Company

Deutsche Bank Global Markets Research

September 2011

Deutsche Bank

Global Research

Global Banking Sector – Credit quality in a deleveraging world

Emerging Markets Focus

Dan Harverd, Mario Pierry, Chris Ellerton and Global Banking Sector Team

Theme

Against a background of 30%-plus falls in bank share prices around the world and growing fears of a severe blow to the European bank sector in the event of a sovereign debt default, we have developed a danger map and stress testing screens to look at the resilience of loan portfolios within different countries' banking systems and the individual banks within them. In this analysis we examine the prospects for post crisis scenarios through the perspective of other severe shocks to international or domestic banking systems, including the Latin American debt crisis of the 1980's, and the debt deflation crises of Sweden in 1990 and Japan, Thailand and Hong Kong from 1997 onward.

Deutsche Bank AG/London

Research Team

UK/Europe

Matt Spick
+44(20)754-57895
matt.spick@db.com

Jason Napier
+44(20)754-74433
jason.napier@db.com

Carlos Berastain
+34-91-3355-971
carlos.berastain@db.com

Carolyn Dorrett
+44-20-7547-3133
carolyn.dorrett@db.com

Alexander Hendricks
+49-69-9104-5864
alexander.hendricks@db.com

David Lock
+44-20-7541-1521
david.lock@db.com

Paola Sabbione
+39-02-8637-9704
paola.sabbione@db.com

Jan Wolter
+46-8-463-5519
jan.wolter@db.com

Dimitris Giannoulis
+302-10-725-6174
dimitris.giannoulis@db.com

SebastianYoshida
+44-20-7545-6489
Sebastian yoshida@db.com

USA

Matthew.O'connor
+1(212)250-8489
matthew.o-connor@db.com

Michael Carrier
+1(212)250-6600
michael.carrier@db.com

Head of Global Sector Product:
Richard Beaurepaire

Adam Chaim
+1-212-250-2966
adam.chaim@db.com
Noah Gunn
+1-212-250-7970
noah.gunn@db.com

David Ho
+1-212-250-4424
david.ho@db.com

Matt Klein
+1-212-250-3088
matthew.klein@db.com

Robert Placet
+1-212-250-2619
robert.placet@db.com

Chris Voie
+1-212-250-5085
chris.voie@db.com

LATAM

Mario Pierry
+55-11-2113-5177
mario.pierry@db.com

Tito Labarta
+1-212-250-5944
tito.labarta@db.com

Marcelo Cintra
+55-11-2113-5095
marcelo.cintra@db.com

Asia

Tracy. Yu
+852 2203 6186
tracy.yu@db.com

Andrew Hill
+65 6423 8507
andrew-d.hill@db.com

Sophia Lee
+852 2203 6226
sophia.lee@db.com

Jee Hoon Park
+82 2 316 8908
jeehoon.park@db.com
Judy Zhang
+852 2203 6193
judy.zhang@db.com

Clara Jung
+82 2 316 8835
clara.jung@db.com

Raymond Kosasih
+62 21 318 9525
raymond.kosasih@db.com

Arinta Harsono
+62 21 318 9519
arinta.harsono@db.com

Sukrit Khatri
+852 2203 5927
sukrit.khatri@db.com

Manish Shukla
+91 22 6658 4211
manish.shukla@db.com

Rafael Garchitorena
+63 2 894 6644
rafael.garchitorena@db.com

JAPAN

Yoshinobu Yamada
+81-3-5156-6754
yoshinobu.yamada@db.com

AUSTRALIA

James Freeman
+61-2-8258-2492
james.freeman@db.com

Andrew Triggs
+61-2-8258-2378
andrew.triggs@db.com

James Wang
+61-2-8258-2054
james-z-wang@db.com

CEEMEA

Dan Harverd
+972-3-710-2019
dan.harverd@db.com

Bob Kommers
+7-495-933-9223
bob.kommers@db.com

Kazim Andac
+90-212-319-0315
kazim.andac@db.com

Ryan Ayache
+971-4-428-3781
ryan.ayache@db.com

Stefan Swanepoel
+27-11-775-7369
stefan.swanepoel@db.com

Rahul Shah
+971 -4 4283-261
rahul.shah@db.com

Marcin Jablczynski
+44-22-579-8733
marcin.jablczynski@db.com

Hilal Varol
+90-212-319-0332
hilal.varol@db.com

Contents

Table of Contents

The authors of this report wish to acknowledge the contributions made by Sudhanshu Gaurav of Evalueserve, a third-party provider to Deutsche Bank of offshore research support services.

Fundamental theme: Charting a danger map for a crisis prone and credit troubled world

Against a background of 30% plus falls in bank share prices around the world and growing fears of a body blow to the European bank sector in the event of a sovereign debt default, we have developed a danger map and stress testing screens to look at the resilience of loan portfolios within different countries' banking systems and the individual banks within them. In this analysis we also look at this "post crisis environment" through the perspective of other severe shocks to international or domestic banking systems, including the Latin American debt crisis of the 1980's, and the debt deflation crises of Sweden in 1990 and Japan, Thailand and Hong Kong from 1997 onwards

INDUSTRY Factors/Drivers

1. **Credit growth trends are divergent:** Since 2007/08 there have been three clear trends: (i) loan growth in emerging markets has accelerated; (ii) private sector credit growth within developed economies has been grinding down, (iii) overall debt to GDP ratios have risen sharply, courtesy of large scale issuance of government debt**.**
2. **Credit quality in EM is potentially fragile:** Non-performing loans are still at elevated levels in CEE, Russia and Brazil, while credit costs across EM are at mid-cycle levels. Credit quality is susceptible to deterioration in the economic backdrop.
3. **The system can cope with a severe credit cycle** Since capital ratios are high and pre-provision profitability is robust we find that on paper at least, bank sectors can cope with a normal (i.e. non Sovereign) but severe credit cycle.
4. **At one level it's a classic post-crisis formbook:** Looking back at severe banking crises we observe 4 common features over the 4 following years: very slow real GDP growth, an average 150% increase in government debt, a contraction in domestic loan markets, and a reversion towards mean in private sector debt to GDP ratios
5. **But on a different level it's a "recovery environment" like no other, at least since the 1930's:** i.e. record low interest rates, record high private sector plus government debt levels to GDP and a real possibility of serial sovereign default

Key THINKING

1. **Downgrades to global growth** assumptions are occurring at a time when total debt to GDP ratios are close to record highs Markets may be overestimating loan growth rates in 2012E and 2013E.
2. **Bad debt charges drive earnings estimates:** in emerging markets bad debt charges are forecast to be relatively flat in 2012E, after falling sharply from 2009 highs. Quite modest adjustments to credit quality assumptions would have a significant impact on estimates.
3. **EM banks would remain profitable in downturn:** On our screens, if the credit cycle turns down the US banking industry outperforms Europe, where a severe cycle puts much of the system in loss. Emerging market bank sectors, with higher pre-provision profit margins, remain quite profitable
4. **Leveraging up in a deleveraging world:** Private sector debt-to-GDP ratios are much lower in EM than DM. However the rate of increase in EM leverage has been rapid since the global financial crisis, during an era of deleveraging in much of the developed world. These divergent trends lead to the question whether an equilibrium level exists.
5. The possibility of renewed crisis is never remote in this environment; we find cross border exposures to the periphery public sectors modest relative to the 1980's LatAm crisis, but a potential breakup of the currency adds dimensions to balance sheet destruction which are difficult to model.

THEMATIC WINNERS AND UNDERPERFORMERS

- **Valuations** at least now discount a gloomy although not an extreme outcome. But in this environment we expect cost of capital to remain very high. The Eurozone crisis poses a double jeopardy for the global bank sector first through potential losses from government bond holdings and secondly via the negative feedback loop from financial markets and consumer and business confidence onto the key variables of volume growth and loan quality
- **Our danger map suggests** that the sources of credit risk in EM stem mainly from the increase in credit penetration, the maturity of the cycle and credit mix. The level of interest rates, a tightening of regulatory standards and low unemployment rates are currently supportive. In addition credit standards have improved since the last recession as banks have improved risk management systems and tightened underwriting standards. Emerging markets score a little lower than developed markets on macro risk and have more attractive industry fundamentals although much higher valuations. Their problems look far more manageable and there are more policy options for them.
- **We prefer lower beta stocks with strong capital,** above average pre-provision profitability and superior asset quality metrics: PKO BP, Halkbank, Sberbank, Bradesco, Itau Unibanco, and Banorte.

Executive summary

Credit quality in a deleveraging world

The dramatic decline in bank share prices over the last three months has taken place against a background of downward revisions to global growth estimates and deterioration both in the economic reality (lower growth/higher fiscal deficits) of the European Sovereign Debt Crisis and the political consensus on how to deal with or contain it. The bank sector is unusually sensitive to the economic outlook firstly because the combination of private sector debt to GDP and government debt to GDP stands at all time highs, and secondly because the assumption that credit quality improves accounts for around 90% of estimated 2011 earnings growth and 35% of 2012 earnings growth in developed markets. Whatever the ultimate outcome of the Eurozone crisis, the bottom line to us is that the problems in the periphery economies, Italy and Spain, are potentially quite to very negative for the GDP outlook, may put further pressure on normal asset quality measures, and possibly set the scene for a "super severe" downturn in credit quality with unquantifiable spill-over effects.

Figure 1: Private and Public Sector Debt to GDP (%): Developed Economies

	2003	2004	2005	2006	2007	2008	2009	2010	Change from 2003	Change from 2008
USA	197	202	205	215	222	239	246	245	48	6
Australia	107	109	114	119	125	132	145	146	39	14
Japan	272	281	282	277	278	299	314	320	48	21
UK	152	159	165	171	182	195	216	218	67	23
Sweden	142	142	154	165	180	196	210	202	59	6
France	146	150	155	157	164	171	184	195	49	24
Germany	189	188	189	182	174	178	189	198	9	20
Greece	157	166	176	191	200	216	233	254	97	39
Ireland	140	158	182	198	217	243	271	266	126	23
Italy	171	172	178	184	186	189	195	210	40	21
Portugal	176	183	210	216	223	237	256	261	85	24
Spain	156	164	175	191	201	211	227	247	91	36
Median	157	165	177	187	193	203	222	232	54	22

Source: IMF, various central banks, Deutsche bank estimates of median values.

How to make money in this deleveraging environment

It is axiomatic first that it is very difficult to make money in financial stocks during a period in which the market anticipates a financial crisis; and second that such periods can be productive for long-term investors, providing there is no recapitalization requirement, as stocks tend to price in a very high cost of equity before, during and in the aftermath of a crisis, which subsequently declines. Our danger map, which we discuss below, suggests there are parts of the world where bank sectors are not particularly risky. These include Japan, the Nordic countries, Australia and Germany in developed markets and Thailand, Malaysia, Indonesia and Mexico in emerging markets. The danger map also suggests that the Eurozone countries generally are not attractive even in the absence of a crisis (see Matt Spick's report *European banks Strategy: Ex-growth and challenged: a bleak outlook for banks* 24th August 2011), and we find it surprising that the deleveraging process in Europe is so slow relative to the US and UK.

We think that within developed markets there will be long-term winners in this environment. These include the names that have the combination of financial strength and strategic/geographic positioning to take market share or extend their foot print, or which simply have the capital strength to pay dividends and weather further turbulence without diluting their shareholders. In the US this category would include Wells Fargo and JP Morgan and in Europe, Barclays and BNP Paribas. In Japan we find SMFG attractive and in Australia ANZ. In spite of the slightly elevated risk scores in our danger map we believe that Brazil's Itau Unibanco and China's China Construction Bank will outperform the bank sector. In Emerging Europe we like PKO Bank Polski.

Crisis . . . what crisis?

In this report we ask a number of questions including: just what kind of post crisis environment are we in? We attempt to answer this by looking back through the rear view mirror of past crisis environments and conclude that in developed economies at least we are in an environment like no other: debt levels are at all time highs, interest rates are at 200 year lows, and there is a real risk of developed country sovereign defaults for the first time since 1936. In the most severe crises we identify that have taken place against the background of asset price and debt deflation shocks we find that: government debt rises very sharply, real GDP growth over a four year period is very slow, the stock of private sector debt contracts or grows very slowly, and the ratio

of credit to private sector credit to GDP declines and in some instances starts a multiyear journey to mean reversion. The major difference between these past post crisis environments and this one is that in previous post crisis periods the expansion in government debt levels started from much lower levels and that government credit was considered good.

Figure 2: Crises Compared

	Sweden 1990/94	Australia 1990/94	Hong Kong 1997/01	Thailand 1997/01	Japan 1997/01	Average	UK 2008/12E	USA 2008/12E	Ireland 2008/12E
Cumulative increase in nominal GDP t-1 to t+4	0.0%	24.1%	5.7%	15.2%	-3.0%	8.4%	12.9%	12.9%	-15.3%
Cumulative increase in real GDP t-1 to t+4	-0.1%	12.6%	9.8%	-1.3%	2.4%	4.7%	2.6%	8.7%	-7.4%
Increase in Government debt t-1 to t+4	114%	132%	NA	322%	49%	154%	121%	87%	310%
Increase in bank lending t-1 to t+4	0%	10%	-14%	-13%	-9%	-5%	10%	4%	-42%
Govt debt to GDP Ratio t -1 (%)	28	17	NA	15	100	40	44	62	25
Govt debt to GDP Ratio t +4 (%)	62	31	NA	54	153	75	87	103	114
Bank loans to GDP ratio t (%)	93	81	149	129	106	112	143	174	192
Bank loans to GDP Ratio t+4 (%)	88	76	138	72	100	95	135	159	149

Source: Deutsche Bank

We conclude that we are in a deleveraging and possibly deflationary environment, which is likely to be crisis prone and of long duration. We find that in the instances where mean reversion of debt to GDP ratios takes many years (Japan 1989 to 2003; Thailand 1997 to 2006; Hong Kong 1997 to 2006) that bank stock performance is poor but when the adjustment in debt to GDP is relatively shallow (Australia, Sweden) bank shares perform strongly once the market starts to focus on earnings power and valuation.

Credit quality in 2011

We ask what credit quality looks like within the global banking system and we draw the following broad conclusions. First that it the developed economies it appears to have been stabilizing in 2010 and 2011 but that it is very fragile. Second, that in emerging markets, credit quality metrics are so good that it is doubtful whether they can be sustained and might deteriorate very suddenly on adverse economic developments give the very rapid pace of credit growth, the major expansion in credit to GDP ratios and the real possibility that undervalued currencies and/or hot money inflows are contributing to asset price and credit bubbles.

In the UK and Europe, the quantum of non-performing loans is quite high and the ratio of provisions to non-performing loans is quite low, making the sector vulnerable to the risk of re-provisioning and to new non-performing loan formation, although so far, credit quality has been protected by surprisingly resilient house prices. In the US, credit quality is improving but the system is highly sensitive to real estate values as well as to employment levels and GDP growth.

We find that quite modest adjustments to credit quality assumptions have quite a significant impact on earnings estimates.

Figure 3: Index of House Prices: Developed Markets

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% ch from high/low
USA	100	111.3	129.2	149.1	150.2	136.2	110.7	107.2	104.6	-30%
Australia	100	118.2	125.9	127.7	137.7	153.3	160.0	165.5	185.7	186%
Japan	100	93.6	87.8	83.4	81.1	81.4	82.8	79.9	76.2	-24%
Hong Kong	100	88.0	119.7	140.0	137.2	148.2	176.4	172.8	212.6	213%
UK	100	119.5	139.9	147.1	156.5	170.8	159.3	147.5	156.1	-9%
Sweden	100	109.8	120.0	129.0	144.4	158.7	150.6	165.9	174.6	174%
France	100	111.7	128.7	148.4	166.3	177.3	179.4	166.7	177.2	-1%
Germany	100	100.5	100.1	100.5	101.0	102.1	103.3	104.8	106.8	7%
Greece	100	105.4	107.8	119.6	135.1	143.5	145.7	139.4	136.6	-5%
Ireland	100	113.7	123.5	135.0	150.9	139.9	127.1	104.5	93.2	-38%
Italy	100	106.1	112.6	121.3	128.1	134.7	138.2	137.7	137.8	-1%
Spain	100	116.3	132.9	147.2	156.4	159.7	154.6	142.7	133.8	-16%

Source: Deutsche Bank

Danger maps and stress screens

Turning to the potential resilience of the global banking system to a "normal" (i.e. non sovereign) credit cycle we ask whether it can cope with a severe credit downturn.

In this report we assess credit risk through two screening methodologies. First, we develop a danger map or score card to measure macro and system risk and second we assess the resilience of national banking systems to a major hike in bad debt provisions and to stressed pre-provision profits.

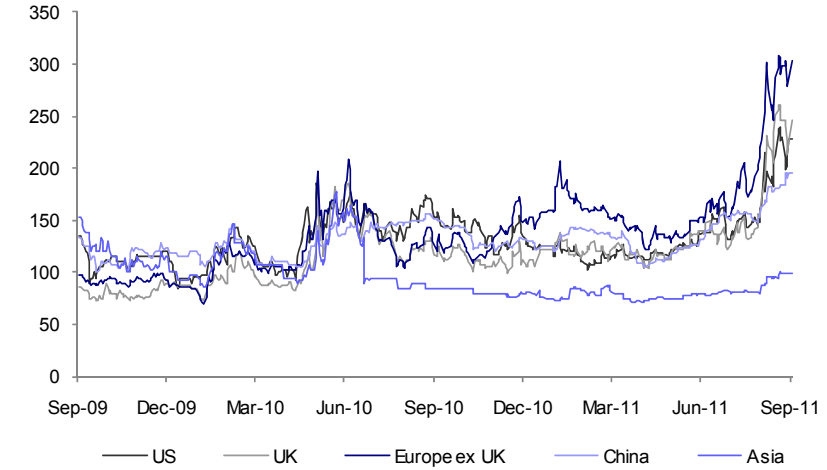
Our danger map scores 9 macro factors on a 1 to 5 basis with 5 being most risky or dangerous. The score card makes no comment on such industry fundamentals as profitability or earnings growth but concentrates on vulnerability to a downturn in the credit cycle. We find that in the developed economies Japan, Australia, Sweden, Germany and Hong Kong are the least risky countries; that Europe's periphery countries and Spain are the most risky; and that the US scores slightly below average in terms of risk and the UK is around average.

Turning to emerging markets we find that their average score is a little below the average for the developed economies and that the least risky countries are Mexico, Thailand, Indonesia, Malaysia and Korea. Although measures of profitability, loan quality and capital strength within emerging markets are generally superior to the banking systems of developed economies and levels of government and external indebtedness are generally low, there are some flashing warnings signs, particularly in the BRIC banking systems.

First, private sector loan growth over the last few years has been phenomenal and particularly so since 2008; second, the expansion in credit to GDP ratios has been very pronounced; third, artificially undervalued currencies and/or hot money inflows quite often contribute to asset and credit bubbles; fourth, changes in lending practices (e.g. Brazil payroll loans) or state influence on lending policies (China, India) can have a severely adverse impact on credit quality when the cycle turns; last but not least, real trends in credit quality are often disguised by the velocity of credit growth, by asset price bubbles and by high rates of nominal GDP growth, all of which can turn in on themselves very rapidly, as witness the US and UK in 2008, Russia in 2009 and, most spectacularly, Ireland in 2008.

It is interesting in our view that in the recent hike in bank CDS prices, China has moved up in tandem with the US and Europe, albeit from a lower base but that CDS prices elsewhere in Asia have remained relatively flat.

Figure 4: Bank CDS Prices



Source: DataStream

Figure 5: Danger Map Scores: Developed Markets

	USA	Australia	Japan	Hong Kong	UK	Sweden	France	Germany	Greece	Ireland	Italy	Portugal	Spain	Israel	Average
Deregulation of Lending	1	2	1	1	2	1	2	1	2	3	2	1	1	1	**2**
% of Credit to GDP	4	3	1	3	5	4	3	2	1	5	1	5	5	3	**3**
Change in % of Credit to GDP	2	1	1	3	3	4	1	2	3	5	2	5	4	2	**3**
Maturity of Cycle in Years	2	3	2	3	3	1	3	2	5	2	2	3	3	2	**3**
Credit Mix	3	1	2	3	3	2	2	3	5	4	5	3	3	2	**3**
Unemployment	4	1	1	1	3	1	4	2	5	4	2	5	5	1	**3**
Current account position	4	2	1	1	2	1	2	1	5	2	4	4	4	2	**3**
Level of real interest rates	1	2	2	1	1	1	2	2	2	3	2	2	2	2	**2**
Exchange rate flexibility	1	1	2	5	1	1	5	5	5	5	5	5	5	2	**3**
Total Danger Map Score (out of 45)	**22**	**16**	**13**	**21**	**23**	**16**	**24**	**20**	**33**	**32**	**25**	**33**	**32**	**17**	**23**

Source: Deutsche Bank

Figure 6: Danger Map Scores: Emerging Markets

	Brazil	Mexico	Russia	India	China	Turkey	Malaysia	Thailand	Korea	Indonesia	Poland	Average
Deregulation of Lending	1	1	2	3	3	2	1	1	2	2	2	**2**
% of Credit to GDP	3	1	2	2	5	1	4	2	4	2	1	**2**
Change in % of Credit to GDP	5	3	3	4	4	5	3	1	3	2	4	**3**
Maturity of Cycle in Years	5	2	4	3	3	1	2	2	3	3	2	**3**
Credit Mix	3	2	4	4	4	2	2	2	3	2	2	**3**
Unemployment	1	3	2	1	1	2	2	2	1	1	3	**2**
Current account position	3	2	1	3	1	5	1	1	1	2	4	**2**
Level of real interest rates	2	1	2	3	3	2	2	2	2	2	3	**2**
Exchange rate flexibility	2	2	3	3	3	2	3	3	3	3	2	**3**
Total Danger Map Score (out of 45)	**25**	**17**	**23**	**26**	**27**	**22**	**20**	**16**	**22**	**19**	**23**	**22**

Source: Deutsche Bank
We score each factor on a 1(grey) to 5 (blue) basis with 5 denoting the greatest risk/danger

On our stress test, we screen banks and national banking systems on two measures. First we use two years of recessionary loan loss provisions (generally equivalent to 2% of loans but with variations) as a percentage of tangible book value and second, two years of recessionary loans less two years of pre-provision profits flexed down by 25% as a percentage of tangible book value. We find that the system copes with this quite well. The US outperforms Europe, the periphery countries are badly hit, and emerging markets generally remain quite profitable.

Figure 7: Summary of Stress Tests

	2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	Core tier one to Risk weighted assets 2012E)
USA	-33.3%	4.6%	11.8%
Australia	-61.0%	-16.4%	8.5%
Japan	-22.3%	-1.2%	NA
Hong Kong	-13.0%	16.9%	11.2%
UK	-32.4%	2.2%	8.2%
Sweden	-68.1%	-39.9%	8.6%
France	-46.0%	-3.9%	10.0%
Germany	NA	NA	NA
Greece	-82.4%	-38.9%	7.4%

Source: Deutsche Bank

Figure 7: Summary of Stress Tests (Cont'd)

	2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	Core tier one to Risk weighted assets 2012E)
Ireland	-90.1%	-75.1%	12.4%
Italy	-49.8%	-14.0%	0.9%
Spain	-73.3%	-14.1%	9.1%
Israel	-18.9%	10.1%	7.9%
Brazil	-67.7%	23.7%	10.8%
Mexico	-40.9%	0.5%	15.4%
Russia	-22.7%	22.0%	13.3%
India	-23.0%	25.4%	8.0%
China	-32.0%	11.9%	10.5%
Turkey	-18.5%	17.6%	16.1%
Indonesia	-73.6%	-21.6%	15.9%
Malaysia	-43.3%	-6.0%	6.0%
Thailand	-16.3%	20.9%	10.9%
Korea	-29.0%	0.9%	8.8%
Poland	-47.5%	-8.9%	15.2%

Source: Deutsche Bank

The elephant in the room

We look at the European sovereign debt crisis and benchmark it against the Latin American debt crisis of the 1980's. We find that this sovereign debt crisis has at least five dimensions.

The first is the cross border exposures to private sector entities, often originated and funded by the subsidiaries of the largest European banks. Losses from these exposures have been in the region of US$90bn, with US$50bn of losses in Ireland alone. Further losses from these exposures are baked into analyst estimates; whether these estimates are conservative or not remains to be seen.

The second dimension to the crisis is the sovereign/public sector exposures, which too are often held in the domestic subsidiaries of European banks. We find these exposures generally quite modest when measured against the totality of European bank assets and capital. Certainly, they are dimensionally lower than the exposures of the US money center and European megabanks to Latin America relative to assets and capital in the 1980's.

The third dimension is the ownership by domestic banks in the periphery economies, Spain and Italy, of their own sovereigns' bonds. Such holdings are typically 150% to 220% of tangible book value and thus substantial write-downs could trigger recapitalization requirements.

The fourth dimension is the potential spillover effects including runs on banking systems and the negative feedback loop to consumer and business confidence that might develop from a disorderly default, which are impossible to model.

The fifth dimension is the possibility of an extreme outcome if the Euro was to break up, which again is not something that readily lends itself to company-specific modeling.

Possibly the most desirable scenario, but not necessarily the most likely outcome, is provided by the Latin American 1980's crisis resolution: i.e. a very long period of uncertainty and significant write downs of private sector debt and then a Brady bond type solution to, and write down of, government debt once the bank sector can afford it.

Figure 8: Distribution of European Bank Claims on selected countries

(US$bn)	Public sector	Banks	Private sector	Total	Relative to total European bank loans and Securities
Portugal	32388	40447	121770	194605	0.55%
Ireland	15355	70539	291742	377636	1.07%
Greece	54196	10918	80669	136317	0.39%
Spain	88054	199269	344866	632189	1.79%
Italy	231216	127261	126891	485368	1.38%
Total	421209	448434	965938	1826115	5.18%

Source: IMF and BIS

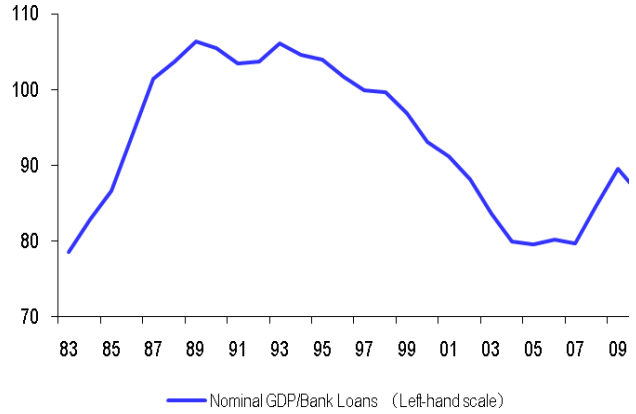
Bank sector performance in a deleveraging world

There are few recent data points to benchmark and measure bank sector performance in a deleveraging environment for the good reason that over the last 30 years private sector debt to GDP ratios have been steadily or rapidly climbing in most parts of the world.

We have identified three periods in which there was significant deleveraging (in terms of private sector debt to GDP ratios) over a long period of time: Thailand between 1997 and 2007, Japan between 1989 and 2003, and Hong Kong between 1997 and 2005.

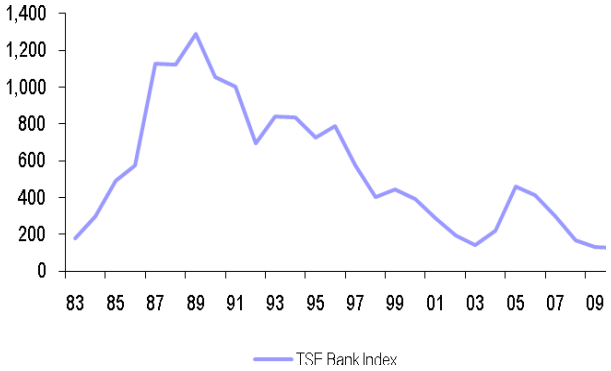
In Japan, the bank sector underperformed dramatically during the period of deleverage and then near-quadrupled when the deleveraging period came to an end in 2003. It subsequently underperformed from 2005 reflecting first the withdrawal of quantitative easing and then the global financial crisis and the dilution for Basel 3 related rights issues (for more on this see our report *Japan Redux: After the Reflation trade*? 24th May 2011).

Figure 9: Japan - Nominal Gross Domestic Product/Bank Loans (Calendar Year、%)



Note: Bank loans= Domectically Licenced Bank Accounts and Trust Accounts. Do not include for central government.
Source: Cabinet Office, Government of Japan, Bank of Japan

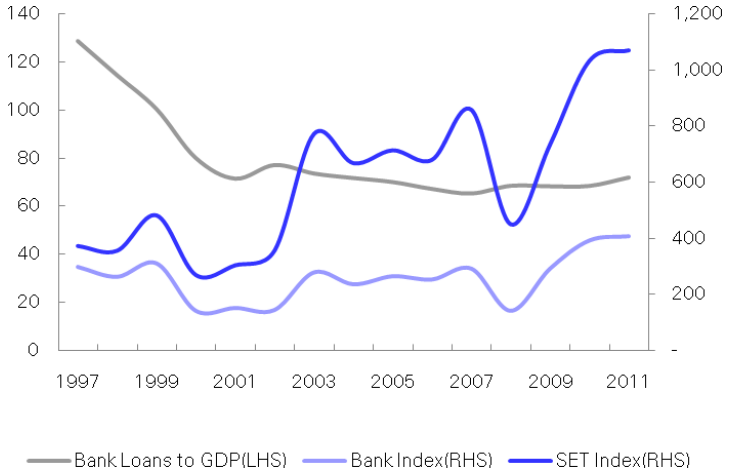
Figure 10: Japan - TSE Bank Index (Year-end)



Source: Tokyo Stock Exchange

In the case of Thailand, the graph below plots the Thai bank sector after the initial devaluation shock in 1997 through to 2011 against credit to GDP. It can be seen that the bank sector was dead money in absolute terms and much worse than that relative to the Thai equity market during the long deleveraging period. The Thai banking sector started to perform once debt to GDP troughed, which happened to be when it reverted to pre-crisis levels in 2007.

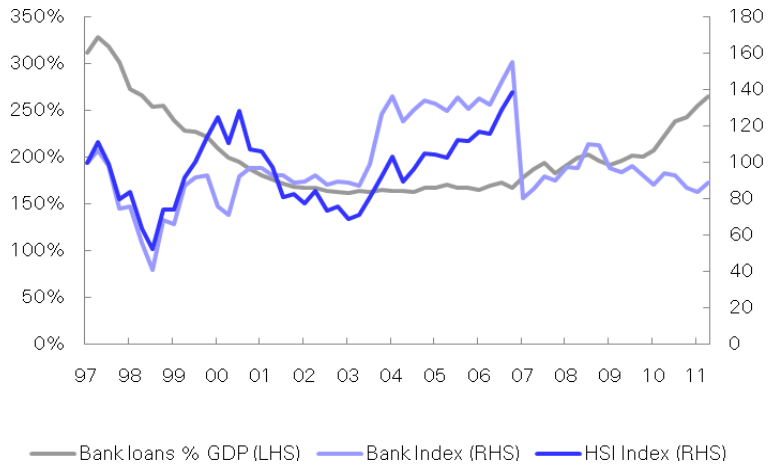
Figure 11: Thailand bank sector performance in a deleveraging world



Source: Deutsche Bank

The case of Hong Kong is less conclusive. Bank shares underperformed the Hong Kong market in the early part of the deleveraging process and then outperformed from 2003 but were poor investments between 1997 and 2004 and the index is now back below where it started before the 1997 Asian banking crisis, even though there was no recapitalization requirement.

Figure 12: Hong Kong bank sector performance in a deleveraging world



Source: Deutsche Bank

Unless we are accused of being selective in the data we use, we should point out that after the Swedish crisis, bank stocks quadrupled in 1993 although debt to GDP modestly shrank and performed reasonably in 1994 and 1995 during a more significant deleveraging.

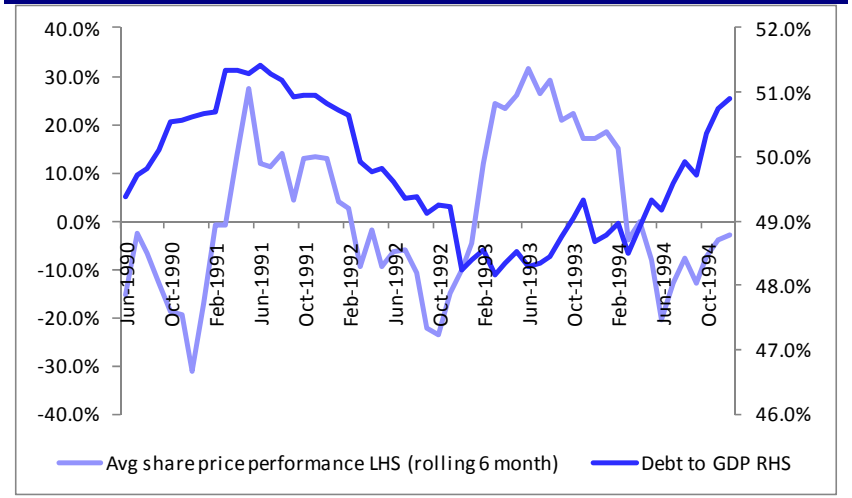
Figure 13: Bank sector performance in the early 1990s vs Credit to GDP

Year	Swedish Bank Index, YoY	Swedish Credit/GDP
1989	11.6%	78.2%
1990	-29.8%	92.9%
1991	-19.1%	93.0%
1992	-67.2%	95.8%
1993	382.1%	93.3%
1994	-1.5%	87.7%
1995	13.5%	84.0%

Source: Deutsche Bank

In Australia, we found no statistical correlation over a long period between bank sector performance and credit to GDP.

Figure 14: Australia - Debt vs GDP vs share price performance during 1990s



Source: Deutsche Bank

However, in Australia and Sweden the deleveraging period was relatively short and shallow and was followed by a sustained period in which debt to GDP rose steadily and in the context of a bull market in housing.

How to navigate this document

This research note divides into three parts which are linked but which can also stand alone: the first is an overview, which chronicles recent patterns of credit growth and changes in private sector and government debt to GDP ratios; which looks in detail at credit quality and loan loss provisioning ratios across the countries which we highlight in this report; which stress tests companies and banking systems and puts them in the framework of our danger map; and which assesses this post crisis environment against others. The second part is the country section. This provides a perspective on the composition of loan portfolios in each of the countries covered in this report and some of the credit issues relevant to that country. The third part of the note provides thumb nail case studies of nine crises ranging from the Latin American Debt Crisis of the 1980s to Ireland's ongoing banking crisis.

Credit growth and leverage

Since the banking crisis of 2008/09 and the accompanying recession there have been two broad developments in bank and market based credit.

Private sector lending

First, private sector lending has decelerated or actually contracted in many of the most indebted developed market economies as households and corporations have delevered and as lenders have tightened credit standards. The median growth in domestic credit between December 2008 and December 2010 for the developed economies was about 2%. The stock of credit has declined in Japan and the US, has been flat in the UK but has continued to grow in most countries in the Eurozone.

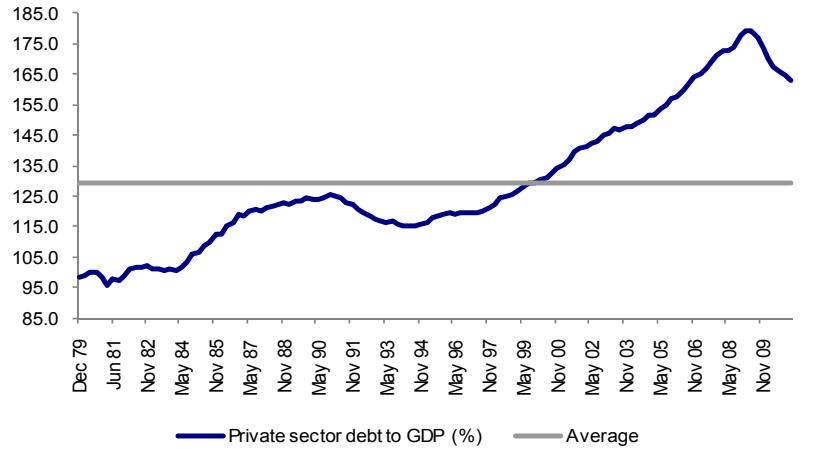
Figure 15: Indexed Credit Growth 2003 to 2010: Developed Economies

	2003	2004	2005	2006	2007	2008	2009	2010	Change since 08
USA	100	109	120	133	145	148	145	144	-3%
Australia	100	112	127	146	169	191	204	212	11%
Japan	100	96	98	100	103	107	103	102	-4%
Hong Kong	100	106	114	121	146	161	162	208	29%
UK	100	110	120	132	151	161	161	162	0%
Sweden	100	107	122	139	161	179	183	189	6%
France	100	106	116	128	144	153	153	163	7%
Germany	100	99	98	98	99	101	101	104	3%
Greece	100	119	141	173	207	240	240	248	3%
Ireland	100	125	164	200	238	234	215	171	-27%
Italy	100	108	117	130	144	151	152	165	9%
Portugal	100	111	121	131	145	158	162	164	4%
Spain	100	117	148	184	215	229	226	229	0%
Median	100	109	120	132	146	161	162	165	2%

Source: IMF, various central banks, Deutsche Bank estimates

The deleveraging in the US has taken the ratio of private sector debt to GDP down by over 16 percentage points to 163%, a sudden and large decline but to a level still well over its long term average. A contraction in the stock of credit in the US had not occurred previously in any period for at least 60 years. As we see later, a contraction in private sector credit has become a commonplace occurrence in Japan since the mid 1990s and has also been a feature of other post crisis environments. Japan's debt to GDP ratio reverted to mean over a ten year period. Thailand delevered for 10 years after the 1997 currency and banking crisis, with debt ratios again reverting to mean and Hong Kong for almost as long after its deflationary shock post 1997. Slow credit growth can mean that system NPL ratios remain high since NPL levels are not diluted or are diluted very slowly by new flows of performing credit.

Figure 16: Private sector credit to GDP: US



Source: Federal Reserve

There have been more modest declines in private sector debt to GDP ratios in the UK, Australia, and Sweden amongst others, but the median increase since 2003 has been around thirty percentage points. Private sector debt to GDP ratios, which are heavily influenced by home ownership trends and house prices, are particularly elevated in Spain, Portugal, Ireland and Sweden. As we show later, after a severe financial crisis private sector debt to GDP ratios invariably contract, which may suggest that Europe has yet to adjust since debt to GDP ratios generally have continued to rise in the Eurozone countries post crisis.

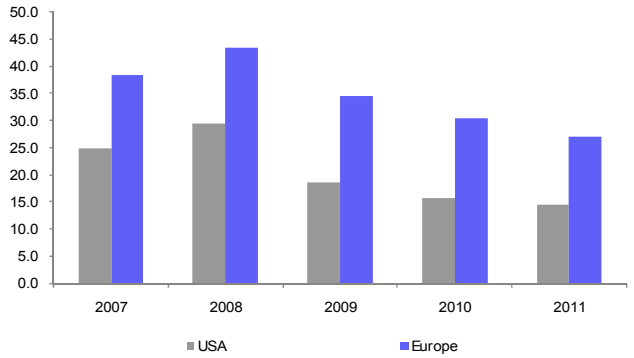
Figure 17: Private Sector Debt to GDP (%), Developed Economies 2003 to 2010

	2003	2004	2005	2006	2007	2008	2009	2010	Change from 2003	Change from 2008 or high
USA	148	152	155	164	171	178	174	164	17	-13
Australia	94	98	103	110	116	120	128	123	30	-5
Japan	92	88	89	89	91	99	99	98	6	-1
UK	113	118	123	128	138	143	148	142	30	-6
Sweden	101	104	116	126	140	158	170	167	66	-3
France	83	85	89	93	100	103	106	110	28	7
Germany	124	120	117	113	109	109	112	111	-13	2
Greece	60	67	75	85	95	105	106	112	52	7
Ireland	109	129	154	173	192	199	206	170	60	-29
Italy	66	69	72	77	83	85	89	94	28	9
Portugal	120	125	147	152	161	172	180	178	58	-3
Spain	107	117	137	157	171	177	180	181	74	4
Median	104	111	117	119	127	132	138	133	30	-2

Source: Federal Reserve, various central banks, Deutsche Bank estimates

Private sector deleveraging in the highly indebted economies has been complemented by deleveraging of banking systems as a response to regulatory and market pressure. According to the Bank of England, global banks have raised over US$500bn in equity since 2009 and reduced total assets by over US$3 trn.

Figure 18: : Bank leverage: USA and Europe



Source: Deutsche Bank estimates

In marked contrast to developed economies, the pace of lending growth has accelerated in many emerging markets since 2008, partly driven by a leakage of US monetary policy. There has been a more than threefold median increase in the stock of credit of the emerging markets covered in this report since 2003 and a 35% increase since 2008.

Figure 19: Indexed credit growth 2003 to 2010: Emerging Economies

	2003	2004	2005	2006	2007	2008	2009	2010	Change since 08
Brazil	100	119	145	175	224	293	338	408	39%
Russia	100	121	170	250	383	515	502	565	10%
India	100	127	189	242	294	346	404	515	49%
China	100	111	122	140	164	189	251	300	59%
Turkey	100	150	226	331	403	555	593	794	43%
Indonesia	100	127	160	183	230	301	332	409	36%
Malaysia	100	126	148	165	179	203	219	247	22%
Thailand	100	107	114	121	128	143	142	159	11%
Korea	100	105	114	130	149	170	177	183	8%
Poland	100	103	115	142	185	253	275	298	18%
Median	100	120	147	170	204	273	303	354	30%

Source: IMF, various central banks, Deutsche Bank estimates

Rapid credit growth has resulted in a notable expansion in the private sector debt to GDP ratios of emerging economies. These ratios are typically much lower than in developed markets with a median ratio of 52% against 133%, but interest rates are much higher, suggesting that debt service levels are not that different. The consumer debt service in Brazil for instance is amongst the highest in the world at 23% although private sector credit to GDP is lower than the average in emerging markets and approximately a third of the median level in developed economies.

Figure 20: Private Sector Debt to GDP (%): Emerging Markets

	2003	2004	2005	2006	2007	2008	2009	2010	Change from 2003	Change from 2008 or high
Brazil	26	28	29	31	39	43	51	49	23	6
Russia	21	23	25	30	37	40	42	41	20	1
India	30	34	44	49	49	49	50	50	20	1
China	125	118	112	110	104	102	125	128	3	26
Turkey	15	18	23	29	32	39	41	48	33	9
Indonesia	22	24	25	24	25	27	26	28	6	1
Malaysia	85	95	101	102	99	97	115	115	30	17
Thailand	74	72	70	67	65	69	68	69	-5	0
Korea	70	68	71	77	82	89	90	84	14	-5
Poland	31	34	29	36	44	40	56	53	23	13
Median	30	34	37	42	47	46	53	52	20	4

Source: The IMF, various Central Banks, Deutsche Bank Estimates

Government debt

The second unambiguous development since 2008 has been the notable increase in government debt in nearly all developed economies following much lower than expected tax revenues and, in some countries, because of the cost of bailing out and recapitalising banking systems. The median increase in public debt levels has been 83% since 2003, 59% since 2007 and 27% since 2008. These increases have been more modest than in previous crisis periods but have started from a higher base.

Figure 21: Indexed Government Debt Growth: Developed Economies

	2003	2004	2005	2006	2007	2008	2009	2010	Increase from 2008
USA	100	108	116	122	130	152	177	199	31%
Australia	100	97	96	94	100	133	204	278	108%
Japan	100	108	109	108	109	111	115	119	7%
UK	100	111	120	130	140	169	214	249	47%
Sweden	100	94	98	107	110	106	103	97	-8%
France	100	107	114	115	120	131	148	163	25%
Germany	100	106	110	115	116	118	127	133	13%
Greece	100	109	117	134	142	156	178	195	25%
Ireland	100	101	102	101	109	184	241	341	85%
Italy	100	103	108	114	115	116	116	128	10%
Portugal	100	107	121	128	132	141	160	180	28%
Spain	100	105	92	88	84	98	130	186	90%
Median	100	107	110	114	115	132	154	183	27%

Source: IMF, Deutsche bank Estimates

Relative to GDP, G7 gross public debt levels climbed from 82% in 2007 to 112% in 2010. IMF forecasts predicate a further increase to 123% by 2014. If these forecasts are correct, the stock of G7 public debt will have increased by 83%, from the equivalent of US$30.7trn in 2007 to US$46.0 trn in 2014E. For the developed countries in this report, the median increase in public sector debt to GDP ratios since 2008 has been 19 percentage points.

Figure 22: Public Sector Debt to GDP: Developed Economies

(%)	2003	2004	2005	2006	2007	2008	2009	2010	Change from 2003	Change from 2008
USA	49	50	50	51	51	61	72	80	31	19
Australia	13	12	11	10	9	12	18	22	9	11
Japan	180	193	193	188	188	200	215	222	42	22
UK	39	41	43	43	44	52	68	76	37	24
Sweden	41	37	38	39	39	38	39	35	-6	-3
France	63	65	66	64	64	68	78	84	21	17
Germany	65	69	71	69	65	69	76	87	22	18
Greece	97	99	100	106	105	110	127	142	45	32
Ireland	31	29	27	25	25	44	66	96	65	52
Italy	104	104	106	107	104	104	106	116	11	12
Portugal	56	58	63	64	63	65	76	83	27	18
Spain	48	47	38	34	30	34	47	66	18	32
Median	52	54	57	57	57	63	74	84	25	19

Source: IMF, Deutsche bank Estimates

The increase in public sector debt has more than cancelled out whatever deleveraging has taken place in the private sector. The combination of public and private sector debt to GDP has risen in every country we follow here since 2008, with the smallest increases in the US and Sweden. The median ratio of public and private sector debt to GDP has increased from 157% in 2003 to 232% in 2010 and this ratio is expected to increase by a further 10 to 15 percentage points by 2014:

Figure 23: Private and Public Sector Debt to GDP (%): Developed Economies

	2003	2004	2005	2006	2007	2008	2009	2010	Change from 2003	Change from 2008
USA	197	202	205	215	222	239	246	245	48	6
Australia	107	109	114	119	125	132	145	146	39	14
Japan	272	281	282	277	278	299	314	320	48	21
UK	152	159	165	171	182	195	216	218	67	23
Sweden	142	142	154	165	180	196	210	202	59	6
France	146	150	155	157	164	171	184	195	49	24
Germany	189	188	189	182	174	178	189	198	9	20
Greece	157	166	176	191	200	216	233	254	97	39
Ireland	140	158	182	198	217	243	271	266	126	23
Italy	171	172	178	184	186	189	195	210	40	21
Portugal	176	183	210	216	223	237	256	261	85	24
Spain	156	164	175	191	201	211	227	247	91	36
Median	157	165	177	187	193	203	222	232	54	22

Source: IMF, various central banks, Deutsche bank Estimates

Again, there has been a contrasting trend in many emerging markets, where public debt to GDP ratios are not only much lower than in developed economies but have tended to be stable or in decline since 2003:

Figure 24: Public Sector Debt to GDP (%): Emerging Economies

	2003	2004	2005	2006	2007	2008	2009	2010	Change from 2003	Change from 2008
Brazil	15	12	9	9	10	9	10	10	-5	1
Russia	27	21	14	8	7	7	8	9	-18	2
India	64	54	64	61	58	56	55	54	-10	-2
China	26	24	24	23	22	20	21	20	-6	0
Turkey	65	59	54	48	42	43	49	42	-23	-1
Indonesia	64	65	61	60	63	68	73	75	11	7
Malaysia	45	46	44	42	42	41	53	53	8	12
Thailand	123	120	116	108	102	106	113	110	-13	4
Korea	22	25	29	31	30	30	34	37	16	7
Poland	6	6	5	5	4	3	4	4	-2	1
Median	36	35	36	37	36	36	41	40	-6	2

Source: IMF, various central banks, Deutsche bank Estimates

The sum of private and public sector debt in emerging markets relative to GDP has actually declined relative to developed market debt since 2003, although the pace of private sector debt growth has been significantly higher.

Figure 25: Private and Public Sector Debt to GDP Ratios (%)

	2003	2004	2005	2006	2007	2008	2009	2010	Change from 2003	Change from 2008
Brazil	41	40	38	40	49	52	61	59	18	7
Russia	48	43	39	38	44	47	50	49	2	3
India	94	88	108	110	107	105	105	104	10	-1
China	151	142	136	133	126	122	146	148	-3	26
Turkey	80	77	77	77	74	82	90	90	10	8
Indonesia	86	89	87	84	88	95	98	103	17	8
Malaysia	130	140	145	144	141	138	168	168	38	29
Thailand	197	192	186	176	168	174	181	179	-18	4
Korea	92	93	100	108	112	119	123	122	30	2
Poland	37	40	34	41	49	43	60	57	21	14
Median	89	89	93	96	98	100	102	103	13	7

Source: IMF, various central banks, Deutsche bank Estimates

Thus in a nutshell, while leverage in the banking system measured by the multiple of total assets to net tangible assets has declined since the 2008/09 crisis, debt levels in the global economy have increased in absolute terms and relative to GDP. Downgrades to GDP growth expectations are thus occurring either when private sector and public sector debt levels relative to the size of economies are at or close to record levels, or after a period in which private sector debt growth in absolute terms and relative to GDP has expanded at a very rapid pace, particularly in emerging markets.

Large fiscal deficits and fears of government default have weighed very heavily on bank sectors An IMF analysis of losses from securities and loans incurred by banks operating in the developed economies between 2007 and March 2010 suggested that cumulative losses for the banking system were in the region of US$2.3trn, including US$0.6trn from securities. The only segment of the securities portfolios which attracted nil losses were the holding of government bonds, which accounted for about 25% of total securities.

Credit quality

The loan quality of the global banking system in 2010

Loan quality measures are notoriously backward looking and loan quality forecasts are invariably based, by necessity, on consensus economic forecasts. As end 2010 the loan quality of the banking systems was fragile. NPLs/NPA's were running at around 5% of total loans in the US and Europe against the position in 2007, when NPL ratios were in the 1 to 2% range. NPls are forecast to continue to rise at a reasonably subdued rate in the Eurozone in 2011 but be close to peak levels at that time but to have peaked already in the US. These forecast are consistent with first half results and a scenario of moderate GDP growth in a negative real interest rate environment.

Figure 26: NPL to total loans (%): developed markets

	2007	2008	2009	2010	2011E	2012E
Australia	0.5	1.1	1.9	2.0	1.6	1.3
Hong Kong	0.4	0.9	0.8	0.3	0.3	0.3
Japan	2.9	2.6	2.3	2.9	2.5	NA
USA	0.8	1.8	3.1	2.9	2.1	1.5
France	3.4	3.8	4.6	5.5	5.6	4.9
Germany	2.8	3.1	4.6	4.9	4.4	4.1
Greece	4.9	4.6	6.8	9.6	13.5	14.0
Ireland	0.8	4.0	11.2	9.9	11.4	10.8
Italy	5.0	5.2	7.2	8.0	8.2	7.5
Portugal	0.8	1.0	2.0	2.6	3.1	3.4
Spain	0.9	2.6	4.3	4.8	5.5	5.0
Sweden	0.4	0.8	2.0	1.9	1.7	1.5
UK domestc banks	1.8	3.4	5.8	6.8	7.9	6.6
European average	1.5	2.5	4.4	4.8	4.6	4.3
Unweighted average	2.0	2.7	4.4	4.8	5.2	5.1

Source: Deutsche Bank

NPL coverage has fallen in Europe since 2007 from around 60% to around 40% in 2011 but has risen elsewhere.

With the exception of Russia, NPL levels in emerging markets barely changed in 2008 as any increase in crisis related NPLS was counterbalanced by the very rapid growth in the stock of credit. CDS prices for Chinese banks have risen in tandem with US and European banks and to quite similar levels. Few market observers believe that the published NPL ratios for the Chinese banking system provides an accurate assessment of real system loan quality in that economy and the example of Russia in 2009 and indeed the US in 2008, shows how dramatically and quickly NPL levels can change. NPLS are more than 100% covered in many of the emerging market countries.

Figure 27: NPL to total loans (%): emerging markets

	2007	2008	2009	2010	2011E	2012E
Brazil	7.7	8.3	9.7	8.1	9.0	9.4
Russia	0.7	1.8	10.2	8.8	7.1	4.8
India	1.8	1.6	1.4	1.4	1.2	1.2
China	1.8	1.4	1.0	0.7	0.9	0.9
Turkey	4.9	4.6	5.6	3.7	3.4	3.3
Asia Average	1.7	1.6	1.5	1.5	1.3	1.2
Global Emerging Market Average	2.3	2.5	2.8	2.5	2.4	2.3

Source: Deutsche Bank

Impairment charges

The provision charge was running at around "normal" levels in 2007 and thereafter between 2008 and 2010 ran at a multiple of average levels but reached a crisis peak in 2009. The peak was very high relative to history in the US and for domestic banking institutions in the UK but was not particularly elevated in Europe. Because revenue lines in the US and Europe are under pressure, the assumption of declining bad debt charges is the major driver of projected earnings growth, accounting for over 100% of forecast earnings growth in Europe and the USA in 2011E and about 40% in 2012.

Figure 28: Provision charge to average loans (%): Developed markets

	2007	2008	2009	2010	2011E	2012E
Australia	0.20	0.58	0.49	0.30	0.19	0.21
Hong Kong	0.15	0.51	0.35	0.12	0.21	0.24
Japan	0.26	0.29	0.72	0.47	0.41	NA
USA	0.62	2.40	4.34	2.22	1.12	0.81
France	0.41	0.97	1.43	1.01	0.75	0.45
Germany	0.25	0.49	0.91	0.59	0.47	0.38
Greece	0.72	1.33	2.43	2.33	2.22	1.92
Ireland	0.18	1.12	6.53	11.24	1.44	1.17
Italy	0.44	0.70	0.96	0.74	0.68	0.62
Portugal	0.49	0.69	0.93	0.83	0.87	0.77
Spain	0.37	0.94	1.48	1.35	1.11	0.96
Sweden	0.03	0.22	0.79	0.22	0.01	0.07
UK domestc banks	0.83	1.34	2.05	1.58	1.31	0.80
European average	0.35	0.75	1.05	0.74	0.65	0.55
Unweighted average	0.38	0.88	1.75	1.70	0.82	0.69

Source: Deutsche Bank

In contrast, emerging markets provision charges rose relatively modestly in 2009 (Russia excepted) before falling back to normal or below normal levels in most countries. Again, growth in the stock of loans as well as robust economic growth, low or negative real interest rates and upward pressure on asset prices has helped maintain low provision charges. The worry for emerging markets is that the undervaluation of currencies is pumping up asset bubbles and that the very low bad debt charges are a sign post to what almost by definition must be a more difficult environment down the line.

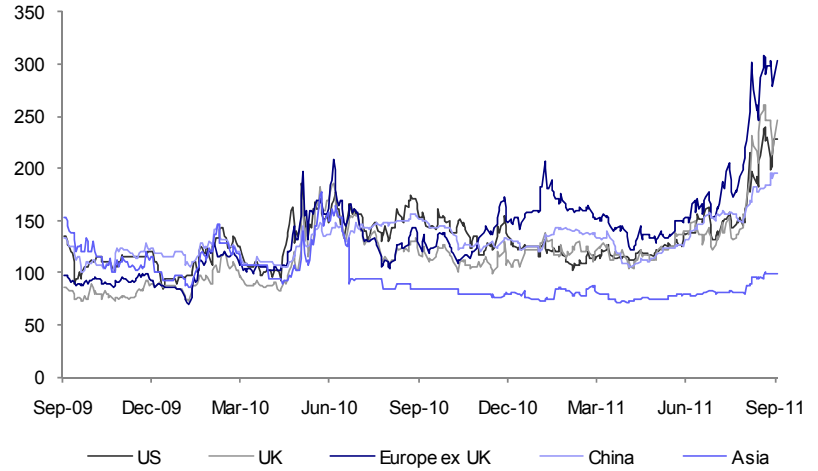
Figure 29: Provision charge to average loans (%): Emerging markets

	2007	2008	2009	2010	2011E	2012E
Brazil	5.26	5.03	7.16	4.69	4.78	4.83
Russia	1.44	2.98	6.91	2.18	1.09	0.82
India	0.41	0.46	0.45	0.37	0.50	0.46
China	0.33	0.52	0.21	0.23	0.28	0.29
Turkey	1.06	1.44	2.43	1.12	0.83	0.86
Asia Average	0.37	0.57	0.46	0.35	0.34	0.32
Gem average	0.50	0.55	0.51	0.41	0.44	0.41

Source: Deutsche Bank

Bank share prices have fallen by about 35% in developed markets and 20% in emerging markets so far this year. This compares with a decline in Deutsche Bank analysts' 2012E earnings estimates of less than 20% for European bank and about 12% for UK banks. US bank earnings estimates have been revised up. The decline in bank share prices since August has been accompanied by very sharp increases in bank CDS prices for banks generally but particularly for US and European banks

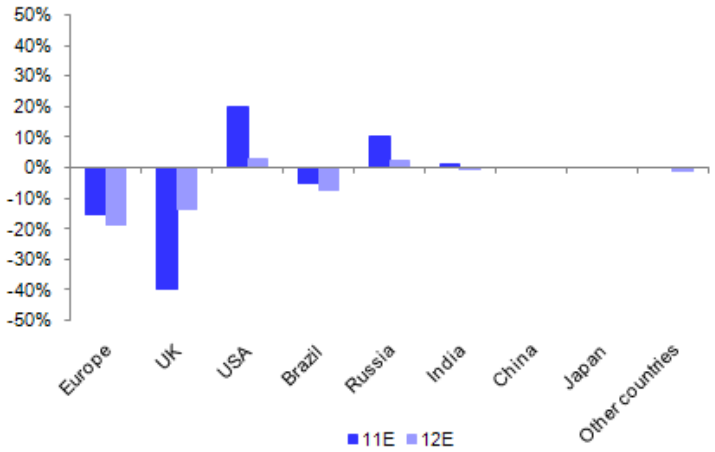
Figure 30: Bank CDS Prices



Source: DataStream

The fall in share prices may well be connected to investor concern as to a bad outcome with the sovereign debt crisis, the Euro, US mortgage related litigation or all of these, but it may also be the case that the market is discounting a severe downturn in the credit cycle as GDP growth in the US and Europe slows down and should growth become negative.

Figure 31: EPS revisions YTD



Source: Deutsche Bank

Because NPL levels are high and loan loss reserves against NPLSs are not universally so, and because pre-provision profit growth is low or negative, developed market bank earnings estimates in 2012E and 2013E are highly sensitive to any change in assumptions around asset quality. For instance aggregate forecasts for Europe in 2012E assume a decline in the NPL ratio from an estimated 5.66% in 2011E to 4.85%, which is consistent with a decline in the bad debt charge from 0.86% of loans in 201E to 0.70% in 2012E.

