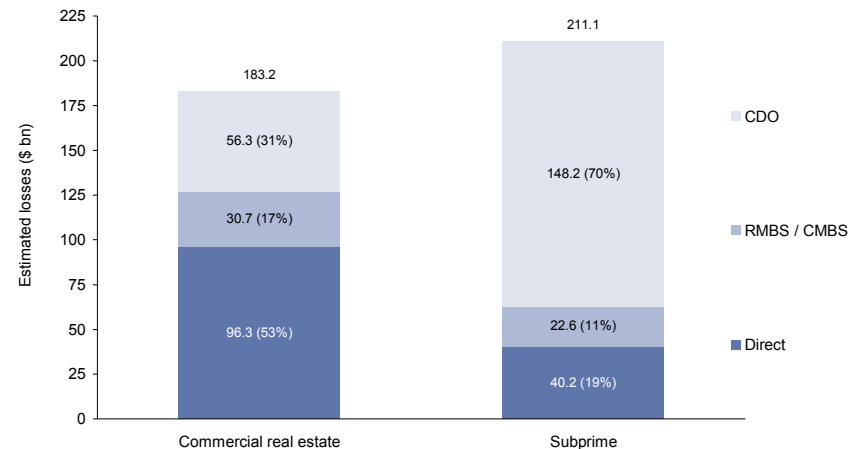
Source: Goldman Sachs Research estimates.

Exhibit 2: Estimated CRE and subprime exposures – by product

Source: Goldman Sachs Research estimates.

Exhibit 3: Expected ultimate CRE and subprime losses – by investor type

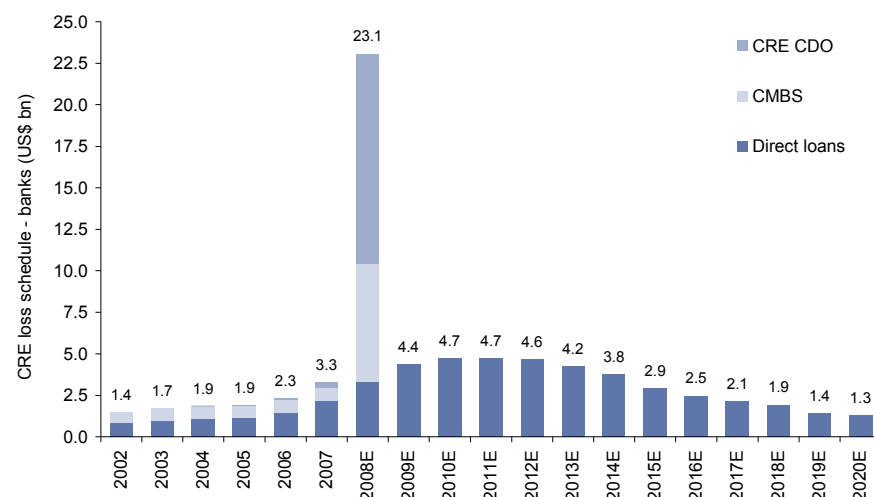
Source: Goldman Sachs Research estimates.

Exhibit 4: Expected ultimate CRE and subprime losses – by product

Source: Goldman Sachs Research estimates.

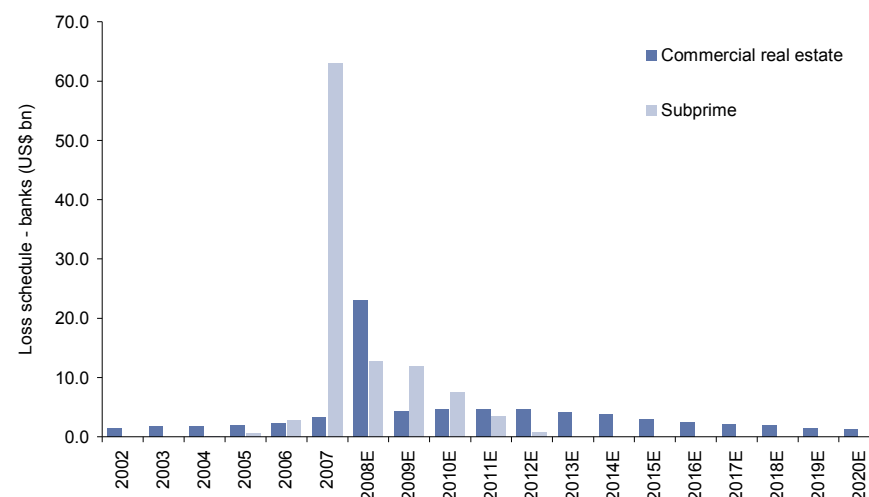
- We expect the timing of commercial real estate losses for global banks to be substantially different to subprime** given the lower levels of securitization (which reduces the mark-to-market losses) and the different default profiles (CRE losses are spread over a greater number of years). Only 28% of US commercial real estate loans have been securitized since 1995 (although securitization activity has been higher for recent vintages) compared with 80% of subprime loans, suggesting that CRE losses are likely to be recognized more slowly than in the case of subprime. We see this as a critical point, as **banks should be able to offset losses in future years against future retained earnings. Hence, we do not envisage CRE-related losses creating the same capital pressure as subprime losses but see them as more of an “earnings drag”**. Exhibit 5 sets out the expected default profile of CRE-related losses, while Exhibit 6 sets out the expected default/loss profile for subprime lending. This implies that the banks could book US\$23 bn of CRE-related losses in 2008, consisting mainly of write-downs on CMBS and CDO portfolios; we expect the market will move to discount future expected losses as CRE prices decline.

Exhibit 5: Expected distribution of CRE losses: 2008 will see the realization of future CMBS and CRE CDO-related losses as indices discount future losses



Source: Goldman Sachs Research estimates.

Exhibit 6: We expect the tail of CRE losses to be much longer than subprime given the higher percentage of directly held loans

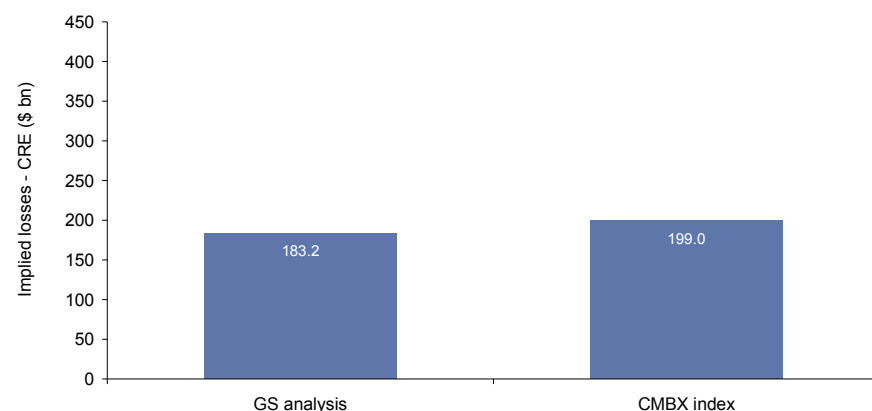


Source: Goldman Sachs Research estimates.

- Our estimate of the mark-to-market hit arising from CRE lending for the banks sector is US\$20 bn vs. estimated intrinsic subprime mark-to-market losses of US\$63 bn.** We believe that 81% of subprime losses are likely to be crystallized as mark-to-market losses, compared with 47% for commercial real estate. We note, however, that actual subprime mark-to-market losses taken by the banking sector have been closer to US\$94 bn, as the ABX index has overshoot our estimate of intrinsic losses (based on forecast loss curves). Our analysis suggests that the ABX index is pricing in losses of US\$416 bn, compared with our loss estimate of US\$211 bn. As a result, banks that have been forced to mark to the ABX may benefit from write-backs if the index recovers and they continue to hold their positions. We estimate that the CMBX index is pricing in US\$199 bn of commercial real estate losses, which is much closer to our loss estimate of US\$183 bn (8% higher). We believe that substantial

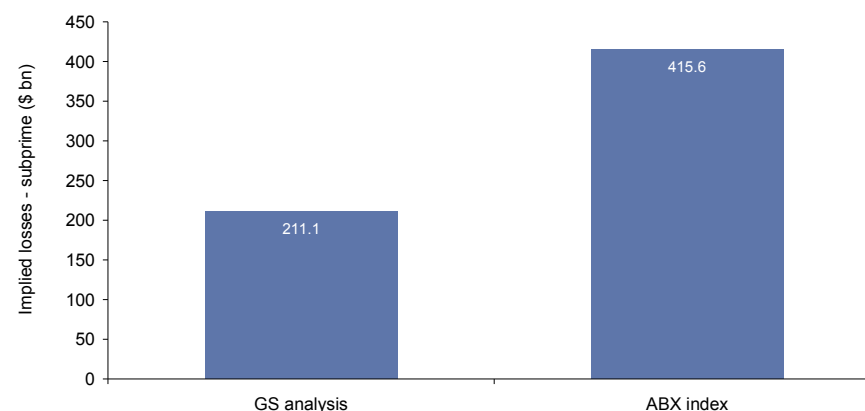
index over-shooting is less likely in the CRE market compared with subprime, as investors have more ability to conduct due diligence on the assets underlying CMBS securities (versus subprime RMBS). In addition, we believe that the current index levels provide some support for our US\$20 bn near-term mark-to-market loss estimate for the global banks on US CRE assets (given that the CMBX is likely to be used as an indicator of market prices for hard-to-value CMBS and CRE CDO assets).

Exhibit 7: Our estimate of implied losses on CRE is not dissimilar to losses implied by the CMBX index



Source: Goldman Sachs Research estimates.

Exhibit 8: Implied subprime losses on the ABX index are almost 2x our estimate of intrinsic losses



Source: Goldman Sachs Research estimates.

We see several similarities between subprime and commercial real estate lending...

- Both commercial and residential real estate have seen rapid price appreciation in recent years as a result of access to cheaper credit. As a result, we believe that pricing in both asset classes is significantly above long-term trends.
- Both commercial real estate and subprime losses will be sensitive to declining property prices (although the subprime segment is substantially more vulnerable to short-term price corrections). We believe that US house prices could decline by around 20% from peak to trough, while we expect US commercial real estate prices to decline by 21%-26%, driven by (1) increases in financing costs reducing investor demand; and (2) a decline in demand in the occupier market as a result of slowing economic growth. This situation is likely to be exacerbated by forced sales from fund redemptions and breaches of LTV covenants.
- The volume of credit securitized in both the subprime and commercial real estate markets has grown significantly since 2003, which we believe might have affected underwriting standards negatively. The percentage of US CRE loans that have been repackaged into CMBS structures has grown from 29% in 2003 to 46% in 2007.

