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Deutsche Bank

11 May 2011

US Large Cap Banks

Banking 101

Special Report

Understanding banks and bank stocks
In this (98 page + Appendix) report, we discuss how to analyze banks and bank stocks. We discuss key topics including: what drives bank revenues, trends in capital, credit and liquidity, the impact from regulation (both current and historically), interest rates, how bank stocks are valued and how bank stocks trade.

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Understanding banks and bank stocks
In this (98 page + Appendix) report, we discuss how to analyze banks and bank stocks. We discuss key topics including: what drives bank revenues, trends in capital, credit and liquidity, the impact from regulation (both current and historically), interest rates, how bank stocks are valued and how bank stocks trade.

Back to the basics: net interest income to be key driver of revenues
Net interest income represents about 65% of total revenue at the banks. After two decades (i.e. the 1990s and 2000s) of trying to diversify away from net interest income and into fee revenue, net interest income is likely to be the key driver of revenues going forward given regulatory changes have reduced fee revenue and likely less asset turnover from here (which generates fees).

M&A has helped banks become more efficient, but more may be needed
Efficiency ratios averaged about 60% in 2010—similar to the average of the past 20 years. This is down meaningfully from the nearly 70% level banks averaged for much of the 1980s. A meaningful amount of this improvement likely reflects consolidation as data supports that bigger banks are more efficient. With revenue potentially a challenge for many years ahead, becoming more efficient will be a key driver of profitability and growth. And while the number of banks has been reduced by 55% since 1984 to nearly ~6,500 (including ~1,000 that are public), the number of branches is up 50% (vs. a 30% rise in the US population).

Bank stocks and interest rates
There has been weak correlation between daily changes in interest rates and bank stocks. However, there does seem to be fairly strong correlation during periods of meaningful changes in interest rates. In general, bank stocks underperform when rates rise materially and outperform when rates decline sharply.

Profitability (ROAs and ROEs): Why Normal Isn't Normal
Many banks are targeting ROAs going forward similar to what they generated over the past 20 years—or about 1.25%. However, this seems optimistic to us given the historical period most look to (the early 1990s to 2006) included several positive macroeconomic trends that boosted bank profitability—many of which are unlikely to be sustainable going forward. As a result, we think normalized bank ROAs will be lower (we estimate closer to 1%). Also see our Weekly Cheat Sheets for historical ROAs and targeted ROAs by bank.

Interestingly, since 1935, there were only 14 years where the banking industry had an ROA above 1% (from 1993-2006). This compares to a long-term average ROA for banks of just 0.75%. Additionally, bank return on common equity (ROCE) since 1935 has averaged just 10% (vs. 13.7% from 1993-2006).

Our key products
1) Bank Cheat Sheets (Weekly). Analysis of key trends—refreshed regularly to focus on what's relevant at any given point. The staples include metrics on balance sheet mix, interest rate risk, market share, credit, capital, and valuation. We also include mgmt outlook comments and our current model assumptions.
2) Question Bank (Quarterly). A page of key questions for each bank we cover.
3) Bank Bull….and Bear. 3 positives and 3 risks for each bank we cover.

Deutsche Bank Securities Inc.

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Summary

Below we highlight some of the key takeaways of this report.

How a Bank Makes Money
A bank's revenues can be broken down into two major components. The first is net interest income, which represents about 65% of total bank revenue and is produced from making loans and investing in securities (and earning a spread on this over a bank's cost of funds, mostly deposits). The second is fee revenue, which most commonly includes deposit service charges, capital markets/asset management, mortgage and loan fees, among others.

Interest Rates and Banks
Interest rates play a vital role in how a bank makes money—both directly (driving loan, securities and deposit pricing and borrowing costs) and indirectly (impacting loan demand, default rates, and capital markets activity). Over the past 30 years, interest rates have been in a steady decline. As a result, banks have generally maintained liability-sensitive balance sheets over this period. In addition, with the yield curve still at historically steep levels (the 10yr vs. 3-month Treasury spread is currently ~3.15% vs. about 1.35%-1.40% over the past 50 years), banks continue to play the carry trade.

Capital
Capital has become an increasing focus since the start of the financial crisis in late 2007. Lack of capital and liquidity are two major contributors to the most recent bank crisis. We are currently awaiting final capital guidelines in the U.S. which will likely take some (but not necessarily all) of the suggestions of Basel 3.

Credit
While banks are primarily exposed to credit risk through the process of making and holding loans on their balance sheets, credit risk arises from other sources including holding securities and entering into certain derivative contracts. Credit losses are one of the quickest ways for banks earnings/capital to be offset/depleted, which is why it's so important for banks to be able to measure and manage this risk. Credit losses relative to pre-provision earnings were higher in 2009 than they've ever been, but have been trending down since.

Liquidity
While strong capital ratios are a key ingredient to generating public confidence in a banking institution and for a stable banking system, liquidity is even more important. This can be seen with a number of the failed banks/financial institutions or forced sales during the most recent crisis. While many had adequate capital at the time of failure/takeover, it was the lack of confidence and the resulting inability to fund themselves that forced a failure/distressed sale.

Regulation
Increasing bank regulation has been a key topic the past few years given the financial crisis and the passage of Dodd-Frank. But changes in regulation is nothing new for banks, as the industry has experienced several periods of meaningful changes since early 1900s.

Competitive Landscape
Although the U.S. banking industry has been around for the last two hundred years, it's very different than many other mature industries due to regulation. In total, there are ~6,500 banks—of which 977 are publicly traded (with $1.0 trillion of market capitalization and $11 trillion of assets). The banking industry has become more consolidated over the past 30-40 years, with the number of banks (both public and private) contracting by 55% since 1984.

Securitizations

Securitizations play a major role in the financial markets, providing a supply of funds for all types of loans through the creation of asset-backed securities. When properly constructed, securitizations are beneficial to all players in the market, with borrowers (home/property buyer) getting mortgages and at more attractive rates (both due to increase in supply of funds), originators earning fees and investors earning a yield.

Bank Stocks: How They Are Valued

Bank stocks can be valued using a number of different metrics, with investors relying more on certain metrics vs. others depending on the operating environment (including what point in the credit cycle we are in). Banks are valued, for the most part, based on their earnings power and expected growth and like other financials (brokers, property-casualty insurers, and life insurers) they are also valued based on book value.

Impact from Rates on Stocks

Since 1976 there has been weak correlation between interest rates and stock prices overall. However, there does seem to be fairly strong correlation during periods of meaningful changes in interest rates. In general, bank stocks underperform when rates rise materially and outperform when rates decline sharply.

Other Factors and Bank Stocks

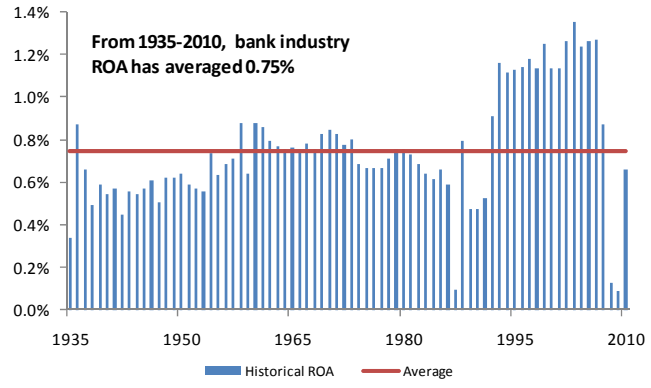
There are several factors that drive bank stock performance in addition to interest rates, including macro factors such as unemployment and M&A activity. Other bank specific factors that influence stock performance include net charge-offs, reserve build/bleed, net interest margins (NIM), securities gains/losses and M&A.

Why Normal Isn't Normal

Many banks are targeting ROAs going forward similar to what they generated over the past 20 years—viewing this as a normal level. However, from the early 1990's to 2006 there were several positive macroeconomic trends that boosted bank profitability—many of which are unlikely to be sustainable going forward. As a result, we think normalized bank returns (ROAs and ROEs) will be lower going forward than they have been over the past 20 years.

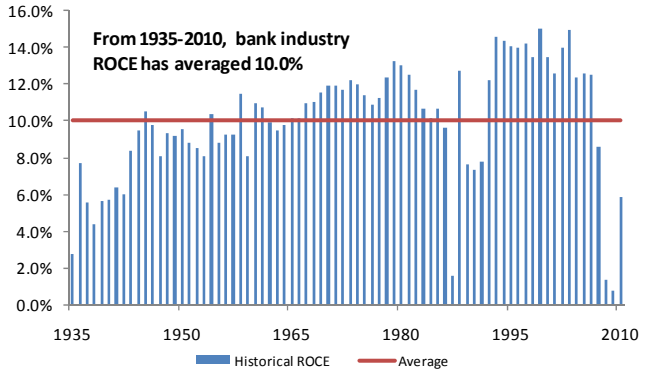
Interestingly, since 1935, there were only 14 years where the banking industry had an ROA above 1% (from 1993-2006). This compares to a long-term average ROA for banks of just 0.75%. Additionally, the banking industry's return on common equity (ROCE) going back to 1935 has averaged 10% (vs. 13.7% from 1993-2006). See Figures A and B.

Figure A: Historical bank ROAs



Source: FDIC
Note: Data is for all US commercial banks

Figure B: Historical bank ROCEs



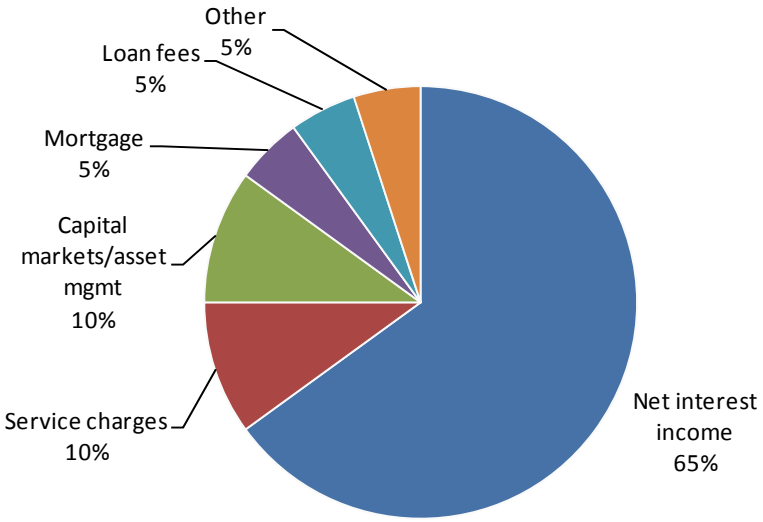
Source: FDIC
Note: Data is for all US commercial banks

How a Bank Makes Money

Revenue Components

A bank's revenues can be broken down into two major components. The first is interest income, which is revenue produced from extending loans to borrowers and/or investing in other earning assets, such as securities. The second is fee revenue (also called noninterest income), which most commonly includes service charges on deposits (such as overdraft fees and other deposit charges), capital markets/asset management, mortgage and loan fees, among others.

Figure 1: Revenue components of banks



Source: SNL and company documents

Net Interest Income—the Largest Source of Revenue at Banks

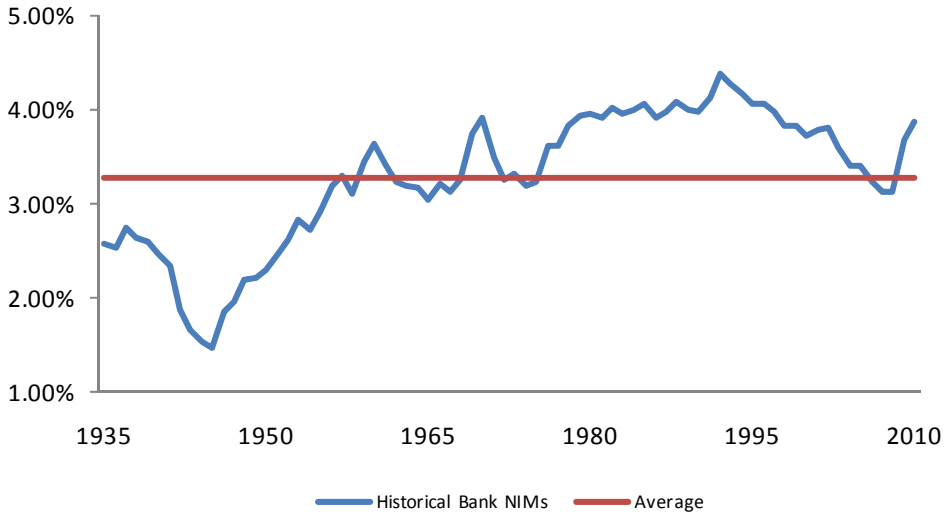
The largest component of a bank's revenue is net interest income (NII)—which accounts for about 65% of revenues on average (see Figure 1). NII is the dollar difference between the interest earned on a bank's earning assets (i.e. loans, securities and other interest earning investments) and the funding cost of a bank's liabilities—which consists of deposits and borrowings. NII is driven by volumes (i.e. assets) and spreads (net interest margin).

Net Interest Margin

A bank's net interest margin (NIM) is a key profitability metric, representing the spread between interest income and interest expense dividend by average earning assets. NIMs increased from the mid-1940s through the early-1990s (see Figure 2). This reflected improved funding profiles (as banks shifted towards core deposit funding and away from wholesale funding), higher concentration of loans relative to other lower yielding earning assets, and a shift towards higher yielding consumer vs. corporate loans.

From the early 1990s through 2008, NIMs declined—largely reflecting increased deposit and loan competition. More recently, NIMs have increased, reflecting a combination of positive funding trends (lower deposit costs driven in part by growth in low-cost deposits and run off of higher cost CDs), improving loan spreads and a steep yield curve.

Figure 2: Historical bank NIMs



Source: FDIC
Data for all FDIC insured commercial banks in the U.S.

Why some banks have higher NIMs than others

There are a variety of reasons as to why certain banks have higher NIMs than others. Differences are driven by a combination of higher asset yields, lower funding costs and equity capital levels.

- Asset yields. Asset yields are driven by the mix of assets (i.e. a higher proportion of loans, which depending on the type, typically have higher margins than securities and other short-term earning assets). In addition, it could reflect a loan mix that is geared more towards higher yielding types (e.g. greater exposure to credit card vs. commercial loans).
- Funding costs. A bank with lower funding costs will typically have a higher proportion of low-cost or noninterest bearing, core deposits (vs. higher cost CDs/brokered deposits).
- Capital levels. A bank with a higher amount of equity capital will have a greater portion of its funding that is noninterest bearing which will benefit its NIM as a result.
- Other. The amount of nonperforming assets (see page 44 of credit section), interest rate risk in a bank's securities portfolio (see page 19 of interest rate section), and the amount of loan/deposit competition within a bank's marketplace all impact NIM.

NIMs need to be considered in context with credit/interest rate risk

While having a higher NIM makes a bank more profitable, how this higher NIM is achieved is important. Higher NIMs can be driven by higher credit and/or liquidity risk, as well as having potentially higher operating expenses associated with it. For example, while credit card receivables typically carry the highest yields they also typically have the highest credit losses. Additionally, while loans typically have a higher margin than securities, related expenses are higher and liquidity is (usually) less.