Figure 32: Bank Share price performance: Local Currency (%)

	1w	1m	3m	YTD	YOY
USA	-0.8	-3.5	-23.5	-30.7	-23.4
Australia	-3.6	-5.3	-13.4	-22.3	-21.8
Japan	-2.8	-6.8	-9.3	-26.2	-22.9
Hong Kong	-5.1	-2.3	-18.9	-27.2	-20.3
UK	-2.6	-15.8	-36.1	-42.2	-50.5
Sweden	-7.5	-17.0	-28.8	-31.9	-26.4
France	-19.0	-30.6	-53.7	-51.9	-57.6
Germany	-15.8	-31.4	-49.9	-55.5	-43.2
Greece	-1.8	-29.6	-52.7	-56.5	-69.4
Ireland	-7.0	-33.6	-58.8	-83.9	-92.1
Italy	-8.7	-21.3	-42.7	-56.8	-64.4
Spain	-5.1	-10.2	-21.2	-24.8	-39.3
Israel	-8.6	-8.7	-23.8	-32.9	-23.3
Brazil	-7.4	-0.5	-16.1	-25.6	-17.8
Mexico	0.0	1.8	-18.5	-25.1	-12.4
Russia	13.7	7.7	-25.8	-26.9	-8.0
India	-1.5	-7.7	-13.6	-22.2	-21.7
China	-1.0	-1.4	-13.4	-16.1	-18.2
Turkey	4.2	8.7	-13.5	-22.4	-22.3
Indonesia	-1.1	-2.8	-5.7	-7.7	11.4
Malaysia	-2.4	-3.6	-5.6	0.6	6.6
Thailand	-0.9	-4.5	1.3	-3.9	8.1
Korea	-4.7	-9.1	-21.5	-31.2	-19.0
Poland	-7.0	-13.4	-30.0	-26.3	-18.4

Source: Deutsche Bank

All other things being equal, a 10% increase in the NPL ratio covered 50% by new provisioning and a 10% re-provisioning of the existing book of non-performing loans would arithmetically flow to a doubling of the loan loss provision charge and a reduction in pre-tax profits of around 40%. The simple model below shows the sensitivity of bank earnings to changes in NPL and bad debt assumptions.

Figure 33: Sensitivity of EPS estimates to changes in NPL assumptions

Sensitivity of profits to NPL assumptions	
Loans	1000
Pre-provision profit to loans	2.50%
NPL Ratio	5.66%
Coverage ratio	37%
Bad debt charge	0.70%
Cost of 10% re-provisioning with 50% coverage	0.28%
Cost of 1 percentage point increase in NPLs 50% covered	0.50%
Revised bad debt charge	1.48%
Forecast Pre provision profit	25.0
Forecast provisions at 0.70%	7.0
Forecast pre-tax profit	18.0
New provisions	7.8
Revised pre-tax profit	10.2
Downgrade	-44%

Source: Deutsche Bank

Clearly, forecasting error on bank earnings estimates will be greatest for companies/countries with high NPL ratios (i.e. high betas). Estimates for these banks will have the greatest downside risk to reprovisioning requirements on the existing NPL stock and will probably be more vulnerable to further increases in NPLS, given that the high ratio relative to peers is already flagging poorer pre-crisis loan underwriting. As loan quality deteriorates, the market also looks more closely at overall NPL coverage ratios.

Figure 34: Provisions to NPL Coverage ratios: Developed Markets

	2006	2007	2008	2009	2010	2011E	2012E
USA		180.9%	147.5%	100.8%	128.4%	140.8%	179.9%
Australia	149.5%	133.0%	94.0%	70.3%	60.8%	58.4%	61.8%
Japan	29.1%	32.6%	29.1%	25.8%	24.4%	24.8%	24.9%
Hong Kong	230.5%	195.8%	335.8%	228.5%	214.8%	208.2%	209.7%
UK	57.9%	47.3%	46.0%	44.7%	47.2%	53.6%	56.2%
Sweden	65.1%	68.8%	46.6%	51.3%	50.2%	52.8%	55.6%
France	76.7%	83.2%	77.0%	73.5%	67.3%	68.6%	71.0%
Germany	52.2%	55.6%	46.7%	46.4%	47.8%	46.4%	51.6%
Greece	63.1%	57.1%	47.9%	42.9%	41.2%	38.2%	42.7%
Ireland	63.0%	56.1%	33.5%	43.3%	44.4%	52.8%	58.7%
Italy	59.7%	60.9%	59.0%	48.9%	48.7%	52.5%	54.5%
Spain	238.6%	196.1%	95.6%	75.2%	73.8%	71.6%	75.4%
Israel	277.7%	328.0%	315.1%	361.9%	378.9%	94.7%	94.0%

Source: Deutsche Bank

Asset quality versus loan quality

The IMF has estimated that about 25% of the estimated US$2.3trn of losses from loans and securities during the period 2007 to March 2010 derived from securities holdings. The table below shows the IMF's estimate of the distribution of loans and securities across the banking systems of developed markets. Two points stand out. First, securities made up 28% of the total of loans and securities; and second, the Euro area, by far the largest component (41%) of the bank sector, held US$ 7trn in securities.

Figure 35: Developed Market Banking System March 2010

(US$bn)	US Banks	UK Banks	Euro Area Banks	Other Mature Europe banks	Developed Asia Banks	Total
Loans	8059	6744	15994	3241	6150	40188
Securities	4502	1625	6907	729	1728	15491
Total	12561	8369	22901	3970	7878	55679
Distribution	23%	15%	41%	7%	14%	100%
GDP	14119	2182	12476	1755	6346	36878
Loan and securities to GDP (X)	0.89	3.84	1.84	2.26	1.24	1.51
Securities as a percentage of loans and securities	36%	19%	30%	18%	22%	28%

Source: IMF, Deutsche bank estimates

As at March 2010 and again using IMF estimates, approximately 31% of total European bank securities (US$2.1trn) were government bonds.

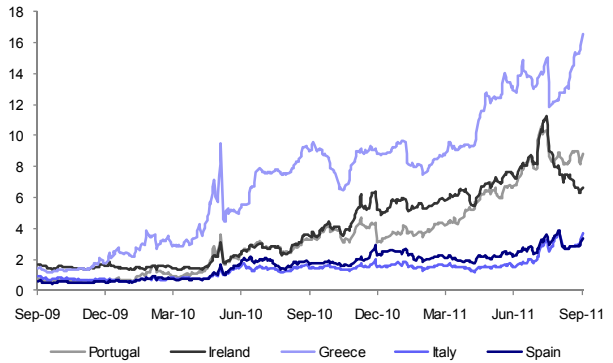
Figure 36: Distribution of Euro area securities portfolio March 2010

	US$bn	%T
- Residential mortgages	966	14%
- Consumer	272	4%
- Commercial Mortgage	264	4%
- Corporate	1316	19%
- Governments	2146	31%
- Foreign	1943	28%
Total for Securities	6907	100%

Source: Deutsche Bank

We discuss this in more detail below, but in brief the Eurozone public debt market constitutes a US$ 10 trillion asset class and is thus approximately the size of the US mortgage market. Sovereign debt and mortgage assets have traditionally been at the top of the food chain of bank balance sheets in terms of liquidity and capital management. Mortgage related losses cost the banking system approximately US$ 1trn over the banking crisis. Over the last 12 months there has been severe quality degradation within the other low risk weighted asset class.

Figure 37: Sovereign 10 year bond spreads



Source: DataStream

Figure 38: Key changes in income and expense items Europe

	2008	2009	2010	2011	2012
Income (€bn)	-45	63	34.8	-0.3	27.9
Expenses	32.4	-21.4	24.5	6.2	2.7
Pre-provision profits	-77.4	84.4	10.3	-6.5	25.2
Provisions	57.8	53.3	-46.5	-22.9	-14.4
Pre-tax profits	-135.2	31.1	56.8	16.4	39.6
Income (%)	-10%	15%	7%	0%	5%
Expenses	12%	-7%	9%	2%	1%
Pre-provision profits	-40%	73%	5%	-3%	12%
Provisons	130%	52%	-30%	-21%	-17%
Pre-tax profits	-91%	221%	126%	16%	33%

Source: Deutsche Bank

In a nutshell, because of the sensitivity of the growth outcome to loan loss provisioning, there is the potential for significant forecasting error even without factoring in adverse developments in the Eurozone sovereign debt crisis.

Earnings growth for the US universe is even more dependent that Europe on the fulfillment of expectations that credit quality will continue to improve and bad debt charges decline in 2011 and 2012 as revenues are forecast to decline in 2011 and rise only very modestly (2.2%) in 2012.

Figure 39: Key changes in income and expense items USA

	2008	2009	2010	2011	2012
Income (USbn)	-15.4	185.4	-32.5	-30.7	10.5
Expenses	26.2	42.3	24.0	-0.5	-14.1
Pre-provision profits	-43.7	139.4	-40.4	-30.1	24.5
Provisions	84.1	68.2	-98.5	-56.0	-10.2
Pre-tax profits	-121.2	81.7	28.9	26.1	34.7
Income (%)	-5%	58%	-6%	-7%	2%
Expenses	13%	19%	9%	0%	-5%
Pre-provision profits	-35%	174%	-18%	-17%	16%
Provisons	158%	50%	-48%	-52%	-20%
Pre-tax profits	-151%	nm	71%	38%	36%

Source: Deutsche Bank

In emerging markets the story is very different. Forecasts assume that bad debt provision charges remain fairly constant.

Testing for a recessionary credit cycle

The traditional framework for valuing or assessing bank shares via normalized or peak loan losses (and hence normalized or trough earnings) has a credibility problem, as indeed do stress tests generally. There are three reasons this may be the case.

First private and public sector debt is at record levels, suggesting the potential for extreme outcomes including multiple sovereign defaults.

Second, the combination of 2008/09 crisis loan loss provisions and securities losses was so far out of a "normal" range that the market may be recalibrating expectations based upon the last experience rather than on the last few recessions. Three year cumulative loan loss provisions for our US universe were 10.8% between 2008 and 2010, well over twice the previous peak three year loss rate in 1987 to 89, which was when the money center banks provided against around 60% of their Latin American sovereign debt exposures.

Figure 40: Three year Cumulative Loan Provision Rates in Crisis Period

Ireland 2008-10	**19.0%**
USA 2008-10	10.8%
Sweden 1990-92	9.2%
Japan 1997-99	6.2%
Australia 1991-93	6.1%
UK 2007-09	5.9%
Korea 2001-03	5.1%
USA 1987-89	4.5%
Global average 2007-09	4.1%

Source: FDIC, Deutsche Bank estimates

Loan loss provisions in developed markets between 2008 and 2010 ran at between normal levels and 6 times normal levels.

Figure 41: Three year cumulative losses against normal loss rates 2008 to 2010

	2008-2010	2008 to 2010 Normal	Multiple of normal (X)
USA	10.8%	1.80%	6.0
Australia	1.8%	1.80%	1.0
Japan	1.3%	0.90%	1.5
UK	5.9%	1.80%	3.3
Sweden	1.6%	0.90%	1.8
France	3.4%	1.50%	2.3
Greece	6.1%	1.80%	3.4
Ireland	19.0%	1.50%	12.7
Italy	2.8%	1.50%	1.9

Source: FDIC, Deutsche Bank estimates

Furthermore, the bulk of the securities losses and loan losses were taken against assets which the banks and their regulators assumed were the lowest risk. In fact, only government bonds were risk free in 2008/09.

Figure 42: Distribution of losses on securities 2007 to 2010 (US$bn)

	USA	UK	Euro Area	Total
- Residential mortgages	166	11	104	281
- Consumer	0	2	8	10
- Commercial Mortgage	48	8	40	96
- Corporate	17	7	0	24
- Governments	0	0	0	0
- Foreign	66	29	72	167
Total losses for Securities	297	57	224	578

Source: IMF

Third, the IMF has counted 63 sovereign debt crises since 1970 but there has been no sovereign default by a developed economy since the 1930's. Large scale defaults and/or the breakup of the Euro are possible outcomes, but it is impossible to calculate the consequences including the potential loan losses and capitalization requirements of those outcomes.

In the country sections which follow, we assess loan portfolios on a country by country basis and stress tests the coverage universe using two screens.

Screen 1: Two years severe recessionary losses as a percentage of 2012E tangioble net asset value.

Screen 2: Two years 2012E pre-provision profits, flexed down by 25% less two years severe recessionary losses as a percentage of tangible net asset value.

Severe recessionary losses is generally taken as four times "normal" or average loan losses over very long term, although analysts have deviated from this by exception. The table below summarises the actual and forecast country loan loss aggregates from 2007 to 2012E as a percentage of average loans, with the final column showing the estimate of severe loan loss charges. For bank sector in the developed economies the range is from 1% to 3.5% and in the emerging markets the range is from 1.3% to 7.5%.

With the exception of the US, the UK and Ireland the assumption on a severe loan loss charge is above the peak GFC charge of 2009. For the US, the peak charge is less than 50% of the 2009 charge and for the UK it is a somewhat lower.

Figure 43: Loan loss charges to average loans: Developed Markets

	2006	2007	2008	2009	2010	2010E	2012E	2012 Stress
USA	NA	1.48%	3.55%	4.65%	2.62%	1.27%	1.01%	2.8%
Australia	0.17%	0.19%	0.47%	0.82%	0.45%	0.30%	0.23%	2.12%
Japan	0.31%	0.31%	0.70%	0.38%	0.23%	0.35%	0.38%	1.00%
Hong Kong	-0.13%	0.03%	0.33%	0.21%	0.07%	0.20%	0.22%	1.00%
UK	0.82%	0.92%	1.75%	2.58%	1.55%	1.17%	0.83%	2.12%
Sweden	-0.04%	0.03%	0.33%	0.96%	0.36%	0.18%	0.14%	2.58%
France	0.26%	0.46%	1.03%	1.46%	0.90%	0.67%	0.48%	2.12%
Germany	0.28%	0.44%	0.66%	0.49%	NA	NA	NA	NA
Greece	0.79%	0.70%	1.20%	1.77%	1.96%	1.91%	1.68%	3.60%
Ireland	0.10%	0.16%	1.26%	6.53%	11.24%	1.44%	1.17%	3.51%
Italy	0.50%	0.49%	0.70%	1.14%	0.97%	0.83%	0.71%	2.00%
Spain	0.55%	0.60%	0.99%	1.42%	1.36%	1.29%	1.31%	2.97%
Israel	0.56%	0.31%	0.82%	0.84%	0.49%	0.31%	0.44%	0.92%

Source: Deutsche Bank

Figure 44: Loan loss charges to average loans: Emerging Markets

	2006	2007	2008	2009	2010	2010E	2012E	2012 Stress
Brazil	6.09%	4.63%	4.64%	6.12%	4.31%	4.41%	4.79%	6.22%
Mexico	2.35%	4.03%	5.81%	5.87%	3.87%	2.82%	2.51%	5.50%
Russia	0.92%	0.74%	2.42%	7.17%	2.55%	0.44%	0.43%	2.12%
India	0.67%	0.78%	0.79%	1.01%	0.93%	0.89%	0.82%	1.30%
China	0.74%	0.75%	1.17%	0.46%	0.41%	0.54%	0.51%	2.04%
Turkey	0.57%	0.78%	1.12%	1.81%	0.26%	0.42%	0.51%	1.80%
Indonesia	2.24%	1.62%	2.33%	2.39%	2.07%	1.72%	1.85%	7.48%
Malaysia	0.98%	1.02%	0.67%	0.79%	0.57%	0.40%	0.44%	2.76%
Thailand	2.30%	2.76%	1.48%	1.32%	1.12%	0.97%	0.99%	1.17%
Korea	0.40%	0.54%	1.11%	1.20%	1.26%	0.75%	0.60%	1.76%
Poland	0.04%	0.11%	0.85%	1.68%	1.34%	1.10%	1.01%	4.02%

Source: Deutsche Bank

For the US it could be argued that the loan loss charge of 2009 equivalent to 9X a normal charge was truly exceptional first in the context of a 30% decline in house prices over two years and second in the context of exceptional fixed income trading revenues which allowed banks to appease the markets by increasing loan loss reserving ratios.

The assumption of a 25% fall in pre-provision profits sustained over two years may or may not be conservative. Large declines in pre-provision profits were recorded by US and European wholesale banks in 2008 as securities losses were taken against the revenue line. Clearly given the uncertainty attached to the value of GIIPS government bonds, there is scope for a repeat of significant write-downs. As a benchmark a 25% decline in European bank pre-provision profits sustained over two years for our European universe would imply a reduction in income of €110bn or US$1555bn against the expected outcome, equivalent to about 1% of loans and 3% of securities. That would be twice as bad as the outcome in 2008 and 2009 when compared with the run rate of pre-provision profits in 2007.

Figure 45: Aggregate pre-provision profits by country 2007 to 2012E: Developed Markets (local currency)

	2007	2008	2009	2010	2011E	2012E
USA	123,727	79,989	219,417	178,989	148,849	173,391
Australia	25,882	28,335	35,197	37,111	40,174	43,876
Japan	5,027	3,759	4,686	4,935	4,567	4,671
Hong Kong	45,645	37,617	33,890	39,943	50,453	59,205
UK	51,629	56,469	56,276	58,959	56,584	63,695
Sweden	13,839	13,057	16,176	14,305	14,639	16,088
France	19,034	18,635	28,575	34,178	36,700	39,611
Germany	44,060	28,460	44,069	NA	NA	NA
Greece	5,947	6,361	6,443	5,516	5,923	5,927
Ireland	6,830	6,739	6,569	4,260	733	859
Italy	29,409	24,202	26,548	23,295	23,873	27,598
Spain	28,805	34,497	41,531	41,029	40,425	44,536
Israel	12,640	4,645	13,695	11,948	12,073	13,488

Source: Deutsche Bank

The flex down assumption looks particularly conservative for emerging market banks, whose traditional banking models makes pre-provision profits less volatile.

Figure 46: Aggregate pre-provision profits by country 2007 to 2012E: Emerging Markets (local currency)

	2007	2008	2009	2010	2011E	2012E
Brazil	51,238	59,314	75,423	83,042	96,982	114,747
Mexico	150,386	164,931	183,202	169,226	178,447	208,081
Russia	223,508	318,794	527,570	529,119	571,615	672,001
India	472,246	614,553	743,420	870,734	1,078,210	1,290,613
China	531,430	692,684	666,650	857,761	1,080,339	1,247,177
Turkey	15,074	15,181	24,380	23,104	21,404	23,537
Indonesia	33,565	44,040	53,885	69,061	76,116	90,772
Malaysia	17,132	17,862	18,807	22,111	24,515	28,573
Thailand	120,549	154,772	160,155	192,722	230,827	262,143
Korea	17,717	18,059	16,387	20,791	25,497	24,587
Poland	12,309	16,302	15,719	18,013	20,036	23,406

Source: Deutsche Bank

Most of the 2008 decline in European and US pre-provision profits was attributable to mortgage related securities losses. A decline in European-pre-provision profits of US$155bn would be equivalent of 37% of the US$ 421bn of cross border claims by European banks on the GIIPS at end 2010.

The table below summarises the results at country level. The banking systems of most developed economies would be in loss. On average in the developed economies this stress tests costs banks in developed economies around 10% of NAV. The actual outcome would depend on the existing levels of loan lo0ss reserving, tax shields and other factors, but bank sectors would not in aggregate significantly run down tier one ratios.

Figure 47: Summary of Stress Tests

	2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	Core tier one to Risk weighted assets 2012E)
USA	-33.3%	4.6%	11.8%
Australia	-61.0%	-16.4%	8.5%
Japan	-22.3%	-1.2%	NA
Hong Kong	-13.0%	16.9%	11.2%
UK	-32.4%	2.2%	8.2%
Sweden	-68.1%	-39.9%	8.6%
France	-46.0%	-3.9%	10.0%
Germany	NA	NA	NA
Greece	-82.4%	-38.9%	7.4%
Ireland	-90.1%	-75.1%	12.4%
Italy	-49.8%	-14.0%	0.9%
Spain	-73.3%	-14.1%	9.1%
Israel	-18.9%	10.1%	7.9%
Brazil	-67.7%	23.7%	10.8%
Mexico	-40.9%	0.5%	15.4%
Russia	-22.7%	22.0%	13.3%
India	-23.0%	25.4%	8.0%
China	-32.0%	11.9%	10.5%
Turkey	-18.5%	17.6%	16.1%
Indonesia	-73.6%	-21.6%	15.9%
Malaysia	-43.3%	-6.0%	6.0%
Thailand	-16.3%	20.9%	10.9%
Korea	-29.0%	0.9%	8.8%
Poland	-47.5%	-8.9%	15.2%

Source: Deutsche Bank

The outcome in emerging markets is much more benign. The explanation is partly that emerging market banks have much high pre-provision profit margins.

Figure 48: Country average pre-provision profit margins: Developed Markets

	2006	2007	2008	2009	2010	2011E	2012E
USA	NA	3.4%	2.1%	5.0%	4.4%	3.7%	4.3%
Australia	2.3%	2.2%	2.1%	2.2%	2.1%	2.2%	2.3%
Japan	1.3%	1.2%	0.8%	1.0%	1.1%	1.1%	1.1%
Hong Kong	4.0%	4.6%	3.4%	2.8%	2.8%	3.0%	3.1%
UK	3.2%	3.0%	2.1%	2.3%	2.4%	2.3%	2.6%
Sweden	1.6%	1.5%	1.3%	1.5%	1.3%	1.3%	1.4%
France	3.1%	1.9%	1.7%	2.2%	2.4%	2.5%	2.6%
Germany	1.0%	0.8%	0.5%	0.8%	NA	NA	NA
Greece	3.7%	3.6%	3.0%	2.7%	2.3%	2.5%	2.5%
Ireland	1.7%	1.9%	1.7%	1.7%	1.2%	0.7%	0.8%
Italy	2.5%	2.4%	1.8%	1.9%	1.7%	1.7%	1.9%
Spain	2.7%	2.8%	3.0%	3.3%	3.1%	3.0%	3.2%
Israel	2.0%	2.2%	0.7%	2.1%	1.8%	1.7%	1.8%

Source: Deutsche Bank

And partly that analysts make assumptions on severe loan loss provisions which might prove optimistic in a crisis give the very high rates of credit growth experienced over the last two and five years.

Figure 49: Country average pre-provision profit margins: Emerging Markets

	2006	2007	2008	2009	2010	2011E	2012E
Brazil	13.7%	13.3%	11.5%	11.8%	11.0%	10.9%	11.2%
Mexico	10.5%	10.2%	9.8%	10.1%	8.7%	8.1%	7.9%
Russia	6.1%	4.9%	4.7%	6.8%	6.4%	5.8%	5.6%
India	3.1%	3.4%	3.6%	3.7%	3.6%	3.6%	3.6%
China	3.0%	3.8%	4.3%	3.3%	3.3%	3.6%	3.7%
Turkey	8.7%	9.2%	7.0%	9.7%	7.7%	5.6%	4.9%
Indonesia	7.3%	7.3%	7.5%	7.5%	8.1%	7.3%	7.1%
Malaysia	3.6%	3.6%	3.4%	3.1%	3.2%	3.1%	3.2%
Thailand	4.6%	4.1%	4.9%	4.8%	5.3%	5.5%	5.7%
Korea	2.5%	2.6%	2.3%	1.9%	2.4%	2.8%	2.4%
Poland	5.4%	5.2%	4.8%	3.9%	4.2%	4.2%	4.4%

Source: Deutsche Bank

The screen does show some counter-intuitive results. For instance Nordic banks screen as the most vulnerable to a severe loan loss scenario. Again, this principally reflects pre-provision margins, which are low for Nordic banks relative to European and global peers; but the risk profile of Nordic loan books, with around 40% of total loans represented by mortgages and 35% by large corporate is commensurately low.

To provide an overlay to theses simple screens, we have attempted to assess the relative riskiness of countries with a heat/danger map score card, which ranks countries on 9 factors on a scale of 1 to 5 with 5 being the highest risk. The factors are (i) De-regulation of lending/changes in lending practice; (ii) bank loans as a percentage of GDP; (iii) Change in the dbt to GDP ratio; (iv) maturity of the cycle in years;(v) credit mix (vi) unemployment; (vii) current account position;; (viii) level of real interest rates; (ix) Current account position.

Danger map scores are summarized below. In developed markets we find Australia, Sweden, Hong Kong and Germany least risky and the GIIPS most risky. We find emerging markets significantly less risk than developed market banking systems.

Figure 50: Danger Map Scores: Developed Markets

	USA	Australia	Japan	Hong Kong	UK	Sweden	France	Germany	Greece	Ireland	Italy	Portugal	Spain	Israel	Average
Deregulation of Lending	1	2	1	1	2	1	2	1	2	3	2	1	1	1	**2**
% of Credit to GDP	4	3	1	3	5	4	3	2	1	5	1	5	5	3	**3**
Change in % of Credit to GDP	2	1	1	3	3	4	1	2	3	5	2	5	4	2	**3**
Maturity of Cycle in Years	2	3	2	3	3	1	3	2	5	2	2	3	3	2	**3**
Credit Mix	3	1	2	3	3	2	2	3	5	4	5	3	3	2	**3**
Unemployment	4	1	1	1	3	1	4	2	5	4	2	5	5	1	**3**
Current account position	4	2	1	1	2	1	2	1	5	2	4	4	4	2	**3**
Level of real interest rates	1	2	2	1	1	1	2	2	2	3	2	2	2	2	**2**
Exchange rate flexibility	1	1	2	5	1	1	5	5	5	5	5	5	5	2	**3**
Total Danger Map Score (out of 45)	**22**	**16**	**13**	**21**	**23**	**16**	**24**	**20**	**33**	**32**	**25**	**33**	**32**	**17**	**23**

Source: Deutsche Bank

Figure 51: Danger Map Scores: Emerging Markets

	Brazil	Mexico	Russia	India	China	Turkey	Malaysia	Thailand	Korea	Indonesia	Poland	Average
Deregulation of Lending	1	1	2	3	3	2	1	1	2	2	2	**2**
% of Credit to GDP	3	1	2	2	5	1	4	2	4	2	1	**2**
Change in % of Credit to GDP	5	3	3	4	4	5	3	1	3	2	4	**3**
Maturity of Cycle in Years	5	2	4	3	3	1	2	2	3	3	2	**3**
Credit Mix	3	2	4	4	4	2	2	2	3	2	2	**3**
Unemployment	1	3	2	1	1	2	2	2	1	1	3	**2**
Current account position	3	2	1	3	1	5	1	1	1	2	4	**2**
Level of real interest rates	2	1	2	3	3	2	2	2	2	2	3	**2**
Exchange rate flexibility	2	2	3	3	3	2	3	3	3	3	2	**3**
Total Danger Map Score (out of 45)	**25**	**17**	**23**	**26**	**27**	**22**	**20**	**16**	**22**	**19**	**23**	**22**

Source: Deutsche Bank
We score each factor on a 1(grey) to 5 (blue) basis with 5 denoting the greatest risk/danger

Crisis . . . what crisis?

The elephant in the room

The elephant in the room or at least in this report so far is the Eurozone debt crisis, which is partly a "non crisis" involving elevated commercial bank NPLS's in a low growth environment and partly a crisis involving strained government finances, potential debt default, and potentially, a major currency, liquidity, and asset quality crisis in the world's largest banking system by far.

One way of thinking about these exposures is to split them into in-market (domestic) problems, and cross-border (contagion) problems. The idea that in-market (domestic) problems are major, and generally we think terminal, should not be contentious, but we do look at this issue below. Then we look at cross-border contagion issues.

In-market risks: the domestic sovereign crisis

Before looking at cross-border risk, we should look at why sovereign risk and banking sector risk become so closely entwined for banks, such that it becomes a near-iron rule that a failed sovereign will almost always lead to a failed banking system. The reverse is also often true when debt to GDP and leverage are high, i.e. a failed banking system will lead to a failed sovereign, as was the case for Ireland in 2008-10.

The mechanism by which sovereign to bank failure is transmitted is straightforward, and takes place by two channels. First, a failed or weak sovereign is unable to meet its "normal" commitments to spend, often because it is frozen out of the international debt markets. This is effectively the case in Greece at the moment. Savage retrenchment of government expenditure is often a contributory factor to economic slowdown, which drives domestic bad debts. Second, banks will routinely hold for liquidity purposes large volumes of their parent country sovereign debt. Banks need to hold large portfolios of liquid assets (and these are growing because of new requirements such as LCR), and the data tell us that these are routinely met through the domestic sovereign. Below we summarise data showing European GIIPS banks' exposure to their domestic sovereign debt, and to their domestic economy. In almost all instances for GIIPS banks, exposure to the domestic sovereign is larger than tangible equity, and domestic loans are a multiple of tangible equity.

Figure 52: Illustration of latest Domestic Sovereign Exposures

Country	Bank	Shareholders Equity	Goodwill	Tangible Equity	RWAs	Tier 1 as forecast	Domestic GIIPS Loan Book	As % T Eq	Domestic GIIPS Sov Risk	As % T Eq	Loan Book	"EU Risk" Loans (if known)	"EU Risk" bonds (if known)	Total risk bonds / TNAV
Italy	Banco Popolare	11,887	5,155	6,732	93,215	7,813	93,661	1391%	11,374	169%	97,726	93,661	11,632	172.8%
Italy	Monte dei Paschi	18,461	7,596	10,864	107,053	9,706	157,275	1448%	26,610	245%	161,150	157,275	27,135	249.8%
Italy	UBI Banca	12,615	5,475	7,140	93,249	8,224	102,774	1439%	8,240	115%	103,786	102,774	8,242	115.4%
Italy	Intesa SanPaolo	59,891	26,168	33,723	333,995	37,894	303,924	901%	64,473	191%	385,185	308,512	66,156	196.2%
Italy	Banca Popolare di Milano	4,659	840	3,819	45,432	3,852	32,359	847%	2,206	58%	36,104	32,359	2,343	61.4%
Italy	UniCredito	69,417	25,192	44,225	478,086	48,230	250,400	566%	38,664	87%	564,289	250,400	41,055	92.8%
Italy	Credito Emiliano	1,980	356	1,624	17,254	1,487	19,543	1203%	6,729	414%	20,289	19,543	6,729	414.3%
Ireland	Bank of Ireland	8,883	0	8,883	75,093	11,085	76,561	862%	4,990	56%	105,000	76,561		0.0%
Iberia	Bankinter	3,082	74	3,008	30,578	2,603	41,947	1395%	2,535	84%	41,947	41,947	2,535	84.3%
Iberia	Banco Popular	8,712	640	8,072	90,639	9,018	87,902	1089%	8,874	110%	96,619	96,619	9,727	120.5%
Iberia	BBVA	39,630	9,722	29,908	331,282	33,629	193,675	648%	53,452	179%	352,411	193,675	54,099	180.9%
Iberia	Banco Santander	79,138	26,527	52,611	603,699	63,751	210,430	400%	41,807	79%	737,090	240,174	45,666	86.8%
Iberia	Banco de Sabadell	6,009	850	5,159	56,248	5,512	68,847	1334%	7,296	141%	70,976	68,847	7,387	143.2%
Iberia	BCP	4,912	472	4,440	57,777	5,365	58,916	1327%	5,829	131%	71,500	63,964	5,829	131.3%
Iberia	BES	5,416	121	5,295	69,490	6,138	44,526	841%	2,683	51%	48,000	49,026	3,047	57.5%
Greece	EFG EuroBank	4,064	734	3,330	42,617	5,393	41,589	1249%	7,700	231%	49,194	41,589	7,700	231.2%
Greece	Alpha Bank	4,117	193	3,924	46,522	5,767	37,826	964%	4,200	107%	46,086	37,826	4,200	107.0%
Greece	Piraeus Bank	3,470	384	3,086	36,962	4,137	29,012	940%	8,000	259%	35,790	29,012	8,000	259.3%
Greece	ATE Bank	1,198	14	1,184	11,511	1,403	22,320	1885%	4,600	389%	19,164	22,320	4,600	388.5%
Cyprus	Bank of Cyprus	2,928	479	2,449	27,342	3,996	10,589	432%	2,000	82%	28,651	10,589	2,000	81.7%
Cyprus	Marfin Popular Bank	4,074	1,635	2,439	27,464	3,283	13,710	562%	3,000	123%	26,395	13,710	3,000	123.0%

Source: Deutsche Bank

These exposures show in a very practical way the link between sovereign restructuring and a domestic banking crisis.

Cross border contagion risks: the sovereign crisis

Easily the largest component (60%) of bank exposures to Greece, Ireland, Italy, Portugal, Spain (GIIPS) is in the form of loans to private sector entities, often booked in and funded from local subsidiaries. Impairments from these loans are already baked into analyst estimates.

Since the start of 2008, cumulative UK bank losses alone from non Sovereign and non-bank Ireland country exposures have exceeded €20bn – over 22% of total peak exposures. These losses are greater than the current exposure of all European banks to Irish public sector debt. If the average loan loss rates experienced by domestic banking systems are applied to the private sector exposures in the table below, then cumulative losses on cross border loans to private sector borrowers in the GIIPS are so far in the region of US$90bn.

The cross border exposures to sovereign debt are actually quite modest. On IMF data the total assets of Europe's banking systems are around US$28trn. On this basis the aggregate cross border sovereign exposures of GIIPS are equivalent to about 1.5% of total European bank assets. Greek government debt held by non Greek banks represents just 0.12% or so of total European bank assets.

Figure 53: Distribution of European Bank Claims on selected countries

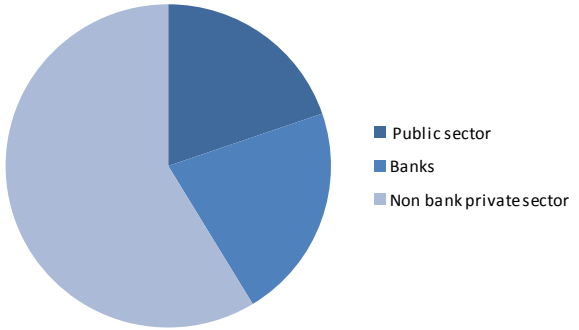
(US$bn)	Public sector	Banks	Private sector	Total	Relative to total European bank loans and Securities
Portugal	32388	40447	121770	194605	0.55%
Ireland	15355	70539	291742	377636	1.07%
Greece	54196	10918	80669	136317	0.39%
Spain	88054	199269	344866	632189	1.79%
Italy	231216	127261	126891	485368	1.38%
Total	421209	448434	965938	1826115	5.18%

Source: IMF and BIS

Aggregate claims on the GIIPS by European banks including loans to banks and non bank private sector borrowers of US$1.8trn represents about 5% of European bank assets. To put this into context, the loan exposures of systemically important US and UK international banks to defaulting Latin American countries in the mid 1980s was equivalent to 10% of their assets and over 15% of their total loans.

Of course the European exposures in the table above do not include the domestic banks' own loan books or their holdings of their governments' bonds, of which more later.

Figure 54: Pie Chart of Eurozone country exposures



Source: Deutsche Bank

A 2008 IMF study concluded that between 1970 and 2007 there were 124 banking crises, 208 currency crises and 63 sovereign debt crises. Carmen Reinhart and Kenneth Rogoff describe banking crises in their book This Time Is Different as an "equal opportunity" event, as commonplace in developed economies as in emerging markets. But a sovereign debt default has not taken place in a developed economy in the 1930's, shortly after the Great Recession, and then it was relatively minor (Spain suspended interest payments on external debt between 1936 and 1939).

Given that no one can how the sovereign debt crisis or indeed the Euro crisis will evolve and end and how a disorderly event should it occur would affect financial markets generally, it is impossible in our view to find a robust framework to stress test losses or incorporate government default assumptions into a normal credit cycle. An alternative but possibly no more useful approach is to see if other crises and post crisis periods provide a sign post for crisis resolution, loan quality issues and the like.

In the appendix to this report we include thumbnail length case studies of 9 banking crises, including the Latin American debt crisis of the 1980's, Argentina's banking and currency crisis of 2001/02 and Japan's banking crisis. Some of these crises were extreme boom and bust property cycles within the context of an inflationary macro-economic environment: asset bubbles were blown up by deregulation and popped by monetary tightening. At least in this respect the US sub prime lending crisis was not so different from many others, although "innovation" in lending practices rather than deregulation was the catalyst. Others involved deflationary shocks and a subsequent contraction in loan to GDP ratios over a multi year period.

Figure 55: Summary of Case Study Crises

Country	Date	Crisis thematic	Duration	Bank shareholders	Policy and political response
Argentina	2001	Deposit run; unpegged currency/75% devaluation; systemic chaos, inflation, high unemployment and severe social hardship. Government default	2 years	Survived but 65% down from pre-crisis 2000 levels to 2011 in nominal terms	Driven by events. Banks kept alive via issuance of bonds to compensate them for losses of exchanging their US$ assets and liabilities for Pesos at different rates
Japan	1997	A burst asset bubble. Deflationary and systemic pressures leading to heavy and persistent loan losses, recapitalisation and consolidation	5 years	Survivor banks 90% down from 1989 peak and now trading close to 25 year lows. Problems did not end with loan clean up	Learn as you go: many mistakes by regulators and Central bank but set template for the policy response to the 2008/09 crisis
Hong Kong	1997	Property crash and deflation as a consequence of property bubble and fixed exchange rate in context of SE Asian banking crisis and currency devaluations. A period in which bank lending contracted significantly in absolute terms and relative to GDP	2 years	No recapitalisation required in spite of 70% decline in property. System never went even close to loss. But It took 10 years for bank shares to reach post crisis highs because of the shrinkage of the loan book	Very proactive and wide awake before and after crisis. Actions included direct intervention in currency and stock markets and deregulation of deposit markets
Mexican default and Latam Debt Crisis	1982	Sovereign debt crisis and official debt repayment moratorium involving 10 countries with total debts to international banks of US$191bn. Debts were bank loans not government bonds Loan exposures of US money center banks equivalent to 16% of total loans and 200% plus of capital	7 years	International banks wrote down US$61bn in 1987 and 1989. Limited recapitalisation required. Bank shares performed surprisingly well The crisis set the scene for the consolidation of US money center banks	Highly accommodative: regulators allowed unusual accounting practices to flatter balance sheets and played for time. Banks effectively bailed out, at a cost, by the IMF and World Bank. Policy making driven by events
Sweden	1992	Property bubble following deregulation of system. Collapse required systemic recapitalisation and selective nationalization. Government debt to GDP doubled from 30% to 60% in 4 years and the stock or private sector debt contracted	2 years	Wiped out if their bank required state assistance Survivor banks were spectacular medium and long term investments if bought near the crisis lows	Resolute, very effective implementation and clearly thought out plan involving establishment of bad bank and rebuttal of moral hazard through shareholder wipe outs
Australia	1992	Multi year property and lending bubble following deregulation of system and entry of foreign banks	2 years	Dividends were cuts. Some large recapitalisations. Bank shareholders survived and then prospered	Post crisis the regulatory system was overhauled and reformed
Ireland	2008	Collapse of property bubble and wholesale deposit run followed by 20% decline in GDP and pressure on loan quality Loan losses tp GDP of 60% to 70% sets new record for a developed economy	Ongoing	Effectively wiped out	State guaranteed all liabilities of domestic banking system and recapitalised it. Created a bad bank to cleanse system of NPLs. Bank bail out costs almost destroyed governments finances
USA	2008	Rising interest rates bursts a housing bubble fostered by the innovation of AAA sub-prime securitizations and a long period of low rates. As house prices declined financial institutions were exposed at over leveraged and some as insolvent	2 years	Bank stocks are down over 60% from pre-crisis levels ROE remains below 20 year average of 11% and likely to remain depressed because of higher capital and liquidity requirements	Regulatory oversight contributed to the crisis Government went into overdrive effectively nationalizing the GSEs and injected capital into the banks via TARP and regulators effectively increased capital requirements through SCAP
Korea	2003	The government used the financial sector to jump start the Korean economy after the 1997 Asian banking crisis and then failed to contain the after effects of a massive credit stimulus/bubbles		Credit card companies experienced large portfolio write downs and were forced into mergers and or recapitalization The bank sector was at its bottom when the govt came out with measures to stabilize the system	The government was directly or indirectly responsible for the boom and bust cycle

Source: Deutsche Bank

In spite of many differences, possibly the most relevant to the European crisis today was the Latin American debt crisis of the 1980's. It involved many creditor and debtor countries. The debtor nations had borrowed too much money in the wrong currency. US and UK megabank exposures were sufficiently large (16% of total loans and 240% of equity) to threaten the solvency of the international financial system. The crisis took a long time (7 years) to work out. At the time informed observers were fearful that multiple country default could trigger a systemic collapse of the international banking system and a global recession. The policy response was ad hoc and driven by events. Politicians, the IMF, the World Bank, central banks, bank regulators, suspect accounting principles and financial markets all played their part in providing a fix, and ultimately (which coincided with when their balance sheets could bear the cost) commercial banks took very large (US$60bn) write downs as a prelude to the resolution of the crisis.

Possibly the major difference between the Eurozone crisis and any other over the last 70 years is that the domestic banking systems within the Eurozone hold unlikely weapons of self-destruction within their balance sheets in the form of their own governments' bonds, and that they are all inextricably linked. A disorderly default on government debt and withdrawal from the Euro would leave a massive recapitalization requirement even before the huge increase in private sector foreign currency loan impairments was factored in.

Until recently, the market appeared to have been banking on Benjamin Franklin's laconically grim political truism on signing the Declaration of Independence on July 4th 1776: "We must all hang together, Sir, or most assuredly we will all hang separately" The pragmatic view has been that at the end of the day the political, social and economic disincentives to disorderly debt repudiation or to abandoning the Euro would be greater than the reflation incentive. In 2002 Argentina devalued its currency and defaulted on its external debt after its banking system suffered a run on its deposits, which remains a possibility within the Eurozone. The Argentinean banking crisis of 2001/02 (which occurred when the ratio of private sector debt to GDP was just 27%) led to the near immediate resignation of the government. The subsequent 75% devaluation impoverished bank depositors, triggered a severe recession, an inflationary spiral and a prolonged period of high unemployment, social hardship and civil unrest. Nevertheless, Argentina's economy and bank sectors did subsequently recover and within a relatively short time span.

The pragmatic view, however, has been shaken by apparently hard lined resistance to bail outs by the German government amongst others. Even without a systemic financial and banking crisis, a rigorous austerity regime suggests a prolonged period of low growth and persistent deflationary pressures on asset quality measures within the indebted economies of the Eurozone must lie ahead. Just how severe this turns out to be will depend to a large extent on property values.

Banking systems around the world are indirect but fairly obvious plays on property, which back up 50% or more of loans and 20% to 30% of securities. So far since 2009, most banking systems have been protected by the better than expected resilience, at least in nominal terms, of house prices. Even in Greece, house prices have held up relatively well and although US house prices remain weak, the chances of a further 2008 style decline look very remote given the relationship between house prices and household income. Only in Ireland has there been an outright collapse in residential and commercial real estate values.

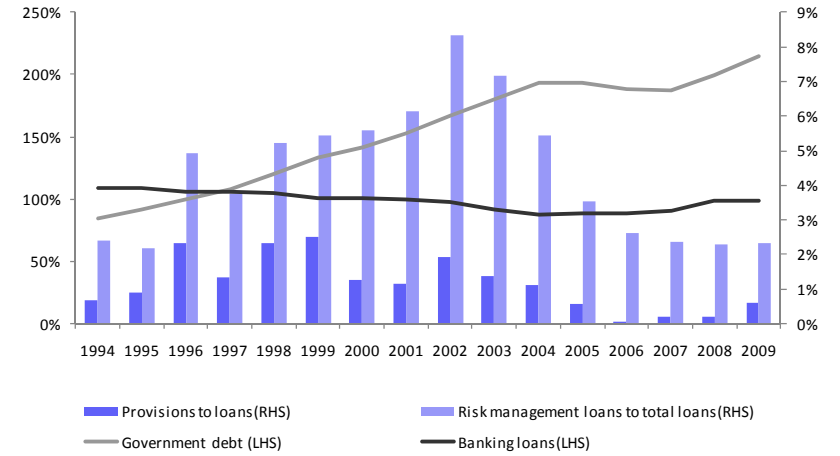
Figure 56: Index of House Prices: Developed Markets

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% ch from high/low
USA	100	111.3	129.2	149.1	150.2	136.2	110.7	107.2	104.6	-30%
Australia	100	118.2	125.9	127.7	137.7	153.3	160.0	165.5	185.7	186%
Japan	100	93.6	87.8	83.4	81.1	81.4	82.8	79.9	76.2	-24%
Hong Kong	100	88.0	119.7	140.0	137.2	148.2	176.4	172.8	212.6	213%
UK	100	119.5	139.9	147.1	156.5	170.8	159.3	147.5	156.1	-9%
Sweden	100	109.8	120.0	129.0	144.4	158.7	150.6	165.9	174.6	174%
France	100	111.7	128.7	148.4	166.3	177.3	179.4	166.7	177.2	-1%
Germany	100	100.5	100.1	100.5	101.0	102.1	103.3	104.8	106.8	7%
Greece	100	105.4	107.8	119.6	135.1	143.5	145.7	139.4	136.6	-5%
Ireland	100	113.7	123.5	135.0	150.9	139.9	127.1	104.5	93.2	-38%
Italy	100	106.1	112.6	121.3	128.1	134.7	138.2	137.7	137.8	-1%
Spain	100	116.3	132.9	147.2	156.4	159.7	154.6	142.7	133.8	-16%

Source: Deutsche Bank, Case Schiller, Nationwide, IMF

The Japanese banking crisis provides the most resonant template for the aftermath of a banking crisis in the context of a low interest rate and low demand environment. The Japanese bank loan to GDP ratio moved from about 80% in 1983 to 110% at the peak of the bubble in 1989 and then reverted towards mean over the next 15 years. Because there was very little nominal growth in GDP, the mean reversion was accomplished through a significant reduction in the stock of loans. During this process declining loan quality and high impairments were a persistent issue for the banking system, since deflation triggered declines in commercial property values and re-provisioning requirements on old NPLs and increased the stock of non-performing loans. As commercial bank loans to GDP shrank, the government stepped up to the plate and issued bonds, which were largely bought by domestic households and domestic institutions, particularly banks. This deleveraging process was incredibly painful for the industry..During the period of deleveraging loan losses were very high but thereafter fell sharply.

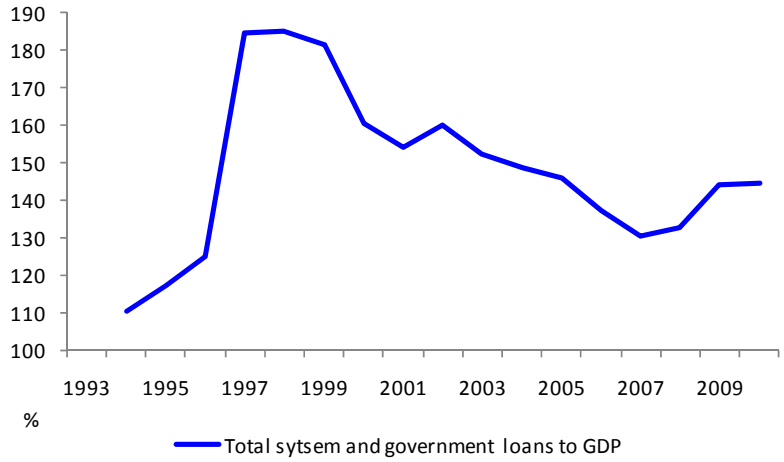
Figure 57: Japan: government and bank loans to nominal GDP against loan quality



Source: Deutsche Bank

In Thailand's banking crisis a similar reversion to mean took place. The devaluation of the Thai currency in July 1997 contributed to a huge spike in the loan to GDP ratio, from 110% to 144% and substantial losses within the financial system. If government debt is included the ratio of total debt jumped from 125% of GDP in 1996 to 185% of GDP, in 1997 as government debt rose from 15%of GDP pre crisis to 58% in 2000. This level of indebtedness was stratospheric relative to other emerging markets and to developed markets at that time. Thereafter the ratio of total credit to GDP declined over the next 11 years to 112%, the level pertaining in 1996. This adjustment was taken initially by a very significant (35%) contraction in the stock of commercial bank credit which fell for 4 consecutive years until recovering strongly from 2002. The Thai banks were forced to recapitalize and their share prices fell 90% plus over the crisis year. After an initial recovery period, Thai bank shares basically flat lined during the subsequent 9 year deleveraging period and began to perform strongly from 2007, when commercial bank loans to GDP troughed at 72%.

Figure 58: Thailand: Banking System and Government debt to GDP 1994 to 2010



Source: Deutsche Bank

The other crisis and post crisis which is possibly relevant to the current period is Hong Kong's in 1997. Loose US monetary policy was imported into Hong Kong's economy via the HK$/US$ peg and real estate values doubled between 1992 and 1997. The Asian banking crisis which the devaluation of the Thai currency triggered took place just as US monetary policy tightened considerably. Short term interest rates rose from 5.6% in 1996 to 9.5% at end 1997. Hong Kong was unable to devalue its currency to regain its competitiveness against its South East Asian competitors, whose currencies

were significantly devalued in 1997 and 1998. Adjustment therefore had to be taken through asset values and real wages. Nominal GDP was more or less static between 1996 and 2002, the stock of bank credit contracted by 47% from 318% of GDP in 1996 to 163% in 2002 and over that period and there was a 60% decline in house prices.

Figure 59: HK Macro 1992 to 2001

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
GDP local currency (HKD bn)	805	928	1,047	1,116	1,229	1,365	1,293	1,267	1,318	1,299	1,277
Average short term interest rate	Na	3.5%	4.8%	6.2%	5.5%	7.4%	8.5%	6.0%	6.2%	3.7%	1.9%
Period end short term interest rate	4.5%	3.7%	6.3%	6.0%	5.6%	9.5%	5.7%	6.1%	6.0%	2.0%	1.5%
Period end 10 year government bond yield	Na	na	na	na	7.3%	8.9%	6.6%	7.7%	6.6%	6.2%	4.6%
CPI	78	84	92	100	106	113	116	111	107	105	102
Current account surplus/deficit (%)	Na	5.4%	-1.1%	na	na	-4.4%	1.5%	6.3%	4.1%	5.9%	7.6%
House price index	100	111	147	126	142	204	134	120	106	92	82
Banking loans (HKD bn)	2,470	2,857	3,265	3,739	3,915	4,122	3,304	2,813	2,461	2,185	2,076

Source: Deutsche Bank

Hong Kong banks survived this more or less unscathed and for three reasons. The first is that loan losses from mortgages were very modest because the banks' regulator, the HKMA which had been wide awake before and after the crisis, had decreased the maximum loan to value loan progressively as the bubble built up and therefore loan underwriting standards were very tight; second, bank capital ratios were very high and funding for the large banks was retail; third, the HKMA was extremely proactive in boosting confidence in the system. In mid August 1998 and controversially at the time it used Hong Kong's Exchange Fund to support the currency and buy the stock market in large size (US$15bn), with the intention of deterring and damaging short sellers, successfully as it turned out. Over the next 18 months the Hang Seng index, which had fallen over 60% between July 1997 and August 1998, rose three fold, surpassing its pre crisis peak. Hong Kong bank shares, however, more or less flat lined from 1998 to 2006 and did not revert to their pre crisis peaks until 2007, and then only for a brief period.

So what crisis or post crisis environment is this?

The table on the next page compares the post crisis environments on various debt and GDP parameters following five severe banking crises, four of which are covered in more detail in a later section of this report. Four trends are clear. First, real GDP growth was very slow or negative (Sweden and Thailand) over a five year period. Second, there was a very rapid increase in government debt in all cases (bar Hong Kong, where there was no government debt) with an average increase of 154% and the average ratio of government debt to GDP rose by 35 percentage points to 75%. This is a higher growth rate than experienced by most developed economies after the GFC but the starting point of government debt to GDP ratios was much lower at 40% on average, including the ratio of 100% for Japan.

Figure 60: Crises Compared

	Sweden 1990/94	Australia 1990/94	Hong Kong 1997/01	Thailand 1997/01	Japan 1997/01	Average	UK 2008/12E	USA 2008/12E	Ireland 2008/12E
Cumulative increase in nominal GDP t-1 to t+4	0.0%	24.1%	5.7%	15.2%	-3.0%	8.4%	12.9%	12.9%	-15.3%
Cumulative increase in real GDP t-1 to t+4	-0.1%	12.6%	9.8%	-1.3%	2.4%	4.7%	2.6%	8.7%	-7.4%
Increase in Government debt t-1 to t+4	114%	132%	NA	322%	49%	154%	121%	87%	310%
Increase in bank lending t-1 to t+4	0%	10%	-14%	-13%	-9%	-5%	10%	4%	-42%
Govt debt to GDP Ratio t -1 (%)	28	17	NA	15	100	40	44	62	25
Govt debt to GDP Ratio t +4 (%)	62	31	NA	54	153	75	87	103	114
Bank loans to GDP ratio t (%)	93	81	149	129	106	112	143	174	192
Bank loans to GDP Ratio t+4 (%)	88	76	138	72	100	95	135	159	149

Source: Deutsche Bank

Third, over the same five year time period of t-1 to t+4 bank lending contracted on average by 5%. Only in Australia after its banking crisis in 1990 did the stock of credit increase. The largest contraction was in Hong Kong and Thailand (for Hong Kong we have used mortgage and consumer loans rather than total loans: the stock of total loans shrank by around 45%). Fourth, in all economies, the stock of loans fell relative to GDP.

When the experience of the US and UK post crisis is compared with the four deflationary shocks it looks as if bank sectors and economies are following a classic form book: slow or negative real GDP growth for a prolonged period, a significant increase in government debt, an abrupt slowdown or contraction in the stock of private sector debt, and, possibly, a reversion to the mean level of private sector debt to GDP.

The two differences between the post 2009 environment and previous crises are first that levels of debt are much higher on average post GFC (this is not universally true as Japan had already a debt to GDP ratio of 253% by 2002); and second that government credit was considered good after the previous crises. Arguably, when banks are unable to buy the bonds of their own sovereigns, the traditional liquidity, capital adequacy and banking models based on the hierarchies of credit has broken down.

It seems to us that the many of the banking systems in the developed economies are in a debt deflation environment and that because debt levels are at post war record highs the equilibrium is quite unstable. This suggests a bad and crisis prone background which is likely to be of long duration for financial institutions.

The good news is that the private sectors of the US and the UK started to deleverage immediately and recapitalized their banking institutions early on. That immediate private sector deleveraging and bank recapitalisation did not occur in Japan is one of the many explanations given for the scale of its banking crisis and the duration of its subsequent economic problems.

The bad news is that the adjustment has not happened in the Eurozone countries either at all or to anything like the same extent. A good outturn for loan quality within bank sectors might be for private sector debt to GDP ratios (and loan to deposit ratios) to revert towards mean without significant weakness in asset prices over a multi year period. This may be a tall order. Prolonged austerity in the Eurozone will most likely equate to prolonged and severe loan quality problems.

If Japan, Thailand, Hong Kong and possibly Ireland provide any signposts the period in which private sector debt ratios revert to mean is likely to be in the region of 7 to 10 years. This would suggest that the post crisis period will be of long duration and that there is no quick fix.

The Latin American debt moratorium episode, insofar as it provides a template for a multi country sovereign debt crisis, also points to a long duration for the government debt problems of the periphery countries and other developed economies.

The share price performance of bank sectors in Japan, Thailand and Hong Kong over the 10 years that followed on from the bubble peak might suggest that post crisis or post bubble, deleveraging and adjustment periods do not provide a great environment for bank shareholders. Bank sectors in Sweden and Australia struggled and underperformed markets in the early post crisis period and subsequently performed well, but the era of deleverage in Australia and Sweden was a short and shallow and thereafter followed a long period in which loan growth outpaced nominal GDP growth and in which housing enjoyed a long bull market.

Country Sections

United States

Overview

In this section we look at the US banks, with a focus on those covered by Deutsche Bank.

- Since the US credit crisis began in 2007, loan loss provisions have averaged 3.1% of average loans. We believe credit losses for US banks peaked in 2009 (at 4.65% of loans) and declined to 2.6% in 2010.
- Despite the US labor and housing markets slowly recovery, we believe credit quality at US banks will continue to improve given most US banks continue to runoff high-risk loans, and benefit from loss mitigation, loan resolution/modification programs. We estimate loan loss provisions declining to about 1% of average loans by 2011 (or $40-45b—half of what it was in 2010).
- Leverage ratios remain elevated in the US. Nonfinancial (and nongovernment) debt to equity (or net worth) remains well above historical levels. In total, US debt/equity was 34% at the end of 2010, down from a peak of 38% at 12/31/08, but well above the historical average of 28% since 1986.
- Credit mix has improved for US banks, given many banks have repositioned loan portfolios by reducing exposure to subprime, option adjustable rate mortgages, home equity, non-owner occupied/multi-family commercial real estate (CRE).
- For the US banks under our coverage, residential real estate (including home equity/2nd lien mortgages) represent 30% of loans and CRE represents 16%. In our view, these categories represent the longer-term credit risks for the sector.
- With regards to the Danger Map, we score the US at 22 out of 45. This puts US in the middle of the pack on the Danger Map.

Credit Data: Trends

Below we summarize data on revenue, profitability, and asset levels from 2007 to 2010, as well as our forecasts for the US banks under our coverage. Credit losses likely peaked in 2009 and will likely improve meaningfully over the next 1-2 years.

Figure 61: Aggregation of quoted bank data, local currency (USD bn), US

	2007	2008	2009	2010	2011E	2012E
Net Interest Income	180,406	219,782	268,911	252,038	235,427	240,258
Other Operating Income	153,754	98,947	235,225	219,616	199,978	207,981
Total Revenue	334,160	318,729	504,136	471,654	435,404	448,238
Costs	200,166	226,343	268,653	292,664	287,056	272,730
Pre-Provision Profits	123,727	79,989	219,417	178,989	148,349	175,509
Loan Loss Provisions	53,114	137,188	205,429	106,896	50,339	43,612
Pre-Tax Profit	80,142	-41,036	40,701	69,595	95,758	129,611
Total Assets	7,369,372	8,800,475	8,987,487	9,050,791	9,094,405	9,135,895
Average Assets	7,064,448	7,469,266	9,133,904	9,193,725	9,096,096	9,074,022
Risk weighted assets	5,196,550	6,021,803	6,112,370	5,820,995	5,762,377	5,798,995
Total Loans	3,444,758	4,511,691	4,176,454	4,010,565	3,940,907	3,989,246
Revenue / Average Loans	9.3%	8.2%	11.4%	11.5%	10.9%	11.1%
Pre-Provision Profit / Average Loans	3.4%	2.1%	5.0%	4.4%	3.7%	4.4%
Loan Loss Provisions / Average Loans	1.48%	3.55%	4.65%	2.62%	1.26%	1.08%
PPP / Loan Loss Provision Cover	2.3	0.6	1.1	1.7	2.9	4.0

Note: Aggregated data from BAC, BBT, C, CMA, FHN, FITB, HBAN, JPM, KEY, MTB, PNC, RF, STI, TCB, USB, WFC, ZION.
Source: Company data and DB estimates.

Estimates by Bank

Below we summarize our credit loss forecasts for 2012 for the US banks in our coverage universe. We then show our estimate of severe recessionary loan losses, which for the purposes of this exercise we have taken as 4x normalized. We then express this as a percentage of 2012 tangible book value (TBV), and also as a percentage of 2012 pre-provision profit (PPP) flexed down by 25%, as a proxy of a potential contraction during a crisis.