- Both markets have seen a shift towards interest-only loans, as well as increased leverage among borrowers. Hence, in the event of a default, the loss incurred is likely to be higher (due to higher outstanding principal) than would have been the case for a standard loan.
- The distribution of loans via both RMBS and CMBS is likely to mean that losses will be broadly disseminated outside the US, as well as across the financial industry (i.e. not just banks). We estimate that 40%-50% of subprime losses were “exported” outside the US compared with around 25% of the commercial real estate losses that we expect.

... as well as three important differences

- Loss curves on commercial real estate have a significantly longer tail than subprime, meaning that losses are recognized over a much longer time frame. We expect around 95% of subprime losses to be realized within seven years of the loan being granted, compared with 38% for commercial real estate. However, we expect banks to recognize credit losses at the time of default, shortening the time period in which losses will affect bank earnings and capital ratios by 18-24 months.
- Outstanding balances in commercial real estate are much more broadly distributed across different vintage years than subprime loans. Consider that outstanding 2006/2007 subprime loans represent 60% of the total US subprime market, while in commercial real estate, the comparable number is 28%. Earlier vintages are likely to benefit from higher levels of equity (given a combination of higher asset appreciation rates and lower LTVs at origination).
- The absolute level of securitization in the commercial real estate segment is materially lower than is the case for subprime. As noted, only 28% of US commercial real estate loans have been securitized since 1995 compared with 80% of subprime loans. This, in turn, means that CRE losses are likely to be realized over a much longer time frame than in the case of subprime.

Commercial real estate-exposed stocks

We are making the following recommendation changes in the US to reflect our cautious stance on CRE credit quality:

- **First Horizon (FHN), which we add to the Americas Conviction Sell List, is one of the worst-positioned banks in our coverage universe from a real estate risk standpoint** given its large exposure to higher-risk real estate which comprises a significant 45% of its loan portfolio. Challenges are likely to persist given continued credit deterioration and losses in the mortgage business. Specifically, despite big reserve building in 4Q2007, reserves to NPAs are still less than 1x given significant deterioration in the residential construction book in which 6% of loans are now nonperforming and another 3% are delinquent but still accruing. Put another way, 9% of residential construction loans are currently not making payments. First Horizon has the biggest exposure to residential construction among banks in our coverage at 20%, and issues are tied to the bank's "out-of-footprint expansion" as loans in Florida and California are going bad at twice the rate of the rest of its portfolio. Apart from credit, mortgage clearly remains challenging as – excluding one-time charges in the most recent quarter – the current run rate is a loss of \$0.20 per share per quarter in the business which offsets two-thirds of the earnings generated by the core Tennessee banking franchise. Moreover, it is estimated that the balance sheet is neutrally positioned for declining rates. First Horizon trades at 1.4x tangible book and we view the stock as unlikely to trade at any premium to tangible book, at least for the near term.
- **We are downgrading sun-belt apartment REIT Camden Property Trust (CPT) to Sell from Neutral due to increased mortgage defaults and rising inventories of unsold single-family/condo homes** in the company's markets, which has contributed to the growing shadow rental supply, and should result in either occupancy losses or reduced rents. We also expect below-average internal growth (2% NOI growth) in CPT's portfolio due to slowing job growth and increased supply in the company's markets, and we worry about risks surrounding Camden's \$2.1 billion development pipeline (focused mostly in the DC metro area) including financing and lease-up risks resulting in compressed yields.
- **Morgan Stanley (MS), which we have downgraded to Neutral from Buy due to concerns about expected losses in its CRE loan portfolio.** Our outlook calls for CRE prices to fall 21%-26% from current levels, which we believe could create significant headwinds for the firm in upcoming quarters. Although all of our large-cap firms have exposure to CRE, we thought moving to the sidelines on Morgan Stanley was appropriate over the next three to six months given our concerns about CRE because the firm has meaningful risk (\$17.5 billion net CMBS exposure). We believe Morgan Stanley could see some write-downs in coming quarters as a result of this exposure as credit spreads have widened in the CMBS markets. In addition to our CRE concerns, we see further downside to US housing prices, which may continue to have a negative impact on other parts of their securities business.
- **iStar Financial (SFI), a niche CRE lender, which we have cut to Neutral from Buy.** iStar enjoys a leading position within the high-end CRE market and has demonstrated an almost pristine credit track record. However, the current inhospitable unsecured and equity markets preclude iStar from taking full advantage of this highly-anticipated wide-credit-spread opportunity. And while iStar's conservative LTVs (about 67% on average) should buffer anticipated CRE price depreciation, concerns remain about potential negative surprises in light of the recently-acquired Fremont portfolio. Our valuation methodology reverts to EVA® modeling; our new 12-month price target of \$32 (from \$45) implies 20% potential upside.

In Europe, we highlight the following stock recommendations and rating changes:

- **Credit Suisse, which is on our Conviction Sell List, has a 9.1% market share in CMBS issuance (2005-2007), the highest among the European banks.** Our analysis of announced CMBS exposure versus underwriting participation (see Exhibit 31) suggests that, on average, banks have retained around 50% of their “league table” participation. Consequently, we believe that Credit Suisse could have SFr28 bn of gross US CMBS exposure.
- **Barclays remains on our Conviction Sell List**, as we believe that earnings estimates are too high and returns are set to fall as the bank has to retain assets for longer. We estimate that Barclays will have to hold an additional £35 bn of RWAs on its balance sheet at the end of 2007, which we forecast will reduce its equity Tier 1 ratio to 4.9%, 35 bp below the level where we believe management would feel comfortable. In particular, we estimate the bank is holding £10 bn of CMBS, split 60% Europe and 40% US, on which it has yet to take any material writedowns. Based on our analysis of CRE, we estimate that Barclays might have to take a £400 mn writedown on the US exposure in addition to our expectation of a further c.£1.2 bn writedown on its existing sub-prime exposure.
- **Anglo Irish downgraded from Buy to Neutral. We estimate that around 12%, or €7.9 bn, of Anglo Irish’s loan book consists of US CRE.** While we believe that exposure to writedowns of structured products is small, we forecast a material rise in provisions on direct lending to US CRE over the next two to eight years. Anglo Irish has expanded aggressively in the US since 2005, increasing its loan book by over 200% and hence is particularly exposed to the higher losses likely in the 2006 and 2007 portfolios. We reduced our FY09 estimates by 9% to factor in an annual loss rate of 100 bp in Anglo Irish’s US portfolio, as well as sharply slowing loan growth. We see valuation support as (1) we view 7.1x our new '08 EPS estimates as undemanding, (2) we expect the losses to be “slow burning”, and (3) we believe that the character of Anglo Irish lending, with more focus on cash flows and less on property value, will shelter them from an above-average pick up in loan loss provisions on CRE.

Exhibit 9: Summary of ratings, price targets and risks

US financials	Rating	Price	Price target	Time-frame	Methodology	Risks
First Horizon	Sell*	\$20.4	\$15.0	12 months	DCF	Key downside risks are continued credit and mortgage losses. Key upside risks are the steepening yield curve and rising mortgage refinance volumes.
iStar Financial	Neutral	\$25.4	\$32.0	12 months	EVA	Unforeseen credit deterioration
Morgan Stanley	Neutral	\$48.6	\$50.0	6 months	P/BV	Upside risks include: (1) better than expected GDP growth (2) improving credit market conditions, primarily within mortgages (3) better global equity markets activity. Downside risks include: (4) worse than expected CRE-related losses and (5) additional write-downs and/or capital raising.
Camden Property Trust	Sell	\$48.0	\$40.0	12 months	Discount to forward NAV	Risks to our sell rating include: (1) improved job growth in the company's markets resulting in a greater level of absorption of new supply; (2) additional Fed rate cuts helping to support existing cap rates in CPT's markets; and (3) improved development yields related to faster lease-ups at targeted rents.
European financials	Rating	Price	Price target	Time-frame	Methodology	Risks
Anglo Irish	Neutral	€9.53	€11.40	3 months	P/BV	A more severe commercial real estate downturn than we are currently forecasting in the US, UK and Ireland.
Barclays	Sell*	479p	439p	3 months	SOTP	Better credit market conditions than expected allowing greater ability to on-sell positions, lower impairments than forecast or no further write-downs.
Credit Suisse	Sell*	SFr61.4	SFr69.9	3 months	SOTP	Better than expected global growth and a more rapid recovery in capital markets.

* also on the relevant Conviction List.

Source: Company data, Goldman Sachs Research estimates.

Methodology for estimating commercial real estate exposures and losses

We have estimated the US commercial real estate (CRE) exposures and losses of banks globally in a five-stage top-down analysis:

1. We have developed three separate frameworks to estimate commercial real estate appreciation through 2009;
2. We have used a regression analysis (driven by our CRE price appreciation forecasts and typical patterns of default) to estimate total defaults for US CRE loans issued between 1995 and 2007. In addition, we have estimated loss severity by vintage based on historical loss-at-default data and our expectation for CRE appreciation. Combining our forecasts for defaults and loss severity, we have estimated CRE losses by vintage for loans issued since 1995;
3. We have used issuance data for CRE loans, CMBS and CRE-backed CDOs to assess the split of outstanding CRE loans and losses by product;
4. We have used estimates on holders of CRE loans and investors in CRE-backed debt securities (CMBS and CRE-backed CDOs) to pinpoint CRE exposures and losses by type of investor, including banks; and
5. We have used our analysis to assess the level of losses currently priced into the CMBX index.