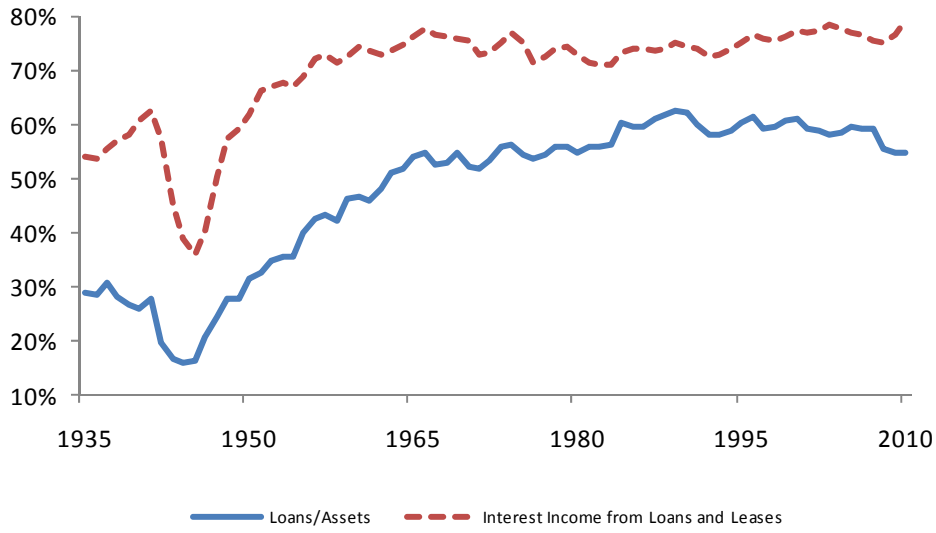
Lastly, while noninterest bearing (and low cost) deposits are a cheaper source of funding (increasing NIM), one has to factor in the amount of additional operating expenses (e.g. branch expenses, etc.) relative to minimal operating expenses from wholesale borrowings.

Loans

Loans make up the largest portion of a bank's assets and NII

Loan portfolios make up the largest asset type on a balance sheet and as a result are the greatest contributor to interest income. Additionally, from a profitability standpoint, banks would prefer to make loans vs. buy securities, as loans typically offer higher returns on a risk-adjusted basis. However, the downside to loans is that they usually carry a greater amount of credit risk and lack the liquidity that most securities offer. In Figure 3, we show historical loans/total assets and interest income from loans. Over the past 20 years, loans have represented about 70% of assets and 75% of interest income.

Figure 3: Loans /assets and percent of interest income from loans and leases



Source: FDIC

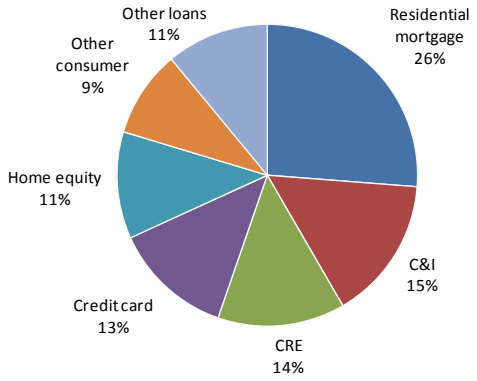
Major loan categories

Banks make a number of different loan types. Below, we highlight the major categories:

- Real estate – Real estate loans represent the largest loan category, making up more than half of loans for all commercial banks. Real estate loans can be broken down into three major categories: 1) closed-end residential real estate (which represent ~25% of total loans); 2) revolving home equity (10% of total loans); and 3) commercial real estate (~25% of total loans). Commercial real estate includes construction, land development, and other land, as well as loans secured by farmland, multifamily (5 or more) residential properties, and nonfarm nonresidential properties.
- Commercial & Industrial (C&I) – Loans to businesses which represent 20% of total loans.
- Consumer – Consumer loans are loans to individuals (that aren't secured by real estate) and include credit cards as well as loans to finance cars, mobile homes and student loans. Consumer loans make up about 15% of total loans outstanding.
- Other – Other includes: loans for purchasing or carrying securities, agricultural production, foreign governments and foreign banks, states and political subdivisions, nonbank financial institutions, unplanned overdrafts, and lease financing receivables.

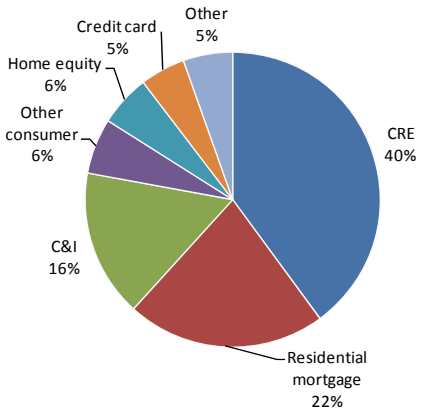
In Figure 4 and 5 we highlight the loan mix of the largest 25 banks and smaller banks. Smaller banks have meaningfully higher exposure to commercial real estate (CRE) at 40% of total loans vs. just 14% at the largest banks. On the other hand, the largest banks have more home equity exposure (11% of total loans) vs. 6% for smaller banks.

Figure 4: Loan mix at top 25 banks as of March 2011



Source: Federal Reserve

Figure 5: Loan mix for all other banks as of March 2011



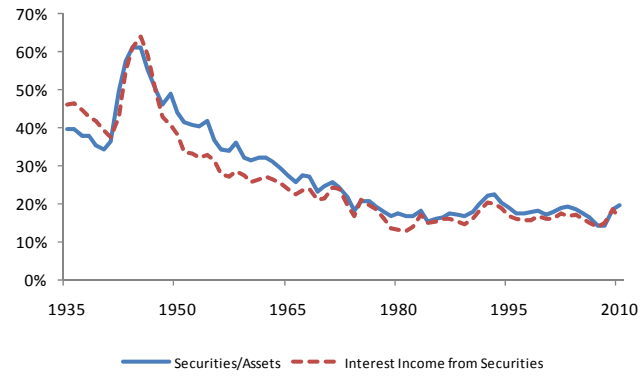
Source: Federal Reserve

Securities

Banks hold securities for three primary reasons: 1) as a source of liquidity; 2) to help manage interest rate risk; and 3) as an earnings contributor (through both interest income and realizing gains/losses through the sale of securities). Securities make up ~20% of banks' total assets on average and contribute a similar amount to interest income. See Figures 6 and 7.

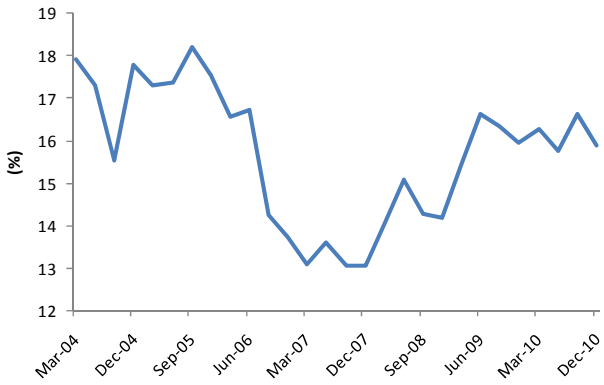
More recently, banks have increased securities, largely reflecting a lack of loan demand, a steeper yield curve and a desire to build capital ratios (as most securities require less capital support than most loans do). While this boosts profitability in the near term, it also increases interest rate risk—a negative in a rising rate environment. See section on interest rates (page 15) for additional discussion on this topic.

Figure 6: Securities / earning assets; and percentage of interest income related to securities



Source: FDIC
Note: Data is for all US commercial banks

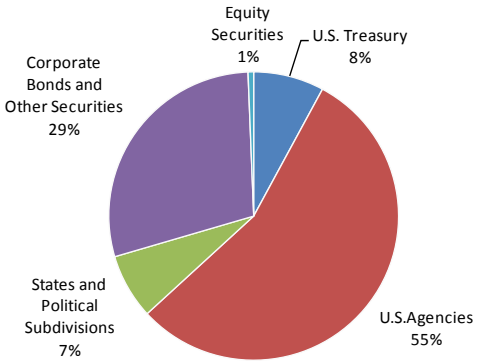
Figure 7: Securities/Assets



Source: SNL
Note: Data for the 20 largest US banks by assets

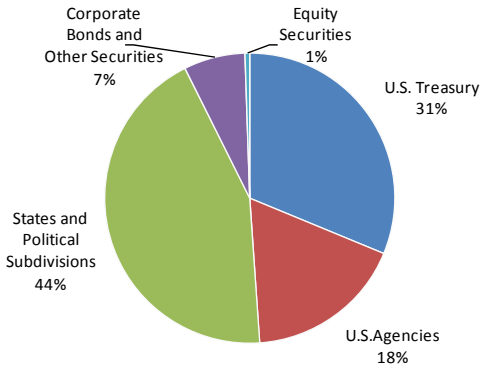
Over the past 30 years, the mix of securities has shifted as banks have sought out higher yields. Securities portfolios are now more heavily weighted towards government agency issued securities and corporate bonds with less US Treasuries and state and municipal bonds (see Figure 8 and Figure 9).

Figure 8: Bank industry securities portfolio mix - 2010



Source: FDIC

Figure 9: Bank industry securities portfolio mix - 1980



Source: FDIC

Deposits

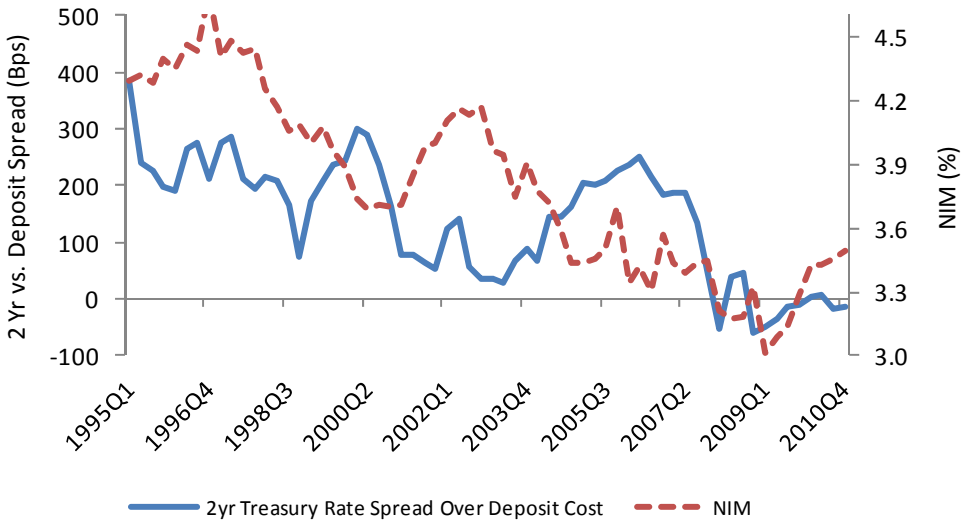
Deposits are a key driver of net interest income

By comparing banks' deposit rates to market interest rates we can get a better sense of how meaningful deposits are to bank profitability. When we look at the spread between deposit costs at the largest 25 banks and the two-year Treasury yield (we look at the two-year as we think two years is a good estimate of the average duration of bank deposits), we find that the average spread has been about 140bps over the past 15 years. See Figure 10.

However, with the low rate environment deposits are not as valuable currently

More recently, this deposit spread has turned negative, reflecting extremely low interest rates. This has resulted in market interest rates being lower than deposit costs (which reflects a floor of 0% on noninterest bearing deposits and longer-dated CDs/brokered deposits having a higher interest cost on average). However, while there is a negative spread on deposits currently, deposits will become more valuable if/when market interest rates rise. In addition, as mentioned earlier, deposits provide a stable source of funding and liquidity.

Figure 10: Spread between 2-year Treasury rates and bank deposit costs

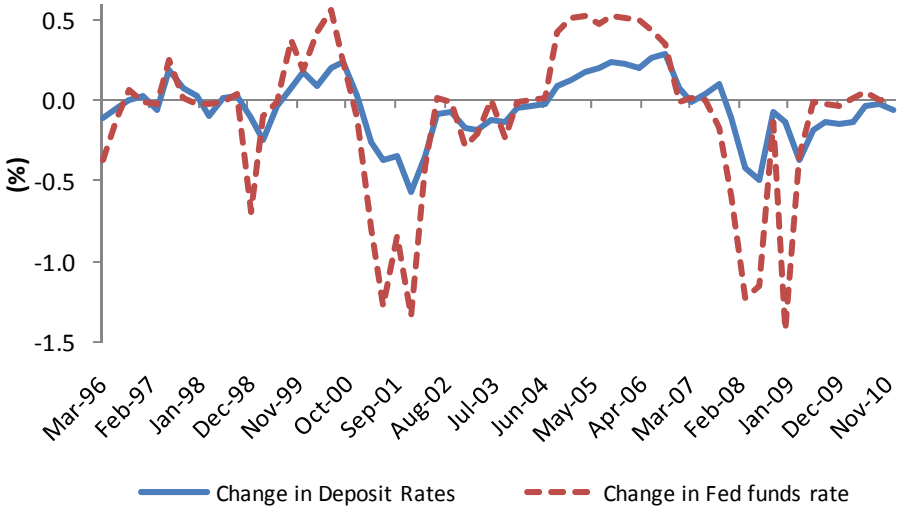


Source: SNL and Capital IQ

Deposit repricing may be greater when rates rise than in the past

Historically, deposit repricing has averaged about 40% of the increase in the Federal Funds rate (see Figure 11). However, we believe that if/when rates start to increase, deposit repricing may be higher as customers may seek higher yielding products as rates rise and commercial deposit customers draw down on deposits to invest and grow.

Figure 11: Change in deposit rates has averaged 40% of the change in Fed funds rate

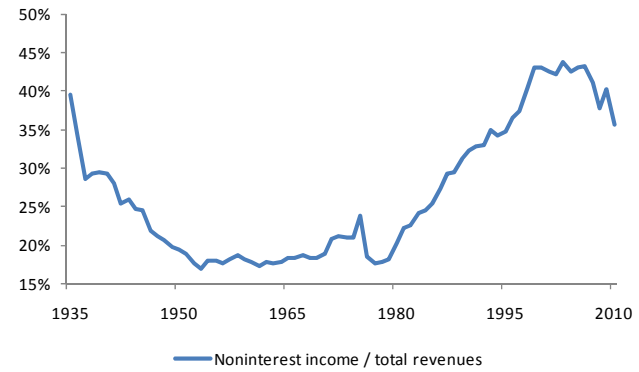


Source: SNL and Capital IQ

Noninterest Income (i.e. fee revenue)

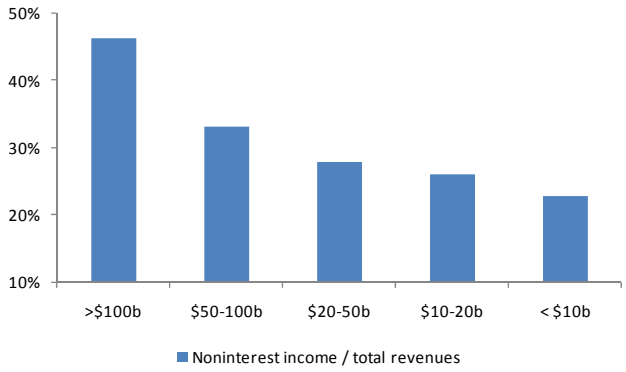
Noninterest income accounts for about 35% of revenues. Fee revenues have increased as a percentage of revenues (from about 18% in the late 1970s to their peak of just under 45% in 2003). This increase reflected new fee structures and acquisitions/expansion into fee businesses (asset/wealth management, capital markets, etc). More recently, noninterest income has been under pressure from regulatory-related changes (overdraft/cards), generally weaker capital markets and less gain on sale (mortgage revenue). Fee income represents a larger portion of revenues at large banks (40-50% on average for banks with assets greater than $100b). Smaller banks are more dependent on net interest income (fees represent less than 30% of total revenues for banks with less than $50b in assets). See Figures 12 and 13.