We estimate annual credit losses of USD $80b for the US banks. Over two years, this would be equivalent to 20-25% of 2012 TBV. If we include PPP estimates as an offset, most US banks would be breakeven. For those that wouldn't be (CMA, FHN, HBAN, KEY, RF, STI, and ZION), losses would be about 3% of TBV (i.e. these banks would be loss-making).

Figure 62: Summary 2012E data and comparing recessionary loan loss charges as % of opening TBV and of PPP

USD ($M)		Loan Loss Provisions		Pre-Provision Profit (PPP)		2 Years of Recessionary losses		
Ticker	Avg Loans	Forecast	Severe Recession	Forecast	Less Recessionary Losses	Forecast	As % 2012 Tangible Equity	% incl. 2 yrs. of PPP (flexed down by 25%)
BAC	884,587	8,399	17,692	32,339	14,647	35,383	25%	NM
BBT	112,315	913	2,246	3,597	1,351	4,493	37%	NM
C	636,433	11,681	12,729	30,762	18,033	25,457	16%	NM
CMA	41,879	266	838	876	38	1,675	28%	6%
FHN	16,100	69	322	321	-1	644	27%	7%
FITB	80,939	540	1,619	2,366	747	3,238	30%	NM
HBAN	41,448	307	829	1,052	223	1,658	34%	2%
JPM	697,856	8,076	13,957	44,942	30,985	27,914	19%	NM
KEY	54,822	372	1,096	1,361	265	2,193	24%	2%
MTB	55,685	286	1,114	1,499	385	2,227	43%	0%
PNC	153,413	705	3,068	5,494	2,425	6,137	25%	NM
RF	85,236	703	1,705	1,996	291	3,409	36%	4%
STI	115,951	976	2,319	2,869	550	4,638	33%	2%
TCB	16,326	139	327	457	131	653	37%	NM
USB	209,963	2,054	4,199	9,163	4,964	8,399	35%	NM
WFC	781,367	7,902	15,627	35,616	19,989	31,255	28%	NM
ZION	37,846	223	757	799	42	1,514	34%	7%
Total	4,022,167	43,612	80,443	175,509	95,065	160,887	23%	3%

Source: Deutsche Bank estimates, (*) flexed down by 25%

United States in the middle of the pack on the Danger Map

Below we summarize our Danger Map indicators for the US. We score the US overall at 22 out of 45. This puts US in the middle of the pack on the Danger Map. This represents the aggregate of a 1 to 5 score across nine risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending.

Overall, we rate the US as less risky in terms of, deregulation of lending, level of real interest rate, and exchange rate flexibility. We rate the US as more risky in terms of % of credit to GDP, unemployment and current account position.

Figure 63: Scoring the "danger map"

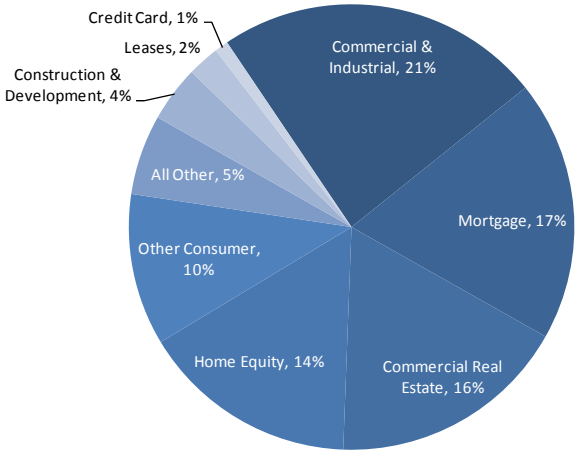
Danger Factor	Score	Comment
Deregulation of Lending	1	
% of Credit to GDP	4	Higher than historical averages
Change in % of Credit to GDP	2	Improving
Maturity of Cycle in Years	2	
Credit Mix	3	
Unemployment	4	Unemployment remains elevated
Current account position	4	
Level of real interest rates	1	
Exchange rate flexibility	1	
Total Danger Map Score (out of 45)	22	

Source: Deutsche Bank

Understanding the US banks' loan books

For the US banks under our coverage, residential real estate (including home equity/2nd lien mortgages) represent 30% of loans and CRE represents 16%. In our view, these categories represent the longer-term credit risks for the sector—particularly if the US economy deteriorates further. Write-downs for residential mortgage and home equity loans for the US as a whole still have a ways to go, in our view. For example, we estimate that 35-45% of home equity has little to no equity backing the loan. And for first lien mortgages, we estimate 30-40% have LTVs of 95%-plus.

Figure 64: US banks under coverage: loan mix (at 3/31/11): Total of USD 4.1b



Note: Data is based on US bank regulatory filings as of 3/31/11. Aggregated data from BAC, BBT, C, CMA, FHN, FITB, HBAN, JPM, KEY, MTB, PNC, RF, STI, TCB, USB, WFC, ZION.
Source: SNL Financial

Australia

Overview

- In this section we look at the major Australian banks, with a focus on those covered by DB (ANZ, CBA, NAB and WBC). Over the last five years, loan loss provisions in the banking book averaged 42bp, and peaked at 82bp.
- We believe that should there be another economic downturn, the Australian banking sector is better placed compared with prior to the global financial crisis to withstand such shocks as:
  - Banks provision levels have significantly increased, measured on any metric. For example, the Australian banks are currently holding significant levels of collective provisions which can be drawn on when impaired assets increase.
  - Banks have significantly reduced their exposures to high risk sectors such as commercial property in recent years in response to the GFC.
  - Australian housing is well insulated from any significant downturn in house prices with low average LVRs, lenders' mortgage insurance for LVR>80% and ample room for the central bank to move down rates (current cash rate is 4.75%).
- Whilst we cannot see the banks making these losses, even in an extremely recessionary scenario where losses reach 2.1% of total GLA, or an aggregate credit loss of $40bn for the four majors per annum, the Australian banks will still be profitable with a combined total profit before tax of $3.2bn. We note this loss scenario is significantly higher than the peak loss experienced during the GFC which was 0.82% of GLA.
- Based on our analyses of case studies, and our global experiences of bank lending we put Australia at the low end of the pack on the Danger Map.
- Capital ratios have improved significantly, with Core Tier 1 ratio increasing by 2.4% to an average of 7.7%.

Credit Data: Trends

Below we summarise data from 2005 to 2010 for the aggregated Australian major banks in our coverage universe. We see declining PPP combining with rising loan losses to reduce PPP/LLP cover from 13.7x to 2.7x. We note that a majority of the loan loss provision has been used to increase collective provision levels which remain elevated.

Figure 65: Aggregation of quoted bank data, local currency (AUD$m), Australia

Local Currency	2006	2007	2008	2009	2010
Net Interest Income	27,785	30,395	34,110	43,712	46,867
Other Operating Income	18,994	18,790	19,918	20,217	21,479
Total Revenue	46,779	49,185	54,028	63,929	68,346
Costs	22,291	23,303	25,693	28,732	31,177
Pre-Provision Profits	24,488	25,882	28,335	35,197	37,169
Loan Loss Provisions	1,786	2,273	6,512	13,108	7,906
Pre-Tax Profit	22,702	23,609	21,823	22,089	29,263
Total Assets	1,489,237	1,757,207	2,054,943	2,341,064	2,482,298
Average Assets	1,423,027	1,609,856	1,911,065	2,359,868	2,439,524
Risk weighted assets	968,397	1,103,708	1,019,951	1,172,166	1,179,100
Core tier one capital	53,945	58,655	59,741	83,248	85,593
Risk Cushion above 7% plus 1 year PPP	24,488	25,882	28,335	35,197	37,169
Total Loans	1,119,538	1,279,296	1,468,010	1,716,393	1,774,966
Average Loans	1,059,634	1,199,417	1,373,653	1,592,201	1,745,679
Revenue / Average Loans	4.4%	4.1%	3.9%	4.0%	3.9%
Pre-Provision Profit / Average Loans	2.3%	2.2%	2.1%	2.2%	2.1%
Loan Loss Provisions / Average Loans	0.17%	0.19%	0.47%	0.82%	0.45%
PPP / Loan Loss Provision Cover	13.7	11.4	4.4	2.7	4.7

Source: Deutsche Bank, Company Data

Estimates by Bank

Below we summarise forecast data for 2012 for the aggregated major Australian banks in our coverage universe (ANZ, CBA, NAB and WBC). We then show our estimate of severe recessionary loan losses, which for the purposes of this exercise we have taken as 2.1% of total GLA.

We then express this as a % of 2012 BV, and also as a % of 2012 pre-provision profit. These estimates show in our view that (1) the Australian banks have good pre-provision profit generation, insulating them from potential loan losses, and that (2) in a severe credit book downturn, we still expect a profit.

Figure 66: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of non-flexed PPP

Local Currency, 2012E	ANZ	CBA	NAB	WBC	Total
Forecast Average Loan Balances	413,564	528,140	432,572	505,768	1,880,044
Forecast Loan Loss Provisions	1,045	1,012	1,491	960	4,508
Severe Recession Loan Loss Provisions	8,768	11,197	9,171	10,722	39,857
2012 Pre-Provision Profit	10,160	11,737	10,276	10,849	43,023
2012 PPP less Recessionary Losses	1,393	541	1,106	127	3,166
2012 Forecast Tangible Equity	33,668	30,463	33,773	33,314	97,904
2 Years of Recessionary losses	17,535	22,393	18,341	21,445	58,269
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-52%	-74%	-54%	-64%	-60%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	-7%	-16%	-9%	-16%	-16%

Source: Deutsche Bank, Company Data

Danger Map Indicators for Australia

Below we summarise our Danger Map Indicators for Australia. We score Australia overall at 16 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We rate Australia as low on the mix, unemployment and exchange rate flexibility.

Figure 67: Scoring the "danger map"

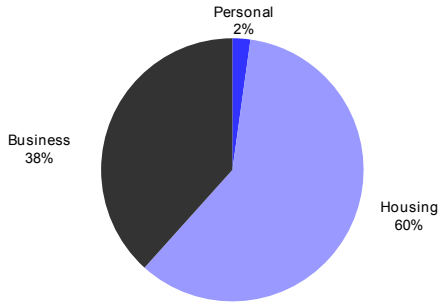
Danger Factor	Score	Comment
Deregulation of Lending	2	No recent deregulation of lending
% of Credit to GDP	3	Credit to GDP is 130%
Change in % of Credit to GDP	1	Only 1% growth in last 3 yrs
Maturity of Cycle in Years	3	Year 3 of the recovery
Credit Mix	1	Heavily mortgage led with exposure to risky lending (e.g. commercial property) significantly reduced
Unemployment	1	Historically low unemployment
Current account position	2	
Level of real interest rates	2	
Exchange rate flexibility	1	
Total Danger Map Score (out of 45)	16	

Source: Deutsche Bank

Understanding the Australian banks' loan books

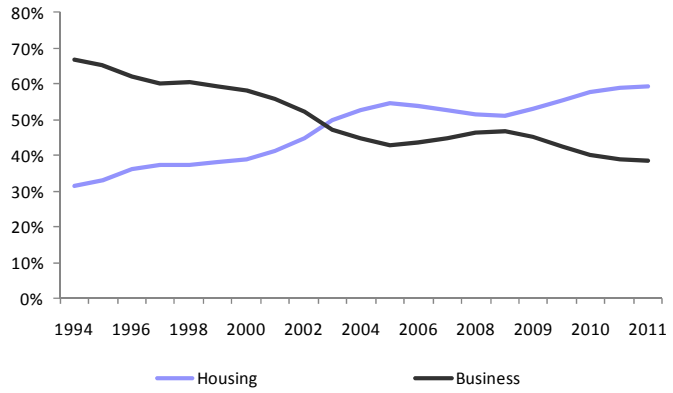
As discussed above, we believe Australian banks have low risk in their loan portfolios which has a high proportion of housing lending. This proportion has increased over the years.

Figure 68: Housing a major proportion of loan book



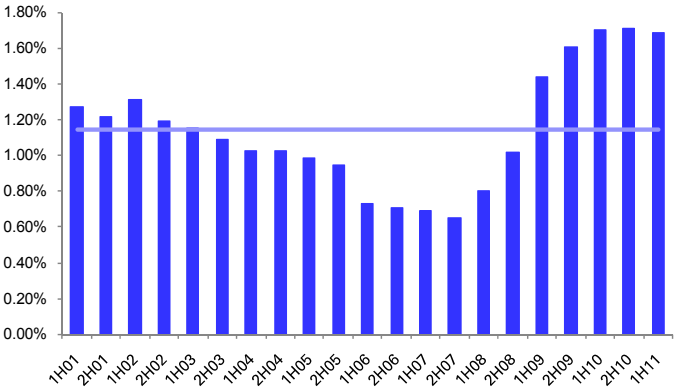
Source: Deutsche Bank, Company Data

Figure 69: Housing has increased as a proportion over time



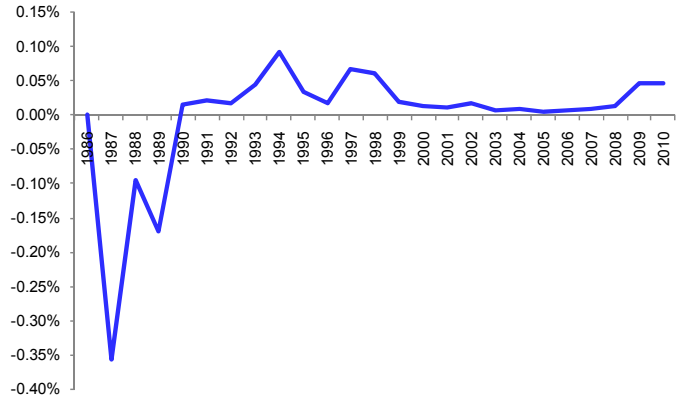
Source: Deutsche Bank, Company Data

Figure 70: Total provision to RWA improved



Source: Deutsche Bank, Company Data

Figure 71: Write-off history for mortgages



Source: Deutsche Bank, Company Data

Japan

Overview

- The average credit cost ratio for all Japan's listed banks over the past five years is very low at 39bp. If we exclude FY3/09, the year of the Lehman Brothers Shock, the average declines to 30bp.
- There are two broad reasons for low credit costs. First, the writing down of bad debts, which ballooned during the late 1980s bubble, has been completed. Accumulated credit costs from FY3/95 through FY3/04 are equivalent to 20% of FY3/95 lending. Most of the companies whose survival was called into question in the late 1990s have already gone into legal proceeding. In addition, banks have made ample provisioning for loans likely to become bad debts. On the other hand, equity ratios for Japanese companies as a whole are improving year by year, so bank borrowing is declining. Lending growth is being sustained by an increase in housing loans, while lending to companies is declining. This is a reason for recently low credit costs.
- Present market consensus, which called for a very moderate rise in credit costs from 30bp before the failure of Lehman, now expects costs to contract to 20-25bp. In such circumstances, if stress occurs, a level of about 100bp would be appropriate. This is far below the 330bp recorded in FY3/98 but above the 70bp seen in the immediate aftermath of the collapse of Lehman. If credit costs were 100bp, they could basically be absorbed every year by net operating profit (PPP) for the five major banks.
- We believe bad debt problems are unlikely to re-ignite in Japan, where credit growth is limited. Nevertheless, caution is necessary when it comes to TEPCO loans, with faces nuclear reactor problems. The government is considering compensation for regions damaged by the earthquake, so under normal circumstances this would not place any burden on the banks. That said, if political uncertainty persists, there is a risk not only of delays in making legislation but also of some banks shouldering part of the burden.

Figure 72: Aggregation of quoted bank data, local currency (JPY bn), Japan

Local Currency	2006	2007	2008	2009	2010
Net Interest Income	8,192	8,313	8,446	8,425	8,104
Other Operating Income	3,442	3,147	1,866	2,637	3,181
Total Revenue	11,634	11,460	10,313	11,062	11,285
Costs	6,234	6,432	6,554	6,376	6,350
Pre-Provision Profits	5,400	5,027	3,759	4,686	4,935
Loan Loss Provisions	1,290	1,355	3,141	1,721	997
Pre-Tax Profit	7,109	5,426	-342	2,753	3,920
Total Assets	747,757	767,197	794,097	803,458	827,095
Average Assets	750,773	757,477	780,647	798,777	815,276
Total Loans	425,465	435,397	455,894	439,706	436,651
Average Loans	421,671	430,431	445,645	447,800	438,178
Revenue / Average Loans	2.8%	2.7%	2.3%	2.5%	2.6%
Pre-Provision Profit / Average Loans	1.3%	1.2%	0.8%	1.0%	1.1%
Loan Loss Provisions / Average Loans	0.31%	0.31%	0.70%	0.38%	0.23%
PPP / Loan Loss Provision Cover	4.2	3.7	1.2	2.7	4.9

Source: Deutsche Bank aggregation of company data

Credit Data: Trends

Overall NOP (PPP) for Japan's listed banks is stable at around ¥5trn. NOP tends not to fluctuate based on such core businesses as loans and deposits, but is more sensitive to gains and losses on bond holdings. In Japan as a whole, the loan-deposit ratio has declined and is currently about 81%, and bank holdings of yen-denominated assets, such as JGBs, are on the increase. Even during FY3/09, when Japanese banks reported overall losses, credit costs were within NOP, but impaired losses on shares and foreign bonds increased, pushing overall bank earnings into the red. Therefore, the level of stress exerted on Japanese banks likely depends on market risk rather than credit risk. However, after the collapse of Lehman, foreign bond holdings fell sharply. The data below are based on parent bank figures, and exclude subsidiaries including securities subsidiaries and non-banks. In Japan, data is released for parent and consolidated bank operations at the same time.

Estimates by Bank

Listed Japanese banks can be divided into the five major banking groups and the 83 regional banks. Among the five majors, Mizuho FG and Sumitomo Mitsui Trust HD (SMTH), which have a relatively high proportion of loans to large companies, have low credit costs. In FY3/11, credit costs for parent banks were virtually zero (reverse profit 2.5bp, at Mizuho and 3.5bp cost at SMTH). For MUFG and Sumitomo Mitsui FG (SMFG) credit costs were about 20bp. We look for these levels to continue in FY3/12. If credit costs of 100bp continued for two successive years, we estimate that the impact on tangible equity would likely be small, with credit costs at Resona HD relatively high among the five bank groups.

Figure 73: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of non-flexed PPP

Local Currency, 2012E	MUFG	SMFG	Mizuho	Resona	SMTH
Forecast Average Loan Balances	76,000	56,850	59,000	27,000	20,200
Forecast Loan Loss Provisions	150	100	120	60	30
Severe Recession Loan Loss Provisions	760	569	590	270	202
2012 Pre-Provision Profit	1,040	760	685	280	245
2012 PPP less Recessionary Losses	280	192	95	10	43
2012 Forecast Tangible Equity	7,910	5,122	5,112	1,520	1,791
2 Years of Recessionary losses	1,520	1,137	1,180	540	404
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-19%	-22%	-23%	-36%	-23%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	1%	0%	-3%	-8%	-2%

Source: Deutsche Bank estimates

Danger Map Indicators for Japan

As outlined above, credit risk is very low for Japanese banks. Overseas loans average 11-16% for the top three bank groups (MUFG, SMFG, Mizuho FG) but close to half of these loans are to Japanese companies, while the remainder are to major foreign companies or project finance for infrastructure. There is little direct sovereign lending and we do not believe overseas loans are likely to become a problem. Caution is necessary regarding loans to TEPCO. If all of the loans were written off, we calculate the impact on tangible equity for SMFG and Mizuho FG at about 10%. That said, a Cabinet decision has already been reached regarding government support for TEPCO, and in the absence of resistance from opposition parties action based on the decision should proceed smoothly.

Figure 74: Scoring the "danger map"

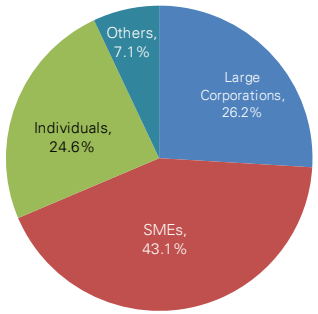
Danger Factor	Score	Comment
Deregulation of Lending	1	Deregulation had completed.
% of Credit to GDP	1	90%, down from 106% in 1993
Change in % of Credit to GDP	1	Stable in the last few years
Maturity of Cycle in Years	2	Loans are basically short-term
Credit Mix	2	Well diversified. Loans to Tokyo Electric Power may be subject to political debates.
Unemployment	1	Unemployment broadly unchanged
Current account position	1	
Level of real interest rates	2	
Exchange rate flexibility	2	
Total Danger Map Score (out of 45)	13	Low, due to no major credit growth

Source: Deutsche Bank

Loan portfolio highlights

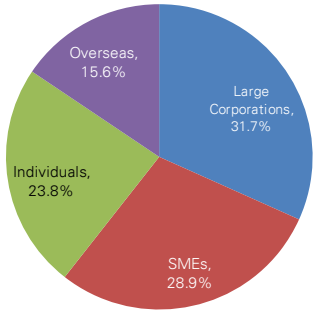
The shares of domestic lending by Japanese banks are 26% to large corporations, 43% to SMEs and 25% to individuals. Post-financial crisis, large companies have healthy balance sheets and there have been no large bankruptcies over the past several years. Most lending to individuals is for housing loans, for which credit costs are low. Unsecured lending to individuals is made by non-banks rather than banks, and the market for such lending shrank dramatically last year following the tightening of regulations on maximum interest rates and the start of regulations on annual income. Accordingly, lending to SMEs presents the greatest risk, but the banks' loan portfolios are made up of small loans to numerous borrowers, and even during the financial crisis loans to SMEs were not a problem. We should also pay attention to public guarantees on loans to SMEs. Based on macro-economic data, about 20% of lending to these borrowers is backed by public guarantees.

Figure 75: Japanese Banks Domestic Loan Portfolio (Total)



Note: Others include loans to public sector
Source: BoJ

Figure 76: MUFG (parent) Loan Portfolio



Source: MUFG

Hong Kong

Overview

- In this section we look at the Hong Kong banks, with a focus on those covered by DB (Hang Seng Bank, Bank of East Asia, Bank of China (Hong Kong), Wing Hang Bank and Dah Sing Banking Group). Over the last five years, credit costs in Hong Kong have been relatively benign, with average credit costs at just 10bps. Credit cost peaked in 2008 at 33bps but then quickly declined to 7bps in 2010. Across the cycle, average annual credit cost is about 25bps which is low relative to other regions.
- In the case of severe asset quality deterioration in Hong Kong, we believe that peak provisions could reach 4x their normalised level using previous downturns (1998, 2003, and 2008) as a reference. We estimate combined credit losses of HKD 19bn per annum for the Hong Kong banks under our coverage. Over the two years, this would be equivalent to 13% of 2012 closing tangible book value. If we include PPP estimates as an offset (flexed down by 25% which is consistent with the 2007-2009 experience) then there would be a gain of 17% of book value, i.e. the banks would be able to offset the credit losses and still register a profit.
- As an international financial centre, Hong Kong has a sizeable exposure to non-HK loans and trade finance, which accounted for more than 28% total system loans (Mar 2011). Exposure to the Hong Kong property sector is sizable,accounting for 52% of domestic loans. As such, recent property prices increases of 19% and 10% in 2010 and 2011 YTD have increased concern over potential asset quality deterioration. Recent property price increases have been driven by historically low mortgage rates (c.1.3%), increased buying from mainland Chinese, and a shortage of supply. In an effort to prevent a property bubble, HKMA has introduced various prudential measures including a maximum LTV of 50% for property priced above HK$10m (or US$ 1.3m). While a sharp correction in property prices may well increase credit costs for the sector from a very low base, we believe Hong Kong banks have robust profitability and sufficient capital to weather any negative impact. In fact, we estimate the loan-to-value ratio of system mortgage book to be roughly 40% - suggesting a comfortable equity buffer -, and Hong Kong bank's exposure to the high-end market, which is the focus of bubble concern, is quite modest
- As regards the Outlook and the Danger Map for Hong Kong, we score Hong Kong overall at 21 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. This puts Hong Kong in the middle of the pack on the Danger Map – neither in the danger of the red, nor sitting pretty in the green.

Credit Data: Trends

Below we summarise data from 2006 to 2010 for the aggregated Hong Kong banks in our coverage universe. The data shows that despite downturn in 2008, Hong Kong banks' profitability was robust enough to withstand increases credit costs and key ratios point to a healthy sector overall. During the period, credit growth was strong at CAGR 15%, reflecting increased loans to China and rapid recovery in trade volume. Asset quality also remained healthy. Credit cost was already low at 33bps in 2008 relative to other regions and this further declined to 7bps in 2010. As a result, the PPP/LLP cover quadrupled from 10.1x in 2008 to 41.2x in 2010.

Figure 77: Aggregation of quoted bank data, local currency (HKD mn), Hong Kong

Local Currency	2006	2007	2008	2009	2010
Net Interest Income	36,615	44,577	47,834	43,297	45,392
Other Operating Income	15,885	22,761	14,244	18,947	21,132
Total Revenue	52,500	67,337	62,078	62,244	66,525
Costs	17,520	21,693	24,461	28,354	26,582
Pre-Provision Profits	34,979	45,645	37,617	33,890	39,943
Loan Loss Provisions	-1,120	290	3,723	2,501	968
Pre-Tax Profit	39,221	49,042	21,538	37,738	45,272
Total Assets	2,116,406	2,463,212	2,571,453	2,738,297	3,395,620
Average Assets	1,980,434	2,289,809	2,517,332	2,654,875	3,066,959
Risk weighted assets	1,096,912	1,319,306	1,269,181	1,316,069	1,524,286
Core tier one capital	137,860	130,014	124,719	147,387	162,756
Risk cushion above 7% plus 1 year PPP	96,055	83,307	73,494	89,153	95,999
Total Loans	902,787	1,076,523	1,163,205	1,246,874	1,580,419
Average Loans	868,294	989,655	1,119,864	1,205,040	1,413,646
Revenue / Average Loans	6.0%	6.8%	5.5%	5.2%	4.7%
Pre-Provision Profit / Average Loans	4.0%	4.6%	3.4%	2.8%	2.8%
Loan Loss Provisions / Average Loans	-0.13%	0.03%	0.33%	0.21%	0.07%
PPP / Loan Loss Provision Cover	-31.2	157.5	10.1	13.6	41.2

Source: Deutsche Bank aggregation of company data

Estimates by Bank

Below we summarise forecast data for 2012 for the aggregated Hong Kong banks in our coverage universe (Hang Seng Bank, Bank of East Asia, Bank of China (Hong Kong Holdings), Wing Hang Bank and Dah Sing Banking Group). We then show our estimate of severe recessionary loan losses, which for the purposes of this exercise we have taken as 4x normalised.

We then express this as a % of 2012 BV, and also as a % of 2012 pre-provision profit flexed down by 25% (this is the same PPP experience we saw in the 2007-2009 credit cycle, when PPP in aggregate fell from HKD 46bn to HKD 34bn). These are simple numbers, but they do show in our view that (1) the Hong Kong banks have good pre-provision profit generation, with PPP expected to reach close to HKD 60bn (by 2012), and that (2) even a severe credit book downturn, would not have disastrous results on the banks' profitability, in aggregate. Overall, the banks seem to be very well cushioned from incurring huge losses.

Figure 78: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of non-flexed PPP

Local Currency, 2012E	HSB	BEA	BOCHK	DSB	WHB
Forecast Average Loan Balances	587,627	397,964	731,594	90,068	117,053
Forecast Loan Loss Provisions	1,162	964	1,790	236	146
Severe Recession Loan Loss Provisions	5,876	3,980	7,316	901	1,171
2012 Pre-Provision Profit	19,941	7,685	27,453	1,566	2,560
2012 PPP less Recessionary Losses	14,064	3,705	20,137	666	1,390
2012 Forecast Tangible Equity	87,334	46,746	131,074	15,115	16,798
2 Years of Recessionary losses	11,753	7,959	14,632	1,801	2,341
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-13%	-17%	-11%	-12%	-14%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	21%	8%	20%	4%	9%

Source: Deutsche Bank

Danger Map Indicators for Hong Kong

Below we summarise our Danger Map Indicators for Hong Kong. We score Hong Kong overall at 21 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analysis of case studies, and our global experiences of bank lending. We rate Hong Kong as medium on the mix and stage of cycle issues, and high in terms of % of debt in GDP. This puts Hong Kong in the middle of the pack on the Danger Map – neither in the danger of the red, nor in the comfort of the green.

Figure 79: Scoring the Hong Kong "danger map"

Danger Factor	Score	Comments
Deregulation of Lending	1	Recently introduced maximum LTV for mortgages (>HK$10m LTV capped at 50%)
% of Credit to GDP	3	Debt to GDP ratio is high, due to HK being an international financial centre, not due to over-leverage (Total Debt/GDP = 315%; Total Debt excluding overseas loans/GDP = 247%)
Change in % of Credit to GDP	3	Increased by 83 pp from 2007 to 2010 (seems high but due to HK being an international financial centre)
Maturity of Cycle in Years	3	
Credit Mix	3	55% of loans for use in HK are exposed to the residential and commercial property market
Unemployment	1	Unemployment at low level of 3.5% (Apr 2011) and declining YTD
Current account position	1	No current account deficit. 2010 current account / GDP = 6.6%
Level of real interest rates	1	HK's real interest rate is -3.2% due to high inflation rate but monetary policy having to follow the US
Exchange rate flexibility	5	HK Dollar exchange rate is pegged to US Dollar
Total Danger Map Score (out of 45)	**21**	

Source: Deutsche Bank

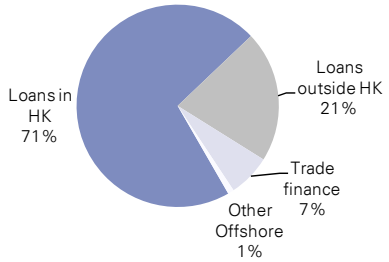
Understanding the Hong Kong banks' loan books

Since Hong Kong is an international financial centre, the system has a sizable exposure to non-Hong Kong loans and trade finance. Loans for use outside Hong Kong, which are mostly loans to mainland China, accounted for 21% of total loans as of March 2011. When China tightens its credit, Hong Kong's overseas loan growth typically benefits and vice versa. For example, in 2010, loans for use outside Hong Kong increased by 48% as credit demand in mainland China was channeled to Hong Kong banks. Recovery in Hong Kong export/import volumes as well as the launch of RMB trade settlement in July 2009 helped to drive trade finance growth. While in 2009 trade finance declined by a 6%, it grew by 57% in 2010. We expect trade finance to continue to grow as Hong Kong evolves into the trade settlement centre of China.

As of March 2011, domestic loans accounted for 71% of system loans. Exposures to property sector are quite high relative to other regions since mortgage lending accounts for 25% and commercial property lending accounts for 27% of loans for use in Hong Kong. While compared to other regions the property exposure may seem high, we believe the risk for mortgage loans is quite low. Due to the recourse nature of mortgage loans in Hong Kong, actual default is likely to be low, which was the case in 1997 when Hong Kong suffered a severe property price correction (property price fell by 52% to October 1998). (For more details, refer to the section on Hong Kong's credit crisis case study).

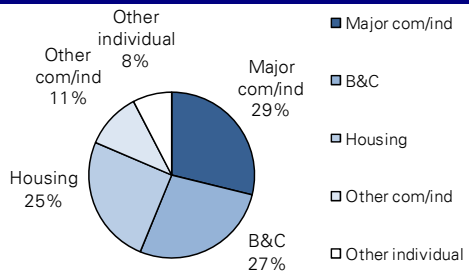
Commercial and industrial loans account for 29% of domestic loans. This mainly consists of manufacturing, transport, wholesale & retail trade and loans to financial concerns & brokers. Other commercial loans account for 11% which mainly is for utilities & telecommunications, hotel & catering and loans to small & medium enterprises. Credit card lending accounted for 2.4% of loans for use in HK.

Figure 80: Breakdown of gross loans by geographic usage (Mar 2011)



Source: Deutsche Bank, HKMA

Figure 81: Breakdown of loan for use in HK by major economic sector (Mar 2011)



Source: Deutsche Bank, HKMA

UK

Overview

- This section looks at the UK banks, focussing on those covered by DB (Barclays, Lloyds Banking Group, HSBC, RBS and Standard Chartered). The UK banking sector, both listed and unlisted, suffered significantly during the credit crisis, as a combination of rapid credit growth and significant reliance on short term wholesale funding markets drove liquidity failures and falling asset prices which later lead to significant capital destruction.
- Northern Rock, the first UK bank to fail, ran into difficulties in July 2007, followed by the sale or closure of Bradford & Bingley, Alliance & Leicester, HBOS and a number of building societies. The remaining five listed banks have increased core tier 1 capital from £113bn in 2006 to the £233bn we forecast by end 2011, driving the sector average CT1 ratio to 10.6% under Basel 2.5 from a little over 6% in 2006.
- Stressing the UK banks for a return to recession-level loan losses, we see a fairly resilient picture. Two years of recession losses cost the sector 10% of tangible equity including stressed pre-provision profit, and 33% of TNAV excluding any PPP. Best positioned are Barclays and StanChart which we would expect to remain profitable. LBG looks worst, driven by the high level of assumed recession losses; with £65bn in NPLs at 1H11, LBG is also exposed to a risk of required re-provisioning for existing problem loans.
- As regards the Danger Map and Outlook, we score the UK at 23 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We see the UK as vulnerable from a credit/GDP, credit mix, and macroeconomic growth and stability perspective. On the Deutsche Bank base case of modest but steady UK economic growth, and expected resolution of EU sovereign issues in Italy and Spain, we expect loan loss normalization to continue, leaving the stocks attractively valued.

A difficult crisis

The UK banks fared poorly during the crisis, with rapid growth in loans backed by higher risk commercial and residential real estate, significant inventories of US market-risk assets (especially sub-prime, Alt-A and CDOs held in conduits and treasury portfolios), and dependence on frequent refinancing of wholesale funding combining to fell Northern Rock, Bradford & Bingley, Alliance & Leicester, HBOS and RBS. The surviving UK banks have all raised significant amounts of capital to offset losses, facilitate debt market access, and meet rising regulatory requirements. Figure 82 shows that the five listed banks have increased core tier 1 capital by £120bn or 106% since end 2006, which we expect to result in FY2011 core tier 1 ratios of over 10.5%, including the Basel 2.5 requirements.

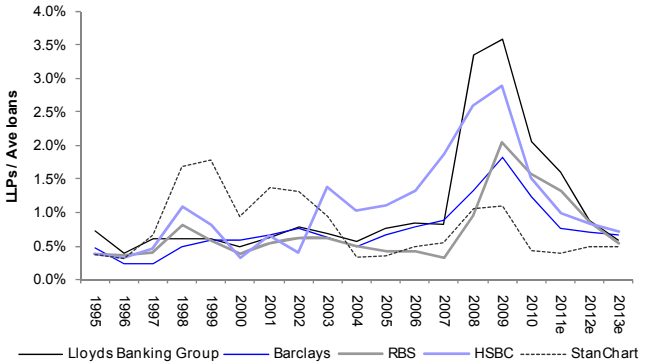
Figure 82: UK listed bank capital levels and ratios before and after the crisis (£'m)

	Core tier 1 capital					Risk-weighted assets					Core tier 1 ratio		
	2006	2010	2011	2012	2011/2006	2006	2010	2011	2012	2011/2006	2006	2010	2011
Barclays	16,776	42,861	44,947	49,357	168%	297,828	398,031	437,365	458,090	47%	5.6%	10.8%	10.3%
LBG	26,664	41,371	38,586	41,271	45%	432,012	406,372	382,373	361,961	-11%	6.2%	10.2%	10.1%
HSBC	42,986	70,802	81,618	91,074	90%	572,365	672,630	706,261	741,574	23%	7.5%	10.5%	11.6%
RBS	20,281	49,309	47,796	52,795	136%	400,257	462,600	507,093	484,770	27%	5.1%	10.7%	9.4%
StanChart	6,446	17,646	19,912	21,911	209%	93,563	149,437	164,518	180,679	76%	6.9%	11.8%	12.1%
Total/Ave	**113,153**	**221,990**	**232,859**	**256,407**	**106%**	**1,796,025**	**2,089,070**	**2,107,609**	**2,227,074**	**22%**	**6.3%**	**10.6%**	**10.6%**

Source: Deutsche Bank estimates, Company data

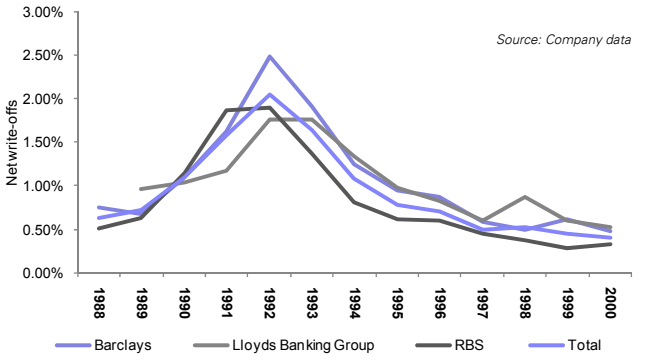
All of the banks other than StanChart have also embarked on significant plans to reduce the size of their balance sheets in order to improve loan/deposit ratios, business mix, and overall profitability. At the end of 1H11, LBG and RBS had £125bn each in loans which are considered non-core and in the process of being run-off or sold.

Figure 83: Loan losses/average loans – this cycle



Source: Company data, Deutsche Bank estimates

Figure 84: Average write-off rates – early 1990's



Source: Company data

Though loan losses are normalising rapidly following a crisis credit cycle which was materially worse than that of the early 1990's, loan portfolios remain fragile. Consumers have suffered about a c.7% fall in real income in 09/10, with disposable income further pressured by material increases in taxes (VAT), and gas, electricity, petrol and food prices. LBG estimate that c.2% of their mortgage borrowers are on government support to meet mortgage interest payments despite record low interest rates.

Figure 85: Lloyds Banking Group impaired loans (£'m)

	2H08	1H09	2H09	1H10	2H10	1H11	% of loan bk	HoH %	YoY %
Retail	10,106	11,394	11,015	10,464	9,750	9,390	**2.6%**	**-4%**	**-10%**
o/w Secured	4,756	7,612	7,196	6,861	6,769	6,695	**2.0%**	**-1%**	**-2%**
o/w Unsecured	5,350	3,782	3,819	3,603	2,981	2,695	**10.4%**	**-10%**	**-25%**
Wholesale	18,470	31,725	35,114	36,779	32,835	30,630	**18.7%**	**-7%**	**-17%**
o/w Corporate	n/a	n/a	9,362	7,906	6,635	5,750	**7.8%**	**-13%**	**-27%**
o/w Commercial	n/a	n/a	2,695	2,652	2,856	2,993	**10.1%**	**5%**	**13%**
o/w Corporate Real Estate BSU	n/a	n/a	16,505	19,624	17,518	16,212	**68.5%**	**-7%**	**-17%**
Wealth & International	2,728	5,900	12,704	15,632	20,342	23,836	**37.2%**	**17%**	**52%**
o/w Int Ireland	1,775	3,995	9,712	11,689	14,445	17,672	**64.1%**	**22%**	**51%**
Total	**32,701**	**50,921**	**60,802**	**64,753**	**64,606**	**65,468**	**10.9%**	**1%**	**1%**

Corporate books remain at risk from a double dip in commercial real estate in particular, as shown by the magnitude of the current CRE NPL portfolios, at £16bn at LBG, for example (Figure 85).

Credit Data: Trends

We summarise data for the UK banks in our coverage universe in Figure 86. Outside of crisis conditions, the (capital-markets-assisted) strong pre-provision profit generation of the banks is evident at 2.4% of loans, comfortably sufficient to absorb the 70-80bps of normalised loan losses we expect. We forecast that the banks will comfortably comply with the Basel 3 capital requirements, allowing for phasing of the capital definition.

Figure 86: Aggregation of quoted bank data, local currency (£'m), UK

	2006	2007	2008	2009	2010	2011E	2012E
Net Interest Income	45,664	50,427	75,154	67,414	70,884	68,487	70,316
Other Operating Income	47,980	55,969	55,259	62,034	65,864	64,696	69,230
Total Revenue	93,644	106,396	130,413	129,447	136,748	133,184	139,546
Costs	49,352	54,685	73,822	73,043	77,642	77,812	78,301
Pre-Provision Profits	44,292	51,711	56,591	56,404	59,106	55,372	61,245
Loan Loss Provisions	11,303	15,672	46,321	63,662	37,688	27,898	19,934
Pre-Tax Profit	**33,459**	**36,836**	**-6,624**	**-2,662**	**21,052**	**26,641**	**43,484**
Total Assets	3,293,594	4,829,297	7,441,710	5,663,256	5,832,557	6,179,688	6,204,263
Average Assets	3,090,166	4,052,315	6,772,766	6,439,494	5,775,161	5,963,962	6,191,976
Risk weighted assets	1,412,101	1,794,983	2,439,385	2,148,350	2,128,109	2,198,433	2,227,946
Basel 3 additions (if known)	0	0	0	0	91,000	41,111	41,111
Core tier one capital	74,615	91,617	104,793	168,361	172,977	176,452	189,423
Risk Cushion > 7% plus 1 year PPP	25,650	28,770	21,527	31,612	34,317	31,124	34,676
Risk cushion to average loans	1.86%	1.69%	0.81%	1.28%	1.41%	1.27%	1.39%
Total Loans	1,459,265	1,959,020	2,659,526	2,367,061	2,466,079	2,483,136	2,495,521
Average Loans	1,379,005	1,704,810	2,651,303	2,470,888	2,427,262	2,457,501	2,489,328
Revenue / Average Loans	6.8%	6.2%	4.9%	5.2%	5.6%	5.4%	5.6%
Pre-Provision Profit / Average Loans	3.2%	3.0%	2.1%	2.3%	2.4%	2.3%	2.5%
Loan Loss Provisions / Ave Loans	0.82%	0.92%	1.75%	2.58%	1.55%	1.14%	0.80%
PPP / Loan Loss Provision Cover	3.9	3.3	1.2	0.9	1.6	2.0	3.1

Source: Deutsche Bank estimates, Company data

Estimates by Bank

High cumulative losses already booked by the UK banks in this cycle provides some protection to shareholders in the event of a double dip. But the losses shown so far also clearly demonstrate how vulnerable certain loan books are. LBG, for example, has already booked loan losses of over 8% of group loans, compared with three year peak losses in the early 1990's recession of 6% at Barclays (91-93), 5% at LBG (92-94), and 5.2% for RBS (91-93). Figure 87 shows our standard screen for the proportion of tangible equity placed at risk by two years of recession-level loan losses, including and excluding forecast pre-provision profit.

Figure 87: How resilient are the capital bases of the UK banks in a credit downturn

Local Currency, 2012E	Barclays	RBS.L	Lloyds	HSBC (£)	STAN (£)	Total	HSBC ($)	STAN ($)
Forecast Average Loan Balances	524,382	526,641	581,653	699,681	183,742	2,516,099	1,111,654	291,929
Forecast Loan Loss Provisions	3,731	4,539	5,127	5,828	913	20,138	9,260	1,451
Severe Recession Loan Loss Provisions	6,401	9,256	10,063	16,672	2,283	60,414	26,488	3,627
2012 Pre-Provision Profit	12,586	11,690	10,400	21,696	5,703	62,075	34,471	9,061
2012 PPP less Recessionary Losses	6,185	2,434	337	5,024	3,420	17,401	7,983	5,434
2012 Forecast Tangible Equity	51,521	60,790	42,313	91,157	23,159	268,939	144,831	36,794
2 Years of Recessionary losses	12,802	18,512	20,126	33,343	4,566	89,349	52,976	7,254
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-25%	-30%	-48%	-37%	-20%	-33%	-37%	-20%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	12%	-2%	-11%	-1%	17%	-10%	-1%	17%

Source: Deutsche Bank estimates, Company data; Note: Barclays, RBS, LBG, HSBC severe recession losses use repeat of 2009/2010 loan losses seen by each bank, including the benefit of fair value reversals in the case of LBG. For StanChart, which hasn't really seen a credit cycle in the downturn, we use loan losses of 2.5x our forecast.

We have used 09/10 actual loan losses for all banks other than StanChart (which has not had a real credit cycle in years, for which we use 2.5x our 2012 forecast impairment rate) as our recession charge. We haircut 2012 forecast PPP by 25% to reflect likely weak revenue conditions (transaction volumes and lower investment banking revenues) in a downturn.

In aggregate, we believe these results show a resilient picture for the sector as a whole, with 2 years of recession losses costing the sector 10% of tangible equity including PPP, and 33% of TNAV excluding any pre-provision profit. Best positioned on this basis are Barclays and StanChart, both of which we would expect to remain profitable. LBG looks worst, driven by the high

level of recession losses we assume, of 173bps of loans, as compared with normalised LLPs of 55bps. With £65bn in NPLs at 1H11, LBG is also exposed to a risk of required re-provisioning for existing problem loans, if collateral values fall.

Danger Map Indicators for UK

Below we summarise our Danger Map for the UK. We score the UK overall at 23 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We rate the UK as vulnerable from a credit/GDP, credit mix, and macroeconomic growth and stability perspective. On the Deutsche Bank base case of modest but steady economic growth in the UK, and resolution of EU sovereign issues in Italy and Spain, we expect the normalisation of loan losses for the UK banks to continue, leaving the stocks apparently attractively valued.

Figure 88: UK danger map

Danger Factor	Score	Comments
Deregulation of Lending	2	Credit conditions have tightened significantly since the crisis
% of Credit to GDP	5	Extremely high, exacerbated by London's international financial centre status
Change in % of Credit to GDP	3	Significant deleveraging and decent nominal GDP growth seeing some reduction in debt/GDP
Maturity of Cycle in Years	3	Tepid growth, low consumer confidence, negative real wages, significant government austerity measures
Credit Mix	3	Substantial commercial real estate exposure has lead to significant losses; remains an area of some vulnerability
Unemployment	3	Stabilised
Current account position	2	
Level of real interest rates	1	Bank base rate 0.5%, retail price inflation > 5%.
Exchange rate flexibility	1	
Total Danger Map Score (out of 45)	**23**	

Source: Deutsche Bank estimates

Nordics

Overview

- In this section we look at the Nordic banks, with a focus on those covered by Deutsche Bank (Danske Bank, DnB NOR, Nordea, Sv. Handelsbanken, SEB and Swedbank). Over the last five years, we find that loan loss provisions in the banking book averaged 32bps, and peaked at 100bps (2009). The minimum level was reached in 2006, when banks had write-backs at 3bp of lending.
- We believe that peak provisions on a further downturn across the Euro zone would likely reach 4x their normalized level. We estimate credit losses of Euro 29bn for the Nordic banks per annum, in the severe scenario. Over two years, this would be equivalent to 68% of 2012 closing tangible book value (TBV). If we include pre-provision profit (PPP) estimates as an offset (flexed down consistently with the crisis experience), then the loss would be 30% of TBV, i.e. the banks would be loss-making.
- Despite this severe scenario, we estimate that the sector CT1 would be 8.0% post the losses. This is well above any regulatory requirement. Despite this, if a banking system lose 30% of its equity, it would likely trigger capital raisings anyway to keep access to debt capital markets open. Generally, the banks are domestically focused, and 55-85% of banks' lending is concentrated to the Nordics. Compared to EU, the Nordic banks have a higher proportion of low risk mortgages, representing close to 40% of lending.
- As regards the Danger Map, we score Nordics overall at 16 out of 45. This captures a 1 to 5 score across a number of risk metrics. This puts Nordics at the lower end of the pack on the Danger Map.

Credit Data: Trends

Below we summarize data from 2006 to 2010 for the aggregated Nordic banks in our coverage universe. We can see clearly that even though the credit cycle was not that severe, rising loan losses, cut the PPP/LLP ration in half, from 3.9x to 1.6x.

Figure 89: Aggregation of quoted bank data, Nordics (EURbn)

Currency, EURbn	2006	2007	2008	2009	2010	2011E	2012E
Net Interest Income	13,586	15,169	17,568	18,239	16,945	17,885	19,387
Other Operating Income	13,004	13,712	11,845	15,017	13,998	13,949	14,593
Total Revenue	26,591	28,880	29,413	33,256	30,943	31,834	33,980
Costs	13,898	15,041	16,356	17,080	16,638	17,195	17,892
Pre-Provision Profits	12,693	13,839	13,057	16,176	14,305	14,639	16,088
Loan Loss Provisions	-325	233	3,336	10,236	3,821	1,992	1,565
Pre-Tax Profit	10,181	10,816	7,505	3,562	7,672	9,337	10,793
Total Assets							
Average Assets	1,366,796	1,545,481	1,750,893	1,831,493	1,846,135	1,859,870	1,855,418
Risk weighted assets	693,640	793,096	806,912	701,005	720,684	744,836	769,926
Core tier one capital	44,955	17,306	34,952	47,573	52,766	60,181	65,919
Basel 3 deductions (if known)							
Risk Cushion above 7% plus 1 year PPP	12,693	13,839	13,057	16,176	14,305	14,639	16,088
Risk cusion to average loans							
Total Loans	840,235	966,506	1,074,674	1,057,432	1,087,048	1,112,243	1,149,034
Average Loans	794,647	903,371	1,020,590	1,066,053	1,072,240	1,099,645	1,130,638
Revenue / Average Loans	3.3%	3.2%	2.9%	3.1%	2.9%	2.9%	3.0%
Pre-Provision Profit / Average Loans	1.6%	1.5%	1.3%	1.5%	1.3%	1.3%	1.4%
Loan Loss Provisions / Average Loans	-0.04%	0.03%	0.33%	0.96%	0.36%	0.18%	0.14%
PPP / Loan Loss Provision Cover	n.m.	n.m.	3.9	1.6	3.7	7.3	10.3

Source: Deutsche Bank aggregation of company data

Estimates by Bank

Below we summarize forecast data for 2012 for the aggregated Nordic banks in our coverage universe (Danske Bank, DnB NOR, Nordea, Sv. Handelsbanken, SEB and Swedbank). We then show our estimate of severe recessionary loan losses, which for the purpose of this exercise we have taken as 4x normalized. The normalized LLPs are defined as the 25 year Nordic average, which is 65bp.

We then express this as a percentage of 2012 book value (BV), and also as a percentage of 2012 PPP flexed down by 25%, as a proxy of a potential contraction during a crisis. We estimate credit losses of Euro 29bn for the Nordic banks per annum. Over two years, this would be equivalent to 68% of 2012 closing TBV. If we include PPP estimates as an offset, then the loss would be 30% of TBV, i.e. the banks would be loss-making.

Taking a step back, this simple exercise, show in our view that the Nordic banks' PPP profit level would not be enough to keep banks in profit if the region suffered a macro shock and deep credit crisis, similar to the crisis in the early 1990s.

Figure 90: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of PPP

EURbn, 2012E	Danske B.	DnB NOR	Nordea	SHB	SEB	Swedbank	Total
Forecast Average Loan Balances	226,866	146,523	332,313	171,827	120,471	132,638	1,130,638
Forecast Loan Loss Provisions	640	229	521	111	60	3	1,565
Severe Recession Loan Loss Provisions	5,536	3,868	8,507	4,536	3,180	3,502	29,129
2012 Pre-Provision Profit	3,066	2,399	5,122	1,812	1,807	1,883	16,088
2012 PPP less Recessionary Losses	-2,470	-1,470	-3,385	-2,724	-1,374	-1,619	-13,041
2012 Forecast Tangible Equity	16,572	13,949	25,157	9,998	10,761	9,092	85,530
2 Years of Recessionary losses	11,071	7,736	17,014	9,072	6,361	7,003	58,259
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-67%	-55%	-68%	-91%	-59%	-77%	-68%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	-39%	-30%	-37%	-64%	-34%	-46%	-40%

Source: Deutsche Bank estimates, (*) flexed down by 25%

Danger Map Indicators for Nordics

Below we summarize our Danger Map Indicators for Nordic region. We score Nordics overall at 16 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. This puts Nordics at the lower end of the pack on the Danger Map. The risk factors in Nordics is the above average indebtedness and high proportion of interest only loans. The mitigating factor is the regions strong social security systems, the healthy fiscal situation, a recourse structure in banks' lending, the current account position, level of real interest rates and the exchange rate flexibility.

Figure 91: Scoring the Nordic "danger map"

Danger Factor	Score	Comment
Deregulation of Lending	1	No recent deregulation of lending
% of Credit to GDP	4	Higher than the European average
Change in % of Credit to GDP	4	Above the European average
Maturity of Cycle in Years	1	Year 1 of the recovery in the Nordic and Baltic regions
Credit Mix	2	Traditional model, but high proportion of mortgage (secured) lending
Unemployment	1	Unemployment falling or stable across Nordics
Current account position	1	
Level of real interest rates	1	
Exchange rate flexibility	1	
Total Danger Map Score (out of 45)	16	

Source: Deutsche Bank

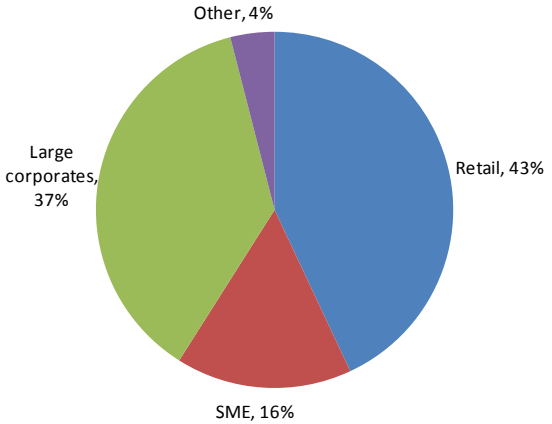
Understanding the Nordic banks' loan books

The Nordic banks' lending mix is more geared towards low risk mortgages, compared to rest of Europe. In total, retail lending is 43% of credit exposure, of which 92% is mortgage lending and rest unsecured. Large corporate represent 37% of the average loan books of the Nordic banks under coverage. This highlights, the Nordic industry structure, with a large proportion of export driven blue chip companies. The experience in the last two downturns, has been that the SME segment, rather than large corporates, have been the loss drivers.

On the positive, the Nordic banks: 1) do not have large financing businesses within their investment banks, and 2) have a high proportion of domestic retail exposures. As a consequence, the average Nordic loan losses over time, and peak losses, are below EU averages. Instead, the main loss driver in the Nordic bank sector, has been the banks' international operations, primarily in the Baltics and Ireland.

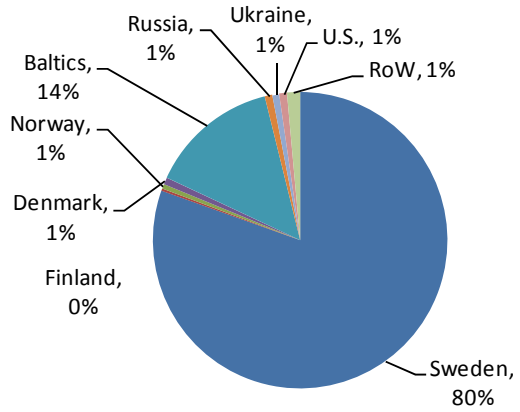
In Figure 93 to Figure 94, we show the lending split for the Nordic bank sector and for each bank. In General, banks are domestically focused and Nordics represent between 55% and 85% of total lending.

Figure 92: Nordic banks under coverage: average loan mix (Q4-10)



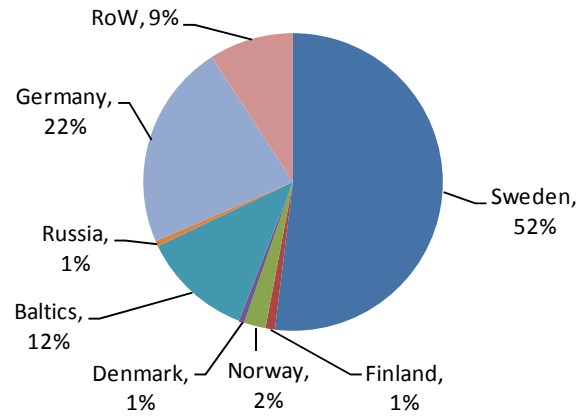
Source: Deutsche Bank, companies data

Figure 93: Swedbank loans (Q4-10)



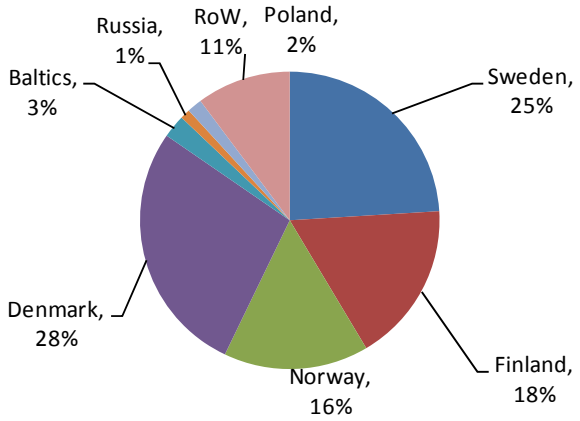
Source: Deutsche Bank, company data

Figure 94: SEB loans (Q4-10)



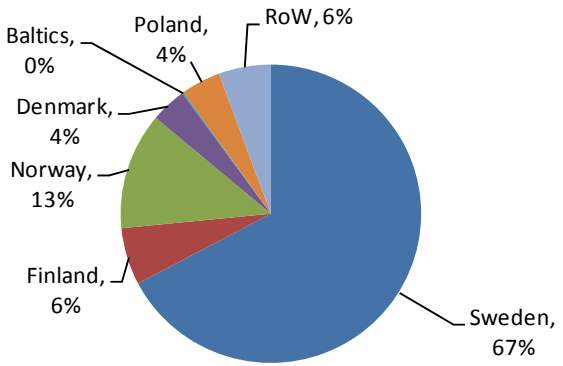
Source: Deutsche Bank, company data

Figure 95: Nordea loans (Q4-10)



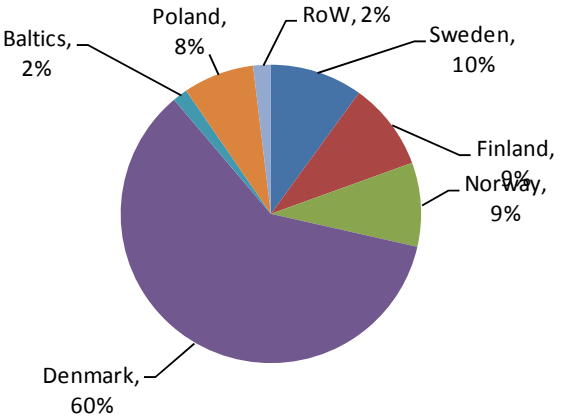
Source: Deutsche Bank

Figure 96: Sv. Handelsbanken loans (Q4-10)



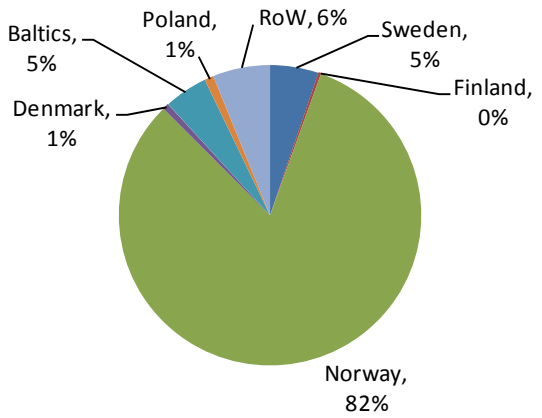
Source: Deutsche Bank

Figure 97: Danske Bank loans (Q4-10)



Source: Deutsche Bank

Figure 98: DnB NOR loans (Q4-10)



Source: Deutsche Bank

France

Overview

- In this section we look at the French banks, with a focus on those covered by DB (BNP Paribas, Société Générale and Credit Agricole). Over the last five years, we find that credit loan loss provisions in the banking book averaged 82bp, and peaked at 146bp.
- We believe that peak provisions on a further downturn across the euro zone would likely reach 4x their normalised level, given that a slowdown would not see government (fiscal) intervention, as firepower is exhausted. We estimate credit losses of Euro 32bn for the three French majors per annum. Over two years, this would be equivalent to 46% of 2012 closing tangible book value. If we include PPP estimates as an offset (flexed down consistent with the 2007-2009 experience) then the loss would be 4% of TBV, i.e. the banks would be slightly loss-making.
- These data are somewhat less severe (loss-making) than other countries in Europe and elsewhere. The French banks' portfolios still include large domestic books (where usury laws have prevented the banks moving up the risk curve). But we see more risk in the French banks' financing businesses, which survived the downturn surprisingly well. A more corporate driven downturn would represent the key risk this time out, in our opinion.
- As regards the Outlook and the Danger Map for France, we score France overall at 24 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. This puts France at the higher end of the pack on the Danger Map.

