Deutsche Bank

12 March 2009

India Financial Sector

Asset quality: Facing the credit crisis head on

FITT Research

Fundamental, Industry, Thematic, Thought-leading
Deutsche Bank Company Research's Investment Policy Committee has deemed this work FITT for investors seeking differentiated ideas. While credit quality risks in Indian banks are undoubtedly on the rise, we remain below-consensus on the extent of the likely NPL increase. Our analyses suggest that stock prices now offer compelling selective investment opportunity across the India financial sector. This includes paired or hedged ideas as the credit quality impact is likely to be materially different across the sector.

Fundamental: Strong headwinds, but corporate preparedness generally high

Industry: Favourable regulatory regime, but transparency risk increases

Thematic: Sensitivity analysis reveals primacy of private banks

Thought leading: Rising default risks but retail seasoning data positive

Actionable ideas: Our top picks are HDFC Bank, HDFC and PNB. We also suggest pair trades: i) Buy HDBK-Sell SBI ii) Buy PNB-sell Canara Bank iii) Buy ICICI-sell basket of Union Bank, BoB & Canara Bank iv) Buy basket of HDFC Bank & ICICI-sell Axis

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Fundamental: Strong headwinds, but corporate preparedness generally high
We estimate our coverage universe will report a ~50% increase in NPLs in year to Mar'10E over Mar'09E. This is significantly lower than consensus that expects closer to a doubling in NPLs. Sharp credit controls and portfolio seasoning should result in NPLs peaking sooner and less severely than most think. We also derive comfort from sizeable unrealized gains, lesser global dependence of the economy, comparatively modest GDP deceleration and subsequent lower risk of job losses.

Industry: Favourable regulatory regime, but transparency risk increases
Institutional frameworks such as the foreclosure law work not just as post-delinquency tools, but also as a deterrent to willful defaults. Prudential exposure guidelines and transition to Basel II function as effective self-control mechanisms. We are concerned, however, that aggressive bank restructuring – an otherwise necessary and positive trend – could make bank balance sheets more opaque and evoke investor skepticism over reported NPLs.

Thematic: Sensitivity analysis reveals primacy of private banks
Detailed scenario analyses of rising NPL conditions reveal that private sector banks hold a clear advantage over PSU banks and underscore the importance of adequate capitalization levels. Valuation analysis suggests that the market has already priced in 50% higher than our *increased* NPL estimates, with many banks now trading at valuations closer to periods when NPLs were 3-4x higher.

Thought leading: Rising default risks but retail seasoning data positive
Our detailed analysis of corporate India's conventional default risk indicator ratios, Altman Z scores across sectors and Merton's methodology indicate rising default probabilities in general with expectedly greater degree of stress in export-oriented sectors. We conclude that the 'tail risk' is still increasing, but our seasoning analysis also reveals lesser-known, positive aspects of retail loans.

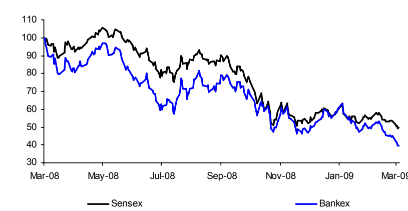
Actionable ideas
Our top picks are HDFC Bank, HDFC and PNB. We also suggest pair trades: i) Buy HDBK--sell SBI; ii) Buy PNB--sell Canara Bank; iii) Buy ICICI--sell basket of Union Bank, BoB and Canara Bank; iv) Buy basket of HDFC Bank and ICICI--sell Axis.
The material changes to earnings estimates and target prices in this report are summarized in Figure 1.

FITT Research

Top picks	
HDFC (HDFC.BO),INR1,255.80	Buy
HDFC Bank (HDBK.BO),INR798.85	Buy
PNB (PNBK.BO),INR303.75	Buy

Companies featured	
HDFC (HDFC.BO),INR1,255.80	Buy
Axis Bank (AXBK.BO),INR280.90	Hold
Bank of India (BOI.BO),INR181.05	Buy
HDFC Bank (HDBK.BO),INR798.85	Buy
ICICI Bank (ICBK.BO),INR262.95	Buy
IDFC (IDFC.BO),INR47.20	Sell
Kotak Mahindra (KTKM.BO),INR222.70	Hold
PNB (PNBK.BO),INR303.75	Buy
State Bank of India (SBI.BO),INR896.80	Hold
Union Bank of India (UNBK.BO),INR116.40	Hold
YES Bank (YESB.BO),INR41.45	Hold

Bankex vs. Sensex



Performance			%
	1m	3m	12m
Sensex	-8.4	-7.1	-47.9
Bankex	-19.6	-20.6	-55.9
DB pvt banks index	-20.5	-17.3	-66.4
CNX PSU bank index	-18.5	-20.4	-45.1

DB vs. Consensus				INR/share
	DB EPS	Cons EPS	DB TP	Cons TP
Axis	48.5	52.7	375	621
BOB	53.1	51.7	245	312
BOI	62.4	58.9	260	330
Canara	42.5	42.3	160	203
HDFC	80.2	91.9	1,430	1,710
HDFC Bk	64.3	62.4	1,025	1,146
ICICI	41.4	38.7	375	518
PNB	90.3	89.3	410	536
SBI	183.6	154.3	1,025	1,358

Altman Z Scores - Corporate risk			
	Dec 02	Dec 07	Dec 08
Textiles	1.02	1.70	1.48
Auto	1.93	3.20	3.00
Auto Ancillaries	2.30	2.81	2.31
Cement	1.30	2.91	2.58
Leather	1.82	2.42	1.85
Steel	0.82	2.42	2.32
Chemicals	2.32	2.89	2.80
Construction	1.68	2.11	2.36

Source: Prowess database, DB

Table of Contents

The authors of this report wish to acknowledge the contribution made by **Amit Jain,** employee of Evalueserve, a third party provider to Deutsche Bank for offshore research support services.

Figure 1: Summary of changes to earnings estimates and target prices

(Rs/share)	EPS estimates						Target price			Rating	Remarks – Reasons for TP and earnings changes
	FY10E revised	FY10E old	Change	FY11E revised	FY11E old	Change	Revised	Old	Change		For all stocks, we have changed our cost of equity assumptions due to revised DB estimates on risk free rate and market risk premium
Axis Bank	48.5	50.7	-4%	54.3	57.1	-5%	375	520	-28%	HOLD	Sharp increase in NPAs and consequently lower adjusted book
Bank of Baroda	53.1	55.5	-4%	61.9	66.1	-6%	245	265	-8%	HOLD	Increase in NPAs and consequently lower adjusted book
Bank of India	62.4	64.4	-3%	72.0	74.4	-3%	260	315	-17%	BUY	Increase in NPAs and consequently lower adjusted book
Canara Bank	42.5	43.7	-3%	45.8	48.8	-6%	160	175	-9%	HOLD	Increase in NPAs and consequently lower adjusted book
HDFC Ltd	80.2	80.5	0%	90.5	91.1	-1%	1430	1550	-8%	BUY	Lower valuation of Insurance and HDFC Bank in SOP
HDFC Bank	64.3	66.2	-3%	84.7	87.0	-3%	1025	1100	-7%	BUY	Increase in NPAs and consequently lower adjusted book
ICICI Bank	41.4	41.4	0%	51.3	51.3	0%	375	395	-5%	BUY	No change in provisions and NPAs. Lower TP due to lower insurance business valuation and losses assumed for certain kind of exposures
IDFC	5.2	5.2	0%	5.0	5.0	0%	43	48	-10%	SELL	TP affected due to change in cost of equity assumptions, No change in earnings
Kotak	11.8	11.8	0%	13.7	13.7	0%	270	300	-10%	HOLD	No change in provisions and NPAs. Lower TP due to lower insurance business valuation
PNB	90.3	95.6	-6%	98.7	104.9	-6%	410	540	-24%	BUY	Sharp increase in NPAs and consequently lower adjusted book
SBI	183.6	183.6	0%	208.2	208.2	0%	1025	1170	-12%	HOLD	No change in provisions and NPAs. Lower TP due to lower insurance business valuation
Union Bank	27.1	29.8	-9%	30.0	32.4	-7%	140	155	-10%	HOLD	Increase in NPAs and consequently lower adjusted book
Yes Bank	10.2	10.7	-5%	12.4	12.7	-2%	50	60	-17%	HOLD	Increase in NPAs affecting book value and reduction in normalised RoE

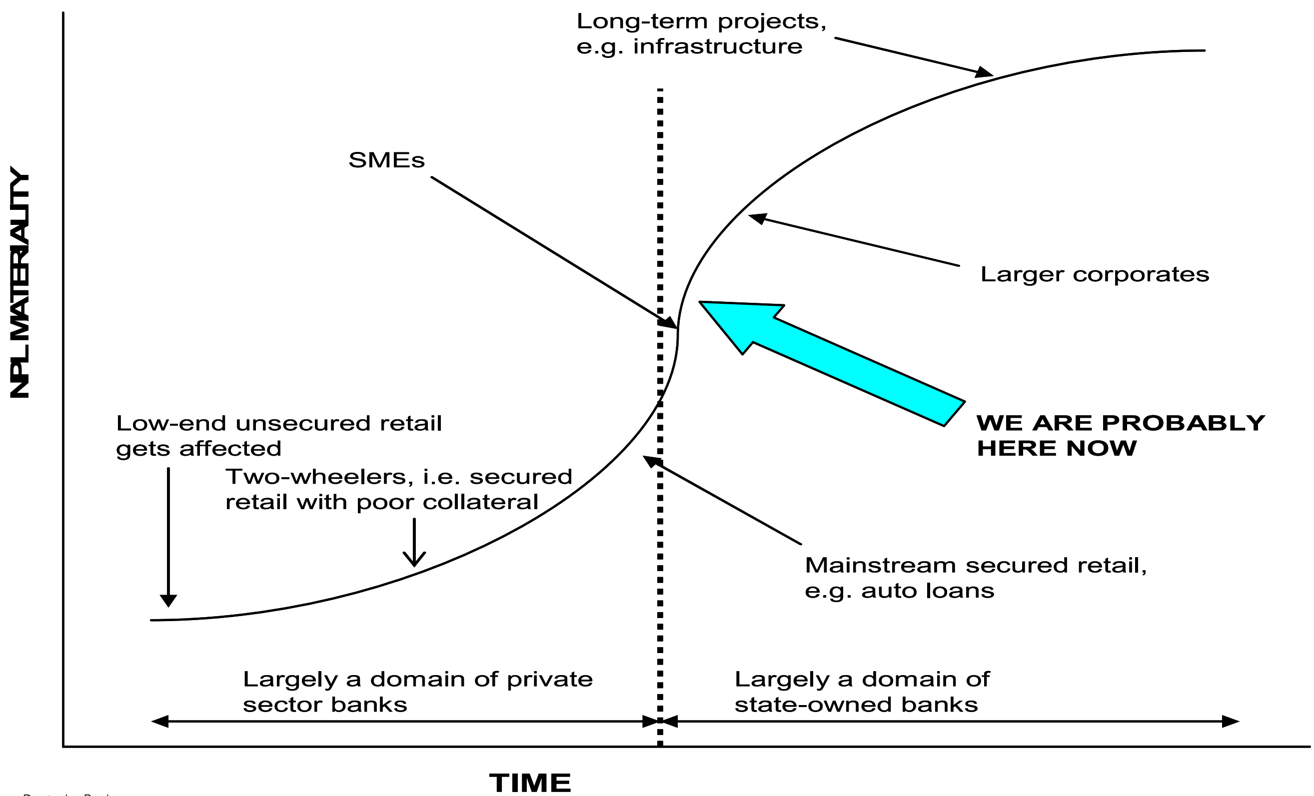
Source: Deutsche Bank. Note: SBI, Kotak and IDFC figures are consolidated figures. We haven't changed rating for any of the stocks

This report recommends one or more "pairs trades," involving the simultaneous purchase of one or more securities and sale of one or more other securities. As the name implies, this is a trade idea (not fundamental research) that is only recommended to be executed in its entirety. As such, the buy and sell components of the trade might not align with the analyst's current fundamental research rating on the stocks involved on a stand alone basis.

For valuations and risks on stocks with changes more than 10%, please see the chapter titled "Valuations and stock picks".

Executive summary

Figure 2: The NPL cycle in India: only half-way through, but rate of increase to slow



Source: Deutsche Bank

Corporate lending

- ***Corporate lending concentrated on structurally better segments, a fact not well appreciated***
- ***Profit margins and Altman Z scores trending down, but hugely improved from the levels in early 2000s when NPLs were 3-4x current levels. Expectedly, export-dependent sectors such as textiles are more beleaguered, but they constitute only ~15% of corporate loan book***
- ***SME lending: very solid financial metrics, though vulnerabilities rising***
- ***The relatively lower global dependence of the economy certainly helps as a risk-mitigating factor for delinquencies***
- ***In the context of the DB-projected modest GDP growth slowdown from 6.4% in year to Mar'09E to 4.8% in Mar'10E, an NPL increase assumption of 50% is conservative in our opinion***

Profit margins for the key borrower sectors have recently been declining or flattening out after several years of uninterrupted increase, but are still way above the bad times of early 2000s. Our Altman Z score analysis across sectors shows similar trends. The analysis also confirms that global pressures have been the key culprit – sectors such as textiles that have shown maximum score worsening have a large export component. Recent observations of credit rating agencies are also corroborative.

Analysis using Merton's risk-neutral default probability model indicates rising probability of default for all sectors, albeit modestly.

There is anecdotal evidence of tail risk (i.e. risk for the bottom rung of borrowers, take SMEs as a proxy) rising. Financial metrics of SMEs are still very strong, which implies improved ability to weather the downturn. However, SMEs have been complaining of falling sales, reduced availability of credit and extending of debtor payment periods.

General economic drivers of asset quality do not appear to be as despairingly negative as the sentiment is. India is considerably less global than most of the rest of Asia. Also, DB estimates of GDP growth deceleration is modest and certainly cannot imply debilitating credit quality. Hence a 50% increase in the year to Mar'10E is reasonably conservative in our opinion.

Retail loans

- ***While recognising that job losses do cast a shadow on retail asset quality, we show that threats are exaggerated***
- ***The relief from lower interest rates is a clear positive***
- ***Collection challenges remain***
- ***Home loans – half of retail – remain structurally the best, with high quality collateral. Auto loans are stressed, but the 2007 pool is better than older pools. Unsecured has already seen considerable deterioration and incremental delinquencies may be limited***
- ***Retail loan book seasoning is very evident, and this can provide favourable tailwinds for credit quality with NPLs in certain categories peaking out***

While deterioration is inevitable in retail loans, the good news is that banks are relatively higher up the retail NPL experience curve than for corporate NPLs. The rapid loan growth of 2005/6/7 is of concern, but the significant moderation in loan growth over the last two years (as a result of central bank initiatives and banks' self-imposed withdrawal) has mitigated the extent of the default risk.

The loan growth party for the three years running up to 2008 was reined in due to regulatory strictures on recovery processes by banks and proceeding RBI guidelines. This resulted in repossessions and use of third party agents becoming severely constrained. Banks have responded by shutting off credit that requires intensive recovery efforts. Retail loan risk has thus been effectively stabilized. We expect little change in the stressed credit environment in the short term, so the answer to further asset quality improvement lies in continued discipline in limiting or shutting off credit to these loan sectors.

Recent job losses may have cast a shadow on outlook on retail credit quality. However, we show that a 6x increase in job losses in the next one year period would imply an unemployment rate lower than the highs seen in the early 2000s. Hence the threat could be exaggerated.

Individual categories within retail present a very mixed picture. Fortunately, half of the retail loan portfolio is in residential mortgages which we view as the safest among all classes, and post-delinquency recoveries are high. Probability of fraud hurting credit quality of home loans has reduced with the credit bureau now having attained critical mass and appraisal procedures severely tightened. Auto loans are now getting more stressed due to the deepening economic downturn, but our study reveals that assets originated in 2007 are behaving much better than those originated in 2005/6, and credit losses still remain structurally low due to eventual recoveries. Personal loan and credit card losses have however been on the rise.

Our assessment reveals that loan books are getting rapidly but unevenly seasoned, i.e. aged, across banks, and expectedly the lagged NPLs of unseasoned banks are rising faster than those of seasoned portfolios. Seasoned books present lesser residual risks with NPLs reducing with higher seasoning. Non-mortgage retail loans season in 22-24 months, which suggests that banks that experienced peak growth up to 2007 should experience their peak in NPLs very soon.

Institutional and regulatory developments: beneficial, though may muddy the true picture

- ***Farm credit, i.e. 15% of bank lending and feeding 18% of GDP, is a seasonal and not a cyclical issue, largely immune from rest of the NPL cycle. There is considerable forbearance on this, being a priority sector, and recoveries tend to be high***
- ***A very effective foreclosure law and credit bureau can also act as deterrents to default in addition to being a post delinquency tool – these did not exist in the last cycle. Banks are sitting on hugely appreciated collaterals***
- ***Basel II transition has made keeping NPLs in books harder and lending to better rated corporates easier. Tough prudential norms have kept banks on a leash in this cycle***
- ***Restructuring, if judiciously used by banks and borrowers, can be an effective tool to address temporary cash flow issues and alleviate asset quality pressures. Even this was not available at the time of NPL problems in the mid 1990s***
- ***However, indiscreet restructuring – not ruled out in the current climate – may only postpone the problem, and makes bank balance sheets opaque***

Several structural changes over the years have made asset quality more controllable in this cycle than ever before. The foreclosure law has been working wonders not just in post-delinquency recovery but also as a deterrent to willful default. Basel II has made keeping NPLs in loan books harder but lending to better rated corporates easier. Tough prudential guidelines from RBI have kept banks in a leash.

Restructuring is a useful tool for tiding over borrowers' temporary cash flow problems if used judiciously. We however draw attention to our concern that aggressive restructuring of loans by banks could end up making bank balance sheets opaque and prolong the reported NPL increase timeline. This currently enjoys regulatory forbearance for economic reasons, but is likely to increase investor skepticism about reported numbers. Since there is a facility to do a second restructuring of an asset till June 2009 (without having to downgrade the asset), we expect major corporate NPLs to manifest only from Sep'09.

Benign rate cycle eases pressure on credit quality, but not entirely

- ***A round of fiscal stimuli totaling 1.5% of GDP, and continued monetary easing, should be a stress reliever for many sectors***
- ***Unrealised gains on the bond book – 4-12% of shareholder equity of banks – can combat difficult conditions of NPL deterioration, of course only as long as interest rates stay low***
- ***It becomes difficult for unrealised gains to come to banks rescue when NPLs reach 15% from current 2.5% and the coverage requirement for new NPLs is 25% - an unlikely extreme stressed situation, in our view***

- ***Stimulus packages do have a flip side – they themselves could become the cause of rising rates***
- ***NIM and operating cost pressures, mainly for PSU banks, can reduce the operating cushion available to banks for handling higher credit charges***

The generous liquidity infusion by RBI and stimulus packages by the government (fairly generous in the global context as well) in recent months should ease pressure on the economy, and help the cause of asset quality. Also, the significant fall in rates (even net of the recent retracement) has built in significant unrealized bond gain cushion (4-12% of banks' shareholder equity).

However, paradoxically the authorities' munificence could lead to problems with the rate cycle because of the huge increase in government borrowings. That in turn limits the treasury gains opportunity. Margins could be pressured by irrational competition for assets initiated by some PSU banks, falls in investment yields, re-pricing of high yield short term corporate assets and insufficient fall in deposit rates. Additionally, pre-provision profits could face additional risks from wage revisions and pension liabilities shortfalls (mainly PSU banks).

Detailed scenario analysis: high capitalization really the winner

- ***At extreme high levels of NPLs and coverage, earnings of all banks get wiped out. However, private banks generally stand out as less affected in our more "reasonable" cases***
- ***HDFC Bank and Axis appear well protected, and within PSU banks the high scorer is Bank of India***
- ***The book value impact – obviously a function of how well-capitalised the bank is – is also much lower on private banks***
- ***In our most likely case(50% higher NPLs), SBI and Canara Bank are affected the most, others modestly***
- ***PSU banks get pushed into the regulatory minimum 6% Tier I at NPL levels of 4-9% - more likely than the 9-24% NPLs needed for private banks to reach 6% Tier I***

At extreme levels of NPLs and provision coverage, earnings of all banks get wiped out. However, private banks generally stand out as less affected in our more "reasonable" NPL/growth scenarios. HDFC Bank and Axis appear best protected, and within PSU banks the high scorers are Bank of India and Union Bank.

The book value impact of rising NPLs is directly a function of how well capitalized a bank is. Once again, private banks stand out as better cushioned in virtually all scenarios. In our more "realistic" case like 50% higher NPLs, SBI and Canara Bank are affected the most, others modestly. The capital cushion of PSU banks against a dramatic credit quality downturn is thin – scenarios delivering NPL numbers that will push them into the regulatory minimum 6% Tier I level are far from unrealistic. Private banks, on the other hand, are sitting on huge amounts of capital. In the current global environment for banks, we believe that it is capital and not growth that deserves greater respect.

In the event we apply the post 2000 peak loan loss provisioning charges, downsides to ICICI and PNB are least. HDFC Bank and Kotak are already *at* their post 2000 peak LLP's.

Valuations, stock picks and pair ideas

- ***PSU banks will need recapitalization in most NPL stress cases or else let Tier I fall, inviting downgrades from rating agencies. In that respect, private banks such as ICICI, HDFC Bank and Kotak are very well-placed***
- ***Our modified tangible equity to total assets ratio, adjusted for treasury securities, shows that Indian banks are far healthier than what their Tier I ratios indicate***
- ***ICICI and Yes Bank appear to have comparatively lower-risk corporate loan portfolios***
- ***Stocks are pricing in NPLs that are 50% higher than our increased estimates for FY10 (which already reflect a 50% increase in NPLs over FY09E for the sector)***
- ***Continue to prefer private banks to PSU banks; other than the reasons already cited above, the valuation premium of the former over the latter is now at its lowest in the last seven years***

PSU banks will need large amounts of capital in extreme NPL stress cases or else breach Tier I levels and invite aggressive downgrades from rating agencies. Private banks are at the other end of the spectrum with Axis having relatively less cushion; ICICI, HDFC Bank and Kotak are very well placed. Conclusions are similar when looking at modified tangible equity to total assets ratio (a better indicator of capital strength than Tier I, in our opinion), Canara Bank appears particularly vulnerable against this metric.

After looking at (admittedly limited) data on portfolio composition and associated vulnerability, capital position, impact of rising NPLs on financials and opportunities to restructure, and overlaying them with more subjective risk considerations, we have raised our NPL assumptions and reduced bank TPs accordingly.

We continue to prefer private banks over PSUs, which is contrary to the present consensus trend. Our key arguments include: 1. comparatively more seasoned books, 2. less pressure to grow, 3. better capitalization position, 4. less opacity created by restructuring as corporate books are smaller, and 5. share price underperformance in the last six months. Private banks are today priced at the lowest valuation premium over PSU banks in the last seven years.

We believe that risks to NPLs are broadly priced in, with a 50% higher NPL assumption still delivering TPs that are mostly higher than current market prices. Our top picks are HDFC Bank and HDFC, and PNB within PSU banks. Pair trade ideas are summarized in Figure 3.

Figure 3: Actionable ideas

	P/E			P/BV			RoE			EPS growth			Stock performance			Remarks
	FY09E	FY10E	FY11E	FY09E	FY10E	FY11E	FY09E	FY10E	FY11E	FY09E	FY10E	FY11E	1m	3m	12m	
Favoured picks																
HDFC Bank	14.2	12.5	9.5	2.3	2.0	1.7	16.9%	17.1%	19.2%	24.0%	13.7%	31.8%	-9.4%	-9.9%	-37.7%	Stable growth, margins, asset quality and greater visibility of earnings
HDFC Ltd	16.6	14.5	12.8	2.5	2.2	2.0	16.6%	17.0%	17.3%	2.9%	14.3%	12.8%	-12.0%	-14.8%	-53.5%	Stable retail disbursement growth, margins, asset quality and greater visibility of earnings
Best picks within PSU banks																
Punjab National Bank	3.5	3.4	3.1	0.7	0.6	0.5	20.9%	18.0%	17.1%	37.4%	1.0%	9.3%	-21.6%	-30.3%	-37.8%	Higher margin structure, larger unrealised gains on treasury book and floating provisions created offers the best cushion in case of asset quality downturn
Pair trade ideas																
Buy HDFC Bank – Sell SBI																Better capitalisation, asset quality and control on margins of HDFC Bank compared to SBI
Buy PNB – Sell Canara Bank																Better capital position and margins of PNB
Buy ICICI – Sell PSU Bank basket – Union. BoB, Canara																A play on better capitalisation and lesser exposure to SME sector for ICICI
Buy basket of HDFC Bank and ICICI – Sell Axis Bank																Play on relative differences in seasoning
Buy HDFC Bank – Sell Kotak Mahindra Bank																Higher knock on earnings and book value in case of higher NPLs for Kotak

Source: Deutsche Bank Note: Valuations are as of Friday 6th March 2009

Corporate lending quality

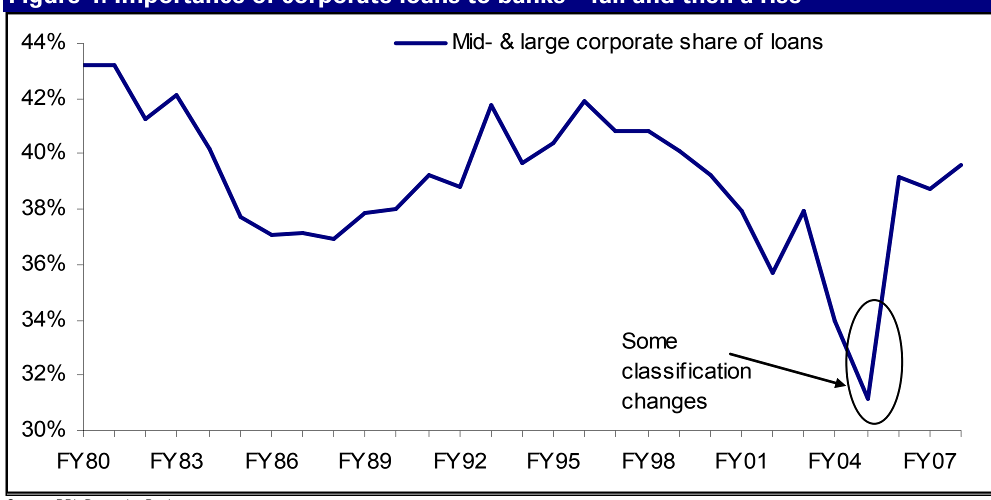
- ***Corporate lending concentrated on structurally better segments, a fact not well appreciated***
- ***Profit margins and Altman Z scores trending down, but hugely improved from the levels in early 2000s when NPLs were 3-4x current levels. Expectedly, export-dependent sectors such as textiles are more beleaguered, but they constitute only ~15% of corporate loan book***
- ***SME lending: very solid financial metrics, though vulnerabilities rising.***
- ***The relatively low global dependence of the economy certainly helps as a risk-mitigating factor for delinquencies***
- ***In the context of the DB-projected modest GDP growth slowdown from 6.4% in year to Mar'09E to 4.8% in Mar'10E, an NPL increase assumption of 50% is conservative in our opinion***

Lending concentrated on structurally better segments

The de-risking of the banking system's loan book that started after the unpleasant experience with corporate NPLs in the mid-1990s has brought down the importance of the corporate loan book, though recently there is an increase due to retail lending falling off (Figure 4).