Figure 12: Noninterest income as a % of revenue



Source: FDIC

Figure 13: Fees / total revenues by asset size

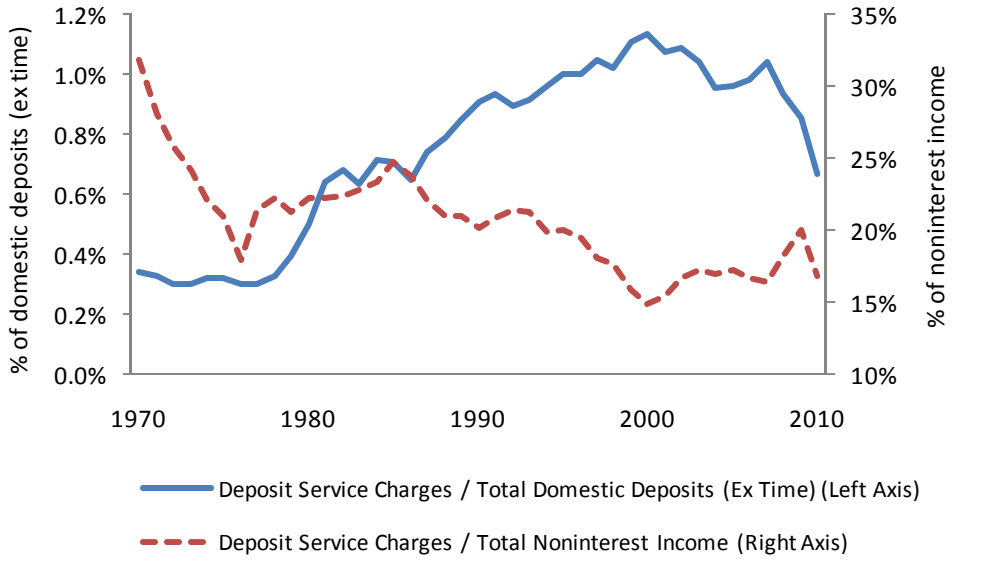


Source: SNL
Data for full year 2010

Deposit service charges

Deposit service charges typically account for the largest portion of banks' fee revenue, representing 16% of total noninterest income in 2010 for banks with assets of greater than $1b and 27% of noninterest income for banks with less than $100m in assets. See Figure 14.

Figure 14: Deposit service charges



Source: FDIC
Data for all FDIC insured commercial banks

Non-sufficient funds (NSF) and overdraft fees

Banks charge customers overdraft/non-sufficient fund (NSF) fees when they make a withdrawal/write checks when there are insufficient funds in the account to cover the transaction. Historically, NSF fees represented about 50% of deposit service charges and generated $25-$38b of fees per year. However, given changes to Regulation E, banks are now required to have customers opt-in to NSF/overdraft programs related to debit cards and ATMs. This has caused a meaningful decline in service charges at some banks. And starting in 3Q11, banks regulated by the FDIC (which includes only BBT among the largest banks) will have to implement additional changes that will reduce NSF fees (related to the order of which transactions are processed, how many NSF fees can be charged per day, etc).

Recent Changes to Regulation of Bank Fee Income

Regulation E

In late 2009, the Federal Reserve issued amendments to Regulation E, which among other things limits banks' ability to charge overdraft fees on ATM and debit card transactions that overdraw a consumer's account. Banks are now required to obtain a consumer's consent (essentially opting into the banks overdraft program) before they can charge any overdraft fees. The new Fed rules went into effect on July 1, 2010 for accounts opened on or after that date, and on August 15, 2010, for previously existing accounts.

CARD Act

In May 2009, the Credit Card Accountability Responsibility and Disclosure (CARD) Act of 2009 was enacted. The CARD Act resulted in several changes such as: 1) restricting banks' ability to change interest rates and assess fees to reflect individual consumer risk; 2) requiring standard payment dates and prohibiting banks from allocating payments in ways that maximize interest charges; and 3) requiring banks to inform cardholders in advance on any

change in interest rates, fees or other terms of the card and to give them the option to cancel the card before new terms go into effect.

Potential consequences of the new regulation include: 1) higher interest rates for all card users (even those with good credit); 2) reduced credit limits to consumers with bad credit, 3) increases in annual fees, and 4) more variable instead of fixed interest rates.

Debit-card interchange fee regulation

As part of the broader financial service regulatory reform, in mid-May 2010 the Senate voted in favor of an amendment that would allow the Federal Reserve to regulate debit interchange fees charged by banks and other financial firms to merchants for the use of their debit cards. Under the Federal Reserve's current proposal the average debit card charge per transaction would be reduced by ~75% (to $0.12 down from the previous average of $0.44). However, there is a debate over whether these reforms should be delayed or potentially watered down.

Expenses

Noninterest expense

Expenses incurred unrelated to funding costs. These are also known as operating expenses. The largest portion is typically personnel expenses (wages, salaries and other employee benefits), which represent about 40% of noninterest expenses.

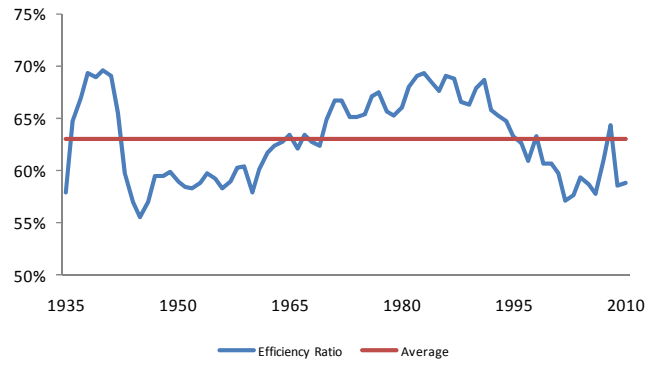
Efficiency ratio

The efficiency ratio measures how efficiently a bank is managed. The ratio is noninterest expense (ex expenses associated with amortization of intangibles and goodwill impairments) divided by total revenue (i.e. net interest income (FTE) and noninterest income, ex securities gains and other one-time items).

The average efficiency ratio for the banking industry going back to 1934 is slightly less than 65%. See Figure 15. Efficiency ratios have increased in the past few years given lower revenues and higher expenses related to higher environmental costs (including credit related, higher FDIC premiums, etc.). 2010 benefited from some one-time gains at large banks.

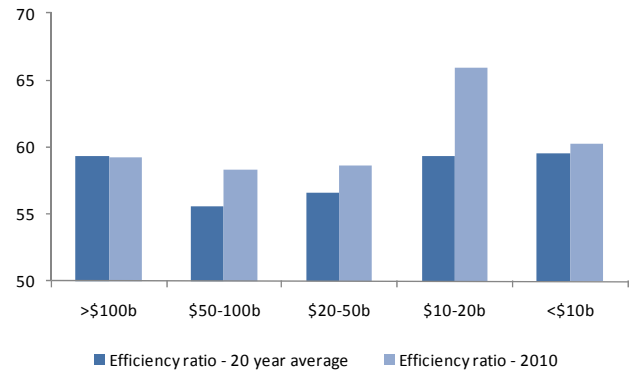
Efficiency ratios tend to decline as asset size increases. However, this is the case only to a certain point. Banks with assets greater than $100b have higher efficiency ratios than banks with assets between $50-100b. See Figure 16. However, part of this could be a difference in business mix—i.e. higher capital markets revenues, etc.

Figure 15: Historical efficiency ratios of the US banks



Source: FDIC

Figure 16: Efficiency ratios of banks by asset size in 2010



Source: SNL

Credit expenses are currently elevated and are likely to remain so for some time

In addition to pressure from higher net charge-offs and building of loan loss reserves (see credit section on page 46), banks are also faced with higher credit related costs that show up in noninterest expense--such as other real estate costs related to foreclosed property, credit and collection costs, reserves for unfunded commitments, mortgage application fraud and mortgage insurance.

What is OREO/OREO expense?

Other real estate owned (OREO) is property that is acquired through foreclosure or other legal proceedings. Through the foreclosure process, real estate is marked down to fair value and held on banks' balance sheets as such. Any further gains or losses upon disposal, increases/decreases in valuation allowance, or write-down subsequent to repossession are classified as OREO expenses. This expense is sometimes recorded as 'other real estate expense', 'gain/loss on sale of foreclosed assets' (or similar line item) or in some cases, lumped into 'other income/expense', making it difficult to measure. Banks can generally hold OREO for up to five years, but can hold it for up to an additional five years with the approval of state and federal regulators if they have made good faith efforts to dispose of the property.

Interest Rates and Banks

Interest rates play a vital role in how a bank makes money—both directly (i.e. driving loan, securities and deposit pricing and borrowing costs) and indirectly (i.e. impacting loan demand, default rates, and capital markets activity).

Over the past 30 years, interest rates have been in a steady decline since peaking in 1981 (with the 10-year Treasury yield currently ~3.20% vs. nearly 14% in 1981). As a result, banks have generally maintained liability-sensitive balance sheets over this period, taking advantage of faster declining funding costs (liabilities) vs. slower-declining investment yields in loans/securities (assets). And with the yield curve still at historically steep levels (the 10yr vs. 3 month Treasury spread is currently ~3.15% vs. about 1.35%-1.40% over the past 50 years), banks continue to play the carry trade (i.e. funding higher-yielding fixed assets like securities with shorter-term, lower-cost liabilities). The concern is what happens if rates were to rise sharply or the yield curve was to flatten and banks were caught in a meaningful asset-liability mismatch (as what happened during the S&L crisis). In this section, we take a closer look at this and other impacts interest rates and the yield curve have on the banking industry.

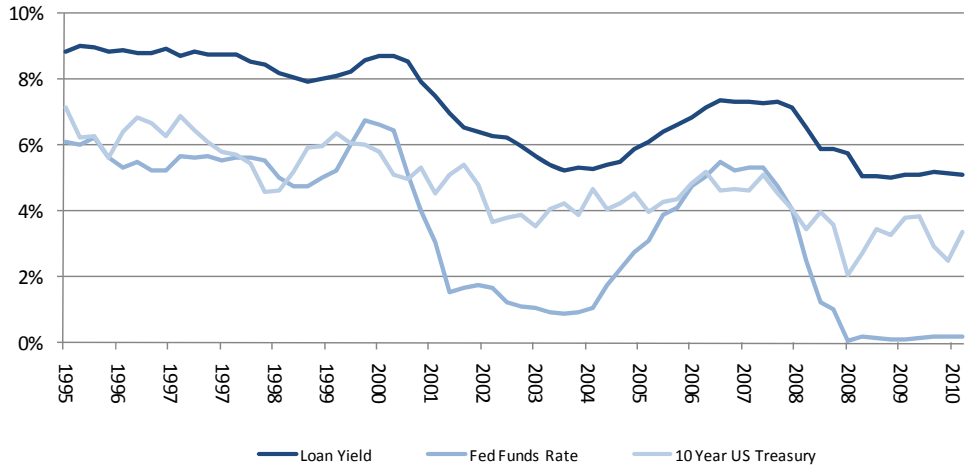
Interest Rates - Impact on Loans

Interest rates are a key driver of loan yields

Loan yields are generally derived from a market interest rate depending on the type of loan as well as its maturity and risk profile. Fixed rate loans have yields that do not change over a set time period and are typically based on rates on the Treasury yield curve that correspond to the average maturity of the loans. Variable rate loans are driven off the London Interbank Offered Rate (LIBOR) or the prime rate, and re-price annually or more frequently.

Loans that price off short-term rates include commercial, home equity, and credit card. Long-term interest rates also impact loan pricing (such as residential mortgages). Over time, there's been a strong relationship between loan yields and the Fed funds rate (93% correlation), and to a lesser extent with 10-year Treasury rates (86% correlation). See Figure 17. Below, we highlight different types of loans and their basic pricing methodology:

Figure 17: Loan yields vs. Fed funds rate and 10-year US Treasury



Based on median historical loan yields for: ASBC, BAC, BBT, BK, BOKF ,BPOP, C, CBSH, CFR, CMA, COF, CYN, FBP, FCNCA, FHN, FITB, FULT, HBAN, JPM, KEY, MI, MTB, NTRS, PNC, RF, SNV, STI, STT, TCB, USB, WBS, WFC, ZION
Source: SNL Financial, Bloomberg Financial LP

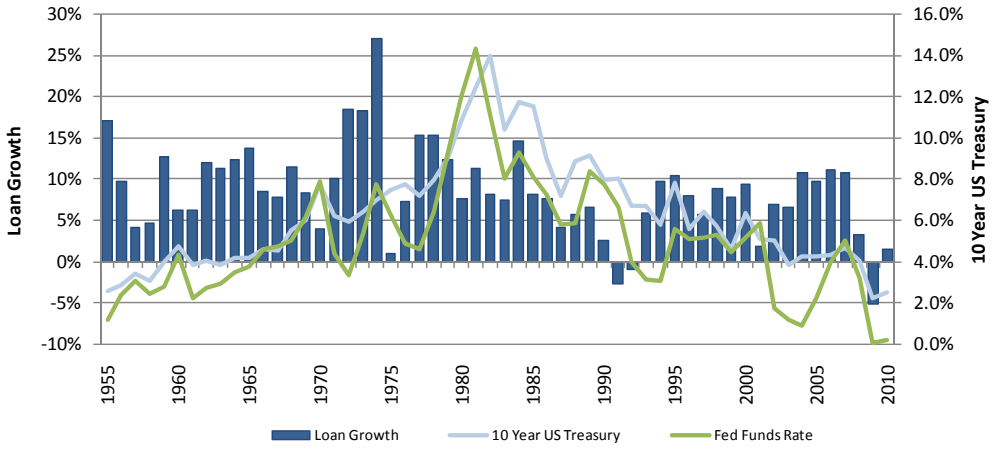
Declining interest rates are generally a positive for loan growth

Since interest rates are a key driver of loan pricing, they have a meaningful impact on loan demand. Lower interest rates reduce financing burdens for consumers and lower hurdle rates for commercial borrowers. For example, low long-term interest rates typically leads to lower mortgage rates, which helps spur residential mortgage originations, and low short-term rates spurs demand for consumer loans (i.e. credit card)—and to some extent commercial demand. In contrast, as rates rise (typically in conjunction with rising inflation), it acts as a monetary constraint that slows both the economy and loan demand. See Figure 18.

Other factors such as the strength of the economy, lending standards, government programs, and consumer sentiment also come into play. For instance, in a declining mortgage rate environment, potential homebuyers may wait to borrow if they think rates may fall even more, which slows new mortgage origination activity, despite lower rates. If employment levels are weak, consumers can save more and borrow less, and if loan underwriting standards have tightened, they may not have access to credit at all. Similarly, an uncertain macro outlook often forces commercial borrowers to trim budgets and wait on capital expenditures (despite the lower cost of capital).

Annual loan growth was higher in the early 1960s (11% vs. 8% historically) and in the early 1970s (14%) as demand for loans accelerated following a drop in rates. Government programs also helped mortgage growth in the mid to late-1970s, leading up to the Savings and Loan Crisis in the early 1980s (see discussion on page 72). As rates peaked in 1981-1982, loan growth slowed and remained subdued until after the recession in the early 1990s. This likely reflected the increasing role of the mortgage GSEs (Fannie Mae and Freddie Mac) in the US mortgage market (see securitization section on page 79). Loan growth accelerated in the mid-1990s through 2007 (with some slowdown in the 2000-2001 downturn), given a growing economy, low interest rates, increasing leverage and loosening of underwriting standards by the banks.

Figure 18: Loan growth (y/y) vs. 10 Year US Treasury and Fed funds rate

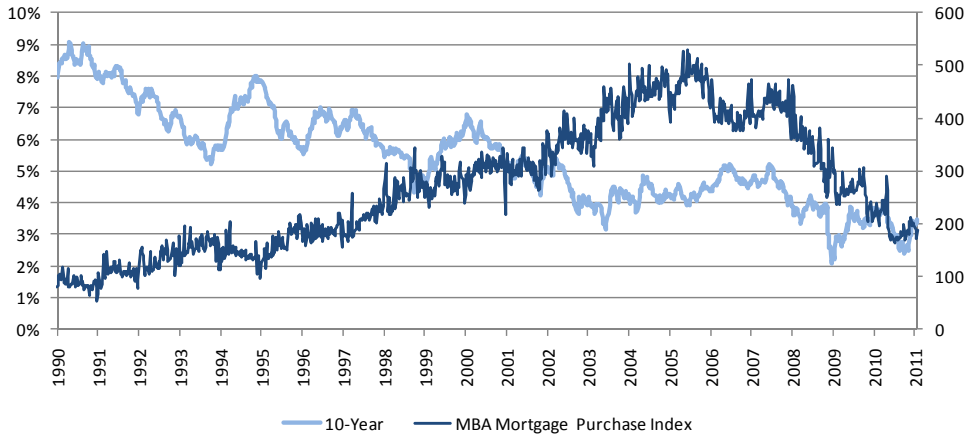


Source: SNL Financial, Bloomberg Finance LP

Declining long-term rates help mortgage purchase activity, but other factors at play

Mortgage purchase activity (per the MBA Purchase Index) rose significantly as long-term rates declined from 1990 to 2005. However, rising asset values, improving macro trends, and loosening underwriting standards were arguably the bigger drivers. See Figure 19.