Credit Data: Trends

Below we summarise data from 2005 to 2010 for the aggregated French banks in our coverage universe. We can see clearly that even though the credit cycle was not that severe, declining PPP combines with rising loan losses to reduce PPP/LLP cover from 12.3x to 1.5x.

Figure 99: Aggregation of quoted bank data, local currency (Euro bn), France

Local Currency	2006	2007	2008	2009	2010
Net Interest Income	21,887	20,118	33,559	46,946	52,062
Other Operating Income	44,660	44,699	31,639	32,917	38,365
Total Revenue	66,547	64,817	65,198	79,863	90,427
Costs	41,123	45,783	46,563	51,288	56,249
Pre-Provision Profits	25,424	19,034	18,635	28,575	34,178
Loan Loss Provisions	2,074	4,523	11,571	18,906	12,739
Pre-Tax Profit	25,513	16,335	8,626	11,052	22,082
Total Assets	3,658,480	4,180,439	4,858,774	4,638,741	4,723,759
Average Assets	3,412,506	3,919,460	4,519,607	4,748,758	4,681,250
Total Loans	904,825	1,052,720	1,198,051	1,385,657	1,439,830
Average Loans	810,401	978,773	1,125,386	1,291,854	1,412,744
Revenue / Average Loans	8.2%	6.6%	5.8%	6.2%	6.4%
Pre-Provision Profit / Average Loans	3.1%	1.9%	1.7%	2.2%	2.4%
Loan Loss Provisions / Average Loans	0.3%	0.5%	1.0%	1.5%	0.9%
PPP / Loan Loss Provision Cover	12.3	4.2	1.6	1.5	2.7

Source: Deutsche Bank aggregation of company data

Estimates by Bank

Below we summarise forecast data for 2012 for the aggregated French banks in our coverage universe (BNP Paribas, Société Générale and Credit Agricole). We then show our estimate of severe recessionary loan losses, which for the purposes of this exercise we have taken as 4x normalised.

We then express this as a % of 2012 BV, and also as a % of 2012 pre-provision profit flexed down by 25% (this is the same PPP experience we saw in the 2008 credit cycle, when PPP in aggregate fell from over Euro 25bn to under Euro 19bn). These are simple numbers, but they do show in our view that (1) the French banks have good pre-provision profit generation, but that (2) in a severe credit book downturn, we would expect a breakeven or worse result, in aggregate.

Figure 100: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of non-flexed PPP

Local Currency, 2012E	CredAg	BNPP	SocGen
Forecast Average Loan Balances	412,469	729,875	388,801
Forecast Loan Loss Provisions	1,872	3,162	2,346
Severe Recession Loan Loss Provisions	6,558	10,510	5,599
2012 Pre-Provision Profit	8,554	20,034	11,022
2012 PPP less Recessionary Losses	1,996	9,524	5,424
2012 Forecast Tangible Equity	33,947	66,018	41,054
2 Years of Recessionary losses	13,116	21,020	11,197
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	39%	32%	27%
2 years of Recessionary losses as % 2 years of PPP flexed down by 25%	136%	103%	100%

Source: Deutsche Bank estimates

Danger Map Indicators for France

Below we summarise our Danger Map Indicators for France. We score France overall at 24 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We rate France as low on the mix and stage of cycle issues, medium in terms of % of debt in GDP and high on exchange rate flexibility and unemployment. This puts France at the higher end of the pack on the Danger Map.

Figure 101: Scoring the French "danger map"

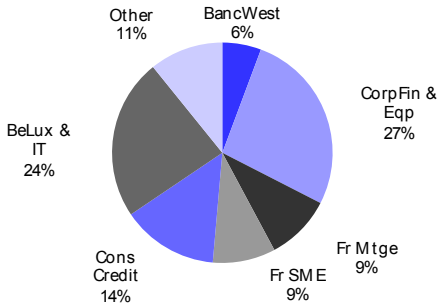
Danger Factor	Score	Comment
Deregulation of Lending	2	No recent deregulation of lending
% of Credit to GDP	3	Close to the European average
Change in % of Credit to GDP	1	Close to the European average
Maturity of Cycle in Years	3	Year 3 of the recovery in the euro zone.)
Credit Mix	2	Heavily mortgage led and ursury influenced credit book
Unemployment	4	
Current account position	2	
Level of real interest rates	2	
Exchange rate flexibility	5	
Total Danger Map Score (out of 45)	24	

Source: Deutsche Bank

Understanding the French banks' loan books

As discussed above, we regard French banks as not too high risk in their loan portfolios, but with still some danger areas. One of the key points regarding the French banks is that their books are in fact very diverse, and not particularly "French" in nature, as shown below.

Figure 102: BNP Paribas loan out-standings as at Q1 2011: total of Euro 685bn



Source: Deutsche Bank

The low risk segments for the banks are, in our view, the domestic French retail exposures. These are restricted under French usury laws; it is illegal for French banks to charge above certain interest rates[1], and this has been an effective constraint against banks moving up the risk curve. As a consequence, we quite happily use rather low estimates of through-cycle loan losses for residential mortgages and domestic consumer credit.

French banks also, however, have large financing businesses within their investment banks, and large corporate and investment banking loan books. Although investment grade corporate credit has been remarkably robust over the last few years, corporate leverage has not reduced, and consequently is as likely as any other area to be the "next big risk". High-yield corporates (leaving aside leveraged finance / financial sponsor businesses) have also had easy access to credit. And we also believe that the French banks have continued to grow specialized lending areas like aircraft leasing or commodities financing.

[1] The Usury Rate is published quarterly by the Banque de France, as governed by Article 313-3 of the French Consumer Code. Usury was originally prohibited in France in January 1886, with the law on usury later amended in 1966, and and finally reaching its present form in the French Consumer Code. It covers all loans up to a certain size, beyond which in theory loans would be decided as usurious or not by the Banque de France on a case-by-case basis, although we believe that in practise usury is not applied at all to large corporate lending.

Germany

Overview

- In this section we look at the German banks; given the majority of large German banks is not listed we have concentrated on sector data that include all German institutions based on HGB accounting rules. Over the last decade, we find that loan loss provisions peaked at 114bps in 2008; another high was reported in the 2002/3 recession with 102bps.
- We believe that peak-to-trough cycles for credit risk are somewhat smoothed by HGB accounting rules and the general focus on non-equity investors of the majority of banks in Germany. As evidence we point towards an increase of 'only' 2.5x from the lowest reported LLP rate of 46bps in 2005/06 and the above mentioned 115bps peak for 2008. We doubt that loan provisions exceed EUR40bn in an economic downturn, about 150% of the 2010 charge and in line with the dynamics of EBA stress test results for the largest German banks.
- Benchmarking these potential losses with the average pre-provision profits of the last decade of EUR41bn we see limited risk to capital for the sector as a whole. However, we point out that we expect individual institutions to report losses; we would refer to historic financial performance as a reasonable guidance to identify these banks. More generally, we view the German banking sector to be short of capital given high investments in non-core credit risk, such as debt securities and interbank lending.
- As regards the Danger Map for Germany we result an overall score of 20. This captures a 1 to 5 score across a number of risk metrics, drawn from our analysis of case studies, and our global experience of bank lending. This puts German within the better half of countries.

Figure 103: Aggregation of German banks (EUR bn)

Local Currency	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average
Net Interest Income	79.2	85.6	81.7	85.0	88.2	89.1	91.6	90.6	91.5	91.2	87.4
Other Operating Income	34.3	31.0	34.6	30.7	41.1	41.6	34.0	16.6	34.8	34.5	33.3
Total Revenue	113.5	116.5	116.3	115.7	129.3	130.7	125.6	107.2	126.3	125.7	120.7
Costs	-81.0	-78.3	-77.3	-75.8	-78.8	-81.5	-81.6	-78.7	-82.2	-83.6	-79.9
Pre-Provision Profits	32.4	38.2	39.0	39.9	50.5	49.2	44.1	28.5	44.1	42.1	40.8
Loan Loss Provisions	-19.6	-31.2	-21.8	-17.3	-14.0	-14.0	-23.6	-36.6	-27.0	-26.1	-23.1
Pre-Tax Profit	14.1	10.9	1.8	10.4	33.2	27.6	20.5	-25.0	-2.9	11.6	10.2
Total Assets	6,386	6,452	6,471	6,664	6,903	7,188	7,626	7,956	7,510	8,352	7,151
Average Assets	6,267	6,419	6,462	6,567	6,783	7,045	7,407	7,791	7,733	7,931	7,041
Capital	276	292	294	288	303	337	352	378	379	381	328
Total Loans	3,065	3,037	3,037	3,024	3,035	3,062	3,171	3,245	3,176	3,271	3,112
Average Loans	3,065	3,051	3,037	3,030	3,029	3,048	3,117	3,208	3,211	3,223	3,102
Revenue / Average Loans (%)	3.70	3.82	3.83	3.82	4.27	4.29	4.03	3.34	3.93	3.90	3.89
Pre-Provision Profit / Average Loans (%)	1.06	1.25	1.28	1.32	1.67	1.61	1.41	0.89	1.37	1.30	1.32
Loan Loss Provisions / Average Loans (%)	0.64	1.02	0.72	0.57	0.46	0.46	0.76	1.14	0.84	0.81	0.75
PPP / Loan Loss Provision Cover (x)	1.65	1.22	1.79	2.31	3.60	3.51	1.87	0.78	1.63	1.61	1.76

Source: Deutsche Bank, Deutsche Bundesbank

Danger Map Indicators for Germany

Below we summarize our Danger Map Indicators for Germany. We score Germany overall at 20 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. This puts German within the better half of countries.

Figure 104: Scoring the German "heat map"

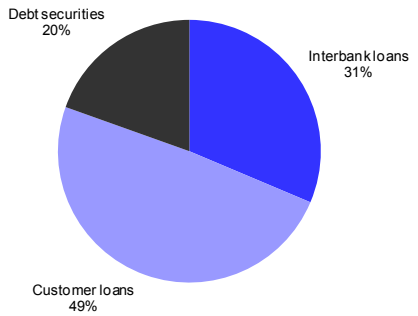
	Score	Comment
Deregulation of Lending	1	No recent deregulation of lending
% of Credit to GDP	2	Better than European average
Change in % of Credit to GDP	2	Lower than European average
Maturity of Cycle in Years	2	Close to European average
Credit Mix	3	Traditional model, but high non-core credit share
Unemployment	2	Moderate improvement, good level
Current account position	1	
Level of real interest rates	2	
Exchange rate flexibility	5	
Total Danger Map Score (out of 45)	**20**	

Source: Deutsche Bank

Understanding German banks' loan books

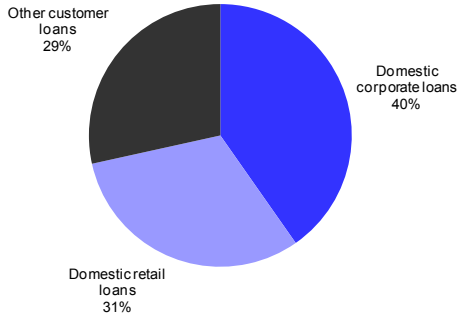
The 3 most important important balance sheet positions for German banks are customer loans, followed by interbank assets and debt securities. There account for 80% of all assets. However, while customer loans are the biggest position they only make up for less than 50% of important balance sheet positions. In our view, German banks' exposure to debt securities and interbank activities is inflated and needs to be consolidated in the new regulatory environment. From a risk-reward perspective this should not be negative, in our opinion, as we perceive these activities to be unattractive.

Figure 105: Important balance sheet positions



Source: Deutsche Bank, Deutsche Bundesbank

Figure 106: Break-down of customer loans



Source: Deutsche Bank, Deutsche Bundesbank

Customer loans break down in domestic corporate loans with 40%, demestic retail loans with 31% and other customer loans with 29%. We view this as quite balance; from a risk perspective we view domestic retail lending as good quality and corporate lending as average quality. Overall, Germany is a rather mature market with limited lending growth opportunities.

Greece

Overview

- In this section we look at the Greek banks, with a focus on those covered by Deutsche Bank (Alpha Bank, Piraeus bank, Eurobank and ATE bank). We also present historical data for National Bank of Greece but refrain from showing our estimates as we are restricted on the name. In the last two years Greek banks have been caught in the middle of the Greek sovereign crisis as they were (and still are) significant owners of Greek public debt.
- Greek banks have been operating a pure retail model which up to 2009 allowed them to grow lending volumes by 20-25% p.a. and generate RoEs of 15-20% as leverage in Greece moved towards EU standards. They applied the same model to neighboring SEE countries which contributed up to 25-30% of group pre-tax income. In Greece, however, the loans/GDP ratio did not blow out of proportion and stayed at c.1.5x.
- Following the outburst of the Greek sovereign crisis Greek banks found themselves owing c. 20% of Greek public debt or 2.5x their tangible equity. Gradually they saw 15% of their deposit base reduced and wholesale/interbank markets shutting down. As a result they increased their exposure to ECB funding to c.E100bn or 20% of their total assets.
- The Greek banking system (and the sovereign) has entered into a vicious circle of credit rating downgrades, deposit outflows, loan de-leveraging, fiscal tightening and recession. 2011 will mark the third recessionary year in a row with real GDP growth down c.5% yoy. We expect negative growth in 2012 as well (-1.8%). In this context asset quality has deteriorated significantly with the average NPL ratio in Greece rising to 11% in Q2 2011 from 2% in 2006. In the same period bad debt charges (loan loss provisions/loans) increased almost fivefold to 224bps. Neither NPLs nor cost of risk have peaked yet.
- Capital-wise the Greek banks entered the crisis with a CT1 ratio of 8%. Capital support from the state in 2008 added another 140bps while equity raisings contributed another 180bps. Nevertheless, these measures have been eaten away by the recession and the potential PSI (bond swap of GGBs) leaving CT1 ratio unchanged at 8% as of Q2 2011.
- As regards the Danger Map, we score Greece overall at 33 out of 45. This captures a 1 to 5 score across a number of risk metrics. We rate Greece as extremely vulnerable from a macroeconomic perspective (fiscal deficit, sustainability of debt, unemployment). Greece seems to rank decently on a credit/GDP basis.

Figure 107: Greek banks' CT1 ratios 2006-2011

	Core capital (%)				RWA (EURm)			
	2006	2009	2010	Q2 2011	2006	2009	2010	Q2 2011
National Bank of Greece	9.5%	9.5%	12.0%	10.1%	43,512	67,407	72,306	66,071
Alpha bank	7.7%	8.8%	9.1%	8.0%	33,566	51,100	48,831	47500
Eurobank	7.7%	8.4%	8.0%	8.5%	34,504	47,827	47,968	44,858
Piraeus bank	7.5%	7.8%	7.6%	7.2%	21,800	37,394	38,100	36,675
ATE bank	11.4%	3.9%	1.8%	1.8%*	10,261	15,098	12,636	12,841*

*Source: company data and Deutsche bank; *Q1 2011*

Credit Data: Trends

Below we summarize data from 2006 to 2010 for the aggregated Greek banks in our coverage universe. Thanks to PPP proving resilient (cheap ECB funding, foreign operations) we see that the rise in provisions for loan losses is still covered for albeit the ratio has fallen from 5x to almost 1x (2010).

Figure 108: Aggregation of quoted bank data, local currency (Euro mn), Greece

Local Currency	2006	2007	2008	2009	2010	2011E	2012E
Net Interest Income	6,467	8,191	9,549	9,899	10,146	9,943	10,028
Other Operating Income	2,946	3,706	3,426	3,227	2,010	2,320	2,278
Total Revenue	9,413	11,897	12,974	13,126	12,156	12,263	12,305
Costs	4,728	5,950	6,613	6,683	6,640	6,340	6,378
Pre-Provision Profits	**4,685**	**5,947**	**6,361**	**6,443**	**5,516**	**5,923**	**5,927**
Loan Loss Provisions	1,006	1,155	2,540	4,227	4,768	4,552	3,922
Pre-Tax Profit	**3,732**	**4,917**	**3,808**	**1,999**	**745**	**1,462**	**2,005**
Total Assets	**232,373**	**284,159**	**332,159**	**354,378**	**360,837**	**350,297**	**351,079**
Average Assets	216,514	258,266	308,159	343,268	357,608	355,567	350,688
Risk weighted assets	143,643	183,288	212,224	218,826	219,841	214,106	216,134
Core tier one capital	7,170	9,539	8,568	13,081	12,183	14,925	16,006
Risk Cushion above 7% plus 1 year PPP	4,685	5,947	6,361	6,443	5,516	5,923	5,927
Total Loans	**142,832**	**189,436**	**235,647**	**241,588**	**243,725**	**233,788**	**234,253**
Average Loans	127,175	166,134	212,542	238,617	242,656	238,756	234,020
Revenue / Average Loans	7.4%	7.2%	6.1%	5.5%	5.0%	5.1%	5.3%
Pre-Provision Profit / Average Loans	3.7%	3.6%	3.0%	2.7%	2.3%	2.5%	2.5%
Loan Loss Provisions / Average Loans	0.79%	0.70%	1.20%	1.77%	1.96%	1.91%	1.68%
PPP / Loan Loss Provision Cover	4.7	5.2	2.5	1.5	1.2	1.3	1.5

Source: Deutsche Bank

Estimates by Bank

Below we summarize forecast data for 2012 for the aggregated Greek banks in our coverage universe (Alpha Bank, Eurobank, Piraeus bank, ATE bank). We then show our estimate of severe recessionary loan losses, which for the purposes of this exercise we have taken as 6x normalized. We have used this figure as this, in our view, would reflect the increase in bad debt charges were non-performing loans to double vs. 2010 levels.

We then express this as a percentage of 2012 book value (BV), and also as a percentage of 2012 PPP flexed down by 25%, as a proxy of a potential contraction during a crisis. We estimate credit losses of Euro 5bn for the Greek banks (covered) p.a. Over two years, this would be equivalent to 90% of 2012 closing TBV. If we include PPP estimates as an offset, then the loss would be 50% of TBV.

Figure 109: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of PPP

Local Currency, 2012E (EURm)	AB	EFG	BOP	ATE	Total
Forecast Average Loan Balances	44,844	48,366	35,108	18,640	146,957
Forecast Loan Loss Provisions	783	1,257	606	265	2,910
Severe Recession Loan Loss Provisions	1,614	1,741	1,264	671	5,290
2012 Pre-Provision Profit	976	1,215	583	361	3,136
2012 PPP less Recessionary Losses	-638	-526	-681	-310	-2,155
2012 Forecast Tangible Equity	3,930	3,197	3,033	1,260	11,420
2 Years of Recessionary losses	3,229	3,482	2,528	1,342	10,581
2 Years of Recessionary losses as % 2012E TE	-82%	-109%	-83%	-107%	-93%
2 years of Recessionary losses as % of 2 years of PPP (*)	-45%	-52%	-55%	-64%	-39%

Source: Deutsche Bank estimates, (*) flexed down by 25%

The results of this exercise show that despite a relatively resilient PPP margin Greek banks' equity would be almost entirely wiped out was recession to intensify further from here causing NPLs to double in size.

Danger Map Indicators for Greece

Below we summarize our Danger Map Indicators for Greece. We score Greece overall at 33 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We rate Greece as low, in terms of overall leverage to GDP and high in terms of macroeconomic outlook, loan mix, economy structure and exchange rate flexibility. This places Greece at the upper end of the Danger Map (red zone).

Figure 110: Greece danger map

Danger Factor	Score	Comments
Deregulation of Lending	2	No recent deregulation of lending
% of Credit to GDP	1	Lower than the European average
Change in % of Credit to GDP	3	Lower than the European average; recession-driven
Maturity of Cycle in Years	5	4-year recession expected with the maturity cycle prolonged
Credit Mix	5	Consumption driven economy with focus on mortgages/consumer loans
Unemployment	5	Unemployment is rising
Current account position	5	Persistent current account deficit
Level of real interest rates	2	
Exchange rate flexibility	5	Zero
Total Danger Map Score (out of 40)	**33**	

Source: Deutsche Bank

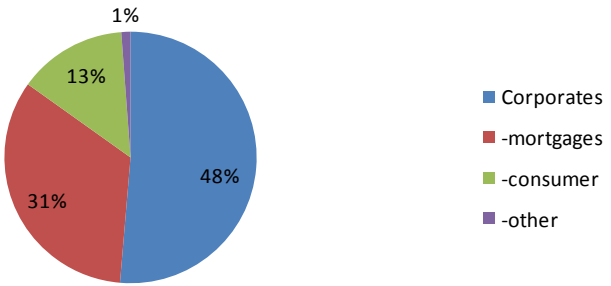
Greek banks' loan books

Figure 111: Greek credit to GDP

	2006	2007	2008	2009	2010
Household & Corporate credit to GDP	78%	87%	91%	97%	112%
Mortgage loans to GDP	25%	28%	27%	34%	35%
Consumer loans to GDP	12%	12%	12%	15%	15%

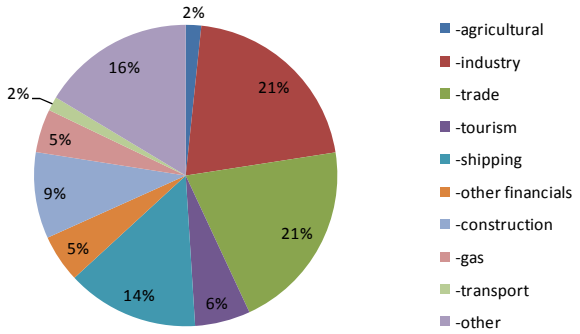
Source: Hellenic Bank Association

Figure 112: Breakdown of system loans in Greece (E254bn)



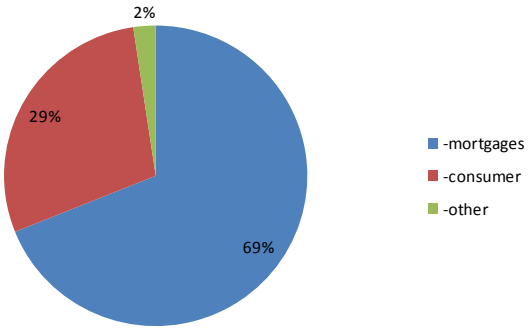
Source: Bank of Greece; July data

Figure 113: Breakdown of corporate loans (E122bn)



Source: Bank of Greece: July data

Figure 114: Breakdown of household loans (E116bn)



Source: Bank of Greece; July data

Italy

Overview

- In this section we look at the Italian banks, with a focus on those covered by Deutsche Bank (Intesa, Unicredit, MPS, Banco Popolare, UBI Banca, Banca Popolare di Milano and Credem). Over the last five years, we find that loan loss provisions in the banking book averaged 76bps, and peaked at 114bps (2009); their minimum level was 49bps in 2007.
- We believe that peak provisions on a further downturn across the Euro zone would likely reach 4x their normalized level. We estimate credit losses of Euro 29bn for the Italian banks per annum. Over two years, this would be equivalent to 52% of 2012 closing tangible book value (TBV). If we include pre-provision profit (PPP) estimates as an offset (flexed down consistently with the crisis experience), then the loss would be 12% of TBV, i.e. the banks would be loss-making.
- These data are probably manageable, but not negligible. Italian banks do not have large investment banking businesses, can count on the support of retail clients (the private debt to GDP is particularly low, at 38%, and families' savings are a valuable source of funding for banks), and generally their lending portfolios are fragmented. However, the corporate, SMEs, and small business exposures weight 67% on the Italian banks' total loans, thus an extensive economic downturn in Italy can hit their asset quality (for example, in 2009, the general drop in exports hurt all sectors and all regions).
- As regards the Danger Map, we score Italy overall at 25 out of 45. This captures a 1 to 5 score across a number of risk metrics. This puts Italy in the middle of the pack on the Danger Map – neither angry red, nor soothing green.

Credit Data: Trends

Below we summarize data from 2006 to 2010 for the aggregated Italian banks in our coverage universe. We can see clearly that even though the credit cycle was not that severe, declining PPP combines with rising loan losses to reduce PPP/LLP cover from 5.1x to 1.7x.

Figure 115: Aggregation of quoted bank data, local currency (Euro bn), Italy

	2006	2007	2008	2009	2010
Net Interest Income	32,684	37,234	41,418	37,508	34,802
Other Operating Income	30,163	29,234	20,255	24,340	23,581
Total Revenue	62,847	66,468	61,673	61,848	58,383
Costs	35,758	37,059	37,471	35,301	35,088
Pre-Provision Profits	27,089	29,409	24,202	26,548	23,295
Loan Loss Provisions	5,346	6,066	9,351	15,556	12,941
Pre-Tax Profit	13,559	13,130	11,481	6,566	5,441
Total Assets	1,856,996	2,139,441	2,214,036	2,120,334	2,140,436
Average Assets	1,677,371	1,998,219	2,176,738	2,165,342	2,136,287
Total Loans	1,154,433	1,259,550	1,380,922	1,335,178	1,341,845
Average Loans	1,073,784	1,226,544	1,327,390	1,368,707	1,337,877
Revenue / Average Loans	5.9%	5.4%	4.6%	4.5%	4.4%
Pre-Provision Profit / Average Loans	2.5%	2.4%	1.8%	1.9%	1.7%
Loan Loss Provisions / Average Loans	0.50%	0.49%	0.70%	1.14%	0.97%
PPP / Loan Loss Provision Cover	5.1	4.8	2.6	1.7	1.8

Source: Deutsche Bank aggregation of company data

Estimates by Bank

Below we summarize forecast data for 2012 for the aggregated Italian banks in our coverage universe (Intesa, Unicredit, MPS, Banco Popolare, UBI Banca, Banca Popolare di Milano and Credem). We then show our estimate of severe recessionary loan losses, which for the purposes of this exercise we have taken as 4x normalized.

We then express this as a percentage of 2012 book value (BV), and also as a percentage of 2012 PPP flexed down by 25%, as a proxy of a potential contraction during a crisis. We estimate credit losses of Euro 29bn for the Italian banks per annum. Over two years, this would be equivalent to 52% of 2012 closing TBV. If we include PPP estimates as an offset, then the loss would be 12% of TBV, i.e. the banks would be loss-making. Actually, without flexing by 25% PPP, Italian banks would be at breakeven, even suffering of the stressed credit losses.

Figure 116: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of PPP

Local Currency, 2012E	UCG	ISP	MPS	Banco	UBI	BPM	Credem	Total
Forecast Average Loan Balances	602,518	418,417	168,971	101,640	109,239	40,754	21,785	1,463,322
Forecast Loan Loss Provisions	5,215	2,606	1,041	618	605	228	75	10,389
Severe Recession Loan Loss Provisions	12,050	8,368	3,379	2,033	2,185	815	436	29,266
2012 Pre-Provision Profit	13,522	9,416	2,942	1,408	1,576	741	360	29,966
2012 PPP less Recessionary Losses	1,472	1,047	-437	-624	-609	-74	-75	700
2012 Forecast Tangible Equity	43,219	36,690	11,767	6,824	8,423	4,610	1,814	113,347
2 Years of Recessionary losses	24,101	16,737	6,759	4,066	4,370	1,630	871	58,533
2 Years of Recessionary losses as % 2012E TE	-56%	-46%	-57%	-60%	-52%	-35%	-48%	-52%
2 years of Recessionary losses as % of 2 years of PPP (*)	-9%	-7%	-20%	-29%	-24%	-11%	-18%	-12%

Source: Deutsche Bank estimates, (*) flexed down by 25%

These are simple numbers, but they do show in our view that (1) the Italian banks have a decent pre-provision profit generation, but that (2) in a severe credit book downturn, we would expect a loss, in aggregate (worse for smaller banks, than for larger banks).

Danger Map Indicators for Italy

Below we summarize our Danger Map Indicators for Italy. We score Italy overall at 25 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We rate Italy as low, for the percentage of debt to GDP and stage of cycle issues, and high in terms of lending mix and exchange rate flexibility. This puts Italy in the middle of the pack on the Danger Map – neither bright red, not soothing green.

Figure 117: Scoring the Italian "danger map"

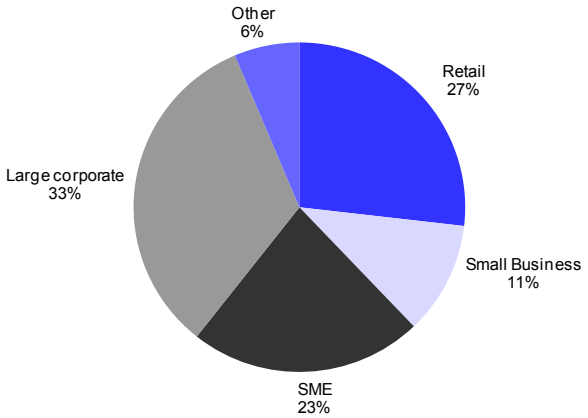
Danger Factor	Score	Comment
Deregulation of Lending	2	No recent deregulation of lending
% of Credit to GDP	1	Lower than the European average
Change in % of Credit to GDP	2	
Maturity of Cycle in Years	2	
Credit Mix	5	Traditional model, but high weight of corporate, SMEs and Small business
Unemployment	2	Unemployment broadly unchanged
Current account position	4	
Level of real interest rates	2	
Exchange rate flexibility	5	
Total Danger Map Score (out of 45)	25	

Source: Deutsche Bank

Understanding the Italian banks' loan books

Small Business, SMEs, and large corporate represent 67% of the average loan books of the Italian banks under coverage: in our view, this highlights one of the main risks for the sector, in the case of economic downturn. And the fragmentation of the exposures does not help a lot, if the crisis is spread among all industries and regions.

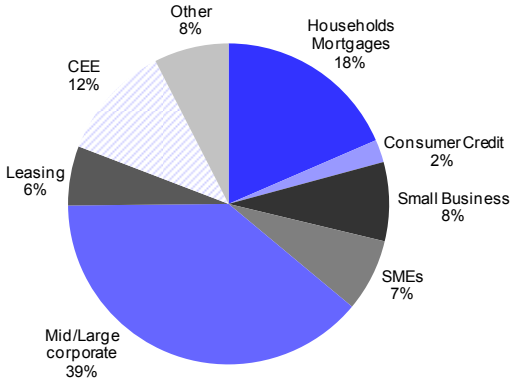
Figure 118: Italian banks under coverage: average loan mix (Q1-11): total of Euro 1,250bn



Source: Deutsche Bank, companies data (for UCG and ISP, we exclude the exposure to CEE countries)

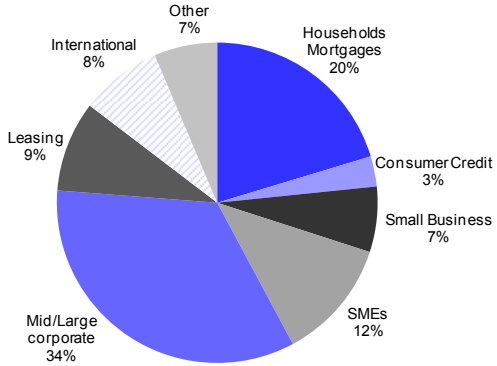
On the positive, the Italian banks: 1) do not have large financing businesses within their investment banks, and 2) have safe Italian retail exposures, due to the very low debt of families/individuals. As a consequence, we quite happily use rather low estimates of through-cycle loan losses for residential mortgages and domestic consumer credit.

Figure 119: Unicredit loans (Q1-11): total of Euro 556bn



Source: Deutsche Bank, company data

Figure 120: Intesa loans (Q1-11): total of Euro 369bn



Source: Deutsche Bank, company data

Figure 119 and Figure 120 refer to the largest Italian banks (Unicredit and Intesa), whose books partially vary from peers' for their presence abroad (Germany, Austria, CEE for Unicredit, and CEE only for ISP). Despite this diffident geographical mix (which could help in case the economic downturn regards only Italy), their lending mix is actually similar to the sector average.

Spain

Overview

This section looks at the Spanish banks, focussing on those covered by DB (Santander, BBVA, Popular, Sabadell, Banesto and Bankinter). Since the start of economic/financial crisis, the profitability, solvency levels and, in some cases, viability of Spanish financial institutions have been (and still are) subject to a number of major tensions and challenges. Some of these challenges are related to the peripherals' sovereign/economic situation (and their implications for access to funding markets, etc.) and others are more specifically related to Spain and the consequences of the past decade's housing bubble. Some of these challenges have prompted the Spanish Government to launch/promote a profound restructuring process for savings banks, a process that is still ongoing and which still leaves many questions. For more details see "Spanish Saving Banks: Are we there yet?" report published on 29 March 2011 and "Interpreting EBA stress tests results" report published on 16 July 2011.

- As a result of their higher than European peers pre-provision margins (due to higher NIM and more streamlined cost structures), the stock of generic provisions that were built between 2000-2007, the disposal of non-core assets, the earnings diversification (in Santander and BBVA's case only) and admittedly some capital calls (none of them received public capital support), the Spanish listed banks have all managed to remain profitable and solvent since the beginning of the crisis. The six listed banks picture in this report have increased core tier 1 capital from E57.7bn in 2006 to the E112bn we forecast by end 2012, driving the sector average CT1 ratio to 9.1% from a little over 6% in 2006.
- Stressing the Spanish banks for a return to recession-level loan losses, a two years of recession losses (which we assume could be 2x higher that the ones observed at the peak – with the exception of Bankinter at 1.5x due to its better credit profile) would cost the sector 11% of tangible equity including stressed pre-provision profit (flexed down by 25% consistently with the crisis experience), and 70% of TNAV excluding any PPP. The best positioned are Santander and BBVA.
- As regards the Danger Map and Outlook, we score the Spanish banks at 32 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We see the Spanish as vulnerable from a credit/GDP, % change of credit to GDP, credit mix and unemployment. Even under the Deutsche Bank base case, of modest but steady Spain economic growth, and expected resolution of EU sovereign issues in Italy and Spain, we expect loan loss to remain higher until mid/late 2012 moment when we expect the first clear signs of normalization.

Credit Data: Trends

We summarise data for the Spanish in our coverage universe in Figure 121. Outside of crisis conditions, the (capital-markets-assisted) strong pre-provision profit generation of the banks is evident at 3.1% of loans, comfortably sufficient to absorb the 130bps of loan losses we currently forecast in 2012 (2.4x PPP/loan loss provision cover). This rich PPP is mostly explained by a high NIM and the fact that they enjoy some of the lower cost to income ratios in Europe.

Figure 121: Aggregation of quoted bank data, local currency (Euro million), Spain

	2006	2007	2008	2009	2010	2011E	2012E
Net Interest Income	25,730	30,590	38,872	47,127	48,667	49,481	53,955
Other Operating Income	19,447	22,093	22,978	23,284	23,678	24,713	25,654
Total Revenue	45,178	52,683	61,850	70,411	72,345	74,194	79,609
Costs	21,448	23,878	27,354	28,881	31,316	33,769	35,073
Pre-Provision Profits	23,729	28,805	34,497	41,531	41,029	40,425	44,536
Loan Loss Provisions	4,833	6,164	11,528	17,706	17,792	17,495	18,277
Pre-Tax Profit	**21,390**	**23,985**	**21,011**	**19,162**	**19,191**	**18,140**	**22,305**
Total Assets	1,560,799	1,757,005	1,953,690	2,034,473	2,168,870	2,227,550	2,310,092
Average Assets	1,508,776	1,658,902	1,855,347	1,994,082	2,101,672	2,198,210	2,268,821
Risk weighted assets	953,673	1,036,347	1,044,230	1,104,300	1,168,414	1,174,951	1,237,912
Basel 3 additions (if known)	0	0	0	0	0	0	0
Core tier one capital	57,760	73,376	73,157	88,321	98,592	104,477	112,724
Basel 3 deductions (if known)	0	0	0	0	0	0	0
Risk Cushion above 7% plus 1 year PPP	23,729	28,805	34,497	41,531	41,029	40,425	44,536
Risk cusion to average loans							
Total Loans	966,234	1,104,434	1,224,103	1,270,545	1,336,880	1,367,925	1,417,928
Average Loans	886,320	1,035,334	1,164,269	1,247,324	1,303,713	1,352,403	1,392,926
Revenue / Average Loans	5.1%	5.1%	5.3%	5.6%	5.5%	5.5%	5.7%
Pre-Provision Profit / Average Loans	2.7%	2.8%	3.0%	3.3%	3.1%	3.0%	3.2%
Loan Loss Provisions / Average Loans	**0.55%**	**0.60%**	**0.99%**	**1.42%**	**1.36%**	**1.29%**	**1.31%**
PPP / Loan Loss Provision Cover	**4.9**	**4.7**	**3.0**	**2.3**	**2.3**	**2.3**	**2.4**

Source: Deutsche Bank estimates, Company data

Estimates by Bank

Figure 122 shows our standard screen for the proportion of tangible equity placed at risk by two years of recession-level loan losses, including and excluding forecast pre-provision profit.

As our recession charge we have used 2x the peak loan losses seen for all banks in 2009/10 (exception being Bankinter for which we use 1.5x considering its better relative credit profile). Note that for Santander and BBVA, which make more than half of their profits outside Europe, mainly Latam, we have used the same assumption. We haircut 2012 forecast PPP by 25% to reflect likely weak revenue conditions in a downturn.

Figure 122: How resilient are the capital bases of the Spanish banks in a credit downturn

Local Currency, 2012E	Santander	BBVA	Popular	Sabadell	Banesto	Bankinter	Total
Forecast Average Loan Balances	748,146	364,746	97,041	71,578	69,061	42,355	1,392,926
Forecast Loan Loss Provisions	11,400	4,224	1,064	774	650	165	18,277
Severe Recession Loan Loss Provisions	22,147	10,234	3,632	2,070	1,194	349	39,627
2012 Pre-Provision Profit	27,338	12,137	1,876	1,262	1,505	418	44,536
2012 PPP less Recessionary Losses	5,191	1,903	-1,756	-808	311	68	4,909
2012 Forecast Tangible Equity	55,987	33,837	8,452	5,388	5,959	3,102	112,724
2 Years of Recessionary losses	44,294	20,467	7,265	4,140	2,388	699	79,253
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-79%	-60%	-86%	-77%	-40%	-23%	-70%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	-6%	-7%	-53%	-42%	-2%	-2%	-11%

Source: Deutsche Bank estimates, Company data

In aggregate, we believe 2 years of recession losses would cost the sector 11% of tangible equity including PPP, and 70% of TNAV excluding any pre-provision profit. Best positioned on this basis are Santander and BBVA, both of which we would expect to remain profitable.

Danger Map Indicators for Spain

We score the Spanish banks at 32 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We see the Spanish as vulnerable from a credit/GDP, % change of credit to GDP, credit mix and unemployment. Even under the Deutsche Bank base case, of modest but steady Spain economic growth, and expected resolution of EU sovereign issues in Italy and Spain, we expect loan loss to remain higher until mid/late 2012 moment when we expect the first clear signs of normalization.

Figure 123: Spain danger map

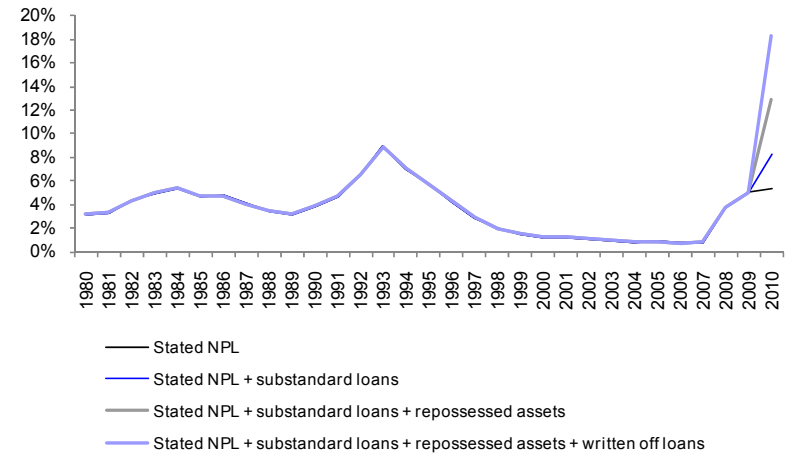
Danger Factor	Score	Comment
Deregulation of Lending	1	No recent deregulation of lending
% of Credit to GDP	5	One of the highest in Europe
Change in % of Credit to GDP	4	Grew massively in the last decade and deleveraging effort not too significant yet
Maturity of Cycle in Years	3	Modest GDP growth. Significant Government austerity measures.
Credit Mix	3	Mostly retail oriented, but with high component of real estate. Large names (SAN/BBVA) well diversified geographically
Unemployment	5	Highest unemployment rate in Europe
Current account position	4	
Level of real interest rates	2	
Exchange rate flexibility	5	
Total Danger Map Score (out of 45)	32	

Source: Deutsche Bank estimates

Credit quality: Recent trends and outlook

Traditional NPL ratio metrics do not represent a true picture of the underlying credit quality trends. In addition to loans currently in default, we should incorporate in the analysis those loans under surveillance (substandard loans), the repossessed/acquired real estate assets and those loans that have been written off already. The system's NPA stands at c18% of the total lending book, which compares to the most recent stated NPL peak in 1993 of 8.9% and June's stated NPL ratio of 6.5%.

Figure 124: Spanish banks' credit quality



Source: Deutsche Bank estimates and Bank of Spain

In the coming months a large percentage of loans currently classified as substandard (mostly real estate-related) will effectively be in default (based in conversations with the banks, we would estimate 65% of them). We believe the worst on the real estate asset front is probably behind us. The stock of repossessed assets may continue heading north but at a much slower pace. There is lower visibility and clearer risks (on the downside) in the non-real estate-related credit bucket. Unemployment remains high and is likely to remain so for some time. Moreover, a sizeable portion of people are running out of unemployment subsidy and additional austerity measures may add to the current economic tensions, all of which will contribute to an increase in residential mortgages/SME lending in arrears.

Linked to the previous point and leaving aside any potential changes by the Bank of Spain to the provisions requirements, the fact that the stock of generic provisions is running thinner in most banks, the cost of risk should be maintained at fairly demanding levels in 2011 and 2012, thus we would be cautious in calling a normalisation of the cost of risk.

Israel

Overview

- The average credit cost ratio of Israel's banks over the past five years is 55bps which is representative of typical mid-cycle provisioning levels for the banks. The peak of 84bps in 2009 was significantly lower than the peak of 110bps in the severe downturn of 2002-03.
- There are two main reasons for the decline in credit costs in recent years. After the banks experienced heavy credit losses in the corporate segment in the 2001-03 recession, there was a multi-year tightening of underwriting standards and improvement in collateralization levels. The vast majority of growth in corporate credit came from the capital markets, where lending standards were looser. Secondly, there has been an ongoing change in the credit mix due to an increase in mortgage loans where credit losses tend to be lower.
- The banks have reported below normalized levels of credit costs in recent quarters due to ongoing improvement in asset quality and some large recoveries from corporate lending. This trend reversed somewhat in recent results with an increased level of general provisioning and as current market conditions deteriorate, the outlook is for higher credit loss expenses.
- We assume that peak provisions in a further downturn would reach 90bps, which is about double normalized levels, though see the local economy as relatively resilient to global conditions. The main area for concern would be lending to real estate developers and leveraged holding companies. With peak provisions at 90bps, the banks would remain mildly profitable (low single digit ROE) with credit losses more than absorbed by pre-provision profit. We calculate that peak provisions would need to reach c200bps for the banks to be loss-making, a level of losses that would be unprecedented for the system. We score Israel at 17 points on the danger map (slightly safer than the average), with the main concern due high corporate debt from the capital markets.

Credit Data: Trends

Below we summarize aggregated data for the Israeli banks under our coverage for 2006 to 2010. Pre-provision profits showed a high level of volatility in 2008 due to MBS and Lehman related losses, but recovered sharply in 2009 on profits from realizing equity holdings. Our current outlook is for stable PPP on limited fee growth and NIMs stability.

Figure 125: Aggregation of quoted bank data, local currency (ILS bn), Israel

Local Currency	2006	2007	2008	2009	2010
Net Interest Income	22,290	23,031	17,890	23,255	24,868
Other Operating Income	13,751	14,774	12,601	15,996	14,542
Total Revenue	36,041	37,805	30,491	39,251	39,410
Costs	24,929	25,165	25,846	25,556	27,462
Pre-Provision Profits	11,112	12,640	4,645	13,695	11,948
Loan Loss Provisions	3,059	1,814	5,225	5,530	3,256
Pre-Tax Profit	8,053	10,826	-580	8,165	8,692
Total Assets	897,281	942,762	982,135	1,006,964	1,020,674
Average Assets	886,739	920,022	962,449	994,550	1,013,819
Total Loans	550,613	607,371	668,915	649,309	686,601
Average Loans	550,947	578,992	638,143	659,112	667,955
Revenue / Average Loans	6.5%	6.5%	4.8%	6.0%	5.9%
Pre-Provision Profit / Average Loans	2.0%	2.2%	0.7%	2.1%	1.8%
Loan Loss Provisions / Average Loans	0.56%	0.31%	0.82%	0.84%	0.49%
PPP / Loan Loss Provision Cover	3.6	7.0	0.9	2.5	3.7

Source: Deutsche Bank aggregation of company data

Estimates by Bank

Below we compare our forecasted credit loss expenses to the level we would expect in a severe global recession (assumed at 2x normalized levels). The main distinction in the credit portfolios of the banks is that Mizrahi is mainly retail focused and so has less cyclical provisioning levels, Hapoalim has more of a corporate focus, while Leumi and Discount are more evenly balanced between segments. We estimate that recessionary level loan loss provisions would be adequately covered by pre-provision profits and that the banks

would remain profitable (with the exception of Discount). On average we estimate that two years of recessionary credit losses would be equivalent to 19% of 2012 tangible book value, though would expect this to be more than compensated for by pre-provision profit, such that equity levels would increase.

Figure 126: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of non-flexed PPP

Local Currency, 2012E	Hapoalim	Leumi	Mizrahi	Discount
Forecast Average Loan Balances	242,466	241,060	116,866	122,855
Forecast Loan Loss Provisions	1,091	741	467	676
Severe Recession Loan Loss Provisions	2,425	2,411	584	1,229
2012 Pre-Provision Profit	5,225	4,211	2,146	2,026
2012 PPP less Recessionary Losses	2,801	1,800	1,562	797
2012 Forecast Tangible Equity	25,641	25,478	7,866	11,398
2 Years of Recessionary loan loss provisions	4,849	4,821	1,169	2,457
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-19%	-19%	-15%	-22%

Source: Deutsche Bank estimates

Danger Map Indicators for Israel

Below we summarize our Danger Map Indicators for Israeli banks, with an overall score of 17 points. Overall the quality of the banks' credit portfolios has improved considerably in recent years, while the macro environment is supportive relative to many other economies since public debt to GDP ratios have been on the decline and the economy has been running a current account surplus. That said, the corporate sector has high levels of leverage due to debt raised on the capital markets, a number of high profile leverage buyouts, and large dividend payouts that have reduced equity levels. The main source of credit growth in the current cycle has come from mortgages, where we do not expect significant credit losses (despite elevated real estate prices) due to low LTVs of c60% on average for new lending. More of concern would be lending to real estate developers who may have overpaid to acquire land banks as real estate prices were on the rise.

Figure 127: Scoring the Israeli banks "danger map"

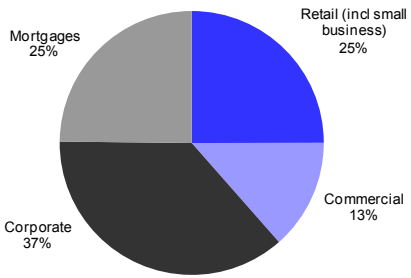
Danger Factor	Score	Comments
Deregulation of Lending	1	No recent deregulation, some tightening on mortgage lending
% of Credit to GDP	3	Relatively high non-banking credit, decline in government debt to GDP to 73%
Change in % of Credit to GDP	2	Growth in mortgages
Maturity of Cycle in Years	2	Year 2 of credit growth
Credit Mix	2	Mostly corporate, but growth from retail/mortgages
Unemployment	1	Unemployment at all time low <6%
Current account position	2	Moderate surplus though in decline
Level of real interest rates	2	Risen 275 bps over past two years. On hold to loosening bias
Exchange rate flexibility	2	Central Bank intervened to prevent currency appreciation.
Total Danger Map Score (out of 45)	17	

Source: Deutsche Bank

Overview of Israeli banks' loan portfolios

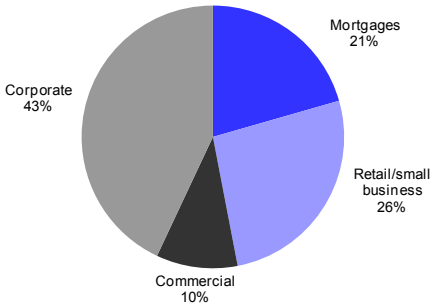
The Israeli banks had a historic orientation towards corporate lending, though this has changed considerably in recent years. Due to a process of disintermediation by the capital markets, lending to corporate by banks has been stagnant for a number of years. Instead the banks have targeted under-penetrated areas such as mortgage and general purpose retail lending. The process has improved the credit mix of the banks in our view and been carried out in a relatively prudent manner, with the majority of retail lending tied to payroll accounts. Lending in the corporate segment is concentrated as a result of the concentrated nature of corporate ownership in the economy. The six largest borrowers account for c10% of credit risk at the largest banks, with loans in excess of ILS 400m accounting 18% of total loans at Hapoalim and 15% at Leumi. Mizrahi is unique amongst the banks for having a high retail orientation, with retail lending accounting for three-quarters of the loan book, most of which is concentrated in mortgages.

Figure 128: Israeli banks average loan mix



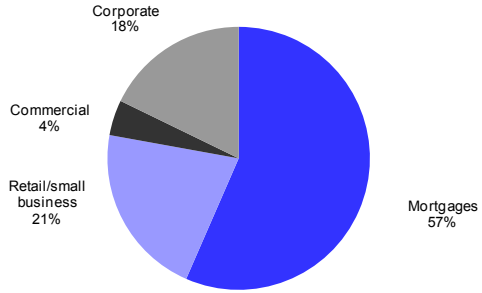
Source: Deutsche Bank, company data

Figure 129: Hapoalim – corporate oriented loan mix



Source: Deutsche Bank, company data

Figure 130: Mizrahi – retail oriented loan mix



Source: Deutsche Bank, company data

Brazil

Overview

- In this section we look at the Brazilian financial system, with a focus on Banco do Brasil, Bradesco and Itau Unibanco. Over the last five years, loan loss provisions averaged 5.2% of average loans, peaking at 6.1% in 2009; their minimum level was 4.3% in 2010.
- We assume that peak provisions could reach 6.2% (roughly in line with 2009's peak) of average loans in the event of a significant downturn in the Brazilian economy. (We note that the Brazilian economy contracted 0.6% in 2009). In such case, we estimate credit losses of R$63.8bn for the three Brazilian banks. Over two years, this would be equivalent to 68% of 2012 tangible book value (TBV). If we include pre-provision profit estimates as an offset (reduced by 25% for a crisis scenario), then there would be a 24% increase in TBV, meaning that system would remain profitable.
- Brazilian banks are well reserved and well capitalized, and the Brazilian Central Bank (BCB) has instruments to provide liquidity in case of another credit crunch, especially by reducing its high reserve requirements on bank deposits. In addition, the BCB cautiously requires that banks maintain a capital ratio of at least 11%. According to the BCB, the Brazilian banks' overall capital ratio exceeded 17% in mid-2011. We note that the current capital ratio is inflated by a large volume of deferred tax credits, which will have to be gradually removed from the capital calculations to adjust to Basel III requirements. However, the BCB plans to initiate a migration to Basel III in July 2012 and expects most banks to adjust relatively easily to the new rules mainly by retaining profits.
- In the danger map, we score Brazil overall at 25 out of 45. This captures a 1 to 5 score across a number of risk metrics. This puts Brazil into a moderate to high zone on the danger map (in context to emerging markets).

Credit data: Trends

Below we summarize aggregate data from 2006 to 2010 for the three largest Brazilian banks. We note that the deterioration in credit quality in 2009 led PPP/LLP to 1.9x, which improved to 2.6x (a normalized level) in 2010; Figure 131.

Figure 131: Brazilian financial system data

R$mn	2006	2007	2008	2009	2010
Net Interest Income	65,373	72,967	85,872	105,591	116,275
Other Operating Income	22,826	30,049	31,146	35,454	43,033
Total Revenue	88,199	103,016	117,019	141,045	159,308
Costs	40,191	52,406	57,705	65,622	76,266
Pre-Provision Profits	41,054	51,238	59,314	75,423	83,042
Loan Loss Provisions	18,252	17,898	23,975	38,965	32,470
Pre-Tax Profit	22,978	33,244	35,549	36,868	50,814
Total Assets	875,371	1,143,407	1,594,489	1,823,045	2,203,769
Average Assets	790,052	1,009,390	1,368,948	1,708,767	2,013,407
Total Loans	290,813	438,998	595,366	678,787	828,136
Average Loans	299,559	386,253	517,182	637,077	753,461
Revenue / Average Loans	29.4%	26.7%	22.6%	22.1%	21.1%
Pre-Provision Profit / Average Loans	13.7%	13.3%	11.5%	11.8%	11.0%
Loan Loss Provisions / Average Loans	6.09%	4.63%	4.64%	6.12%	4.31%
PPP / Loan Loss Provision Cover	2.2	2.9	2.5	1.9	2.6

Source: Deutsche Bank aggregation of Company data.

Estimates by bank

Below we summarize forecast data for 2012 for the aggregate banks in our analysis, Banco do Brasil, Bradesco and Itau Unibanco. We estimate loan loss provision of 6.2% for the system, roughly in line with the peak of 2009; Figure 132.

We estimate that the potential impact in such scenario represents c.70% of tangible book (68%) if provisions remain at such level for two years. However, if we offset such provision with two years of pre-provision profit (flexed down by 25%), the system would remain profitable, as post-provision profits would represent 24% of the system tangible equity.

Figure 132: Brazilian banks – impact of recessionary loan loss charges on TBV and PPP

R$mn, 2012E	BBAS3	BBD	ITUB	Total
Forecast Average Loan Balances	419,838	267,854	338,286	1,025,978
Forecast Loan Loss Provisions	16,403	12,645	20,077	49,125
Severe Recession Loan Loss Provisions	20,992	17,411	25,371	63,774
2012 Pre-Provision Profit	38,528	31,962	44,257	114,747
2012 PPP less Recessionary Losses	17,536	14,551	18,886	50,973
Loan Losses to Total Loans	5.0%	6.5%	7.5%	6.2%
2012 Forecast Tangible Equity	51,147	58,161	79,123	188,430
2 Years of Recessionary losses	41,984	34,821	50,743	127,548
2 Years of Recessionary losses as % 2012 Forecast TE	-82%	-60%	-64%	-68%
2 years of Recessionary losses as % of 2 years of PPP*	31%	23%	20%	24%

*Source: Deutsche Bank estimates. * Flexed down by 25%.*

Danger Map Indicators for Brazil

Below we summarize our Danger Map Indicators for the Brazilian banks. We score Brazil at 25 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We believe that unemployment should not be a major concern in Brazil, as it is in historical lows. However, recent growth in credit and maturity credit cycle should be on investor's radar screen, as credit has grown at a CAGR of 20% in the past 7 years. Finally, we believe that such growth should decelerate in the coming years; see Figure 133.

Figure 133: Brazilian banks: Danger Map

Danger Factor	Score	Comments
Deregulation of Lending	1	No meaningful changes in regulation recently
% of Credit to GDP	3	Ratio has doubled in the past 7 years, but from a low level and remains below the level of developed markets
Change in % of Credit to GDP	5	Credit has grown at a CAGR of 20% since 2003
Maturity of Cycle in Years	5	We expect loan growth to start to decelerate in the coming years
Credit Mix	3	Credit growth driven by individual loans; mortgage penetration remains very low
Unemployment	1	Unemployment at historically low levels
Current account position	3	Current account represents 2.3% of GDP
Level of real interest rates	2	Rates have been rising for the past 1.5 years, but are low compared to historical levels and have recently started to trend down
Exchange rate flexibility	2	Floating exchange rate system
Total Danger Map Score (out of 45)	25	

Source: Deutsche Bank estimates.

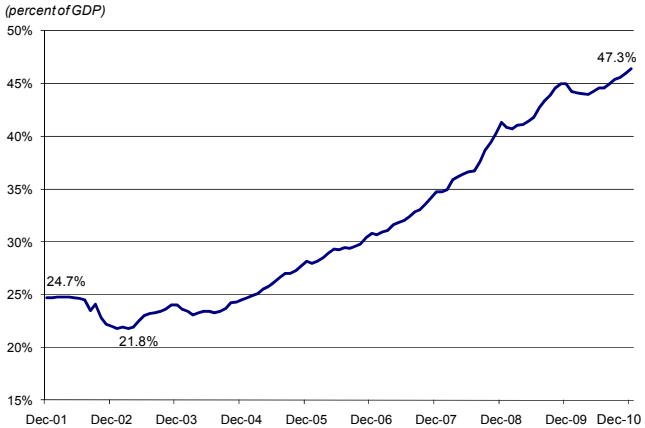
Brazilian bank loan book

System loans have been growing at a double digit pace since 2004 (at a CAGR of 20%), led by a declining interest rate environment, economic stabilization, and changes in the regulatory environment, which essentially made it easier for banks to foreclose on mortgages; Figure 134. As such, loan penetration has improved to 47% of GDP from 22% in 2003; Figure 135. Such growth has been driven primarily by consumer loans (especially payroll loans, credit cards, and autos), including mortgages, although the mortgage market remains fairly underpenetrated at less than 10% of total credit (or less than 5% of GDP).