The surge in the importance of corporate lending in the last two years is mainly a result of other channels of funding getting shut, and hence not necessarily reflective of high-risk excesses

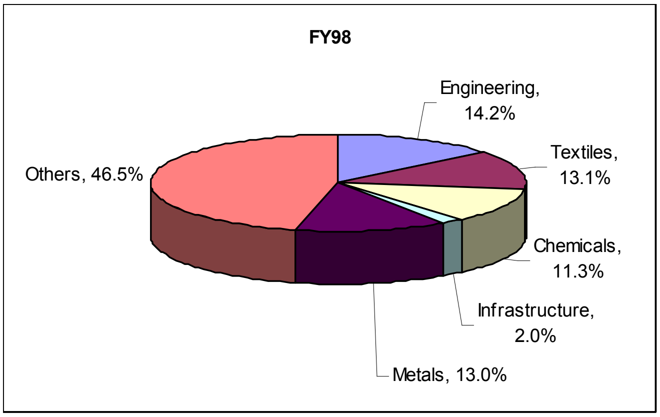
Figure 4: Importance of corporate loans to banks – fall and then a rise



Source: RBI, Deutsche Bank

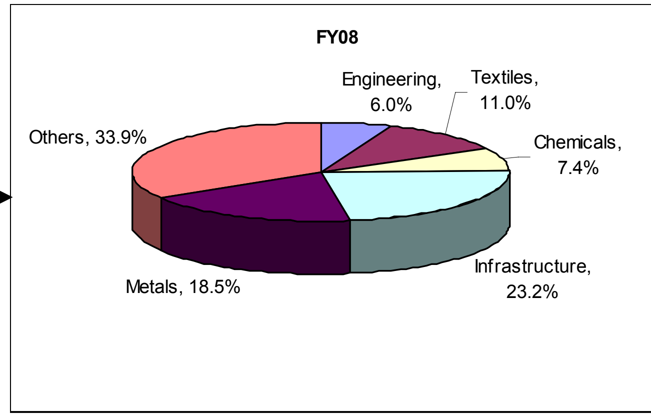
There have been notable changes in the profile of industry exposures, and correspondingly the risk – see Figure 5 & Figure 6. Infrastructure has become the single-largest segment within corporate credit – this was 2% in 1998. What happens to the infra book will define corporate NPLs to a great extent, and this is one area where we are positive from the credit quality perspective as we explain later. Metals, where the commodity price risk is now elevated, are an increased % of the book -- 18.5% currently vs. 13% earlier -- whereas textiles, which contributed to the bulk of the industrial NPLs in the previous cycle and are probably the most challenged now, are smaller.

Figure 5: Corporate loan breakdown ten years ago…



Source: RBI, Deutsche Bank

Figure 6: …and now

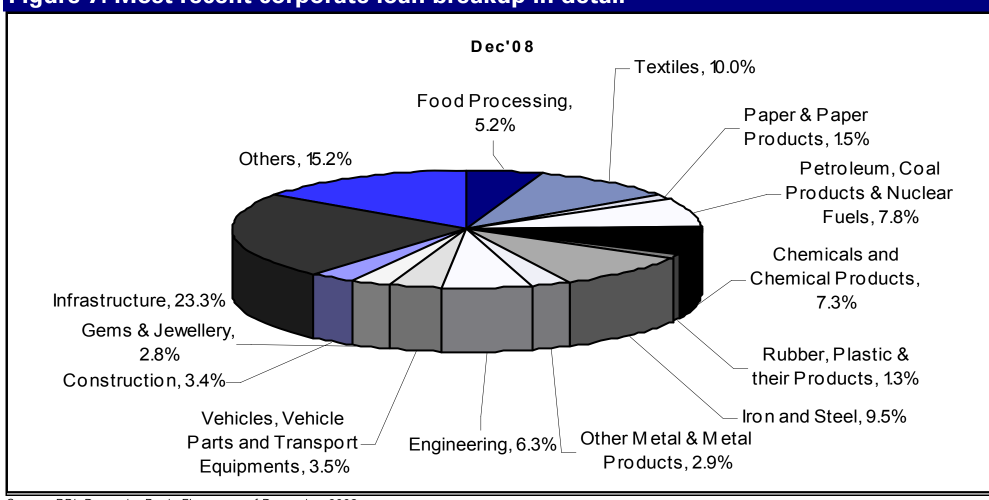


Source: RBI, Deutsche Bank

The debate on this matter is not settled, but paradoxically, such a large exposure to infrastructure itself may prevent a tipping of the scales towards a blowout of NPLs. Our infrastructure analyst Manish Saxena who until recently was very negative on the sector has now turned more optimistic, as he notes a perceptible change in promoters' return expectations, an all-out government push towards the sector and a reduction in interest rates benefiting at the margin.

Infrastructure is probably the only sector among the major borrowers where there is no demand constraint. Also, projects have an interest/principal moratorium, and lend themselves to easy restructuring

Figure 7: Most recent corporate loan breakup in detail



Source: RBI, Deutsche Bank. Figures as of December 2008

Other than infrastructure whose dynamics we have discussed and petroleum lending which is quasi-sovereign, no sector within corporate lending appears to be facing meaningful risk from excessive recent growth (Figure 8).

Abnormal growth in petro loans due to subsidy on marketing companies – this is quasi-sovereign lending

Infrastructure and construction have consumed a large part of lending, consistently

Figure 8: Fast-growing segments have fortunately been relatively less risky ones

	Nov '07	Feb'08	May '08	Aug '08	Dec'08
Food Processing	30%	32.0%	35.1%	25.6%	17.6%
Textiles	24%	23.0%	20.9%	23.1%	18.4%
Paper & Paper Products	19%	23.0%	21.4%	23.9%	25.4%
Petroleum, Coal Products & Nuclear Fuels	18%	23.3%	62.8%	91.8%	114.5%
Chemicals and Chemical Products	10%	13.9%	24.8%	27.1%	28.0%
Rubber, Plastic & their Products	23%	16.1%	25.5%	30.4%	34.0%
Iron and Steel	32%	19.2%	24.4%	33.7%	24.7%
Other Metal & Metal Products	11%	18.5%	22.8%	27.4%	34.8%
Engineering	28%	26.2%	23.4%	24.4%	28.3%
Vehicles, parts & Transport Equipment	38%	38.4%	26.7%	27.5%	28.3%
Gems & Jewellery	8%	9.3%	6.0%	15.0%	13.0%
Construction	37%	33.3%	29.6%	48.3%	57.0%
Infrastructure	35%	42.1%	41.7%	35.8%	38.5%
Industry overall	**25%**	**25.9%**	**26.9%**	**30.6%**	**30.2%**

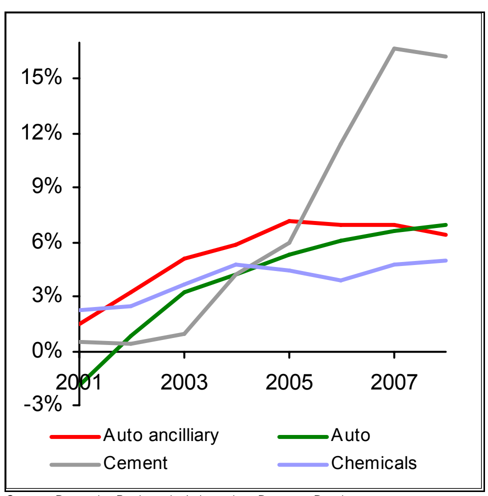
Source: RBI, Deutsche Bank

Default probabilities rising, but system prepared with better cushion

Profit margins generally trending down, but hugely improved from early 2000s levels
Figure 9-Figure 12 summarise the point. Even the usual suspect sectors (i.e. commodities, exports) where profit margins have fallen, the margins are far better than in the early 2000s. And there is a large number of segments where margins are still rising, though at a decelerated pace.

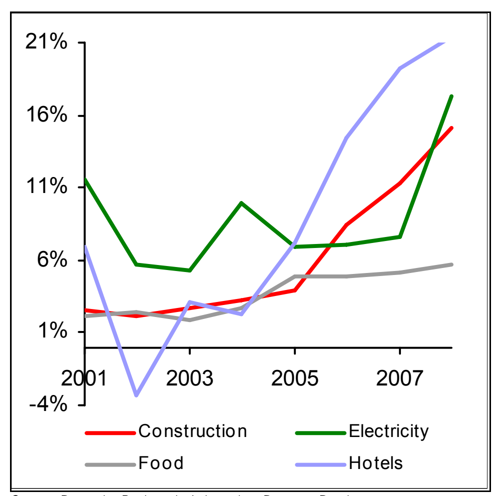
It is critical to address the reason for comparing with the post-2000 period and not the mid 1990s which was worse. Structurally, the banking system and the economy were too different from today in the mid '90s. The post-2000 environment is closer to now; that in our opinion is an apples-to-apples comparison

Figure 9: Net profit margins – part 1



Source: Deutsche Bank analysis based on Prowess Database

Figure 10: Net profit margins – part 2

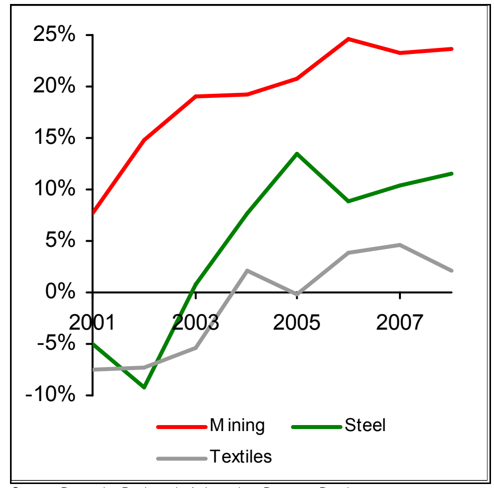


Source: Deutsche Bank analysis based on Prowess Database

Figure 11: Net profit margins – part 3

Source: Deutsche Bank analysis based on Prowess Database

Figure 12: Net profit margins – part 4

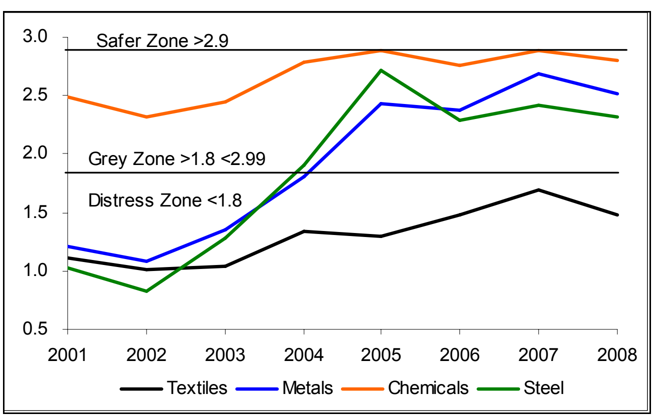


Source: Deutsche Bank analysis based on Prowess Database

Altman Z scores vindicate conclusions from the simple financial analysis

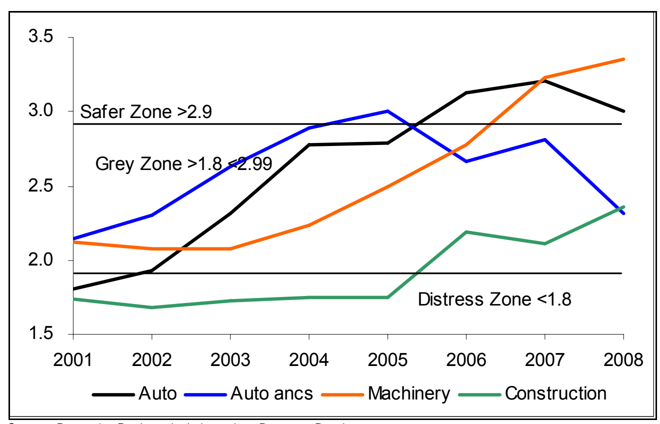
See the summaries in Figure 13-Figure 16. Two key takeaways are i) no gainsaying the fact that very few sectors are in the unequivocal "safety zone" (as per the Z score only), but at the same time ii) ALL sectors are better off than the bad days of 2001, corroborating our conclusions from the plain vanilla profitability analysis earlier. For details on computation of Z scores see *Annexure 2: Corporate default risk assessment models*.

Figure 13: Altman Z scores: part 1



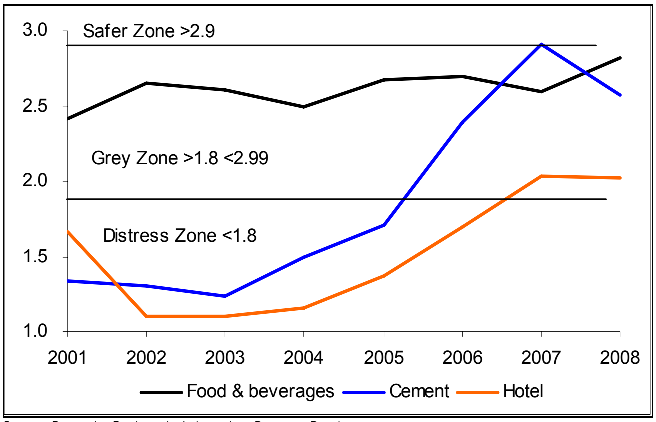
Source: Deutsche Bank analysis based on Prowess Database

Figure 14: Altman Z scores: part 2



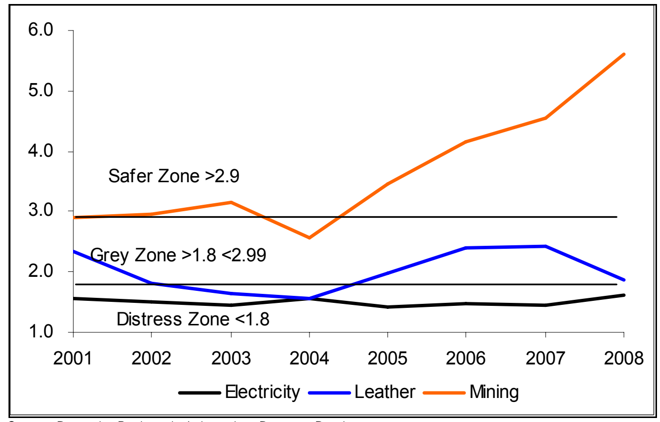
Source: Deutsche Bank analysis based on Prowess Database

Figure 15: Altman Z scores: part 3



Source: Deutsche Bank analysis based on Prowess Database

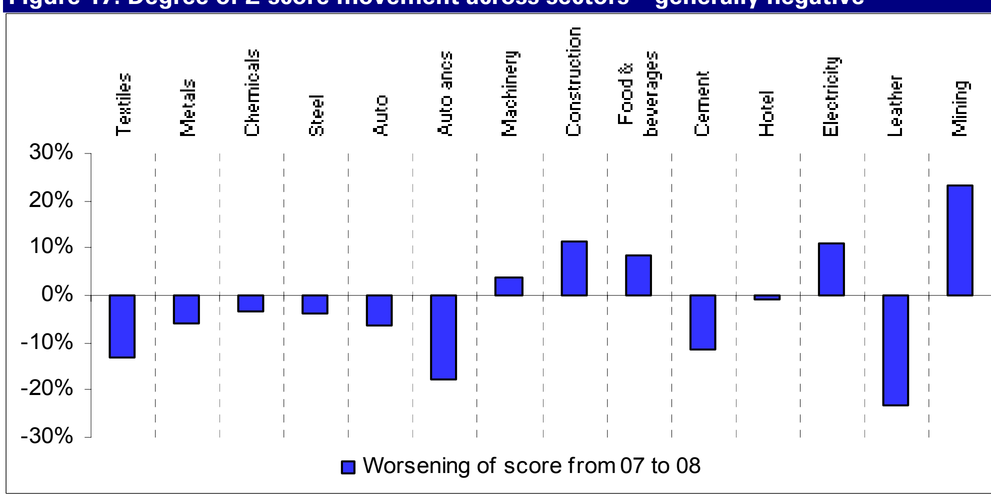
Figure 16: Altman Z scores: part 4



Source: Deutsche Bank analysis based on Prowess Database

It is not a coincidence that the three sectors where the score worsening is the highest and hence pose higher risks – textiles, auto ancillaries and leather – are export oriented, hurt by the overall global stress. But these sectors constitute only ~15% of corporate loans, i.e. ~6% of total loans

Figure 17: Degree of Z-score movement across sectors – generally negative



Source: Deutsche Bank analysis based on Prowess Database

Figure 18: Movement in % of companies in grey zone from Dec 07 to Dec 08

	% of companies in grey zone in	
	FY07	**FY08**
Textiles	55.5%	43.0%
Auto	37.5%	56.3%
Auto ancillaries	43.8%	54.5%
Leather	50.0%	55.6%
Mining	20.0%	36.0%
Construction	43.6%	45.5%
Machinery	35.4%	36.5%
Chemicals	43.6%	42.9%
Steel	46.8%	48.9%
Metals	47.8%	49.0%
Cement	60.0%	57.1%
Food & beverages	38.9%	38.1%
Hotels	45.9%	36.1%
Electricity	47.6%	50.0%

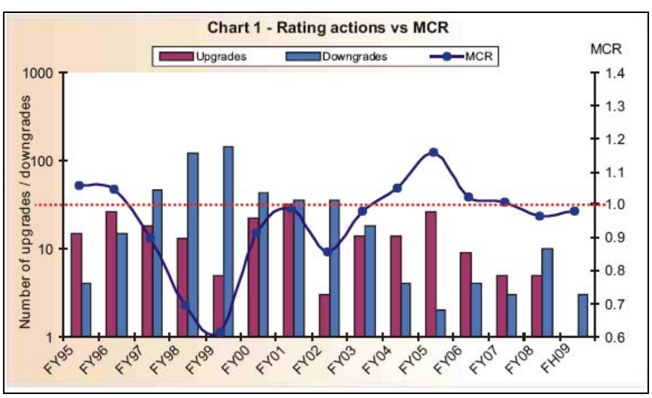
Source: Deutsche Bank analysis based on Prowess Database.
Grey zone refers to a Z score of between 1.23 and 2.9, considered to be a "question mark"

Most sectors show a larger number of companies having moved from the safe zone to grey zone. The only apparent outlier is textiles where there is a fall, but that is because a larger percentage has moved to the vulnerable zone from the grey zone already

Limited use of Merton's risk-neutral default probability model also shows rising default probabilities across sectors from Dec'07 to Dec'08, but most of them modest increases. It is thus directionally corroborative, but the model is too complex, requires a multiplicity of assumptions/inputs and to that extent the absolute number outputs may be prone to error. For some more details please see *Annexure 2: Corporate default risk assessment models*.

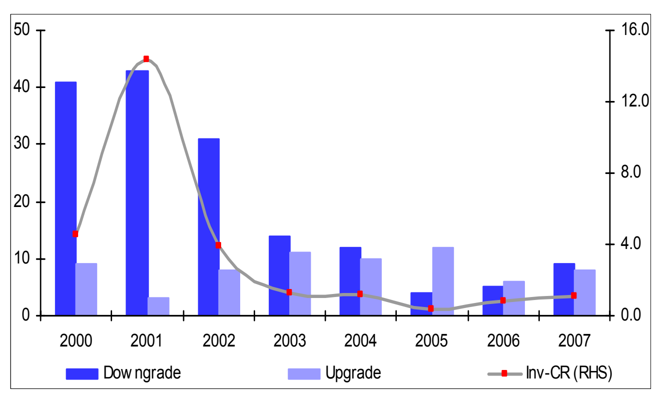
Credit rating agencies are also speaking in a similar tone – that the situation is worsening but we are far better than the infirmities seen in the last cycle (Figure 19 & Figure 20).

Figure 19: Rating outlook increasingly negative…



Source: CRISIL Ratings, Deutsche Bank
MCR refers to upgrades plus reaffirmations divided by downgrades plus reaffirmations

Figure 20: …but compare with 2001 & see the difference



Source: ICRA Ratings, Deutsche Bank.
The inverse credit ratio is the ratio of downgrades to upgrades

Real estate: too small to pose structural banking risk, but remains on the insolvency edge

The reason for a separate sub-section is to address investor concerns on property lending, as a fallout of what has happened to this sector elsewhere in the world. We have dealt with it in detail in two previous reports '*Banks-property connection: Too small to shake the foundation*' dated September 17, 2008 and '*Banks' real estate lending: Not as much risk as it seems*' dated January 30, 2009, but a summary follows.

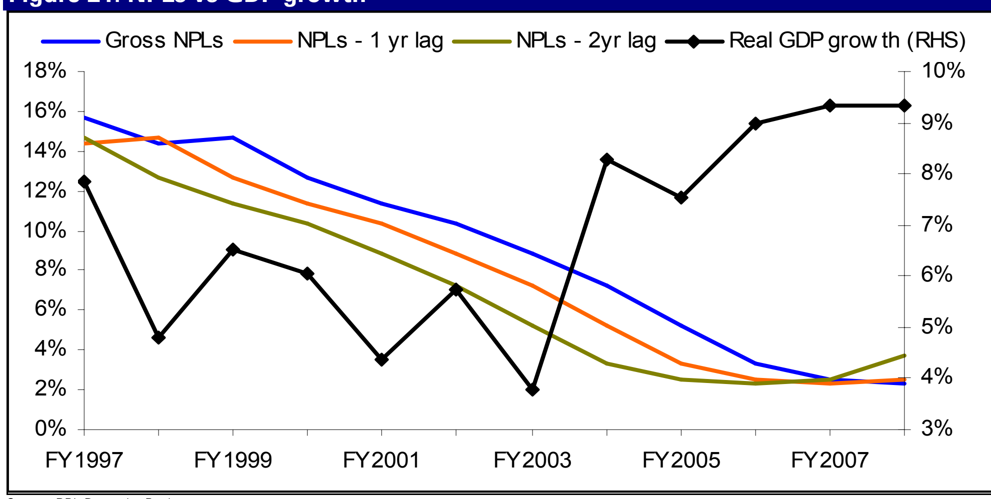
- Real estate accounts for just 3% and residential mortgages for 12% of loan books of banks
- Real estate loans are risk-mitigated through 2-3x over-collateralisation. More buffer is added through lending rates for developers that are at least 200bps higher than similarly-rated companies from other sectors
- The basis for making the loan is project cost and not market value of the property; most lending is project specific and not a general corporate loan
- Bank lending is typically limited to 50-60% of project cost, and hence the margin is 40-50%. Thus (theoretically), defaults should translate into losses only after the value of the project falls by more than 40-50%

That said, there is no disputing that developers are already in a difficult situation. Our property analyst Abhay Shanbhag believes that many are already insolvent, though not technically so due to restructuring of loans. So we are not downplaying the possibility of developer defaults, but emphasizing the point that significant protection is available to banks.

The growth slowdown-NPL buildup relationship: no clear correlation

Historically we cannot establish a meaningful correlation between growth slowdown and NPL formation, even on a lagged basis (Figure 21). NPLs have been declining all of the last 10 years but growth has passed through cycles.

Figure 21: NPLs vs GDP growth



Source: RBI, Deutsche Bank

Even if the logical relationship between growth and NPLs were to hold, we think our assumption of a 50% growth in NPLs in FY10E over FY09E is reasonable, considering that DB is projecting a slowdown in GDP growth from 6.4% in FY09E to 4.8% in FY10E.