Figure 19: MBA Mortgage Purchase Index vs. 10 year US Treasury and Fed funds rate

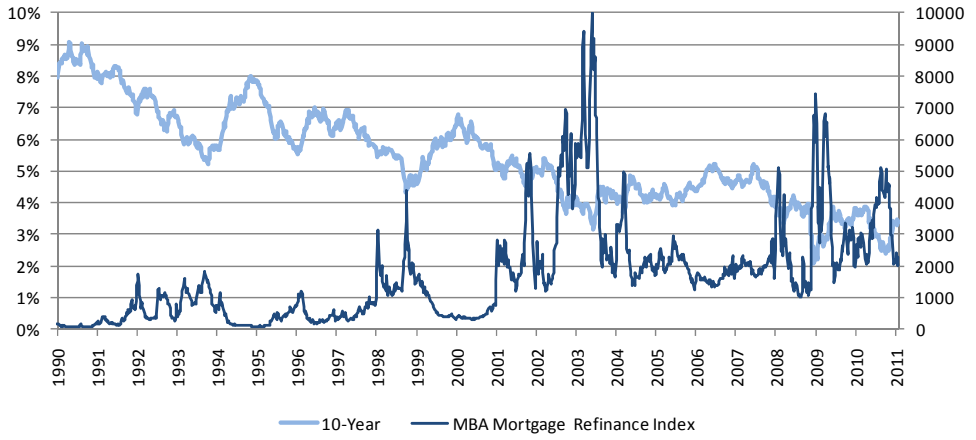


Source: Mortgage Bankers Association, Bloomberg Finance LP

Sharp declines in interest rates spurs mortgage refinancing activity

Over the past 15 years, meaningful declines in long rates (driving lower mortgage rates) have by and large led to spikes in refinancing activity (as measured by the MBA Refinance Index). Since there are transaction costs associated with refinancing a mortgage, many individuals will wait until rates have dropped past a certain threshold from their original rate to refinance. This could happen over time (like it did in the early 1990s) or it can happen quickly (as we saw in early 2009 and at the end of 2010). However, after most spikes in refinancing activity, rates have tended to increase, which moderates the spikes in refinancing activity. See Figure 20.

Figure 20: MBA Mortgage Refinance Index vs. 10 Year US Treasury and Fed funds rate



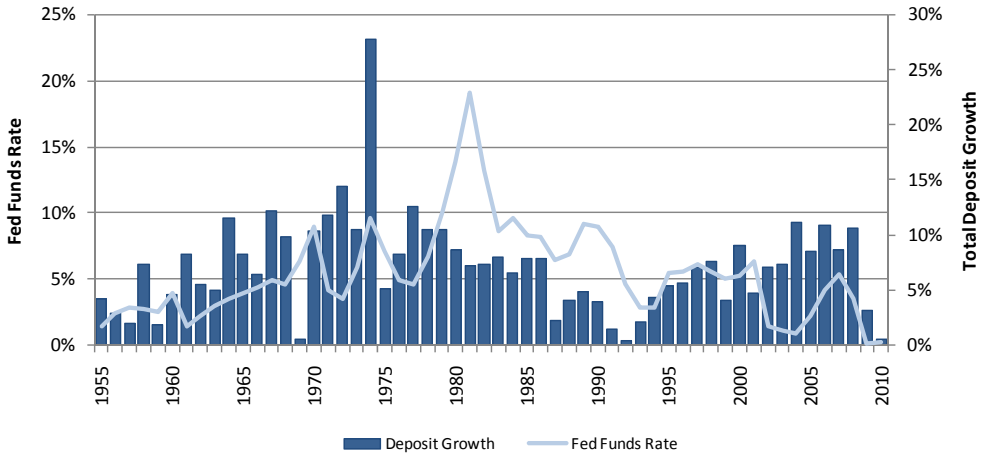
Source: Mortgage Bankers Association, Bloomberg Finance LP

Interest Rates - Impact on Deposits

Bank deposits trend in the direction of short-term rates over certain periods, although the historical correlation is not very strong (less than 20%). See Figure 21. Deposit pricing remains an important tool that banks use to manage net interest income because deposits are usually a bank's biggest cost of funding (in dollar terms). Short-term savings deposits, money market deposits, and Fed funds are very interest-rate sensitive, while other deposits aren't (including demand deposits and NOW accounts). CDs are fixed rate for a certain period of time but tend to reprice when they mature relative to current interest rates.

Interest rates play an important role in liability management. If a bank is liability sensitive in a rising rate environment (i.e. its funding costs will reprice faster than its interest-yielding assets) and wants to reduce its liability sensitivity, it could issue long-term CDs and debt and use the proceeds to replace shorter-term borrowings. However, this strategy would initially reduce net interest income and NIM.

Figure 21: Deposit growth vs. Fed funds rate

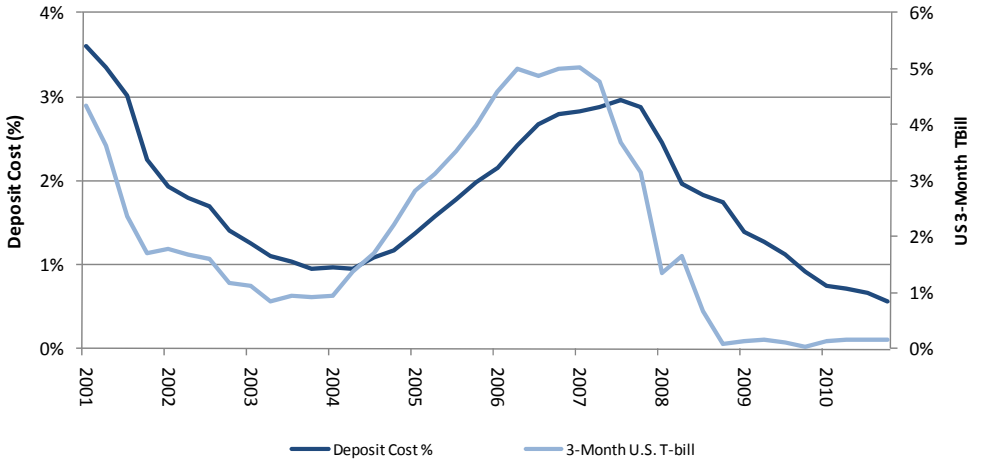


Source: Federal Reserve, Bloomberg Finance LP

Deposit repricing typically lags changes in interest rates by six to nine months

As interest rates change, banks need to reprice deposits to reflect market rates. If priced incorrectly, a bank's deposit base could shrink, which reduces its ability make loans and other investments. How soon and how much a bank reprices its deposits varies depending on each bank's strategy, deposit base, and asset-liability position. We found that over the past 10 years, changes in deposit pricing lagged changes in the 3-month T-bill by about 6 to 9 months (96% correlation). See Figure 22.

Figure 22: Deposit pricing vs. 3-month T-bill

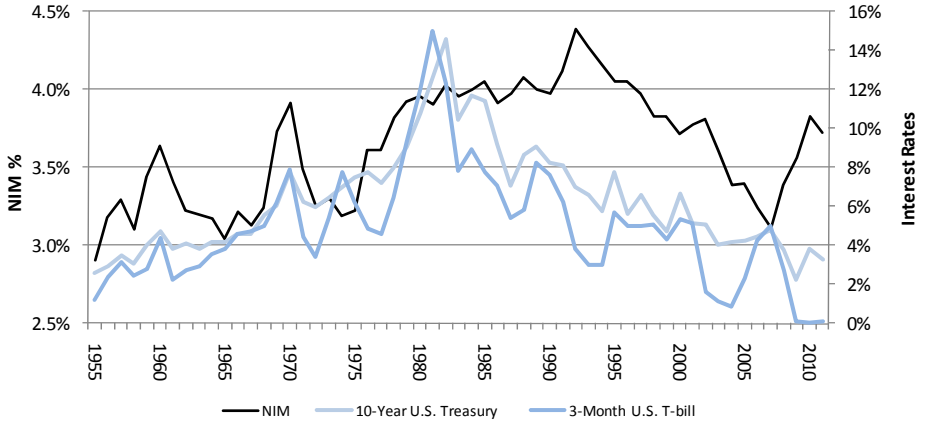


Source: SNL, Bloomberg Financial LP

Interest Rates - Impact on Net Interest Margin (NIM)

NIMs generally rise when rates rise as the result of higher loan and securities yields, but the relationship is largely attributed to the shape of the yield curve. Historically, interest rates (more so 3-month T-bills) and NIMs were highly correlated, which was the case between 1955 and the early 1980s (80% correlation). However, from the mid-1980s to the mid-1990s, NIMs held relatively steady even as rates declined. Further declines in interest rates through 2007 led to an eventual decline in NIMs. Subsequent NIM improvement in 2010 (despite lower rates) has been driven by a relatively steep yield curve and lower funding costs (i.e. shifting to lower cost deposits and higher-cost CDs rolling off). See Figure 23.

Figure 23: NIM vs. 10 year Treasury and 3-month T-bill



Source: Federal Reserve, Bloomberg Financial LP

Interest Rates - Impact on Securities

Banks use securities portfolios to help manage interest rate risk. For example, a bank could buy higher yielding bonds (when loan demand is weak, like it is now) and lock in a stream of interest income. However, when loan demand returns and these securities need to be sold to fund loan growth, the bank may incur losses if rates rise after the securities were purchased. In a falling rate environment, a bank could hold onto its fixed income securities to continue to earn higher than market yields, foregoing securities gains. In this situation, a bank could choose to take securities gains, but would have to reinvest the proceeds from the sale at lower yields. These securities may also prepay depending on prepayment rules.

Interest rate expectations are a key driver of securities positioning

Generally, as rates rise and if banks are liability sensitive, profit margins shrink as liabilities (deposits and other funding) reprice quicker than loans and securities (i.e. funding costs rise more rapidly than earnings on assets). If management expects rates to rise, and a bank wants to be more asset sensitive (or less liability sensitive), it could shorten the maturity of its assets by selling long-term securities and using the proceeds to buy short-term securities (this would likely put some pressure on NIM/NII). If the securities portfolio is not rebalanced as discussed above (or other changes are not made to shift the bank to a more asset sensitive/less liability sensitive position), rising rates could hurt book value (through changes in other comprehensive income) due to the greater price risk of assets vs. liabilities.

Rising interest rates could lead to securities losses

There is an inverse relationship between interest rates and securities prices (rising rates lead to lower securities prices and vice versa), which becomes more important when loan demand is weak and rates are relatively low. As the economy improves and rates rise, a bank may eventually be forced to sell securities later at a capital loss (to meet loan demand).

Prolonged low interest rates may lead to reinvestment risk

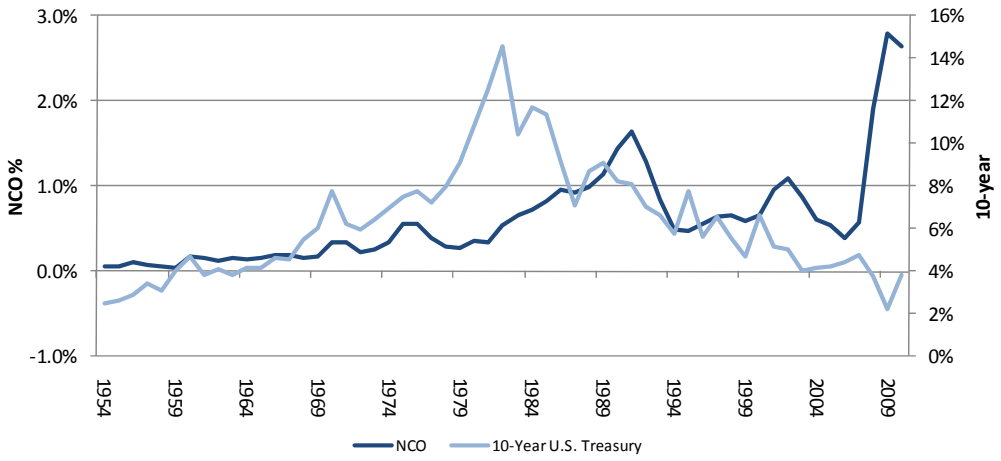
If rates are expected to stay low for a long period of time, banks are forced to reinvest their interest income and any return of principal, whether scheduled or unscheduled, at lower prevailing rates. While the weighted average maturity of bank debt securities portfolios are typically longer duration, banks tend to hold a significant portion of mortgage-backed securities (63% as of 12/31/10). Low interest rates tend to accelerate mortgage pre-payment rates (mortgage holders backing the MBS may pay back their mortgages early).

Interest Rates – Impact on Credit Costs

Over the past 50 years, we found that industry net charge-off rates had a moderate to strong correlation to the 10-year Treasury rate over certain periods, especially from 1954 to 1974, during which time interest rates and charge-offs both rose steadily (90% correlation). See Figure 24. Generally, if a bank has more exposure to variable rate loans, a rise in rates would lead to larger payments for borrowers (especially if they are longer term loans like auto or home), creating a larger cash flow burden, and thus, likely more defaults. If a bank has more exposure to fixed rate loans, a drop in rates may increase defaults, since borrowers who cannot refinance would rather not make payments when lower rates are available (and go into default). And even if the borrowers were able to refinance (lowering default rates), a bank would not be able to benefit from being in fixed rate loans because its loan book would refinance to variable rate, thus becoming more rate sensitive.

10-year rates tend to fluctuate with macro conditions, so during periods of sharply falling rates that correspond to a weakening economy, charge-offs often rise. Such was the case in the early 1980s and in 2008.

Figure 24: Historical net charge-off rates (NCO %) vs. 10-year Treasury



Source: FDIC, US Treasury

Bank Interest Rate Sensitivity

A bank's interest rate sensitivity is characterized by how quickly its assets (loans and securities) re-price relative to its liabilities (deposits and borrowings) given a change in interest rates. Banks historically have been liability sensitive (meaning their liabilities reprice sooner than their assets) given a generally positively sloped yield curve and a secular decline in interest rates. A prolonged low interest rate environment generally hurts banks if they are asset sensitive. But assuming interest rates eventually need to rise off current record low levels, banks that are more asset sensitive (i.e. on average, assets reprice faster than liabilities) will be better-positioned.

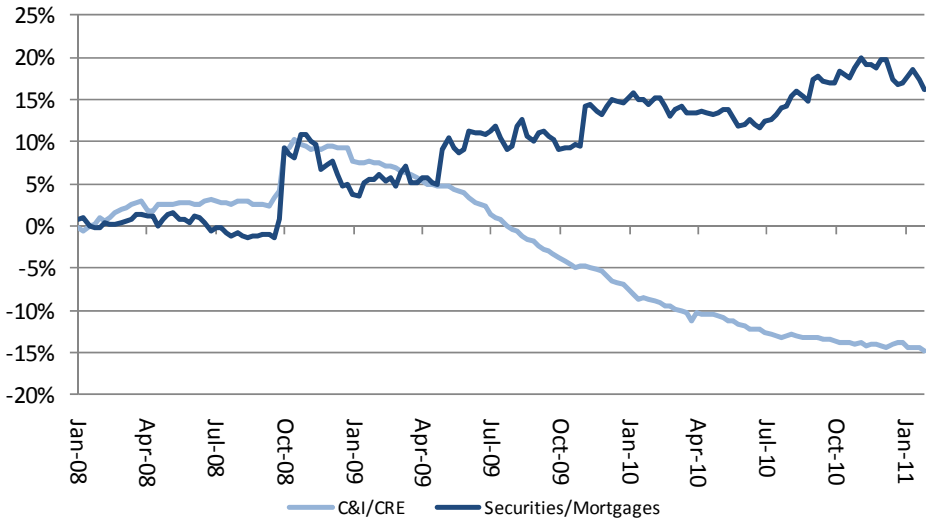
Limitations of bank disclosures on interest rate sensitivity

While more banks have been providing additional disclosures on the impact of interest rates, a number of drawbacks remain. First, the disclosures represent one point in time, which can be misleading given that: 1) banks are continuously rebalancing assets and liabilities and 2) sensitivities could be managed towards the end of the quarter. Also, most disclosures only highlight the impact to net interest income, but not the impact to the balance sheet (i.e. potential unrealized securities losses). Finally, there are too many unknown assumptions that make bank by bank comparisons difficult (i.e. assumptions on loan prepayments, deposit repricing, and securities repositioning).