Figure 134: System credit growth (YoY)

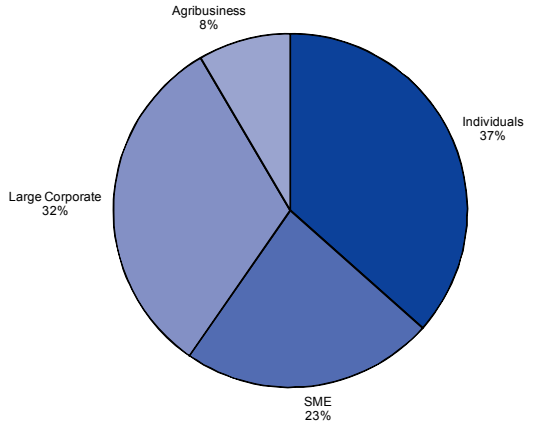
Source: Deutsche Bank estimates and Brazilian Central Bank.

Figure 135: Loan penetration (%of GDP)



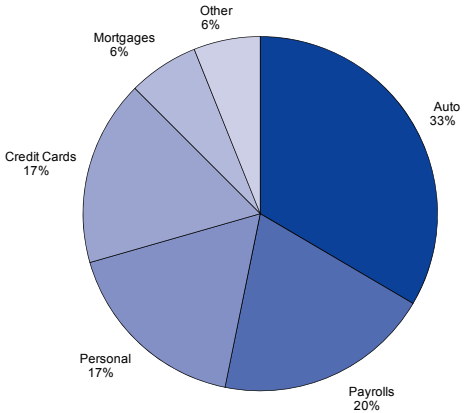
Source: Deutsche Bank estimates and Brazilian Central Bank.

Figure 136: Loan breakdown



Source: Deutsche Bank estimates and Company reports. * Reflects the loan portfolios of Banco do Brasil, Bradesco, Itau Unibanco, and Santander Brasil on June 30, 2011.

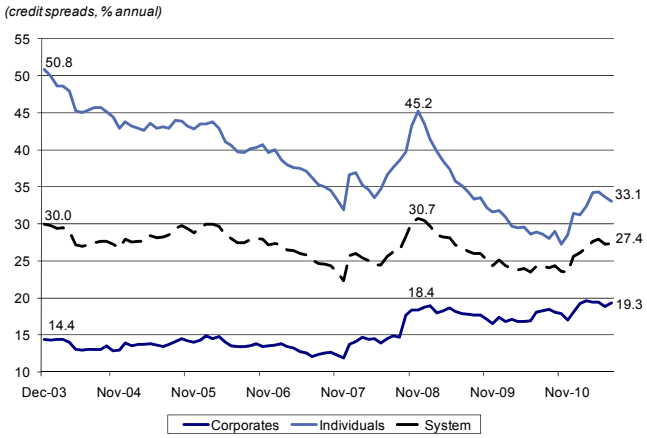
Figure 137: Individual loan breakdown



Source: Deutsche Bank estimates and Company reports. * Reflects the loan portfolios of Banco do Brasil, Bradesco, Itau Unibanco, and Santander Brasil on June 30, 2011.

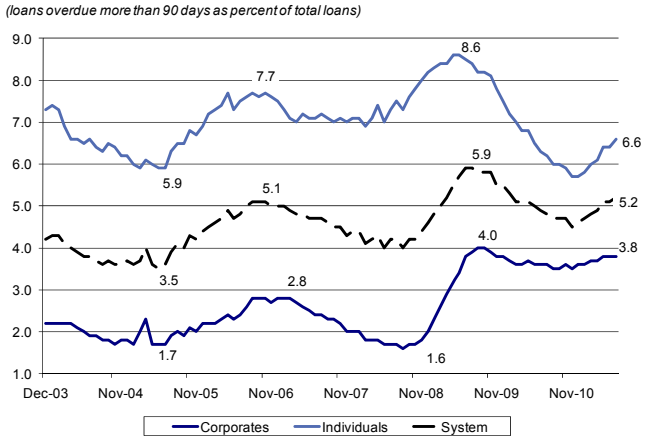
Loan spreads are notoriously very high in Brazil, which is usually explained by the overall high level of interest rates, high reserve requirements on bank deposits, heavy tax burden on the financial sector, and high bank concentration. The natural consequence is a high non-performing loan ratio; Figure 138 and Figure 139.

Figure 138: System credit spreads



Source: Deutsche Bank estimates and Brazilian Central Bank.

Figure 139: System NPLs



Source: Deutsche Bank estimates and Brazilian Central Bank.

We do not believe there is a credit bubble in Brazil

Investors are increasingly concerned about the consequences of the fast expansion in credit that Brazil has experienced over the past few years, especially the possibility of a banking crisis. These concerns have been heightened by the heavy debt burden on consumers, strong inflow of foreign capital, and the rapid increase in real estate prices.

However, we do not believe that Brazil is heading towards a banking crisis, as 1) credit as a share of GDP was extremely low before it started growing in 2004, and remains relatively low today when compared to other countries, 2) financial bubbles such as the US mortgage bubble usually thrive under low interest rates, which is clearly not the case in Brazil. Moreover, in contrast to the US, the mortgage market amounts to less than 5% of GDP in Brazil, and 3) Brazilian banks are well reserved and well capitalized, and the Central Bank has instruments to provide liquidity in case of another credit crunch, especially by reducing its high reserve requirements on bank deposits.

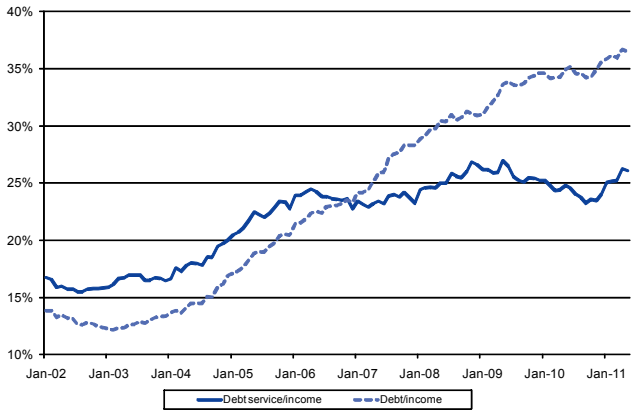
In addition to high reserve requirements on bank deposits, the Brazilian Central Bank cautiously requires that banks maintain a capital ratio of at least 11% – above international standards. According to the Central Bank, the Brazilian banks' overall capital ratio exceeded 17% in mid-2011. The current capital ratio is inflated by a large volume of deferred tax credits, which will have to be gradually removed from the capital calculations to adjust to Basel III requirements. However, the Central Bank plans to initiate a migration to Basel III in July 2012 and expects most banks to adjust relatively easily to the new rules mainly by retaining profits.

But loan growth is likely to decelerate in the coming years

Brazilian consumers face a very high debt service burden of 26% (perhaps the highest in the World), reflecting both high interest rates and average consumer loan duration of less than two years. However, such ratio is not new and has remained relatively stable since 2008 despite the strong increase in consumer debt, due to a decline in interest rates and increase in loan duration; Figure 140 and Figure 141.

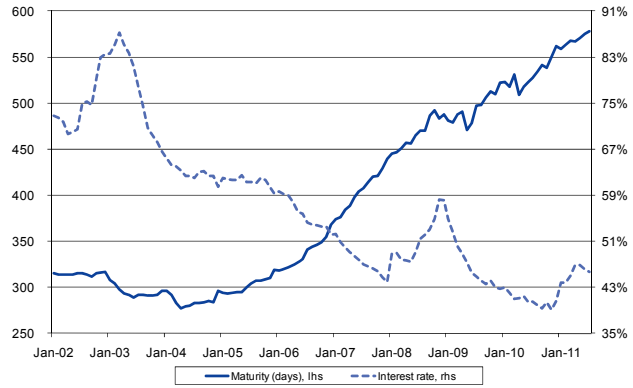
This does not mean that one should not worry about the heavy consumer debt burden. In the near term, the introduction of macro-prudential measures at the end of 2010 and monetary tightening are slowing consumer credit expansion. In the medium term, however, the heavy debt burden could restrain further financial development. We believe that further credit penetration will depend essentially on a decline in interest rates and an increase in loan maturities, especially through further development of the mortgage market. While the mortgage market in Brazil is still very small and has plenty of room to grow, we believe that further expansion will depend on critical changes in the mortgage system, primarily in the development of alternative funding instruments, as currently mortgages are primarily funded by savings accounts.

Figure 140: Household debt and debt service



Source: Deutsche Bank estimates and Brazilian Central Bank.

Figure 141: Interest rate vs. loan maturity – Individuals



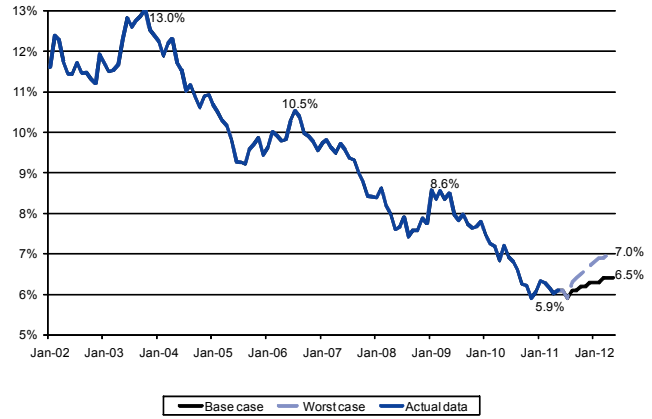
Source: Deutsche Bank estimates and Brazilian Central Bank.

Asset quality should deteriorate, but less than in previous cycle

Non-performing loans increased sharply in 2009 in the aftermath of the Lehman Brothers crisis and domestic recession. As the economy recovered, delinquency of consumer loans declined steadily and bottomed at 5.7% in January 2011 (very close to the series' nadir of 5.3% registered in October 2000). Non-performing consumer loans are rising again, but remain relatively low by historical standards. Corporate loan delinquency, however, failed to decline alongside the economic recovery. A possible explanation is that the market is facing an "adverse selection problem," as the better credits pursue cheaper loans from the BNDES, and riskier borrowers have to seek financing from commercial banks.

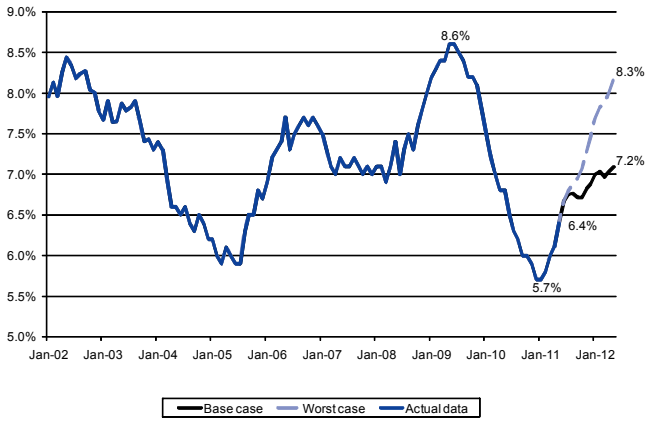
We expect NPLs to increase further in the coming months, both in the consumer and corporate segments, due to rising interest rates and expected deceleration in economic activity. However, we do not expect NPLs to rise more than they did in previous cycles, given a historically low unemployment rate, and rising labor earnings.

Figure 142: Unemployment



Source: Deutsche Bank estimates and Brazilian Central Bank.

Figure 143: Consumer NPL scenarios



Source: Deutsche Bank estimates and Brazilian Central Bank.

Mexico

Overview

- In this section we look at the Mexican financial system and Banorte, which is the fourth largest bank in Mexico and the only one under our coverage. Most banks in Mexico are owned by global banks, such as Citigroup, BBVA, Santander, HSBC, and Scotia Bank. Over the last five years, loan loss provisions in the banking system averaged 4.1% of average loans, peaking at 5.4% in 2009; their minimum level was 2.3% in 2006.
- We assume that peak provisions reach 5.5% of average loans (similar to 2009) in the event of a significant downturn in the Mexican economy. In such case, we estimate credit losses of Ps154bn. Over two years, this would be equivalent to 41% of 2012 tangible book value (TBV). If we include pre-provision profit (PPP) estimates as an offset (reduced by 25% for a crisis scenario), then there would still be a 1% increase in TBV.
- We think the banks in Mexico are well protected, given an average capital ratio of 17.4% for the system, well above Mexico's minimum requirement of 8%, and an average coverage ratio of 200% of NPLs as of December 2010. Furthermore, we view the above scenario as very extreme, as GDP fell 6.5% in 2009, but recovered 5.5% in 2010 and our economists do not expect a recession in Mexico next year. DB economists forecast GDP growth of 4.0% in 2011 and 3.5% in 2012, even with a potential slowdown in the US. Nonetheless, profitability could be under pressure from higher provisions.
- In the Danger Map, we score Mexico overall at 17 out of 45. This captures a 1 to 5 score across a number of risk metrics. This puts it at a moderate to low risk in the Danger Map, but not at an extreme case.

Credit Data: Trends

Below we summarize data from 2006 to 2010 for the aggregated Mexican financial system. The deterioration in the credit cycle peaked in 2009 and has been improving. The coverage of loan loss provisions (LLP) by PPP improved to 2.3x in 2010, near the level seen in 2007.

Figure 144: Mexico financial system data

Pesos mn	2006	2007	2008	2009	2010
Net Interest Income	168,192	205,032	234,241	235,948	244,704
Other Operating Income	79,962	83,675	83,343	106,129	97,339
Total Revenue	248,155	288,707	317,584	342,077	342,043
Costs	123,246	143,155	155,437	161,815	177,518
Pre-Provision Profits	127,894	150,386	164,931	183,202	169,226
Loan Loss Provisions	28,678	59,321	98,194	106,203	74,947
Pre-Tax Profit	99,215	91,065	66,737	76,999	94,279
Total Assets	3,651,317	4,244,874	4,943,505	4,828,977	5,357,606
Average Assets	3,434,826	3,948,095	4,594,189	4,886,241	5,093,291
Total Loans	1,371,970	1,717,512	1,910,513	1,993,291	2,166,634
Average Loans	1,259,122	1,544,741	1,814,013	1,951,902	2,079,963
Revenue / Average Loans	19.7%	18.7%	17.5%	17.5%	16.4%
Pre-Provision Profit / Average Loans	10.2%	9.7%	9.1%	9.4%	8.1%
Loan Loss Provisions / Average Loans	2.28%	3.84%	5.41%	5.44%	3.60%
PPP / Loan Loss Provision Cover	4.5	2.5	1.7	1.7	2.3

Source: Deutsche Bank, CNBV.

Estimates for Banorte and System

Below we summarize forecast data for 2012 for the Mexican financial system and Banorte. We estimate loan loss provisions of 5.5% of system loans and 3.5% of Banorte loans, similar to the levels reached in 2009 when GDP in Mexico fell 6.5%.

The potential impact of such a scenario would represent more than 40% of tangible equity for both the system and Banorte if provisions remained at such levels for two years. Nonetheless, if we offset such provisions with two years of pre-provision profits (flexed down by 25%), the system and Banorte would remain profitable, as post-provision profits would represent 12% of Banorte's tangible equity and 1% of the system's. Nonetheless, profitability would be severely pressured, which could significantly impact valuation as Banorte trades at 2.1x trailing tangible book value.

Figure 145: Mexico banks – impact of recessionary loan loss charges on TBV and PPP

Pesos mn, 2012E	Banorte	System
Forecast Average Loan Balances	390,546	2,802,916
Forecast Loan Loss Provisions	6,600	65,962
Severe Recession Loan Loss Provisions	13,669	154,160
2012 Pre-Provision Profit	23,400	208,081
2012 PPP less Recessionary Losses	9,731	53,920
2012 Forecast Tangible Equity (TE)	63,787	753,292
2 Years of Recessionary losses	27,338	308,321
2 Years of Recessionary losses as % 2012 Forecast TE	-43%	-41%
2 years of Recessionary losses as % of 2 years of PPP*	12%	1%

*Source: Deutsche Bank estimates. * Flexed down by 25%.*

Danger Map Indicators for Mexico

Below we summarize our Danger Map Indicators for Mexican banks. We score Mexico overall at 17 out of 45. This captures a 1 (least risk) to 5 (most risk) score across a number of risk metrics, drawn from our experience of past crises. We rate Mexico low in credit penetration and the level of interest rates, which are near historical lows. We think unemployment is the biggest concern, as it is near a ten-year high, but it is improving. This puts Mexico at a moderate to low level of risk.

Figure 146: Mexican banks: Danger Map

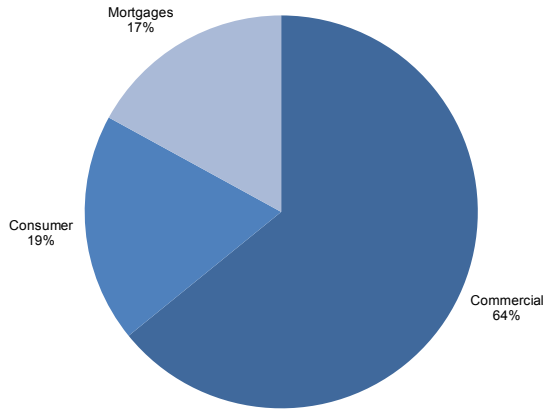
Danger Factor	Score	Comments
Deregulation of Lending	1	No meaningful changes in regulation recently
% of Credit to GDP	1	One of the lowest ratios in Latam, and still below pre-Tequila crisis levels
Change in % of Credit to GDP	3	Credit has grown at a CAGR of less than 15% in the past seven years
Maturity of Cycle in Years	2	Credit growth is accelerating after single digit growth in 2009
Credit Mix	2	Consumer loan penetration is one of the lowest in the region
Unemployment	3	Near a ten-year high, but improving
Current account position	2	Current account represents 0.9% of GDP
Level of real interest rates	1	Interest rates at historically low levels and unlikely to rise in the near term
Exchange rate flexibility	2	Floating exchange rate system
Total Danger Map Score (out of 45)	17	

Source: Deutsche Bank estimates.

Mexican bank loan books

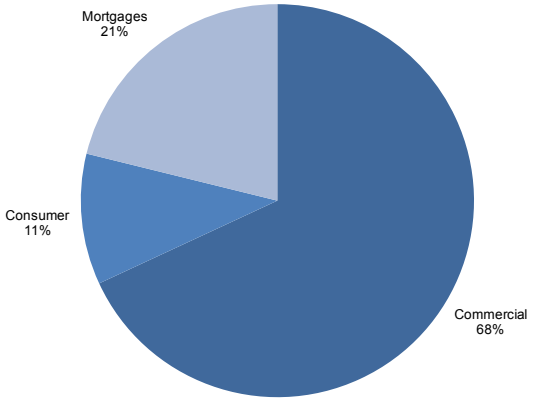
Consumer loans are still a relatively minor percentage of Mexican bank loans. Indeed, consumer loans represent 19% of total loans for the system as of December 2010 and only 11% for Banorte. Meanwhile, commercial loans represent 64% of system loans and 68% of Banorte's loans, and mortgages represent 17% of system loans and 21% of Banorte's loans. As such, we think significant asset quality deterioration can be contained, as consumer loans are the riskiest types of loans. For example, the consumer NPL ratio for the system reached 8.0% in 2008 from 5.9% in 2007 and 4.4% in 2006. However, the total NPL ratio only increased to 3.2% in 2008 from 2.5% in 2007 and 2.0% in 2006. The consumer NPL ratio has since improved to 4.4% and the total NPL ratio has improved to 2.3% at the end of 2010.

Figure 147: System loans as of December 2010



Source: Deutsche Bank, CNBV.

Figure 148: Banorte loans as of December 2010



Source: Deutsche Bank, company data.

Russia

Overview

- In this section we look at the Russian banks, with a focus on those covered by Deutsche Bank (Sberbank, VTB, Nomos, Bank Saint Petersburg and Vozrozhdenie). Over the 2006-10 period, we find that loan loss provisions averaged 2.8%, and peaked at 7.3% in 2009. The minimum level was reached in 2007, when banks had risk costs of 0.8% of loans.
- We think that Russian banks are highly exposed to the region's economy (=oil price). In fact, a crisis now would probably more damaging than the 2008/09 crisis: asset quality is worse, IB exposure bigger and state support less likely due to fiscal constraints. Liquidity in the sector has deteriorated in recent months although is still abundant compared to the 2008/09 crisis.
- While Russian banks' earnings are highly geared to changes in asset quality, we see their capital as resilient. High profit margins (before impairment charges are taken into account) allows the banks to accumulate bad debt provisions without making a loss, while low leverage ratios mitigate the impact of rising bad loans on earnings and capital. This conclusion is underpinned by the experience of the 2008/09 crisis when most banks (with the exception of VTB) remained profitable in spite of surging NPLs.
- As regards the Danger Map, we score Russia overall at 23 out of 45, which puts Russia at the higher end on the Danger Map for Emerging markets. Russia's main weaknesses are the poor current asset quality, the one-dimensional exposure of the economy / currency to change in the oil price and the limited ability of the authorities to mitigate its impact.

The 2008/09 crisis experience in Russia

The 2008/09 crisis fully exposed Russia's dependence on the global economy, international capital markets and the limited diversification of the domestic economy.

- First, while the state was almost debt-free, Russian companies and banks were heavily dependent on international capital markets. In total they had around USD500bn in foreign debt in 2008, or over 30% of GDP and almost equal Russia's FX reserves. In 2009, around USD120bn in foreign debt was coming due and this caused imminent problems when capital markets closed.
- Second, the slowdown in the global economy caused by the financial crisis led to an unprecedented collapse in commodity prices. In a matter of six months, the oil price slumped from USD145 to just over USD30 per barrel. Two-thirds of Russia's exports and half of budget revenues are coming from oil. Our economists estimate that each USD5 change in the oil price has a 0.3ppt impact on real GDP growth.
- Third, the slumping commodity prices wreaked havoc on the RUR exchange rate. Between 2Q08 and 1Q09, the RUR shed 35% vis-à-vis the USD. Due to the dominance of oil and gas for the Russian economy, the ruble is closely correlated to the oil price.

Currency weakness is a much bigger problem in Russia than in most large emerging markets, because the economy is not diversified: Russia exports commodities and imports finished goods and consumer products. There is hardly a domestic producers' base that competes with imported goods or exports to developed markets' consumers.

In 2009, Russia's real GDP shrank 7.8% and inflation surged to 15.5% from single-digit in 2008, making it one of the worst performing economies in the industrialized world in 2009. Instead of stabilizing the economy through import substitution and rising exports, the ruble devaluation merely led to imported inflation and depleted consumption.

Credit Data trends

The crisis had an immediate impact on credit quality. The payment system almost came to a halt as companies and consumers stopped paying ruble bills in anticipation of further devaluation and the economy moved into cash hoarding mode. Credit quality soured and the sector's NPL ratio surged from 1.8% in mid-2008 to a 10.0% peak in February 2010.

Russian banks' capital proved resilient to the crisis. Exceptionally high profit margins (before credit costs are taken into account) allowed the banks to accumulate bad debt provisions without making a loss. This is demonstrated by aggregated data of the Russian banks in our coverage universe. Russian banks' pre-provision profit margin reached 7.0% in 2009, and this allowed them to absorb 7.3% risk costs.

Russian banks also benefit from low leverage ratios, which mitigate the impact of rising bad loans on earnings and capital. Russian banks assets total 6-8x Tier 1 capital, which compares to 12-15x for banks such as Bank of America and JPM and up to 25-30x for some European banks (Barclays, SocGen, BNP).

Figure 149: Aggregation of quoted bank data, Russia)

In RUR bn	2006	2007	2008	2009	2010	2011E	2012E
Net Interest Income	253	336	523	691	699	824	989
Other Operating Income	10	8	13	-7	2	34	39
Total Revenue	372	488	638	868	939	1,107	1,324
Costs	191	258	305	322	397	519	615
Pre-Provision Profits	181	231	332	546	542	588	709
Loan Loss Provisions	27	35	170	571	216	30	33
Pre-Tax Profit	153	196	160	-30	317	556	666
Total Assets	5,090	7,639	11,069	11,374	13,888	16,843	19,652
Average Assets	4,413	6,365	9,354	11,221	12,631	15,366	18,248
Risk weighted assets	4,641	6,869	9,915	10,173	12,859	15,566	18,101
Basel 3 additions (if known)							
Core tier one capital	518	1,094	1,209	1,362	1,654	2,054	2,462
Basel 3 deductions (if known)							
Risk Cushion above 7% + 1 year PPP	182	231	333	546	542	588	709
Risk cushion to average loans							
Total Loans	3,474	5,661	8,061	7,580	8,901	11,137	13,547
Average Loans	2,688	4,567	6,861	7,820	8,190	10,019	12,342
Revenue / Average Loans	13.8%	10.7%	9.3%	11.1%	11.5%	11.1%	10.7%
Pre-Provision Profit / Average Loans	6.7%	5.0%	4.8%	7.0%	6.6%	5.9%	5.7%
Loan Loss Provisions / Average Loans	1.0%	0.8%	2.5%	7.3%	2.6%	0.3%	0.3%
PPP / Loan Loss Provision Cover	6.6	6.5	2.0	1.0	2.5	19.6	21.5

Source: Deutsche Bank's aggregation of company data

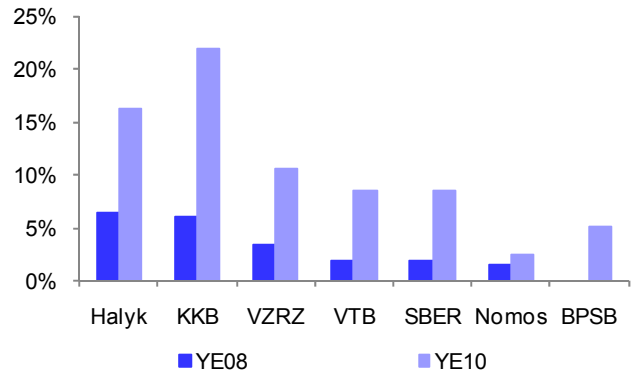
What is different now?

While the probability of a repeat of the 2008/09 crisis is, perhaps, limited, we think a crisis now would be more damaging to Russian banks for several reasons:

- Bad assets are weighing on the sector: Current NPL ratios are three to five times higher than before the 2008/09 crisis, as most Russian banks have not dealt with the bad loans from the crisis. At the same time, coverage ratios are much lower. At first glance the banks look well-provisioned with NPL coverage of over 100%, but coverage drops to 70% if restructured loans - which account for 5-10% of loan portfolios - are also taken into consideration.
- Increased IB exposure: Since the 2008/09 crisis, VTB, and to a lesser extent Sberbank, have built up a significant IB presence. For Sberbank a loss in IB is unlikely to have more than a 5% P&L impact, but at VTB - where IB accounted for 19% of 2010 revenues and 36% of profits - a loss at IB could also easily halve profits and knock 1% off the forecast 10% Tier 1 ratio at YE11, bringing VTB close to a new capital increase.

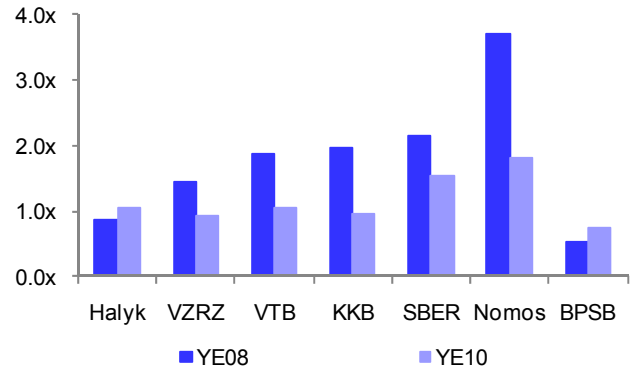
On the positive, balance sheets have improved compared to 2008. Two years of strong deposit growth - spurred by positive real deposit rates (unprecedented in Russian modern history) and significant social spending by the government – has brought the sector's LDR down from 140% in 2008 to just over 100%. Even VTB, which heavily relied on capital markets' funding before the 2008/09 crisis, now derive over 60% of funding from deposits, albeit with significant support / pressure from state and state companies.

Figure 150: NPL ratio



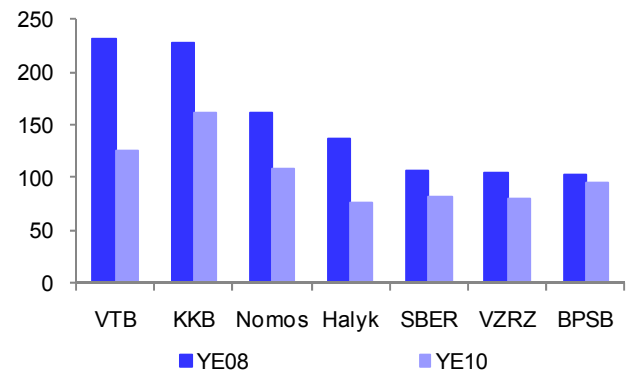
Source: Companies

Figure 151: NPL coverage



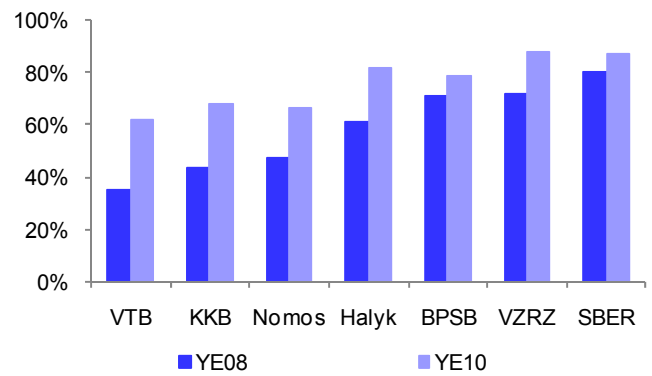
Source: Companies

Figure 152: Loans-to-Deposits ratio



Source: Companies

Figure 153: Deposits as % of IBL



Source: Companies

Estimates by Bank

Below we summarize forecast data for 2012 for the aggregated Russian banks in our coverage universe. We then show our estimate of severe recessionary loan losses, which for the purpose of this exercise we have taken as 4x normalized. We estimate the normalized LLPs at 1.5% of loans, which is based on medium term sector growth of around 20%, a mid-cycle provision level of 5% of loans and 50bp write-offs.

The table below highlights that the impact of a recessionary scenario on Russian banks' capital would be minimal. We estimate the accumulated Recessionary losses of the five Russian banks under coverage at only RUR32bn (on a pre-tax basis). Two years of recessionary losses would thus lead to an aggregated net loss (using the 20% statutory tax rate in Russia) of only RUR52bn, or only 2% of tangible equity.

Figure 154: Summary of forecast data, Russian banks

In RUR bn, 2012E	SBER	VTB	Nomos	VZRZ	STBK	Total
Forecast Average Loan Balances	7,436	4,034	480	153	239	12,342
Forecast Loan Loss Provisions	8	17	6	1	17	50
Severe Recession Loan Loss Provisions	446	242	29	9	14	741
2012 Pre-Provision Profit	482	182	26	6	13	709
2012 PPP less Recessionary Losses	36	-60	-3	-3	-2	-32
2012 Forecast Tangible Equity	1,575	740	77	22	48	2,392
2 Years of Recessionary losses	892	484	58	18	29	1,434
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-57%	-65%	-74%	-84%	-59%	-60%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	-11%	-28%	-24%	-44%	-20%	-17%

Source: Deutsche Bank

Danger Map Indicators for Russia

Below we summarize our Danger Map Indicators for Russia. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We score Russia overall at 23 out of 45, which puts Russia at the upper end on the Danger Map for Emerging Markets. The main weaknesses in Russia are the poor credit quality at present, as Russian banks have yet to fully digest the legacy of bad loans from the previous crisis, the difficulty in repossessing collateral and the one-dimensional exposure of the economy and the currency to the oil price, which severely limits policy makers' ability to counter the impact of a global fallout.

Figure 155: Scoring Russia on the "danger map

Danger Factor	Score	Comments
Deregulation of Lending	2	No recent deregulation of lending. State banks dominate the sector
% of Credit to GDP	2	Banking sector penetration is low, mitigating the impact of credit growth on the economy
Change in % of Credit to GDP	3	Credit penetration broadly unchanged since 2007
Maturity of Cycle in Years	4	Bad loans from the 08/09 crisis still weighing on balance sheets
Credit Mix	4	High % of large corporate loans. Difficulties in repossessing collateral
Unemployment	2	Unemployment broadly unchanged
Current account position	1	Surplus
Level of real interest rates	2	Real rates negative, but less than before the 2008/09 crisis
Exchange rate flexibility	3	Currency largely driven by the oil price
Total Danger Map Score (out of 45)	23	

Source: Deutsche Bank

India

Overview

- In this section we look at the Indian banks, with a focus on those covered by DB (six government owned banks (PSU banks) and five private banks). Over the last five years, we find that loan loss provision (as % of average loans) averaged 86bp, with maximum of 115bps (FY2010) and minimum of 69bps (FY2007).
- The average through cycle credit cost of Indian Banks varies between 25 to 100bps. We believe that peak provisions in case of a recession would likely reach 2x their normalised level. We estimate credit losses of INR 1.08 trn per annum for the eleven Indian banks. Over two years, this would be equivalent to 38% of 2012 closing tangible book value. As we had seen in the period 2007 to 2009 the PPP at Indian banks went up. In case of another recession we believe that Indian banks will still continue to report profits, but may be a lower level of profitability.
- The actual impact on earnings by way of credit costs could be lower than above if RBI allows any one-time relaxation to the banks as it did in 2008. In end 2008 RBI allowed banks to restructure real estate loans once and other loans twice and yet continue to treat them as standard assets. In these cases banks were required to make only NPV provisions on restructured loans, which were generally lower than the case compared to situation had these loans turned NPL
- As regards the Outlook and the Danger Map for India, we score India overall at 26 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. This puts India at the upper end on the Danger Map for Emerging Markets.

Credit Data: Trends

Below we summarise data from 2005 to 2010 for the aggregated Indian banks in our coverage universe. We see that while pre-provision profits (PPP) have risen over the period, loan loss provisions (LLP) have risen as well resulting in decline in PPP/LLP cover from 4.6x to 3.8x.

Figure 156: Aggregation of quoted bank data, local currency, (INR m)

Local Currency	2006	2007	2008	2009	2010
Net Interest Income	524,319	608,975	773,836	886,112	1,189,297
Other Operating Income	287,516	448,731	486,371	707,038	675,799
Total Revenue	811,835	1,057,705	1,260,207	1,593,150	1,865,096
Costs	477,093	585,459	645,654	849,730	994,361
Pre-Provision Profits	334,742	472,246	614,553	743,420	870,734
Loan Loss Provisions	72,341	107,794	136,748	205,543	227,184
Pre-Tax Profit	264,434	366,544	477,701	540,807	645,812
Total Assets	20,833,528	25,897,684	31,584,242	36,185,766	43,606,867
Average Assets	18,849,475	23,365,606	29,115,971	33,885,004	39,896,317
Total Loans	12,148,814	15,046,066	18,596,312	21,515,733	26,467,671
Average Loans	10,851,025	13,771,012	17,289,199	20,312,562	24,311,089
Revenue / Average Loans	7.5%	7.7%	7.3%	7.8%	7.7%
Pre-Provision Profit / Average Loans	3.1%	3.4%	3.6%	3.7%	3.6%
Loan Loss Provisions / Average Loans	0.67%	0.78%	0.79%	1.01%	0.93%
PPP / Loan Loss Provision Cover	4.6	4.4	4.5	3.6	3.8

Source: Deutsche Bank aggregation of company data

Estimates by Bank

Below we summarise forecast data for 2012 (FY13E or year ending 31 March 2013) for the aggregated Indian banks in our coverage universe. We then show our estimate of severe recessionary loan losses, which for the purposes of this exercise we have taken as 2x normalised.

We then express this as a % of 2012 BV, and also as a % of 2012 pre-provision profit flexed down by 25% (this is the same PPP experience we saw in the 2008 credit cycle). These are simple numbers, but they do show in our view that (1) the Indian banks have good pre-provision profit generation, but that (2) even in a severe credit book downturn we would still expect Indian banks to continue to make profits, in aggregate.

Figure 157: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of non-flexed PPP

Local Currency, 2012E	Axis	HDFC Bank	ICICI	Kotak	Yes	Bank of Baroda	Bank of India	Canara	SBI	PNB	Union	Total
Forecast Average Loan Balances	1,637,040	1,812,874	2,454,575	461,721	412,495	2,592,216	2,391,376	2,369,452	11,004,607	2,740,900	1,697,801	**29,575,057**
Forecast Loan Loss Provisions	15,423	18,869	24,574	2,958	905	12,826	14,192	11,792	125,486	23,049	11,732	**261,805**
Severe Recession Loan Loss Provisions	24,556	36,257	49,092	9,234	2,062	20,738	28,697	28,433	132,055	32,891	20,374	**384,389**
2012 Pre-Provision Profit	76,448	95,251	109,882	27,668	15,498	80,060	64,375	74,850	380,146	101,505	52,527	**1,078,210**
2012 PPP less Recessionary Losses	51,892	58,994	60,790	18,434	13,436	59,323	35,679	46,417	248,091	68,614	32,154	**693,822**
2012 Forecast Tangible Equity	219,406	294,575	601,765	123,043	44,610	250,740	200,931	240,904	958,049	257,127	150,975	**3,342,125**
2 Years of Recessionary losses	69,410	76,866	104,074	19,577	17,490	109,910	101,394	100,465	466,595	116,214	71,987	**1,253,982**
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-32%	-26%	-17%	-16%	-39%	-44%	-50%	-42%	-49%	-45%	-48%	**-38%**
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	21%	22%	10%	18%	13%	4%	-2%	5%	11%	14%	5%	**25%**

Source: Deutsche Bank

Danger Map Indicators for India

Below we summarise our Danger Map Indicators for India. We score India overall at 26 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We rate India as medium in terms of % of debt in GDP and high on change in leverage and mix. This puts India at the upper end on the Danger Map for Emerging Markets

Figure 158: Scoring the India "danger map"

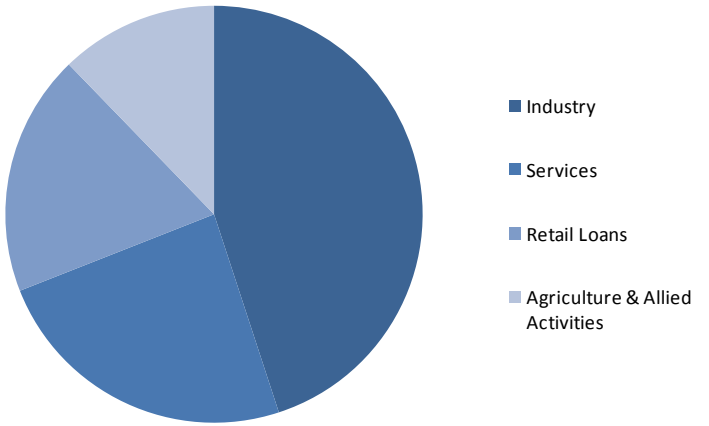
Danger Factor	Score	Coment
Deregulation of Lending	3	Indian banks are required to lend 40% of loans to priority sector - agriculture & weaker sections. This is besides holding 24% in government bonds
% of Credit to GDP	2	Debt to GDP tends to range between 50 to 60% as fiscal deficit continues to remain high and both central and state governments borrow to plug the gap
Change in % of Credit to GDP	4	20 percentage point expansion since 2003
Maturity of Cycle in Years	3	
Credit Mix	4	Some state influenced lending policy
Unemployment	1	
Current account position	3	
Level of real interest rates	3	
Exchange rate flexibility	3	
Total Danger Map Score (out of 45)	26	

Source: Deutsche Bank

Understanding the Indian banks' loan books

As discussed above, we regard Indian banks as not too high risk in their loan portfolios. One of the key points regarding the Indian banks is that their books are in fact very diverse, with retail loans accounting for ~20% of total loans.

Figure 159: Loan mix of Indian Banking system – total INR37.09trn (June 2011)



Source: Reserve Bank of India, Deutsche Bank

Retail loans in India are largely secured loans – mortgages, auto loans. Credit card loans are only 0.5% of the banking system loans as Indian banks have been very conservative in giving unsecured retail loans. Due to the significant investments being made in infrastructure in India it is the largest sector within industry group followed by metals.

Fee income business for Indian banks is still largely related to lending business. Fee income from non-lending activities like asset management, advisory, investment banking, etc. is still very small. However, Indian Banks are required to invest 24%of their liabilities in to government securities – statutory liquidity ratio (SLR). The available for sale (AFS) part of this investment needs to be MTM every quarter and it makes them vulnerable to interest rates.

China

Overview

- In this section we look at the Chinese banks, with a focus on those banks covered by DB (ICBC, CCB, ABC, BOC, BoCom, CMB, CNCB, MSB, CRCB, SPDB, Industrial, CEB, SZDB, BOBJ, BONJ and BONB). Over the last five years, we find the average credit cost for listed China banks amounted to 71bps. Credit cost peaked in 2008 at 117bps but since then quickly declined to 46bps and 41bps in 2009 and 2010, respectively.
- In the case of severe asset quality deterioration in China, we believe that peak provisions could reach 4x normalized level or 2x the distress level experienced in 2008. We estimate credit losses of Rmb815bn per annum for the Chinese banks under our coverage. Over the two years, this would equivalent to 32% of 2012 closing tangible book value. If we include PPP estimates as an offset (flexed down by 25% which is consistent with the 2007-2009 experience in the western markets) then there would be a gain of 12% of book value, i.e. the banks would be able to offset the credit losses and still register a profit.
- Chinese economy is driven by fixed capital investment (in 2010, fixed asset investment amounted to 61% of total GDP), whereas banks need to comply with the national credit policy. In 2008-9, China government had significantly loosened both its monetary and fiscal policy by launching the RMB4trn investment plan issued in late 2009 to stimulate the economy, given global financial crisis. According to the estimates by the National Audit Office (NAO), the local government had raised Rmb5.22trn (or 15.3% of China's 2009 GDP) of new debt since 2008 and the bulk of the debt was bank loans to government investment corporations set up by local government (or what are known as local government financing vehicles, LGFV). Hence, Chinese banks grew loans by 33% yoy in 2009 and this raised market concerns about system asset quality, especially for loans extended to the real estate sectors and LGFV. According to NAO and our estimates, as of end 2010, weak quality LGFV loans amounted to Rmb560bn or 11.2% of the total LGFV loans of Rmb4.97trn. This included (1) Rmb244bn of loans to LGFV of improper corporate registration, (2) Rmb150bn of evergreen loans, (3) Rmb73.1bn of loans with overstated collateral, (4) Rmb46.4bn of loans with invalid guarantee by the local government, (5) Rmb35bn of loans used for non-production activities, (6) Rmb8bn of overdue loans. We believe the asset quality of the Listed Banks is much stronger than the sector as a whole given their tighter underwriting standards. Even if we were to assume a NPL ratio of 12% for the total loans (Rmb2.83trn) extended to the local government, the impact on pre-tax profit was 7% after incorporating the excess provisions of Rmb265bn as an offset. Hence, we believe the asset quality risks for the Listed Banks are manageable.
- As regards the Outlook and the Danger Map for China, we score China overall at 27 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. This puts China at the upper end on the Danger Map for Emerging Markets.

Credit Data: Trends

Below we summarize data from 2006 to 2010 for the aggregated Chinese banks in our coverage universe. The data shows that despite economic downturn in 2008, Chinese banks' profitability was robust enough to withstand rise on credit cost and key ratios point to healthy sector overall. Credit cost peaked at 117bps in 2008 and then declined to a relatively low level at 46bps in 2009 and 41bps in 2010. As a result, PPP/LLP ratio recovered from 3.7x in 2008 to 8.1x in 2010.

Figure 160: Aggregation of quoted bank data, local currency (Rmb mn), China

Rmb mn	2006	2007	2008	2009	2010
Net Interest Income	578,586	789,665	940,607	902,844	1,136,956
Other Operating Income	70,222	130,665	200,709	252,722	299,776
Total Revenue	648,808	920,331	1,141,316	1,155,567	1,436,732
Costs	292,433	388,900	448,632	488,917	578,971
Pre-Provision Profits	356,375	531,430	692,684	666,650	857,761
Loan Loss Provisions	88,685	104,486	189,243	93,760	105,820
Pre-Tax Profit	267,716	422,138	491,475	574,713	755,852
Total Assets	24,921,508	29,988,375	35,157,042	44,325,586	52,616,564
Average Assets	23,060,126	27,454,942	32,572,709	39,741,314	48,471,075
Risk weighted assets	14,125,608	16,677,758	19,008,077	24,484,866	29,884,024
Core tier one capital	1,408,478	1,719,038	1,874,841	2,194,276	2,921,514
Risk Cushion above 7% plus 1 year PPP	776,060	1,083,025	1,236,960	1,146,985	1,687,394
Total Loans	12,865,398	14,912,561	17,481,457	23,492,779	27,734,706
Average Loans	12,034,698	13,888,980	16,197,009	20,487,118	25,613,743
Revenue / Average Loans	5.4%	6.6%	7.0%	5.6%	5.6%
Pre-Provision Profit / Average Loans	3.0%	3.8%	4.3%	3.3%	3.3%
Loan Loss Provisions / Average Loans	0.74%	0.75%	1.17%	0.46%	0.41%
PPP / Loan Loss Provision Cover	4.0	5.1	3.7	7.1	8.1

Note: Due to the inaccessibility of historical data, we don't include the data of ABC and CRCB.
Source: Deutsche Bank aggregation of company data

Estimates by Bank

Below we summarize forecast data for 2012 for the aggregated Chinese banks in our coverage universe (ICBC, CCB, ABC, BOC, BoCom, CMB, CNCB, MSB, CRCB, SPDB, Industrial, CEB, SZDB, BOBJ, BONJ and BONB). We then show our estimate of severe recessionary loan losses, which for the purposes of this exercise we have taken as 4x normalized. We then express this as a % of 2012 BV, and also as a % of 2012 pre-provision profit flexed down by **25%** (this is the same PPP experience we saw in the 2007-2009 credit cycle in the western market). In China, PPOP fell by 3.5% only from Rmb693bn to Rmb667bn in 2009 for the banks under our coverage.

These are simple numbers, but they do show in our view that (1) the Chinese banks have good pre-provision profit generation, with PPP expected to reach to Rmb 1494bn (by 2012), and that (2) even a severe credit book downturn, would not have dramatic results on the banks' profitability, in aggregate. Overall, the banks seem to be well cushioned from incurring huge losses.

Figure 161: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of non-flexed PPP

Rmb mn	ICBC	CCB	ABC	BOC	BoCom	CMB	CNCB	MSB	CRCB	SPDB	INDB	CEB	SZDB	BOBJ	BONJ	BONB
Forecast Average Loan Balances	8,150,416	6,882,660	5,994,681	6,679,937	2,740,118	1,750,445	1,632,531	1,329,834	157,468	1,395,463	1,076,992	986,059	507,877	442,722	110,650	152,736
Forecast Loan Loss Provisions	42,661	24,682	30,564	29,353	18,931	8,454	13,438	9,723	531	5,811	5,348	4,968	3,370	2,396	843	1,313
Severe Recession Loan Loss Provisions	172,789	145,912	127,087	141,615	58,091	37,109	34,610	28,192	3,338	29,584	22,832	20,904	10,767	9,386	2,346	3,238
2012 Pre-Provision Profit	353,994	269,261	239,440	225,413	89,660	56,565	52,584	43,785	7,059	44,243	39,448	32,884	14,095	14,320	5,485	5,440
2012 PPP less Recessionary Losses	181,205	123,349	112,353	83,799	31,569	19,456	17,974	15,592	3,720	14,659	16,616	11,979	3,328	4,935	3,139	2,202
2012 Forecast Tangible Equity	1,118,941	898,945	755,683	807,606	288,475	224,396	186,852	166,724	31,350	170,612	133,073	152,342	48,989	68,621	24,510	20,339
2 Years of Recessionary losses	345,578	291,825	254,174	283,229	116,181	74,219	69,219	56,385	6,677	59,168	45,664	41,809	21,534	18,771	4,692	6,476
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-31%	-32%	-34%	-35%	-40%	-33%	-37%	-34%	-21%	-35%	-34%	-27%	-44%	-27%	-19%	-32%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	17%	12%	14%	7%	6%	5%	5%	6%	12%	4%	10%	5%	-1%	4%	14%	8%

Source: Deutsche Bank

Danger Map Indicators for China

Below we summarise our Danger Map Indicators for mainland China. We score China overall at 27 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analysis of case studies, and our global experiences of bank lending. We rate China as medium on the maturity of cycle in years, change in % of credit to GDP and deregulation of lending, and low in terms of % of unemployment, current account position and exchange rate flexibility. This puts China at the upper end on the Danger Map for Emerging Markets.

Figure 162: Scoring the China "danger map"

Danger Factor	Score	Comments
Deregulation of Lending	3	Price competition for loans are restricted, with floor lending rates for different loans.
% of Credit to GDP	5	Rapid increase in 2009 (In 2010, Total Rmb & forex loan/GDP = 128% and Total Rmb loan /GDP = 120%)
Change in % of Credit to GDP	4	Rapid incresae in 2009, around 100% to 120% during last 5 years
Maturity of Cycle in Years	3	Around 24.5% and 17.2% of the local government bank loans of Rmb8.9trn will mature in 2011 and 2012
Credit Mix	4	Some state influenced lending policy
Unemployment	1	Stable around 4%
Current account position	1	No current account deficit. Current A/C surplus = 5.1% of GDP in 2010
Level of real interest rates	3	Real interest rate is negative, but is rising due to higher lending rates and falling inflation expectation
Exchange rate flexibility	3	Undervalued currency leading to potential credit bubble
Total Danger Map Score (out of 45)	**27**	

Source: Deutsche Bank

Understanding the Chinese banks' loan books

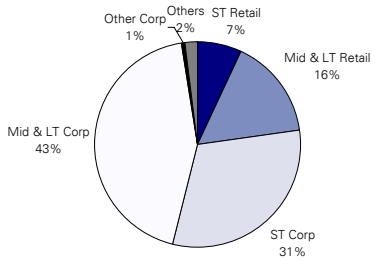
China's economic growth has been driven by fixed asset investment (FAI accounted for 61% of total GDP in 2010) and as a result, around 59% of banks' loans are medium to long term loans. We expect this ratio to fall as China becomes increasingly consumption dependent. Overall, China's asset quality remains strong, with NPL ratio falling to 1.1% as of end March 2011.

As discussed above, the total outstanding bank loans to local governments and LGFVs amounted to RMB8.5tn by the end of 2010, or 16.6% of total system loan outstanding, according to NAO's report. We believe the impact on banks' earnings is manageable when the LGFV loans hit maturity (24.5% in 2011, 17.2% in 2012, 28.1% in 2013-15, 30.2% after 2016). Even if we were to assume a 12% NPL ratio for loans to the local government, the pre-tax profit impact on the banks that under our coverage was 7% only after incorporating the excess provision.

In addition, around 18.8% of total loan was granted to the real estate sector as end of March 2011, including 12.3% to mortgage finance and 6.5% to real estate developers. With a minimum down-payment of 30% and an estimated loan-to-valuation (LTV) ratio of less than 55%, we believe the asset quality risk for mortgage loans is low. Additionally, we think the risk of loan to real estate developers is controllable as the Listed Banks lend to large developers with strong track record and adequate collateral.

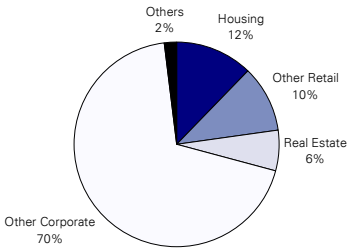
In combination with loans extended to real estate developers, corporate loans accounted for 75% of total loans by the end of March 2011, which mainly consist of loans to manufacturing, transportation, utilities, wholesale & retail trade sectors. And as for the retail loans, which accounted for 23% of total loans, is mainly for housing mortgage, personal consumer loans, auto loans and credit cards. The remaining 2% of total loans is for overseas purpose.

Figure 163: Breakdown of gross loans by term, China (Mar 2011)



Source: Deutsche Bank, PBOC

Figure 164: Breakdown of loan for by major sector, China (Mar 2011)



Source: Deutsche Bank, PBOC

Turkey

Overview

In this section, we analyze the asset quality evolution of Turkish banks we cover (Akbank, Garanti, Halkbank, Isbank, Vakifbank, Yapi Kredi, Bank Asya, Albaraka Turk) during the last global financial crises (2008 and 2009) and possible impact of a further global downturn on Turkish banks. While averaged at 95bps over the last five years, the cost of risk adjusted for NPL collections (CoR) bottomed at 57bps in 2006 and peaked at 181bps in 2009, when the negative influence of global crisis felt intensely.

Taking into consideration the trends seen between 2006 – 2011; on a global downturn specific loan loss provisions would increase 3.5x from their normalized levels, in our view. On this basis, we estimate that the loan loss provisions of Turkish banks we cover would increase to TRY8bn (cumulative) per annum (CoR: +180bps). In two-year horizon; this would therefore be equivalent to 18% of 2012e closing tangible book value. Having said that the potential hike in specific provisions is considerable in Turkish banks standards, we believe that the system would remain profitable. Assuming that all the remaining P/L items remain unchanged as in our base assumptions, the pre-provision profit (PPP) should more than offset the deterioration in the asset quality outlook. We expect net interest income and fee revenues to be the major drivers of PPP in the underlying time frame. As regards the Danger Map, we score Turkish banks overall at 22 out of 45. This captures 1 to 5 score across a number of risk metrics. This put Turkey in-line with the average for Emerging markets.

Credit Data: Trends

Below, we summarize data between 2006 and 2010 for the cumulated Turkish banks in our coverage universe. It is evident that even at the time of the global crisis, Turkish banks managed to cover 5.4x of their loan losses in 2009 and the ratio increased to 29.9x in 2010.

Figure 165: Turkish banks financial summary (2006-2010), Turkey*

TRYm	2006	2007	2008	2009	2010
Net Interest Income	12,349	15,153	17,575	25,113	23,644
Other Operating Income	6,410	9,237	9,389	11,125	12,367
Total Revenue	18,760	24,390	26,964	36,238	36,010
Costs	8,898	10,044	12,756	13,235	15,049
Pre-Provision Profits	10,614	15,074	15,181	24,380	23,104
Loan Loss Provisions**	697	1,278	2,417	4,539	773
Pre-Tax Profit	8,016	11,234	10,031	15,823	18,079
Total Assets	309,728	358,910	452,058	522,027	623,542
Average Assets	286,979	334,319	405,484	487,043	572,785
Total Loans	142,297	185,327	246,708	255,503	340,953
Average Loans	121,569	163,812	216,017	251,106	298,228
Revenue / Average Loans	15.4%	14.9%	12.5%	14.4%	12.1%
Pre-Provision Profit / Average Loans	8.7%	9.2%	7.0%	9.7%	7.7%
Loan Loss Provisions / Average Loans**	0.57%	0.8%	1.1%	1.81%	0.3%
PPP / Loan Loss Provision Cover**	15.2	11.8	6.3	5.4	29.9

** An aggregate of Akbank, Garanti, Halkbank, Isbank, Vakifbank, Yapi Kredi, Albaraka Turk and Bank Asya*
*** Loan loss provisions includes collections from previous periods*
Source: Deutsche Bank

Estimates by Bank

In this section, we have analyzed the possible impact of global financial crises on the individual banks we cover (Akbank, Garanti, Halkbank, Isbank, Vakifbank, Yapi Kredi, Albaraka Turk and Bank Asya). In order to remain on the conservative side, we assumed that loan losses of each bank would increase 3.5x and remain at such levels for two years.

As can be seen from Figure 166; the potential impact of a hike in loan loss provisions on tangible equity would be 18% on average. However, this still implies positive bottom-line earnings for Turkish banks, thanks to the expected strength at top-line revenues that are to be driven primarily by asset repricing and sustained credit volume expansion.

Figure 166: Turkish banks – impact of recessionary loan loss charges on opening TBV and PPP

TRYm, 2012E	Akbank	Garanti	Halkbank	Isbank	Vakifbank	Yapi Kredi	Bank Asya	Albaraka Turk	Total
Forecast Average Loan Balances	76,058	93,071	61,976	88,638	63,494	72,415	14,599	8,863	479,112
Forecast Loan Loss Provisions*	425	474	203	437	395	398	87	48	2,467
Severe Recession Loan Loss Provisions (3.5x of the estimate)	1,487	1,659	709	1,530	1,382	1,395	304	167	8,634
2012 Pre-Provision Profit	4,581	4,592	2,866	4,508	2,446	3,612	559	372	23,537
2011 Pre-Provision Profit	4,050	4,131	2,720	4,169	2,209	3,307	498	317	21,404
2012 PPP less Recessionary Losses	3,093	2,933	2,157	2,978	1,064	2,217	255	206	14,903
2012 Forecast Tangible Equity	18,624	20,409	10,416	16,449	10,785	13,445	2,273	1,138	93,538
2 Years of Recessionary losses	2,975	3,317	1,418	3,061	2,765	2,789	609	333	17,267
2 Years of Recessionary losses as % 2012e TE	**-16%**	**-16%**	**-14%**	**-19%**	**-26%**	**-21%**	**-27%**	**-29%**	**-18%**
2 years of Recessionary losses as % of 2 years of PPP**	**19%**	**16%**	**27%**	**21%**	**7%**	**18%**	**8%**	**16%**	**18%**

** Loan loss provisions includes collections from previous periods*
*** Flexed down by 25%*
Source: Deutsche Bank estimates

Danger Map Indicators for Turkey

In Figure 167, we have summarized the Danger Map Indicators for Turkish banks. We score nine indicator from 1 (less risky) to 5 (high risky), drawn from our expertise from the past crises.

On this basis, we rate Turkey at 22 out of 45, which located Turkish banks in line with average for Emerging markets. Loan to GDP levels of Turkish banks are well-below European banks and on this basis, increase in loan/GDP ratios are above European averages (credit to GDP has tripled since 2003, albeit from a low level). However, the recovery cycle of NPL cycle of Turkish banks start just after the recovery starts as NPL additions declines and NPL collections increases.