Lesser global dependence of the economy also helps

This fact is well known but we would still like to re-emphasise it because similar to recent cost of funds and liquidity problems, the first flush of NPL problems should emanate from the globally exposed sectors. With exports at 13.6% of GDP and imports at 21.1%, the "value at risk" for the economy (to use a risk management term) is ~35% - this is well in excess of 50% for most Asian economies. We do acknowledge that pressures can come from elsewhere, but the lower global exposure is definitely risk-mitigating, in our view.

Anecdotally tail risk rising, but here too vulnerabilities manageable

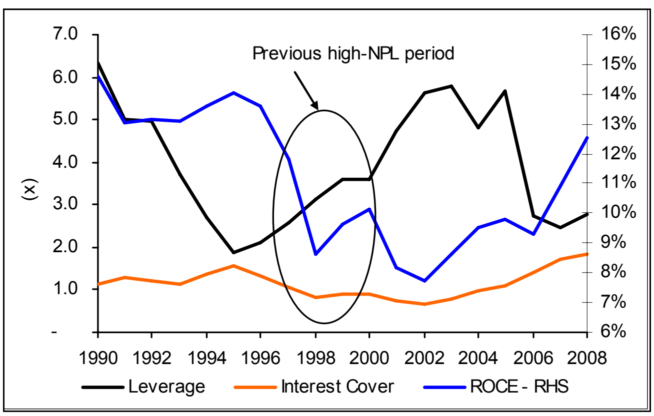
Tail risk is the term used for default probabilities associated with borrowers at the bottom of the rung – generally expressed in sales turnover terms – and in case of corporate lending, can be conveniently represented by SME lending as a proxy (there is tail risk in retail as well, but that can be assessed only by the bank as external observers lack sufficient information).

SMEs lending: solid financials, though vulnerability increasing

A detailed analysis of profitability and conventional default risk indicators of small corporates (Figure 22 & Figure 23) indicates that small companies are far better cushioned and prepared this time than when they were plunged into a slowdown in the last cycle. Admittedly, they have weakened after the last data point, though quarterly data is too patchy to depend on, for small companies, but logically it should take a much severer and protracted slowdown to exhaust the buffer in the numbers. *This result is clearly contrary to the common impression of extreme fragility of SMEs.*

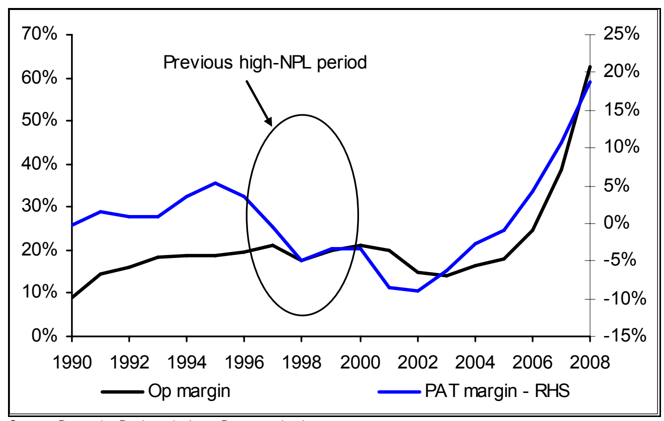
The tightness in credit markets during Oct-Dec'08 could have finished off hundreds of SMEs had it continued. The situation is more stable now, though fault lines have increased.

Figure 22: SME – conventional default risk indicators



Source: Deutsche Bank analysis on Prowess database.
We have taken 2500+ companies that are below sales turnover of INR1bn, as a proxy for SMEs

Figure 23: SME – profitability ratios



Source: Deutsche Bank analysis on Prowess database.
We have taken 2500+ companies that are below sales turnover of INR1bn, as a proxy for SMEs

The only sector where the rising tail risk as per the Altman Z methodology (Figure 24) agrees with the rising risk for the sector in general is textiles, which is not surprising – textile SMEs would also have either a large direct export component or feed into predominantly export-dependent large corporates. Otherwise it tends to give a fairly benign impression of the tail. However, this is not conclusive because quality and consistency of the data on the bottom rung companies is less reliable.

Meaningfully increased tail risk

Reduced tail risk

Figure 24: Altman Z analysis does not show much increased risk with the tail

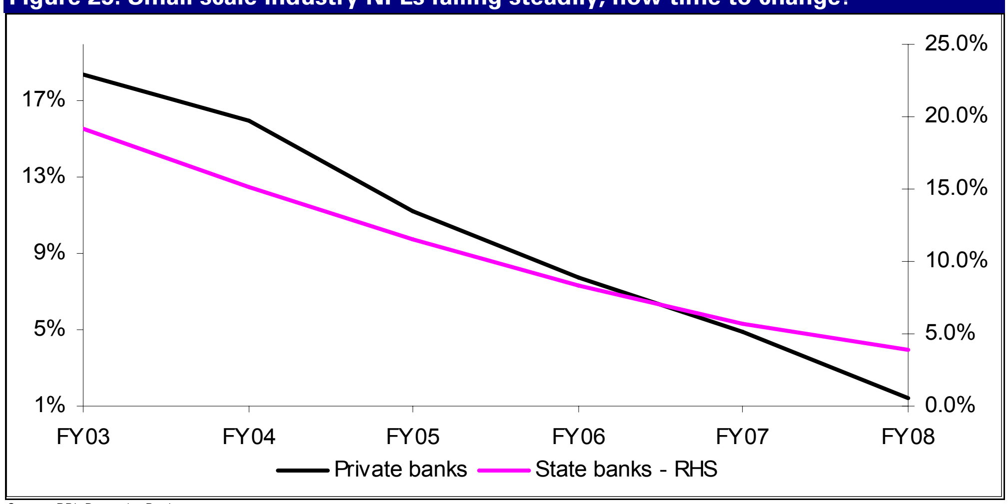
(% of bottom 10% in each sector)	Less than scores 1.23 - most vulnerable		Safest Zone - Scores > 2.9	
	FY07	FY08	FY07	FY08
Textiles	33%	41%	23%	22%
Metals	17%	11%	40%	41%
Chemicals	22%	22%	42%	43%
Steel	15%	2%	46%	52%
Auto	9%	9%	36%	18%
Auto ancs	17%	10%	50%	40%
Machinery	25%	21%	42%	43%
Construction	50%	26%	38%	39%
Food & beverages	28%	30%	34%	37%
Cement	13%	6%	38%	31%
Hotel	36%	36%	6%	15%
Electricity	27%	27%	15%	12%
Leather	27%	27%	27%	20%
Mining	26%	11%	47%	42%

Source: Deutsche Bank. The universe for each sector is the bottom 10% by sales, reasonably indicative of the tail

The small sector NPLs have had a dream run downwards, in line with the economy and ability of the segment to access larger volumes of formal credit (Figure 25). SSIs in the picture are even smaller than what we normally understand by SMEs; while it pays to be cognizant of the rising risks in this category, the reality is also that they are navigating this down-cycle a lot better prepared with low delinquencies at present.

Bank of Baroda, the only bank to have separately reported SME NPLs at a manageable 3%, believes that NPLs are stable

Figure 25: Small scale industry NPLs falling steadily, now time to change?

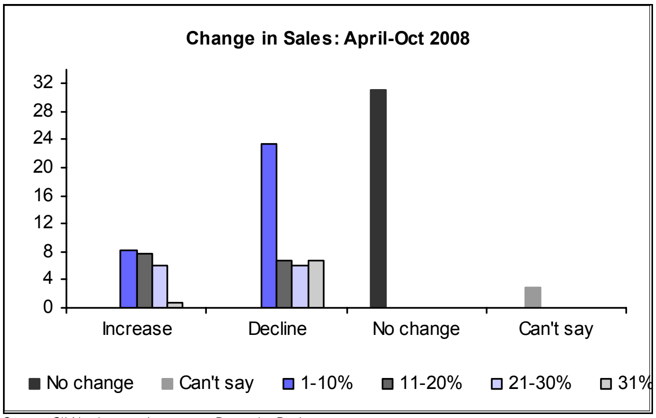


Source: RBI, Deutsche Bank.
SSI as per RBI definition does not necessarily equate to SME, the latter is a more loosely used term

SME survey does provide some disappointing indicators

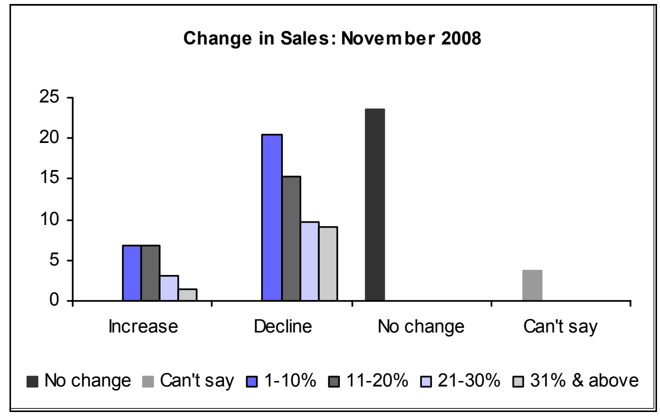
The number of respondents reporting sizeable declines in sales is on the rise (Figure 26 & Figure 27).

Figure 26: SME sales decelerating



Source: CII Northern region survey, Deutsche Bank

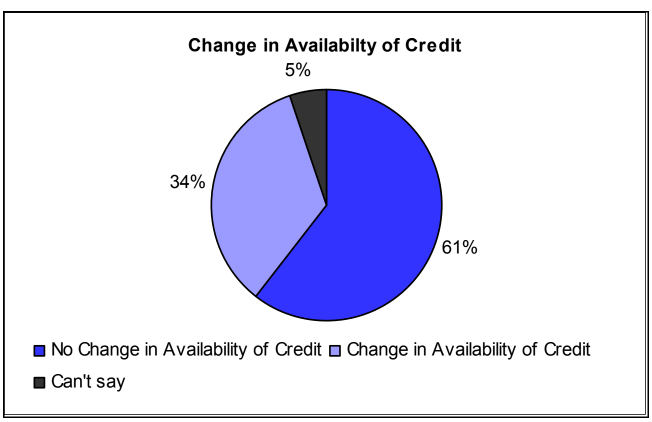
Figure 27: SME sales decelerating (cont'd)



Source: CII Northern region survey, Deutsche Bank

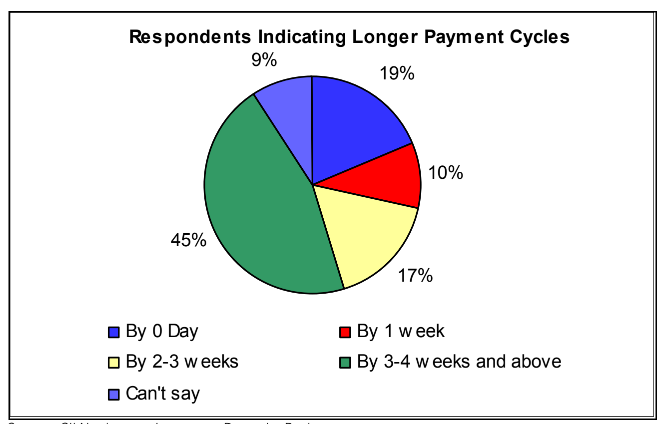
A majority felt there has been a change in credit availability (Figure 28) and an alarmingly high percentage of respondents reported 3-4 weeks elongation in payment cycles (Figure 29). Of course, the survey related to Q3FY09 which when tightness in financial markets was unprecedented; the environment is better today but risk aversion still prevails and our checks reveal that for small companies, liquidity is hard to get. *This survey was done in Q3FY09 which was one of the worst quarters for the economy and funding costs in the last five years, and things have improved at the margin thereafter.*

Figure 28: SMEs' access to credit getting harder



Source: CII Northern region survey, Deutsche Bank

Figure 29: Small industries facing longer receivables



Source:: CII Northern region survey, Deutsche Bank

PSU banks have a much larger exposure to SMEs than private banks (Figure 30).

We estimate that a doubling of SME NPLs can hurt earnings by 2-24% and book value by 0.5-5%, with ICICI least affected and Canara Bank the most

Figure 30: SMEs to total lending for individual banks

Banks	SME as a proportion of total loans (As of 3QFY09)
ICICI Bank	4.0%
HDFC Bank	9.0%
Axis Bank	18.8%
SBI	44.2%
PNB	14.5%
Union Bank	16.0%
Canara Bank	16.6%
Bank of Baroda	10.8%
Bank of India	17.6%

Source: Company data, Deutsche Bank.
Note: For SBI we have included SME and mid corporate group into SME loans; wherever applicable suitable assumptions have been made based on FY08 exposures and then 3Q09 exposures have been calculated

Retail credit quality outlook

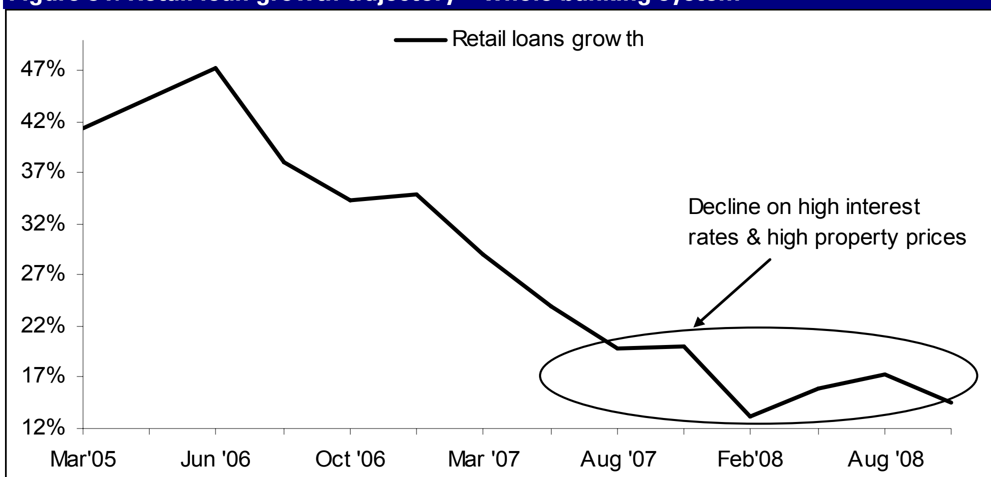
- ***While recognising that job losses do cast a shadow on retail asset quality, we show that threats are exaggerated***
- ***The relief from lower interest rates is a clear positive***
- ***Collection challenges remain***
- ***Home loans – half of retail – remain structurally the best, with high quality collateral. Auto loans are stressed, but the 2007 pool is better than older pools. Unsecured has already seen considerable deterioration and incremental delinquencies may be limited***
- ***Retail loan book seasoning is very evident, and this can provide favourable tailwinds for credit quality with NPLs in certain categories peaking out***

Economics still supportive, but collection difficulties continue

Low growth for the last two years a positive, fast growth earlier now coming to roost
The huge retail loan growth during 2005-2007 (Figure 31) amid certain unsatisfactory practices and prevailing deficiencies has, among other things, been leading to escalating delinquencies:

- Too much competition, implying higher chances of adverse selection and potential over-leveraging of individuals
- The practice of aggressive use of outsourced marketing agents by some private banks. They had little interest in originating quality credit and on several occasions "polished up" applications
- A relatively nascent credit bureau (it is quite mature and tested now)
- Frauds, mainly with home loans

Figure 31: Retail loan growth trajectory – whole banking system



Source: RBI, Deutsche Bank

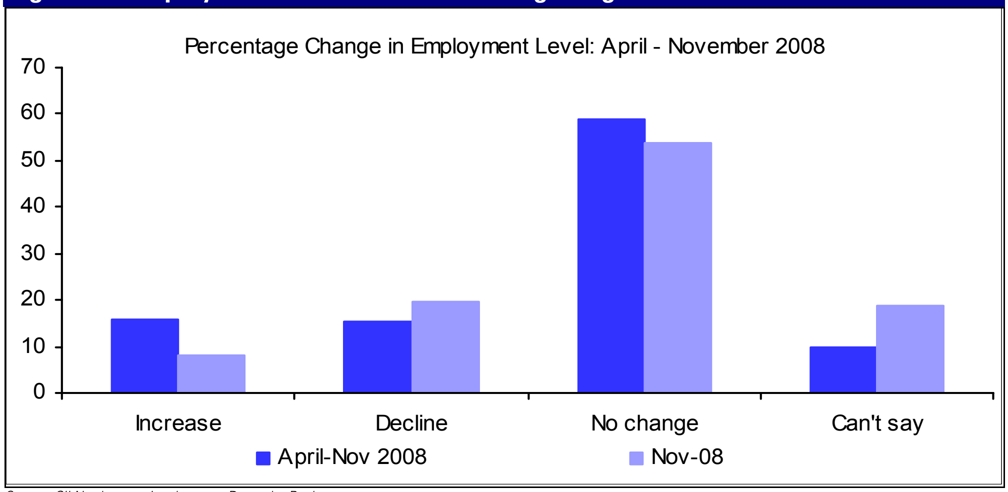
Due to central bank and the sector's initiatives, excesses in retail lending have come down considerably, resulting in much lower growth rate not just recently but over the last two years (Figure 31).

Job losses a crucial determinant of retail credit quality, threats exaggerated in our opinion

This, in our opinion, is the single most important variable determining the retail credit quality outlook and not so much inflation or interest rates. Anecdotal evidence of job losses does exist (regular employment data not available in India) – the media has generally been highlighting it often and during a recent parliamentary debate one member mentioned a figure of 1m, half of which related to the export-intensive sectors. A chamber of commerce survey (Figure 32) also points to a similar trend.

With several stimulus packages now in action, job losses could be stemmed. Gauging the seriousness of the problem, the government has requested firms to cut compensation rather than lay off workers

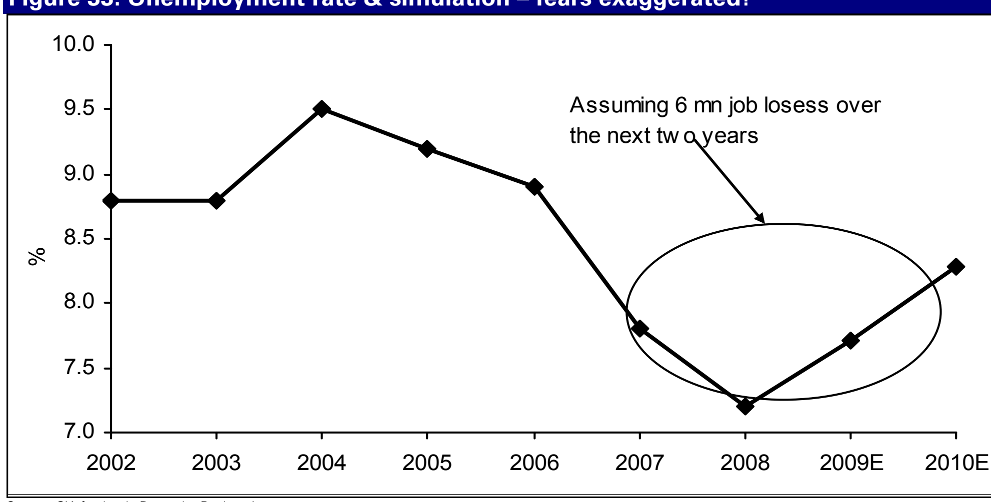
Figure 32: Employment situation seems to be getting cloudier



Source: CII Northern regional survey, Deutsche Bank

With the help of the rather limited data that we have at our disposal, we see that even with the assumption of 6m job losses in the next year (i.e. 6x what has reportedly happened till now), the unemployment rate would still be below the highs in early 2000s (Figure 33). This shows that unemployment should not be a major destabilizing factor for retail credit quality (this is a causal relationship but we do not have tools to mathematically connect them).

Figure 33: Unemployment rate & simulation – fears exaggerated?



Source: CIA factbook, Deutsche Bank estimates

Retail loan quality pressure from the inflation side now less

There is some truth in the premise that two-wheeler and personal loans started souring in late 2007 when inflation started going up, putting pressure on disposable incomes to pay off these loans. The situation could have become worse in 2008 when inflation went up even more, but by then banks had contained their retail assets portfolios. We are envisaging quite the opposite outlook in the near future, with inflation possibly going down to 2-3% by mid-2009 – one of the lowest in recent years. However, food prices in India are notoriously fickle and can create unexpected surges in inflation, which then can add this dimension back to retail asset quality.

Falling interest rates can be a big positive, and this indeed is different from last time

This obviously applies only to floating rate loans, which are relevant for residential mortgages. This is nevertheless an important consideration because a mortgage can be the single largest loan commitment for a household. We show in Figure 34 that recent drops in interest rates – and possibly more to follow – are capable of offsetting significant salary declines. In the corporate context in the last cycle (since retail was very small), this opportunity was simply not available and high interest rates, necessitated by high inflation, aggravated the NPL problem. Since 75% of corporate loans too are effectively at floating rate, the beneficial impact of interest rate relief on asset quality is yet not fully appreciated.

Figure 34: A 200bps decline in interest rates can offset 11% decrease in salary

Retail - Loan (Mortgage) - Stable salary	Earlier (2008)	Current (2009)	Increase
Loan	2,000,000	2,000,000	
Tenure - No of months	180	180	
Interest rate	11%	9%	-2%
EMI	22,732	20,285	-11%
Monthly salary (assuming 50% of EMI)	45,464	45,464	0%
Affordability	2.0x	2.2x	12%

Retail - Loan (Mortgage) - Declining salary	Earlier	Current	Increase
Loan	2,000,000	2,000,000	
Tenure - No of months	180	180	
Interest rate	11%	9%	-2%
EMI	22,732	20,285	-11%
Monthly salary (assuming 50% of EMI)	45,464	40,463	-11%
Affordability	2.0x	2.0x	0%

Source: Deutsche Bank

Strictures on recoveries vitiated repayment culture, changes may take time

Legislative and regulatory censure on banks for the reportedly strong-arm tactics used by recovery agents created sympathy for defaulters (the media even wrote accounts of borrower suicides after harassment for recoveries). On top of that, court orders became necessary for repossessions, and agents had to be trained for 100 hours, pulling them off work. As a consequence, some not-so-recalcitrant borrowers also took advantage of the situation. To an extent the farm loan waiver (though targeted at a totally different category) also contributed to this feeling.

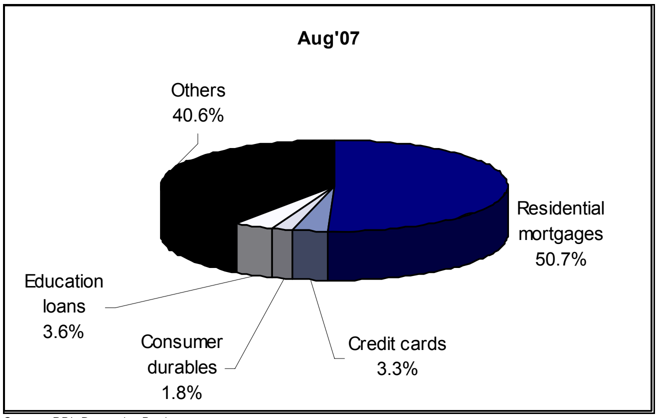
With reports of a weak economy, the environment has turned pro-borrower, due to which changes could be late in coming

RBI has reportedly taken cognizance of the fact that banks have severely reacted to these developments by just shutting off credit to several retail segments, ranging from auto loans to personal loans. They are agreeable to making the recovery guidelines less onerous on banks. However, banks are not particularly hopeful because the matter is not entirely within RBI's jurisdiction – the guidelines have been framed based on court decisions.

Individual categories: mixed picture, unsecured riskiest

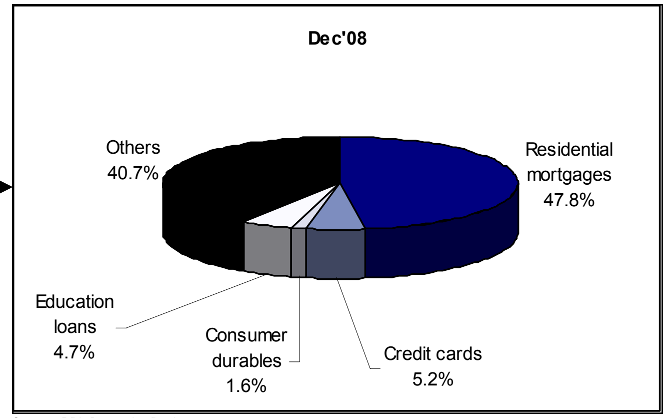
Figure 35 and Figure 36 put in perspective the breakup of the retail loan book currently and two-years-ago, to help understanding of the asset quality. *The point to underscore is that fortunately the largest segment – residential mortgages – is also comparatively the safest.*

Figure 35: Retail loans breakup in Aug'07…



Source: RBI, Deutsche Bank

Figure 36: …and Dec'08



Source: RBI, Deutsche Bank

Home loans: structurally safest and highest quality collateral

With LTVs that barely exceed 75%, a black (unaccounted) component of 10-40% of the transaction acting as a cushion for the lender and a lot of attachment with the place of residence, mortgage asset quality should remain within limits. The key risk is job losses; but in an average Indian household, paying off the home loan is accorded high priority (there are several cases of defaulting on a car loan but servicing a home loan well).

HDFC's experience shows – and also intuitively obvious – that lower ticket sizes are generally better credit, as they symbolize genuine house buying for self-occupation, lower individual leveraging and potentially higher home equity as well. Indian banks' home loan ticket sizes are relatively small (smaller for PSU banks) – see Figure 37. Similarly, HDFC reports an average ticket size of about Rs1.5m. To put that number in context, a 2-bedroom apartment in a relatively close Mumbai suburb costs Rs5-7.5m.