Why banks haven't been positioned for rising rates until more recently

The relatively steep yield curve makes it tempting for banks to play the carry trade. And with low rates and weak loan demand, many banks have added securities while running off shorter duration commercial loans (many of which are variable rate) and replacing them with two to three year duration mortgages. Since 2009, we've seen a steady decline in commercial/CRE loans (down nearly 15% since 2008) while securities/mortgages rose (up 15% over this period). See Figure 25. However, this trend began to slow towards the end of 2010, as loan demand began to recover (particularly in commercial) and many banks shifted some longer-duration assets into more liquid, shorter duration assets in anticipation of higher rates.

Figure 25: C&I/CRE loans vs. securities/mortgages

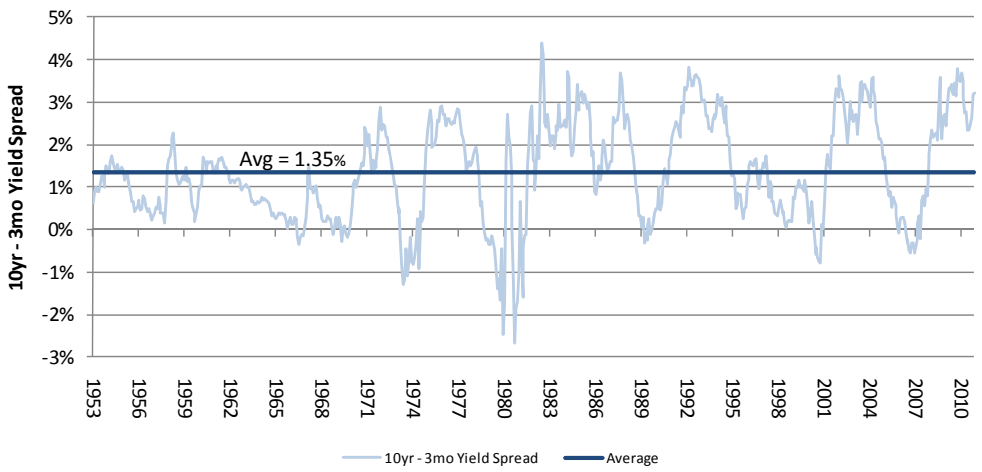


Data is for 25 largest commercial banks
Source: Federal Reserve, Bloomberg Financial LP

Yield Curve – Impact on the Carry Trade

The current yield spread (10 year vs. 3 month) is about 315bps vs. 135-140bps historically. See Figure 26. If the yield curve remains steep (combined with low interest rates and weak loan demand), banks will likely continue to boost net interest income through the carry trade. Since banks are naturally asset sensitive, they generally add fixed rate assets such as securities and mortgages to bring their interest rate positions back to neutral or to be more liability sensitive, depending on the environment. Although some could consider securities and mortgages as leverage, the spreads on these assets (funded with core deposits) have been pretty stable under a variety of yield curve scenarios. This is true given that theoretically, a bank could fund three-year duration assets with a duration-matched liability and thus not take any interest rate risk since the assets will reprice in the same manner as the liabilities. Still, the carry trade can be a very risky strategy when over-leveraged and rates rise unexpectedly.

Figure 26: Historical 10-year Treasury/3-month US T-Bill yield spread



Source: Bloomberg Financial LP

The carry trade helped set off the Savings and Loans crisis in the early 80s

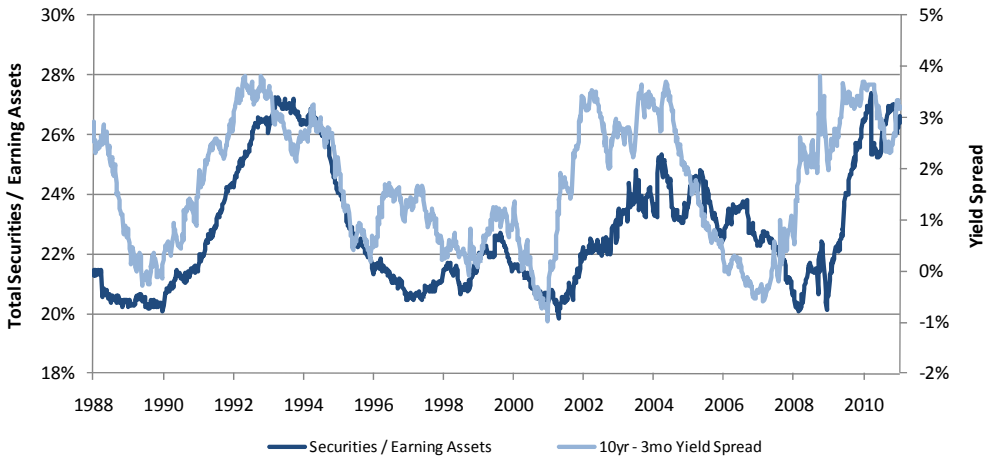
Over-leverage to the carry trade was a cause of the Savings and Loans crisis in the early 1980s, which highlights the risk of big asset-liability mismatches. Leading up to the 1980s, federal policy pressured savings and loan institutions (S&Ls) to invest in long-term, fixed-rate mortgages. S&Ls used short-term deposits to fund them, creating a large mismatch in maturities. A federal ban on adjustable-rate mortgages until 1981 made this worse.

The crisis essentially started after then Fed chairman Paul Volcker decided in October 1979 to restrict money supply growth, causing interest rates to spike. Short-term rates rose more than 6% between June 1979 and March 1980 (from 9.1% to 15.2%). Deposit costs rose meaningfully, while banks were stuck with longer-term fixed rate assets. For example, the interest rate spread between mortgage portfolios and average funding costs was -1% in 1981 and -0.7% in 1982. Furthermore, as rates spiked, prices declined for securities held by the banks, which resulted in large losses. From 1981 to 1982 alone, the S&L industry collectively lost nearly $9b and eventually lost $160b, with over 700 savings and loans failing. See the competitive landscape section on page 71 for addition discussion on the S&L crisis.

Carry trade strategies based on the yield curve

Banks often try to take advantage of expected future changes in rates by coordinating investment activities with forecasted changes in the level and shape of the yield curve. When the curve is low and steeply upward sloping, banks buy short-term securities. As rates rise, banks buy more higher-yielding securities, while balancing their liquidity to meet loan demand. When the curve is high and flatter, banks switch to longer-term securities to take advantage of higher yields and to maximize net interest income, during which time, liquidity is not a big problem because loan demand is typically weak in higher rate environments. When the curve declines, longer term securities are sold and capital gains are realized and rolled over into short-term securities. Market timing is key when using these strategies, because if rates continue to rise after the securities mature, banks are forced to meet liquidity needs by buying funds at increasingly higher rates or selling the longer-dated securities at lower values to meet loan demand. Generally, as shown in Figure 27, banks increase their securities exposure during periods when the yield curve is the steepest.

Figure 27: Securities/Earning Assets vs. yield spread

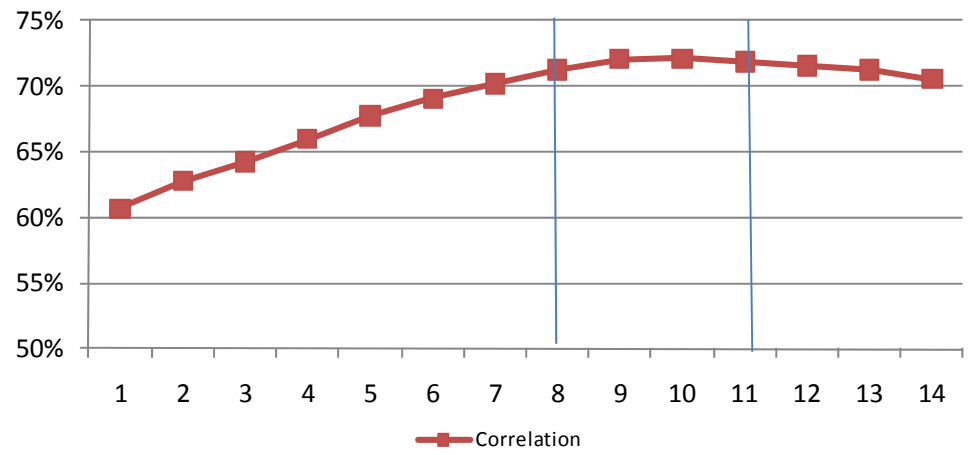


Source: Federal Reserve, Bloomberg Financial LP

Securities repositioning generally lags interest rate changes by eight to ten months

Banks add and reduce securities over time rather than immediately following yield curve changes. We found that the correlation of securities as a percentage of earnings assets and the shape of the yield curve was the highest eight to ten months after rate changes (72% correlation). We found a higher correlation during periods of rapid shifts in the yield curve, which makes sense as banks scramble to adjust to a meaningful yield curve change. See Figure 28.

Figure 28: Correlation of securities/earning assets vs. yield spread

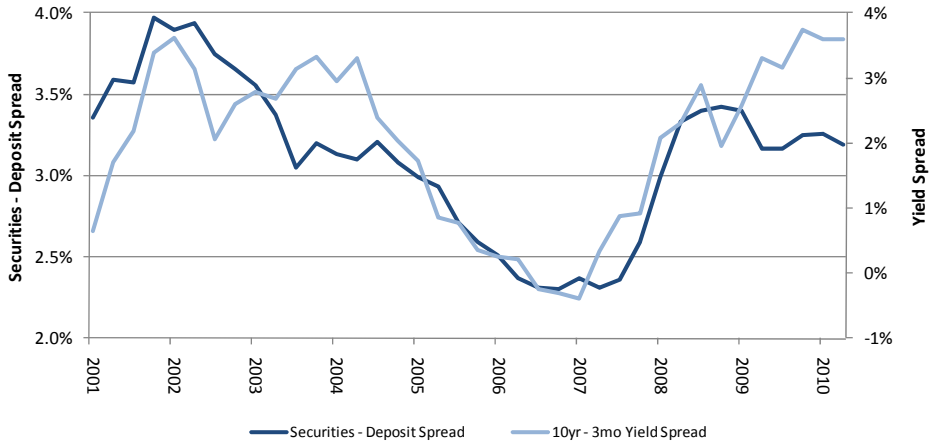


Source: Federal Reserve, Bloomberg Financial LP

A flatter or even inverted yield curve still makes the carry trade possible

Flatter yield curves tend to result in lower spreads banks can earn with the carry trade since shorter-term rates reprice more quickly as rates rise, while rates on fixed rate longer-term securities and mortgages are fixed. During times of prolonged flatter/inverted yield curves, there is spread pressure since most deposits are priced off of short-term rates. However, there is less risk of spread compression since deposit repricing tends to lag and is not 100% elastic. It is still possible for banks to make money from the securities spread even if the yield curve flattens or becomes inverted. For example, in 2006 and 2007 when the yield spread inverted, banks earned a 225-250bp spread on securities. We found an 80% correlation between the spread earned on securities over deposits and the yield curve. See Figure 29.

Figure 29: Securities - deposits spread vs. yield spread



Source: SNL, Bloomberg Financial LP

Yield Curve – Impact on Earnings

We found that the correlation between the yield curve slope and bank NIMs since 1955 was less than expected (at 30-40%) even if we graphed NIMs with a lag. The relationship has weakened since the 1980s, in large part because deregulation has allowed banks to diversify into lines of business that produce noninterest income (which is not as affected by changes in the yield curve) and banks have incorporated more sophisticated interest rate hedging strategies.

Flattening/inverted yield curve generally pressures earnings. In general, a flattening yield curve (in which interest rates decline) leads to some earnings pressure given fixed rate assets prepay/come due, reinvestment rates are lower (in either absolute terms or vs. expectations), and new assets are added to the balance sheet at lower spreads. Moreover, a flatter yield curve tends to reduce the attractiveness of the carry trade. Also, falling long-term rates may imply investors and businesses are pessimistic about the future and are waiting to expand until they feel the economic outlook is more stable. The impact from a flatter yield curve generally takes a few quarters to kick in, given the repricing of some deposits take longer and rebalancing securities and loans takes time.

A steepening yield curve is often better for earnings. A steepening yield curve is a positive for earnings, as banks can earn a higher spread between the return on longer-dated loans and securities and the cost of shorter-term deposits. Rising rates often occurs in conjunction with an expanding economy, which tends to lower credit costs and increase loan demand.

Inverted yield curve often signals weakness. An inverted yield curve usually corresponds to a weak/weakening economy. Since 1927, the average weekly yield curve has been inverted in 10 calendar years, with 13 inverted yield curves since 1960, including in 2006 and 2007. Since 1960, prolonged inverted yield curves have preceded most recessions, as was the case with the past seven. During these periods, net interest income for banks experienced pressure as loan demand was weak and securities yields were often low.

Yield Curve – Impact on the Balance Sheet

Banks generally restructure securities books as the yield curve flattens

Based on our analysis, we found that banks tend to sell securities (recognizing losses) in periods of flattening or inverting yield curves. Since 1990, we found that there were two periods (1994 and 1999-2000) of significant rate hikes and yield curve flattening, during which time banks repositioned their securities portfolios

1994 rate cycle

The Fed raised rates by 300bps (to 6%) from February 1994 to February 1995. The yield curve began to flatten out in April 1994 and bottomed out in December 1995 (flattening 94bps between the first and last rate hikes). After the last Fed rate increase, the curve continued to flatten out until the end of 1995 (by 150bps). Banks began to restructure their securities portfolios in 3Q94, with more meaningful shifts in 4Q94 (banks incurred $900m of securities losses). In hindsight, considering that the yield curve continued to flatten for another four quarters, it made sense for banks to continue to sell securities through 2H94.

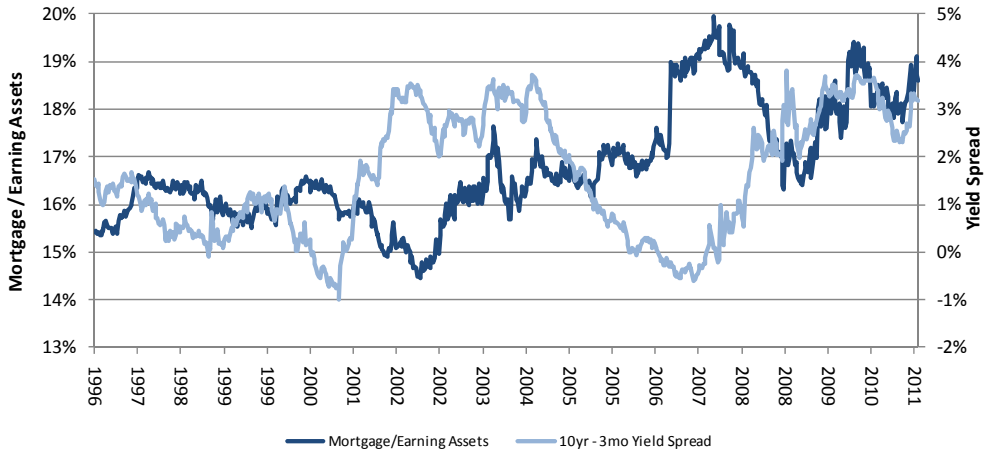
1999-2000 rate cycle

The Fed raised rates by 175bps during this period—from 4.75% in June 1999 to 6.5% in May 2000. The yield curve began to flatten out in April 1994 and bottomed out in December 2000. Between the period's first and last rate increases, the yield curve flattened 87bps and continued to flatten for six months after the last Fed rate hike. Banks booked some losses on sales of securities in 2H99, and this accelerated throughout 2000. However, after the curve steepened in a big way 12 months later (and even more so the following year), in hindsight, it probably didn't make sense for banks to reposition securities that way.