Figure 167: Turkish banks : Danger Map

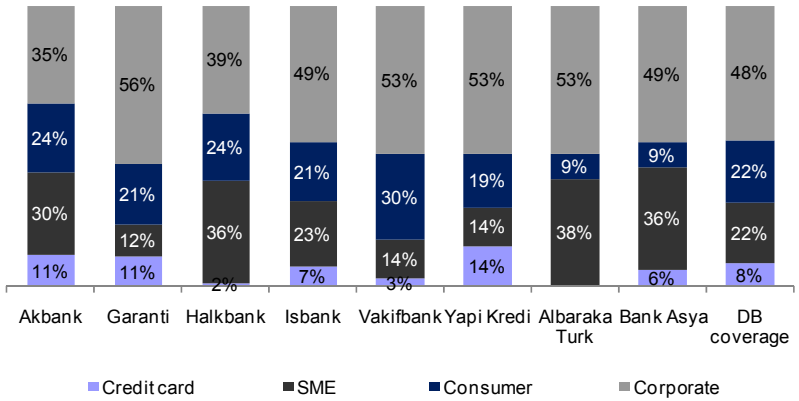
Danger Factor	Score	Comment
Deregulation of Lending	2	No recent deregulation of lending
% of Credit to GDP	1	Well below the European average
Change in % of Credit to GDP	5	Credit to GDP has tripled since 2003, albeit from a low level
Maturity of Cycle in Years	1	Year 1 of the recovery in the Turkish banks.
Credit Mix	2	A simple model still high share corporate loan with limited CoR
Unemployment	2	Unemployment broadly unchanged
Current account position	5	
Level of real interest rates	2	
Exchange rate flexibility	2	
Total Danger Map Score (out of 45)	22	

Source: Deutsche Bank

Turkish banks: The structure of the loan book

The main drivers of NPL additions were SME and unsecured retail loans (mainly credit card and general purpose loans), when asset quality records of the corporate segment remained strong in 2008 and 2009. That is being said; system loans expanded at CAGR of 23% between 2008 and 1Q11, and were driven by retail and SME segments. In the meantime, household debt/GDP increased to 17.3% from 13.6% in 2008. As a result, 52% of total loans were composed of SME, credit card and consumer loans as of 1Q11 (2008: 48%). On this basis, we think that those banks that are more exposed to these segments could feel more pressure at the asset quality level in the event of deterioration in global economic conditions.

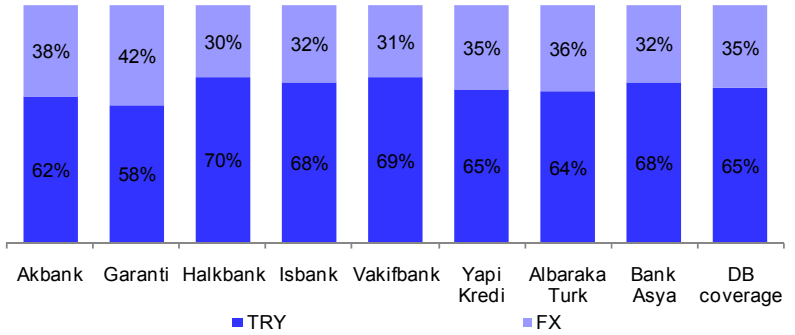
Figure 168: Turkish banks – Loan breakdown by segment (1Q11)



Source: Company data, Deutsche Bank

On the other hand, relative to its global counterparts, we think Turkish banks would remain immune to another potential global crisis, on the back of; 1) less-sophisticated balance sheets (i.e. no embedded derivatives), 2) Corporate loans ▪ less risky relative to SME/consumer loans ▪ still capture 48% share in the overall loan mix, and 3) Turkish banks are not allowed to lend in FX to retailers and that partially limits the hike in NPL additions at times of depreciation of TRY against foreign currencies. It should be noted that only 35% of loans are in FX in Turkey, which mainly represent loans extended to the corporate segment (see Figure 169).

Figure 169: Turkish banks – Loan breakdown by currency (1Q11)



Source: Company data, Deutsche Bank

Indonesia

Overview

- In this section, we look at Indonesian banks, with a key focus on major banks such as Mandiri, BCA, BRI and BNI. These represent our top picks in the Indonesian banking sector. Over the past four years, blended credit costs for the industry reached its peak of 239bps of average loans during the recent global financial crisis in 2008/09. Still, we can argue that the actual credit costs could be lower than stated numbers as some of these numbers were related to legacy loans (eg BNI and Mandiri).
- We believe that peak credit costs to reflect recessionary risks could reach double than our existing forecasts. While this may appear to be low compared to some countries in the regions, we argue that this is conservative considering that 1) actual new NPL formation is merely 1.5% of average loans (which below our existing provision charges of 1.8% of loans); and 2) to begin with, Indonesian banks have coverage ratio of over 100% (in some cases reaching as high as 321% for BCA) which can be used to mitigate rising NPL formations.
- Based on these analyses, we concluded that Indonesia banks stand to withstand rising recessionary risks (and in turn credit risks). We estimate that assuming recessionary losses, this would only reduce PPOP by 50% - in other words Indonesian banks would still book ROAE of approx 10%. Also, the country's economy is largely under leveraged with loan to GDP of 28%.

  In "Danger Map" indicators for Indonesian banking sector; the country scores 19 out of 45; which indicates abilities to absorb risks of recessionary. Based on this, this indicates that Indonesian banking sector is still attractive. Generally, we still see a number of years of robust loan growths.

Credit data trends

The table below summarises data from 2007-2010 and our projections for 2011-12F for banks in our coverage. During the last financial crisis in 2008/2009, we saw pick-up in Indonesian banks' LLP from a low of 1.62% in 2007 to a high of 2.33% in 2008 and 2.39% in 2009. Some of these increases were reflecting some loan write-off, which were more visible in some banks due to legacy loans (eg BNI and Mandiri). Given the economy's strong recovery and performance, banks too benefit from rising income. Hence, despite generally still a high LLP charge of approx 2.1% of average loans, Indonesian banks' PPP/LLP ratio improved to 3.9x from a low of 3.1-3.2x in 2008-09.

Figure 170: Aggregation of quoted bank data (Rpbn), Indonesia

Local Currency	2007	2008	2009	2010	2011E	2012E
Net Interest Income	57,238	70,186	80,353	93,889	104,635	124,199
Other Operating Income	13,655	16,680	20,896	33,241	36,892	40,669
Total Revenue	70,894	86,866	101,250	127,130	141,528	164,868
Costs	37,383	42,672	47,160	58,126	65,477	74,283
Pre-Provision Profits	33,565	44,040	53,885	69,061	76,116	90,772
Loan Loss Provisions	7,413	13,731	17,177	17,640	17,945	23,737
Pre-Tax Profit	26,464	30,705	37,190	51,491	58,460	67,230
Total Assets	1,073,314	1,230,128	1,410,977	1,657,098	1,904,269	2,158,157
Average Assets	988,855	1,151,721	1,320,553	1,534,037	1,780,683	2,031,213
Risk weighted assets	528,265	706,698	844,300	1,057,118	1,204,819	1,538,460
Basel 3 additions (if known)	0	0	0	0	0	0
Core tier one capital	96,150	103,449	131,004	162,773	206,092	244,255
Basel 3 deductions (if known)	0	0	0	0	0	0
Risk Cushion above 7% plus 1 year PPP	33,565	44,040	53,886	69,061	76,117	90,773
Risk cushion to average loans	0	0	0	0	0	0
Total Loans	509,050	670,110	768,337	932,465	1,148,348	1,422,936
Average Loans	457,466	589,580	719,224	850,401	1,040,406	1,285,642
Revenue / Average Loans	15.5%	14.7%	14.1%	14.9%	13.6%	12.8%
Pre-Provision Profit / Average Loans	7.3%	7.5%	7.5%	8.1%	7.3%	7.1%
Loan Loss Provisions / Average Loans	1.62%	2.33%	2.39%	2.07%	1.72%	1.85%
PPP / Loan Loss Provision Cover	4.5	3.2	3.1	3.9	4.2	3.8

Source: Deutsche Bank; aggregation of company data

Estimates by banks

Table below summarises our forecast data for major banks that are in our top picks. We show how severe recessionary loan losses (which for this purpose, we assume a 2 time of "normal" provision charges) affect banks' profitability.

We conclude that Indonesian banks have capacity to absorb higher provision charges in the case of recessionary losses. Amongst major banks; Mandiri and BCA stand out in terms of ability to absorb higher provision charges. We also argue that Indonesian banks' high coverage ratios suggest their ability to mitigate rising credit costs.

Figure 171: Summary of forecast data and computing recessionary loan loss charges as % of equity and PPP

Local currency, 2012F Rpbn	Mandiri	BCA	BRI	BNI	Total
Forecasts ave Loans	343,445	232,719	325,993	179,991	1,082,148
Forecast Loan Loss Provisions	4,293	2,327	8,802	4,050	19,472
as % of ave loans	1.25	1.00	2.70	2.25	1.80
Severe Recession Loan Loss Provisions (2x)	8,586	4,654	17,604	8,100	38,944
2012F PPOP	20,541	16,086	28,895	12,702	78,224
2012F PPOP less Recessecionary Losses	11,955	11,432	11,291	4,602	39,280
2012F Total equity	71,041	48,267	61,456	44,300	225,065
2 years of Recessionary losses	8,586	4,654	17,604	8,100	38,944
2 years of Recessionary losses as % of 2012F total equity	12.1	9.6	28.6	18.3	17
2 years of Recessionary losses as % of 2012F PPOP	41.8	28.9	60.9	63.8	49.8

For Indonesian banks; given their already high credit cost (hence high coverage); we only assume double in credit costs

Source: Deutsche Bank

Danger Map Indicators for Indonesia

Below we summarise our "Danger Map" indicators for Indonesian banking sector. Overall, we score 19 out of 45; which is derived based on a score between 1 to 5 across a number of risk metrics, drawn from our analyses of case studies and our global experiences of bank lending. Based on this, this indicates that Indonesian banking sector is still attractive. Generally, we still see a number of years of robust loan growths. The government's fiscal discipline would also likely keep overall loan to GDP at below 30%.

Figure 172: Scoring the "Indonesian "heat map"

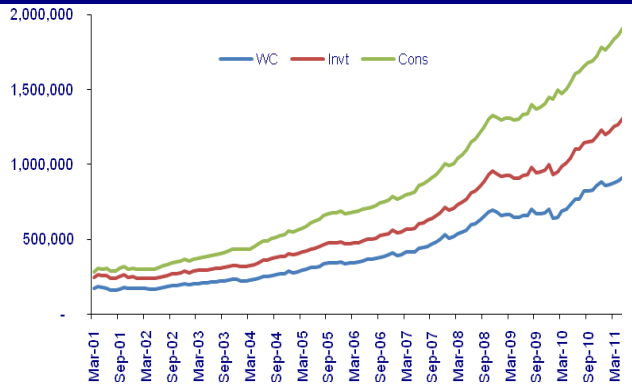
Danger Factor	Score	Comments
Deregulation of Lending	2	
% of Credit to GDP	2	Loan to GDP of 28% is the lowest in the region (vs Phils of 32%, Malaysia of 117% and SG of 115%)
Change in % of Credit to GDP	2	Current loan/GDP at 28% may seem like a sluggish pace looking from 2005 loan/GDP of 25%. However, loans have almost tripled in size since then. And the industry is still poised for loan growth of 20-25% per annum for the medium term
Maturity of Cycle in Years	3	
Credit Mix	2	Banking system credit mix: 32% consumer loans and 68% corporate loans (48% investment loans and 21% WC loans)
Unemployment	1	Current unemployment level at 7%, down from a high of 11% in 2005
Current account position	2	Current account to GDP is below 1%. Current account deficit is at USD1.9bn
Level of real interest rates	2	ID's real interest rate is 2.2%, July inflation has eased to 4.6% YoY (vs 5.5% in Jun) and Central Bank has maintained the BI rate at 6.75% since February
Exchange rate flexibility	3	IDR to USD has strengthen 5.8% YTD
Total Danger Map Score (out of 45)	19	

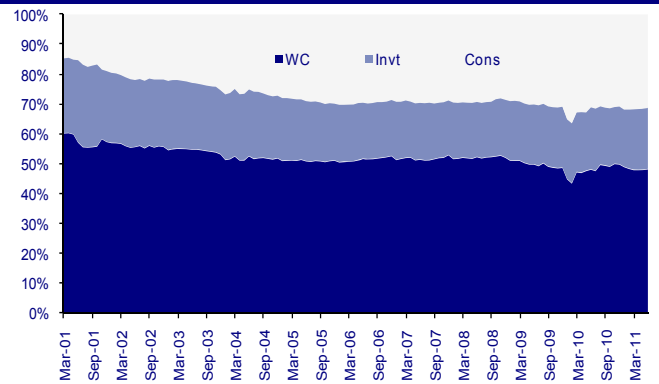
Source: Deutsche Bank

Understanding Indonesian banks' loan books

Generally, Indonesia banking sector has a relatively young credit history. Overall loan portfolios are still tilted towards corporate segments (including SME and/or commercials) – accounting for approx 70% of total loan books. In recent cases, investments had had fast growth of approx 27% yoy; largely reflecting the country's rising investments – necessary for supply side expansions. This suggests low inflations risks arising from surging consumer loans. The two pie charts below, we show major banks' typical loan breakdown. It is consistent that consumer loans representing abt 25% for BCA and 14% for Mandiri.

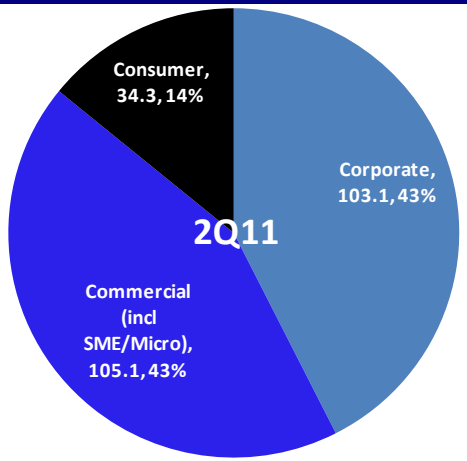
Figure 173: Indonesian banking sector – System loan breakdown





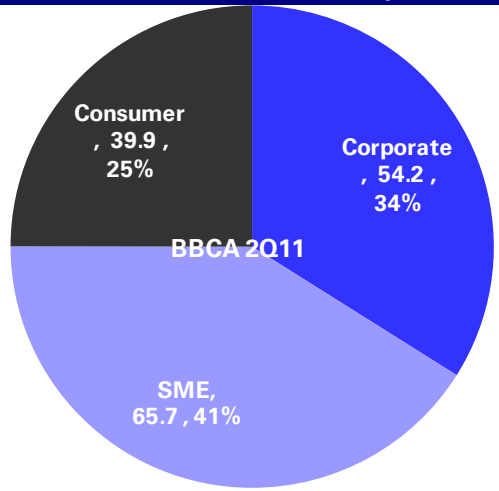
Source: Deutsche Bank and Bank Indonesia

Figure 174: Mandiri – Loan mix – Tilted towards corps



Source: Deutsche Bank and Mandiri

Figure 175: BCA – Loan mix – Tilted towards corps



Source: Deutsche Bank and BCA

Malaysia

Overview

- In this section we look at the Malaysian banks, with a focus on those covered by DB (AMMB, CIMB, Hong Leong Bank, Maybank, Public Bank and RHB Capital). Over the last five years, we find that credit loan loss provisions in the banking book averaged 81bp, and peaked at 102bp.
- Assuming peak provisions on a further macro downturn would reach 4x their normalised level, we estimate credit losses of RM24.7 for the five Malaysian banks per annum. Over two years, this would be equivalent to 43% of 2012 closing tangible book value. If we include PPP estimates as an offset (flexed down consistent with the 2007-2009 experience) then the loss would be 7% of TBV, i.e. the banks would be slightly loss-making.
- As regards the Outlook and the Danger Map for Malaysia, we score Malaysia overall at 20 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending.

Credit Data: Trends

Below we summarise data from 2005 to 2010 for the aggregated French banks in our coverage universe. We can see clearly that even though the credit cycle was not that severe, declining PPP combines with rising loan losses to reduce PPP/LLP cover from 12.3x to 1.5x.

Figure 176: Aggregation of quoted bank data, local currency (RMm), Malaysia

Local Currency	2006	2007	2008	2009	2010
Net Interest Income	15,316	17,413	19,026	21,568	23,848
Other Operating Income	10,866	13,039	12,900	14,681	17,358
Total Revenue	26,183	30,452	31,926	36,248	41,206
Costs	11,223	13,320	14,065	17,441	19,096
Pre-Provision Profits	14,960	17,132	17,862	18,807	22,111
Loan Loss Provisions	4,125	4,780	3,538	4,771	3,919
Pre-Tax Profit	10,758	12,962	13,808	12,696	18,565
Total Assets	765,660	869,185	937,195	1,052,562	1,142,905
Average Assets	696,249	817,422	903,190	994,878	1,097,734
Total Loans	450,226	489,555	567,675	643,880	725,875
Average Loans	419,188	469,890	528,615	605,778	684,878
Revenue / Average Loans	6.2%	6.5%	6.0%	6.0%	6.0%
Pre-Provision Profit / Average Loans	3.6%	3.6%	3.4%	3.1%	3.2%
Loan Loss Provisions / Average Loans	0.98%	1.02%	0.67%	0.79%	0.57%
PPP / Loan Loss Provision Cover	3.6	3.6	5.0	3.9	5.6

Source: Deutsche Bank aggregation of company data

Estimates by Bank

Below we summarise forecast data for 2012 for the aggregated Malaysia banks in our coverage universe (AMMB, CIMB, Hong Leong Bank, Maybank, Public Bank, RHB Capital). We then show our estimate of severe recessionary loan losses, which for the purposes of this exercise we have taken as 4x normalised.

We then express this as a % of 2012 BV, and also as a % of 2012 pre-provision profit flexed down by 25%. These are simple numbers, but they do show in our view that (1) the Malaysian banks have good pre-provision profit generation, but that (2) in a severe credit book downturn, we would expect a breakeven or worse result, in aggregate.

Figure 177: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of non-flexed PPP

Local Currency, 2012E	AMMB Holdings	CIMB Group	Hong Leong Bank	Malayan Banking	Public Bank	RHBC	Total
Forecast Average Loan Balances	75,480	196,179	46,551	279,462	191,845	106,021	895,537
Forecast Loan Loss Provisions	409	453	252	1,013	902	576	3,605
Severe Recession Loan Loss Provisions	2,083	5,415	1,285	7,713	5,295	2,926	24,717
2012 Pre-Provision Profit	2,595	6,336	1,538	8,111	6,169	3,207	27,955
2012 PPP less Recessionary Losses	512	921	253	398	874	281	3,238
2012 Forecast Tangible Equity	11,423	27,548	8,119	35,791	16,764	14,151	113,795
2 Years of Recessionary losses	4,166	10,829	2,570	15,426	10,590	5,852	49,434
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-36%	-39%	-32%	-43%	-63%	-41%	-43%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	-2%	-5%	-3%	-9%	-8%	-7%	-7%

Source: Deutsche Bank

Danger Map Indicators for Malaysia

Below we summarise our Danger Map Indicators for Malaysia. We score Malaysia overall at 20 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We rate Malaysia as lower risk on each of the key categories. The one area of risk we note is credit to GDP, where we are mindful of consumer leverage and mortgage LTV ratios, as discussed below.

Figure 178: Scoring the Malaysia "danger map"

Danger Factor	Score	Comments
Deregulation of Lending	1	No recent deregulation of lending
% of Credit to GDP	4	Low by global standards, although high relative to other emerging markets
Change in % of Credit to GDP	3	Leverage rising rapidly again
Maturity of Cycle in Years	2	Year 3 of the GDP growth recovery. Inflation the key concern although currently benign
Credit Mix	2	Dominated by mortgages, auto financing and working capital funding
Unemployment	2	Unemployment broadly unchanged
Current account position	1	Strong surplus
Level of real interest rates	2	Low
Exchange rate flexibility	3	Undervalued currency
Total Danger Map Score (out of 30)	20	

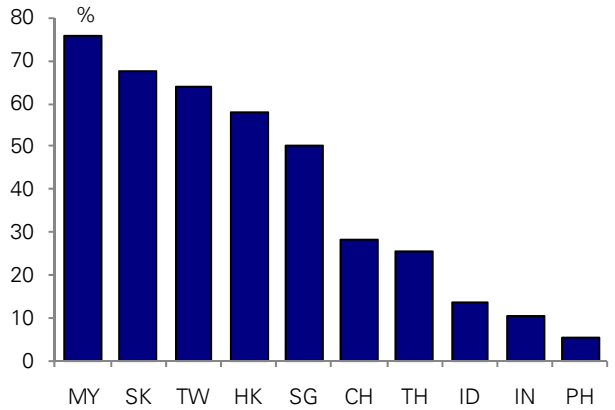
Source: Deutsche Bank

Household debt levels in Malaysia are at the top end of the range relative to regional peers (Figure 179), and mortgage loan to valuation ratios are also at the high end (Figure 180). However, we note that:

- Like-for-like household debt comparisons are not easy to make and in Malaysia's case, substantial pension fund savings provide a material offset. If we net EPF balances from Malaysian household debt, Malaysia would be at the other end of the range in Figure 179.
- High mortgage LTV's are a little more concerning, although from a nationwide perspective, percentage house price appreciation has been in the mid/high single digit levels for many years, which is not suggestive of bubble conditions.

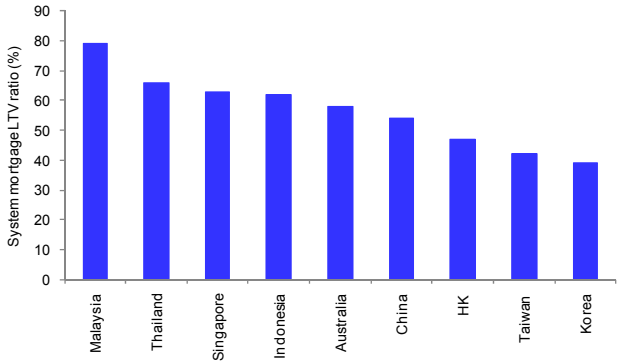
So there are some offsets which suggest a situation less negative than the headlines indicate. But clearly given weakening macro conditions the potential for credit quality deterioration is an increasingly relevant issue.

Figure 179: Household debt to GDP



Source: Deutsche Bank, CEIC. Data is last available.

Figure 180: Mortgage LTV ratios



Source: Deutsche Bank, Company data

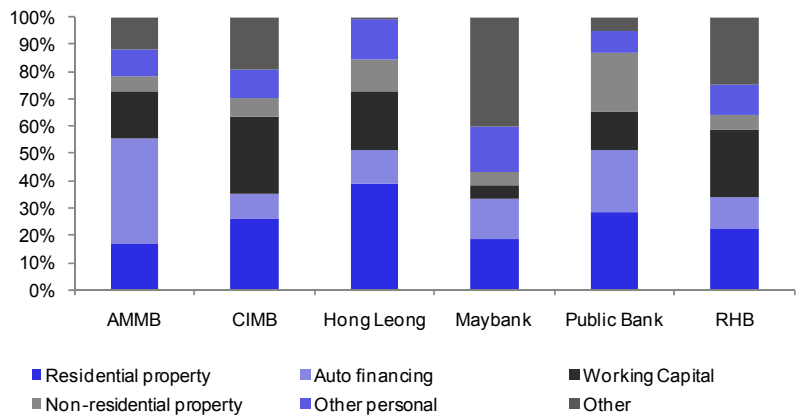
Understanding the Malaysian banks' loan books

As discussed above, we regard Malaysian banks as having a moderate level of risk in their loan portfolios. Balances are dominated by three key categories; residential lending, auto financing and working capital funding.

In terms of residential property (24% aggregate loans) and auto financing (17%), the recent challenge for banks has been competitive pricing which has driven down product profitability. Clearly the problem would be exacerbated by a credit cycle. As noted above there are reasons to be cautious on this front although at this stage there are no signs of deterioration.

Working capital funding (18% aggregate loans) is largely driven by the SME sector which is likely to see more substantial credit quality deterioration in the event of a macro slowdown. Given Malaysia's economy is highly export dependent the SME sector is vulnerable to shifting global trends.

Figure 181: Aggregate loan balances of RM655bn



Source: Deutsche Bank, Company data. Data is latest available

Thailand

Overview

- In this section we look at Thai banks, focusing on the seven banks covered by DB (Bangkok Bank, Bank of Ayudhya, Kasikornbank, Krung Thai Bank, Siam Commercial Bank, TMB Bank and Thanachart Capital). Over the past 10 years, credit loan loss provisions in the Thai banking system averaged 84bp, with a peak of around 170bp.
- Despite the recent slowdown in the global economy, we believe that the asset quality of Thai banks will remain resilient due to improved risk management systems that allow banks to detect problem loans before they become NPLs and help clients. Another key factor is the financial strength of Thai corporates following a prolonged de-leveraging cycle after the 1997 crisis (the industry's net D/E dropped to 1.0 x in 2010 vs. more than 3x in 1997). Even during the 2009 economic contraction, Thai banks were able to reduce their NPL ratios and reduce credit costs.
- To gauge the potential impact from a new domestic recession, we assumed the credit costs of Thai banks increased 3x from our current estimate (i.e. around the same level as their peak in 2007). We estimate two years of high provisioning levels could cut 25% of the industry's closing tangible book value in 2012F. Based on our scenario analysis, Thai banks' equity is still sufficient to cover a severe recession.
- We believe a new credit cycle has already started in Thailand, led by strong domestic demand, a recovery in private investment and solid consumption. This in turn has been supported by government stimulus programs and rising farm commodity prices. Retail loans have led the recovery since 2008, especially for loans with collateral backing, i.e. mortgage or car loans. Loans for business began picking up in mid-2010 and we expect this trend to continue over the next few years.
- As regards the Outlook and Danger Map for Thailand, we gave Thai banks an overall score of 16 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies and our global experiences of bank lending. This puts Thai banks at the lower end of the pack on the Danger Map.

Credit Data: Trends

Below we summarized data from 2006 to 2010 for Thai banks under our coverage. Credit costs surged during 2006-2007 but this was mainly due to regulatory changes that required banks to book 100% of uncovered NPLs. During the 2009 recession, the asset quality of Thai banks remained strong, with NPL ratios and credit costs continuing to decline while LLR/NPL ratios strengthened. This reflects improved risk management at banks as well as the financial strength of Thai corporates. Moreover, pre-provisioning profit rose, led by a solid recovery in non-interest income amid improved cost efficiency. The PPP/ loan loss provision coverage ratio jumped to 4.7x in 2010 from only 1.5x in 2007.

Figure 182: Aggregation of quoted bank data, local currency

Local Currency	2006	2007	2008	2009	2010
Net Interest Income	173,884	187,488	213,989	207,878	241,587
Other Operating Income	86,078	88,180	91,025	111,368	136,139
Total Revenue	259,962	275,668	305,014	319,246	377,945
Costs	130,711	155,119	150,242	159,091	185,223
Pre-Provision Profits	129,252	120,549	154,772	160,155	192,722
Loan Loss Provisions	64,167	80,476	46,733	44,222	40,918
Pre-Tax Profit	65,085	40,073	108,039	115,933	151,804
Total Assets	6,367,671	6,561,537	7,294,279	7,760,496	9,081,442
Average Assets	6,084,432	6,464,604	6,927,908	7,527,387	8,420,969
Total Loans	2,863,286	2,969,773	3,356,232	3,354,787	3,965,959
Average Loans	2,791,280	2,916,530	3,163,003	3,355,509	3,660,373
Revenue / Average Loans	9.3%	9.5%	9.6%	9.5%	10.3%
Pre-Provision Profit / Average Loans	4.6%	4.1%	4.9%	4.8%	5.3%
Loan Loss Provisions / Average Loans	2.30%	2.76%	1.48%	1.32%	1.12%
PPP / Loan Loss Provision Cover	2.0	1.5	3.3	3.6	4.7

Source: Deutsche Bank aggregation of company data

Estimates by Bank

To gauge the potential impact from a severe recession scenario, we assumed Thai banks' credit costs would increase 3x from our current estimate (around the same level as the peak cycle in 2007). We estimate two years of high provisioning levels could cut 25% of the industry's closing tangible book value in 2012. Based on our scenario analysis, Thai banks' equity is still sufficient to cover a severe recession.

We then expressed this as a percentage of 2012 BV and also as a percentage of 2012 pre-provision profit. In this assumed recession scenario where credit costs tripled from our normalized estimate, Thai banks' pre-provision operating profit should be sufficient to cover the shortfall even if we assume another 25% downside in our PPP forecast (assuming flat loan growth and 20-30bps decline in NIM as seen during 2009 given other factors remaining constant). Although these are simple numbers (see Fig. 2), we believe they demonstrate that Thai banks can generate solid pre-provision profit that can mitigate two years of high provisioning levels.

Figure 183: Summary of forecast data and comparison of loan loss costs as % of opening TBV and non-flexed PPP

Local Currency, 2012E	BBL	BAY	KBANK	KTB	TMB	TCAP	SCB	Total
Forecast Average Loan Balances	1,635,099	812,725	1,406,982	1,596,207	438,348	725,752	1,454,578	8,069,691
Forecast Loan Loss Provisions	6,200	11,040	8,000	6,800	2,000	3,266	4,400	41,706
Severe Recession Loan Loss Provisions	18,600	33,120	24,000	20,400	6,000	9,798	13,200	125,118
2012 Pre-Provision Profit	54,136	33,187	56,838	40,517	8,029	16,940	58,386	268,033
2012 PPP less Recessionary Losses	35,536	67	32,838	20,117	2,029	7,142	45,186	142,915
2012 Forecast Tangible Equity	262,460	114,413	174,254	145,973	55,636	41,037	210,105	1,003,876
2 Years of Recessionary losses	37,200	66,240	48,000	40,800	12,000	19,595	26,400	250,235
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	14%	58%	28%	28%	22%	48%	13%	25%
2 years of Recessionary losses as % of 2 years of PPP flexed down by 25%	61%	177%	75%	90%	133%	103%	40%	83%

Source: Deutsche Bank estimates

Danger Map Indicators for Thailand

Below we summarize our Danger Map Indicators for Thailand. We gave Thai banks an overall score of 16 out of 45 which captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies and our global experiences of bank lending. We rate Thai banks as low on deregulation and current account position.

Figure 184: Scoring the Thailand "danger map"

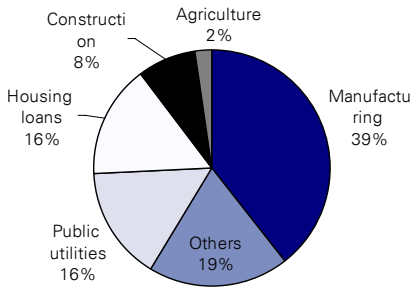
Danger Factor	Score	Comment
Deregulation of Lending	1	
% of Credit to GDP	2	
Change in % of Credit to GDP	1	Increased by 8ppts from 2007 to 101% in 2010
Maturity of Cycle in Years	2	
Credit Mix	2	
Unemployment	2	
Current account position	1	
Level of real interest rates	2	
Exchange rate flexibility	3	
Total Danger Map Score (out of 45)	16	

Source: Deutsche Bank

Understanding Thai banks' loan books

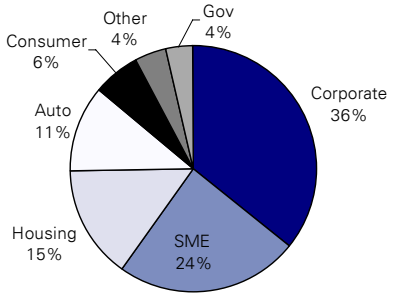
Thailand is a manufacturing-led economy (85% of GDP) with exports accounting for 60-70% of GDP. As a result, the loan books of Thai commercial banks have the biggest exposure to the manufacturing sector (40% of total loans). Loans for public utilities and housing are each about 16-17% while loans for agriculture accounted for the smallest portion at only 2-3% of total loans. In terms of customer exposure, corporate and SMEs loans accounted for more than 60% of total loans by commercial banks. The remainder was retail loans (15% housing, 11% auto and 6% personal loans).

Figure 185: Loan breakdown by business



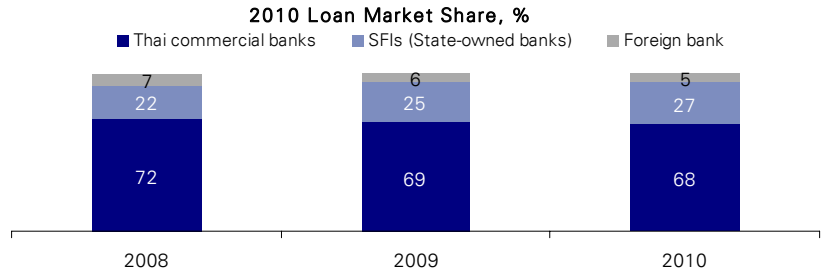
Source: Deutsche Bank aggregation of company data

Figure 186: Loan breakdown by customer



Source: Deutsche Bank aggregation of company data

Figure 187: Loan market share for banks in Thailand



Source: Bank of Thailand

Government banks play an important role in Thailand's economic growth as their loan books account for more than 25% of total system lending. Customers of state-owned banks are mainly from lower-income groups and therefore are not targeted by commercial banks. Over the past few years the government has encouraged state-owned banks to lend more to such groups in order to boost the economy, particularly in upcountry areas.

During the global financial crisis in 2008-09, loans for the retail segment, mainly for mortgages and auto loans, remained resilient, driven by healthy domestic demand and government stimulus programs. This helped mitigate a slowdown in demand by corporates. If the global economy enters a new recession, asset quality for Thai retail customers should be manageable given that banks were quite stringent in credit screening criteria and mostly lent against collateral (houses, vehicles, etc).

Growth in corporate and SME loan has seen an improvement since mid-2010. Momentum remains strong in this segment driven by the sharp recovery in the export sector, solid growth in private investment and government economic stimulus programs. We believe the credit cycle has already started in Thailand and this new investment phase should allow healthy loan growth from the corporate and SME segments to continue over the next few years. In our view, the risk profile of corporate and SME clients has seen a drastic improvement thanks to healthy balance sheets as a result of a prolonged de-leveraging cycle following the 1997 crisis. Also, banks have heeded the lessons of 1997 and now monitor concentration risk very closely.

South Korea

Overview

- In this section we look at Korean banks, focusing on the top eight listed banks covered by DB (KB, Shinhan, Woori, Hana, IBK, KEB, BS, DGB). Over the last five years (2006-2010), the average credit cost for the banks averaged 88bp, peaking at 121bp in 2010.
- Assuming we face a worse than expected global macro impacting the South Korean economy, we believe credit cost could increase to about 2x the average level of the past five years. We estimate credit losses of KRW18tr for our coverage banks per annum under this scenario, and over two years this would be equivalent to 29% of 2012 closing tangible book value. Including PPP estimates as an offset (flexed down consistent with the 2007-2009 experience) then the PPP should actually be enough to cover all the credit losses.
- Our assumptions may look optimistic to some given the South Korean economy's large dependence on global trade, but our key reasoning lies on the corporate restructuring activity that was implemented in 2008 and has been repeated every year since, most recently in 2Q 2011. When the GFC came, the Korean government and the banks worked together to reduce not only actual but potential NPLs in the system since late 2008 by launching an extensive corporate restructuring program, with the goal of preemptively defining corporate borrowers that may face financial troubles in the following years. Additional financial support was provided for companies experiencing short-term liquidity problems but with good business models, problem companies were pushed to go through corporate restructuring programs, and finally companies unlikely to survive in the next few years were liquidated. As a result, credit costs remained relatively high during 2008-2010 at average 116bps, but this was relatively well contained when compared to the 218bp seen during the Credit Card Crisis.
- Other reasons for our relatively low projection for recession type provisioning are; 1) the government's policy reaction and the banks' risk management has improved after two large financial crises – the Asian Financial Crisis (1998) and the Credit Card Crisis (2003), 2) government has ample room to provide fiscal support should it feel the need to intervene in the markets, 3) system loan growth has been very slow since the GFC at only 0.5% in 2009 and 3.3% in 2010 as bank management's focus remained on corporate restructuring and removing potential NPLs rather than growth, and 4) sector credit cost looks to have stabilized at the moment as we estimate it to be 77bp in 2011, a big decline from 121bp in 2010.
- As for the Danger Map for South Korea, we score South Korea overall at 22 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. This puts South Korea in-line with the average for Emerging markets.

Credit Data: Trends

Below we summarize data from 2005 to 2010 for the aggregated Korean banks in our coverage universe. During the last crisis the PPP/LLP cover declined rapidly as PPP declined on lower market rates given the asset sensitive nature of the Korean banks following big interest rate cuts by the central bank, while LLP increased due to rising bankruptcies.

Figure 188: Aggregation of quoted bank data, local currency (KRW bn), South Korea

Local Currency	2006	2007	2008	2009	2010
Net Interest Income	23,361	26,708	30,159	28,034	32,009
Other Operating Income	3,444	6,099	3,664	4,069	5,550
Total Revenue	26,804	32,807	33,823	32,103	37,559
Costs	12,716	15,090	15,764	15,716	16,768
Pre-Provision Profits	14,089	17,717	18,059	16,387	20,791
Loan Loss Provisions	2,302	3,608	8,665	10,061	10,836
Pre-Tax Profit	13,551	16,488	10,124	6,267	9,710
Total Assets	895,762	1,040,724	1,248,894	1,226,199	1,267,734
Average Assets	833,395	968,243	1,144,809	1,237,547	1,246,966
Total Loans	623,799	722,468	839,503	843,700	871,658
Average Loans	574,687	673,134	780,986	841,602	857,679
Revenue / Average Loans	4.7%	4.9%	4.3%	3.8%	4.4%
Pre-Provision Profit / Average Loans	2.5%	2.6%	2.3%	1.9%	2.4%
Loan Loss Provisions / Average Loans	0.40%	0.54%	1.11%	1.20%	1.26%
PPP / Loan Loss Provision Cover	6.1	4.9	2.1	1.6	1.9

Source: Deutsche Bank aggregation of company data

Estimates by bank

Below we summarize forecast data for 2012 for the Korean banks in our coverage universe. We then show our estimate of severe recessionary loan losses, which for this exercise we have assumed as 2x the average of past five years. We then express this as a % of 2012 BV, and also as a % of 2012 pre-provision profit flexed down by 25% (we saw PPP fall by 9% during the 2008 credit cycle but assume a more conservative scenario). If we flexed it down by 9% this would result in average +7% of 2012 forecast tangible equity for the banks listed in the table below.

Figure 189: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of non-flexed PPP

Local Currency, 2012E	BS	DGB	Hana	IBK	KB	KEB	Shinhan	Woori
Forecast Average Loan Balances	27,682	24,683	126,760	142,581	216,156	70,832	196,592	239,614
Forecast Loan Loss Provisions	120	132	560	1,120	1,300	520	920	1,600
Severe Recession Loan Loss Provisions	487	434	2,231	2,509	3,804	1,247	3,460	4,217
2012 Pre-Provision Profit	692	638	2,651	3,687	5,326	1,847	5,656	4,782
2012 PPP less Recessionary Losses	205	204	420	1,178	1,521	600	2,196	565
2012 Forecast Tangible Equity	3,104	2,590	16,502	14,592	26,312	10,710	29,869	23,010
2 Years of Recessionary losses	974	869	4,462	5,019	7,609	2,493	6,920	8,434
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	-31%	-34%	-27%	-34%	-29%	-23%	-23%	-37%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	2%	3%	-3%	4%	1%	3%	5%	-5%

Source: Deutsche Bank estimates

Danger Map Indicators for South Korea

Below we summarize our Danger Map Indicators for South Korea. We score South Korea overall at 22 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. We rate South Korea as relatively high in terms of % of debt to GDP and medium for the credit mix and stage of cycle. This would put South Korea in-line with the average for Emerging markets.

Figure 190: Scoring the Korean "danger map"

Danger Factor	Score	Comment
Deregulation of Lending	2	No recent deregulation of lending
% of Credit to GDP	4	Has started coming down since 2009 but still high vs. Asian average
Change in % of Credit to GDP	3	Rapid increase during 2005-2008 but has started to come down since
Maturity of Cycle in Years	3	Year 3 of the recovery after GFC
Credit Mix	3	Balanced loan portfolio between household and corporate
Unemployment	1	Remains low at 3.3% and employment numbers on the uptrend
Current account position	1	
Level of real interest rates	2	
Exchange rate flexibility	3	
Total Danger Map Score (out of 45)	22	

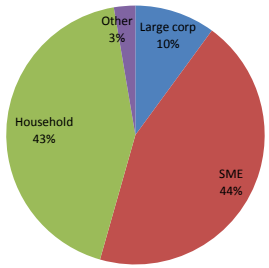
Source: Deutsche Bank

Understanding the Korean banks' loan books

As mentioned above we believe credit risks in the Korean banks' loan books are not too high. Household loan delinquency ratio has remained low at below 1% since 2006 and has remained steady even during the GFC, while corporate restructuring and bad asset disposals and better lending discipline have helped improve asset quality. About 50% of the loans are collateralized, with most of the collateral being real estate – given that house price is only up by 7% during the past five years, we believe the collaterals are relatively solid.

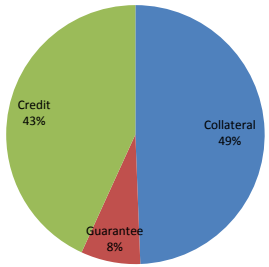
The weakness of the loan books would be the 44% SME loans, as the segment remains naturally sensitive to macro slowdowns. In addition, although household loan asset quality looks stable and shows no signs of deterioration, 70-80% of the loans are floating rate loans and credit risks may rise if interest rates remain on the uptrend.

Figure 191: Loan breakdown



Source: Deutsche Bank, FSS

Figure 192: Loan breakdown by collateral



Source: Deutsche Bank, FSS

Poland

Overview

- In this section we look at the Polish banks, with a focus on those covered by Deutsche Bank. Over the last five years, we find that loan loss provisions in the banking book averaged 80bps, and peaked at 170bps (2009). The minimum level was reached in 2006, when banks had experienced balanced additions and write-backs (4 bps net charge).
- We use the assumption that peak provisions on a further downturn would likely reach 4x their normalized level. We estimate credit losses of PLN 21.6bn for the Polish banks per annum, in the severe scenario, i.e. 4x more than our 2012E current credit losses of PLN 5.4bn estimate. Over two years, this would be equivalent to 48% of 2012 closing tangible book value (TBV). If we include pre-provision profit (PPP) estimates as an offset (flexed down consistently with the crisis experience), then the loss would be 9% of TBV, i.e. the banks would be in the loss-making territory.
- Despite this severe scenario, we estimate that the sector now possesses PLN 23.4bn risk cushion above CT1 7% ratio if one year PPP is included. Moreover, we see the whole sector enjoying backstops from parent companies from Western Europe or Polish State (with balance sheet big enough to accommodate potential recapitalization needs).
- As regards the Danger Map, we score Poland overall at 23 out of 45. This captures a 1 to 5 score across a number of risk metrics. This puts Polish banks in the middle of the pack on the Danger Map – neither angry red, nor soothing green.

Credit Data: Trends

Below we summarize data from 2006 to 2010 for the aggregated Polish banks in our coverage universe. PPP/LLP cover ratio deteriorated to 2.3x in the worst 2009 period, before improving to 3.2x last year and what we forecast to be 3.8x this year. All those ratios mark a deterioration from extremely healthy coverage in 2008 (5.7x) – not even mentioning even better period 2006-7 – but we are overall satisfied with fairly manageable development of the recent crisis in Poland.

Figure 193: Aggregation of quoted bank data, local currency (PLN m), Poland

Local Currency (PLNm)	2006	2007	2008	2009	2010	2011E	2012E
Net Interest Income	11,704	14,134	19,028	17,660	20,707	23,820	27,229
Other Operating Income	11,100	13,361	14,648	14,930	14,462	14,691	15,792
Total Revenue	22,803	27,494	33,676	32,590	35,168	38,511	43,021
Costs	13,720	15,185	17,374	16,871	17,155	18,474	19,615
Pre-Provision Profits	9,083	12,309	16,302	15,719	18,013	20,036	23,406
Loan Loss Provisions	60	260	2,862	6,725	5,711	5,212	5,396
Pre-Tax Profit	9,169	12,247	13,741	9,113	12,415	15,727	18,183
Total Assets	387,785	497,561	636,804	639,237	686,194	741,380	804,288
Average Assets	353,638	429,109	547,817	618,482	641,029	690,622	748,546
Total Loans	188,242	282,739	390,724	409,156	446,050	505,034	567,474
Average Loans	168,125	235,490	336,732	399,940	427,603	475,542	536,254
Revenue / Average Loans	13.6%	11.7%	10.0%	8.1%	8.2%	8.1%	8.0%
Pre-Provision Profit / Average Loans	5.4%	5.2%	4.8%	3.9%	4.2%	4.2%	4.4%
Loan Loss Provisions / Average Loans	0.04%	0.11%	0.85%	1.68%	1.34%	1.10%	1.01%
PPP / Loan Loss Provision Cover	150.4	47.3	5.7	2.3	3.2	3.8	4.3

Source: Deutsche Bank aggregation of company data

Estimates by Bank

Below we summarize forecast data for 2012 for the aggregated Polish banks in our coverage universe (PKO BP, Pekao and 5 smaller players). We then show our estimate of severe recessionary loan losses, which for the purpose of this exercise we have taken as 4x normalized.

We then express this as a percentage of 2012 book value (BV), and also as a percentage of 2012 PPP flexed down by 25% (very severe stress test for Polish market as we never saw 25% contraction of PPP in the last 15 years), as a proxy of a potential contraction during a crisis. We estimate credit losses of PLN 21.6bn for Polish banks per annum. Over two years, this would be equivalent to 48% of 2012 closing TBV. If we compare severe loan losses to PPP flexed down by 25%, we see 123%, i.e. loss-making banking sector on a pre-tax level; however, we would point to differentiation as 4 banks out of 8 would still retain profitability.

Figure 194: Summary of forecast data and comparing recessionary loan loss charges as % of opening TBV and of flexed PPP

PLNm, 2012E	PKO	PEO	BHW	BZW	BRE	GTN	ING	KRB	Total
Forecast Average Loan Balances	156,097	95,401	15,935	39,051	70,909	44,987	40,601	30,428	536,254
Forecast Loan Loss Provisions	1,932	703	140	366	630	770	252	317	5,396
Severe Recession Loan Loss Provisions	7,727	2,811	558	1,464	2,520	3,079	1,009	1,267	21,582
2012 Pre-Provision Profit	7,896	4,616	1,278	2,362	2,002	1,945	1,598	777	23,406
2012 PPP less Recessionary Losses	169	1,805	720	898	-518	-1,134	589	-490	1,824
2012 Forecast Tangible Equity	26,530	22,503	5,422	8,045	8,439	4,998	6,845	3,272	90,831
2 Years of Recessionary losses	15,453	5,622	1,116	2,927	5,040	6,157	2,017	2,534	43,165
2 Years of Recessionary losses as % 2012 Forecast Tangible Equity	58%	25%	21%	36%	60%	123%	29%	77%	48%
2 years of Recessionary losses as % of 2 years of PPP (flexed down by 25%)	130%	81%	58%	83%	168%	211%	84%	217%	123%

Source: Deutsche Bank estimates

Danger Map Indicators for Poland

Below we summarize our Danger Map Indicators for the Polish market. We score Poland overall at 23 out of 45. This captures a 1 to 5 score across a number of risk metrics, drawn from our analyses of case studies, and our global experiences of bank lending. This puts Poland in the middle of the pack on the Danger Map – neither bright red, not soothing green. The risk factors in Poland are faster than average pace of credit extension heading into the crisis of 2009 as well as persistently high unemployment. The mitigating factor is very low credit penetration, especially for corporate and mortgage loans, as well as collateralized nature of lending (mortgage-led), tight market regulation and resilient macroeconomic backdrop in Poland.

Figure 195: Scoring the Polish "danger map"

Danger Factor	Score	Comment
Deregulation of Lending	2	No recent deregulation of lending
% of Credit to GDP	1	Much below the European average
Change in % of Credit to GDP	4	Above the European average
Maturity of Cycle in Years	2	Year 2 of the recovery in the euro zone.
Credit Mix	2	Mortgage led
Unemployment	3	Unemployment broadly unchanged but high
Current account position	4	
Level of real interest rates	3	
Exchange rate flexibility	2	
Total Danger Map Score (out of 45)	23	

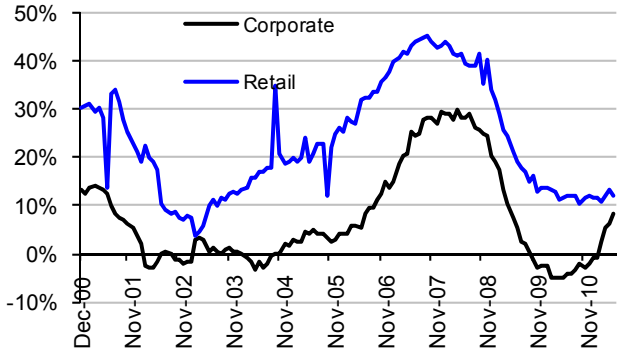
Source: Deutsche Bank

Understanding the Polish banks' loan books

In Poland, we observed fairly strong credit extension before the end-2008 crisis. FX adjusted retail loan growth peaked at c. 40% during late 2007 / early 2008, mainly on the back of mortgage boom. One risky element in Poland is that significant part of mortgage production happened in CHF, and even though the sector switched predominantly to PLN mortgage since post-Lehman, the FX part of the mortgage book still makes up 62% of total (1H11).

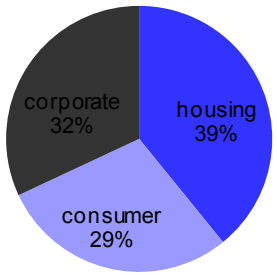
In the last months retail lending stabilized at c. 10% pa growth runrate, while corporate business turned from deleveraging into growth early this year. Polish corporate lending is extremely underdeveloped as corporate loan to GDP ratio of 15% is the lowest in the EU. We continue to find strong fundamental case for further developments in Polish corporate and mortgage lending (penetration for mortgage lending is c. 18% of GDP) and fairly limited prospects for further consumer loan sales. Consumer lending book overall is quite sizeable and historically well developed and in this segment we see shift from POS lending types into card / overdraft lending, typical for the market moving from nascent into gradually maturing. Barring the current stress in the marketplace from potential slowdown fears, we see good prospects for Polish lending to grow at 10%+ rate in the years to come. Moreover, Polish banks L/D ratio is 110% with the bulk of non-deposit funding gathered from parent banks and spent for mortgage funding. The withdrawal of parent funding since end-2008 was not observed.

Figure 196: Polish corporate and retail loan growth



Source: NBP, Deutsche Bank

Figure 197: Polish sector loan split



Source: NBP, Deutsche Bank

Crisis case studies

The Latin American Debt Crisis

"Countries don't go out of business . . ."

The IMF has recorded 63 sovereign debt crises since 1970. The last major and protracted sovereign debt crisis which directly threatened the solvency of major European and US financial institutions was the Latin American debt crisis in the 1980's. The rough chronology to the onset of the crisis was that Mexico defaulted in 1982 on an unmanageable debt burden built up in the mid to late 1970s as international banks "recycled" the OPEC surpluses; other Latin American countries defaulted soon after and by 1983 there were 10 countries in default with outstanding loans of around US$ 200bn.

US and European banks initially denied there was a problem. Citicorp's Chairman Walter Wriston explained: "Countries don't go out of business . . . The infrastructure doesn't go away, the productivity of the people doesn't go away, the natural resources don't go away. And so their assets always exceed their liabilities, which is the technical reason for bankruptcy. And that's very different from a company." Citicorp was one of the largest lenders to Latin American countries and had substantial local operations in Latin American countries.

In contradiction to Walter Wriston's assertion, a secondary market in Latin American debt developed and the market discount to balance sheet par values showed the requirement for very significant provisions against sovereign loans. A similar tension exists today between the market value of some sovereign bonds and the carrying value in held to maturity books.

Citicorp and the other heavily exposed US and UK banks provided against their exposures in a meaningful way only in 1987 (with provisions to exposure of around 30%) and again (a further 30% to 30% of gross exposure) in 1989 – i.e. 5 and 7 years after the problem became explicit. Loan loss provisions of the FDIC insured banks over the 3 year period were 4.5% of average loans, the highest three year cumulative charge since the FDIC was formed and a record which was unbeaten until 2008 to 2010.

The reason the large US and UK banks did not reserve against the problem in the early years of the crisis is that they could not afford to. Problem country exposure was over two times the capital and loan loss reserves of the money center banks and of two of the UK banks. A 40% provision would have wiped out their capital. US and UK regulators were pragmatic and did not require loan loss provisions either against restructured loans or against interest arrears.

Regulatory forbearance gave the banks time to build up capital and loan loss reserves. It also allowed them to finance the debtor countries' interest payments, so throughout the crisis there was no technical default, since the banks simply accrued the interest by granting "new money". During this period the IMF and other supranational agencies provided more new money and thus the percentage of total lending to indebted countries by private sector lending institutions shrank. A similar pattern is evident today as new money bailouts dilute commercial banks exposures.

The Latin American debt crisis was resolved ultimately from 1989, through the plan devised by the US Treasury Secretary Nicholas Brady. The Brady Plan sought permanent reductions in principal and interest payments for the debtor nations and in return the countries which signed up to the plan had to agree to introduce economic reforms to promote growth. The Brady Plan could not have been implemented had the banks not written down their exposures. The banks swapped their exposures for instruments collateralized by US government zero coupon bonds, which could be carried at par with certainty by the creditor banks.

An FDIC study of the crisis suggested that forgiveness of existing debts via debt and debt for equity swaps by private lenders between 1989 and 1994 amounted to approximately US$61bn (out of US$191bn of outstanding loans). These losses were mostly taken by bank shareholders. As a benchmark, the total capital of the 8 largest US money center banks as December 1989 (by far the most exposed US lenders) was US$26.4bn and the capital of the entire FDIC banking system was US$ 204bn.

Figure 198: Average financial data for Eight Money-Center Banks: 1977 to 1989

Year (US$m)	Total Assets	Total Capital	Net Income	Total Loans	LDC Loans	Total Reserves	Provisions for Loans	Total loan charge offs
1977	347495	14282	1554	192571	32554	1538	905	829
1978	392575	15437	1911	217269	35811	1814	866	598
1979	451834	17166	2320	246468	43999	2123	751	447
1980	490753	18918	2614	274920	47614	2310	873	667
1981	519436	20348	2629	312275	53703	2736	1065	654
1982	546729	22115	2764	332799	54655	3036	1583	1254
1983	541968	24211	2853	337542	55704	3416	1933	1518
1984	560921	26655	2835	359018	58518	4107	2575	1957
1985	590235	28233	2550	361849	56595	5451	4301	3003
1986	605566	30343	2659	362495	54387	6988	4779	3426
1987	593584	24954	-5529	338617	52720	17107	13065	2875
1988	577589	29937	6268	332452	49146	16390	2270	2793
1989	584847	26438	-2616	344130	43543	20284	9535	5544

Source: Source: FDIC History of the Eighties – Lessons for the Future

Figure 199: Average financial ratios for eight money-center banks 1977-1988

Year	LDC Loans to total loans	LDC Loans to capital	Reserves to LDC loans	LDC Loans to Cap& Reserves	Net income to assets	Net income to Capital
1977	16.9%	227.9%	4.7%	205.8%	0.45%	10.9%
1978	16.5%	232.0%	5.1%	207.6%	0.49%	12.4%
1979	17.9%	256.3%	4.8%	228.1%	0.51%	13.5%
1980	17.3%	251.7%	4.9%	224.3%	0.53%	13.8%
1981	17.2%	263.9%	5.1%	232.6%	0.51%	12.9%
1982	16.4%	247.1%	5.6%	217.3%	0.51%	12.5%
1983	16.5%	230.1%	6.1%	201.6%	0.53%	11.8%
1984	16.3%	219.5%	7.0%	190.2%	0.51%	10.6%
1985	15.6%	200.5%	9.6%	168.0%	0.43%	9.0%
1986	15.0%	179.2%	12.8%	145.7%	0.44%	8.8%
1987	15.6%	211.3%	32.4%	125.3%	-0.93%	-22.2%
1988	14.8%	164.2%	33.3%	106.1%	1.09%	20.9%
1989	12.7%	164.7%	46.6%	93.2%	-0.45%	-9.9%

Source: FDIC History of the Eighties – Lessons for the Future

At the time of the crisis, some observers viewed the Latin American debt crisis either as the most serious to threaten the financial system since the Great Depression or so serious as likely to be a be a catalyst for another Great Depression. But that did not stop that decade from being good for equity markets and good for bank shares too. For the US Money Center banks, loans to lesser developed countries (LDC loans) peaked at 18% of total loans and 230% of capital just a year or two before the Mexico default. Increased provisioning requirements significantly reduced profitability of exposed banks from 1985 onwards and in two of the years the money center banks reported an aggregate loss.

The price the US Money Center banks paid was that their businesses stopped growing; loan books shrank as they retrenched from international loan markets they lost share within their domestic markets. Capital levels and net asset value per share fell slightly between 1984 and 1989 and total loans also declined. A round of mergers followed in the early 1990's and the roll call of US money centre banks declined from eight to three. At some stage after the crisis is resolved, further consolidation looks a probable outcome in the Eurozone.

The market discounted money centre bank earnings from 1985 onwards figuring that bank capital would be written down as some stage. Major bank stocks traded at steep discount to market averages over 1987 to 1990 as they built up sufficient capital to absorb the losses although, perhaps surprisingly, they performed broadly in line with the S&P 500 until Citicorp "bit the bullet" in1987.

The price that the Latin American debtor nations paid from first over borrowing and then going into a debt moratorium was a lengthy period – a lost decade – of economic stagnation.

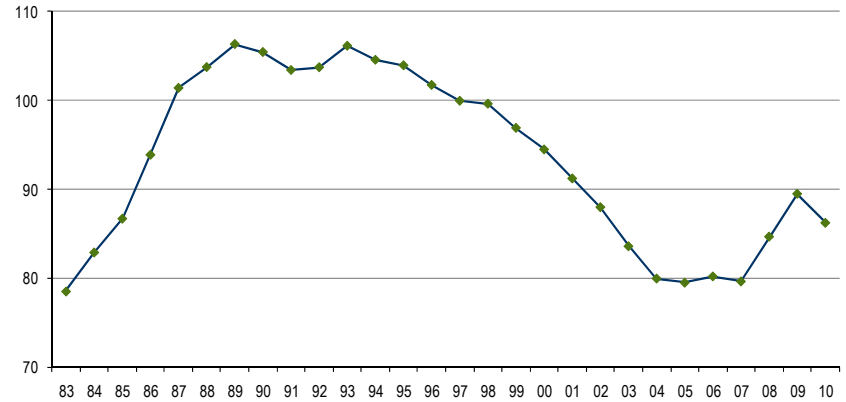
Looking back at the crisis and its resolution it is possible to take away the impression that the IMF, World Bank, bank regulators and banks tackled the problem in a resolute and clearly though out manner. In fact, policy was made up and driven by events and all participants were effectively playing for extra time to build up bank reserves to accommodate shock.

The overall lesson of the 1980's sovereign debt crisis for European banks today could be first that even very large risk concentrations within the global financial system can be restructured, given time and supportive institutional and regulatory structures and attitudes; and second that the stronger bank balance sheets become the more likely is that losses will be recognized. The less hopeful message is that debt forgiveness did not immediately restore the fortunes or growth of the debtor countries.