Figure 37: Estimated home loan ticket size – focus has been on smaller loans

(Rs mn)	FY2006	FY2007	FY2008
ICICI Bank	1.76	2.07	2.65
State Bank of India	1.21	1.25	1.38
Punjab National Bank	1.14	1.28	1.43
Bank of Baroda	1.07	1.21	1.30
Bank of India	1.16	1.52	1.66

Source: Deutsche Bank.
These figures are not declared by the respective banks but estimated by us based on balance sheet data and some assumptions

Banks generally do not report category-wise NPLs, but our discussions reveal that most private banks have mortgage NPLs ~1.5% and PSU banks ~3%. HDFC's NPLs are 0.9% (Figure 38). The rating agency CRISIL estimates that the banking sector's mortgage NPLs are ~2.7% (this excludes HDFC, a pure play mortgage lender and not a bank), which sort of ties in with the above numbers.

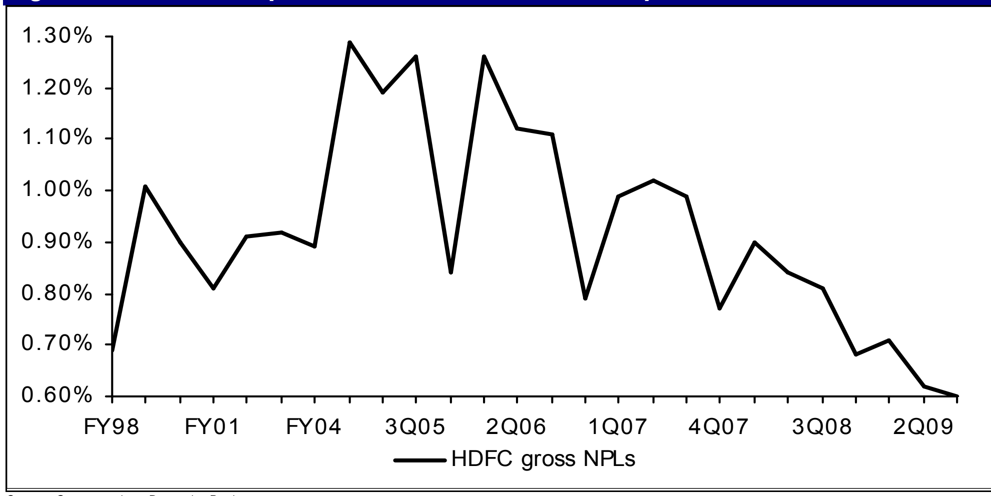
This implies that if housing NPLs rise, increase in provision charges will be modest, as there is no need to make more than the 10% initial minimum regulator-mandated provision

Quality of the collateral manifests in the form of the large gap between NPLs and losses. For example, HDFC's gross NPL is 90bps but the last 30 years cumulative loss 5bps, indicating that *post-delinquency recovery rates are very high*. Arguably the 5bps will increase as the portfolios mature, but with a provision cover of 50bps of assets, we can scarcely visualize a situation of mortgage losses eating into equity.

So if that is the case, why do we still see uncomfortably high NPLs in housing loans? The culprits have less to do with economics: frauds and decentralized operations of PSU banks.

Lack of IT systems, limited interconnectivity of branches coupled with too much competition encouraged frauds, and the erstwhile practice of the branch manager doing everything of the loan (origination, disbursement, collection) was too much of a conflict of interest. Banks have improved considerably on both now.

Figure 38: HDFC had a peak NPL of ~1.3% in the last 10 years



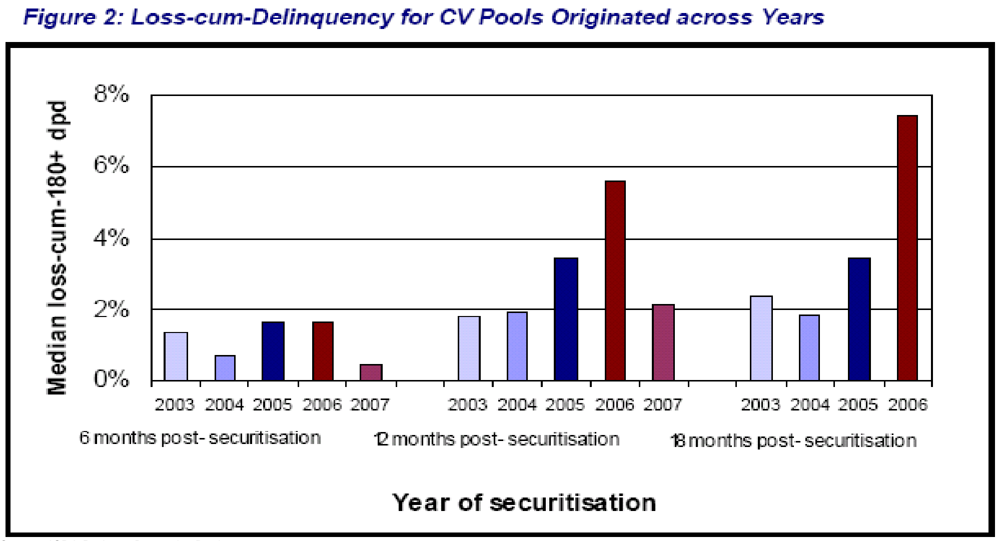
Source: Company data, Deutsche Bank
Note: The Gross NPL ratio is based on 180 days past due basis for housing finance companies

Auto loans: now passing through challenges

It is now more or less established that commercial vehicle delinquencies are on the rise due to the decline in freight demand, though the beginning was more due to high fuel prices (now corrected). Recently, the auto finance of HDFC Bank told us that probably 25% of the fleet in the country is idle. However, there are two pieces of good news

- Unlike two-wheelers and cars, here banks are not complaining about collection difficulties, and
- CV assets originated in 2007 are behaving much better than in the earlier years due to greater discipline within lenders (see Figure 39 & Figure 40).

Figure 39: Truck loans originated in 2007 doing better than previous years'

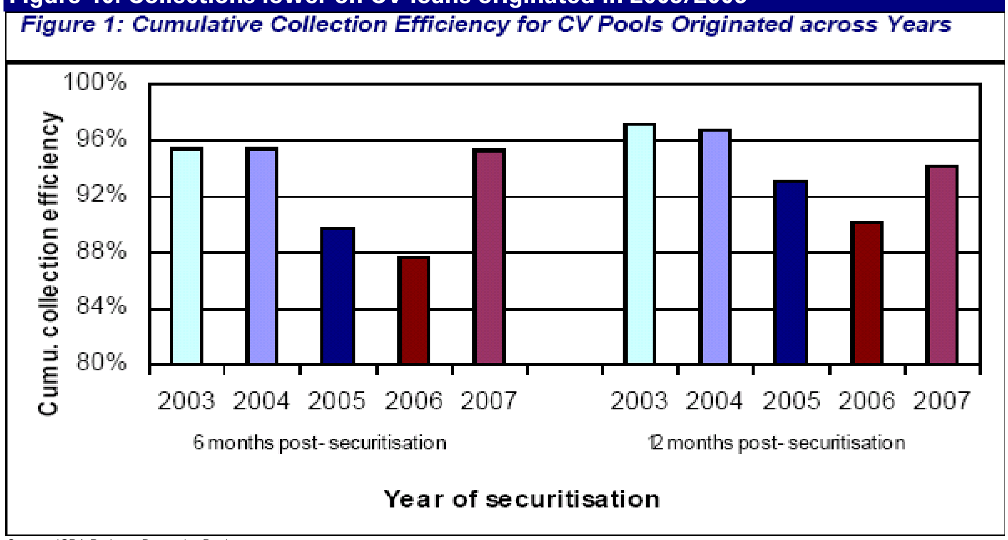


Source: ICRA Ratings, Deutsche Bank

Banks originating large amounts of CV assets in 2005 and 2006 appear to be worst placed in terms of NPLs; but being typically 3-year loans, these should be exiting the books very soon

Of course, this should not be construed to mean that the unseasoned books will necessarily continue to do better – the environment has deteriorated further

Figure 40: Collections lower on CV loans originated in 2005/2006



Source: ICRA Ratings, Deutsche Bank

Figure 41: Eventual losses on auto portfolios

Table 3: Proportion of Loss and Delinquency at End of Pool Tenure

Asset Class	Total Estimated Eventual Loss/ Initial Pool Size*		Bucket-wise Split of Total Estimated Eventual Loss			
		No. of pools	*Crystallised losses*	*180+ dpd*	*91-180 dpd*	*0-90 dpd*
Cars and MUVs	1.92%	18	0.38%	1.09%	0.25%	0.21%
CVs	1.68%	19	0.43%	0.73%	0.19%	0.33%
CE	1.79%	11	0.24%	1.02%	0.26%	0.27%

Source: ICRA Ratings, Deutsche Bank

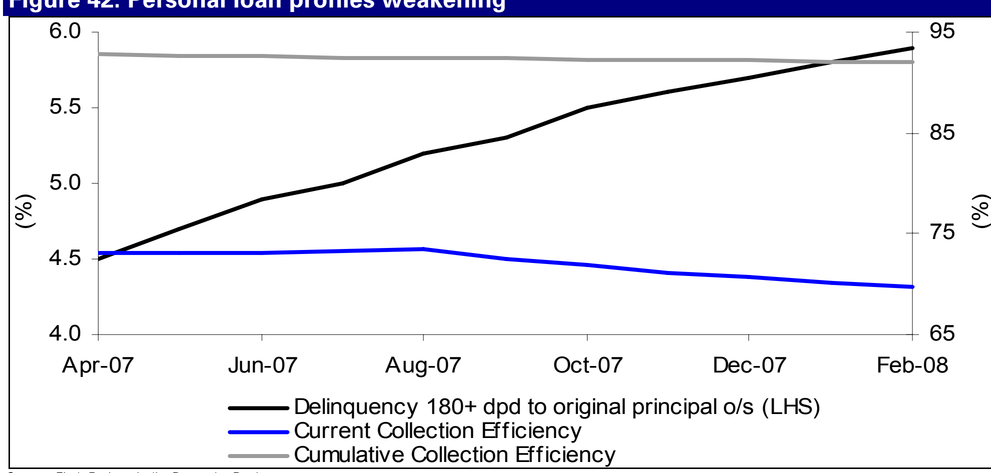
Two-wheelers, the smallest segment of auto, have been facing rising NPLs since late 2007 due to inflation and collection problems. However, lenders have shot back so much by cutting exposure (ICICI has virtually disappeared from the market) and denying credit to dealers who delay vehicle registrations, that NPLs now appear stabilized.

Unsecured loans: already high up on the NPL cycle

Like two-wheelers, personal loan NPLs have been rising for the last one and half years (Figure 42), and credit card delinquencies have started rising more recently. Though we do expect some more rise in unsecured loans NPLs, corrective steps by banks have started yielding results – stoppage of the problematic small-ticket personal loans, lending mainly to banks' existing customers, and a sharp reduction in originations through third parties.

However, the lack of collateral makes crystallized losses very high for this form of lending. In other words, recoveries are low, except in those cases where there are technical NPLs only due to laxity in following up by the bank.

Figure 42: Personal loan profiles weakening



Source: Fitch Ratings India, Deutsche Bank

The NPL behaviour of securitization pools originated by ICICI and rated by ICRA are given below – all segments have been rising (Figure 43).

Figure 43: Recent retail NPLs from securitization pools

Commencement	Underlying assets	90 days past due
Jan-07	New Cars	2.61%
Jan-07	New Cars	2.76%
Jan-07	New and used cars	6.71%(UC), 1.45%(NC)
Mar-07	New and used cars	10.56%(UC), 3.56%(NC)
Mar-07	New and used cars	12.08%(UC), 3.77%(NC)
Mar-07	Personal Loan	7.90%
Jun-07	STPL & PL	27.38%(STPL), 8.88%(PL)
Jun-07	New and used cars	7.67%(UC), 4.53%(NC)
Jun-07	STPL & PL	19.49%(STPL), 8.72%(PL)

Source: ICRA Ratings, Deutsche Bank

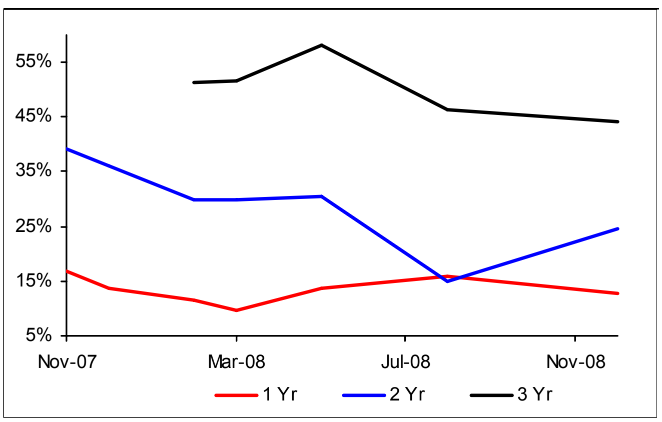
Understanding the grossly underrated seasoning benefit

Seasoning refers to the age of the loan book, which is significant due to the empirically-observed correlation between seasoning and NPLs (especially for retail loans) – higher seasoning either indicates a peaking out of NPLs and/or lesser credit losses, relative to an unseasoned book.

Retail loan book seasoning very evident

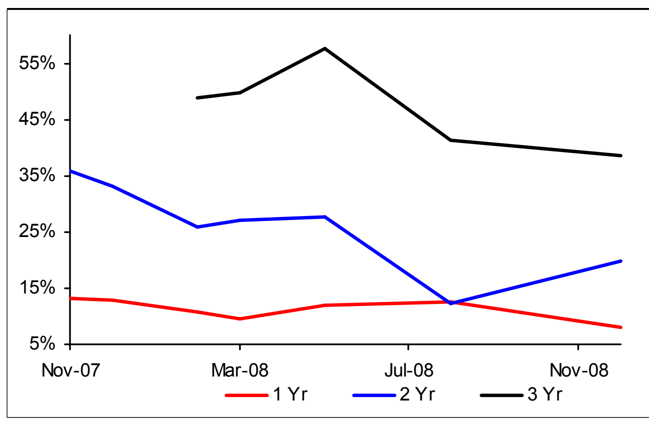
Figure 44-Figure 47 illustrate the point. The good thing about a seasoned book (driven by lower growth in the immediately preceding quarters or years) is that NPLs could stabilize.

Figure 44: Overall retail loans



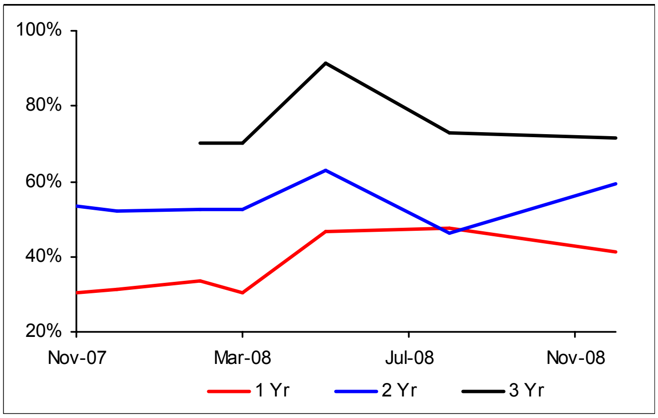
Source: RBI, Deutsche Bank. Figures are for the % of the loan book added in the 1yr, 2yr, or 3yr preceding

Figure 45: Residential mortgages



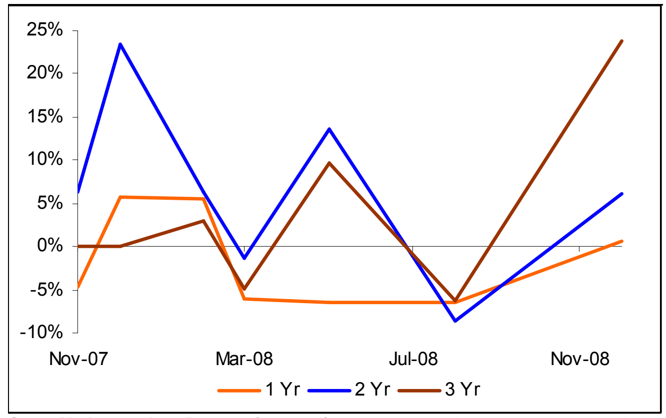
Source: RBI, Deutsche Bank. Figures are for the % of the loan book added in the 1yr, 2yr, or 3yr preceding

Figure 46: Credit cards



Source: RBI, Deutsche Bank. Figures are for the % of the loan book added in the 1yr, 2yr, or 3yr preceding

Figure 47: Consumer durables



Source: RBI, Deutsche Bank. Figures are for the % of the loan book added in the 1yr, 2yr, or 3yr preceding

Figure 48 is more direct evidence (in the case of mortgages) of a seasoned book showing lesser delinquencies.

Figure 48: Mortgage seasoning example

Table 1: 180+ delinquency level in MBS pools

	Months post securitisation					
Average initial seasoning	3	6	12	18	24	30
Average Delinquency Rate (number of pools)						
<18 months	0.03% (5)	0.16% (5)	0.43% (6)	0.61% (6)	0.99% (5)	1.28% (5)
>18 months	0.00% (6)	0.05% (6)	0.29% (6)	0.33% (5)	0.42% (5)	0.35% (4)
Median Delinquency rate						
<18 months	0.01%	0.10%	0.25%	0.60%	1.10%	1.41%
>18 months	0.00%	0.03%	0.21%	0.19%	0.34%	0.18%

Source: ICRA Ratings, Deutsche Bank

Figure 49 shows that *non-mortgage retail loans get fully seasoned in about two years with delinquencies peaking*.

Banks such as ICICI that originated bulk of their retail loans up to 2007 and thereafter slammed the brakes should see their retail NPLs peaking soon. However, since unsecured loans have continued to grow, potential negative surprises will partially offset that

Figure 49: Auto loans seasoning period in the vicinity of two years

Table 2: Peaking of Delinquency and Recovery

Asset Class		Peaking of Delinquency* (in months)		Eventual Loss-cum-DPD to Peak Loss-cum-DPD^	
		Loss-cum-delinquency (90+)	*Loss-cum-delinquency (180+)*	*Loss-cum-delinquency (90+)*	*Loss-cum-delinquency (180+)*
Cars	Mean	24.0	26.9	51.22%	66.27%
	Median	22.0	25.0	54.69%	71.95%
	Range	21-27	22-32	42%- 61%	53% -86%
CVs	Mean	25.3	26.3	41.06%	53.74%
	Median	26.0	27.4	38.87%	50.06%
	Range	21-29	22-30	18%- 50%	27%- 63%
CE	Mean	22.3	24.0	26.99%	42.31%
	Median	22.3	24.0	18.60%	44.49%
	Range	20-24	22-26	17%- 35%	32%-48%

Source: ICRA Ratings, Deutsche Bank

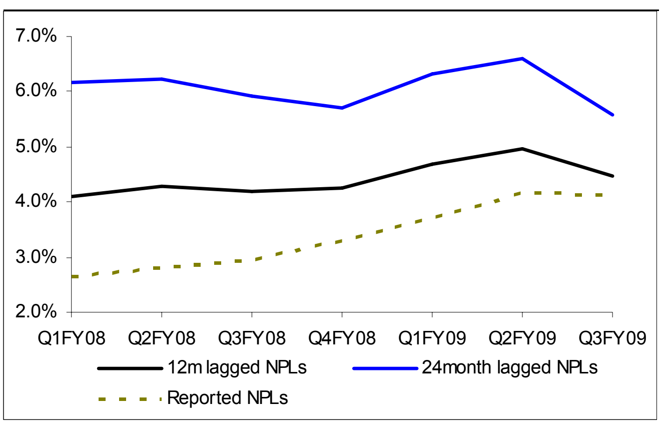
Aging analysis: lagged NPLs show either rising or plateau trend

This analysis assumes that most of the NPLs arise from assets which have been there in the books for some time, say 12 months, and convey some idea of which way reported NPLs could be heading (this ignores "infant mortality" cases common in personal loans for example, but those are usually a small portion of the book).

The final conclusion is that *the lagged NPL trends show that reported NPLs should be rising – which is indeed what we have built into our forecasts – but selectively some banks could be enjoying the benefits of seasoning* (see Figure 56 for those candidates).

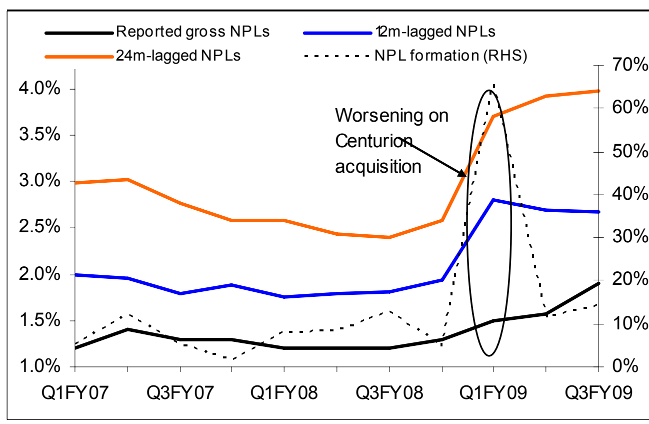
The recent decline in case of ICICI is deceptive as it was due to a writeoff in Q3FY09, else in other cases lagged NPLs have flattened after a declining trend or rising (Figure 50-Figure 55).