Mortgages tend to remain stable regardless of the yield curve

Banks tend to hold more mortgages as the yield curve steepens (i.e. between 2000 and 2004; between 2006 and 2009), but over time, the relationship between the two was weak. Mortgage exposure appeared to have been relatively stable over the past decade (14%-19% of earning assets) across many different yield curve scenarios. See Figure 30.

Figure 30: Mortgages at banks vs. the yield curve

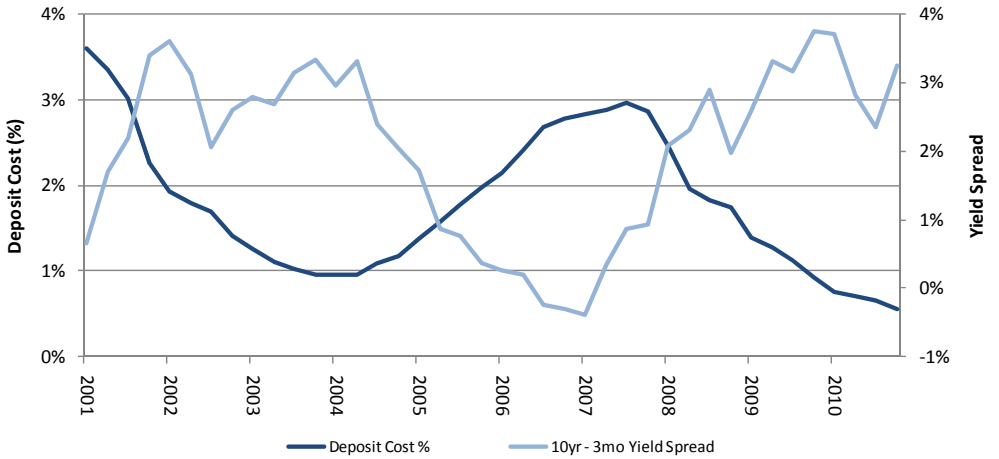


Source: Federal Reserve, Bloomberg Financial LP

Deposit costs rise as the yield curve flattens

As the yield curve flattens, deposit costs tend to rise. Recall that a flatter yield curve occurs when either short-term rates rise (usually the case) or when long-term rates fall. If short-term rates rise, banks need to increase the return on customer deposits to correspond to higher market rates. If the yield curve flattens because rates fall on the long end, yields on longer dated investments may not be as attractive to a bank so it must lower deposit costs to maintain its spreads. We found that over the past 10 years, changes in deposit pricing lagged changes in the yield spread by six to nine months (negative correlation of 90-95%). See Figure 31.

Figure 31: Deposit pricing vs. yield spread

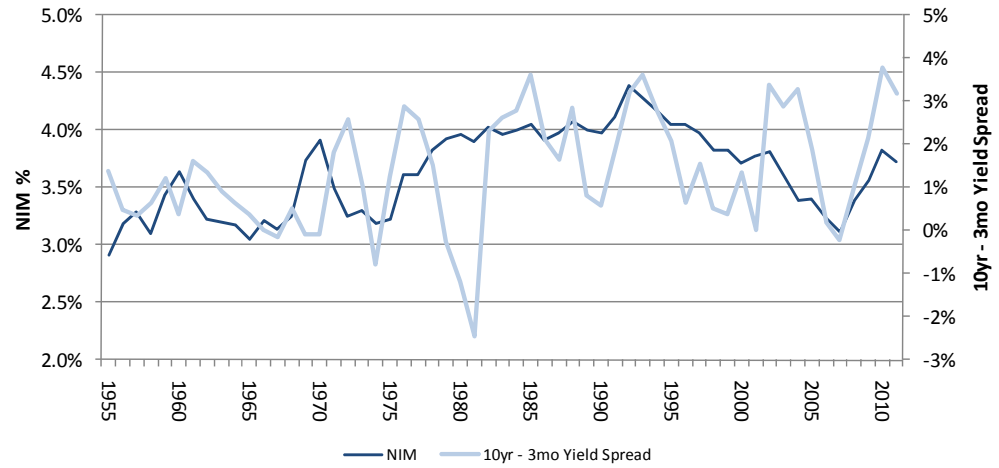


Source: SNL, Bloomberg Financial LP

Yield Curve – Impact on NIM

In theory, NIMs should be closely tied to the yield curve, and there is some evidence to support this. For instance, the recent sharp steepening of the yield curve from 2006 to now coincided with a sharp rise in NIMs. See Figure 32. However, historically, we found only a 30-40% correlation between NIM and yield spreads, which is less than we would have expected.

Figure 32: NIM vs. yield spread

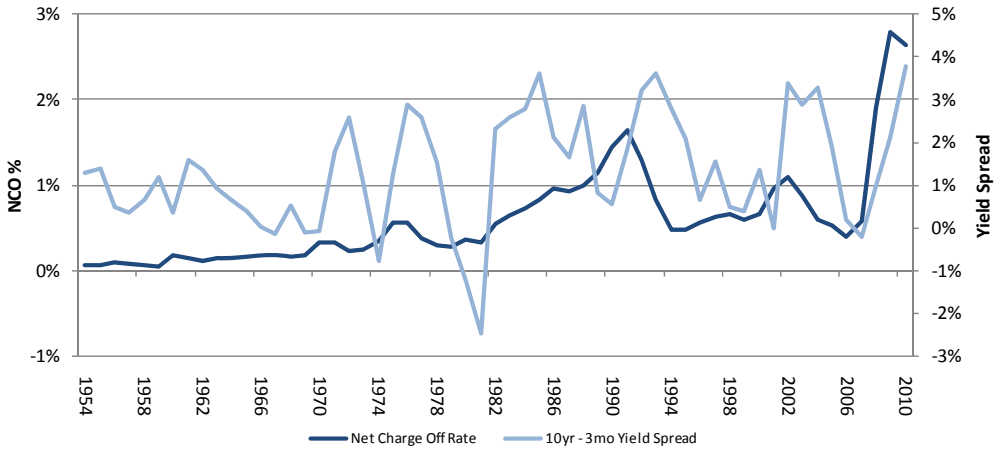


Source: Federal Reserve, Bloomberg Financial LP

Yield Curve – Impact on Credit Costs

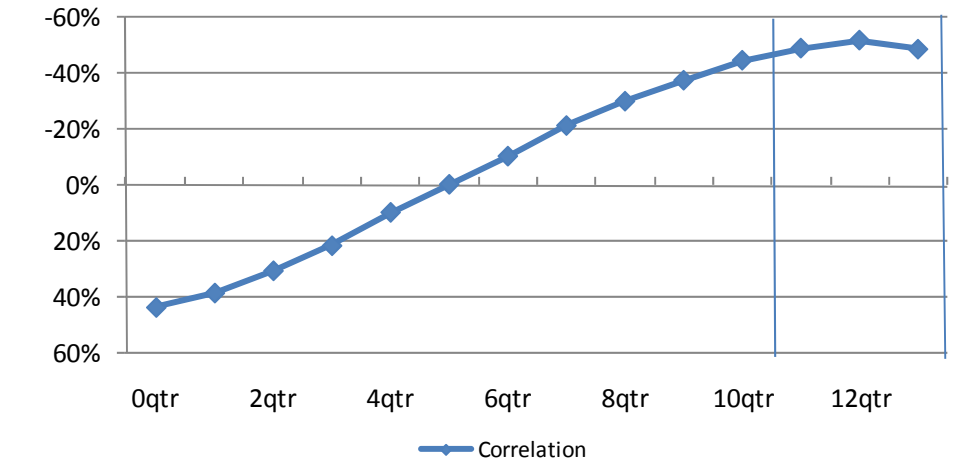
Based on annual data from 1955 to 2010, credit costs (as measured by net charge off rates) tend to have a weak correlation (of ~40%) with changes in the yield curve. See Figure 33. However, on a quarterly basis (since 1985), we found that as the yield curve flattened, credit costs generally rose over time, with the strongest correlation (~50%) 10 to 12 quarters out. See Figure 34. This relationship makes sense given that a flattening yield curve usually suggests that the economy is getting weaker, which leads to deteriorating credit quality. On the other hand, we found that after the yield curve steepened, credit costs had a tendency to decline over the following two to three years.

Figure 33: Net charge-off rates (NCOs) vs. yield spread



Source: Federal Reserve, Bloomberg Financial LP

Figure 34: Correlation of bank NCOs and yield spread

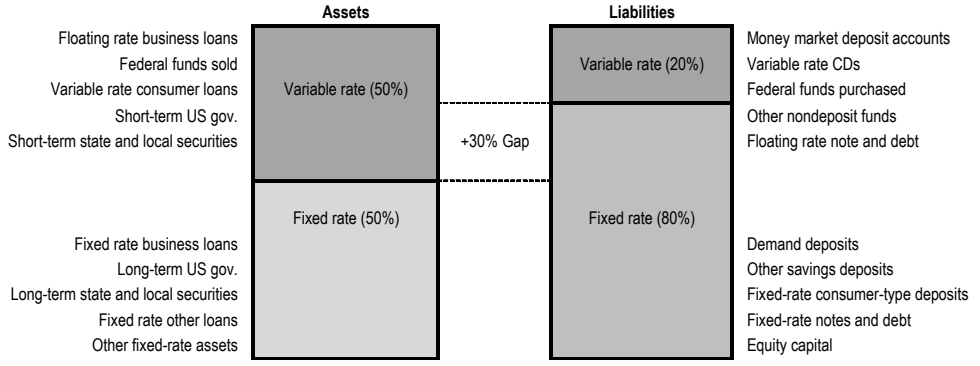


Source: Federal Reserve, Bloomberg Financial LP

Asset-Liability Management

Banks use asset-liability management (ALM) to manage the sources and uses of funds on-balance sheet and off-balance sheet with respect to interest rates and liquidity. The process involves the buying and selling of securities, deciding whether to make certain loans, and determining how to fund banks' investment and lending activities. ALM will generally manage the dollar gap (also known as the funding or maturity gap), which is the difference between the dollar amount of rate-sensitive assets and liabilities. Banks with a positive gap will report higher net interest income if rates rise and lower if rates fall. See Figure 35. The magnitude of the impact and the dollar gap will typically depend on the time horizon (30 days, 31-90 days, etc.) and the amount in each asset/liability category.

Figure 35: Example of positive duration gap (asset sensitive bank)



Source: Deutsche Bank, Elijah Brewer, "Bank Gap Management and the Use of Financial Futures."

The pitfalls of aggressive gap management

Aggressive gap management could destroy shareholder wealth despite increasing net interest income in the short term due to interest rate risk particularly on the asset side. In the case of the carry trade, longer-duration assets would decline more in dollar value than shorter duration assets if rates were to rise and these assets were sold (likely leading to large losses). Separately, if a bank increased its liability sensitivity (i.e. more liabilities would be coming due in a shorter time period), it could put a strain on funding and the bank would have fewer highly liquid assets available to meet funding needs. Lastly, although sophisticated banks use futures, options, and swaps to minimize the effects of big swings in rates, this defensive gap management could also result in shareholder losses due to changes in market values of assets and liabilities, despite a neutral net interest income position.

- Using ALM to respond to rising rates. A bank with a positive duration gap would earn more net interest income from its rate-sensitive assets over the costs of its rate-sensitive liabilities when rates rise. To position for higher rates, a bank could shorten the maturity of its assets by: 1) Selling longer-term securities and using the funds to buy shorter-term securities; 2) Making more variable interest rate loans; or 3) Extending the duration of its liabilities by selling longer-term CDs or longer-term debt for example.
- Using ALM to respond to falling rates. To position for lower rates, a bank could: 1) Lengthen the duration of fixed rate assets and reduce variable interest rate loans; or 2) Shorten the maturity of liabilities by replacing CDs/LT debt with shorter-term borrowings.

Money market instruments are useful for adjusting a bank's interest rate sensitivity

Purchased funds (Fed funds) are readily accessible for banks, and banks have access to however much they want if they are willing to pay for it. In this market, banks are price takers and interest rates are set on a national rather than local level. Buying Fed funds (overnight interbank loans) will tend to shorten asset duration and make banks more interest rate sensitive. Buying short-term Treasuries, deposits at other banks, or Eurodollar CDs also has the same effect. On the liability side, banks can issue CDs in various sizes, or may borrow Fed funds. Shifting from CDs to Fed funds shortens the maturity of banks' liabilities and makes them more rate sensitive.

Managing Interest Rate Risk

Generally, there are two different approaches banks use to manage interest rate risk: 1) On-balance sheet strategies (i.e. loans, deposits, and securities) and 2) Off-balance sheet strategies (i.e. interest rate swaps, futures, forward contracts).

On-balance sheet interest rate risk management

This involves: 1) Changing asset/liability levels and their sensitivity to rates, adjusting maturity schedules, repricing loans/deposits, and adjusting payment schedules; 2) The securitization of assets and selling them to investors; or 3) Buying tranches of securitized loans or participations of large loans.

- Example: If rates rise, the cost of funds increases. However, if the bank has a lot of fixed loans, the earnings on those assets don't rise accordingly--creating a shortfall. One way to deal with this on the asset side would be to shift to adjustable-rate mortgages. On the liability side, the bank could shift to longer-term CDs.

Off-balance sheet interest rate risk management

This usually involves using off-balance sheet derivatives, interest rate swaps and futures. Interest rate swaps are an agreement between two parties to swap rate payments but not principal.

- Example: A bank with a long-term fixed rate mortgage portfolio could agree to receive floating rate payments from another party that wants to have fixed payments.
- Example: A bank is concerned with rising rates on a fixed-rate mortgage portfolio; it could sell derivatives on Treasuries (short Treasuries). If rates rise, the bank's profits from the short sale of Treasuries would offset all or some of the losses on its holdings of fixed-rate mortgages.

Capital

Capital is the portion of a bank's balance sheet that is available to protect depositors (and the FDIC which insures deposits), customers and counterparties from losses. Capital typically consists of several forms of equity, including common, preferred, and hybrid securities.

Capital has become an increasing focus of bank managers, regulators and investors since the start of the financial crisis in late 2007. Lack of capital and liquidity are two major contributors to the most recent bank crisis. Over the last 30 years, there have been three major international regulatory capital proposals made by the Basel Committee. We are currently awaiting final capital guidelines in the U.S. which will likely take some (but not necessarily all) of the suggestions from the Basel Committee's recent recommendations (i.e. Basel III).

Throughout the years, components of capital have become more complex, with banks (and other companies) continuing to seek funding sources that reduce the dilutive effects of issuing common equity, while keeping leverage in check to limit risk and please regulators. Lower amounts of common equity and higher quality capital increases leverage and therefore increases risk (a positive to equity holders in good times but a negative during periods of economic stress). Too much high quality capital leads to lower returns to common equity holders which could lead to a flight of capital to a bank's competitors or other industries. A balance needs to be struck and this has been increasingly the focus of regulators of late.

Types of Non-Common Capital:

- Trust preferred: securities issued by a trust which is formed by a bank. The trust uses the proceeds from these securities to purchase subordinated debt of the bank. The trust uses the interest earned on the debt securities to pay dividends on the trust preferreds. Redemption of the trust preferreds is usually mandatory upon repayment of the debt, but they are frequently redeemed long before then.

  For internationally active banks (defined as those with $250 billion in assets or foreign balance sheet exposure of $10 billion), trust preferreds are capped at 15% of Tier 1 capital, although mandatorily convertible preferred stock in excess of this cap by up to 25% can be counted as Tier 1 capital. The Federal Reserve allows trust preferreds to account for up to 25% of Tier 1 when combined with cumulative preferred stock. Any additional capital supplied by these securities is considered Tier 2 capital (see discussion on measures of capital on page 32).

  Note that under the Collins Amendment of the Dodd-Frank legislation, trust preferred securities will no longer be considered Tier 1 capital for banks with more than $15b of assets after January 1, 2016 (a phase out period is scheduled to begin on January 1, 2013). In the mean time, some banks have already begun calling these securities.