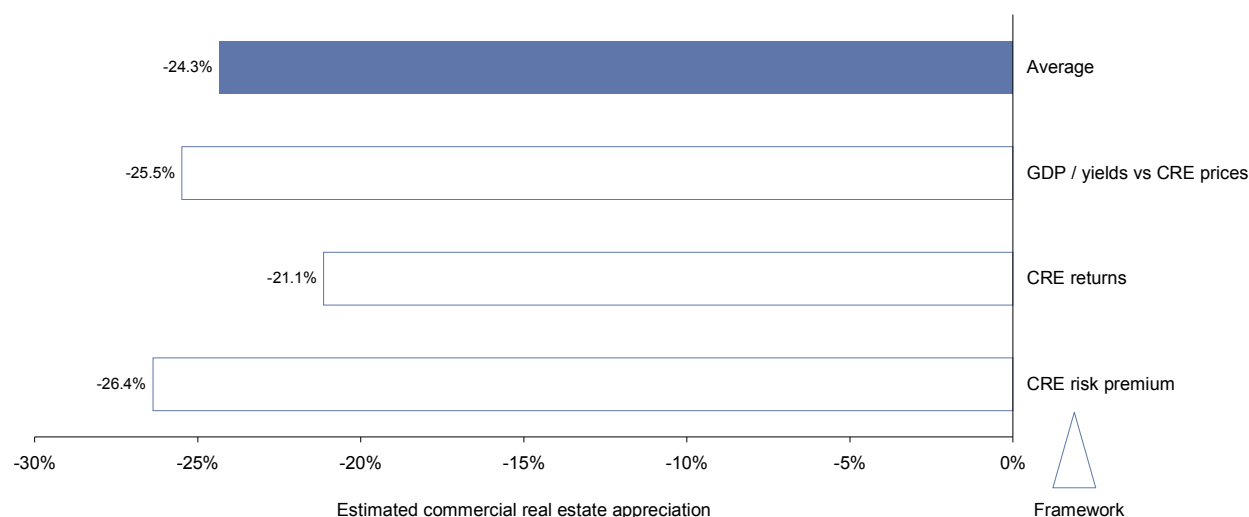
Estimating US commercial real estate defaults, severity and losses

We find a strong historical inverse correlation between CRE price appreciation and defaults. We believe that as commercial real estate prices decline and investors' equity is reduced, there is a greater risk of borrowers defaulting on payments. We have used this relationship as the basis for our estimate of vintage-specific CRE defaults.

We set out our methodology for forecasting CRE prices in Appendix 1. We have developed three models to estimate commercial real estate appreciation through 2009:

- The risk premium historically associated with commercial real estate assets;
- The relationship between yield-adjusted nominal GDP and commercial real estate prices; and
- Five-year rolling returns from commercial real estate.

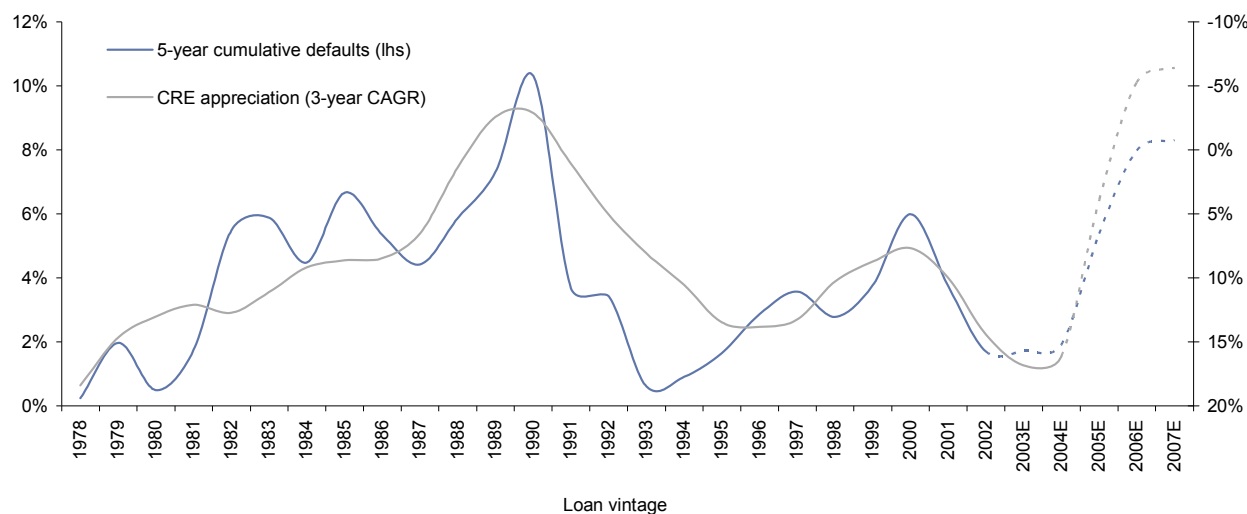
A summary of the results of the three methodologies is set out in Exhibit 10, which suggests a 21%-26% peak-to-trough decline in US commercial real estate prices over 2008-2009.

Exhibit 10: Our three frameworks for forecasting CRE price appreciation suggest peak-to-trough declines of 21%-26%

Source: Datastream, Goldman Sachs Economic Research, Goldman Sachs Research estimates.

We have employed a simple regression analysis to establish the historical relationship between three-year average commercial real estate price appreciation and five-year cumulative defaults for individual loan vintages since 1978. We find that the two factors have exhibited a meaningful negative correlation (-70%) over the last 25 years. To generate five-year cumulative default estimates for 2003-2007 vintages of US CRE loans, we assume that the historical relationship between CRE prices and defaults will continue to hold and use an equal-weighted average of our three estimates for CRE appreciation (-24.3%) to drive our forecasts. We assume that the fall in CRE prices will take place over a two-year period, with a 14.0% decline during 2008 and a further 12.0% fall in 2009.

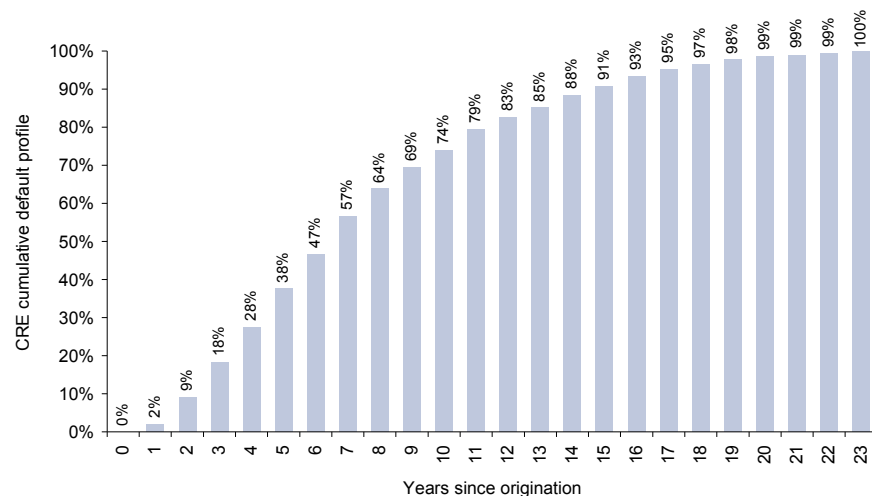
This analysis suggests that five-year cumulative defaults could be 1.7% for loans originated in 2003, rising gradually to 8.3% for 2007 originated loans (Exhibit 11).

Exhibit 11: Our forecasts for US CRE prices imply that five-year cumulative defaults could reach 8.3% for loans originated in 2007

Source: Institutional Investor, Fitch, Datastream, Goldman Sachs Research estimates.

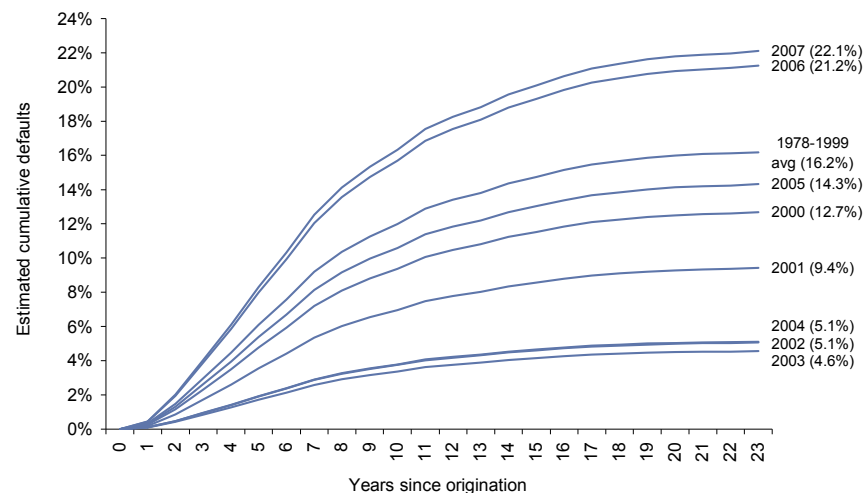
In turn, we use the typical default profile of US CRE loans originated since 1978 (Exhibit 12), combined with our estimates for five-year cumulative defaults, to generate a complete default curve for each vintage of loans (Exhibit 13). This analysis suggests that cumulative defaults for US CRE loans originated in 2006 and 2007 could be 21%-22%, below the historical peak (1986) of 32% but above the long-term average (16%), as well as the performance of recent vintages (cumulative lifetime defaults estimated at 5%-14% for loans originated from 2000-2005).

Exhibit 12: 38% of life-time CRE defaults are typically realized five years after loan origination



Source: Institutional Investor, Fitch Ratings, Goldman Sachs Research estimates.

Exhibit 13: Life-time defaults could rise substantially above the long-term average for loans originated in 2006 and 2007

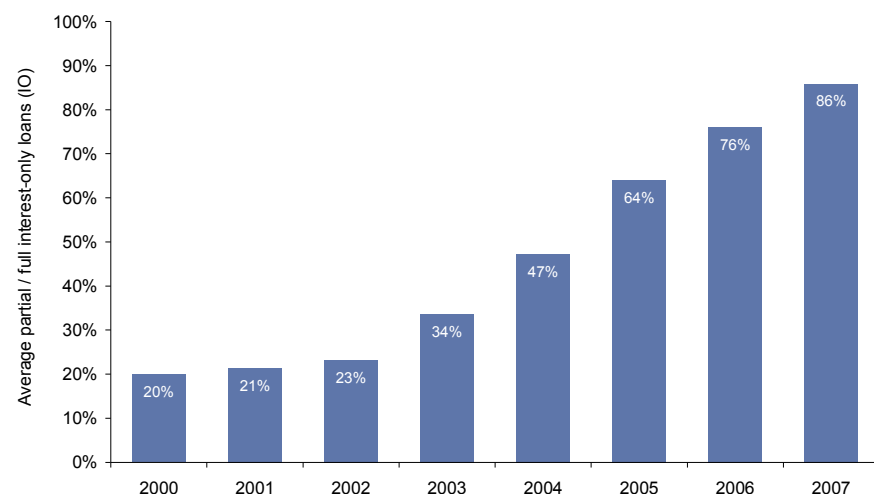


Source: Institutional Investor, Fitch Ratings, Goldman Sachs Research estimates.