Figure 50: ICICI



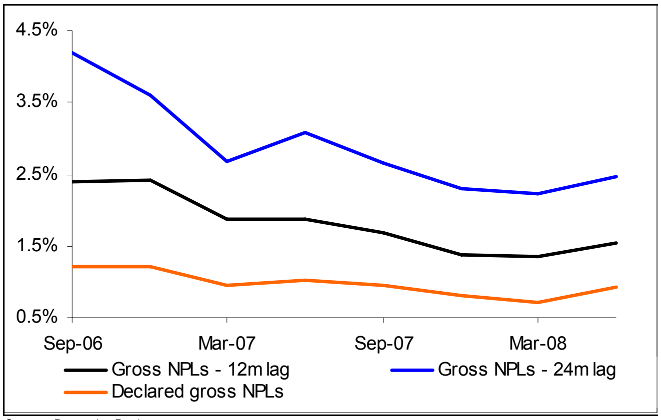
Source: Deutsche Bank

Figure 51: HDFC Bank



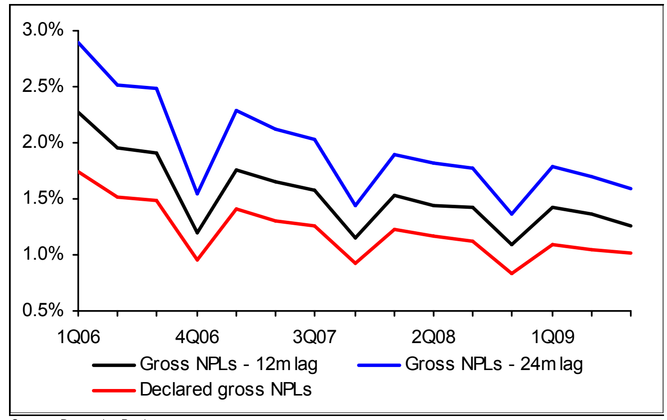
Source: Deutsche Bank

Figure 52: Axis Bank



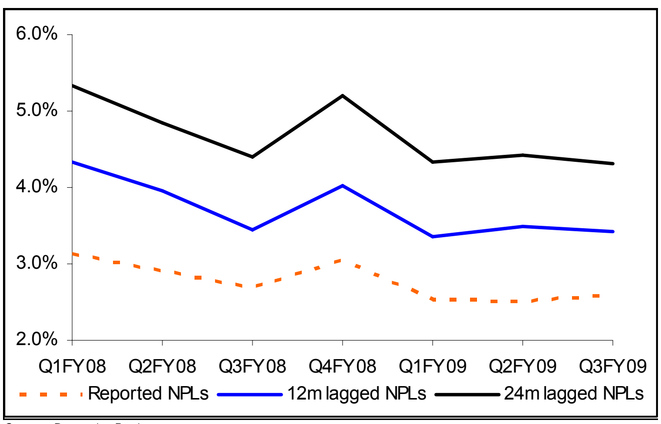
Source: Deutsche Bank

Figure 53: HDFC Ltd



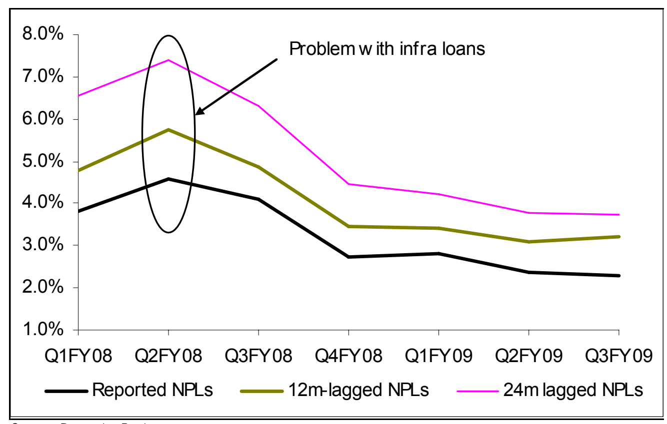
Source: Deutsche Bank

Figure 54: SBI



Source: Deutsche Bank

Figure 55: PNB



Source: Deutsche Bank

Figure 56: Seasoning data for whole book of individual banks

Less seasoned

Most seasoned

Well seasoned

Less seasoned

	1QFY08	2QFY08	3QFY08	4QFY08	1QFY09	2QFY09	3QFY09
Axis Bank							
1 Yr	37.4%	34.9%	33.5%	38.2%	32.5%	35.1%	35.4%
2 Yr	62.1%	58.8%	59.8%	62.6%	57.8%	57.7%	57.1%
3 Yr	76.0%	76.5%	73.0%	73.8%	74.4%	73.3%	74.1%
Bank of Baroda							
1 Yr	21.6%	21.3%	18.7%	21.6%	29.6%	24.5%	24.9%
2 Yr	43.7%	46.3%	45.2%	43.9%	44.8%	40.6%	38.9%
3 Yr	52.4%	58.5%	58.6%	59.3%	60.4%	59.5%	58.9%
Bank of India							
1 Yr	21.1%	21.6%	23.0%	24.4%	28.0%	25.9%	23.8%
2 Yr	35.1%	36.7%	39.9%	41.8%	43.2%	41.9%	41.4%
3 Yr					53.3%	53.1%	54.2%
Canara Bank							
1 Yr	15.2%	13.9%	8.4%	8.2%	13.7%	19.9%	23.5%
2 Yr	36.5%	30.7%	27.4%	26.1%	26.8%	31.0%	29.9%
3 Yr	49.6%	47.4%	46.5%	43.4%	45.1%	44.5%	44.5%
HDFC Bank							
1 Yr	22.6%	25.1%	28.1%	23.7%	40.6%	39.0%	25.5%
2 Yr	44.7%	44.2%	43.3%	38.3%	54.0%	54.3%	46.5%
3 Yr	60.4%	61.3%	62.8%	56.1%	67.2%	65.9%	57.8%
HDFC Ltd							
1 Yr	19.9%	19.6%	21.2%	22.6%	23.6%	23.6%	19.2%
2 Yr	35.7%	36.1%	37.0%	38.4%	38.9%	38.6%	36.4%
3 Yr	50.6%	50.4%	51.0%	50.7%	50.9%	51.2%	49.1%
ICICI Bank							
1 Yr	25.8%	25.0%	19.8%	13.2%	11.5%	6.7%	-1.4%
2 Yr	50.6%	48.3%	43.1%	35.2%	34.3%	30.0%	18.7%
3 Yr	66.8%	67.2%	64.3%	59.5%	56.3%	51.8%	42.3%
Kotak Mahindra Bank							
1 Yr	35.8%	34.8%	33.8%	29.2%	28.4%	23.0%	10.2%
2 Yr	53.5%	56.0%	58.0%	52.6%	54.0%	49.8%	40.6%
3 Yr	71.1%	69.9%	70.9%	67.5%	66.7%	66.1%	62.3%
PNB							
1 Yr	18.9%	18.9%	13.7%	19.2%	16.4%	22.2%	28.2%
2 Yr	41.0%	37.1%	33.8%	37.6%	32.2%	36.9%	38.1%
3 Yr	50.5%	48.9%	49.5%	49.4%	50.7%	51.0%	52.5%
SBI							
1 Yr	24.0%	20.6%	20.2%	18.9%	23.1%	27.2%	22.5%
2 Yr	36.0%	34.5%	37.1%	41.2%	41.5%	42.2%	38.2%
3 Yr	51.7%	50.2%	50.5%	50.3%	50.8%	52.3%	51.3%
Union Bank							
1 Yr	12.4%	10.4%	21.5%	16.0%	16.0%	20.8%	20.1%
2 Yr	34.7%	30.7%	31.6%	28.0%	26.4%	29.0%	37.3%
3 Yr	49.1%	48.1%	48.2%	45.8%	45.1%	45.1%	45.4%
YES Bank							
1 Yr	54.2%	50.4%	44.2%	33.3%	31.2%	34.7%	21.4%
2 Yr	87.4%	82.1%	77.8%	74.5%	68.5%	67.6%	56.1%
3 Yr			96.5%	91.9%	91.3%	88.3%	82.5%

Source: Deutsche Bank Note: The figures indicate the % of loan booked built in the past 1,2 and 3 years.

Institutional developments & regulatory dispensation

- ***Farm credit, i.e. 15% of bank lending and feeding 18% of GDP, is a seasonal and not a cyclical issue, largely immune from rest of the NPL cycle. There is considerable forbearance on this, being a priority sector, and recoveries tend to be high***
- ***A very effective foreclosure law and credit bureau act as deterrents to default in addition to being a post delinquency tool – these did not exist in the last cycle. Banks are sitting on hugely appreciated collaterals***
- ***Basel II transition has made keeping NPLs in books harder and lending to better rated corporates easier. Tough prudential norms have kept banks on a leash in this cycle***
- ***Restructuring, if judiciously used by banks and borrowers, can be an effective tool to address temporary cash flow issues and alleviate asset quality pressures. Even this was not available at the time of NPL problems in the mid 1990s***
- ***However, indiscreet restructuring – not ruled out in the current climate – may only postpone the problem, and makes bank balance sheets opaque***

Farm credit NPLs: a seasonal rather than cyclical issue

The very reason for discussing farm credit (important – 15% of bank loans) quality under this section and not as a separate category is our belief that agricultural loans do not generally follow the mainstream economic cycle.

- Credit quality is primarily determined by the strength of the monsoon and the amount of investment in irrigation (this plays out only over the long term).
- Also, the distribution of rains varies widely across the country and hence there could be material intra-regional differences in farm loan repayment record.
- It is futile to conceptualize an "outlook" for farm loan quality for these reasons, as also due to impact of abrupt policy changes such as loan waivers and rescheduling.

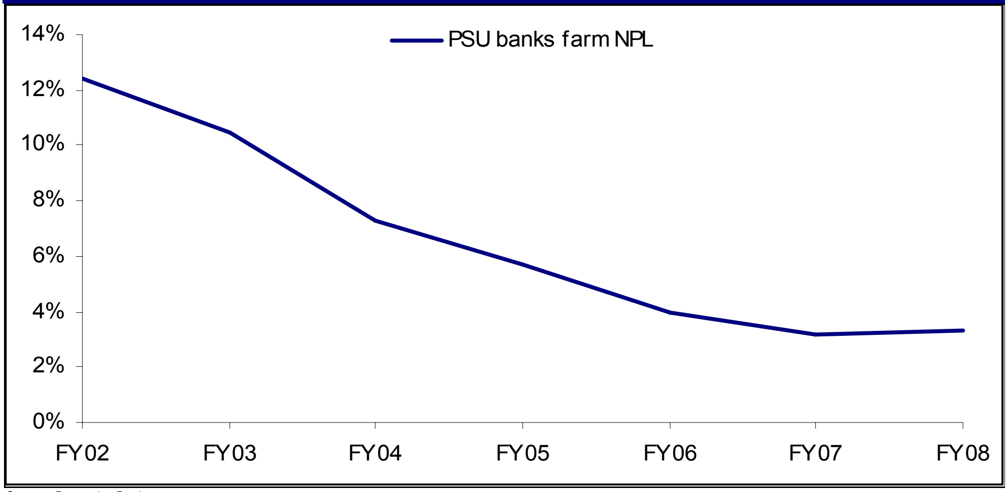
Some trends are clear, however, and possibly lead to a few valid generalizations:

Farm NPLs have been declining steadily over time

This does not necessarily mean a structural improvement – monsoons have generally been very good for the period under consideration, and farm loans get restructured very often. In fact, since this is the largest chunk of the mandated priority sector lending, there is an implied need to manage asset quality and the regulator too has been taking a benign view of farm asset quality, especially in times of natural distress.

Since this is the largest chunk of the mandated priority sector lending, there is an implied need to manage asset quality and the regulator has been taking a benign view of farm asset quality especially in times of natural distress

Figure 57: PSU banks' farm NPLs over the years – end of a declining trend?



Source: Deutsche Bank

Private banks' farm loan portfolios are very young and a long enough time series is not available

Considering PSU banks' overall NPLs are ~2%, farm loans are no more or less delinquent than other parts of the loan book

Figure 58: Individual banks' farm loan NPLs

	FY02	FY03	FY04	FY05	FY06	FY07	FY08
PSU banks:							
Bank of Baroda	18.1%	14.5%	12.9%	9.7%	4.8%	3.9%	3.1%
Bank of India	12.3%	11.8%	11.8%	7.3%	5.3%	3.5%	3.1%
Canara Bank	11.0%	6.9%	6.5%	2.8%	2.8%	1.5%	1.4%
Punjab National Bank	8.7%	7.3%	5.1%	3.0%	3.0%	3.5%	5.1%
Union Bank of India	10.6%	8.0%	6.4%	4.5%	4.4%	3.1%	2.8%
State Bank of India	15.6%	14.9%	12.5%	9.3%	6.3%	4.7%	5.2%
Private banks:							
Axis Bank					2.1%	1.6%	2.2%
HDFC Bank					0.4%	0.4%	0.5%
ICICI Bank					0.3%	2.1%	3.9%
Kotak Mahindra Bank					0.4%	0.3%	0.5%

Source: RBI, company data, Deutsche Bank

A farmer pays only when he has the cash, which is when he harvests and sells the crop. If that leads to a technical non-performing loan, it is not a real default

Recovery rates usually high

Almost all banks we have talked to as well as the farm credit regulator have emphasized the farmer's continual need for loans and hence low propensity to willfully default, though unfortunately we do not have granular enough data to support this. This leads to an eventual high recovery rate even though payments could be delayed.

The best part of the last farm loan waiver was the government's decision to reimburse the banks, unlike earlier mandates when the burden fell solely on banks. Though this may not be extrapolated to any loan waiver in future, at least the government's intentions have been in the right direction.

Delinquencies also depend on the way lending is carried out

In the initial years of priority sector lending, farm credit was done very reluctantly and was nearly synonymous only with crop loans. This is the riskiest form of farm lending and typically led to large delinquencies. However, banks, and more specifically private banks, have progressed to sophisticated versions such as post-harvest financing, warehouse receipt based financing, tractor loans, loans based on gold jewellery etc.

However, on a more long-term basis private banks' farm loan NPLs could rise as their portfolios mature and there are fewer opportunities for being choosy

Some private banks have consciously mapped out regions in the country differentiated by agricultural wealth and payment culture and broadly stick to the better ones.

Also, while public sector banks make all attempts to fulfill the agricultural credit quota, thereby potentially making some adverse selection, some private banks in a particular year may take a decision to stay with a shortfall and bear the penalty – this may be slightly negative for yields but good from the risk point of view.

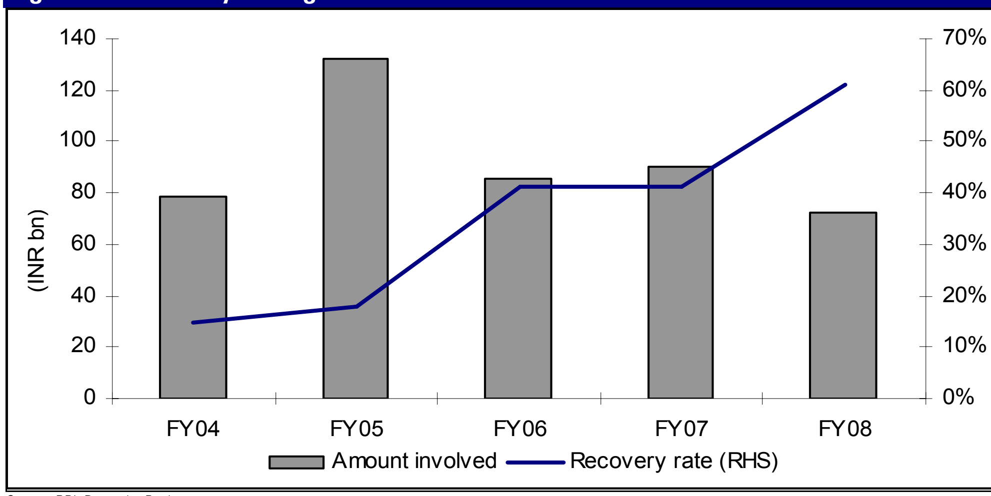
Legal and regulatory environment far better than before

Foreclosure law and credit bureau also deterrents in addition to being a post-delinquency tool

The foreclosure law SARFAESI was promulgated in 2002 and after initial hiccups, has been a very effective instrument – all banks we speak to have commended its application. Such a law was not available in the previous NPL cycle. The law is a stern one, and though not always applied with all the stringency it promises, can bring a borrower to the negotiating table very quickly. Actual recoveries using SARFAESI have gone up (Figure 59), so have NPL sales to stressed asset resolution companies.

Banks are sitting on collaterals which have significantly appreciated in price in the last few years. At these levels, no promoter would like to willfully default and see the collateral seized by the bank. This is where the usefulness of the foreclosure law comes in even as a pre-delinquency tool

Figure 59: Recovery through foreclosure law SARFAESI



Source: RBI, Deutsche Bank

Basel II has made keeping NPLs in books difficult and lending to better rated corporates easier

As per Basel II which the RBI has adopted with some modifications, NPLs attract higher risk weights (hence higher capital) and AAA and AA companies lower risk weights than other risk categories. While banks have not yet been fully ingrained into the Basel II culture, the need to preserve capital has indeed been acting as a deterrent to taking excessive risks.

Tough prudential norms have kept banks on a leash

Our key reference is to the sectoral exposure limits set by the RBI in the mid-1990s and then changed actively from time to time mainly on a counter-cyclical basis to avoid banks overextending themselves or contributing to asset bubbles. Similarly, risk weights and general provisioning norms have been raised to avoid excessive lending to potentially problem-prone sectors. Sometimes RBI has resorted to window guidance and moral suasion. These have certainly reduced risks from bank books, though not eliminated them.

Regulatory forbearance could however mask true picture

Restructuring can make bank balance sheets opaque

Discussions with industry and laterals do underscore this point. Restructuring of large real estate exposures (e.g. Unitech and HDIL have formally announced) has already made headlines, and proposals from other sectors are coming in, after the central bank provided the second restructuring opportunity, valid till June 2009.

In the standard format balance sheet, banks declare the amount restructured during the year and not the outstanding amount. Also, this data is available only once a year

Once restructured, a performing asset need not be downgraded. The genuine stress in the system could get masked as a result. *But disclosing a low figure for NPLs will be accompanied by skepticism, not conviction.* In fact, questions have increased after two small PSU banks – Corporation Bank and Syndicate Bank – specifically declared after their 3QFY09 results that they expect restructured assets to rise sharply.

HDFC Bank has consistently restructured very little, followed closely by SBI. The relatively higher restructuring of PNB, ICICI and Axis' in FY08 may raise credit quality issues in future

Figure 60: Restructuring trends within individual banks

(Amount restructured during the yr/avg loans)	FY2005	FY2006	FY2007	FY2008
Axis Bank	0.8%	1.7%	0.7%	1.3%
Bank of Baroda	2.0%	0.5%	0.4%	0.4%
Bank of India	1.6%	0.2%	0.3%	0.6%
Canara Bank	1.5%	0.2%	0.3%	0.6%
HDFC Bank	0.2%	0.2%	0.0%	0.0%
ICICI Bank	2.6%	0.3%	0.0%	0.8%
Kotak Mahindra Bank	NA	NA	NA	0.0%
Punjab National Bank	0.5%	1.0%	0.8%	0.9%
State Bank of India	2.7%	0.6%	0.3%	0.4%
Union Bank of India	1.5%	0.5%	0.5%	0.6%
Yes Bank	NA	NA	NA	0.4%

Source: Company data, Deutsche Bank

Expect major corporate NPLs to manifest only from Sep-09

In other words, material NPL accretion, particularly for PSU banks, will be largely back-ended in FY10. Even after June 2009 when most of the second restructurings and real estate loan workouts should be over, reported NPLs could be kept under check through restructuring (first-time restructuring as per extant guidelines can continue anyway). Private banks, with a larger proportion of retail assets (higher up in the NPL cycle), could continue to report steady increases in NPLs throughout.

We do not rule out other forms of concessions

At this point in time, we believe credit quality is not an overriding concern for the regulator or government; presently they are trying their best to maintain financial system stability and prevent the economy from going into a steep growth downturn. Even measures such as the second restructuring that benefit asset quality to some extent were put in place primarily with difficulties of India Inc in mind.

However, if the tide turns too adverse for banks, other measures could be in the offing. Some banks have already asked for a return to the 180-day NPL recognition rule (currently it is 90 days) but the RBI has denied it at present. Having to make lesser provisions is another possibility, so is an easing of norms for selling distressed assets. But all these are likely to be considered retrograde from an equity investor's perspective, and most unlikely to be celebrated through higher ratings, as the stress does not disappear from the system.

All restructuring is not bad

There could be situations of genuine stress on a company's cash flows, which require a reprieve in the form of a lower rate and/or longer repayment period. After all, banks need to be practical – too much inflexibility can itself be the cause for trouble. This kind of restructuring can actually help the cause by tiding over a rough period. Of course, there is a risk that this is used by the bank to just postpone the problem.

Impact of rate cycle & liquidity on asset quality

- ***A round of fiscal stimuli totaling 1.5% of GDP, and continued monetary easing, should be a stress reliever for many sectors. The package is generous in the global context***
- ***Unrealised gains on the bond book – 4-12% of shareholder equity of banks – can combat difficult conditions of NPL deterioration, of course only as long as interest rates stay low***
- ***It becomes difficult for unrealized gains to come to banks rescue only when NPLs reach 15% from current 2.5% and the coverage requirement for new NPLs is 25% - an unlikely stressed situation, in our view***
- ***Stimulus packages do have a flip side – they themselves could become the cause of rising rates***
- ***NIM and operating cost pressures, mainly for PSU banks, can reduce the operating cushion available to banks for handling higher credit charges***

The purpose of this section is to establish in one way how well the system is equipped to offset the negatives of asset quality deterioration. Whereas we expect NPLs to rise, interest rates are likely to remain low, thereby offsetting some of the pressures due to treasury profits. We however think that this benefit cannot be exploited indefinitely.

Bountiful liquidity infusion a stress reliever

Can have salutary effects, at least at the margin, on some stressed sectors

As lack of credit itself can drive firms to financial uncertainty, the massive infusion of liquidity from Oct'08 and corresponding decline in interest rates should help companies. Indeed, in the mid-1990s the problem got aggravated by the central bank's requirement to keep interest rates high to combat inflation – thankfully inflation is benign this time. However, low rates or easy liquidity cannot compensate for a sharp fall in demand or prices, which is a problem many borrowers are now facing.

For details of recent measures see Annexure. The Indian fiscal stimulus has been fairly generous (Figure 61) – the circumstances in the US demanded a much larger package with a significantly more challenged banking system.

Figure 61: Comparison of stimulus packages

Countries	Fiscal stimulus	Stimulus as a % of GDP
India	720	1.5%
US	785	5.5%
South Korea	14,000	1.1%
Malaysia	7	1.2%

Source: CIA, media reports, Deutsche Bank
Local currency, figures in billion. Monetary stimuli excluded

Stimuli themselves can however drive rates up, contrary to objectives

With a government borrowing programme for FY09E which is 80% higher than originally budgeted and the FY10E programme 40% higher than even that, the RBI will have a tough balancing act to keep benchmark yields low. This is catch-22: lending rates to corporates cannot come down if sovereign yields become rigid, and stimulus packages aimed at making life easier for corporates necessitate large government borrowing.

Bottomline is that the fall in yields in Q3FY09 is unlikely to repeat in the medium term, though we should remain in a broadly lower interest rate regime than last year. This means treasury profit opportunities could wane.

Unrealised gains buffer encouraging, but NIM cushion thinning

Bond portfolios, particularly of PSU banks, are very significantly undervalued (Figure 62).

Most portfolios will have unrealized gains up to a 1-yr yield of 7%, currently at ~6.2%

Figure 62: Estimate of unrealized gains on the bond portfolio

	Unrealised Gains as % of equity
PSU Banks	
Union Bank	12.0%
Canara	11.6%
PNB	10.9%
SBI - Consolidated	9.8%
Bank of Baroda	8.5%
Bank of India	7.2%
Private Sector Banks	
YES Bank	8.5%
Axis Bank	5.4%
HDFC Bank	5.3%
Kotak Mahindra Bank	4.2%
ICICI Bank	4.0%

Source: Deutsche Bank

These unrealized gains (which can be 'used' only by selling the bonds as marking up is not allowed in India) can offset credit charges under very difficult conditions (Figure 63), but obviously remain so long as interest rates are low.

Figure 63: Gains as a % of credit charges (10% coverage)

NPL assumptions -->	**2x**	**3x**	**50% higher**	**At peak post 2000**	**At 15%**
PSU Banks					
Bank of Baroda	336%	168%	672%	56%	60%
Bank of India	360%	180%	719%	76%	53%
Canara	351%	175%	701%	159%	81%
PNB	359%	180%	718%	91%	83%
SBI - Consolidated	252%	126%	505%	157%	79%
Union Bank	522%	261%	1045%	106%	86%
Private Sector Banks					
HDFC Bank	341%	170%	681%	631%	61%
ICICI Bank	161%	81%	322%	221%	86%
Axis Bank	346%	173%	693%	142%	46%
YES Bank	940%	470%	1880%	NA	79%
Kotak Mahindra Bank	196%	98%	391%	NA	146%

Source: Deutsche Bank

Things become tough if NPL rises to 15% and a 25% coverage is adopted for new NPLs, a highly stressed situation (Figure 64).

Figure 64: Gains as a % of credit charges (25% coverage)

NPL assumptions -->	2x	3x	50% higher	At peak post 2000	At 15%
PSU Banks					
Bank of Baroda	134%	67%	269%	22%	24%
Bank of India	144%	72%	288%	31%	21%
Canara	140%	70%	280%	64%	32%
PNB	144%	72%	287%	36%	33%
SBI - Consolidated	101%	50%	202%	63%	31%
Union Bank	209%	104%	418%	42%	34%
Private Sector Banks					
HDFC Bank	136%	68%	273%	252%	24%
ICICI Bank	64%	32%	129%	88%	34%
Axis Bank	139%	69%	277%	57%	18%
YES Bank	376%	188%	752%	NA	32%
Kotak Mahindra Bank	78%	39%	156%	NA	58%

Source: Deutsche Bank

Net interest margins could be pressured both from the yield and cost side

Risks to earnings from NPLs are comparatively lesser when margins are rising, but the immediate term outlook is quite to the contrary (Figure 65).

Figure 65: Sources of margin pressure

Yield	Cost of funds
Irrational competition for retail assets initiated by some PSU banks	Insufficient fall in deposit rates
Sovereign bond yields falling	Low-cost deposit rates not growing due to high term deposit rates
Re-pricing of short-term corporate loans, some of them 500-600bps lower	

Source: Deutsche Bank

Additional risks to pre-provision profits exist

These could reduce the ability to bear higher credit provisions.

- Wage revisions, in PSU banks. Currently, the negotiations are on: most bank managements, and us, are assuming an increase of 15% but it could potentially be much more
- Higher pension liabilities, for PSU banks. Currently, we have not built in anything extraordinary
- Lower fee income due to lower loan growth
- Reduced treasury profits *compared to FY09*, as it is not likely that the fall in yields will repeat

Note that post the Q3FY09 results we have raised earnings estimates for most banks in view of higher treasury gains outlook – so the interest rate decline effect has been largely built into the numbers.