- Hybrids: most differ from trust preferreds in that the debt purchased by the trust is more deeply subordinated and has interest payments that are deferrable for up to seven years. Hybrids also include a contract to purchase non-cumulative perpetual preferred stock (from the bank) approximately five years in the future. At that time, the trust resells the subordinated debt securities it owns to new investors, using the proceeds to buy the perpetual preferreds.

- Cumulative preferred: stock which typically pays a fixed dividend that takes precedence over common stock dividends. Unpaid dividends accrue and must be paid in full before any distributions are made to common shareholders. Preferred shares are senior to common in the event of liquidation, having a par value which represents its claim.

- Non-cumulative preferred: preferred stock for which unpaid dividends do not accrue. To count as Tier 1 capital, the shares must be perpetual or long-termed (more than 20 years). There is no limit on the contribution of non-cumulative preferred stock to Tier 1 capital (as long as common equity represents more than 50% of Tier 1).
- Convertible preferred stock: preferred stock that includes an option for the holder to convert the preferred shares into common stock, usually after a predetermined date. They are fixed income securities that offer a steady income stream and some capital protection. Dividends on convertible preferreds are paid before those of common shareholders, but convertibles rarely have voting rights.

How regulators view capital

From a regulators point of view, capital is the portion of a bank's balance sheet that is available to absorb unexpected losses while a bank is a going concern. Common equity is the strongest form of capital because it is first in line to absorb losses and last in line in terms of claims on bank assets in bankruptcy. Equity that has a more debt like structure is the weakest form of capital as it is the last portion of a bank's capital to absorb losses. Generally speaking, there are several characteristics of capital that make them strong vs. weak including:

- In general, the lower a form of capital ranks in terms of priority in bankruptcy, the stronger it is considered from a regulatory point of view.
- Capital that is not required to be repaid is stronger than that which is (i.e. common equity is the strongest and very long-dated debt-like securities are the weakest).
- Securities that do not receive contractually obligated dividends are typically a stronger form of capital than those which do.
- Securities that call for cumulative dividends are a weaker form of capital than those that do not.

The Roles of Bank Capital

Bank capital serves numerous roles including:

- Source of funds: bank capital is used to expand operations through acquisitions, originations and through capital expenditures.
- Absorbs unexpected losses/reduces risk of bank insolvencies: capital is net of loan loss reserves (a contra asset), which is an estimate of expected losses on a bank's loan portfolio. Any losses exceeding what a bank has reserved for will reduce capital accordingly. This occurs as banks incur additional provision expense (in excess of charge-offs) or other credit-related costs (both income statement items). See credit section on page 42 for a detailed discussion.
- Alleviates moral hazard: banks' activities are funded largely through customer deposits. Given deposits are insured by the FDIC (currently up to $250K per depositor), there is little incentive for depositors to monitor the health of banks, which reduces the incentives for banks to maintain adequate capital. The higher a bank's capital levels, the more equity holders have at risk, therefore aligning the interest of regulators, the FDIC (which faces increased risk of deposit insurance claims as capital diminishes) and shareholders, to conduct business in a responsible way.
- Public confidence: in times of economic crisis (e.g. 2007-2009), depositors increasingly focused on the capital strength of banks—especially individuals that had deposits exceeding the maximum insured by the FDIC.

There has always been a push and pull relationship with regulators and shareholders, with increased capital requirements resulting in lower returns on equity (ROE) or more risk being taken on (e.g. by making higher yielding risky loans) to maintain returns. Additionally, while higher capital levels may reduce the risk of insolvency, they may also reduce banks

competitiveness vs. other lenders, acting as a constraint on lending and potentially leading to higher interest rates on loans and lower deposit rates (both making them uncompetitive). Most (but not all) of the recommendations of Basel I were adopted by U.S. regulators in the 1990s and have been updated though the years. Basel will be discussed in more detail later in this report, but the major metrics introduced under this proposal are detailed below.

Key Capital Metrics (Regulatory and GAAP)

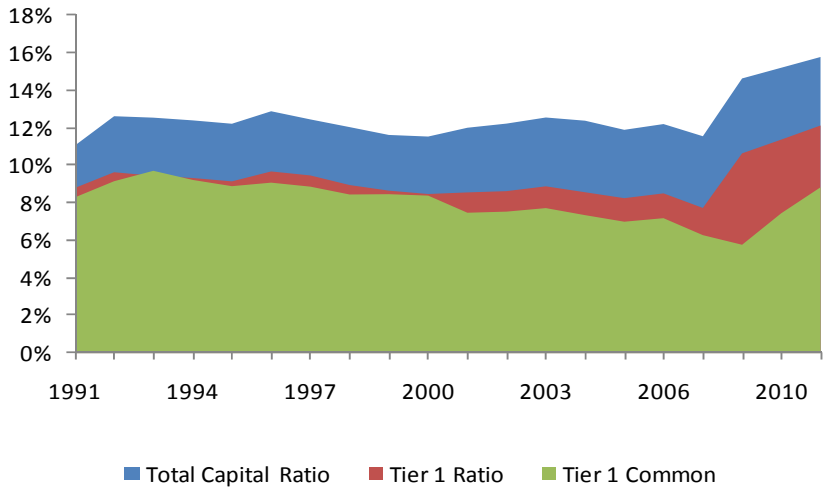
Regulatory (introduced by Basel ex. Tier 1 common)

- Tier 1 Capital ratio: Tier 1 capital divided by risk-weighted assets. Tier 1 capital includes common equity + perpetual non-cumulative preferred stock + cumulative preferred stock + minority interest – most intangibles – AOCI – investments in non-financial companies. Certain intangible assets, including goodwill and deferred tax assets, are deducted from Tier 1 capital or are included subject to limits. Mortgage servicing rights (MSRs), which are the balance sheet value placed on banks' rights to service their mortgage portfolios, are currently included in Tier 1 capital but would be limited under Basel 3 proposals.
- Tier 2 Capital ratio: Tier 1 capital + allowance for loan losses (subject to a limit), subordinated debt and capital that isn't included in Tier 1 capital (such as hybrids above the limit) are permitted to be included in Tier 1 capital) divided by risk-weighted assets.
- Total Risk-Based Capital ratio: Tier 1 + Tier 2 capital divided by risk weighted assets.
- Tier 1 common ratio: Tier 1 common became the focus of regulators in early 2009 with the results of the Federal Reserve's Supervisory Capital Assessment Program. Tier 1 common capital is Tier 1 capital less qualifying perpetual preferred stock, qualifying minority interests in subsidiaries and qualifying trust preferred securities. Under Basel 3, certain components of Tier 1 common may be limited (DTA, MSRs and equity interests in other financial institutions). U.S. regulators will decide on these adjustments.

Total capital has been fairly stable since 1990, but its composition has changed

Total capital levels were fairly stable from 1990-2008. However, common equity accounted for a decreasing portion over this period, while hybrid and preferred stock (included in Tier 1 and Tier 2 Capital) became an increasingly large component before the 2008-2009 downturn (see Figure 36). 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 36: Regulatory capital levels



Source: SNL
Note: Data based on banks under coverage

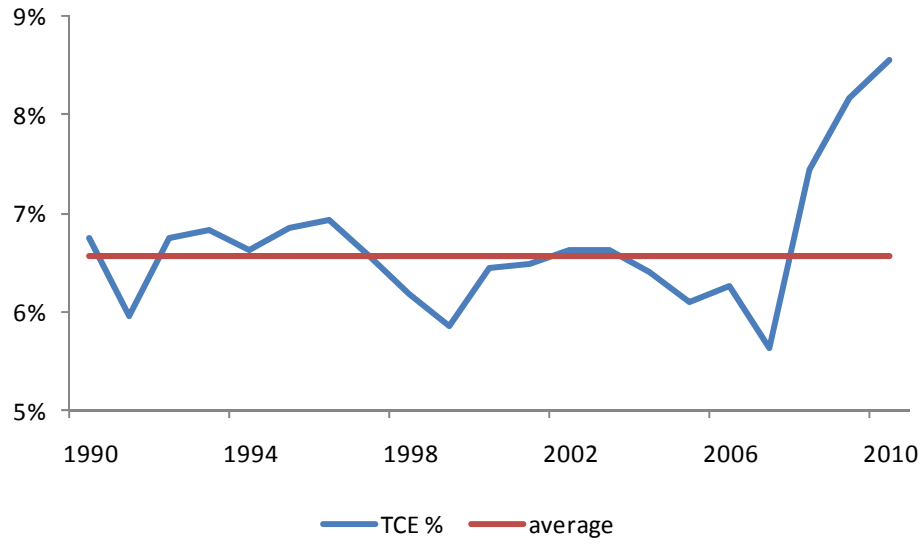
Regulatory ratio (introduced by US regulators)

Leverage Ratio: Tier 1 capital divided by average adjusted assets (average assets less goodwill and intangibles). The leverage ratio does not risk weight assets as other regulatory ratios do. Note that under Basel 1, only the US had minimum leverage ratio requirements.

GAAP

Tangible Common Equity (TCE): Is equal to equity less goodwill and core deposit intangibles divided by tangible assets. Unlike Tier 1 capital, TCE includes unrealized gains and losses on securities and swaps in equity. The TCE ratio does not risk weight assets or adjust for off-balance sheet positions. Similar to Tier 1 common, TCE has become increasingly important over the last couple of years with regulators requiring a larger percentage of capital to be common equity (see Figure 37 for historical TCE ratios).

Figure 37: TCE/tangible assets



Source: SNL
Note: Data based on banks under coverage (BAC, BBT, C, CMA, FITB, FHN, HBAN, JPM, KEY, MTB, PNC, RF, STI, TCB, USB, WFC, ZION)

Regulatory capital requirements and calculation of risk-weighted assets

Under Basel I recommendations, banks should have Tier 1 ratios (Tier 1 capital divided by risk weighted assets) of at least 4% and total capital ratios (total capital divided by risk weighted assets) of at least 8%. See Figure 38. Since the SCAP tests in 2009, regulators have been focusing more on the common equity portion of Tier 1 capital (Tier 1 common). Note that there is currently no regulatory minimum for Tier 1 common, but we believe it could potentially be as high as 8-9% for most banks and 10% for the universal banks (BAC, C and JPM) vs. 9.1% on average for banks at 12/31/10. Note that Basel 3 recommendations suggest a minimum Tier 1 common ratio of 7% and a potential 3% buffer for systemically important banks which would increase the requirement to 10% for the larger banks.

Figure 38: Basel 1 regulatory capital requirements

	Tier 1 Capital	Leverage	Total Capital
Well Capitalized	6% or above	5% or above	10% or more
Adequately Capitalized	4% or above	4% or above	8% or more
Undercapitlized	Less than 4%	Less than 4%	Less than 8%

Source: FDIC

How the composition of a bank's balance sheet affects capital ratios

The denominator of all regulatory capital ratios other than the leverage ratio is risk-weighted assets. Under Basel I, banks' risk-weighted assets are calculated using the risk-weightings in Figure 39, with commercial/CRE carrying the highest risk weightings (at 100%) and cash and U.S. government backed securities the lowest (0%).

Figure 39: Risk weighting of securities and loans

0%	Cash, securities backed by the US government and some US government-sponsored agencies and money due from the Federal Reserve (eg. All treasury securities).
20%	Mortgage backed US government securities and US government sponsored agency securities (eg. All FNM, FRE backed debt).
50%	Loans secured by first liens on 1-4 family and multifamily properties that are owner occupied or rented. If a bank holds both the first and second lien mortgages, they are considered one loan for risk weighting purposes and receive a 50% risk-weighting (other qualifications may apply), mortgage backed securities backed by loans with LTVs of 80% and below, US state and local revenue bonds. The FRB capital rules indicated that TDRs of residential mortgages do not qualify for the 50% risk-weighting while the FDIC's rules do. The FDIC allows NPLs that have demonstrated six timely consecutive payments to carry a 50% weighting; other wise the 100% weighting applies.
100%	All other claims of private obligors, including commercial and consumer loans (card, auto, etc), commercial real estate, residential construction loans, second-lien 1-4 family loans that do not meet the 50% risk-weighting criteria, property, plant and equipment loans and other real estate owned, commercial paper and privately issued debt, investments in unconsolidated subsidiaries, joint ventures, mortgage related securities with residual characteristics and all other assets, including intangibles not deducted from capital. NPAs qualify for a 100% risk-weighting.

Source: FDIC

How Regulatory and GAAP Capital Differ

Tangible common equity (TCE) is a widely used measure of a bank's GAAP capital while regulatory capital is measured by Tier 1, Total capital, Tier 1 common, and leverage ratios. GAAP and regulatory capital differ in several ways, some of which are discussed below.

- Deferred tax assets (DTAs): DTAs arise from (1) deductible temporary differences in the tax and accounting value of banks' assets and liabilities that could be recovered through loss carry backs and (2) operating loss and tax credit carry forwards (dependent on future taxable income). DTAs dependant on future taxable income must have a 50%+ likelihood of being realized within a certain time period (typically 20 years) to be included in GAAP capital. For regulatory capital, the portion of the DTA that relates to loss carry forwards is limited to the lesser of the amount of DTA expected to be realized within one year or 10% of the amount of Tier 1 capital. Note that under Basel 3 proposals, DTAs that arise from temporary timing differences in GAAP and tax accounting would also be subject to certain limitations (discussed in more detail in Basel 3 section).
- Other comprehensive income (OCI): OCI is comprised of unrealized gains and losses on available for sale securities, derivatives used for cash-flow hedges, foreign currency translation and currency hedges (for companies with foreign subsidiaries) and pension liability adjustments. Tangible common includes OCI (whether positive of negative) while regulatory ratios do not. Note that under Basel 3 recommendations, negative OCI (such as unrealized securities losses) would be included in (and reduce) regulatory capital, but positive OCI would not. To adjust for this potential change, some banks have reduced the size and inherent risk of their securities portfolios (by shortening the duration) which reduces the impact that changes in interest rates have on OCI. Banks have also discussed potentially reclassifying some available for sale securities to held to maturity (which would eliminate the need to mark to market and reduce the impact to OCI).

- **Trust preferred securities:** GAAP capital measured by TCE only includes tangible common equity while certain forms of regulatory capital, other than Tier 1 common, may include non-common forms of equity. In general TCE is most closely related to a bank's Tier 1 common ratio with notable exceptions as detailed above.

What Causes Banks' Capital Ratios to Increase/Decrease

Banks capital ratios and the components of capital change over time. Some of this change is due to banks issuing new capital but there are several other factors that influence capital levels including:

- **Profitability:** A bank's profitability changes its capital levels, with positive net income increasing capital and losses reducing it. Capital ratios can however fall in times of profitability if a bank's risk-weighted assets (RWAs) increase faster than capital (e.g. if it's growing its loan/securities portfolio).
- **Changes in RWAs:** selling assets with higher risk-weighting decreases risk-weighted assets and therefore increases capital ratios. Asset sale proceeds could be invested in lower risk-weighted assets or securities to reduce the liquidity drag on earnings.
- **Capital deployment:** Dividend payments and share buybacks reduce capital.
- **Capital conversion:** Converting of non-common capital (preferreds and debt) into common capital increases banks' Tier 1 common ratios. This is what occurred at a number of banks following the results of the SCAP test.

How Much Capital is Enough?

Given that one of the main purposes of capital is to absorb unexpected losses and prevent bank insolvencies, the higher the capital the better from a regulators point of view. However, as previously discussed, higher capital requirements would tend to lead to lower returns (measured by ROE) and possibly more conservative lending standards which may hinder economic growth, so the right balance needs to be struck. At 12/31/10, the average Tier one common ratio for the banks we cover was 9.1%. However, certain factors need to be considered when comparing one banks capital with another's.

- **Earnings power:** A banks ability to generate profits is as important as current capital levels. Future profitability is equivalent to future capital assuming profits are retained, so banks with more favorable earnings expectations may be able to operate with lower capital levels without raising concern. On the other hand, banks with high levels of capital and large operating losses expected for the foreseeable future could be a concern. Low capital levels could point to future dilutive capital raises (especially considering regulators current preference for banks to hold more common capital).
- **Loan loss reserves:** A banks history of building reserves for expected loan losses can also come into play when comparing the capital of banks. Given two banks with the same business model (operating in the same geographies and same asset composition), the more conservative bank in terms of reserving for future losses would have lower capital due to higher past provision expense (which reduces profitability and therefore equity). Recall that provision expense reduces net income, which flows through to retained earnings and capital. However, the more aggressive bank would likely be overstating capital by underestimating losses which, all else equal, would eventually play out in the long run, bringing the two banks capital ratios back in line.