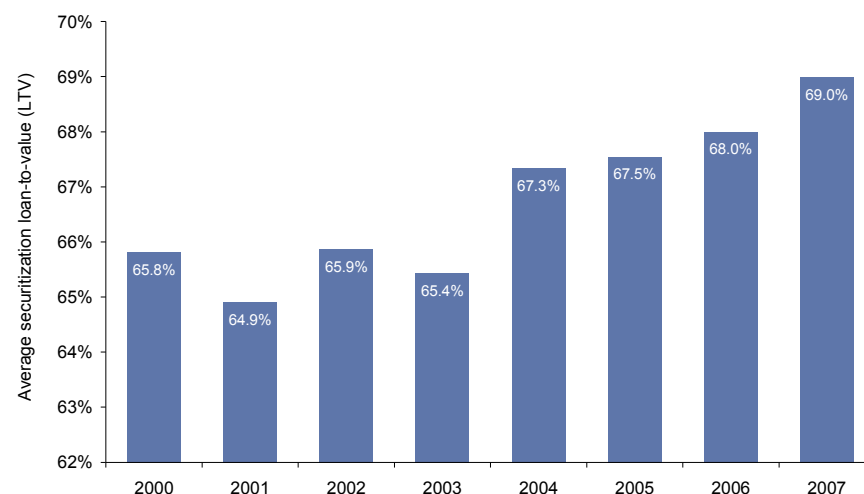
CRE losses could be higher due to a deterioration in underwriting standards

While our estimates could prove overly pessimistic if commercial real estate prices hold up better than we expect, we believe that, at the margin, the risk to our estimates is to the downside. This is because of the marked deterioration that has occurred across four “secondary” factors not captured in our model (due to a lack of consistent historical data), which may exacerbate the inverse relationship between CRE appreciation and defaults:

- **Interest-only (IO) loans:** IO CRE loans have increased from 20% to 86% of lending since 2000 (Exhibit 14). With interest-only loans, the borrower only pays back principal at the end of the period, compared with an amortization loan, where the principal is repaid gradually over the life of the loan. In a scenario of declining property prices, IO loans are therefore likely to be more vulnerable to default; as there has been no collateral repayment, the LTV at refinancing will be higher (potentially over 100%), increasing the sensitivity to rising refinancing costs. In addition, the loss severity of IO loans is likely to be greater due to the higher outstanding balance. Finally, we believe that, as in the case of the US residential mortgage market, the increasing proportion of IO loans may be an indicator of deterioration in the financial strength of the marginal buyer/investor, which could result in higher life-time defaults.
- **Loan-to-value at origination (LTV):** LTV ratios have increased 410 bp (from 64.9% to 69.0%) since 2001 (Exhibit 15). We believe an increased LTV on new loans is likely to result in higher levels of default and severity (i.e. loss at default) given the smaller equity “buffer” and greater sensitivity to CRE price movements of higher LTV loans. In addition, we believe that holders of higher LTV loans are likely to find refinancing more challenging in the event of a property price decline or a change in lenders’ risk appetite (due to the higher-risk nature of the loan). We also note that LTV ratios have risen during a period of CRE yield and spread compression; should risk premiums normalize (through a decline in CRE prices), LTV ratios would rise further still.

Exhibit 14: The proportion of IO loans has risen substantially since 2000...

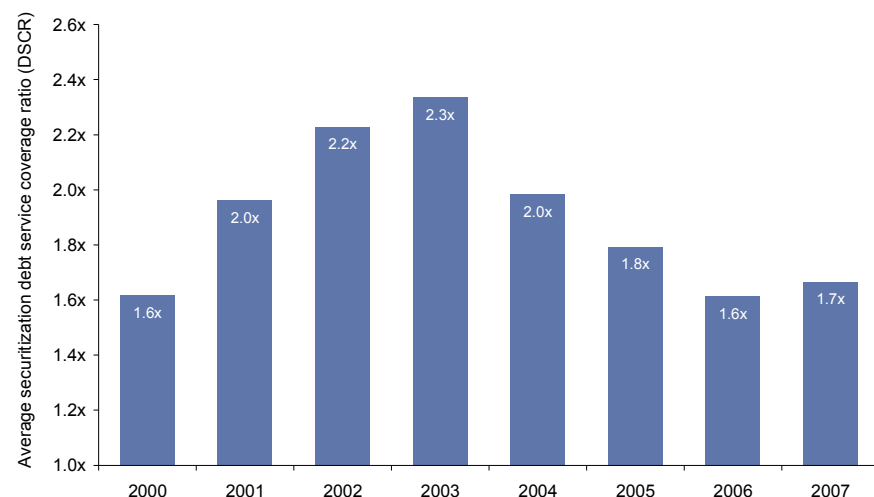
Source: Trepp.

Exhibit 15: ...while LTVs have expanded over the same period

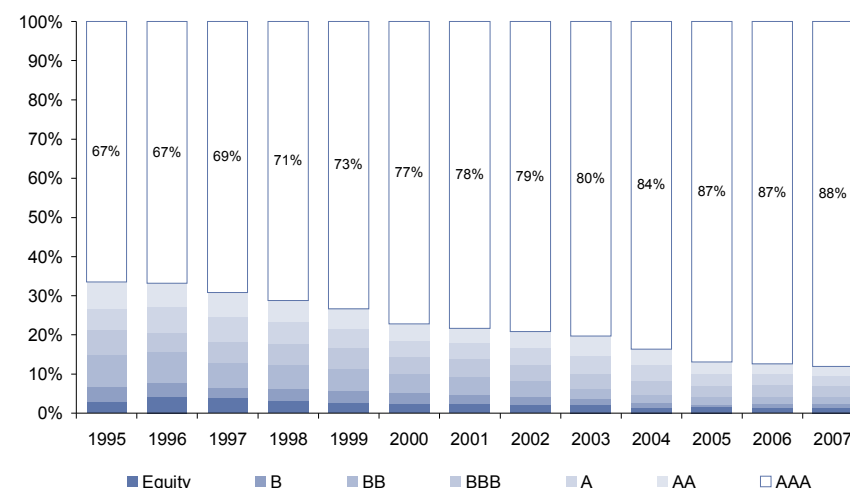
Source: Trepp.

- **Debt service coverage ratios (DSCR):** DSCRs fell from 2.0x in 2001 to 1.7x in 2007 during a period of unusually low interest costs (Exhibit 16). There is an inverse relationship between DSCR (i.e. the ratio of interest costs to operating cash flow from a property) and the probability of default. Where the operating cash flow from a property is close to the financing costs of a property, there is less leeway for a borrower to absorb higher funding costs and/or a decrease in rental income, thereby increasing the probability of default.
- **Securitization:** as in the case of the subprime market, we believe that the availability of securitization financing may have weakened underwriting standards among underwriters that ceased to be the ultimate holders of the credit risk. While this change is not easily quantified, we note that (a) the deterioration in the above three “secondary” factors took place during a period in which securitization activity became ever more prevalent (we estimate that the proportion of CRE loans packaged into CMBS securities rose from 22% in 2000 to 46% in 2007) and (b) the CMBS structures themselves show signs of loosening underwriting standards; the typical attachment point of the AAA tranche fell from 33% in 1995 to 23% in 2000 and 12% in 2007 (Exhibit 17). Not only does this lend support to our thesis that CMBS financing may have contributed to a decline in underwriting, but it also means that senior tranches of CMBS and CRE-backed CDO structures have become substantially more vulnerable to a property market downturn; at peak historical default and severity levels, investment grade tranches (including, in some cases, AAA-rated securities) of recent vintages could thus be affected.

Consequently, we believe that our default estimates for a given level of CRE depreciation are likely to be conservative, and see some risk, possibly substantial, to the downside.

Exhibit 16: Debt service coverage ratios have declined

Source: Trepp.

Exhibit 17: CMBS deal subordination levels have fallen substantially

Source: Commercial Mortgage Alert, Goldman Sachs Research estimates.

In order to generate vintage-specific life-time loss estimates for loans issued since 1995, we have estimated loss severity by vintage. Our estimates are based on the historical relationship between loss severity and three-year average annual commercial real estate appreciation (during the three years following loan origination). We find a meaningful negative correlation (-70%) between these two factors since 1995 and base our estimates on this relationship, combined with our forecasts for CRE appreciation through 2009.

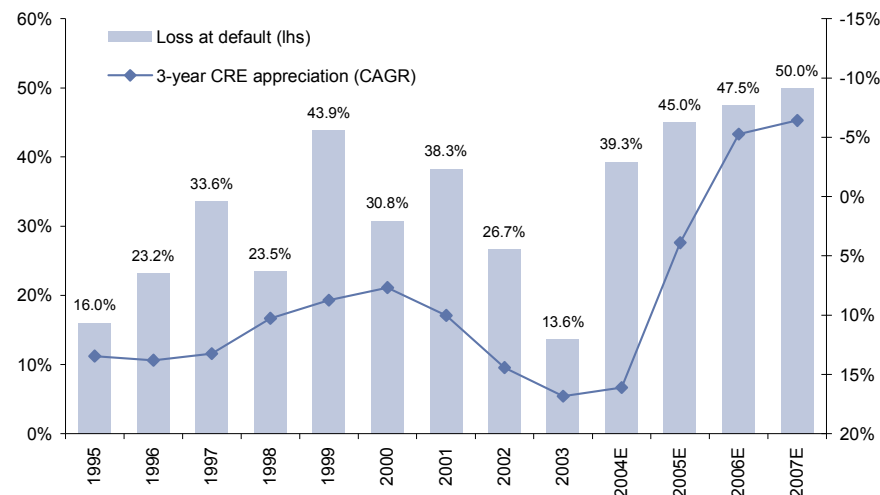
This analysis suggests that loss severity for loans originated during 2005-2007 could exceed the peak levels of the last decade (43.9% in 1999) and reach 50.0% for the 2007 vintage, driven by the expected decline in US commercial real estate prices (Exhibit 18).

It should be noted that our estimates are dependent on our forecasts for CRE appreciation over the coming years. In addition, our estimates are generated on the basis of a relatively short historical dataset of loss severity, which may not fully capture the relationship between CRE appreciation and loss severity or, importantly, the deterioration in the “secondary” factors described above (which may result in greater loss severity for a given level of price appreciation).

Notwithstanding these caveats, combining our estimates for cumulative defaults and loss severity, we have generated vintage-specific expected loss curves for loans issued since 1978. We assume that losses will be realized two years following default, which is broadly in line with history. This analysis suggests that cumulative losses for loans originated during 2000-2005, which have benefited from strong asset appreciation, will be 0.6%-6.5%, while losses on the 2006 and 2007 vintages of loans could rise to 10.1%-11.1% (Exhibit 19).