There are many differences between the Latin American sovereign and the Eurozone sovereign debt crises. Latin American countries defaulted on cross border loans by foreign banks rather than on government bonds or locally funded commercial banking loans, and thus default did not blow up the balance sheets of their domestic banking institutions. The banks most at risk in the 1980's were global and systemically important megabanks whilst arguably those most at risk today are small and large domestic banks which are natural holders of their sovereign's debt. Latin American countries had borrowed too much in the wrong currency but were not burdened by a fixed exchange rate. Last but not least, the magnitude of sovereign cross border exposures was dimensionally larger in the 1980's relative to capital and total loans unless the view is taken that Italy and Spain are classified as problem/defaulting countries.

Japan: collapse of bubble economy and persistence of deflation

Figure 200: Bank Loans/Nominal GDP (Calendar Year,%)



Note : Loans exclude those to the Central Government
Source: BOJ, Deutsche Securities

1. Bubble creation and collapse

The 1985 Plaza Accord effectively resulted in yen appreciation against the dollar, in response to the large scale of the US trade deficit with Japan. In one year following this accord, the yen's rate against the dollar strengthened dramatically from ¥235 to the ¥150 level. The BoJ was concerned over a strong yen recession caused by a slowdown in export industry, and it maintained its low interest rate policy despite the signs of inflation in 1985. The government also reversed its position from fiscal austerity to expansion of public works.

1985 also marked a major turning point for the bank sector. Deposit interest rates were liberalized in stages from 1985. Corporations had greatly improved their balance sheet following the two oil shocks in the 1970s, and their borrowing demand did not expand despite monetary easing. Banks were concerned about further narrowing of their already narrow loan-deposit spreads, and this drove them to seek new borrowers who would borrow at relatively wide spreads. They found these new borrowers in the commercial real estate sphere. Land prices had risen substantially due to the real estate boom accompanying economic expansion, with real estate and construction companies settling into a cycle of new investment using land on which the price had risen as collateral. During this period, bank lending as a percentage of nominal GDP grew rapidly from 83% in 1983 to 106% in 1989. The Nikkei Average also peaked at 38,900 at the end of 1989.

However, by 1990 housing prices in Tokyo and other urban centers were around five times their level in 1984, resulting in increased criticism that housing acquisition had become difficult for individuals. In 1990, the MoF introduced an aggregate ceiling on bank lending for three sectors: real estate, construction, and nonbanks. The BoJ also reversed direction toward monetary tightening, and the economic bubble proceeded to collapse.

2. Financial crisis outline

Bank lending as a percentage of GDP declined after peaking in 1989, but then climbed again to 106% in 1993. This indicates that the bubble did not collapse dramatically, but gradually. Although the BoJ had switched direction toward monetary tightening, there were still surplus funds in the market. Real estate prices also fell gradually, with the result that banks continued to support via new lending borrowers whose earnings had deteriorated. However, the sense of alarm at corporations with weakened earnings suddenly strengthened when a crisis emerged in 1993 among one type of nonbank, namely specialized housing loan companies known as Jusen. Agricultural financial institutions had incurred substantial losses from lending to Jusen, but injections of public funds into them were greatly delayed by the sense of injustice among taxpayers. This prompted the financial sector to look for ways to dispose of bad debts without recourse to public funds, or in other words time-consuming ways. Bank lending as a percentage of GDP eventually fell to 100% in 1998.

Japan suffered a severe credit crunch nonetheless, with Hokkaido Takushoku Bank and Yamaichi Securities failing in 1997, and Long-term Credit Bank of Japan and Nippon Credit Bank failing in 1998. The financial crisis deepened, due to the failure of three out of the 21 major banks as of 1990. Bank lending also fell sharply from 1999. Unrealized gains on marketable securities were

included in Tier II capital from the end of 1992, when Japan introduced Basel 1, but banks' lending capacity also declined in this regard, partly due to lower share prices.

Banks received injections of public funds, mainly as Tier II capital in 1997, and as Tier I capital in 1998, but they were unable to halt their deterioration in asset quality. Credit costs at the major banks persistently exceeded their net operating profit (PPP) in FY3/94–3/03. We believe that Japan's financial crisis was lengthened as a result of delays in injecting public funds, and the low level of net operating profit relative to credit costs.

3. End of the financial crisis

Rapid reorganization of the remaining 18 major banks occurred during 2000–01 in response to adverse operating conditions. By 2001 the 18 banks were concentrated into seven groups: MTFG, UFJ, SMFG, Mizuho Holdings, Resona Holdings, Sumitomo Trust, and Chuo Mitsui Trust (subsequently MTFG merged with UFJ to form MUFG, and the two trust banks merged to form SMTH, resulting in the current five groups).

The Financial Services Agency (FSA) tightened up its inspection manual, and requested major banks to halve their bad debt ratio over two years, after it reached 8.5% in FY3/02. As a result, an injection of public funds into the Resona group was decided in May 2003. Resona Holdings maintained its listing despite this injection of public funds, however, resulting in greatly increased confidence in the financial system, with bank share prices more or less quadrupling over three years until 2006. Earnings at the major banks also improved markedly in FY3/05–3/06, due to substantial reversals of provisions against losses on loans.

We regard it as significant that as of 2004 bank lending as a percentage of GDP finally returned to its pre-bubble level. Cumulative credit costs at the major banks over the 10 years spanning FY3/95–3/04 exceeded 20% of their lending in FY3/95. During the 1990s, financial crises also ended in Korea and Sweden when a level of 20% was exceeded in this way. Cumulative credit costs at the major Japanese banks reached approximately ¥66.9trn, which is equivalent to 13% of GDP in 1995 and 17% in 2004.

4. Persistence of deflation

¥12.7trn in public funds was injected into Japanese banks, which is equivalent to approximately 3.2% of GDP as of 2004. Thus far ¥12.3trn or 96.9% of this has been returned, with the Deposit Insurance Corporation generating a profit of more than ¥1trn. Resona Holdings has outstanding public funds, but even it plans to repay them over the next five years or so. Major banks deemed to have insufficient reserves during the process of bad debt disposal provisioned cautiously even for loans in special mention category, in between bad debt and normal loans, and no banks received public funds in FY08 (FY3/09), when the Lehman Brothers shock occurred. Some banks have applied for public fund injections this year in connection with the Great East Japan Earthquake, but we believe this can be discussed separately from the credit cycle.

Bank lending as a percentage of GDP started to rise in 2008–09, but we believe this was because major corporations switched to bank borrowing when the commercial paper market was not functioning normally for a while after the Lehman shock, not because lending demand recovered. This weighting certainly started to fall again in 2010. The opposition of taxpayers to public fund injections meant that it took 20 years for the completion of one credit cycle in Japan, and following the Lehman shock we believe that the US and European countries put Japan's experience to good use. They now understand that the burden on the taxpayer is lessened in the end by rapid injections of public funds, as we see it. We also believe that the likes of China have learnt from how rapid currency appreciation caused a bubble in Japan.

What is the current situation in Japan, now that it has left behind the bad debt problems from the bubble era? The economic supply-demand gap that arose during the bubble era has not yet gone away, and a zero interest rate policy is continuing. Deflation is consequently continuing in Japan, in contrast to the inflationary trend around the world. Deposit growth and weak lending are continuing, and banks' loan-deposit ratio has recently fallen to 81% after dropping below 100% in 2000. Japan is now a low interest rate spread, low growth market, and the major Japanese banks have changed course toward expansion of operations overseas. We now expect earnings at Japanese banks to diverge according to their success in harnessing growth in Asia.

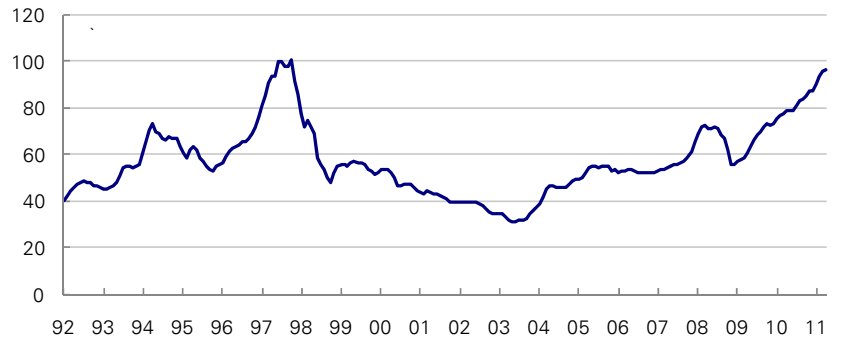
Hong Kong: property bubble

Executive summary

The bubble formation and burst from Sept 1995 to Oct 1999 happened at a very rapid pace in Hong Kong. Property price rose by 90% from Sept 1996 to October 1997, and then fell by 52% until Oct 1998. The housing boom was not driven by leverage but rather due to strong economic growth, high negative real interest rate (which avg -3% pre-crisis and peaked at -6.4%), shortage of supply and speculative capital flowing into the property market.

The convergence of factors such as rising interest rate, expected increase in housing supply and strengthening US Dollar has caused the burst. The impact to the banking sector and the economy was manageable as Hong Kong banks' profitability was robust enough to weather the rise in NPL and credit cost. We estimate the total cost to the banking sector to be 11%, measured as percentage of total system credit cost to 1997 GDP. Due to the recourse nature of Hong Kong mortgage loans and relatively low loan-to-value ratio, actual default on mortgage loans remained low. Equity to asset ratio of Hong Kong banks remained healthy at 9.1% in 1998, which helped to avoid credit crunch. In fact, loans for use in Hong Kong only contracted by 3.8% in 1998.

Figure 201: Property price index



Source: Deutsche Bank, CEIC

Property bubble formation driven by negative real interest rates and shortage of supply

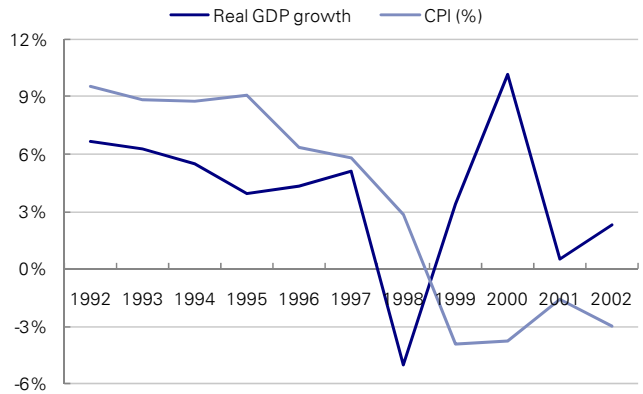
Hong Kong uses the pegged currency regime and since 1983, Hong Kong Dollar has been pegged to the US Dollar. As an international trading hub and financial center, pegged currency offers exchange rate stability to Hong Kong, but downside of it is in times of strong economic growth, the risk of asset price bubble increases as raising interest rate is not an available tool to fight inflation.

The buildup of property bubble in early 1990s leading up to the bubble bursting in October 1997 was attributed to various factors. First, Hong Kong's inflation rate surged to average 8.5% driven by strong real GDP growth which averaged 5.30% from 1992 to 1997. Second, Hong Kong's real interest rate fell to negative territory as Hong Kong's pegged currency regime prevented interest rate hikes. From 1992 to 1997, real interest rate in Hong Kong averaged -3 %, peaking at -6.40%, and this caused money inflow into property and stock markets. Third, strong stock market performance and wealth created flowed into the property market. Hang Seng Index increased by 288% from 1992 to Aug 1997. Fourth, strong property price increase brought speculative capital inflow into the property market. Lastly, mortgage competition intensified which brought down mortgage rate from 10.75% in Aug 1995 to as low as 9% in May 1996.

As a result, property price index rose by 81% from 1992 to April. Concerned about property bubble and bank's increasing exposure to the property market, HKMA introduced prudential measures, mainly limiting banks' property exposures to 40% of loan book and capping maximum loan-to-value ratio to 70%. This as well as rise in mortgage rates helped to stabilize property prices from mid-1994 to late 1995. During this period, property price declined by 39%. However, prices and transaction volumes picked up again in 1996 due to shortage of supply as a result of restricted land supplies in earlier years. The rate of price increase accelerated with property price increasing by 13% and 43 in 1996 and 1997 respectively.

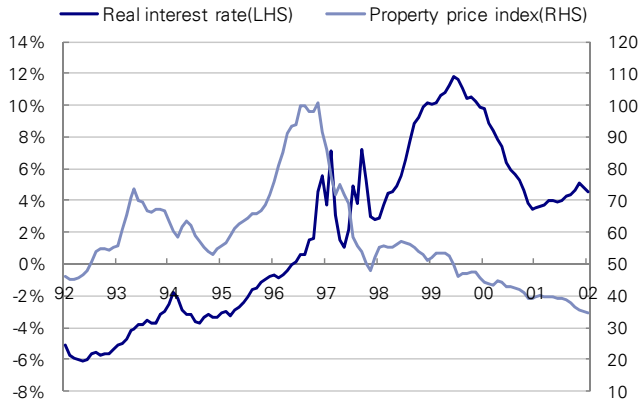
Hong Kong's housing bubble was not caused by leverage. We estimate loan-to-value ratio remained relatively low at c. 60~70%. HKMA introduced more prudential measures, reducing maximum LTV for properties above HKD12m to higher of 60% of value of HKD 8.4m in Dec 1996: From 1992 to 1997, system mortgage loans increased by CAGR 16%, property loans as a percentage to total loans increased from 15% to 24%.

Figure 202: Real GDP growth and CPI



Source: Deutsche Bank, CEIC

Figure 203: Real interest rate and property index



Source: Deutsche Bank, CEIC

Bubble burst but impact to banking sector was manageable

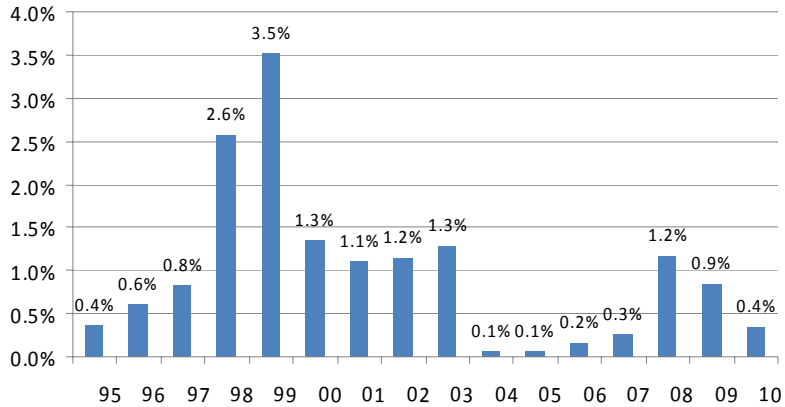
The bursting of bubble was caused by many factors. First, interest rate started to rise. The Hong Kong prime rate rose by 100bps between January 1997 and November 1997. Since mortgage loans in Hong Kong are floating rate tied to prime rate, mortgage rates increased in tandem. Three months HIBOR also rose by 510bps from Jan 1997 to Oct 1997. Second, US Dollar started to strengthen, causing a capital outflow from Hong Kong. Third, the real economy started to deteriorate with the global economic slowdown that began in July 1997. Lastly, housing supply was expected to increase with the government announcing in Oct 1997 its plan to increase the number of flats to at least 85,000 flats a year. Other government measures included plans to increase home ownership rate from 50% to 70% by 2007 and to reduce the average waiting time for public rental housing from 7 to 3 years by 2005.

The bursting of property bubble occurred very rapidly. From October 1997 to October 1998, property prices fell by 52%. Hong Kong GDP contracted by 5.1% and exports declined by 7% in 1998. Consumer and business sentiment also weakened. Hong Kong's fiscal deficit reached to HKD 59.8bn (or 4.4% of its nominal GDP) and unemployment rate surged from 2.4% in Jan 1998 to 6.4% in Jan 1999 (a level unseen since 1983).

Total cost to banking system was 11% of 1997 GDP

The impact to the banking system was negative but manageable. Specifically, asset quality deterioration caused a surge in classified loans which more than tripled from 2.7% in 1996 to 10.1% in 1999. NPL ratio was as high as 7.6% in 1999. As a result, Hong Kong banks' credit cost also surged to 1.29% in Dec 1998. This is about five times higher than historical average credit cost of 0.23% (from Mar 1997 to Mar 2011). The total cost of Hong Kong property bubble bursting to the banking sector is estimated to be roughly 11% of 1997 GDP .

Figure 204: Hong Kong banks' credit cost/GDP



Source: Deutsche Bank, HKMA

Despite the severity of the property price correction, Hong Kong banks' operating profit was strong enough to withstand the spike in credit costs. In fact none of the banks under our coverage reported a loss. Although system wide ROE dropped significantly, ROE remained at 9.5% in 1998 (vs 15.7% in 1997). Banks' profitability was robust enough to weather the bubble burst. The bubble burst also affected caused Hang Seng Index to drop by 20% in 1997 and fall by another 6% in 1998. The market collapse fortunately did not cause significant write down of banks' capital, enough to cause credit crunch. In fact, system equity to asset ratio remained robust at 8.9% in 1999 (vs 9.9% in 1997). Strong capital position prevented capital crunch, helping the quick recovery of the overall economy.

System loans contract and deflation lasts for eight years

Post-bubble bursting, banks in Hong Kong saw fall in both domestic and offshore lending. System loans contracted by 51% from 1998 to 2003, with the major driver being overseas loans (down 88%) as post-Asian crisis, regional banks reduced their short-term overseas bank borrowings for which Hong Kong banks played a significant role as an international financial center. Loans for use in Hong Kong also contracted from 1997 to 2003 but at a much more manageable level of 16%. Mortgage loans recorded positive growth of 7.3% and 3.3% in 1998 and 1999 respectively but remained relatively flat until 2007.

It was under these conditions that the complete interest rates deregulation took place in 2001 which increased competition. The resulting reduction in mortgage interest rates has helped to improve the demand for properties, helping to halt the falling property prices. To facilitate recovery, HKMA and the Hong Kong government also undertook such measures: (1) From June 1998, all land sales in Hong Kong were suspended until April next year, the first time the government has suspended such sales since 1953. (2) HKD3.88bn rate rebate and increased funding to first time home buyers. (3) Fixed rate mortgages was cut from 10.5% to 10.25% with Hong Kong Mortgage Corp committing to buy HKD3.5bn of fixed rate mortgage loans from participating banks.

The bursting of bubble was followed by a quick recovery in the real economy. Hong Kong's real GDP turned positive in 1999, registering 3.4% growth. Fiscal balance also turned surplus of HKD 19.4bn (or 1.5% of its nominal GDP) in 1998. Banking sector ROE improved to 11.6% in 1999 then to 14.7% in 2000. However, Hong Kong experienced deflation until 2005 which was an adjustment mechanism since the option of currency devaluation was not available due to pegged exchange rate system. The return of monetary and financial stability has provided a sound foundation for economic activity to recover. Expansionary fiscal policy, especially an increase in government infrastructure spending, continued in 2002, which contributed to maintain growth in domestic demand. Fast-growing mainland Chinese economy and booming trade with China has also helped the recovery of Hong Kong economy.

Argentina's financial crisis

Banking crisis of 2001/2002

A number of measures by the Argentine government failed to slow the economic crisis in 2001-2002

Beginning in 2001, after two years of economic recession, private depositors began to withdraw funds from the banking system due to growing concerns about the solvency of the system. In response to this run on deposits, the Argentine government instituted a number of measures to stem the flow of money out of the system.

1. *Corralito:* In December 2001, following a massive run on deposits, including a 3% decrease (US$1.8bn) on November 30th alone, the government enforced limits on the amount of cash that could be withdrawn from banks within specified time periods ($1,000 per month). However, this measure increased public concern about the solvency of the banking system and contributed to a further decrease in deposit levels, as many depositors withdrew funds up to the permitted limit.

GDP declined 11% in 2002, the fourth straight year of decline, but has rebounded strongly since

2. *Default:* In December 2001, following a downgrade to its sovereign credit rating, the suspension of loans from the IMF, and the resignation of President De la Rua, the interim government, led by Adolfo Rodriguez Saa formally defaulted on Argentina's debt of about US$150bn.

3. *Devaluation:* In January 2002, Argentina abandoned the fixed 1-to-1 parity between the peso and the dollar. The peso depreciated significantly, reaching a low of 3.86 ARS/US$ in June 2002.

4. *Corralon:* In January 2002, the government extended the maturity for time deposits, freezing them further. Banks were required to issue CEDRO's to affected customers, representing the interest in the underlying, rescheduled deposits.

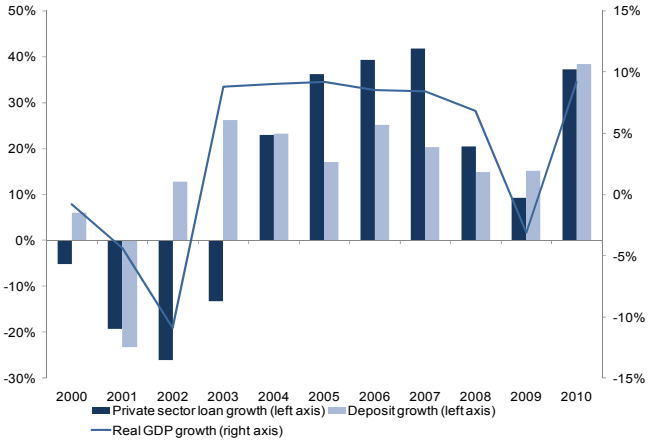
5. *Pesification:* All bank accounts and loans to the private sector denominated in dollars would be converted to pesos. The main problem for the banks was that this conversion was to be made at different exchange rates, assets were converted at 1.1 ARS/US$ and liabilities at 1.4 ARS/US$.

6. *Compensation bonds:* The Argentine government issued bonds (Boden 2007 & Boden 2012) in order to compensate the banks for losses related to the asymmetric pesification.

7. *Amparos:* Many depositors claimed that the pesification was unconstitutional and sued the banks for compensation (with many gaining favorable rulings). The Central Bank rules permit the losses related to *amparos* to be accounted for as an intangible asset and amortized over five years. At the end of December 2006, the Supreme Court ruled that the pesification was constitutional and ordered banks to pay depositors at the 1.4 ARS/US$ exchange rate, adjusted for inflation and 4% annual interest (this works out to around 3.08 ARS/US$).

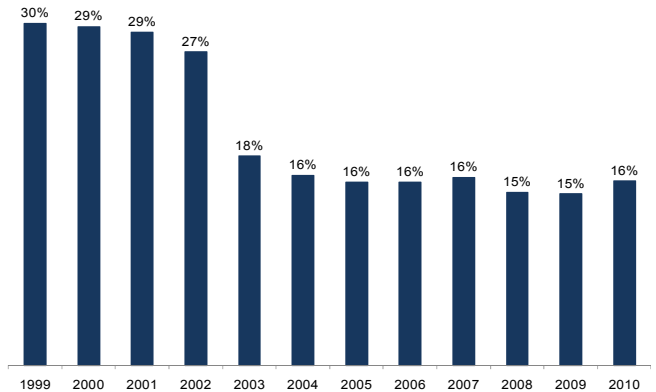
Following these events the economy went into a deep recession. Indeed, GDP declined 4.4% in 2001 and 10.9% in 2002. Furthermore, deposits fell 23% in 2001 and private sector loans fell 19% in 2001 and another 25% in 2002; Figure 205. As such, loans to GDP fell sharply in 2003 to 18% from 27% in 2002. While GDP growth and loan growth have both rebounded strongly since 2003, this has been offset by high rates of inflation, which has kept loans to GDP relatively stable between 15-16%; Figure 206.

Figure 205: GDP growth vs. loan and deposit growth



Source: Deutsche Bank, Central Bank of Argentina.

Figure 206: Loans to GDP



Source: Deutsche Bank, Central Bank of Argentina.

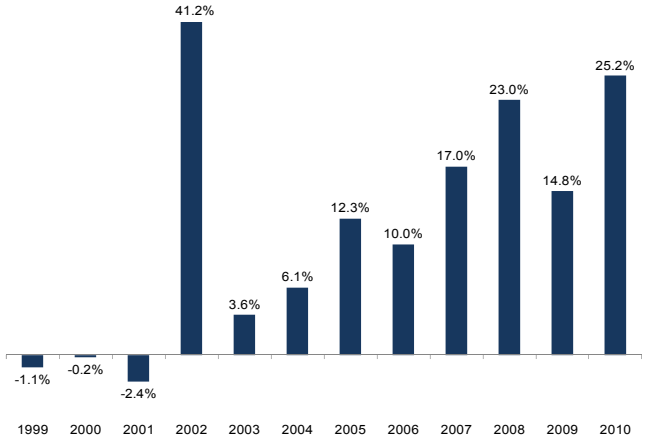
Inflation has risen above 20% again, but still below the peak of 41% in 2002

The crisis triggered very high rates of inflation, as the devaluation of the peso created extreme pressures on domestic prices. Consumer inflation reached a high of 41% in 2002, while wholesale price rose over 100%. The Central Bank introduced a new short-term financial instrument know as a LEBAC (Letras del Banco Central) or Central Bank external bills in order to absorb the excess liquidity generated through its temporary advances to the financial sector. This helped to reduce inflation, and consumer prices quickly stabilized, increasing only 3.6% in 2003. Since 2003, inflation has increased again, reaching 25% in 2010 as the government has pursued a policy high economic growth at the expense of high inflation; Figure 207.

Interest rates have also risen again, but not enough to stave off inflation

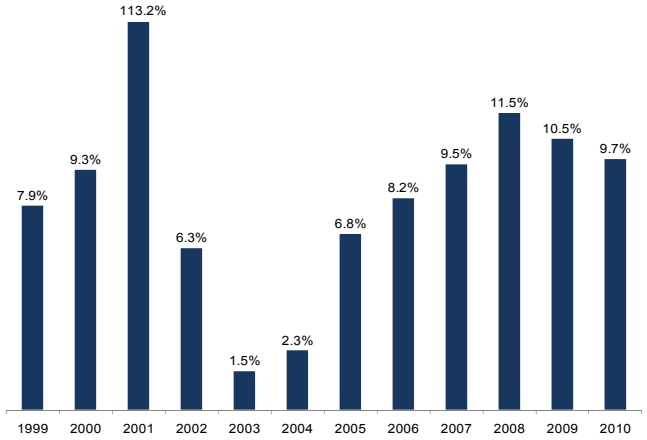
Interest rates rose dramatically during the crisis as well, reaching levels over 100% in 2001. The Central bank began to reduce interest rates after April 2002, reaching a low of 1.5% in 2003. As the economy recovered and continued to grow, interest rates have climbed again reaching 11.5% at the end of 2008, but stabilizing near 10% since then; Figure 208. The reluctance by the government to significantly raise interest rates again has led to negative real rates, which has been positive for the banks as they have benefited from relatively low funding costs and strong volume growth. However, the high levels of inflation present a major risk to the development of the long-term credit market.

Figure 207: Inflation Rate (yoy)



Source: Deutsche Bank estimates, Central Bank of Argentina.

Figure 208: Overnight interest rate (Period-end)



Source: Deutsche Bank estimates, Central Bank of Argentina.

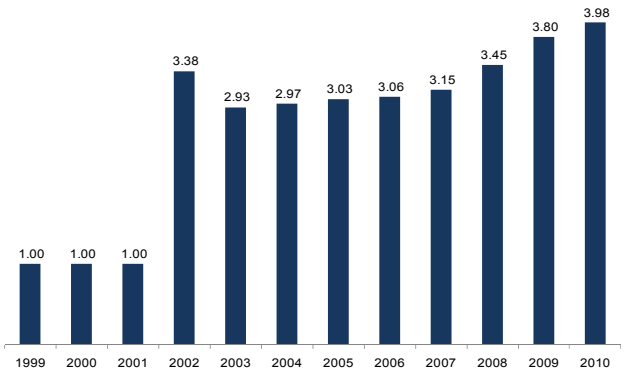
The currency dropped 70% in 2002 and has depreciated gradually since 2003

In January 2002, the Argentine government abolished the fixed parity between the peso and the US dollar, which had been in effect for ten years, and the currency depreciated dramatically, reaching 3.38 APs/US$ by the end of 2002. This led to very high rates of inflation and resulted in many Argentine companies defaulting on their foreign currency debt obligations. However, the devaluation of the currency did make imported goods more expensive, which eventually led to increased demand for domestic products that helped the economy recover. The currency eventually strengthened to 2.93 ARS/US$ by the end of 2003, but has been depreciating at a much more steady pace since then; Figure 209.

Unemployment has improved beyond pre-crisis levels

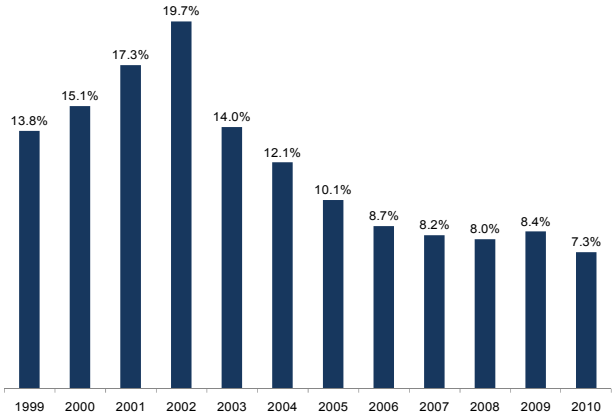
One of the major impacts of the crisis was the tremendous social hardship. Unemployment reached a record high of 19.7% during the crisis. The quality of life of the average Argentine was drastically lowered; many businesses closed or went bankrupt, many imported products became virtually inaccessible, and salaries remained stagnant at the levels before the crisis. However, the unemployment rate has steadily improved as the economy recovered, reaching levels even better than before the crisis. The improvement in the labor market has allowed households to finance a larger portion of their consumption through consumer loans and wages have increased with inflation. The unemployment rate improved to 7.3% in 2010; Figure 210.

Figure 209: FX Rate (Period-end)



Source: Deutsche Bank, Bloomberg Finance LP

Figure 210: Unemployment rate (Period-end)

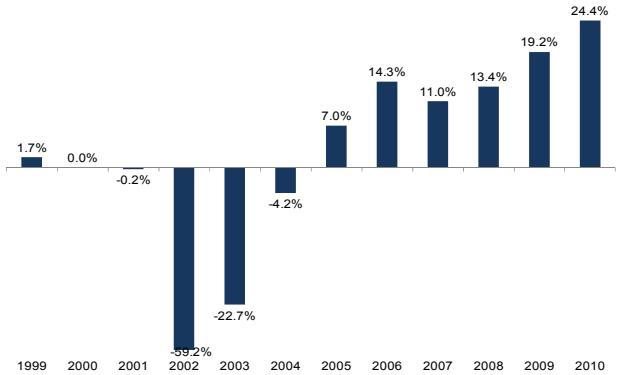


Source: Deutsche Bank, INDEC

ROE for the system collapsed in 2002, but has recovered to well above pre-crisis levels

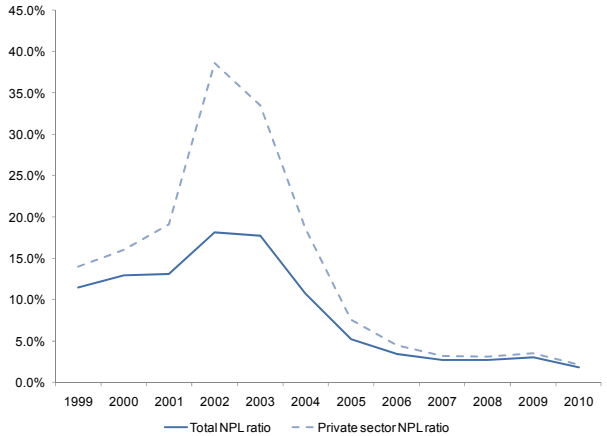
ROE for the system was low before the crisis, but fell to -59.2% in 2002 and -22.7% in 2003, due to negative margins and high provision charges, as asset quality deteriorated significantly. However, ROE has rebounded to well above pre-crisis levels reaching 24% in 2010, as the banks have benefited from strong loan growth, improved asset quality, and much better NIMs; Figure 211. System NPLs spiked to 39% of private sector loans in 2003 and remained at 34% in 2004. Given the strong economic growth we have seen since then, asset quality has improved dramatically with private sector NPLs reaching a low of 2.1% in 2010, just above the total NPL ratio of 1.8%; Figure 212.

Figure 211: System ROE



Source: Deutsche Bank, Central Bank of Argentina.

Figure 212: System NPLs as % of loans



Source: Deutsche Bank, Central Bank of Argentina

Ireland: The Celtic Credit Tiger

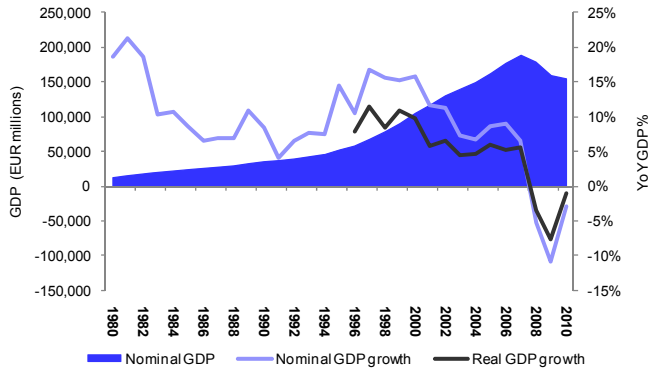
Background to the Crisis

Wider macroeconomic factors:

Rapid economic growth and easier liquidity driven in part by greater risk appetite and falling inflation and interest rates, characterised the global economic environment during the late 1990s. This lead to strong credit growth, higher leverage and significant rises in asset prices. Ireland was no exception, and these conditions would combine to have a significant impact on the Irish economy and banking system.

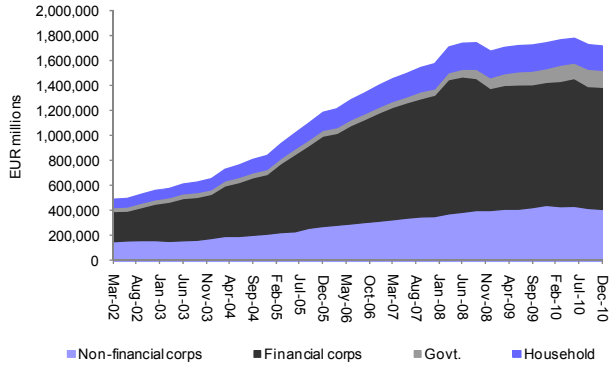
Joining the European Economic Community in 1973 as the lowest GDP/capita country amongst the seven members at the time, Ireland experienced significant growth in GDP from the late 1980s, driven by more stable economic conditions, foreign investment and fairly high population growth (Figure 213). Economic growth dipped in the early 1990s, but from 1995 to 2002 Ireland's GDP nominal growth rate was above 10% per annum, with real GDP growth above 7% from 1996 to 2000.

Figure 213: Irish GDP over time



Source: Haver, Deutsche Bank estimates

Figure 214: The rise in credit since 2002



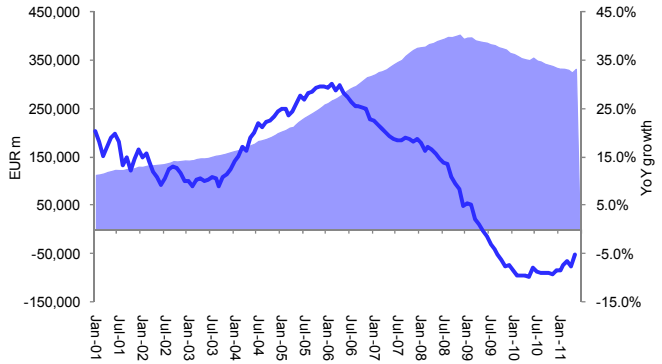
Source: Haver, Deutsche Bank estiamtes

Originally, Irish growth was driven by supply-side changes, but the late 1990s saw a shift to demand-driven growth as wages increased, bank lending expanded and government expenditure accelerated. Euro membership and low interest rates facilitated cheaper international borrowing, fuelling growth despite relatively uncompetitive domestic inflation and wages. Ireland achieved fiscal surpluses for a decade up to 2006, masking an increasing dependence in tax revenues on asset prices linked to corporation tax, stamp duty and capital gains tax. Deductibility of mortgage interest payments from income tax also served to encourage property investment.

Irish Banking Sector

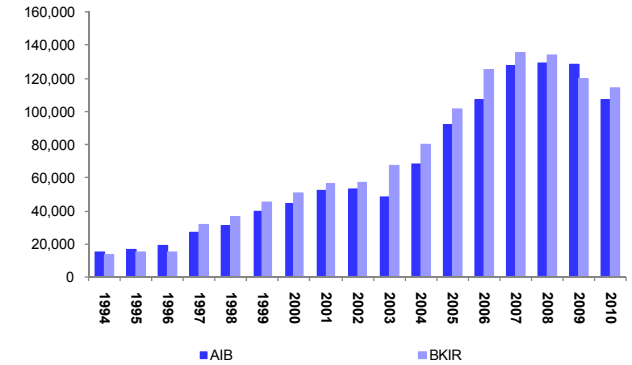
Closer integration with Europe increased the availability of wholesale funding to Irish banks without foreign exchange risk, whilst the entry of foreign banks in the domestic lending market compressed margins and increased debt availability. The result was a huge expansion in property lending. Credit growth was in excess of 10% every year from 2001 until 2008, with 2004-2006 seeing credit growing ~30% a year (Figure 215). Some institutions were more aggressive than others: for example Anglo Irish had a CAGR of c.42% loan growth from 2003-2006, whilst BKIR was c.27%. Nevertheless the rapid quantum of lending expansion was a systemic phenomenon (Figure 216).

Figure 215: Private Sector Credit Growth 2001 onwards



Source: Haver, Deutsche Bank estiamtes

Figure 216: BKIR & AIB loan balances

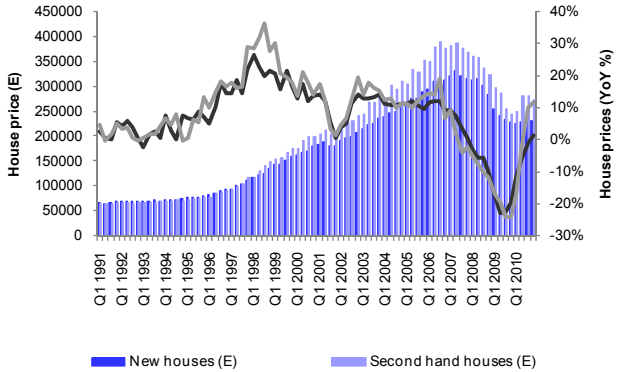


Source: Company data, Deutsche Bank estimates

Failure of risk management & regulation

The recent government-commissioned report into the banking crisis[2] identified 4 key failings of bank management: 1) concentration of lending in property & CRE in particular; 2) poor lending criteria and "a tidal wave of uncritical enthusiasm" to take part in the property boom; 3) remuneration incentives in top and middle management; 4) breaches of accounting and company law at specific institutions. The report cites failures within the regulatory framework where supervisors did not take sufficient action, did not have the resources available, and underestimated the systematic vulnerabilities.

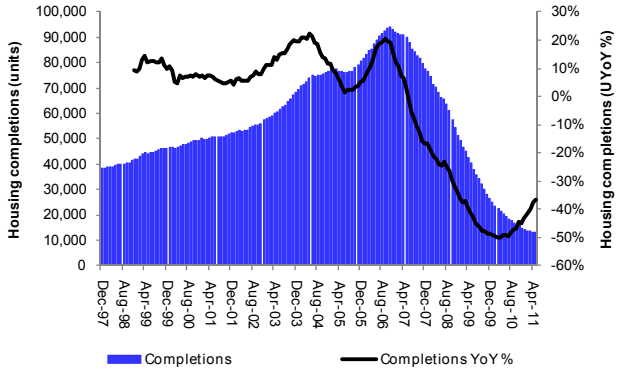
Figure 217: House prices



Source: Department for Environment, Community and Local Government

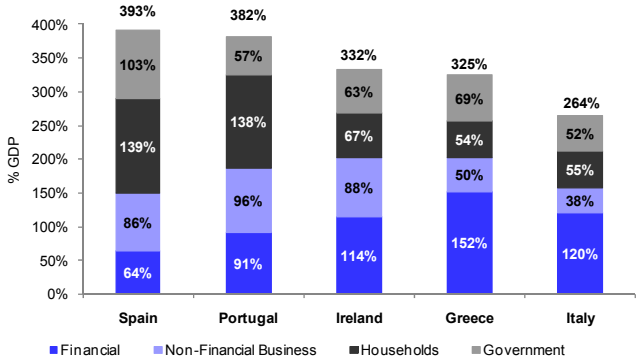
[2] Klaus Regling & Max Watson, 'A Preliminary Report on The Sources of Ireland's Banking Crisis'

Figure 218: Household completions



Source: Department for Environment, Community and Local Government

Figure 219: Sector composition of debt across peripheral countries



Source: Bank of Spain (Data as of June 2010), Bank of Portugal (Data as of June 2010), Bank of England (Data as of September 2010), Central Bank of Ireland (Data as of October 2010), Bank of Greece (Data as of October 2010), Bank of Italy (Data as of October 2010), IMF (data as of October 2010), Eurostat.

Catalysts: house price falls, economic slowdown & liquidity dry up, house price falls

Irish Bank shares peaked in 1H07, with house prices beginning to fall in 1Q07 for the first time since 2002 (Figure 217). GDP growth turned negative in the 3Q07, though Irish banks reported a combined E6.5bn of pre-tax profits in 2007 compared with E5.3bn in 2006, with Anglo Irish reporting a 46% rise (Sept 2007 vs Sept 2006). However, in 1H08, amidst further deteriorating economic conditions, the banks began to warn of falling profitability.

On 25 Sept, 10 days after the Lehman bankruptcy, Ireland became the first Euro country to enter recession. The subsequent liquidity freeze prompted the government to issue a guarantee 5 days later covering all liabilities (deposits and wholesale funding) at 6 Irish financial institutions (AIB, BKIR, Anglo Irish, Irish Nationwide, EBS, Irish Life & Permanent) totalling E400bn in obligations. At the time this guarantee was billed by the government as "the cheapest bailout in the world", but it was to prove controversial as the scale of banking sector problems became apparent, and led to questions around the state's ability to underwrite such a large guarantee (E400bn of liabilities vs GDP of E160bn in 2009). The scale of debt in the public and private sectors across the peripheral countries is shown in Figure 219.

Figure 220: Progression of Irish liability guarantee schemes

30 Sept 2008: CIFS announced. **2-yr blanket guarantee of all deposits & covered debt securities (c.E400bn)**

9 Dec 2009: ELG Scheme announced. Covered new deposits & eligible debt securities for up to 5 yrs

7 Sept 2010: ELG scheme issuance window extended to Dec 2010

29 Sept 2010: CIFS ends

19 Nov 2010: ELG issuance window extended until June 2011

31 Mar 2011: ELG scheme **covered E111bn of liabilities**, of which E81bn were deposits

1 June 2011: ELG issuance window extended until Dec 2011

31 Dec 2011: ELG issuance window due to close

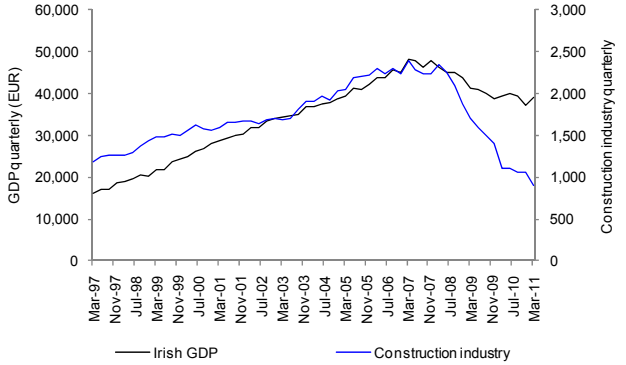
Source: BKIR, NTMA.

Cost & Impact of the crisis

GDP & unemployment impact

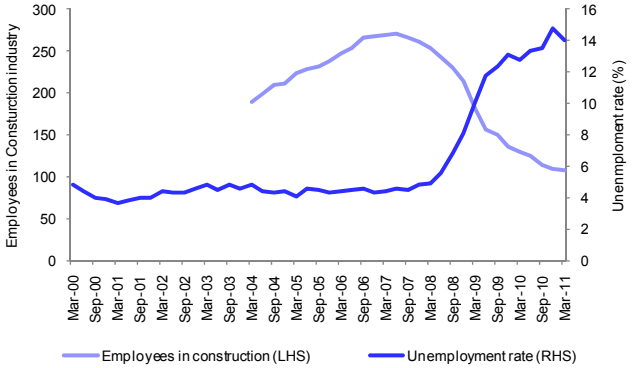
During 2008-2010 Ireland suffered one of the most severe recessions in the history of the modern developed world. The peak-to-trough fall in GDP (from March 2007 to December 2010) was 23% (Figure 221), whilst unemployment rose from a long-run average of c.4% during the first half of the decade to over 14%, remaining stubbornly high today (Figure 222).

Figure 221: GDP & construction component



Source: Haver

Figure 222: Unemployment remains high

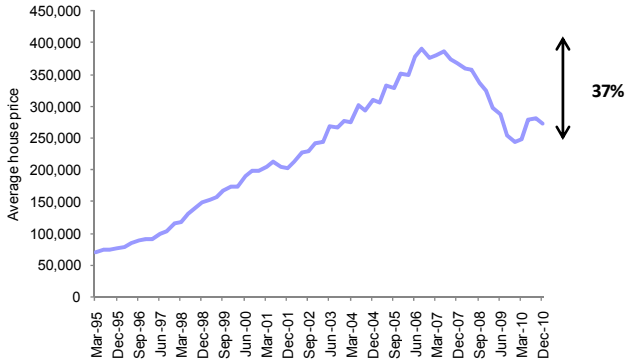


Source: Haver

Construction industry collapse

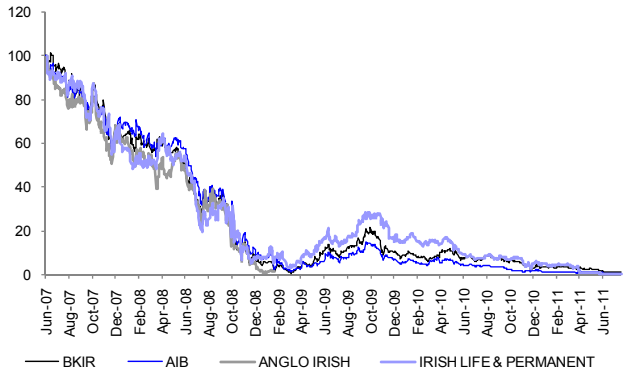
The construction sector, which employed > 12% of the workforce during the boom, has shrunk by 60% and continues to fall. The scale of housing oversupply means it is unlikely, in our view, that the construction industry or house prices will recover in the near term. A recent government review of 2,846 housing developments in Ireland1 found that, of the 121,275 dwellings planned for these developments, 23,250 are complete and vacant, with another 19,830 in various stages of completion. Combined, these amount to c.4 years of current new house builds, and are likely to cap significant near-term gains in house prices, in our view. House prices in Ireland have already fallen 37% peak-to-trough (Figure 223).

Figure 223: House prices peak to trough



Source: Haver, Deutsche Bank estimates

Figure 224: Irish Bank shares since peak



Source: Datastream

Impact on shareholders

From their highs in 1H07, Irish bank shares had already fallen by 70% before the Lehman Brothers bankruptcy (Figure 224). A recovery during 2009 on hopes that the government policies to deal with the crisis would be effective was not sustained.

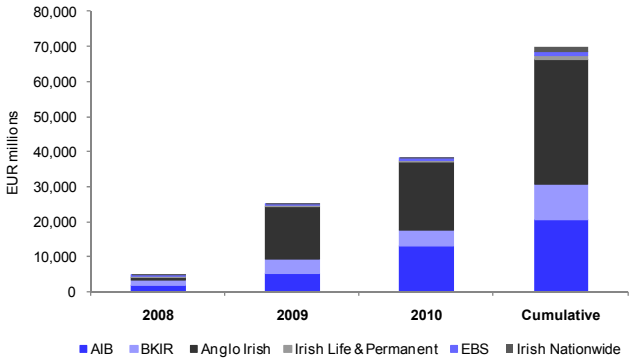
Anglo Irish and Irish Nationwide are now nationalised entities in run-down. AIB is now 99.8% state owned and the building society EBS (also state owned) has become a subsidiary of AIB BKIR recently underwent a E4.3bn capital raise using a combination of LME, rights issue and institutional placing, resulting in 15% state ownership, 19% bondholder ownership and the balance private investors. The banks still listed: BKIR, AIB, Irish L&P are currently 1%, 0.5% and 0.25% of their peak share prices respectively (Figure 224). Fianna Fail, the ruling party which had been in power since 1987, was defeated by a Fine Gael & Labour coalition in Irish national elections in early 2011.

Attempts at resolving the crisis

State guarantee, bailouts and NAMA

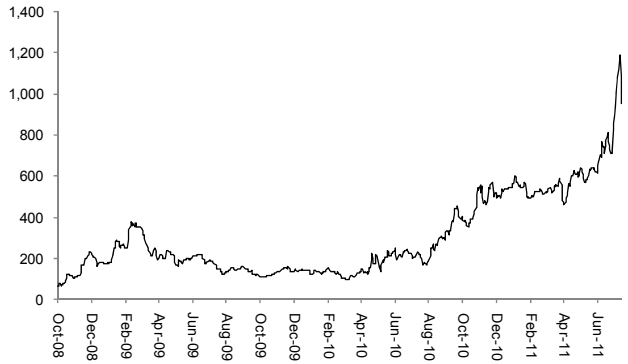
As mentioned above, the initial government response to the crisis facing Ireland in Sept 2008 was to guarantee E400bn of financial sector liabilities in order to keep the sector solvent. This was followed in December by the first of several recapitalisation rounds (E5.5bn contributed in this case). In January 2009, Anglo Irish Bank was nationalised, and a further E7bn was injected into AIB & BKIR. As property prices fell further, the scale of non-performing property development loans became more apparent. The Irish government's solution for this was to create a 'bad bank' (similar to that used by Sweden in the 1990s) called the National Asset Management Agency (NAMA), announced in April 2009. Since then NAMA has bought E72.3bn of loans from the 5 main Irish banks, at an average discount of 58% - significantly higher than was initially expected. These crystallised bank losses, and combined with provisions taken against other portfolios retained by the banks have resulted in impairments of c.E70bn in the three years 2008-2010, of which Anglo Irish represented over half. Adding in losses taken by RBS's Ulster Bank Subsidiary and Lloyds Banking Group's HBOS Irish operations (both of which did not participate in NAMA) raises total impairments taken *up until 2010* to c.E90bn, c.60% of GDP. NAMA has subsequently written down the value of its property loans even further, though it still budgets a net gain to the taxpayer of E1bn over its ten year life.

Figure 225: Provisions through the crisis



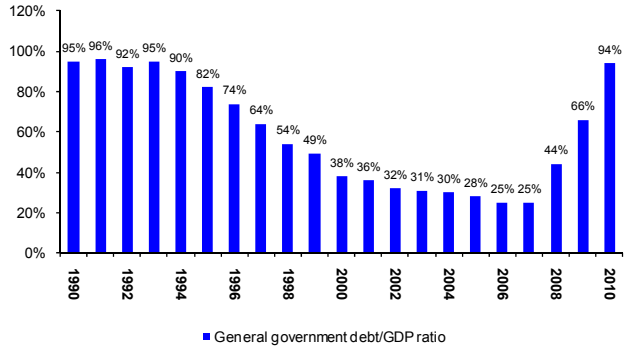
Source: Deutsche Bank estimates, company data

Figure 226: Irish 5yr CDS



Source: Datastream

Figure 227: Irish Debt to GDP

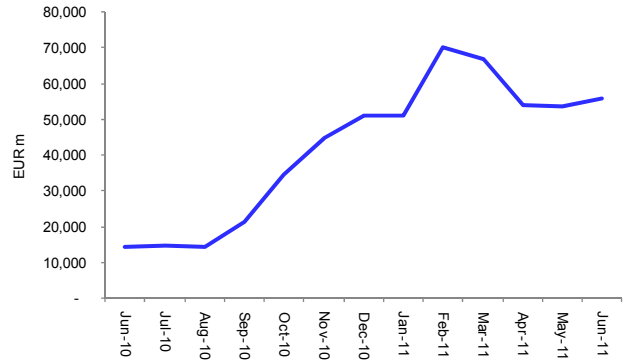


Source: National Treasury Management Agency

...leading to IMF/EU bailout

The scale of property losses saw AIB and BKIR raise additional capital during 2010, with BKIR completing a E3bn capital raise in which the state participated. The liability guarantee was due to expire at the end of September 2010, but with Irish banks struggling to fund in the unsecured markets (Figure 228), this was extended and further capital raisings were ordered (Figure 220). In November 2010, amidst increasing concern over the effectiveness of implemented austerity measures, size of public debt (94% of GDP at the end of 2010, Figure 227), further likely losses from the banking system, and rising CDS premia (Figure 226), the Irish government formally requested support EU and IMF. The result was an E85bn package, comprised of E50bn for budgetary financing needs and E25bn to strengthen bank capital bases and for future contingencies. The Irish state was also required to implement a package of austerity reforms, and conduct a fresh round of stress testing of the banking sector.

Figure 228: ECB financing to Irish Banks



Source: Central Bank of Ireland

IMF/EU-required recapitalisation of the banks

The stress tests, announced at the end of March 2011, sought to establish recapitalisation additional capital requirements for the remaining 4 Irish institutions on the basis of future expected loan losses, plus a buffer designed to cover unforeseen losses and bolster market confidence. As shown in Figure 229 below, the report estimated E20bn of further losses over the 2011-2013 on the base scenario, rising to E27bn in the adverse case. This is on top of the E70bn losses taken by Irish banks since 2008, and assumes no further impairment provisioning requirements at Anglo Irish. If these loss expectations are correct, then almost a quarter of the E400bn of loans on Irish bank balance sheets in 2008 will have been written down over the 6 year period. By way of comparison, the cumulative three year peak losses in the early 1990's recession in UK saw losses of 6.0% at Barclays (91-93), 4.9% at LBG (92-94), and 5.15% for RBS (91-93), further evidence of the scale of the Irish credit crisis and the poor quality of lending which took place in the prior decade.

Figure 229: Central Bank expected loss assumptions

	AIB		BKIR		Irish Life & Permament		EBS		Total	
	Base	Stress	Base	Stress	Base	Stress	Base	Stress	Base	Stress
Residential Mortgages	2,005	3,066	1,361	2,366	1,624	2,679	848	1,380	**5,838**	**9,491**
Corporate	564	972	799	1,179	0	0	0	0	**1,363**	**2,151**
SME	2,157	2,674	1,445	1,837	0	0	0	0	**3,602**	**4,511**
CRE	3,653	4,490	3,148	3,847	231	400	127	197	**7,159**	**8,934**
Non-mortgage corporate and other	1,167	1,403	627	891	259	342	0	0	**2,053**	**2,636**
Total	**9,546**	**12,605**	**7,380**	**10,120**	**2,114**	**3,421**	**975**	**1,577**	**20,015**	**27,723**
Recap requirement	***13,300***		***5,200***		***4,000***		***1,500***		***24,000***	

Source: Central Bank of Ireland Financial Measures Programme Report

The E24bn additional capital raise for the sector is ongoing. The Credit Stabilisation Act (passed by the last Irish government in Dec 2010) gives the Minister of Finance extraordinary powers to inject capital where required, overriding normal equity and bondholder rights and potentially forcing cram down on debtholders. So far these powers have been used to inject capital into AIB, and to generate equity from debtholders in Anglo & AIB. The BKIR capital raise has been completed, though there remains scope for these powers to be used against subordinated debtholders.[3]

Though lossmaking at present, Bank of Ireland management aim to produce a low teens ROE in 2014 driven by an improvement in net interest margin (up by around a third), normalisation of loan losses, and substantial cost cutting. If achieved, this could see the bank producing E800-900m a year in attributable earnings at that point, compared with a current market cap of about E3bn. It is also interesting to note that the company expects to produce a >15% core tier 1 ratio at that date, despite the intent to repay E1.8bn in government preference shares by then. If we assume forward RWAs of, say E62bn, and a normalised core tier 1 requirement of 12%, this would imply surplus capital of about E1.8bn, 60% of current market cap. This plan requires a return to far lower funding costs and easier market access to wholesale debt markets for the Irish banks, as well as loan loss normalisation, prompting a sharp improvement in profitability. We note the purchase of 35% of Bank of Ireland from the Irish government in July 2011 by a group of investors including Fairfax Financial Holdings, WL Ross & Co, Fidelity and Capital Group.

[3] See our note on BKIR's capital raise: 'One step at a time' (July 2011)

Australian Case Study

Australian Banking Crisis – 1991 – 1993

In this section we review the major Australian Banking crisis of 1991–1993 which resulted in 2 of the largest banks in the country taking significant writedowns and requiring substantial capital injections in order to remain solvent. The crisis was driven by a combination of: i) deterioration in the macroeconomic environment; ii) deregulation of the banking industry leading to strong competition and poor lending practices.

We will review these issues in the sections below, coupled with the cost of the crisis and how the crisis was resolved.

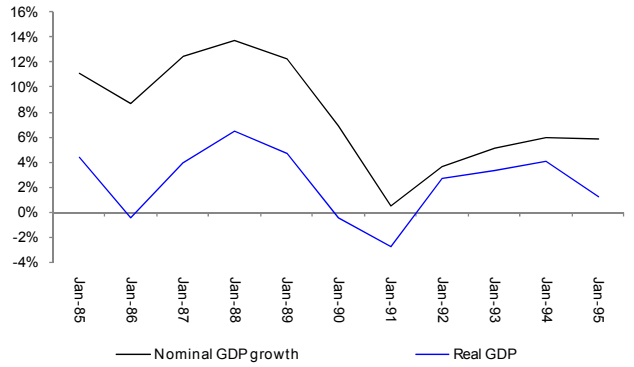
Background to the crisis

In the early 1980's Australia embarked on a series of financial system reforms, primarily in response to the report handed down by the Campbell Committee. These reforms included the removal of interest rate ceilings on bank deposits, the introduction of the tender system for the sale of Treasury notes and bonds, and the floating of the AUD in December 1983.

But the single most important catalyst for the banking crisis was the deregulation of the banking market, which saw the entry of 15 foreign banks in 1985. In the words of former Reserve Bank of Australia (RBA) Governor Ian Macfarlane, "they were eager to gain a foothold in Australia, and this meant lending to where it was easiest to do so, which was lending to businesses. Foreign banks everywhere have always found it difficult to break into the household lending market"[4].

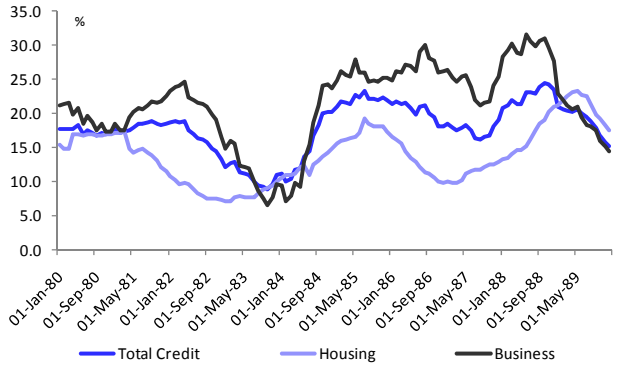
Deregulation led to a boom in asset prices, an associated company takeover frenzy, and a property bubble. In turn, this drove a multi-year boom in GDP growth and credit growth in Australia, as shown in the chart below.