Figure 66: Net interest margin and RoE

(%)	NIM					RoE				
	FY07	FY08	FY09E	FY10E	FY11E	FY07	FY08	FY09E	FY10E	FY11E
Axis Bank	2.92	3.47	3.30	3.29	3.27	21.0	17.6	17.7	17.2	17.1
Bank of Baroda	3.05	2.90	2.87	2.70	2.75	12.4	14.6	15.8	15.2	16.0
Canara Bank	3.15	2.42	2.69	2.67	2.68	16.3	15.0	16.9	14.4	14.7
HDFC Bank	4.00	4.30	4.12	4.17	4.11	19.5	17.7	16.9	17.6	19.6
HDFC Ltd	3.12	3.94	3.56	3.35	3.26	31.3	27.8	16.6	17.1	17.5
ICICI Bank	2.17	2.30	2.41	2.45	2.54	13.4	11.7	8.6	9.2	10.6
IDFC	2.94	2.88	3.56	3.13	2.62	18.3	17.4	13.0	10.5	9.5
Kotak Mahindra Bank	5.20	5.69	5.78	5.69	5.68	20.8	22.1	9.2	6.5	6.8
Punjab National Bank	3.85	3.58	3.56	3.48	3.36	15.5	18.0	20.9	19.0	17.9
SBI (consolidated)	3.03	2.71	2.91	2.69	2.67	16.6	17.9	17.6	15.8	15.7
Union Bank	3.05	2.80	2.99	2.69	2.71	17.3	22.1	20.6	16.0	15.2
Yes Bank	2.79	2.74	2.73	2.71	2.70	13.9	19.0	19.2	19.0	18.8
Bank of India	2.99	2.95	3.08	3.07	3.05	20.6	24.4	25.4	22.9	21.7

Source: Company data, Deutsche Bank

Multi-dimensional scenario analysis on credit quality

- ***At extreme high levels of NPLs and coverage, earnings of all banks get wiped out. However, private banks generally stand out as less affected in more "reasonable" cases***
- ***HDFC Bank and Axis appear well protected, and within PSU banks the high scorers are Bank of India and Union Bank***
- ***The book value impact – obviously a function of how well-capitalised the bank is – is also much lower on private banks***
- ***In our most likely case (50% higher NPLs), SBI and Canara Bank are affected the most, others modestly***
- ***PSU banks get pushed into the regulatory minimum 6% Tier I at NPL levels of 4-9% - more likely than the 9-24% NPLs needed for private banks to reach 6% Tier I***

We have taken one of the conditions as the peak post 2000 which is more reflective of present conditions rather than in the peak in mid-90s, when circumstances were too different

Figure 67: Base case details

	Base gross NPL	Gross NPLs scenarios			
	FY10E	2x	3x	50% higher	At peak post 2000
PSU Banks					
Bank of Baroda	2.39%	4.78%	7.17%	3.59%	16.0%
Bank of India	2.30%	4.60%	6.90%	3.45%	10.7%
Canara	2.81%	5.62%	8.44%	4.22%	8.6%
PNB	3.08%	6.15%	9.23%	4.61%	13.9%
SBI - Consolidated	3.77%	7.53%	11.30%	5.65%	9.3%
Union Bank	2.20%	4.40%	6.61%	3.30%	12.5%
Private Sector Banks					
HDFC Bank	2.81%	5.63%	8.44%	4.22%	3.5%
ICICI Bank	4.86%	9.72%	14.57%	7.29%	8.7%
Axis Bank	1.97%	3.94%	5.91%	2.95%	5.5%
YES Bank	1.30%	2.60%	3.91%	1.95%	NA
Kotak Mahindra Bank	6.40%	12.81%	19.21%	9.60%	NA
Others					
IDFC	0.33%	0.66%	0.98%	0.49%	1.1%
HDFC	1.10%	2.20%	3.30%	1.65%	1.0%

Source: Deutsche Bank

At extreme high levels of NPLs and coverage, earnings of all banks get wiped out. However, private banks generally stand out as less affected in more "reasonable" scenarios. HDFC Bank and Axis appear well protected, and within PSU banks the high scorers are Bank of India and Union Bank

Figure 68: Earnings impact

	Earnings impact - 10% coverage					Earnings impact - 25% coverage				
NPL assumptions –>	2x	3x	50% higher	At peak post 2000	At 15%	2x	3x	50% higher	At peak post 2000	At 15%
Bank of Baroda	-18%	-35%	-9%	-106%	-99%	-44%	-88%	-22%	-266%	-247%
Bank of India	-10%	-19%	-5%	-45%	-65%	-24%	-48%	-12%	-114%	-164%
Canara	-24%	-48%	-12%	-53%	-104%	-60%	-120%	-30%	-132%	-260%
PNB	-17%	-35%	-9%	-68%	-74%	-43%	-86%	-22%	-171%	-186%
SBI - Consolidated	-27%	-54%	-13%	-43%	-86%	-67%	-134%	-34%	-108%	-215%
Union Bank	-15%	-31%	-8%	-75%	-93%	-38%	-76%	-19%	-188%	-233%
HDFC Bank	-10%	-19%	-5%	-5%	-54%	-24%	-48%	-12%	-13%	-134%
ICICI Bank	-28%	-56%	-14%	-21%	-53%	-70%	-141%	-35%	-51%	-132%
Axis Bank	-10%	-19%	-5%	-23%	-73%	-24%	-48%	-12%	-59%	-182%
YES Bank	-5%	-10%	-3%	NA	-62%	-13%	-26%	-6%	NA	-154%
Kotak Mahindra Bank	-35%	-69%	-17%	NA	-46%	-87%	-173%	-43%	NA	-116%
IDFC	-1%	-2%	-1%	-2%	-45%	-3%	-5%	-1%	-6%	-114%
HDFC	-4%	-8%	-2%	-1%	-64%	-10%	-20%	-5%	-1%	-161%

Source: Deutsche Bank

This is directly a function of how well capitalized a bank is. Once again, private banks stand out as better cushioned in virtually all the scenarios. In our most likely case (50% higher NPLs), SBI and Canara Bank are affected the most, others modestly

Figure 69: Book value impact

	With gross NPLs going to (assuming 50% coverage)				
	2x	3x	50% higher	At peak post 2000	At 15%
Bank of Baroda	-16%	-31%	-8%	-94%	-88%
Bank of India	-11%	-23%	-6%	-53%	-76%
Canara	-25%	-51%	-13%	-56%	-110%
PNB	-17%	-33%	-8%	-66%	-72%
SBI - Consolidated	-28%	-55%	-14%	-44%	-89%
Union Bank	-15%	-29%	-7%	-72%	-89%
HDFC Bank	-8%	-16%	-4%	-4%	-46%
ICICI Bank	-14%	-29%	-7%	-11%	-27%
Axis Bank	-9%	-17%	-4%	-21%	-65%
YES Bank	-5%	-10%	-2%	NA	-57%
Kotak Mahindra Bank	-12%	-24%	-6%	NA	-16%
IDFC	-1%	-1%	0%	-1%	-23%
HDFC	-3%	-7%	-2%	0%	-52%

Source: Deutsche Bank

The capital cushion of PSU banks against a credit quality downturn is weak – some of the NPL numbers that will push them into the regulatory minimum 6% Tier I level do not seem unrealistic

Private banks, on the other hand, are sitting on huge amounts of capital. In the current global environment for banks, we believe that it is capital and not (necessarily) growth that deserves greater respect

Figure 70: Implied gross NPLs to reach different levels of Tier I

Banks	Base Tier 1 FY10E	What Gross NPLs will lead to Tier-1 ratio of (50% coverage)		
		8.0%	7.5%	6.0%
Bank of Baroda	6.92%	NA	NA	4.7%
Bank of India	8.19%	2.3%	3.4%	6.6%
Canara	6.47%	NA	NA	3.9%
PNB	8.58%	4.1%	5.1%	8.3%
SBI - Consolidated	8.76%	5.1%	6.1%	9.2%
Union Bank	6.61%	NA	NA	3.6%
HDFC Bank	8.93%	5.3%	7.0%	11.9%
ICICI Bank	10.66%	11.6%	12.7%	16.0%
Axis Bank	8.22%	2.4%	4.0%	8.8%
YES Bank	9.24%	5.3%	7.0%	12.0%
Kotak Mahindra Bank	12.54%	18.2%	19.4%	23.3%
IDFC	19.25%	24.6%	25.5%	27.8%
HDFC	11.43%	7.6%	8.5%	11.4%

Source: Deutsche Bank.

For HDFC Bank, Kotak and Yes Bank, the current LLPs are at their post 2000 peaks, and hence current financials denote high credit charges already. Among others, downsides to ICICI and PNB appear least

Figure 71: Impact on application of peak LLPs post 2000

Banks	LLP FY10E	Peak LLP post 2000	Impact on applying peak LLP			Per share difference
			EPS	BVPS	TP	
Bank of Baroda	0.69%	2.73%	-150%	-27%	-27%	83.22
Bank of India	0.86%	1.99%	-56%	-13%	-13%	35.97
Canara	1.15%	2.29%	-94%	-20%	-20%	41.01
PNB	0.70%	1.29%	-35%	-7%	-7%	40.03
SBI - Consolidated	0.60%	2.58%	-139%	-29%	-23%	254.58
Union Bank	0.80%	2.36%	-135%	-24%	-24%	35.03
HDFC Bank	2.42%	NA	NA	NA	NA	NA
ICICI Bank	1.75%	2.63%	-45%	-5%	-3%	18.82
Axis Bank	1.18%	2.94%	-98%	-19%	-19%	48.39
YES Bank	1.17%	NA	NA	NA	NA	NA
Kotak Mahindra	3.00%	NA	NA	NA	NA	NA
IDFC	0.45%	3.05%	-79%	-8%	-6%	4.10

Source: Deutsche Bank

Note: In all the above cases – Figure 68 to Figure 71 – a negative EPS figure greater than 100% indicates that the bank is getting into losses.

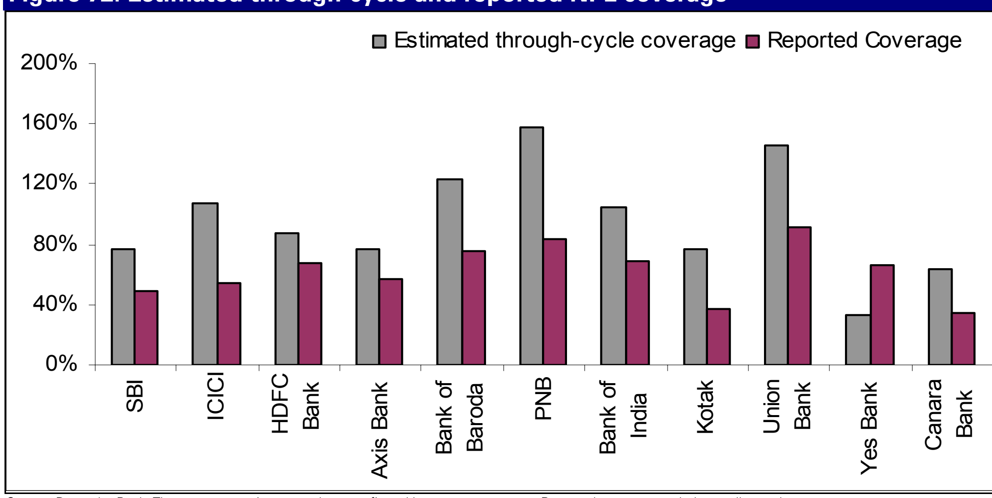
Valuations and stock picks

- ***PSU banks will need recapitalization in most NPL stress cases or else let Tier I fall, inviting downgrades from rating agencies. In that respect, private banks such as ICICI, HDFC Bank and Kotak are very well-placed***
- ***Our modified tangible equity to total assets ratio, adjusted for treasury securities, shows that Indian banks are far healthier than what their Tier I ratios indicate***
- ***ICICI and Yes Bank appear to have comparatively lower-risk corporate loan portfolios***
- ***Stocks are pricing in NPLs that are 50% higher than our increased estimates for FY10, (which already reflect a 50% increase in NPLs over FY09E for the sector)***
- ***Continue to prefer private banks to PSU banks; other than the reasons already cited above and earlier, the valuation premium of the former over the latter is now at its lowest in the last seven years***

Relative attractiveness and vulnerabilities

Most banks are very well covered for normalized loan losses over the cycle. Among PSUs, PNB and Union Bank score well on both reported and through-cycle coverage; all the mainstream private banks are also well off. SBI appears less well-placed

Figure 72: Estimated through-cycle and reported NPL coverage



Source: Deutsche Bank. These are our estimates and not confirmed by any management. Reported coverage excludes unallocated

PSU banks will need large amounts of capital in NPL stress cases or else let Tier I fall and invite downgrades from rating agencies. Private banks are at the other end of the spectrum with Axis probably having relatively less cushion; ICICI, HDFC Bank and Kotak are very well placed

Figure 73: Dilution required for maintaining Tier I at 7.5% under diff NPL scenarios

	Capital required (25% coverage)		Capital Required (50% coverage)		Capital Required (75% coverage)	
	2x NPLs	3x NPLs	2x NPLs	3x NPLs	2x NPLs	3x NPLs
PSU Banks						
Bank of Baroda	14%	19%	19%	31%		
Bank of India	-3%	3%	3%	15%		
Canara	22%	30%	30%	47%		
PNB	-5%	3%	3%	21%		
SBI - Consolidated	-5%	6%	6%	30%		
Union Bank	18%	24%	24%	36%		
Private Sector Banks						
HDFC Bank	-14%	-10%	-10%	-1%	-5%	9%
ICICI Bank	-31%	-19%	-19%	3%	-8%	26%
Axis Bank	-6%	-2%	-2%	5%	1%	12%
YES Bank	-21%	-19%	-19%	-14%	-16%	-9%
Kotak Mahindra Bank	-51%	-34%	-34%	-1%	-18%	32%
Others						
IDFC	-156%	-155%	-155%	-154%	-154%	-152%
HDFC	-49%	-46%	-46%	-40%	-43%	-34%

Source: Deutsche Bank. A negative number indicates excess capital at that level of NPLs

The Tier I capital as a capitalization indicator is deficient in one respect – it gets coloured by risk weights which have now been made very liberal as a pro-cyclical measure and may not reflect the true, *increased* risk. The tangible equity to total assets ratio, now used more globally, does not as such provide a flattering picture of Indian banks. However, it must be remembered that by law banks are required to keep ~30% of their assets in government securities and with RBI – these carry no credit risk. A modified ratio which takes this into account shows that Indian banks are quite well capitalized (Figure 74).

Figure 74: Tangible equity to loans analysis – superior indicator of capital adequacy

Looks like needs capital immediately

Here too, private banks win hands down, as all of them fortunately raised lot of equity capital in 2007

Banks	Tangible Equity/Total Assets	Modified (Tangible equity/Total Assets)	Tier- 1 Ratio	Gross NPLs (FY10E)
PSU Banks				
Bank of Baroda	6.3%	9.6%	7.6%	2.28%
Bank of India	5.1%	8.4%	7.7%	1.93%
Canara	4.7%	7.8%	7.0%	2.81%
PNB	5.6%	10.4%	9.0%	2.83%
SBI	7.3%	11.8%	9.1%	3.77%
Union Bank	4.8%	8.9%	7.5%	2.10%
Private Sector Banks		-		
HDFC Bank	9.0%	15.7%	10.3%	2.27%
ICICI Bank	12.5%	19.5%	11.8%	4.86%
Axis Bank	8.3%	12.3%	10.2%	1.75%
YES Bank	8.0%	12.9%	8.5%	1.17%
Kotak Mahindra Bank	13.2%	22.3%	14.5%	6.40%
Others		-		
HDFC	14.8%	15.6%	14.6%	0.90%
IDFC	20.2%	22.1%	19.5%	0.35%

Source: Deutsche Bank. All data as of Mar-08 unless otherwise specified. The ratio in the second column is defined as (tangible equity + specific provision)/(tangible assets less SLR less cash with RBI)

Some colour on relative risk based on portfolio compositions

The key differences lie in the percentage of SMEs, retail vs. corporate exposures and within retail the importance of unsecured lending (Figure 75). Among the larger banks, ICICI, PNB and BoB score low on overall exposure risk. One needs to be mindful of this conclusion as there are significant variations in classification and the data is missing for many groups.

Figure 75: Overall loan exposure breakup of banks and risk assessment of the same

	Home loans	Car loans	2W loans	CV loans	Personal loans	Credit cards	Education loans	Total Retail	Agri	SME	Other Corporates	Corporate risk score	Composite risk score
Axis Bank	13.3%	2.1%	0.0%	0.8%	2.7%	0.8%	NA	20.7%	7.4%	18.8%	53.1%	3.22	3.05
Bank of Baroda	6.2%	NA	NA	NA	NA	NA	NA	14.8%	12.3%	10.8%	62.2%	3.00	2.73
Bank of India	4.8%	0.6%	NA	NA	NA	NA	0.9%	14.0%	11.1%	17.6%	57.4%	3.16	2.93
Canara Bank	5.2%	NA	NA	NA	NA	NA	NA	13.9%	14.7%	16.6%	54.8%	3.00	2.80
HDFC Bank	3.0%	15.3%	2.1%	8.4%	9.0%	4.2%	NA	60.4%	NA	9.0%	30.6%	3.51	2.83
ICICI Bank	28.6%	7.0%	1.1%	7.0%	5.1%	3.8%	NA	53.9%	14.7%	4.0%	27.4%	2.85	2.52
Kotak	13.7%	20.0%	NA	14.7%	11.6%	NA	NA	81.7%	NA	4.0%	14.3%	3.00	2.23
PNB	5.6%	NA	NA	NA	NA	NA	1.1%	19.1%	15.5%	14.5%	51.0%	3.00	2.65
SBI	10.7%	1.7%	NA	NA	7.6%	NA	1.0%	21.2%	10.3%	44.2%	24.2%	3.00	3.29
Union Bank	4.4%	NA	NA	NA	NA	NA	NA	10.7%	15.1%	16.0%	58.2%	3.00	2.88
Yes Bank		NA	NA	NA	NA	NA	NA	0.7%	NA	37.1%	62.1%	2.28	2.90
Risk level of category	Very low	Medium	High	Medium	High	Very high	Low		Medium	High			
Risk score of category	1	3	4	3	4	5	2		3	4			

Source: Deutsche Bank. Note: For SBI we have included SME and Mid corporate group into SME loans. Wherever applicable suitable assumptions have been made based on FY08 exposures and then 3Q09 exposures have been calculated. Data as of Dec-08

Within industry (corporate) exposures, there is actually little to choose from to differentiate banks. There are too many classification differences and terminologies used, and two more categories are often clubbed, making distinctions impossible. However, to offer some flavour, we have noted them in Figure 76. Some banks give this data for large and small corporates put together, complicating matters further.

Figure 76: Industry (corporate) exposure breakups of banks

	Gems/ Jewellery	Textiles	Auto	Food & beverages	Metals	Traders	Infrastructure	Others	Overall risk score
Axis Bank	3%	6%	8%	3%	8%	5%	8%	59%	3.22
Bank of India	6%	12%	3%	1%	15%	5%	35%	23%	3.16
HDFC Bank	1%	4%	41%	7%	6%	16%	7%	20%	3.51
ICICI Bank				7%	12%	2%	15%	64%	2.85
YES Bank		6%		25%			34%	35%	2.28
Risk level of category	High	Very high	High	Very low	High	High	Low	Medium	
Risk score of category	4	5	4	1	4	4	2	3	

Source: Deutsche Bank. Automobiles include land transport. Infrastructure includes engineering and construction sectors also. The % exposures in industry segment are based on FY08 exposures for most of them barring Bank of India and Axis Bank which is based on Dec 09. Data as of Dec-08

In reality, this is one area where we do not need to bother too much about inter-bank differences because of the strict norms of sector exposures stipulated by the RBI for many years, precluding potential overexposure to some sectors.

Putting it all together – gross NPL outlook

Taking into account the multiplicity of quantitative and qualitative issues discussed hitherto in the report, we have the gross NPL and NPL formation ("slippages") outlook in Figure 77.

A very critical point to note is that *firming up NPL estimates from the analysis, facts and sensitivities is not a straightforward, mathematical process, and involves several elements of subjectivity*. For example,

- Some prefer to show higher gross NPLs by keeping them 100% provided whereas other prefer to write them off, and even this policy may undergo a change within a bank
- Again, active restructuring can hide NPLs for longer than we think
- There could be specific provisions against assets which are currently not NPLs, in which case classifying that asset as an NPL will not invite any provision
- Most importantly, categories are not homogeneous, i.e. the nature and quality of the infrastructure portfolio of one bank could be drastically different from the infra portfolio of another bank. Underwriting standards can and have differed markedly

Figure 77: Gross NPLs and NPL addition/formation

	Gross NPLs				Slippages			
	FY08	FY09E	FY10E	FY11E	FY08	FY09E	FY10E	FY11E
Axis Bank	0.83%	0.96%	1.97%	2.96%	0.87%	0.79%	1.82%	1.97%
Bank of Baroda	1.86%	1.71%	2.39%	2.79%	0.85%	1.20%	1.40%	1.50%
Bank of India	1.70%	1.64%	2.30%	2.88%	1.61%	1.70%	2.25%	2.25%
Canara Bank	1.32%	2.18%	2.81%	3.42%	1.45%	2.20%	2.27%	2.23%
HDFC	0.84%	0.90%	1.10%	1.20%	0.12%	0.33%	0.39%	0.30%
HDFC Bank	1.43%	2.12%	2.81%	3.47%	1.55%	1.60%	2.00%	2.20%
IDFC	0.18%	0.25%	0.33%	0.40%	0.05%	0.07%	0.10%	0.13%
ICICI Bank	3.19%	4.36%	4.86%	5.06%	1.88%	1.70%	1.70%	1.70%
State Bank of India	3.04%	2.91%	3.77%	4.19%	2.34%	2.50%	4.50%	3.50%
PNB	2.78%	2.45%	3.08%	3.61%	2.02%	2.20%	2.90%	2.90%
Union Bank	2.18%	1.84%	2.20%	2.64%	1.22%	1.10%	1.50%	1.80%
Kotak	2.82%	4.98%	6.40%	7.39%	2.29%	4.00%	4.00%	4.00%
Yes Bank	0.11%	0.59%	1.30%	1.89%	0.17%	0.64%	1.01%	1.02%
Average	1.71%	2.07%	2.72%	3.22%	1.26%	1.54%	1.99%	1.96%
Average - Only Banks	1.93%	2.34%	3.08%	3.67%	1.48%	1.78%	2.30%	2.28%
YoY Increase		0.41%	0.74%	0.58%		0.31%	0.52%	-0.03%

Source: Company data, Deutsche Bank. Slippages defined as NPL addition to opening balance of loan book

Changes to estimates and target prices

Reasons for earnings changes

- Increase in provisioning charges due to higher assumption of NPLs

Reasons for TP changes

- Decrease in adjusted book value caused by assumptions of higher NPLs
- Increase in cost of equity assumptions. DB has revised its risk free rate and market risk premium for India
- Lower growth assumed for insurance business and consequently assumptions of lower insurance business valuation in sum-of-the-parts for ICICI Bank, HDFC Ltd, Kotak Mahindra Bank and SBI

- In case of ICICI Bank, we have also netted off additional Rs18 per share of losses expected due to certain problematic exposures
- In case of HDFC Ltd, we have also factored in lower target price of HDFC Bank in sum of the parts

In some cases, the target price revision may appear out of sync with the change in earnings estimates (Figure 78) because our TPs are driven by adjusted book value (i.e. adjusted for net NPLs) which go down significantly in those cases due to increase in NPL assumptions. The corresponding impact of that on earnings is relatively modest because, as we have explained later in the report, young NPLs require low provisions. The increase in cost of equity also explains part of this difference, so does the lower insurance growth which does not come into earnings at all.

Figure 78: EPS, TP changes

	EPS estimates						Target price			New/(Old) rating
	FY10E revised	FY10E old	Change	FY11E revised	FY11E old	Change	Revised	Old	Change	
Axis Bank	48.5	50.7	-4.3%	54.3	57.1	-4.9%	375	520	-27.9%	HOLD
Bank of Baroda	53.1	55.5	-4.3%	61.9	66.1	-6.4%	245	265	-7.5%	HOLD
Bank of India	62.4	64.4	-3.1%	72.0	74.4	-3.2%	260	315	-17.5%	BUY
Canara Bank	42.5	43.7	-2.7%	45.8	48.8	-6.1%	160	175	-8.6%	HOLD
HDFC Ltd	80.2	80.5	-0.4%	90.5	91.1	-0.7%	1,430	1,550	-7.7%	BUY
HDFC Bank	64.3	66.2	-2.9%	84.7	87.0	-2.6%	1,025	1,100	-6.8%	BUY
ICICI Bank	41.4	41.4	0.0%	51.3	51.3	0.0%	375	395	-5.1%	BUY
IDFC	5.2	5.2	0.0%	5.0	5.0	0.0%	43	48	-10.0%	SELL
Kotak	11.8	11.8	0.0%	13.7	13.7	0.0%	270	300	-10.4%	HOLD
PNB	90.3	95.6	-5.5%	98.7	104.9	-5.9%	410	540	-24.1%	BUY
SBI	183.6	183.6	0.0%	208.2	208.2	0.0%	1,025	1,170	-12.4%	HOLD
Union Bank	27.1	29.8	-9.1%	30.0	32.4	-7.4%	140	155	-9.7%	HOLD
Yes Bank	10.2	10.7	-4.7%	12.4	12.7	-2.4%	50	60	-16.7%	HOLD

Source: Deutsche Bank

We maintain our recommendations on all the stocks.

For stocks with changes more than 10%, valuations and risks are summarized below.

Axis Bank

Valuation

We value Axis Bank on single-stage Gordon growth model. Assumptions for the model: FY10E RoE = 16.5%, schematic RoE = 17.5%, risk-free rate = 8.1% (DB), risk premium = 5.4% (DB), beta = 1.15x, leading to cost of equity = 14.3%, perpetual growth rate = 4% (nominal growth rate for developed countries). Target P/BV multiple using single stage Gordon growth model is 1.3x which is applied on FY10E BV to arrive at TP.

Risks

Key upside risks are: i) continued exemplary control on NPLs despite deteriorating economic scenario thereby resulting in lower credit charges and higher than expected earnings forecasts ii) clarity on management succession and iii) Faster opening of branches resulting in larger accretion to CASA base (Low cost mix).Main downside risks are: i) asset quality because of the rapid growth and increase in non-collateralised assets and ii) announced sale of 27% stake of key shareholder leading to a stock overhang.

Bank of India

Valuation

We adopt the single-stage Gordon Growth model (P/BV-RoE) for valuing BoI, as we do for all PSU banks. We weight Mar'10E RoE by 25% and sustainable RoE by 75% to get a blended RoE estimate. Assumptions used in the model are: sustainable RoE = 13.9%, FY10E RoE 22.3%, risk-free rate = 8.1% (DB), equity risk premium = 5.4% (DB) and perpetual growth rate = 4% (a shade below the 5% long-range GDP growth estimate for India, used for all our bank valuation models).

Risks

The main risks are: i) Potential disruptions in the international business - this is 20% of BoI's total business - in the form of rising credit spreads or regulatory strictures/actions ii) Wage settlement leading to a higher-than-expected raise. Though the bank has started providing for a raise of 20%, the raise could be higher because of increased bargaining power of unions iii) Political pressure disturbing the growth-profitability balance.