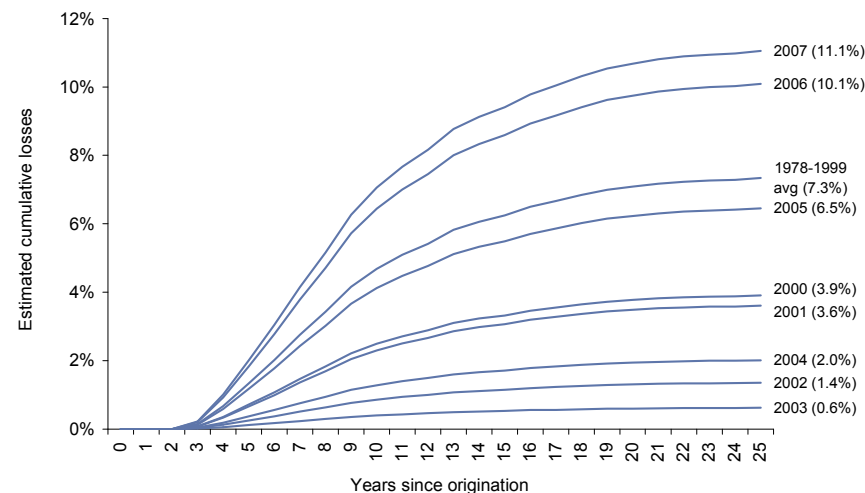
This, in turn, implies that cumulative losses for US CRE loans issued since 1995 could amount to US\$183.2 bn or 5.5% of outstanding loans. Of these losses, we believe US\$150.2 bn (82%) have yet to be taken.

Exhibit 18: Loss severity by vintage could rise above the peak of the last decade for recently originated loans driven by CRE price depreciation



Source: Datastream, Fitch Ratings, Goldman Sachs Research estimates.

Exhibit 19: Our analysis suggests that cumulative life-time losses on 2006 and 2007 vintages of US CRE loans could reach 10%-11%



Source: Institutional Investor, Fitch, Datastream, Goldman Sachs Research estimates.

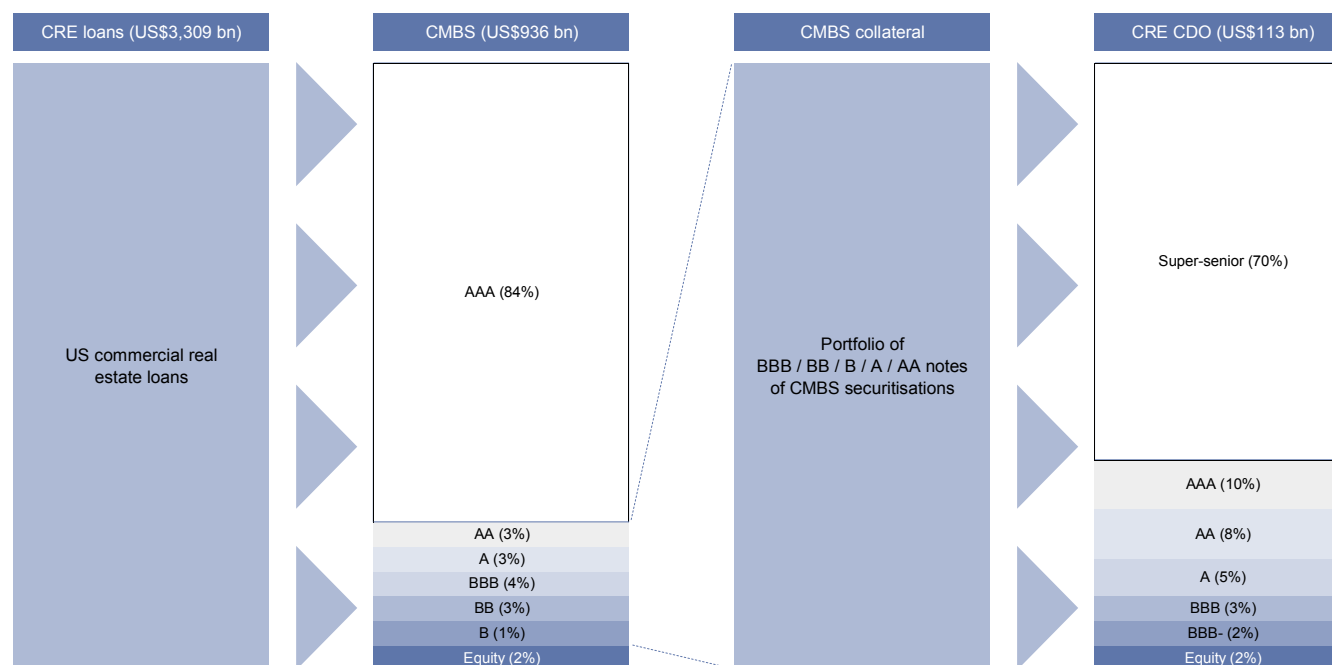
Allocating exposure and losses – by product

We have used issuance data for commercial real estate loans, CMBS and CRE-backed CDOs to assess the split of outstanding CRE loans and losses by product.

We estimate that at the end of 2007, there were US\$3,309 bn of US commercial real estate loans outstanding. We have attempted to split outstanding loans by CMBS, CRE CDOs and directly held loans in the following manner:

- We have used loan and CMBS issuance to assess the proportion of CRE loans originated from 1995-2007 (an estimated US\$3,501 bn) that were securitized (33% or US\$1,149 bn) versus directly by originators and structurers (67% or US\$2,352 bn).
- We have used CRE CDO issuance data to estimate the proportion of CMBS securities that were further repackaged. We estimate that approximately US\$127 bn (or 11% of CMBS issuance) was repackaged into CDO structures.
- This analysis suggests that US\$822 bn of CMBS and US\$113 bn of CDOs backed by US commercial real assets remain outstanding (Exhibit 20).

Exhibit 20: Our analysis suggests that US\$3,309 bn of US CRE loans were outstanding at the end of 2007 of which US\$936 had been securitized into CMBS securities and US\$113 bn had been further repackaged into CRE-backed CDOs



Source: CMA, Goldman Sachs Research estimates.

- We have assumed that CMBS structures backed by US CRE loans, on average, have the following split of credit ratings: AAA, 84%; AA, 3%; A, 3%; BBB, 4%; BB, 3%; and B, 1%, with equity representing 2%, based on Commercial Mortgage Alert data (Exhibit 20). However, there has been a marked change in the subordination levels of CMBS structures over the past ten years, as we point out above, and recent CMBS vintages would in many cases have a greater proportion of AAA-rated securities.
- We have assumed that CRE-backed CDOs were based on CMBS tranches rated from B to AA and that CRE CDOs were, on average, tranching as: super-senior, 70%; AAA, 10%; AA, 8%; A, 5%; BBB, 3%; and BBB-, 2%, with equity representing 2% (Exhibit 20).

We have allocated our estimate of US\$183.2 bn of aggregate US commercial real estate losses in the following order:

- First, direct commercial real estate loans (US\$96.3 bn), to which we have allocated pro-rata annual cumulative losses (i.e. 4.1% of vintage-weighted outstandings).
- Second, equity tranches of CMBS structures (US\$21.4 bn), which carry the first loss and are generally not included in CDOs.
- Third, CRE-backed CDOs (US\$56.3 bn), which have absorbed the majority of lower rated 'mezzanine' CMBS tranches, particularly of more recent vintages, according to our analysis, and are thus affected by losses in excess of the equity tranche.
- Finally, tranches of CMBS structures (US\$9.2 bn) that were not repackaged into CRE-backed CDOs.

Our analysis suggests that the US\$183.2 bn of estimated aggregate US CRE losses will be borne as follows:

- CMBS (not repackaged into CDOs): US\$30.7 bn (17%).
- Direct loans: US\$96.3 bn (53%).
- CDOs: US\$56.3 bn (31%).

This, in turn, implies that:

- CMBS structures of the 2006 and 2007 vintages are likely to see their equity to A-rated tranches (a majority of which have been repackaged into CRE CDOs) wiped out. However, AA tranches should only see moderate losses, and AAA tranches of all vintages should ultimately be untouched, according to our analysis.
- CRE CDO structures originated in 2005, 2006 and 2007 are likely to see all but the super-senior tranches wiped out and super-senior tranches marked down 25%-50%.
- Directly held CRE loans will lose 4.1%, in line with the vintage-weighted average for the industry.

Allocating exposure and losses – by investors

We have attempted to allocate our estimate of aggregate US commercial real estate losses by investor type. We estimate that around 59% of direct US CRE loans are held by banks while the remainder is held by insurance companies (13%), savings institutions (9%), government-sponsored entities (5%) and other investors (14%).

Using data on investors in structured products, we estimate that banks are likely to hold around 23% of total CMBS and CRE CDO exposures. Overall, we estimate that banks hold 49% of US commercial real estate loans either directly or in the form of structured finance securities.

We estimate that of the US\$183.2 bn of overall US commercial real estate losses that we expect:

- 45% (US\$82.4 bn) will be borne by banks;
- 21% (US\$37.9 bn) by savings institutions, including pension funds;
- 16% (US\$28.9 bn) by insurance companies; and
- 15% (US\$28.1 bn) by other investors, including hedge funds and specialists.

We have assumed that CRE CDO exposures are broadly in line with CMBS given that we believe there was significant overlap between the two investor groups. This is, however, a critical assumption as our analysis suggests that substantially all of the CMBS mezzanine tranches were repackaged into CDO structures, which therefore carry a disproportionate amount of ultimate losses. If the distribution of CMBS and CRE CDO securities were substantially different, the results of our analysis could be undermined.

In the context of CMBS, the most important assumption is arguably which investor groups invested in the equity tranches of the structures (given that a majority of both mezzanine and high-grade tranches were repackaged and the AAA tranches should be untouched, according to our analysis). We have assumed that equity tranches of CMBS structures were not repackaged but held equally by banks (generally through proprietary trading desks) and hedge funds/specialist investors.

This analysis allows us to allocate outstanding US commercial real estate loans and losses by investor type. A summary of the results is set out in Exhibit 21. The key takeaways are:

- Banks hold an estimated US\$1,611 bn (49%) of US CRE exposure and US\$82.4 bn (45%) of losses;
- Savings institutions, including pension funds, hold an estimated US\$595 bn (18%) of US CRE exposure and US\$37.9 bn (21%) of losses;
- Insurance companies hold an estimated US\$519 bn (16%) of US CRE exposure and US\$28.9 bn (16%) of losses; and
- Other investors, including hedge funds and specialists, hold an estimated US\$387 bn (12%) of US CRE exposure and US\$28.1 bn (15%) of losses.