Figure 230: Australia's nominal and Real GDP growth



Source: Deutsche Bank, RBA

Figure 231: Credit growth prior to the crisis



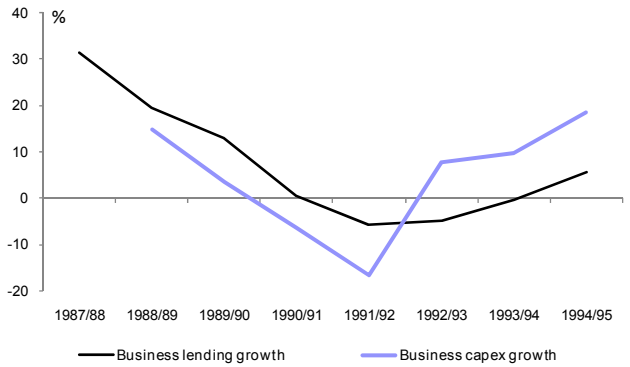
Source: Deutsche Bank, RBA

Annual credit growth averaged 17.9% in the ten years ended 31 December 1989, and total credit in the economy rose from 55% of GDP as at 30 June 1985 to 81% of GDP as at 30 June 1990. Rolling 12 month credit growth peaked in June 1988 at 31.5%, just a couple of years prior to the start of the crisis.

[4] "The Recession of 1990 and its Legacy", Lecture 3 in the Boyer Lectures, delivered by Ian Macfarlane, 2006

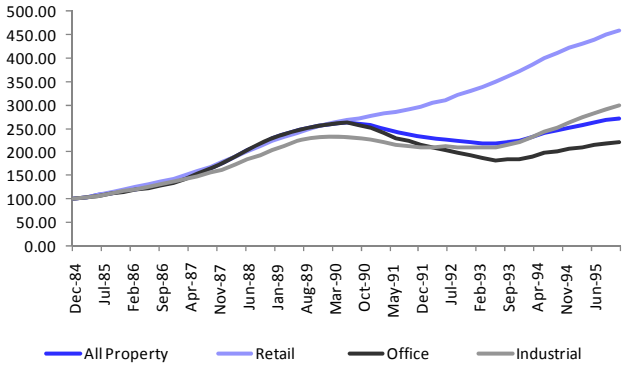
The banking sector reacted to deregulation by chasing growth. Most of this growth was concentrated in the commercial property market and largely reflected speculative investment as shown in the chart below which highlights business credit growing above business CAPEX before the crisis. Interestingly, as highlighted in the previous chart, housing was not as big a driver of total credit growth over this time.

Figure 232: Business credit outpaced business capex



Source: Deutsche Bank, ABS, RBA

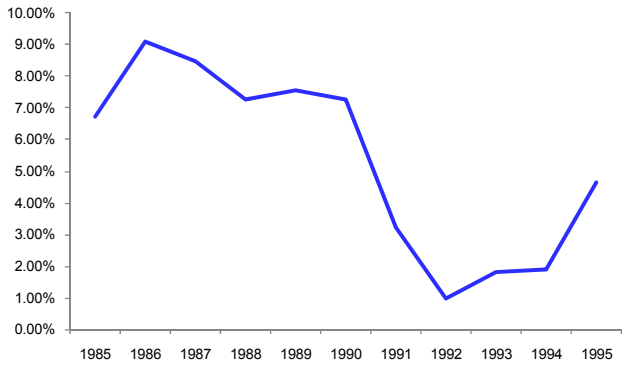
Figure 233: Commercial property prices spiked



Source: Deutsche Bank, IPD. Index base 100 at December 1984 quarter

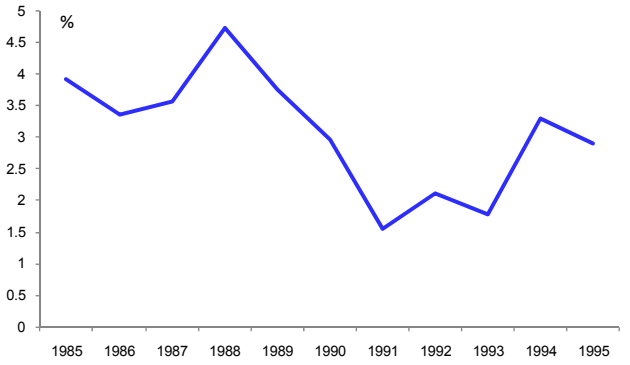
In the 5.5 years from December 1984 to June 1990, commercial property prices increased at a compound annual growth rate (CAGR) of 19% p.a., with growth peaking in CY88 and CY89 at ~30% p.a. This was followed by a peak to trough fall in office property prices of -30% over the subsequent three years.

Figure 234: Inflation was a persistent problem



Source: Deutsche Bank, ABS

Figure 235: World GDP growth stalled sharply



Source: Deutsche Bank, World Bank

The strong period of Australian economic growth was brought to a rather sudden end in 1990, driven by:

- The RBA aggressively raising rates in order to fight inflation, which had increased to 7.5% in the second half of 1989. The official cash rate peaked at over 18% in the second half of 1989, and was accompanied by mortgage lending rates of 16%-17%; and
- The stalling of global economic growth, which flowed through to Australia. Of the 18 OECD countries of reasonable size and development, 17 experienced a recession in the early 1990s[5].

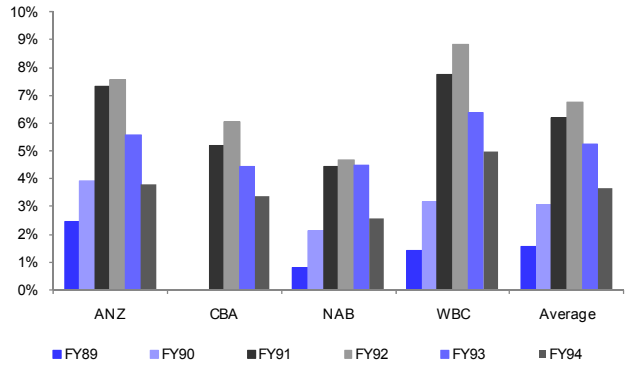
Impact of the crisis

The combination of the factors identified above resulted in:

- Australian GDP growth falling to 0% in 1991 and -3% in 1992;
- Rising unemployment (with the unemployment rate rising to 12% in the years following the recession and banking crisis); and
- An unwinding of the asset price bubble.

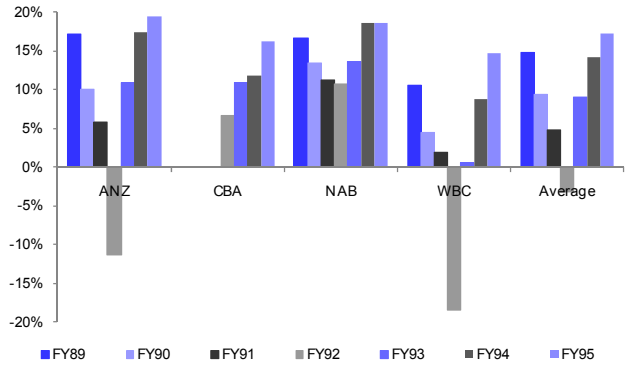
The worsening conditions in the economy soon flowed through to the banking sector. This resulted in a significant increase in non-accrual loans during the crisis, as shown below.

Figure 236: Non-accruals/GLAs peaked at 8% in FY92…



Source: Deutsche Bank, Company Data

Figure 237: …while the bank sector ROE fell to -3%

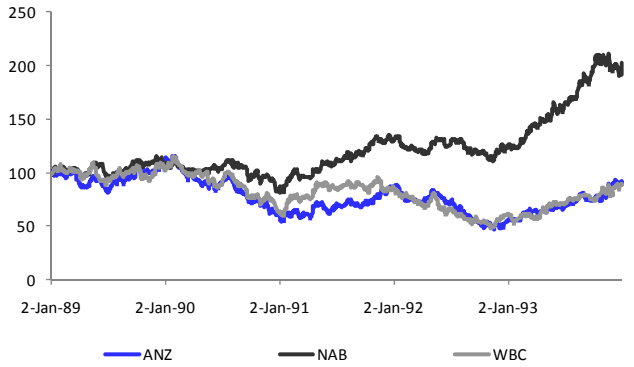


Source: Deutsche Bank, Company Data

The bank sector average ROE fell to -3% in FY92 as a result, and bank sector share prices suffered, most notably ANZ and WBC, which were hit the hardest by the crisis. Eventually, these banks had to be recapitalized. Meanwhile, the broader market index recovered much more quickly.

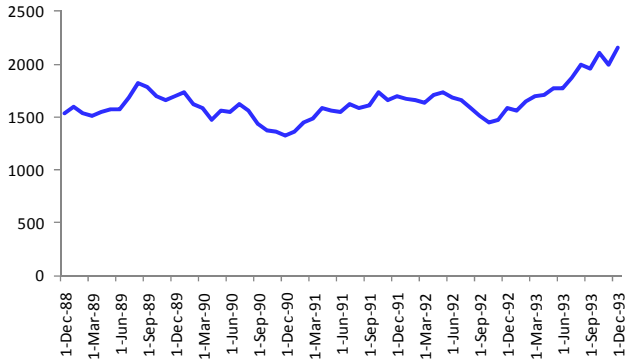
[5] "The Recession of 1990 and its Legacy", Lecture 4 in the Boyer Lectures, delivered by Ian Macfarlane, 2006

Figure 238: ANZ and NAB share prices fell considerably



Source: Deutsche Bank, IRESS. Note: Base index of 100 as at 2 January 1989. CBA excluded given it was not listed until September 1991

Figure 239: The All Ordinaries recovered more quickly



Source: Deutsche Bank, IRESS

The problems were not limited to the major banks. During this period, there were a number of Australian financial institutions outside the majors which failed, including[6]:

- The State Bank of Victoria, which collapsed largely due to problem loans held by its subsidiary Tricontinental. State Bank of Victoria was sold to CBA in 1990;
- The State Bank of South Australia, which was bailed out by the South Australian government when it lost $3.3bn;
- The Pyramid Building Society (the second largest at the time), which failed due to the risky commercial loans it made and a run on deposits in early 1990. The Victorian Government eventually provided financial assistance equal to 25 cents in the dollar to depositors, which cost over $900m;
- The Western Australian Teacher's Credit Society, which sought government assistance and was bought by R&I bank; and
- A number of other financial institutions, including merchant banks such as Rothwell's and Spedley's, a mortgage trust (Estate Mortgage), and a friendly society (the Order of the Sons of Temperance)[7].

Measuring the crisis

The banking crisis/recession was a fairly serious one, with the recession starting in the September quarter of 1990 and lasting until the September quarter of 1991. During the recession, GDP fell by 1.7%, employment by 3.4% and the unemployment rate rose to 10.8%. It took the economy 5 quarters to reach the level of nominal GDP achieved in June 1990. Nonetheless, the recession was not as deep as the 1982 recession, when GDP fell by 3.8%.

In the banking sector, problem loans to gross loans and advances peaked at 7% on average for the major banks. The role of deregulation in the crisis cannot be over-emphasised. Treasury notes that the share of non-performing loans to total assets peaked at 12% for the foreign bank sector in the early 1990s, twice the peak in the broader system[8].

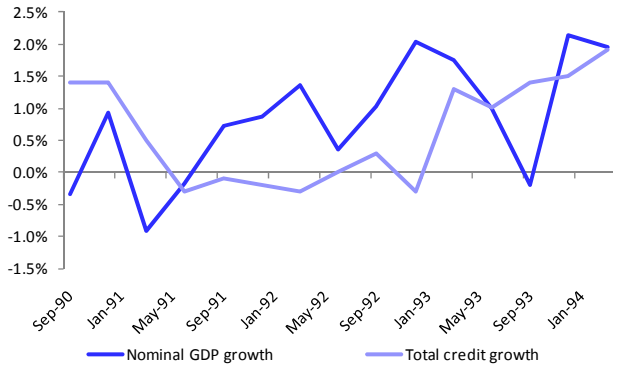
The crisis has a clear impact on credit growth. Although remaining positive in the early stages of the recession, growth in total credit then turned negative in mid-1991, and it wasn't until the June quarter of 1993 that credit growth exceeded nominal GDP growth.

[6] Australian Government Treasury, Study of Financial System Guarantees, 2004

[7] "The Recession of 1990 and its Legacy", Lecture 4 in the Boyer Lectures, delivered by Ian Macfarlane, 2006

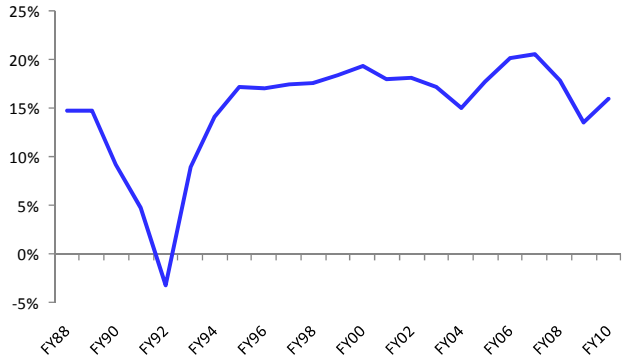
[8] Australian Treasury, Economic Roundup Summer 2003-04, "Globalisation: the role of institution building in the financial sector"

Figure 240: Credit lagged GDP in the recovery



Source: Deutsche Bank, ABS

Figure 241: ROE recovered to pre-crisis levels in FY95



Source: Deutsche Bank, Company Data

Returns for the majors also suffered as a result. It was not until FY95 that the average ROE of the major banks reached pre-crisis levels, but the industry's attractive dynamics has seen a sustained period of strong returns since then.

Resolution of the crisis

The crisis saw recapitalization of both ANZ and WBC. WBC raised $1.2bn of equity capital in September 1992 in a 3-for-10 rights issue. Meanwhile ANZ raised $779m in a 1-for-5 rights issue, which was conducted in two instalments (the first in March 1992 and the second in March 1993).

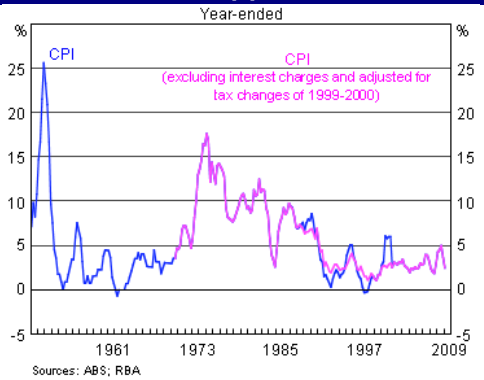
Prudential regulation also picked up significantly after the crisis. Tougher capital requirements were applied to Australian banks, partly reflecting Australia's adoption of the Basel accord, and the RBA also introduced increasingly sophisticated risk management guidelines which led to differentiated capital requirements for specific risks of institutions. Capital adequacy requirements were also introduced and tightened for non-bank deposit taking institutions over the same period. [9]

While the economy took some time to recover, the recession had the effect of permanently lowering inflation and inflationary expectations in the economy. The Australian economy went from a situation in the 1980s of inflationary expectations above 10% to a low inflation environment. This was in part assisted by the adoption of inflation targeting by the RBA in 1993.

This focus on permanently lowering the inflation rate, along with continued emphasis on financial deregulation and the opening up of the economy to international competition, has seen an unbroken period of continuous economic expansion from 1991 to today. As shown below, this environment was also assisted by the depreciation of the AUD.

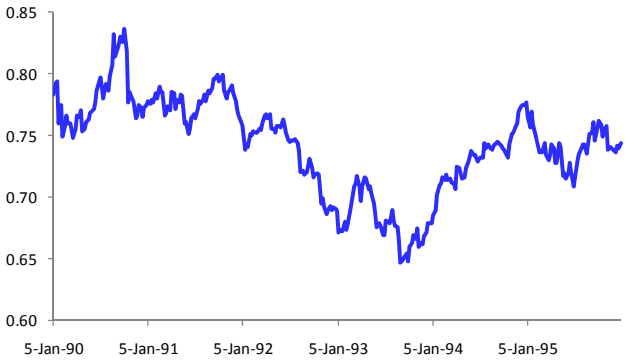
[9] Australian Government, March 1997, "Financial System Inquiry Final Report".

Figure 242: Inflation fell dramatically post crisis



Source: Deutsche Bank, RBA

Figure 243: AUD depreciation assisted the real economy



Source: Deutsche Bank, IRESS

This long period of economic expansion was achieved despite the Asian financial crisis of the late 1990s and the global financial crisis which began in 2008. The expansive environment has been very supportive of the Australian banking sector. In addition, continued strong profitability in the sector, and the vigilance of the prudential regulator, has meant that we have not seen a repeat of the 1991/92 crisis.

Some years after the crisis, the Wallis Committee recommended in 1997 that the Australian Prudential Regulation Authority (APRA) should be set up to assume the responsibility for prudential regulation of the industry, replacing the Reserve Bank of Australia.

Sweden: Deregulation and macro shocks behind 1990s bank crisis

1. Bubble creation and collapse

The Swedish, Norwegian and Finnish, financial crises in the late 1980s and early 1990s have strong similarities and patterns. In particular, most empirical resarch agree that the deregulation of the Swedish credit market in the early and mid-1980s, as well as a negative real interest rates are key explanations for the rapid credit growth, which drove asset prices to un-sustainable levels. In addition, to a bursting real esate bubble, the severity of the banking crises in both Sweden and Norway, was excarbated by a currency- and macro shock.

The deregulation. The Swedish financial sector was heavliy regulated in the late 1970s and early 1980s. Most notably, banks were subject to a) lending celings b) liquidity requirements c) caps on lending rates. In addition, Sweden had a currency regulation, which restriced foreigners and Swedish residents investments in foreign currency denominated financial securities and real estate. The combined effect of these regulations and requirements fostered inefficient banks, and crippled their basic function as suppliers of credit in the economy. The deregulation started in early 1980s, and during the short period of only three years, between 1983 and a1985, the financial system was transformed from being heavily regulated to a much more market oriented system. By 1985, the strict liquidity ratios, lending caps and ceilings on lending rates were all gone. An explanation for the deregulation was the internationalisation of capital markets as well as the Swedish state's need to get access to a more developed fixed income market in order to fund the growing budget deficit.

In addition to deregulation the dynamics of the Swedish economy, set the stage for rapid credit expansion. In the 1980s, the Swedish economy was characterised by high inflation, weak fiscal disciplined and a number of currency devaluations, which kept inflation expectations high. The tax system promoted households, and housing co-corporations, to borrow as interest payments were fully tax deductible. The combination of high inflation and fully deductable interest, implied very low or negative real interest rates, all trough the 1980s.

2. Financial crisis outline

From the mid-1980s, overall lending growth virtually doubled from 14% annually to 29%, in the years from 1985 to 1990. This credit expansion, drove asset inflation and prices on Swedish Commercial Real Estate increased in total by almost 140% in just 5 years, until they peaked in 1990. The Swedish banking crisis started in 1991, and banks' loan losses rapidly increased from just 47bp in the preceding five years to a peak of 360bp in 1993.

The crisis was triggered by a combination of domestic and international factors and events. First, interest rates started to rise, both internationally and in Sweden as the Swedish Riksbank wanted to tame inflation. Sweden had a peg to the Deutsche Mark at the time, and as the pressure on the Swedish krona increased, due to high inflation and a deteriorating fiscal position, the Riksbank was forced to at one point raise over-night interest rates to 500% to defend the currency peg. The defence was unsuccessful and in November 1992, the peg was abandoned and in the next two months the Swedish krona fell by 20%. Real estate companies had borrowed in Deutsche Marks and invested in Swedish real estate, the devaluation triggered a number of defaults, and significant loan losses, in the real estate sector. Another trigger point for the crisis was a Swedish tax reform in 1990/1991, which cut the tax-shield on interest payments from 50% to 30%. Households debt service ability deteriorated and the reform was a negative for house prices.

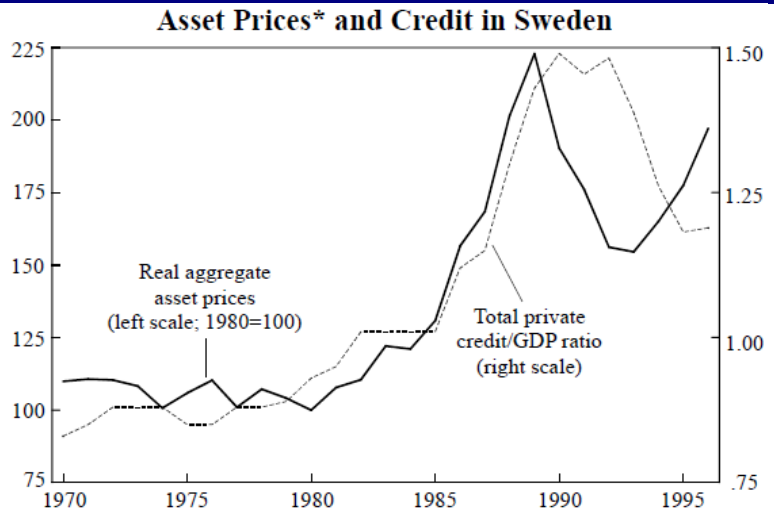
3. End of the financial crisis

In the autumn 1992, the Swedish state had nationalised Nordea and Gota Bank, and issued capital guarantees to Första Sparbanken. Moreover, in September 1992, the government issued a blanket guarantee on all bank debt (not including equity), which covered all banks. Furthermore, Föreningsbanken got in 1993, a capital guarantee from the state, should its capital ratios fall below 9%.

A vehicle for bank resolution was created in May 1993, called Bankstödsnämnden (Banking support authority) and all in all, policy actions and the resolution regimes proved successful in stabilising the system. The blanket guarantee on all bank debt, kept funding markets open for banks and there was a political consensus around the policy actions, which gave them credibility. However, the banks and the macro economy in Sweden, was naturally helped by the 20% depreciation of the currency. After contracting by in total 5.2% in 1991-1993, the Swedish GDP expanded by 3.9% in 1994 and 4.2% in 1995.

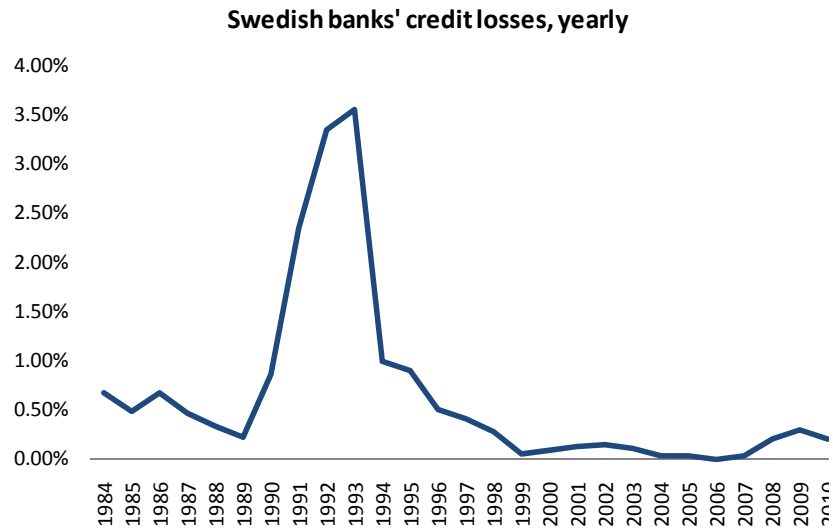
The direct support to the banking system was SEK66bn (P. Englund, 1999, Oxford Review, Vol 15) and the final cost is estimated to SEK35bn, equal to 2.1% of Swedish GDP (Jennergren, Näslund 1997, Bankriser och dess hantering).

Figure 244: Rapid credit expansion driving asset prices to unsustainable levels



Source: Deutsche Bank, Urban Bäckström, What Lessons Can Be Learned from Recent Financial Crisis? The Swedish Experience

Figure 245: Swedish credit losses increased 7x and peaked at 350bp in 1992



Source: Deutsche Bank, company data, SCB, Swedish Riksbank

US Sub-Prime Crisis

Background

The financial crisis was largely caused by excessive risk-taking and poor regulatory oversight. When you get down to the details, the bursting of the housing bubble in 2007 was the primary catalyst behind the economic collapse.

A brief background on the financial crisis

Steadily decreasing interest rates from the early 1980s onward made buying a home more affordable for many. Additionally, easy and available credit provided by the banks starting in the early/mid 2000s made this even easier. In the early 2000s, banks began to hold onto a large percentage of the MBS they originated to capture the spread. With the demand for MBS rising in the US and abroad and supply of conforming loans limited, banks began to securitize subprime loans. Additionally, the underwriting of low- or no-documentation loans and adjustable rate mortgages (ARMs) began to increase, further lowering the quality of mortgages and MBS. Partly enabling the growth in MBS originations were Fannie Mae and Freddie Mac who also began increasing their holdings of risky loans.

The risk involved with MBS was largely overlooked due to the historical track record of real estate, which for the most part increased in value over the longer term and was at the time, in a very strong uptrend (property values in the US more than doubled from 2000 to 2007 based on the Case Schiller Index). Mortgage related debt also more than doubled over this period as a result. The increase in demand for housing led to inflated prices and homeowners became increasingly leveraged, many relying on continued home price increases and future mortgage refinancing to avoid future default. This did not occur and in 2007 when the mortgage market started to unravel, housing prices began to plummet. The sharp housing downturn led to a deep global recession.

The direct impact on banks

As housing prices declined, banks faced substantial losses on their MBS and derivative exposure to this market. As losses continued, it became clear that banks were undercapitalized when adjusting for all of the on and off-balance sheet exposure they had to the mortgage market. Certain customers began pulling funds from some banks that were viewed as less safe and questions started to arise regarding bank liquidity. Many banks had been depending on overnight borrowings (which had to be renewed every night) that were backed by the same MBS they were facing substantial losses on. As this market dried up, the solvency of certain banks came into question. The lack of transparency of banks' balance sheets and the interconnectedness among them magnified the problems. In total, FDIC insured banks incurred almost $600b of loan losses during the crisis (through 1Q11), equal to the previous 18 years of losses combined. Over 300 banks have failed since the start of the crisis.

Other contributors to the crisis

Credit ratings agencies: Triple-A ratings were given to many MBS which in hindsight, did not deserve them given the poor quality of the underlying mortgages. Having a triple-A rating allowed for a different class of investor to invest (some institutions required this rating to invest), providing a continuous flow of capital to underwrite new loans and MBS.

Limited oversight: Regulators continued to rate firms they oversaw as safe in the face of mounting troubles. Firms began taking on too much risk with too little capital and too much reliance on short term borrowings. Helped by deregulation of the OTC derivatives market in 2000, regulators permitted the growth of a massive shadow banking system (including repo lending, off-balance-sheet entities, and use of OTC derivatives).

Derivatives: The signing of The Commodity Futures Modernization Act of 2000 deregulated the over the counter (OTC) derivatives market. Without any oversight, the OTC derivatives market rapidly expanded, growing to $673 trillion in notional amount. The Financial Crisis Inquiry Commission noted that OTC derivatives fueled the crisis in several ways including:

- Credit default swaps (CDS) fueled the mortgage securitization pipeline. CDS were sold to investors to protect against the default or decline in value of mortgage securities backed by risky loans. CDS helped to expand the market, further fueling the housing bubble.

- CDS were essential to the creation of synthetic CDOs (bets on the performance of actual mortgage-related securities). The use of CDOs amplified the losses from the collapse of the housing bubble by allowing multiple bets on the same securities and helped spread them throughout the financial system.
- After the bubble burst, certain institutions, which had not been required to hold meaningful capital against credit protection positions, were bailed out for the US gov't. Additionally, the existence of millions of derivatives contracts between systemically important financial institutions added to uncertainty and escalated panic, leading to the government assistance of these institutions.

Cost and Impact of Crisis

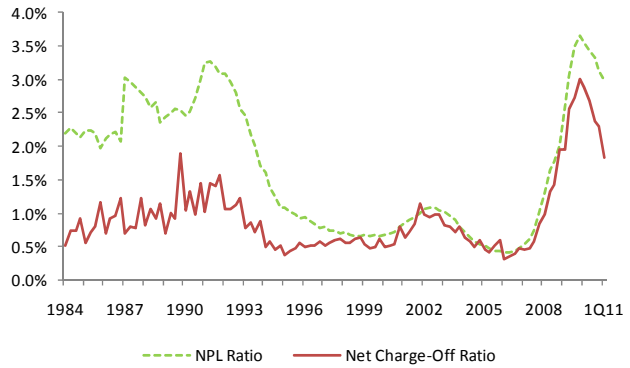
Nonperforming loans (NPLs) and net charge-offs (NCOs)

As a result of the financial crisis, banking sector NPLs (held at all FDIC insured institutions) increased from 0.40% in 2006 to a peak of 3.7% in 4Q09 before falling to 3% in 1Q11. While NPLs increased in all loan categories before peaking in 4Q09, construction and development and other construction loans contributed dramatically to this growth. NCOs followed the same trajectory, increasing from 0.60% in 2007 to a peak of 3.0% in 4Q09. NCOs have fallen substantially since then to 1.8% in 1Q11, but remain elevated by historical standards. See Figure 246.

Bank stock performance

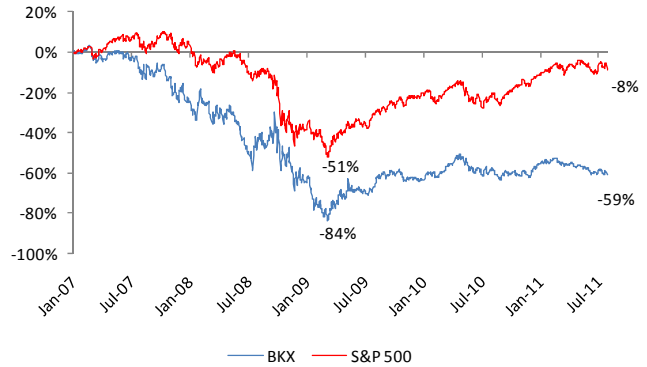
As of 8/12, bank stocks (measured by the BKX) were down almost 60% since the start of 2007 vs. down only 8% for the S&P 500. At the bottom, bank stocks were down 84% from pre crisis levels vs. a 51% decline for the S&P. See Figure 247.

Figure 246: Historical Charge-off and NPA Ratios



Source: FDIC

Figure 247: S&P 500 vs. BKX



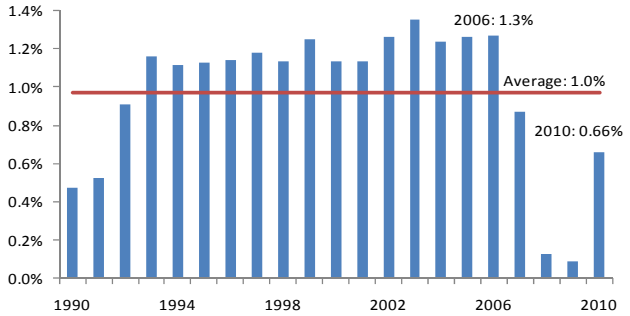
Source: Capital IQ

Return on assets

Return on assets (ROA) for the banking industry fell to 0.15%-0.20% in 2008-2009 vs. 1.3% pre-crisis and 1% on average over the last 20 years given large credit losses. Since then, ROAs have improved (to 0.7% in 2010), given improving credit. While ROAs averaged 1% over the last 20 years, they were much less than this in previous periods. ROAs could be lower than the recent trend going forward as banks somewhat revert to more traditional banking models given regulatory pressures. See Figure 248.

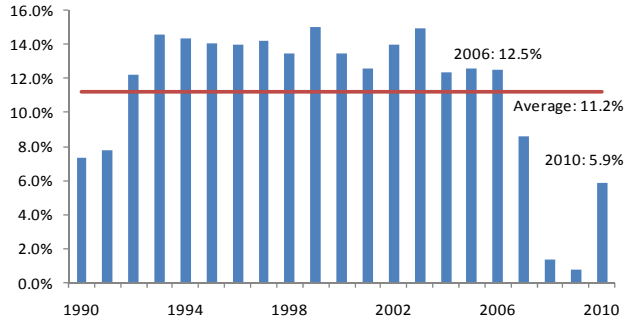
Return on common equity:
Return on common equity (ROCE) remains below its 20 year average of 11% and pre-crisis levels of 12.5% reached in 2006. While we have seen much improvement in late 2010 and early 2011, we may not see longer term ROCE's return to pre-crisis levels given higher capital requirements, specifically the likely requirement for banks to hold meaningfully higher common equity (close to 10% for some of the larger banks vs. ~4% pre-crisis). Additionally, increased regulation has led to fee revenue pressures and more of a shift to the traditional banking model, which could further reduce returns. See Figure 249.

Figure 248: Historical ROA



Source: FDIC

Figure 249: Historical ROCE

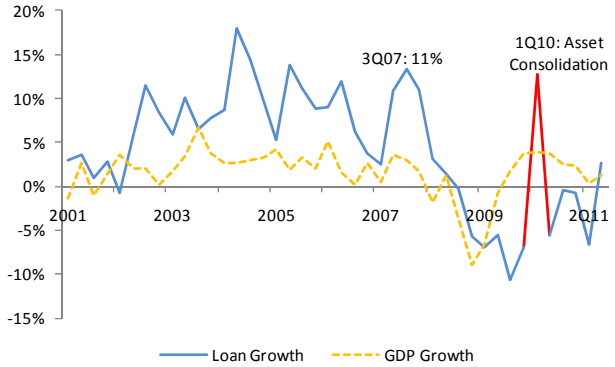


Source: FDIC

Measuring the Crisis and Resolution

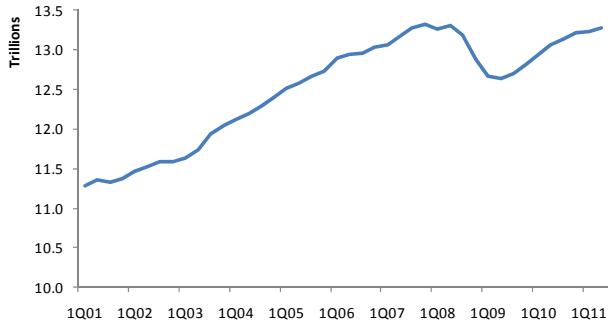
GDP and loan growth: Loan growth exceeded GDP growth from 2002 through 1Q08, but with the start of the financial crisis, new loan originations fell dramatically and banks began to shrink their balances sheets. Loan growth at FDIC insured banks has gone from a low of -10% annualized in 3Q09 to +2.6% in 2Q11 (slightly exceeding GDP of 1.3% based on Fed data). Note the spike in loan growth in 1Q10 was due to banks consolidating off-balance sheet assets due to accounting changes. Loan growth was fairly close to GDP growth in 4Q10 (2.9% vs. 2.3% for GDP) and slightly exceeded it in 2Q11 (2.6% vs. 1.3% for GDP). In dollar terms, GDP has yet to exceed its pre-crisis peak reached in1Q08. See Figure 250 and Figure 251.

Figure 250: Loan vs. GDP growth



Source: FDIC, Federal Reserve, and Bureau of Economic Analysis

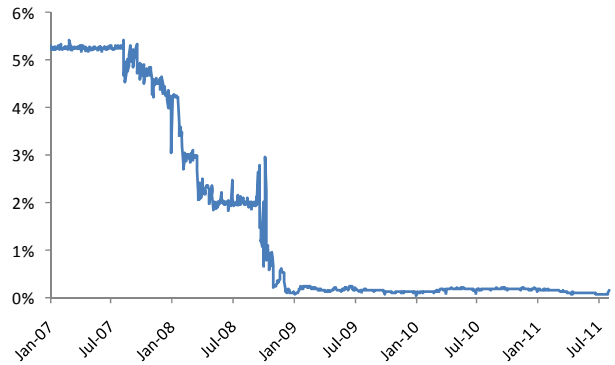
Figure 251: Annualized US GDP (in chained 2005 dollars)



Source: Bureau of Economic Analysis

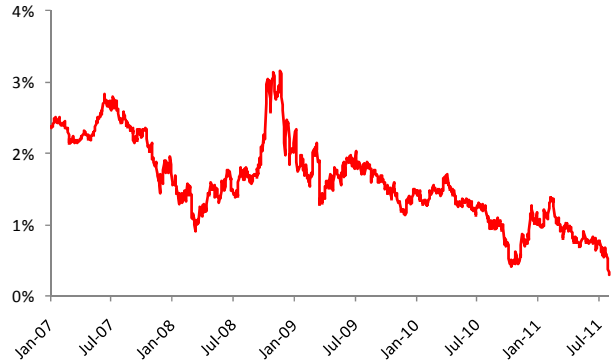
Monetary and fiscal policy: The Federal Reserve has lowered the fed funds rate to near zero at the end of July 2011 from a high of over 5% before the start of the crisis. Inflation adjusted 10-yr treasury rates have fallen by 210bps to 0.30% over this same period (See Figures 252 and 253 below). Additionally, in late 2008, the Federal Reserve announced its program to purchase $1.25 trillion of agency MBS through the end of 1Q10 to provide support to the mortgage and housing markets and to improve conditions in the financial markets. This program supplemented a similar program by the Treasury Department. The purchasing of these securities increased market liquidity and also acted to keep mortgage rates low (by driving up prices/preventing their decline). To further stabilize the economy, the Congress passed a stimulus bill with almost $1 trillion of spending increases and tax cuts.

Figure 252: Fed Funds Rate



Source: Deutsche Bank

Figure 253: Inflation Adjusted 10 Yr Rate



Source: Deutsche Bank

Resolution

Bank recapitalization and Basel 3 implications

Emergency Economic Stabilization Act of 2008. In response to crisis, the Congress passed this Act to improve the strength of financial institutions, and enhance market liquidity. Under the Troubled Asset Relief Program or TARP (part of the Act), the Treasury was allocated $700b to purchase mortgage backed securities from banks to increase banks' liquidity positions. However, these funds were never used for their intended purpose, and on October 14, 2008, $250b of these funds was allocated to purchasing senior preferred shares of banks.

Starting in November 2008, banks in aggregate received $245b in funding through sale of preferred securities to the government (under TARP). Before the results of the SCAP test in March 2009, Tier 1 capital was still the focus of regulators, so the preferred shares significantly helped banks' capital (as well as liquidity) positions. The Act also authorized a temporary increase in the FDIC deposit insurance limit to $250K until December 2009 to increase confidence in the system. The limit increase was subsequently extended through December 31, 2013 and made permanent under Dodd-Frank.

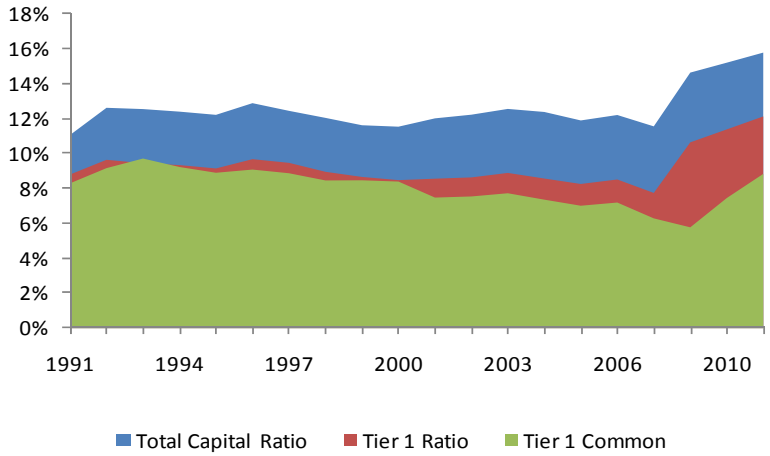
Supervisory Capital Assessment Program (SCAP). On May 7th, 2009 the Federal Reserve released the results the SCAP test, which was an assessment of the adequacy of bank capital levels in response to the economic down-turn. The Fed determined that the 19 largest U.S. bank holding companies should have a capital buffer sufficient to withstand losses and allow them to meet the credit needs of their customers under conditions of a more severe recession than was anticipated at the time.

The SCAP focused not only on the amount of capital banks held, but also on its composition. The SCAP's emphasis on Tier 1 common reflected the fact that common equity is the first level of the capital structure to absorb losses, offering protection to depositors and more senior parts of the capital structure, lowering the risk of insolvency.

A SCAP capital buffer was determined for each bank and targeted a Tier 1 ratio of at least 6% and a Tier 1 common ratio of at least 4% at the end of 2010 under the more adverse macroeconomic scenario discussed below. A BHC was required to have an additional SCAP buffer if it's pro forma Tier 1 ratio was below 6% or if its pro forma Tier 1 common ratio was below 4% at the end of 2010 (based on projections). The results of the test were that the total capital needed for the 19 BHCs to reach the SCAP capital buffer targets under the more adverse scenario was $185 billion, the majority needed to be in the form of Tier 1 common.

The impact of TARP and SCAP on capital. While total capital levels were fairly stable from 1990-2008, common equity had accounted for a decreasing portion over this period and hybrid and preferred stock (included in Tier 1 and Tier 2 Capital) became an increasingly large component before the 2008-2009 downturn (see Figure 254). Tier 1 and Tier 2 capital levels increased following capital raises at the banks via the government TARP program starting in November 2008 and Tier 1 common began to increase in 2009 given common raises to repay TARP and positive earnings.

Figure 254: Regulatory capital levels



Source: SNL
Note: Data based on banks under coverageNew capital and liquidity requirements

Basel 3 capital and liquidity. Final rules on capital and liquidity have not been written in the US, they will likely be guided by Basel 3 proposals which focus on the following:

- **Quality and level of capital:** The Basel Committee recommended raising the quality of capital. Recommendations include an increase in the minimum common equity ratio from 2% to 4.5% and a capital conservation buffer of 2.5%, bringing the total common equity requirement to 7%. Under the recommendations, capital requirements would be phased in from 2013 to January 2019. The Committee also stated systemically important banks should hold an additional common equity buffer (we think 100-250bps), potentially bringing minimum Tier 1 common levels close to 10% for large banks.
- **Liquidity standards:** The committee introduced minimum global liquidity standards consisting of both a short term liquidity coverage ratio and a longer term, structural net stable funding ratio.

Other regulatory changes

Dodd-Frank Wall Street Reform and Consumer Protection Act. The Act which passed in July 2010 was intended to prevent another financial crisis and future bailouts, and provide protection to consumers from bank practices. The Act creates/includes:

- **Consumer Financial Protection Bureau (CFPB):** Housed at the Federal Reserve, the CFPB is expected to protect consumers from deceptive bank practices.
- **Too big to fail:** In attempt to end too big to fail, the Act requires banks to write living wills which will be used to safely liquidate failing banks. The Act also places limitations on how large banks could grow through acquisitions (with liability caps to complement deposit limits that are already in place).
- **Volker Rule:** Prohibits proprietary trading and owning/investing in hedge funds and private equity firms, which will likely lead to the sale of these assets. While the details of the Volker rule have not yet been determined, banks will have two years to comply with the rule once finalized. As nontraditional businesses are sold off, banks will likely look for ways to maintain their balance sheets which could lead to acquisitions.
- **Regulation of hedge funds:** The Act requires hedge funds and private equity firms to register with the SEC and requires them to disclose trade information to determine whether they pose systemic risk to the system.
- **Financial Stability Oversight Council:** The Act also creates the Financial Stability Oversight Council, made up of 10 federal regulators, which has the responsibility of identifying and responding to new risks in the financial system and setting new minimum capital requirements. The council also has the authority to break up or require financial companies to divest assets if they pose danger to the financial system.
- **Derivatives reform:** The Act gives the SEC and Commodity Futures Trading Commission (CFTC) the authority to regulate OTC derivatives and creates a central clearinghouse for them. Credit exposure from derivatives transactions is now considered when determining banks lending limits.
- **Durbin Amendment and Interchange Fees:** The Act calls for the Federal Reserve to place limits on interchange fees, requiring fees to be reasonable and proportional to the cost of processing transactions. The final cap was set at $0.22, which will reduce bank's debti card interchange revenue by ~50% starting in 4Q11.
- **Securitizations:** The Act requires companies that securitize mortgages to retain 5% of the credit risk unless the underlying loans meet certain criteria. This rule is currently being debated—the final criteria for exemption are unknown.
- **Deposit insurance:** Dodd-Frank permanently increased the insured deposit limit to $250k which puts an additional burden on banks through higher assessments (the increase to $250k was previously temporary)—this will affect all banks. Along with these changes, the FDIC changed its assessment calculations on April 1, 2011, which shifts the burden of replenishing the insurance fund to large banks.

South Korea: the credit card bubble

Figure 255: Datapoints before and after the crisis (t=2003)

	t-5	t-4	t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	t+5
Macro											
GDP local currency (W tr)	501	549	603	651	721	767	827	865	909	975	1,026
Average short term interest rate	15.2	6.8	7.1	5.3	4.8	4.3	3.8	3.7	4.5	5.2	5.5
Period end short term interest rate	7.7	7.3	6.9	4.9	4.9	4.4	3.4	4.1	4.9	5.8	3.9
Period end 10 year government bond yield	NA	NA	7.2	7.0	5.8	5.4	3.9	5.6	5.0	5.8	4.9
CPI	7.5	0.8	2.3	4.1	2.8	3.5	3.6	2.8	2.2	2.5	4.7
Current account surplus/deficit (%)	11.9	5.3	2.8	1.7	1.3	2.4	4.5	2.2	1.5	2.1	0.3
Credit Structure											
Government debt (W tr)	80	99	111	122	134	166	204	248	283	299	309
Total credit in economy	NA	NA	NA	883	1,025	1,050	1,064	1,145	1,317	1,475	1,733
Banking loans	200	250	311	357	472	538	566	614	699	804	917
- of which:											
Mortgage loans	NA	NA	NA	NA	NA	153	169	190	216	221	239
Retail/consumer loans ex mortgages	NA	NA	NA	NA	NA	101	107	116	130	143	150
Other loans	NA	NA	NA	NA	NA	285	290	308	353	440	528
Industry data											
Top 5 banks share of banking sector assets		47.4%	50.1%	57.3%	57.3%	57.6%	56.3%	56.0%	60.7%	60.9%	60.1%
Non performing loans		12.9%	8.0%	3.4%	2.3%	2.6%	1.9%	1.2%	0.8%	0.7%	1.1%
Bad debt charge to loans		3.4%	2.8%	1.6%	1.5%	2.2%	1.3%	0.5%	0.4%	0.4%	0.9%
Bank sector equity to assets ratio		5.0	4.0	4.8	4.7	4.6	5.6	6.8	7.0	6.9	5.8
Bank sector ROE		-16.7%	-13.4%	13.6%	12.2%	3.8%	16.9%	20.3%	16.2%	16.2%	7.9%
Asset prices											
Stock market index year end	562	1,028	505	694	628	811	896	1,379	1,434	1,897	1,124
Year on year change in average house prices	-12.4%	3.4%	0.4%	9.9%	16.4%	5.8%	-2.1%	4.0%	11.6%	3.1%	3.1%

Source: Deutsche Bank, BOK, FSS, Kookmin Bank

Background and chronology

The credit card bubble and bust in Korea, in summary, was the result of a failure to contain the after-effects of a set of policies designed to stimulate the economy by jump-starting consumption. The Korean government was suffering the aftermath of the Asian Financial Crisis in 1998 and needed to prevent the rising unemployment and weak household income growth leading to a vicious cycle of weaker consumer spending and lower corporate profits. Hence, in September 1998, the Korean government announced a set of consumer finance boosting measures, which included fiscal stimulus for the housing market and financial support for the credit card business. The measures also included aggressive lowering of property transaction, acquisition and capital gain tax in order to boost the property market.

In addition to the accommodative policy for consumer spending, financial institutions in Korea quickly changed their focus to retail banking from wholesale banking after large corporate failures following the Asian Financial Crisis, leading to eased lending attitudes to households. The financial institution behaviour change with the backdrop of an accommodative consumer spending policy led to a big increase in household credit to W439tr as of end-2002 from W184tr as of end-1998, with a CAGR of 24.3%. The household credit / disposable income ratio during the period surged to 107% from 56%, setting the stage for a big surge in credit card asset delinquencies ahead.

Figure 256: Korean household's debt servicing capability and credit card asset quality

Source: Deutsche Bank, BOK, FSS

Surprise window dressing in large corporate group rattles the Korean credit markets, increases awareness of rapid deterioration in credit card operations

In February 2003, the Korean prosecutors found window dressing in a large conglomerate group affiliate named SK Global. Money market funds with SK Group corporate debt in its portfolio faced immediate redemption pressure and the incident left the corporate debt market in Korea paralyzed. The uncertainties in the financial markets sparked awareness about the deteriorating asset quality of the credit card companies, and it became almost impossible for credit card companies to refinance maturing debt.

In March 2003, to stabilize the financial markets the Korean government came out with measures to curb concerns about credit card companies, mainly by capital raisings by the major shareholders. The government followed suit with another set of measures in April 2003 to stabilize the financial markets, this time deciding to support rollover of credit card company debt and increase the size of capital raisings by the credit card companies. Such measures had a temporary effect of calming the financial markets.

Asset quality deterioration intensifies, turmoil at credit card companies and financial markets once again

The stability in the financial markets didn't last long, as the credit card companies started to see a surge in delinquencies and loan loss provisioning, posted accumulated loss of W5.1tr during from January to September 2003 vs. accumulated profits of W1.4tr during the same period in 2002. Refinancing of credit card debt became almost impossible and the companies started to encounter serious liquidity problems. Money market funds faced severe redemption pressure, causing trouble for the asset management industry.

Resolution of the crisis by recapitalization of the credit card sector and credit recovery programs for low credit individuals

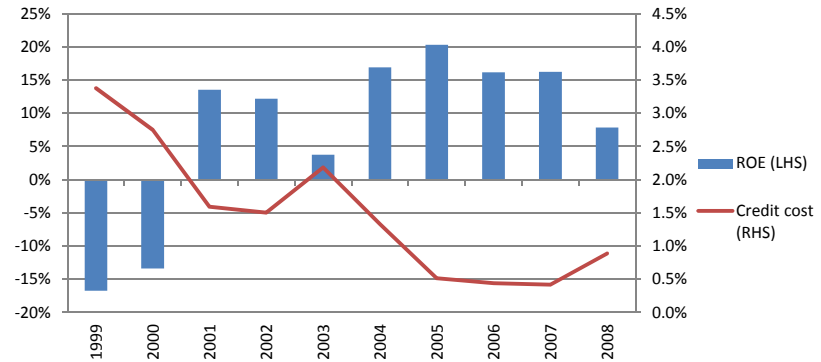
Given pressure from the government to recapitalize, mono-line credit card companies turned to their major shareholder for fresh capital or pursued mergers with other affiliates, while bank owned credit card companies were merged into the mother banks. As a result, major credit card companies such as Kookmin Credit Card were merged by Kookmin Bank, KEB Credit Card was merged by KEB and Woori Card was merged by Woori Bank. Samsung Card, being a mono-line credit card company received financial support from group affiliates to raise W938bn.

The government also urged the creditor financial institutions to provide credit recovery programs for financially troubled individuals, while also setting up funds to provide government-run credit recovery programs.

Cost and impact of the credit card crisis

The banking system's NPL ratios were only marginally impacted as credit card assets only accounted for only 3.4% of total bank loans. However, loan losses and the resulting ROE saw visible impact as credit cost for the sector rose to 2.2% in 2003 from 1.5% in 2002 and ROE fell to 3.8% from 12.2% during the period. The banking sector share prices were actually at bottom when the government came out with measures to stabilize the financial markets in April 2003 and started to rebound.

Figure 257: Banking sector profitability before, during and after the crisis

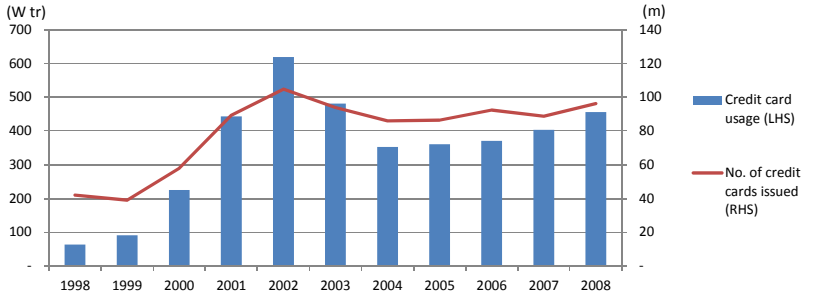


Source: Deutsche Bank, BOK, FSS

Measuring the crisis

Although the credit card bubble burst in Korea led to the highest credit cost for the banking sector since the Asian Financial Crisis at 2.2%, the impact on the overall banking system only lasted a year, with sector ROE, credit cost and NPLs all returning to pre-crisis levels. The impact on the overall economy seemed equally manageable, as nominal GDP growth rate picked up towards pre-crisis levels a year after the crisis. We believe this was because 1) credit card assets only accounted for less than 4% of total bank loans, 2) banks had enough funds to recapitalize most of the largest credit card companies and withstand the credit losses, 3) overall household loan quality remained resilient amid increasing household income and property prices, and 4) credit card issuance requirements were made stricter to fully reflect repaying capability as represented by the big decline in the number of credit card issued during 2003 and 2004.

Figure 258: Credit card usage and no. of credit cards issued



Source: Deutsche Bank, BOK

Appendix 1

Important Disclosures

Additional information available upon request

For disclosures pertaining to recommendations or estimates made on a security mentioned in this report, please see the most recently published company report or visit our global disclosure look-up page on our website at http://gm.db.com/ger/disclosure/DisclosureDirectory.egsr**.**

Analyst Certification

The views expressed in this report accurately reflect the personal views of the undersigned lead analyst about the subject issuers and the securities of those issuers. In addition, the undersigned lead analyst has not and will not receive any compensation for providing a specific recommendation or view in this report. Dan Harverd/Mario Pierry/Chris Ellerton

Equity rating key

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.

Sell: Based on a current 12-month view of total share-holder return, we recommend that investors sell the stock

Hold: We take a neutral view on the stock 12-months out and, based on this time horizon, do not recommend either a Buy or Sell.

Notes:

1. Newly issued research recommendations and target prices always supersede previously published research.

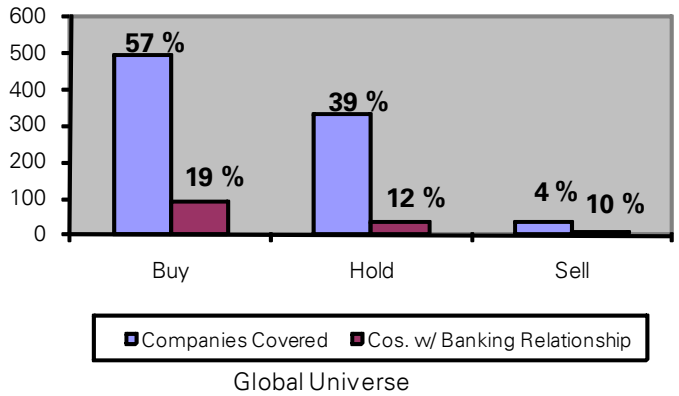
2. Ratings definitions prior to 27 January, 2007 were:

Buy: Expected total return (including dividends) of 10% or more over a 12-month period

Hold: Expected total return (including dividends) between -10% and 10% over a 12-month period

Sell: Expected total return (including dividends) of -10% or worse over a 12-month period

Equity rating dispersion and banking relationships



Regulatory Disclosures

1. Important Additional Conflict Disclosures

Aside from within this report, important conflict disclosures can also be found at https://gm.db.com/equities under the "Disclosures Lookup" and "Legal" tabs. Investors are strongly encouraged to review this information before investing.

2. Short-Term Trade Ideas

Deutsche Bank equity research analysts sometimes have shorter-term trade ideas (known as SOLAR ideas) that are consistent or inconsistent with Deutsche Bank's existing longer term ratings. These trade ideas can be found at the SOLAR link at http://gm.db.com.

3. Country-Specific Disclosures

Australia and New Zealand: This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act and New Zealand Financial Advisors Act respectively.
Brazil: The views expressed above accurately reflect personal views of the authors about the subject company(ies) and its(their) securities, including in relation to Deutsche Bank. The compensation of the equity research analyst(s) is indirectly affected by revenues deriving from the business and financial transactions of Deutsche Bank.
EU countries: Disclosures relating to our obligations under MiFiD can be found at http://www.globalmarkets.db.com/riskdisclosures.
Japan: Disclosures under the Financial Instruments and Exchange Law: Company name - Deutsche Securities Inc. Registration number - Registered as a financial instruments dealer by the Head of the Kanto Local Finance Bureau (Kinsho) No. 117. Member of associations: JSDA, Type II Financial Instruments Firms Association, The Financial Futures Association of Japan. Commissions and risks involved in stock transactions - for stock transactions, we charge stock commissions and consumption tax by multiplying the transaction amount by the commission rate agreed with each customer. Stock transactions can lead to losses as a result of share price fluctuations and other factors. Transactions in foreign stocks can lead to additional losses stemming from foreign exchange fluctuations. "Moody's", "Standard & Poor's", and "Fitch" mentioned in this report are not registered credit rating agencies in Japan unless "Japan" is specifically designated in the name of the entity.
Russia: This information, interpretation and opinions submitted herein are not in the context of, and do not constitute, any appraisal or evaluation activity requiring a license in the Russian Federation.

Deutsche Bank AG/London

Latin American locations

Deutsche Bank Brazil
Av. Brigadeiro Faria Lima, 3900
CEP 04538-132 São Paulo
Brazil
Tel: (5511) 2113 5000

Deutsche Bank Mexico
Blvd. Manuel Avila Camacho No. 40,
Colonia Lomas de Chapultepec
Piso 17
11000 Mexico City, Mexico
Tel: (5255) 5201 8000

Deutsche Bank Chile
Av El Bosque Sur 130
Piso 5 - Las Condes
Santiago de Chile
Chile
Tel: (562) 337 7700

International locations

Deutsche Bank Securities Inc.
60 Wall Street
New York, NY 10005
United States of America
Tel: (1) 212 250 2500

Deutsche Bank AG London
1 Great Winchester Street
London EC2N 2EQ
United Kingdom
Tel: (44) 20 7545 8000

Deutsche Bank AG
Große Gallusstraße 10-14
60272 Frankfurt am Main
Germany
Tel: (49) 69 910 00

Deutsche Bank AG
Deutsche Bank Place
Level 16
Corner of Hunter & Phillip Streets
Sydney, NSW 2000
Australia
Tel: (61) 2 8258 1234

Deutsche Bank AG
Filiale Hongkong
International Commerce Centre,
1 Austin Road West,Kowloon,
Hong Kong
Tel: (852) 2203 8888

Deutsche Securities Inc.
2-11-1 Nagatacho
Sanno Park Tower
Chiyoda-ku, Tokyo 100-6171
Japan
Tel: (81) 3 5156 6770

Deutsche Bank Global Research

Global Banking Report
September 2011

Global Disclaimer