IDFC

Valuation

We value IDFC as sum-of-parts, adding values of the core and non-traditional businesses. The lending (i.e. standalone) business is valued on single stage Gordon Growth model with the following assumptions: Normalised RoE = 12.2%, terminal perpetual growth = 4% (a notch below India's expected long-term GDP growth of 5%), risk-free = 8.1% (DB), beta = 1.4x (Bloomberg), risk-premium = 5.4% (DB). The private/project equity businesses are valued on % of FUM, investment banking on P/E and principal investment on expected unrealized gains.

Risks

Any relaxation by credit rating agencies by allowing IDFC to operate on a higher leverage than the current level 5.5x will result in higher sustainable RoE and consequently higher valuations. Significant reduction in wholesale funding rates coupled with complete resumption of lending to NBFCs by banks could improve IDFC's funding position and consequently margins.

Kotak Mahindra

Valuation

We value KMB on a sum of parts. The core bank is valued on 2-stage Gordon Growth model (ROE-g/COE-g)with the following assumptions: normalized RoE=14.4%, risk-free rate=8.1% (DB), risk premium=5.4% (DB), beta=1.3x (Bloomberg), high growth period = 5 years, growth in initial period=25%, perpetual growth=4%, initial dividend payout=20%, perpetual dividend payout=30%,COE of 15.1%. The life business is valued on appraisal value with 15.1% new business margin and 14x new business multiple, asset management at 4% of funds under management, alternate assets at 7% of AUM and both securities and investment banking at FY10E P/E of 7x.

Risks

Downside risks are further weakness in capital markets, which can hurt the securities and investment banking business - two exceptionally large value creators for KMB and flagging of the low-cost deposit ratio in the present tough liquidity conditions. Upside risks are significantly higher growth in life insurance premiums than expected and aggressive additions to the AUM of the alternate assets business.

PNB

Valuation

The core bank is valued on the single-stage Gordon Growth model (RoE - g)/(CoE - g), which we believe is an appropriate model for a relatively steady-growth public sector bank and volatile earnings due to treasury. Assumptions: schematic RoE estimate 13.8%, FY10E RoE 18.0%, risk free rate 8.1% (DB country estimate), risk premium 5.4% (DB), perpetual growth rate 4% (a notch below the expected 5% long-term nominal GDP growth for India).

Risks

Inability to hold on to current low levels of funding costs and consequently lower margins could affect superior return ratios enjoyed by the bank, particularly since the present high margins are a key reason for superior profitability. Higher bad loan provisioning and weak fee income growth could act as a drag on earnings and consequently RoE. Also, since rural credit is one of the critical growth drivers, any vitiation of the recovery environment due to the loan waiver or climate-related factors is a risk.

SBI

Valuation

We value the core bank based on consolidated estimates using the single-stage Gordon Growth model. Assumptions that go in: blended RoE 14.7%, g = 4% (a share below the 5% long-term forecast for GDP growth in India), risk-free rate 8.1% (DB country estimate), risk premium 5.4% (DB), beta = 1.25x. To that we add the estimated unrealized gain over cost for the insurance business (based on appraisal value, i.e. new business plus value in-force plus unencumbered shareholders' equity).

Risks

Upside possibilities to our call are: i) effective restructuring of corporate assets, delaying the onset of, or preventing asset quality deterioration ii) large scale gain of market share in low-cost deposits from private banks by leveraging its state-owned status and large network. Downside risks are: i) much worse performance on asset quality - since SBI's corporate portfolio is very high, chunky defaults can be more damaging ii) as the largest state-owned bank, may face government pressure to lead loan growth and/or cut lending rates, thereby increasing possibility of adverse selection.

Union Bank

Valuation

We value Union Bank on the single-stage Gordon Growth model (RoE - g)/(CoE - g) model (resulting P/BV from the formula multiplied by Mar'10E adjusted book value). Other assumptions involved are schematic RoE = 14%, FY10E RoE 14.1% and cost of equity = 15.1% using risk free rate = 8.1% and risk premium = 5.4% (both DB country estimates) Target P/BV = 0.9x.

Risks

Key upside risksi) Increase in margins due to improvement in overall liabilities franchise (low cost mix). ii) The present CEO is slated to be there for the next two and a half years or until further directive from the government - stronger initiatives from the top management could sustain the re-rating. Key downside risks i) Higher than expected delinquency rate can result in higher NPLs and consequently higher credit charges thereby suppressing bottomline ii)

Higher cost ratios due to higher than expected wage hikes and pension provisioning due to falling bond yields.

Yes Bank

Valuation

We value YES Bank using a single stage Gordon Growth model with blended RoE of 14.51% (calculated using 25% weightage to FY10 RoE of 18.2% and normalised RoE of 13.27%), cost of equity of 16.2% (using DB risk free rate of 8.1% and risk premium of 5.4% and beta of 1.5 from Bloomberg), perpetual growth rate of 4% (long term sustainable growth rate of developed economies) resulting in a target P/BV multiple of 1x which when multiplied by FY10E adjusted book value gives our target price. The formula applied is P/BV = (RoE - g) / (CoE - g).

Risks

Key upside risk to our hypothesis is a sharp recovery in loan growth accompanied with rise in margins. YES Bank derives large portion of its income from capital market related fees. Pick up in capital market momentum could result in significant improvement in non-interest income. Key downside risks are higher than expected deterioration in asset quality and stagnation of branch network due to unavailability of branch licenses as it could significantly affect low cost deposit mobilisation (CASA) for a small bank like YES Bank.

Stock preference: continue to like private banks

This is clearly contrary to the street preference driven by "low" valuations of PSU banks.

Residual risks lower in private banks though absolute risks are higher

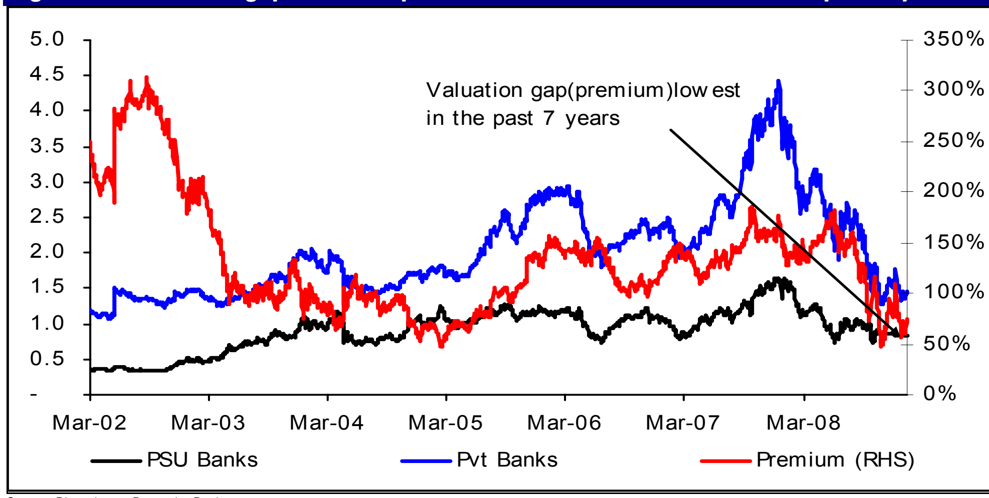
We set out the reasons below:

- The frontline private banks have more seasoned loan books, though the smaller ones are comparatively less seasoned
- Most of them – ICICI is an extreme case – have been judiciously cutting down on growth. PSU banks, on the other hand, driven by SBI, are growing faster now than before. At present, when risks are not decreasing but on the rise, this, in our opinion, is not desirable. The fact that lot of this growth is propelled by huge reductions in lending rates makes matters worse
- PSU banks are more likely to come under pressure from the government to lend more, to keep the economic momentum going. Indeed, lending is being monitored every fortnight and questions asked if a certain segment has not grown well. This could be serious recipe for adverse selection
- All our sensitivity analyses in the previous chapters show that private banks are much better equipped in capitalization terms to take a knock on credit quality. Ratios do not look comfortable for PSU banks. In this environment, we believe that as a strategy, maintaining margins and capital sufficiency deserves a premium, not growth
- Private banks have underperformed in the last six months, in line with global trends
- The fact that private banks have shown rising NPLs whereas PSU banks have not, does not mean that the latter will not happen. To us, this is just a function of where banks are on the asset quality curve – retail NPLs have manifested earlier than corporate NPLs, which are larger for PSU banks. Once corporate NPLs kick in (starting with SMEs), stock prices can react sharply.

- There is or could be growing skepticism on PSU banks' corporate loan books – the fact that they can aggressively restructure and mask NPLs for a long time.

Private sector banks have traded at a premium to PSU Banks consistently in the past. However, it is interesting to note that this premium is now at its lowest in the history though nothing fundamentally has changed in the way they operate. The premium is generally due to better management, better profitability in terms of higher sustainable RoE and also the absence of unpredictability associated with government control. We believe none of those factors have diminished in any way for private sector banks: some of them have now become more pronounced in a pre-election year.

Figure 79: Valuation gap between private and PSU banks lowest in the past 7 years



Source: Bloomberg, Deutsche Bank

We see no reason to change our top picks HDFC Bank and HDFC, with ICICI as the dark horse, where most of the risks have now been discounted. Within public sector banks, we like PNB because of its recent underperformance for apparently no specific fundamental reason; its relatively high margins increase its ability to bear a credit quality shock better, and reasonable capital sufficiency.

Figure 80: Valuation snapshot of our coverage universe

	EPS growth (%)			P/E (x)			P/BV (x)			RoE (%)		
	FY08	**FY09E**	**FY10E**	**FY08**	**FY09E**	**FY10E**	**FY08**	**FY09E**	**FY10E**	**FY08**	**FY09E**	**FY10E**
Private banks												
Axis Bank	36.8	45.2	6.4	9.3	6.4	6.0	1.2	1.0	0.9	17.6	17.7	16.5
HDFC Bank	26.4	24.0	13.7	17.6	14.2	12.5	2.5	2.3	2.0	17.7	16.9	17.1
ICICI Bank	13.1	-6.7	13.2	6.8	7.3	6.5	0.6	0.6	0.6	11.7	8.6	9.2
Kotak Mahindra Bank	77.1	-45.6	-25.6	7.8	14.3	19.2	1.4	1.3	1.2	22.1	9.2	6.5
YES Bank	103.1	33.7	13.0	6.3	4.7	4.1	0.9	0.8	0.7	19.0	19.2	18.2
Average Private banks	**29.6**	**8.8**	**9.0**	**11.5**	**10.6**	**10.0**	**1.5**	**1.4**	**1.2**	**16.0**	**13.3**	**13.2**
PSU banks												
BOB	39.8	29.4	4.2	4.9	3.8	3.6	0.7	0.6	0.6	14.6	15.8	14.6
Bank of India	72.2	45.1	8.4	5.0	3.4	3.1	1.2	0.9	0.7	24.4	25.4	22.3
Canara	10.1	20.5	-7.6	3.9	3.3	3.5	0.7	0.6	0.6	15.0	16.9	14.0
PNB	33.3	37.4	1.0	4.8	3.5	3.4	0.9	0.7	0.6	18.0	20.9	18.0
SBI	39.2	5.8	3.1	5.6	5.3	5.1	1.0	0.9	0.8	17.9	17.6	15.8
Union Bank	64.0	19.7	-17.5	4.4	3.7	4.5	1.1	0.9	0.8	22.1	20.6	14.7
Average PSU banks	**39.8**	**18.6**	**1.4**	**5.3**	**4.6**	**4.5**	**1.0**	**0.8**	**0.7**	**18.1**	**18.6**	**16.3**
Non banks												
HDFC Ltd	16.0	2.9	14.3	17.1	16.6	14.5	2.9	2.6	2.4	20.6	16.6	17.0
IDFC Ltd	33.1	-0.5	-11.9	8.2	8.2	9.3	1.1	1.0	0.9	17.4	13.0	10.5
Average non banks	**22.2**	**-0.5**	**6.5**	**14.4**	**14.3**	**13.2**	**2.4**	**2.2**	**2.0**	**19.6**	**15.4**	**15.1**

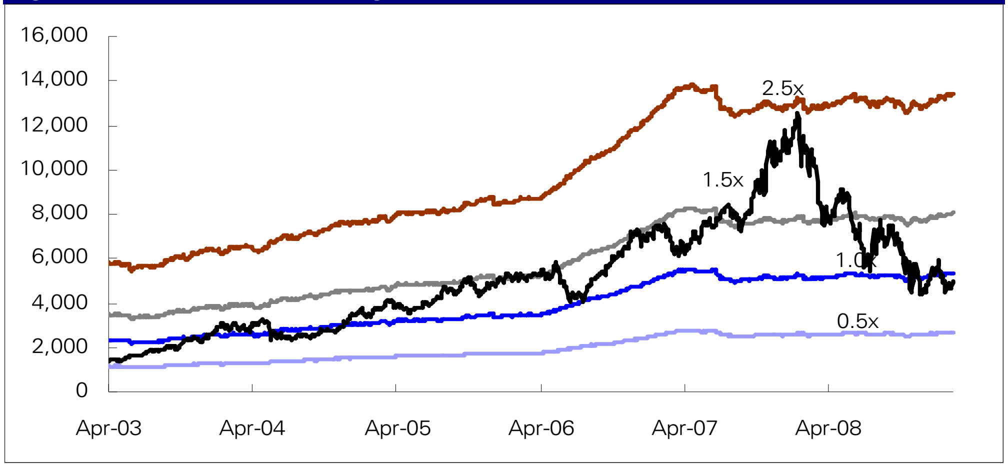
Source: Deutsche Bank

Are the downsides adequately priced in? Appear to be so, in general

We are reluctant to use past valuation trends to assess how much is priced in, though this methodology seems to be convenient and hence popular. We believe that there is significant room for error in directly inferring from past. In our opinion, it is better to have a take on where NPLs can go in stress cases and how much price targets go down as a result.

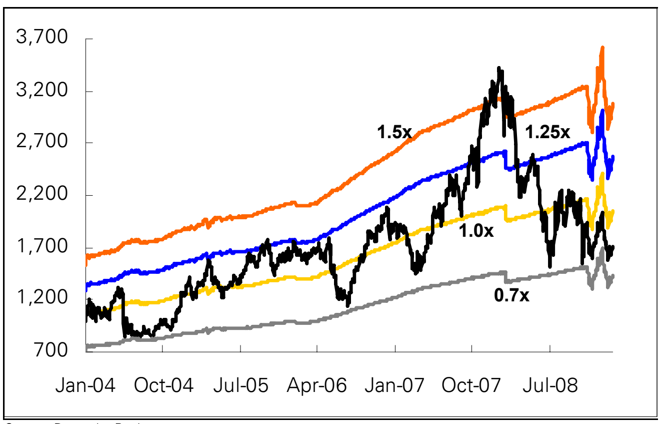
However, for the sake of perspective we have charted out the valuation history for the sector (Figure 81) and different subgroups (Figure 82 & Figure 83). The takeaway is that there has been a significant de-rating of the sector to the valuation levels in the early 2000s, when NPL ratios were 3-5x today. If that suggests that the market is implying a return to those NPLs, we believe it is very unlikely. Other than the drastic circumstantial changes that have happened during this period and outlined elsewhere in this report, the banking system is getting into the impending downcycle with considerable higher preparedness than it did in the previous cycle.

Figure 81: Bankex – P/BV trading bands



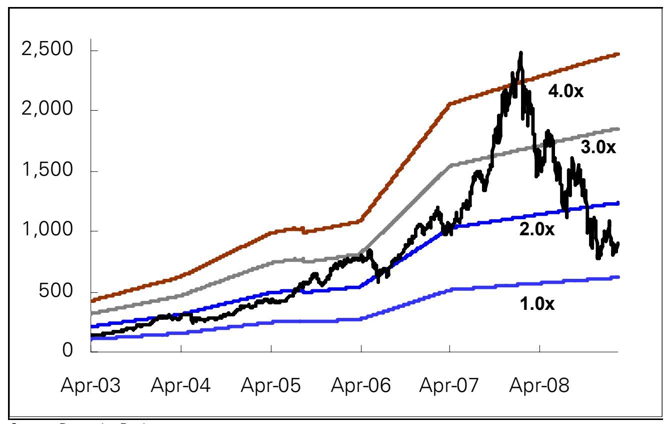
Source: Deutsche Bank

Figure 82: CNX PSU Nifty band charts



Source: Deutsche Bank

Figure 83: DB private financials index band chart



Source: Deutsche Bank

Nuggets of individual banks' valuation histories are noted in Figure 84.

Figure 84: Banks' valuation low points and current valuation

	Lowest P/BV in the last 12 years	Lowest post 2000	Current P/BV
Axis Bank	0.6	0.6	0.9
Bank of Baroda	0.3	0.3	0.6
Bank of India	0.4	0.4	0.7
Canara Bank	0.4	0.4	0.6
HDFC	1.1	1.8	2.2
HDFC Bank	1.8	2.1	2.0
IDFC	1.0	1.0	0.9
ICICI Bank	0.6	0.6	0.9
State Bank of India	0.4	0.4	0.8
PNB	0.2	0.2	0.7
Union Bank	0.3	0.3	0.8
Kotak	0.8	0.8	0.8
Yes Bank	0.6	0.6	0.7

Source: Deutsche Bank Note: Current P/BV is as of Friday March 9th 2009

Another way to judge how well the prices are factoring in further asset quality downturn, sound if not the best way, is to check the TP impact of higher NPLs. It seems that *a situation of 50% higher than estimated NPLs is adequately priced in* – the target prices go down to levels generally higher than current market prices (Figure 85).

Conclusions are similar to the book value impact as all our TPs are based on book value. Note that these increases are over and above the already higher estimated levels, not over the current NPLs

Figure 85: Target price impact of higher NPLs

	With gross NPLs going to				
	2x	3x	50% higher	At peak post 2000	At 15%
Bank of Baroda	-16%	-32%	-8%	-98%	-90%
Bank of India	-11%	-23%	-6%	-54%	-78%
Canara	-26%	-51%	-13%	-56%	-100%
PNB	-17%	-33%	-9%	-66%	-72%
SBI - Consolidated	-22%	-44%	-11%	-35%	-70%
Union Bank	-14%	-29%	-7%	-72%	-89%
HDFC Bank	-16%	-25%	-12%	-13%	-54%
ICICI Bank	-10%	-20%	-5%	-7%	-19%
Axis Bank	-9%	-17%	-5%	-9%	-66%
YES Bank	-5%	-10%	-2%	NA	-57%
Kotak Mahindra Bank	-7%	-14%	-3%	NA	-9%
IDFC	negligible	negligible	negligible	negligible	-21%
HDFC	-3%	-5%	-1%	0%	-38%

Source: Deutsche Bank

However, expect stocks to react to credit quality deterioration regardless of valuations

We believe the market reacts more sharply to changes in asset quality than profits being driven up by treasury gains, i.e. asset quality is fundamentally more important than the rate cycle. Though there is widespread consensus of worsening asset quality, the announcement effect of (say) higher NPLs in quarterly results or higher restructured loans on the balance sheet is likely to be taken negatively by the market. That is why we think that perversely, banks that have already shown rising NPLs (read private sector) are somewhat better off from a valuation perspective than the ones that have not (read PSU banks).

Recent examples illustrating the above point are summarized in Figure 86.

Figure 86: Sharp downward reaction to asset quality deterioration

Banks	Date of results	Quarter	Gross NPAs - Rs mn	QoQ increase	Gross NPA (%)	QoQ increase	1 day performance
PNB	29-Oct-07	2QFY08	47165.7	27%	4.57%	76bps	-5%
Canara Bank	23-Jan-09	3QFY09	25,155	60%	1.94%	63bps	-15%

Source: Company data, Deutsche Bank

Pair trade ideas

- Private basket vs. PSU basket – we have provided reasons above
- Buy HDFC Bank sell SBI – HDFC Bank has shown exemplary margin consciousness through control on growth and superior underwriting standards. It is better capitalized as well.
- Buy PNB sell Canara Bank – the former's much better margins, cost control and better capital position make it a better candidate
- Buy ICICI Bank sell a basket of Union Bank, Bank of Baroda and Canara Bank – a play on the better capitalization theme, as well as less exposure of former on SMEs
- Buy a basket of HDFC Bank and ICICI Bank and sell Axis Bank – play on significant relative differences in seasoning
- Buy HDFC Bank sell Kotak Mahindra – the latter suffers from higher knock on earnings and book value than former in case of higher than expected NPLs

Valuation methodology

We value the core banking business using single-stage Gordon growth model – P/BV = (RoE-g) / (CoE – g) where RoE = blended RoE which is derived using 25% weightage to FY10E RoE and 75% weightage to sustainable/normalised RoE. The sustainable RoE predominantly normalizes for credit costs and leverage ratio. CoE is calculated using DB risk free rate of 8.1% and risk premium of 5.4%, g = perpetual growth rate is assumed to 4% which is a tad below long term sustainable growth rate for India at 5%. The target P/BV obtained using the above formula multiplied by FY10E adjusted book value (adjusted for net NPLs on the book) results in our target price.

For banks which have multiple businesses, we value on sum-of-the-parts basis with banking business being valued using single stage Gordon growth model, insurance business using appraisal value method, asset management and alternative investments using % of AUM and securities and investment banking business on a P/E multiple basis.

Risks

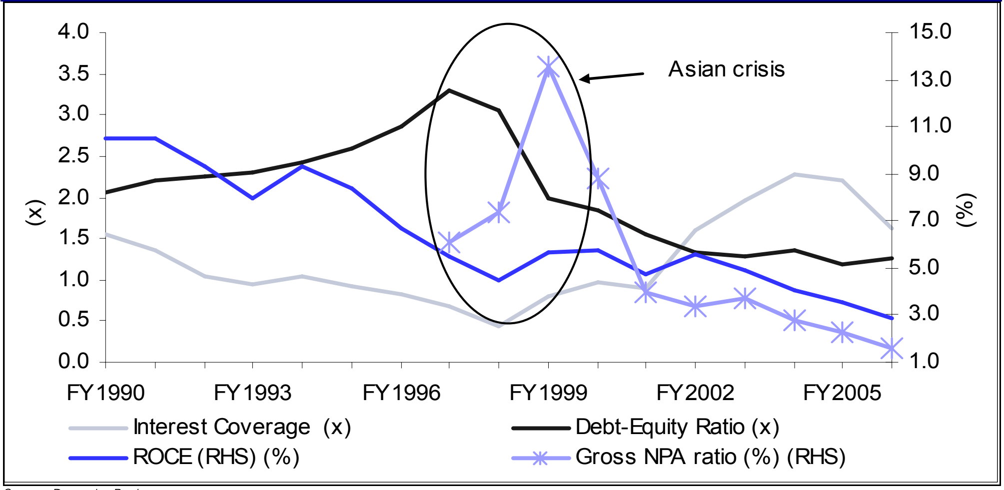
- The biggest risk to our hypothesis is substantial rise in NPLs either due to higher than expected job losses and/or substantially lower corporate profitability thereby resulting in higher delinquencies and consequently higher credit charges.
- Restructuring of unviable proposals merely postpones the problem and could also cause a huge surge in NPLs in case economic growth fails to recover and demand remains substantially weak.
- Ability to cut deposit rates well below the floor set by small-savings schemes could improve margins and offer a cushion against rising credit charges.