Exhibit 21: Our analysis suggest that banks may have US\$1,611 bn of US commercial real estate exposure, which could result in US\$82.4 bn of losses

US CRE exposure (US\$ bn)	Direct	CMBS	CRE CDO	Total		US CRE losses (US\$ bn)	Direct	CMBS	CRE CDO	Total
Banks	1,395	189	26	1,611		Banks	56.6	12.8	13.0	82.4
Insurance companies	300	189	29	519		Insurance companies	12.2	2.1	14.7	28.9
Savings institutions	215	329	51	595		Savings institutions	8.7	3.7	25.5	37.9
Government-sponsored enterprises	124	74	0	198		Government-sponsored enterprises	5.0	0.8	0.0	5.9
Others	339	41	6	387		Others	13.8	11.2	3.2	28.1
Total	2,373	822	113	3,309		Total	96.3	30.7	56.3	183.2

US CRE exposure (%)	Direct	CMBS	CRE CDO	Total		US CRE losses (%)	Direct	CMBS	CRE CDO	Total
Banks	59%	23%	23%	49%		Banks	59%	42%	23%	45%
Insurance companies	13%	23%	26%	16%		Insurance companies	13%	7%	26%	16%
Savings institutions	9%	40%	45%	18%		Savings institutions	9%	12%	45%	21%
Government-sponsored enterprises	5%	9%	0%	6%		Government-sponsored enterprises	5%	3%	0%	3%
Others	14%	5%	6%	12%		Others	14%	36%	6%	15%
Total	100%	100%	100%	100%		Total	100%	100%	100%	100%

Source: Thomson Financial, SIFMA, Markit, Goldman Sachs Research estimates.

We note, however, that our estimates for exposures (and thus losses) are based on distribution assumptions and thus relate to initial gross exposures following loan origination/securitization, with no allowance made for hedging and/or asset sales. This is unlikely to hold true in reality, as investors (including banks and investment banks) are likely to have sought to actively manage their credit exposures, particularly in light of developments in the subprime market. Consequently, we believe our estimates may overstate both net exposures and ultimate losses for specific investor groups even if our industry-level loss estimates hold true.

Assessing the losses implied by the CMBX index

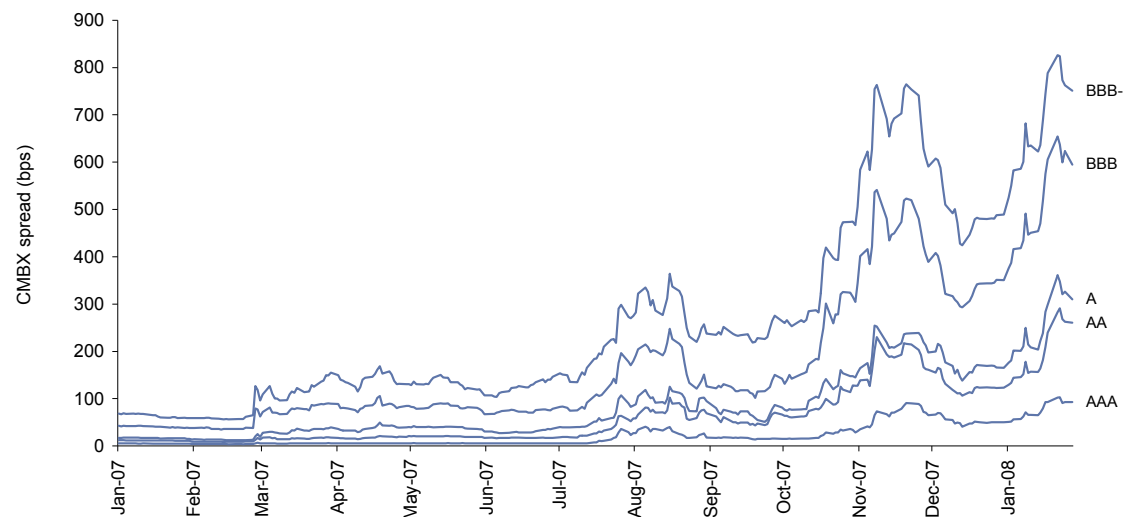
We have used the CMBX index to infer current expected losses implied by CMBS pricing. We have done this for each of the previous three years of outstanding CMBS paper where there is currently good liquidity.

This analysis indicates that the index is currently pricing in US\$62.6 bn of CMBS losses or 11.0% of the outstanding. In turn, we have assumed that direct loans issued during 2005-2007 (US\$757 bn outstanding) will see an equivalent level of losses, which adds another US\$82.2 bn of implied losses. Consequently, we believe that the index is currently pricing in US\$144.8 bn of total US commercial real estate losses, or 112% of our US\$129.0 bn estimate (Exhibit 22). Adding our estimates for losses relating to prior year vintages (US\$54.2 bn), the CMBX index currently appears to be pricing in US\$199 bn of future losses, which is 8% higher than our estimate of US\$183 bn.

Exhibit 22: Our analysis suggests that the CMBX index is currently pricing in US\$144.8 bn of US CRE losses for 2005-2007 loans

CMBX - cash prices	CMBX 1	CMBX 2	CMBX 3	CMBX 4
AAA	94.8	93.9	92.6	93.6
AA	87.6	82.2	75.8	83.5
A	83.6	72.1	65.5	80.0
BBB	71.8	58.1	50.7	61.4
BBB-	65.7	50.6	49.6	53.6
BB	NA	37.8	47.6	45.4
CMBS - tranches outstanding (US\$ bn)	2005	2006	2007	Total
AAA	128.9	165.1	202.6	496.6
AA	4.5	4.9	5.8	15.2
A	4.4	4.9	5.3	14.6
BBB	4.6	5.9	6.7	17.2
BB	2.6	3.6	4.4	10.6
B	1.2	1.7	2.3	5.3
Equity	2.3	2.7	3.1	8.1
Total	148.5	188.9	230.2	567.6
CMBX - implied losses (US\$ bn)	2005	2006	2007	Total
AAA	6.7	11.2	14.0	31.9
AA	0.6	1.0	1.2	2.8
A	0.7	1.5	1.4	3.7
BBB	1.4	2.8	3.1	7.4
BB	1.3	2.1	2.4	5.7
B	0.7	1.1	1.4	3.1
Equity	2.3	2.7	3.1	8.1
Total implied CMBS losses	13.7	22.4	26.5	62.6
Implied CMBS losses as % of outstandings	9.2%	11.9%	11.5%	11.0%
Direct loans (US\$ bn)	2005	2006	2007	Total
Outstandings	251.6	230.0	275.5	757.0
Cumulative losses	9.2%	11.9%	11.5%	11.0%
Total implied direct loan losses	23.2	27.3	31.7	82.2
Total losses implied by CMBX index (US\$ bn)	36.8	49.7	58.3	144.8
Total losses implied by GS analysis (US\$ bn)	28.6	44.5	55.9	129.0

Source: Datastream, Commercial Mortgage Alert, Trepp, Mortgage Bankers Association, Markit, Federal Reserve, Goldman Sachs Research estimates.

Exhibit 23: CMBX spreads have widened significantly over the last 12 months

Source: Markit.

Appendix 1: Forecasting US commercial real estate appreciation

We believe that US commercial property prices are currently being affected by (1) increases in financing costs reducing investor demand; and (2) a decline in demand in the occupier market as a result of slowing economic growth. This situation could be exacerbated by forced sales from fund redemptions and breaches of LTV covenants.

We have developed three models to estimate commercial real estate appreciation through 2009 based on the following:

- The risk premium historically associated with commercial real estate assets;
- The relationship between yield-adjusted nominal GDP and commercial real estate appreciation; and
- Five-year rolling returns from commercial real estate.

Approach #1: CRE risk premium

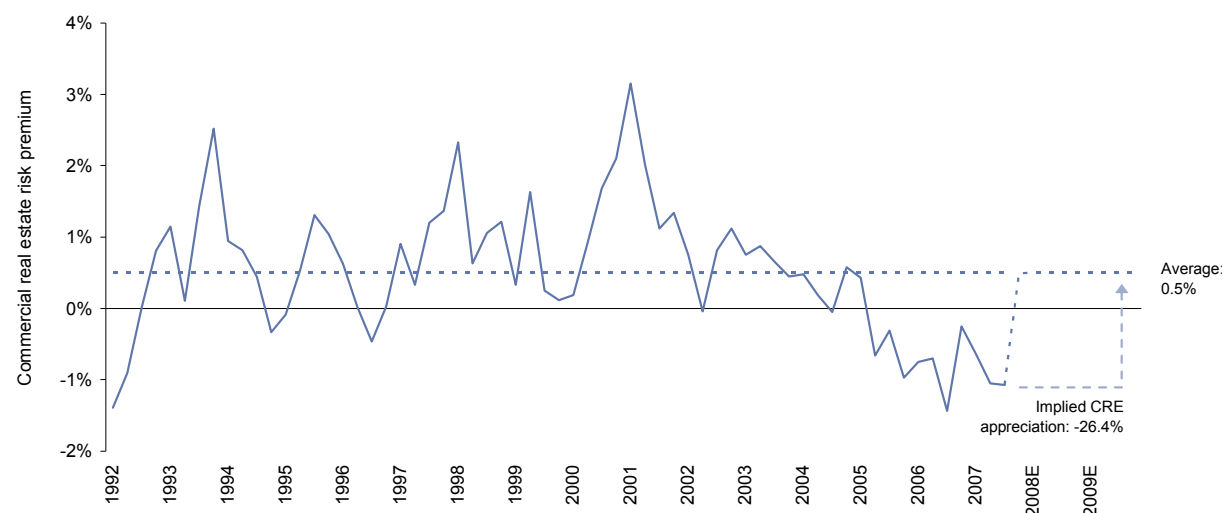
This analysis assumes that the spread between CRE capitalization rates and bond yields will return to its long-term average over time. We have adjusted this "risk premium" for expected rental growth, a liquidity premium associated with commercial real estate as an illiquid asset and a depreciation charge to reflect the fact that property depreciates over time (while bonds do not). Our equilibrium equation (all per annum figures) consequently becomes:

$$\text{CRE yield} - \text{Depreciation of CRE assets} - \text{Liquidity premium} + \text{Expected rental growth} = \text{Bond yield}$$

We have set the annual depreciation charge at 100 bp (which we believe is broadly equivalent to the amount of improvement spending as a percentage of capital value) and assumed a liquidity premium of 200 bp. Our rental growth forecast assumes a return to the average of the last 20 years (54 bp/quarter). This assumption may prove overly optimistic given the above-trend rental growth in recent years. As a consequence, the outcome of our analysis may understate the correction in CRE prices (intuitively, lower realized rental growth would need to be made up for by higher yields and given that both the liquidity premium and depreciation charge are stable over time, the equilibrium would have to be recovered through lower CRE prices). Finally, we use a five-year bond yield given that most property investments are financed over a five-year period.

An illustration of our analysis is set out in Exhibit 24. The analysis suggests that CRE yields need to rise by 158 bp from the current 450 bp to recover their historical risk premium over bond yields. This, in turn, implies that CRE prices would need to fall approximately 26.4%. Assuming no rental growth through 2009, the analysis suggests that CRE prices would need to fall by 31.1%.

Exhibit 24: Our analysis suggests that CRE prices will need to fall 26.4% for the asset class to recover its risk premium vs. bonds



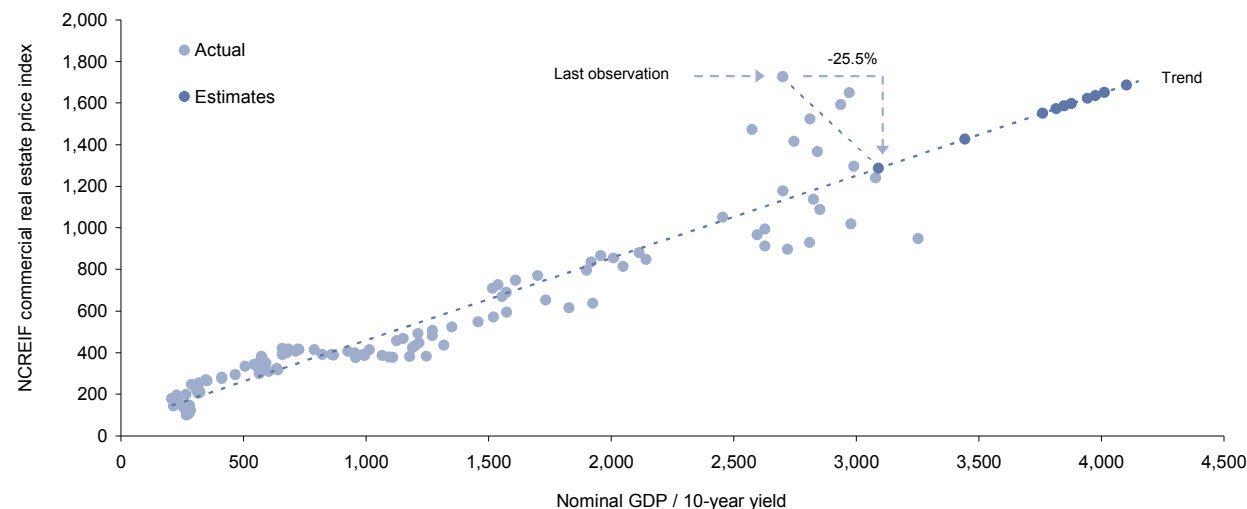
Source: Datastream, Goldman Sachs Economic Research, Goldman Sachs Research estimates.

Approach #2: yield-adjusted nominal GDP

We have found a strong historical correlation between commercial real estate price levels and yield-adjusted nominal GDP; between 1978 and 2002, there was a 95% correlation between these two factors. Over the last five years, however, this relationship has broken down (2003-2007 correlation: 1%) as CRE appreciation outpaced yield-adjusted GDP growth. Between 1Q2003 and 2Q2007, nominal GDP rose 29% while yield-adjusted GDP fell 4% (due to higher interest rates) and the NCREIF CRE index rose 86%.

Our model assumes that the long-term relationship between yield-adjusted nominal GDP and CRE prices will be re-established through a correction in CRE prices. Based on our economists' forecasts for US nominal GDP and 10-year yields through 2009, our model suggests that CRE prices need to fall by 25.5% (see Exhibit 25).

Exhibit 25: Our analysis suggests that commercial real estate prices need to decline by 25.5% to re-establish the historical relationship between CRE price levels and yield-adjusted nominal GDP



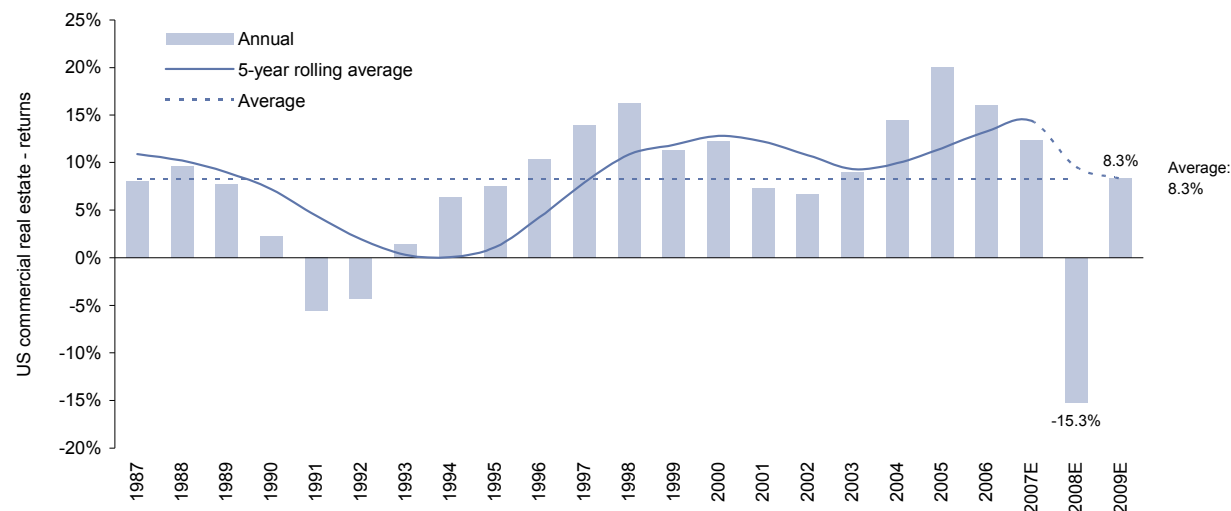
Source: Datastream, Goldman Sachs Economic Research, Goldman Sachs Research estimates.

Approach #3: returns from commercial real estate

We have examined historical US CRE returns to determine the potential magnitude of a correction following a period of above-average returns. Our analysis suggests that since 1987, the CRE asset class has yielded average annual returns of 8.3%. However, over the last five years, annual returns have been running above this level every year, and over the last decade, five-year rolling returns have consistently been above the long-term trend.

To determine the potential fall in CRE prices, we assume that five-year rolling returns will return to trend over a two-year period. This analysis suggests that total returns from US CRE could be -15.3% in 2008 and 8.3% in 2009 (Exhibit 26).

Exhibit 26: To revert to long-term average returns from the asset class, total CRE returns would need to be -15.3% during 2008 and CRE prices could fall 21.1%



Source: Datastream, Goldman Sachs Research estimates.

However, given that these figures relate to total returns, we deduct current annual yields on CRE assets (588 bp) to generate our estimate of underlying price declines; for total annual returns to be -15.3% during 2008, CRE prices would need to fall by approximately 21.1% given that the assets generate a positive yield on an ongoing basis.

Finally, we note that the derivative market is currently pricing in 10%-15% declines in US commercial real estate prices over a two-year period. However, while this confirms our finding that US CRE assets are currently overpriced, we believe liquidity is limited within the derivative market for US commercial real estate and therefore focus predominantly on the indications of our three “fundamental” models described above.

Appendix 2: Risks to our analysis and sensitivity of CRE losses to property price declines

Our analysis of aggregate losses relies on a number of assumptions, which could be inaccurate and materially affect our conclusions. These include our assumptions on cumulative commercial real estate losses and the proportion of CRE loans that are held directly, in CMBS structures and CRE CDOs. The analysis also assumes that all CMBS/CDO structures are identically structured and backed exclusively by US CRE loans, which is unlikely to hold true (but should have only a limited impact on the conclusions of our analysis).

In addition, our analysis assumes that all securitization structures in a given vintage will behave identically (i.e. have identical levels of defaults, losses at default, etc.) while in reality, the underlying CMBS securities are likely to differ, possibly materially, in performance and therefore see different levels of losses within tranches with the same ratings. Consequently, some lower rated tranches are likely to fare better than indicated by our analysis, while some higher rated tranches may be harder hit.

Most importantly, however, our analysis and conclusions rely heavily on our assumptions for commercial real estate appreciation over the coming years given the high (negative) correlation between price developments, defaults and loss severity. In order to assess the sensitivity of our loss estimates to changes in our CRE appreciation assumptions, we have conducted a sensitivity analysis of industry and bank-specific losses to various levels of CRE appreciation in 2008 and 2009. This analysis suggests that the sensitivity is relatively limited; at a -13.5% compound CRE depreciation through 2009 (rather than our base-case -24.3%), estimated industry losses fall to US\$164.7 bn (from US\$183.2 bn), while bank-specific losses fall to US\$74.6 bn (from US\$82.4 bn). At the other end of the spectrum, a peak-to-trough compound decline of 34% through 2009 results in industry losses rising to US\$202.2 bn, while bank-specific losses rise to US\$90.4 bn (Exhibit 28). We believe this is a function of the relatively longer duration and default profile of commercial real estate loans versus subprime, which makes the CRE segment less vulnerable to short-term price corrections.

Exhibit 27: Sensitivity of our estimate for total US CRE losses to various 2008/2009 commercial real estate price appreciation assumptions

	US CRE appreciation 2009E (%)						
	-6.0	-8.0	-10.0	-12.0	-14.0	-16.0	-18.0
US CRE appreciation 2008E (%)							
-8.0	164.7	167.2	169.7	172.2	174.8	177.4	180.0
-10.0	168.4	170.8	173.3	175.8	178.4	180.9	183.6
-12.0	172.1	174.6	177.0	179.5	182.0	184.6	187.2
-14.0	175.9	178.3	180.8	183.2	185.7	188.3	190.9
-16.0	179.8	182.1	184.6	187.0	189.5	192.0	194.6
-18.0	183.7	186.0	188.4	190.9	193.3	195.8	198.4
-20.0	187.6	190.0	192.4	194.8	197.2	199.7	202.2
Cumulative losses - 1995-2007 vintage US CRE loans (US\$ bn)							

Source: Goldman Sachs Research estimates.