Annexure 1: Historical precedent – India & abroad

Lessons from Korea

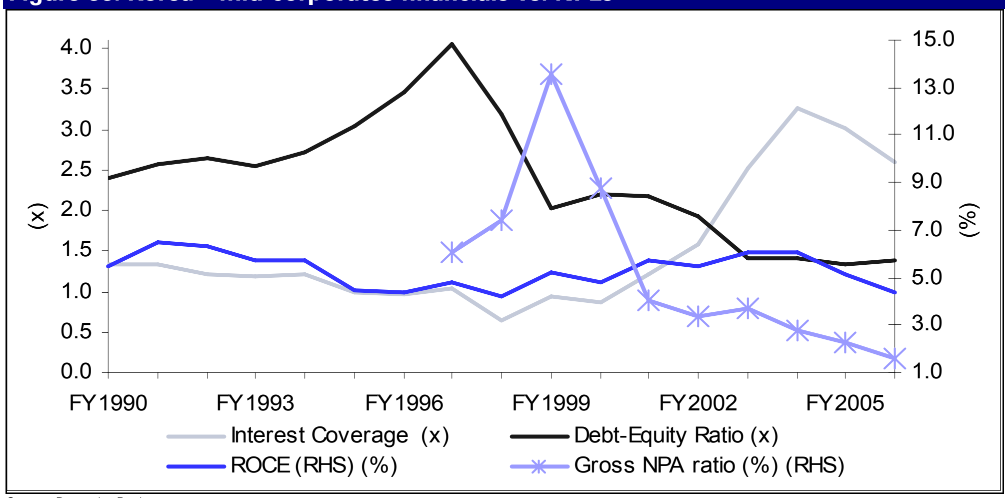
Credit quality directly correlated with corporate financial strength particularly in the earlier years of predominantly corporate lending, which was the case with India too. The upcoming NPL cycle would be driven by a mixture of corporate and retail outlook

Figure 87: Korea – small corporates financials vs. NPLs



Source: Deutsche Bank

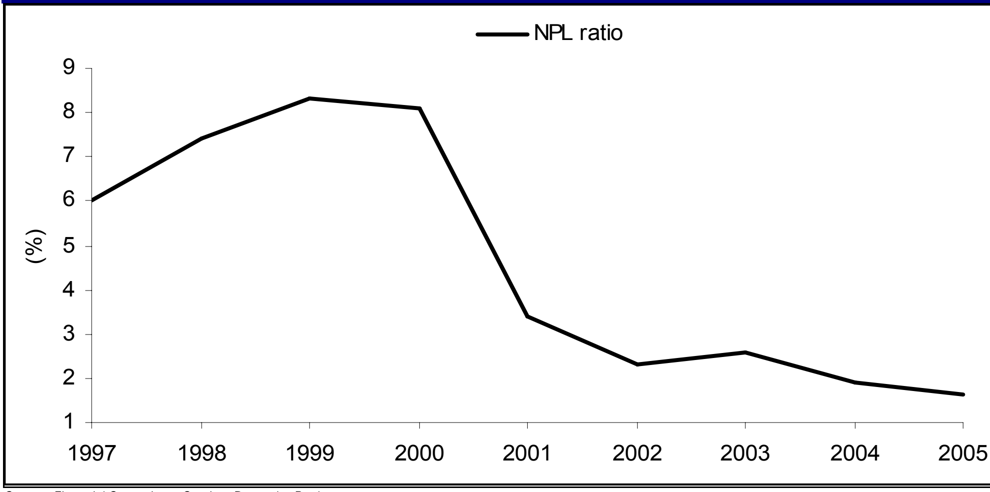
Figure 88: Korea – mid-corporates financials vs. NPLs



Source: Deutsche Bank

Though accounting systems could differ, peak NPLs for India in the 1990s were twice that of Korea. In other words, the notion that Indian banks have not been stress-tested is fallacious

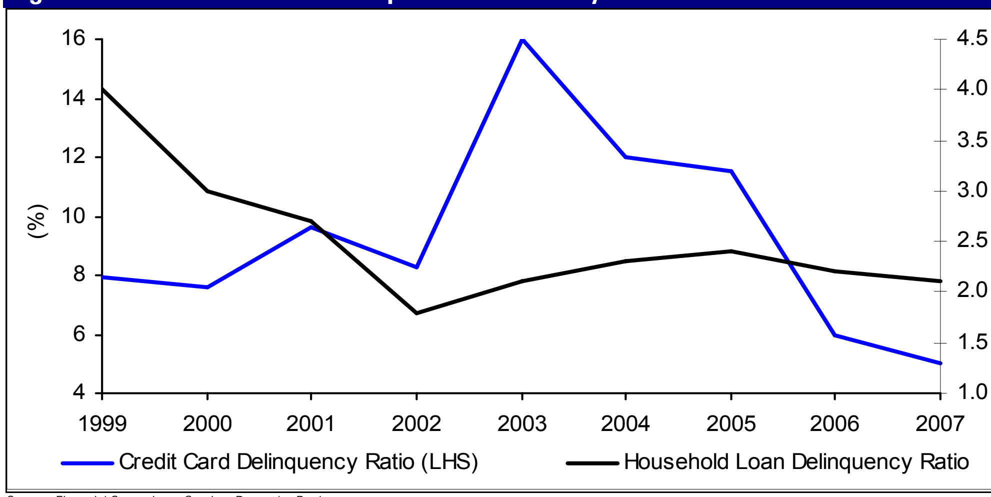
Figure 89: Korea – overall



Source: Financial Supervisory Service, Deutsche Bank

Incidentally, credit card delinquencies are already at levels where Korea peaked, as exemplified by SBI Cards' NPLs

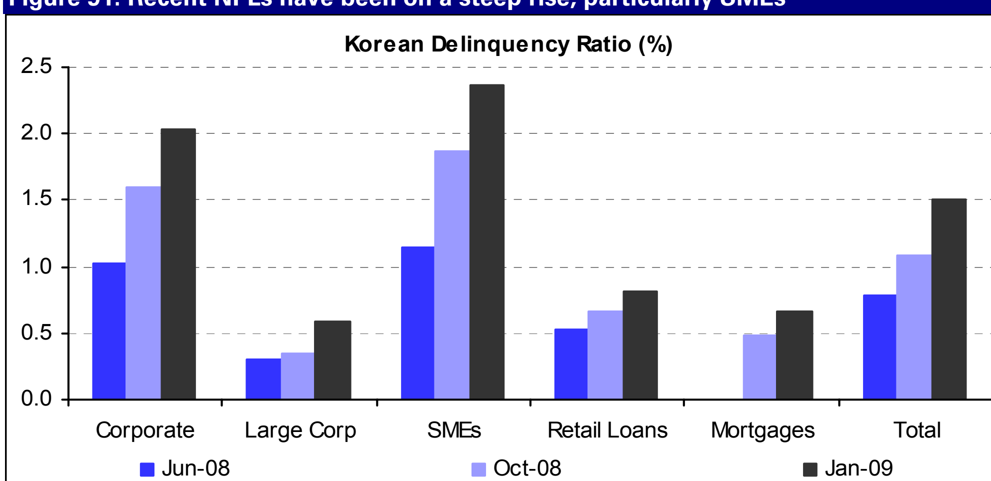
Figure 90: Korea retail loan delinquencies over the years



Source: Financial Supervisory Service, Deutsche Bank

Going by the data provided by BoB – the only bank to do so – it appears that segmental NPLs in India are very similar to those in Korea now

Figure 91: Recent NPLs have been on a steep rise, particularly SMEs

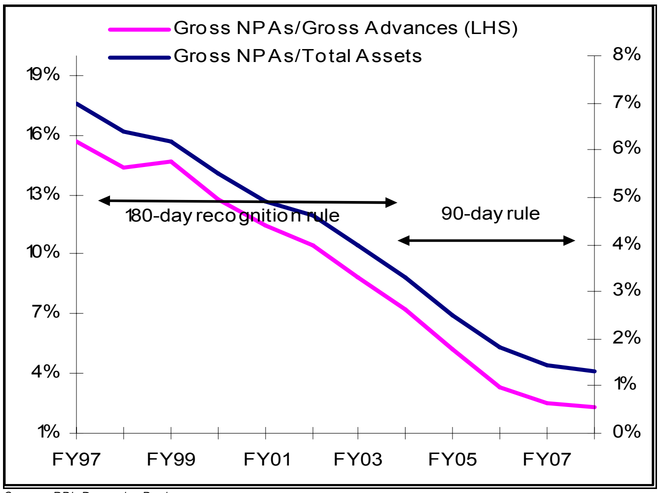


Source: Financial Supervisory Service, Deutsche Bank

Futility of 'what happened last time?'

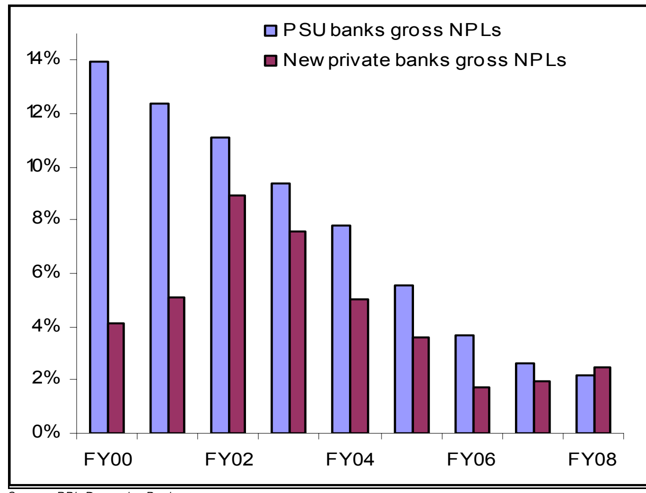
We have been inundated with this question from investors, but the honest answer is that there was no 'last time'. By the same token, it is somewhat irrelevant to argue why (or why not) credit quality deterioration this time around will surpass last time.

Figure 92: NPLs very high in mid-1990s



Source: RBI, Deutsche Bank

Figure 93: Momentum of NPL reduction slackening

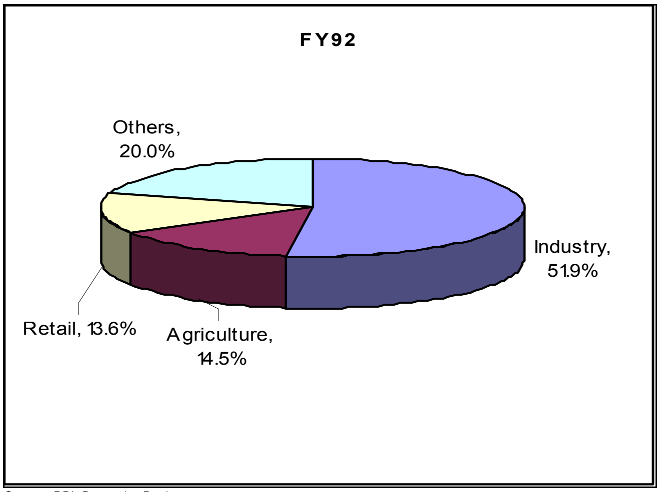


Source: RBI, Deutsche Bank

The subject of differences between the mid-1990s (when India faced an asset quality problem) and now has become clichéd – for the sake of completeness we are tabulating some, but by no means an exhaustive list below:

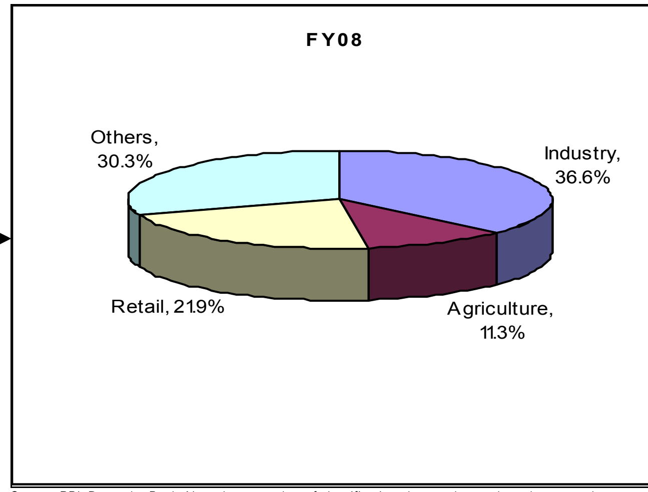
- The portfolio is much more granular, reducing the statistical risk – see Figure 94 & Figure 95
- Corporates are significantly less leveraged
- There is now a foreclosure law, which came into being in 2002
- The inherent discipline has risen due to RBI-mandated exposure norms and Basel II-driven higher risk weights on NPLs as against performing assets

Figure 94: Bank credit composition – FY92



Source: RBI, Deutsche Bank

Figure 95: Bank credit composition – FY08



Source: RBI, Deutsche Bank. Note that a number of classification changes have taken place over the years

Authorities acutely conscious about possibility of a credit quality collapse

To us, the source of greatest comfort is the central bank and government's awareness of this issue, not to forget banks' own awareness, unlike last time when everyone was caught napping. The rapidity with which the RBI has swung from excessively tight monetary policy to a very benign one is noteworthy. Specific vulnerable sectors have been identified and targeted with sops and lifelines. In cases (like lending to non-bank finance companies) where banks have consistently displayed reluctance to lend, special purpose vehicles have been created.

The manner in which it is getting implemented through overt and covert pressure on banks could however lead to adverse selection

Very few realize that the government's concern on banks' risk aversion and caution on lending is well-intentioned under these circumstances. The system has not forgotten that the Asian crisis was caused by abrupt withdrawal of banks after a period of liberal lending. For details of a whole slew of recent measures see Annexure.

Certain global beliefs on credit quality may not hold

Myth no 1: if house prices drop borrowers will start defaulting

This does apply to speculative borrowing for property investment purposes but very rarely applies to borrowing for self-occupation. We understand from HDFC that 95% of the home buying is for the first home, an indication of the high level of self-occupation. Even second home need not be for investment purposes, e.g. one purchased for children.

To the extent defaults are triggered by the gloom factor of falling house prices, the seasoning of home loans gives us some comfort. Home loan growth has been really low in the last two years. Most of the loans were originated in 2005 and 2006, when competition could have been intense but property prices were just on the rise. Prices peaked sometime in early 2008. The book thus has a large cushion to bear a price decline.

The nearly omnipresent black (unaccounted) component of 10-40% in a housing transaction acts as additional home equity for the borrower – by definition, the LTV is decided on the disclosed value, but the whole house is hypothecated to the lender.

Even if the initial LTV was 80-85% in some risky cases, the effective LTV on the same could be more like 50% due to rise in prices and principal amortization

The teaser loans that spurred the sub-prime crisis in the US do not exist in India. Home loans in India have been largely benchmarked to income and hence repayment capacity; any borrower for whom the property price made the house unaffordable would not have been lured just by low interest rates. The teaser loans started by some banks very recently are also relatively safer because the low rate gets reflected in faster principal amortization rather than as a lower monthly outgo – hence comparatively lesser chance of adverse selection.

The right way to look at this issue is that *if a price decline is accompanied by loss of income* then that will incite delinquencies.

Myth no 2: since government will recapitalize PSU banks, impact of NPL increases will be less concerning

This is akin to suggesting that sub-prime stricken banks are good investments as respective governments will bail them out. A bailout or recapitalization ensures survival and retains confidence in the financial system, but it hurts minority shareholders as the equity is devalued. Also, as we have seen in a number of cases around the world, a large capital infusion by the government comes with several operating restrictions. Indian PSU banks are already trading at very low valuations, largely a result of state ownership.

Arguably, PSU banks with vast rural franchises should have appreciated the nuances of tractor financing better

In India the relationship between ownership and asset quality is tenuous (indeed, many scholarly articles establish this weak correlation *globally*). The general belief that PSU banks have been cautious in growing does not explain why even today some of them post home loan NPLs of 4% when even the weaker ones within the private sector have come down to 2-2.5%. Two years ago, there was a near *en masse* exit of PSU banks from tractor financing after a surge in delinquencies. At the same time, we have seen some indiscreet private banks and reckless non-bank financiers.

Myth no 3: provision coverage numbers dropping is a negative

Actually provision coverage numbers are most likely to drop in the coming years as NPLs rise. This is because both from a regulatory as well as prudential standpoint, provisions made on young NPLs are much lower than those on mature NPLs.

Why do banks not make higher provisions because of the cycle? Because the RBI has made the use of floating (unallocated) provisions next to impossible. As a result, auditors are also cagey about higher allocated provisions which could in spirit violate the RBI norm.

Annexure 2: Corporate default risk assessment models

Altman-Z score

Introduction

Altman Z-Score is a multivariate formula that measures the financial health of a company and predicts the probability of its bankruptcy. The score was developed in 1960s by Edward Altman. **Studies measuring the effectiveness of the Z-score have shown the model to be accurate with >70% reliability**.

How does the score/model work?

The predictive model combines 5 different business ratios (using 8 variables) - as per the weighting system devised by Altman, to calculate a score (Z score). The score and its interpretation differ as per the nature of the concerned industry. The weighting system was primarily based on data from manufacturing firms - from publicly held manufacturers, but has since been modified for private manufacturing, non-manufacturing and service companies.

Components of Z-score:

The calculation of Z score is as follows: Z = 1.2T1 + 1.4T2 + 3.3T3 + .6T4 + .999T5. The 5 ratios and their respective weight factor are as follows:

Figure 96: Components of Z-Score

Ratio	Symbol	Weightage	Description
Working Capital / Total Assets	T1	x 1.2	Measures liquid assets in comparison to the size of the company
Retained Earnings / Total Assets	T2	X1.4	Measures the earning power in comparison to the size of the company
EBIT / Total Assets	T3	x. 3.3	Measures the operating efficiency - recognizing operating profit as a leading indicator for its long term existence
Market Value of Equity / Total Liabilities	T4	x 0.6	Measures market dimension of the matrix - We have used book value here
Sales / Total Assets	T5	x 0.999	Measures the sales turnover

Source: Deutsche Bank

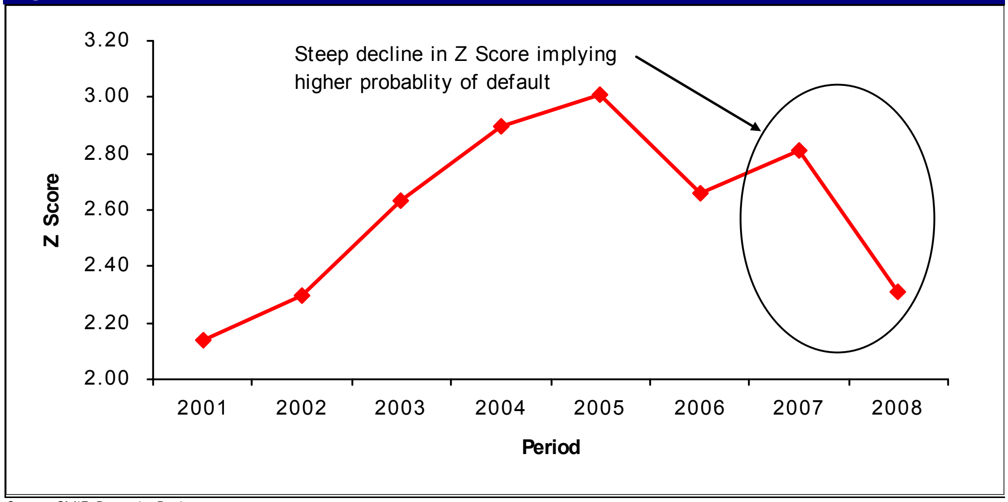
Accordingly, the companies are categorized as per their Z scores:

- Z > 2.99 implies that under current scenario the company is under "Safe" zone
- 1.8 < Z < 2.99 implies that under current scenario the company is under "Grey" Zone
- Z < 1.80 implies that under current scenario the company is under "Distress" Zone

Z-Score model on Indian auto ancillaries industry – an example

A sample study on 425 companies of the Indian auto ancillaries sector reveals that over the last seven years, this sector has remained in the "Grey Zone" except for CY2004 and CY2005 when it was in the safe zone. The Z score deteriorated sharply to 2.31 in 2008 from 2.81 in 2007, which is reflective of the tough global macroeconomic environment and its consequent fallout on export-oriented sectors like auto ancillaries in India.

Figure 97: Auto ancillaries – Trends in Z Scores over the past 8 years



Source: CMIE, Deutsche Bank

Merton's risk-neutral default probability

Introduction

Merton model is also a popular approach to credit-risk modeling. The approach is referred to as the "structural approach" because it relies entirely on the capital structure of the firm (viz: debt and equity) for modeling credit risk. The model generates a probability of default for each firm/sector at any given point in time. To calculate the probability, the model subtracts the face value of the firm's existing debt from an estimate of future market value of the firm and then divides this difference by an estimate of the volatility of the firm scaled to reflect the horizon of the forecast). The resulting score which is referred to as the distance to default, is then substituted into a cumulative density function to calculate the probability that the market value of the firm will be less than the face value of the debt at the forecasting horizon.

As inputs, Merton's model requires the following

- Current value of company's assets
- Volatility of company's assets estimated using market value of company's equity
- Outstanding debt
- Debt maturity

Merton model on Indian auto ancillaries industry – an example

Applying Merton model on Indian auto ancillaries industry results in conclusions similar to the Altman Z-Score model. We selected top 5 listed auto-ancillaries companies in India and applied Merton model to each of those. All of them resulted in higher probabilities of default consistent with our conclusions obtained from Z-Score model. Similar analysis was also carried out across 12 other sectors. We aren't disclosing the details pertaining to our application of Merton Model as the analysis is far too complicated with numerous assumptions and beyond the scope of this report.

Annexure 3: List of recent monetary/fiscal measures

Figure 98: Recent government and RBI measures to stimulate the economy

Period	Type	Measures announced	Impact (Rs bn)
6-Oct-08	Monetary	RBI reduces CRR by 50bps	200
10-Oct-08	Monetary	RBI reduces CRR by 100bps more to 7.5%	400
15-Oct-08	Monetary	RBI reduces CRR by 100bps more to 6.5%	400
15-Oct-08	Monetary	Liquidity support through relaxation in SLR of up to 1.5% of their NDTL, exclusively for funding NBFCs and MFs	600
15-Oct-08	Monetary	Reserve Bank has decided to provide temporary liquidity support to NABARD and scheduled banks	250
20-Oct-08	Monetary	RBI cuts repo rate by 100bps	
29-Oct-09	Monetary	Enhancement of NBFCs' capital raising option for capital adequacy purposes by issue of Perpetual Debt Instruments (PDI) which shall be eligible for inclusion as Tier I Capital to the extent of 15% of total Tier I capital as on March 31 of the previous accounting year	
1-Nov-08	Monetary	RBI cuts repo(50bps), CRR(100bps), SLR(100bps)	800
1-Nov-08	Monetary	Special refinance facility under which all scheduled commercial banks are provided refinance from RBI equivalent to up to 1% of each bank's NDTL as on October 24, 2008 at the LAF repo rate up to a maximum period of 90 days	
15-Nov-09	Monetary	Housing Finance Companies, registered with National Housing Bank (NHB) can raise short- term foreign currency borrowings, under approval route, max amount not exceeding 50 per cent of the NOF or $10m, whichever is higher.	
15-Nov-09	Monetary	Provisioning requirements for all types of standard assets stand reduced to a uniform level of 0.4% except in the case of direct advances to agricultural and SME sectors, which shall continue to be 0.25%	
15-Nov-09	Monetary	All unrated claims, long term as well as short term, regardless of the amount of claim, on the corporates shall attract a uniform risk weight of 100 per cent. Claims secured by commercial real estate would attract a risk weight of 100% as against the extant risk weight of 150%. Claims on NBFC-ND-SI shall be uniformly risk weighted at 100%	
15-Nov-09	Monetary	Export Credit Refinance Facility: Relaxation the eligible limit of export credit refinance (ECR) facility has been enhanced from the existing level of 15% of the outstanding rupee export credit eligible for refinance to 50%.	220
24-Nov-09	Monetary	Banks can now avail of the special regulatory treatment on restructuring of home loans with the earlier cap of 10 years lifted. Restructured housing loans should be risk-weighted with an additional 25 % points. Previously, risk weight was 50% on loans up to Rs 3m and 75 percent on loans of Rs3m+	
6-Dec-08	Monetary	RBI cuts repo and reverse repo by 100bps	
Dec-08	Fiscal	Additional plan expenditure of up to Rs 200 billion	200
Dec-08	Fiscal	Rs 3.50 billion additional funds for export incentives	
Dec-08	Fiscal	Rs 11 billion to ensure full refund of Terminal Excise duty	
Dec-08	Fiscal	Additional Rs 14 billion for textile sector under TUF Scheme.	
Dec-08	Fiscal	The guarantee cover for loans to MSME doubled to Rs 10 million	
Dec-08	Fiscal	Interest subvention of two percent on export credit for labour intensive sectors	
2-Jan-09	Monetary	RBI cuts repo(100bps), CRR(50bps), reverse repo(100bps)	200
2-Jan-09	Monetary	NBFCs, dealing exclusively with infrastructure, can access ECB from multilateral or bilateral financial institutions	
3-Jan-09	Fiscal	Recapitalisation of around half-a-dozen public sector banks to be done in next FY	200
Jan-09	Fiscal	India Infrastructure Finance Company enabled to access in tranches an additional Rs300bn through tax-free bonds to fund additional projects of about Rs750bn over the next 18 months	300
Jan-09	Fiscal	Across-the-board 4% cut in excise duty to bring down the prices of cars, cement, textiles and other products	
Jan-09	Fiscal	States allowed to raise in the current financial year additional market borrowings of 0.5% of Gross State Domestic Product (GSDP), amounting to about Rs300bn for capital expenditure	
Jan-09	Fiscal	Interest rate ceiling on external commercial borrowings (ECBs) scrapped under RBI approval route	
Jan-09	Fiscal	SPV to provide about Rs250bn support against investment-grade paper to NBFCs fulfilling certain conditions.	250
Jan-09	Fiscal	States allowed to raise in the current financial year additional market borrowings of 0.5% of Gross State Domestic Product (GSDP), amounting to about Rs300bn for capital expenditure	
Feb-08	Fiscal	Across-the-board cut in excise & service tax by additional 2%. Excise duty on bulk cement fixed at 8% or Rs 230/ tonne.	290
Mar-08	Monetary	RBI cuts repo, reverse-repo by 50 bps	
Total			**4,310**

Source: RBI. Finance Ministry, Deutsche Bank

Appendix 1

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Buy: Based on a current 12- month view of total share-holder return (TSR = percentage change in share price from current price to projected target price plus pro-jected dividend yield) , we recommend that investors buy the stock.

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2. Ratings definitions prior to 27 January, 2007 were:

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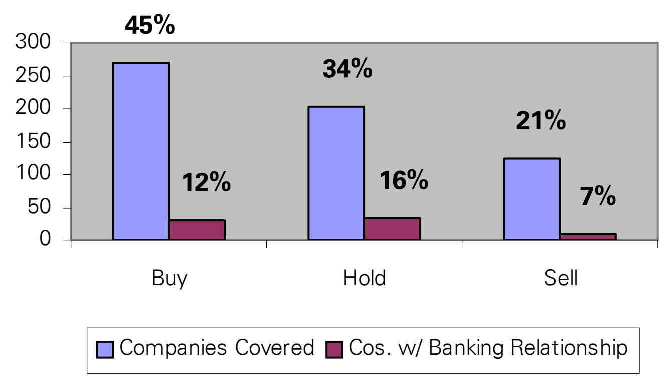

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