Exhibit 28: Sensitivity of our estimate for US CRE losses carried by banks to various 2008/2009 commercial real estate price appreciation assumptions

	US CRE appreciation 2009E (%)						
	-6.0	-8.0	-10.0	-12.0	-14.0	-16.0	-18.0
US CRE appreciation 2008E (%)							
-8.0	74.6	75.6	76.6	77.7	78.8	79.9	81.0
-10.0	76.1	77.1	78.2	79.2	80.3	81.4	82.5
-12.0	77.7	78.7	79.8	80.8	81.9	82.9	84.0
-14.0	79.3	80.3	81.3	82.4	83.4	84.5	85.6
-16.0	80.9	81.9	83.0	84.0	85.0	86.1	87.2
-18.0	82.6	83.6	84.6	85.6	86.7	87.7	88.8
-20.0	84.3	85.3	86.3	87.3	88.3	89.4	90.4
Banks cumulative losses - 1995-2007 vintage US CRE loans (US\$ bn)							

Source: Goldman Sachs Research estimates.

The reason for this relatively limited sensitivity is twofold:

- First, in our analysis, both defaults and loss severity (and thus losses) are a function of three-year cumulative CRE appreciation and have limited “gearing” to CRE appreciation assumptions for single years, particularly because recent years have seen high levels of positive appreciation (boosting cumulative appreciation for all previous vintages). We assume that returns revert to the long-term average (8.3% pa) in 2010 and remain at this level thereafter.
- Second, over the last 30 years, negative CRE appreciation of the extreme magnitude used in our sensitivity analysis has not occurred. As a result, our regression model, arguably, does not fully capture the exponential relationship between CRE depreciation and losses and possibly fails to accelerate implied defaults sufficiently as CRE depreciation rises.

Appendix 3: Stock-specific US commercial real estate exposures

Exhibits 29 and 30 set out the market shares of the bookrunners through 2005-2007 for US CMBS and CDO structures, which highlights the following:

- The top three players (Morgan Stanley, Wachovia and JP Morgan) account for 39% of total US CMBS issuance over the last three years, while the top ten account for 92% of issuance.
- Reported exposures suggest that the issuers have on average retained about 50% of the CMBS they have issued. The largest disclosed holdings are by Lehman (US\$40 bn), Morgan Stanley (US\$31 bn) and Merrill Lynch (US\$23.8 bn). Based on our assumptions of bank exposure to CMBS, the top three own 59% of the total. The losses that we estimate will stem from the CMBS segment, however, are relatively limited, as we believe that junior tranches were mainly repackaged into CDOs, leaving the banks holding the more senior tranches.
- Real estate CDO issuance has amounted to US\$90 bn since 2005, with the top ten players accounting for 87% of total issuance. We believe that the majority of losses in 2008 (US\$12.6 bn or 55%) will stem from these securities through mark-to-market effects. However, given the lack of disclosure, our visibility on where losses may arise is currently limited. We also note that subprime CDO issuance and ultimate ownership of the securities have borne limited resemblance. Hence, we view CDO issuance league tables as being of limited use in predicting CRE-related writedowns.

Exhibit 29: Bookrunners of US CMBS (2005-2007)

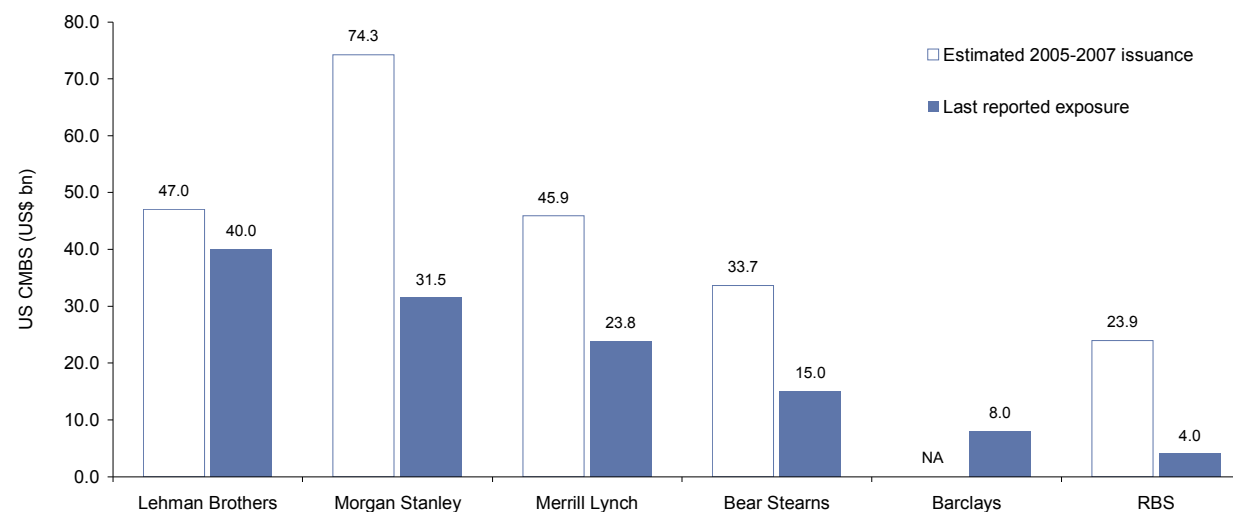
Bookrunners of US CMBS			
US\$ mn		2005-2007	Market share
1	Wachovia	74,423	13.1%
2	Morgan Stanley	74,251	13.1%
3	J.P. Morgan	73,154	12.9%
4	Bank of America	51,641	9.1%
5	Credit Suisse	51,439	9.1%
6	Lehman Brothers	47,040	8.3%
7	Merrill Lynch	45,892	8.1%
8	Deutsche Bank	40,924	7.2%
9	Bear Stearns	33,657	5.9%
10	Citigroup	27,580	4.9%
Total		520,000	91.6%
Industry total		567,788	100.0%

Source: Commercial Mortgage Alert, Goldman Sachs Research estimates.

Exhibit 30: Bookrunners of real estate CDOs (2005-2007)

Bookrunners of real estate CDOs and resecuritizations			
US\$ mn		2005-2007	Market share
1	Wachovia	17,450	19.3%
2	Deutsche Bank	10,976	12.2%
3	Goldman Sachs	10,178	11.3%
4	Morgan Stanley	9,758	10.8%
5	Merrill Lynch	8,563	9.5%
6	Bank of America	7,808	8.6%
7	Bear Stearns	4,395	4.9%
8	RBS Greenwich	3,790	4.2%
9	Citigroup	3,246	3.6%
10	J.P. Morgan	2,635	2.9%
Total		78,799	87.2%
Industry total		90,335	100.0%

Source: Commercial Mortgage Alert, Goldman Sachs Research estimates.

Exhibit 31: Our analysis suggests that issuers of US CMBS securities have retained approximately 50% of exposures, on average

Source: Commercial Mortgage Alert, Company data, Goldman Sachs Research estimates.

- Exhibit 32 sets out the direct loan exposures of the top 15 players to US commercial real estate. The data shows that there is limited concentration among the key players, with the largest exposure (Wachovia) representing 2.1% of the market and the top 15 banks representing 11.7% of the market. Assuming the same quality of assets across the banks, we would expect the losses to reflect aggregate exposure.

Among the European banks, we estimate that HSBC (US\$13 bn), BNP Paribas/BancWest (US\$12 bn) and Anglo Irish (US\$11 bn) all have substantial US CRE loan portfolios.

In addition, US CRE-backed CMBS exposures have been disclosed by RBS (US\$4 bn) and Barclays (US\$8 bn). However, we also note that Credit Suisse and Deutsche Bank feature prominently in the league tables of US CMBS bookrunners over the last few years: since 2005, Credit Suisse has issued US\$51.4 bn of US CMBS (9.1% of total issuance) while Deutsche Bank has issued US\$40.9 bn (7.2% of total issuance). While this is not necessarily an indication of current exposures, we note that the reported exposures of other issuers (Lehman Brothers, Morgan Stanley, Merrill Lynch, Bear Stearns, Barclays and RBS) indicate that, on average, bookrunners have retained around 50% of CMBS exposures. Assuming that this holds true, we estimate that Deutsche Bank could have €14 bn of US CMBS exposure while Credit Suisse could have SFr28 bn of exposure.

Limited disclosure on CRE-backed CDOs makes exposures difficult to assign. However, we believe that, as in the case of subprime-backed CDOs, CRE CDOs are likely to have been distributed across a broad range of investors and geographies, and that issuance is unlikely to be a reliable indicator of ultimate exposures. Nevertheless, we note that Deutsche Bank (US\$11 bn of issuance, 12.2% market share) and RBS (US\$4 bn of issuance, 4.2% market share) have been highly active in this market since 2005 and could therefore be at greater risk of mark-to-market losses.

Exhibit 32: Direct US commercial real estate loan exposure among banks

Direct US commercial real estate loan exposures		
US\$ mn	Outstanding	Market share
1 Wachovia Corporation	49,961	2.1%
2 Bank of America Corporation	43,629	1.8%
3 Wells Fargo & Company	29,310	1.2%
4 JPMorgan Chase & Co.	16,240	0.7%
5 U.S. Bancorp	15,564	0.7%
6 Regions Financial Corporation	15,503	0.7%
7 National City Corporation	13,525	0.6%
8 HSBC	13,000	0.5%
9 BB&T Corporation	12,869	0.5%
10 Comerica Incorporated	12,118	0.5%
11 BNP Paribas (BancWest)	12,000	0.5%
12 SunTrust Banks, Inc.	11,775	0.5%
13 Anglo Irish	11,237	0.5%
14 Zions Bancorporation	10,938	0.5%
15 M&T Bank Corporation	10,434	0.4%
Total	278,101	11.7%
Industry total	2,373,390	100.0%

Source: Company data, Goldman Sachs Research estimates.

Reg AC

We, Richard Ramsden and Frederik Thomasen, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

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The precise calculation of each metric may vary depending on the fiscal year, industry and region but the standard approach is as follows:

Growth is a composite of next year's estimate over current year's estimate, e.g. EPS, EBITDA, Revenue. **Return** is a year one prospective aggregate of various return on capital measures, e.g. CROCI, ROACE, and ROE. **Multiple** is a composite of one-year forward valuation ratios, e.g. P/E, dividend yield, EV/FCF, EV/EBITDA, EV/DACF, Price/Book. **Volatility** is measured as trailing twelve-month volatility adjusted for dividends.

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