  Given that no two banks have the same portfolio of loans (same geography, loan type, borrowers' credit strength), it's difficult to compare the capital levels of banks. However, we do feel that Tier 1 common plus reserves is one of many useful measures when analyzing bank capital.

How Regulatory Capital Requirements Have Changed Over Time

1975: The Basel Committee was formed in 1974 by the central bank governors of the Group of Ten (G10) countries in response to serious disruptions in the financial markets following the failure of several large banks which had global repercussions. In 1975, the Basel Committee released a paper titled 'Principles for Supervision of Banks' Foreign Establishments', which established that all banks that operate internationally should be supervised and that there should be an international standard. Note that all Basel Committee recommendations are just that, and only become binding when adopted by countries' regulators. The U.S. is currently a laggard when it comes to adopting Basel recommendations, with most U.S. banks subject to Basel I vs. Basel II in Europe and currently considering Basel III recommendations released in 2010.

Uniform capital requirements:

1981: Federal regulators in the US established minimum primary capital to asset ratios. Primary capital was defined as common stock, perpetual preferred stock, additional paid-in-capital, retained earnings, capital reserves, and other non-debt instruments. The Federal Reserve Board (FRB) and the Office of the Comptroller of the Currency (OCC) adopted a 6% minimum for banks with less than $1b in assets and 5% for banks with over $1b in assets. Note that large banks had typically been viewed by regulators to be more sound given their more diverse business/asset mix. The FDIC applied a 5% minimum to all domestic banks and all multinational banks were evaluated on a case by case basis.

1983: International Lending and Supervision Act- regulators were given the legal authority to establish and enforce minimum capital requirements. Previously, regulators lacked enforceability.

1985: Three federal regulators settled on a 5.5% primary capital ratio for all banks and established zones for large banks for primary and total capital and measures of asset quality. In response to this, banks that were seen as undercapitalized raised new capital, reduced holdings of liquid assets, and increased off-balance sheet activities, while some attempted to streamline their businesses to cut costs/raise prices (to increase earnings and build capital) and some began to make riskier loans.

Risk-adjusted capital requirements:

1988: Throughout the early 1980s, with banks' capital levels deteriorating and risk appearing to be on the rise, regulators felt that there should be a risk weighted approach to determining capital requirements. The Basel Capital Accord of 1988 (Basel I) provided a set of regulatory standards for international banks to create consistency (to prevent business from shifting to areas with less regulation) and to keep the banking system safe. In June 1988, the Basel Agreement was signed by twelve nations and regulators in the US mandated that all US banks complied by 1992. In general, capital ratios (Tier 1, Tier 2 and leverage) increased following the adoption of the Basel guidelines.

1991: As a result of the savings and loan crisis in the United States, Congress created guidelines for capital requirements in the US with the FDIC Improvement Act (FDICIA) of 1991. The Act called for (1) higher capital ratios, (2) early intervention and corrective action against undercapitalized banks, (3) timely resolution of failures and (4) a risk based deposit insurance premium (see page 61 for more information on deposit insurance premiums). The act also set minimum leverage requirements for banks.

Risk weighting calculations for off and on balance sheet assets

While banks were subject to a number of risks, Basel I focused mostly on credit risk and capital requirements. However, only four risk weights were used (0/20/50/100%) which tends to overestimate the amount of capital for good quality loans (i.e. borrowers with higher FICO

scores and low LTVs) and underestimate the amount of capital for more risky loans. Basel I defined regulatory capital as core capital (Tier 1) and supplementary capital (Tier 2). As previously mentioned, under Basel I recommendations, banks should have Tier 1 ratios of at least 4% and total capital ratios of at least 8%.

Basel I also accounts for credit risk of off-balance sheet exposures. Calculation of risk weighted amounts for off-balance sheet items (to be added to risk-weighted assets to calculate capital ratios) has two steps:

1. To calculate the credit equivalent amount of off-balance sheet items, the face value or notional amount of this item is multiplied by a Credit Conversion Factor (CCF). This translates an off-balance sheet item into an on-balance sheet equivalent amount of a direct loan and is considered to have equal risk. CCFs defined by the FDIC are provided in Figure 40.

Figure 40: Credit conversion factors

0%	Unused portions of commitments with an original maturity of one year or less, Unused commitments (regardless of maturity) which are unconditionally cancelable at any time, provided a separate credit decision is made before each drawing
20%	Short-term, self-liquidating, trade-related contingencies, including but not limited to commercial letters of credit
50%	Performance standby letters of credit and other Transaction-related contingencies, Unused portions of commitments with an original maturity exceeding one year, Note issuance facilities and revolving underwriting facilities
100%	Financial standby letters of credit, Risk participations in bankers acceptances acquired by the reporting bank, Securities lent, Sale and repurchase agreements and assets sold with recourse, Direct credit substitutes, Forward agreements/contingent obligations to purchase assets with drawdown certain, All other off-balance sheet liabilities

Source: FDIC

2. Risk weighting of off-balance sheet assets is calculated by multiplying the credit equivalent amounts (calculated above) by the appropriate risk-weighting factor. Risk weight factors for off-balance sheet items defined by the FDIC are provided in Figure 41 below.

Figure 41: Risk-weighting factors for off-balance sheet items

0%	Off -balance sheet direct claims on, or claims unconditionally guaranteed by the U.S. Government and other OECD central governments
20%	Financial and performance standby letters of credit conveyed to U.S. and other OECD depository institution, Financial and performance letters of credit with remaining maturities of one year or less, Risk participations in acceptances acquired by the reporting bank and subsequently conveyed to U.S. and other OECD depository institutions, Unused commitments with an original maturity exceeding one year conveyed to U.S. and other OECD depository institution, Unused commitments with original maturities of one year or less
50%	Assets transferred with recourse
100%	Commercial and similar letters of credit, Securities lent, Unused commitments with an original maturity exceeding one year, All other off-balance sheet liabilities

Source: FDIC

1996: Over time, Basel I has been amended to account for financial innovation and other risks that were not originally considered when written. In 1996, an amendment was made that required banks to set aside capital to cover market risk of equities, debt securities (including

securities that trade like debt), foreign exchange, commodities and options. This amendment also defined Tier 3 capital whose only purpose was to cover market risks. Tier 3 capital included subordinated debt (with maturities less than two years), but was subject to certain limits.

The largest change in the risk weighting methodology of Basel I came from an amendment which allowed banks to use internal risk models (as an alternative to the standard approach) to determine the required capital for market risk. The standard approach determines the risks associated with each position and how they are to be combined to determine the overall risk capital charge. The internal models approach, in contrast, allows a bank to use its model to estimate the value–at–risk in its trading account.

Issues with Basel I

Under Basel I, capital requirements are only moderately related to a bank's risk taking.

- Risk weightings not reflective of actual risk: The risk-weighting categories do not correspond to the actual risk across the different categories (as measured by banks' internal risk models), which has led to unintended lending practices.
  - When banks' capital levels fall below regulatory requirements, many turn to shedding higher risk-weighted assets rather than raising capital, although this might not in fact be lowering risk.
  - Some have speculated that the category weightings have actually increased the intensity of the boom-bust cycles in the financial systems in several countries.
  - In dealing with international lending to banks outside the Organization for Economic Co-operation and Development (OECD) region, short-term loans only have a risk weighting of 20% while loans over one year, 100% –which some speculate led to large short-term debt buildups before the Asian financial crisis of 1997.
  - No recognition of the term-structure of credit risk: capital targets are set the same regardless of the maturity of the credit exposure.
- Rigid capital requirements: Capital requirements for a given asset class are the same no matter how strong or weak a borrower's credit rating. Capital requirements for loans to borrowers with high credit ratings are much higher than what banks would choose to hold which puts banks at a disadvantage when competing with non-bank lenders.
- Lack of recognition of diversification effects: total capital charges are equal to the sum of the individual risk exposures whereas diversification should provide some benefit in terms of risk reduction.
- Not prepared for innovation: Basel I was not ready for financial innovation
  - The use of derivatives (swaps, options, CDS, etc.) and securitizations brought a new challenge to the simple risk weighting system of Basel I.
  - Financial deregulation opened the door to banks investing in equities and making loans against stocks and increased activities in the securities and insurance sectors.
  - Lack of market risk metrics for off-balance sheet items. While the credit risk on off-balance sheet assets was accounted for using CREs (discussed above), Basel I did not consider market risk (inc. equity price risk, interest rate risk, currency risk, etc.) of these assets. An amendment made in 1996 helped deal with this issue.

These shortfalls of Basel I indirectly encouraged banks to structure transactions to minimize regulatory requirements or, in some cases, to undertake transactions whose main purpose was to reduce capital requirements with no reduction in actual risk taking.

Basel II to deal with financial and operational risks

2004: In June of 2004, the Basel Committee published a new set of recommendations for banking regulation which was called Basel II. As of April 2011, most banks in the U.S. were still subject to recommendations presented under Basel I. The intent of the new set of recommendations was to provide an updated set of standards regarding capital requirement recommendations based on banks' financial, and now, operational risks.

In general, Basel II places more emphasis on banks internal risk models, supervisory review and market discipline. These standards are more flexible, provide incentives for improving risk management and are more sensitive to risk.

The US decided to postpone implementation of Basel II, with a three-year transition period that was expected to begin in 2009, and was to limit its application to between 10 and 20 of the largest banks (those with total assets of at least $250b or with foreign exposure of $10b or more). U.S. banking regulators were concerned with the possible creation of competitive advantages and disadvantages that could negatively impact the numerous small and medium sized banks that make up the vast majority of U.S. banks. Additionally, initial analyses of the impacts of Basel II on U.S. banks yielded mixed results. For these reasons, the US proposed a modified version of Basel I that would create additional risk classes but otherwise leave the original provisions mostly intact.

Basel II contains three pillars:

- Minimum capital requirements: minimum total capital to be considered adequately capitalized remains at 8% (same as under Basel I), with the definition of total capital unchanged and the denominator (risk-weighted assets) now including a component for operational risk (operational component not adopted by the US), adding to credit and market risk under Basel I. However, under Basel II, credit risk is more precisely measured using banks' choice of the standardized approach (like Basel I–based on external credit ratings) or an internal credit risk based approach (similar to the Basel I amendment for calculation of market risk).
- Supervisory review process: supervisors will evaluate risk-measurement techniques of banks.
- Market discipline: increased risk disclosures required.

Capital guidelines following the financial crisis starting in late 2007

2008: In response to the sharp economic downturn and rising risk of bank failures in the U.S. with the failure of Lehman Brothers in September 2008 and forced sale of Bear Stearns, the Congress passed the Emergency Economic Stabilization Act of 2008 (10/3/08). The Act was intended to increase market stability, 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 which in turn increased capital and provide much needed liquidity to the banking system.

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 (which includes preferred shares) was still the focus of regulators, so the preferred shares significantly helped banks' capital (as well as liquidity) positions. The banks we track received a total of $157b through issuance of trust preferred securities to the US Treasury Department, and of this group all have repaid as of April 2011 except for MTB, RF, and ZION.

SCAP test places more importance on common capital

2009: On May 7th, 2009 the Federal Reserve released the results of The Supervisory Capital Assessment Program (SCAP) which was an assessment of the adequacy of bank capital levels in response to the economic down-turn starting in 2007 that resulted in the failure of numerous banks and the need for the government TARP program. The Fed determined that the 19 largest U.S. bank holding companies (BHCs) 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). To determine the size of the SCAP buffer for each firm, supervisors used their estimates of each firm's losses and resources for the more adverse scenario to answer the following two questions:

- If the economy follows the "more adverse" scenario, how much additional Tier 1 capital would a bank need today to have a Tier 1 capital ratio in excess of 6% at year-end 2010?
- If the economy follows the "more adverse" scenario, how much additional Tier 1 common capital would a bank need today to have a Tier 1 common risk-based ratio in excess of 4% at year-end 2010?

The results of the test were that the aggregate capital needed for the 19 BHCs to reach the SCAP capital buffer targets under the more adverse scenario was $185 billion, the vast majority needed to be in the form of Tier 1 common.

What Will Future Capital Requirements Look Like (Basel 3)

2009 – On December 17 2009, the Basel Committee published two papers (*Strengthening the resilience of the banking sector* and *International framework for liquidity risk measurement, standards and monitoring*) which included recommendations for capital and liquidity standards in response to the economic crisis and failure of the banking system under Basel I/II. The Basel Committee pointed out several factors that contributed to the crisis including excessive build up of on- and off-balance sheet leverage, erosion of the quality of capital and insufficient liquidity buffers. Additionally, they stated the crisis was worsened by a procyclical deleveraging process and interconnectedness of large global banks.

Key areas discussed in the proposal were (1) the improvement in the quality of banks' capital (2) more regulation on balance sheet leverage (3) countercyclical capital measures (4) increased capital requirements for trading books, and (5) liquidity and funding standards.

On September 12th, 2010, the Basel Committee released additional information on new capital guidelines (Basel 3). The primary focus was on capital and liquidity:

- Quality and level of capital: The Basel Committee recommends raising the quality of capital. More focus should be placed on the common equity portion of Tier 1 capital, similar to in the U.S. since the results of the SCAP test. 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. See Figure 42 for more details. The Committee also stated systemically important banks should hold an additional common equity buffer (some estimate up to 300bps), potentially bringing minimum Tier 1 common levels up to 10% for large banks.

- **Leverage ratio:** The Committee recommended the use of a leverage ratio to serve as a backstop to the risk-based capital measure and to contain the build-up of excessive leverage in the system. As previously noted, the leverage ratio is already part of the regulatory framework in the U.S.
- **Risk measures:** Recommendations covered increasing the risk coverage for trading activities, securitizations, exposure to off-balance sheet vehicles and counterparty credit exposures arising from derivatives.
- **Increased disclosures and regulatory guidance:** Raising standards for the supervisory review process (Pillar 2) and public disclosures (Pillar 3), together with additional guidance in the areas of sound valuation practices, stress testing, liquidity risk management, corporate governance and compensation;
- **Liquidity standards:** Introduced minimum global liquidity standards consisting of both a short term liquidity coverage ratio and a longer term, structural net stable funding ratio (see liquidity discussion on page 50 for more information).

Figure 42: Capital requirements under Basel 3

	2013	2014	2015	2016	2017	2018	1-Jan-19
Minimum common equity capital ratio	3.5%	4.0%	4.5%	4.5%	4.5%	4.5%	4.5%
Capital conservation buffer				0.625%	1.3%	1.9%	2.5%
Minimum common equity + capital conservation buffer	3.5%	4.0%	4.5%	5.1%	5.8%	6.4%	7.0%
Phase in of deductions (DTAs, MSRs, and financials)		20.0%	40.0%	60.0%	80.0%	100.0%	100.0%
Minimum Tier 1 capital	4.5%	5.5%	6.0%	6.0%	6.0%	6.0%	6.0%
Minimum Total capital	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Minimum total capital + conservation buffer	8.0%	8.0%	8.0%	8.6%	9.3%	9.9%	10.5%
Capital instruments that no longer qualify as non-core Tier1/Tier 2 capital	Phased out over a 10 year period starting 2013						

Source: Basel

Several adjustments to Tier 1 common could have a meaningful impact on capital

In the U.S., where regulators focus is already on Tier 1 common, some of the meaningful recommendations to come out of the new Basel proposal were regarding adjustments to Tier 1 common. Three recommended adjustments could have meaningful impacts on bank capital levels if the rules are adopted by US regulators. The adjustments include:

- **Equity interests in other financial institutions:** The Basel Committee recommends that banks' equity interests in other leveraged financial institutions shall not exceed 10% of Tier 1 common, and 15% when combined with the items below.
- **DTAs related to temporary timing differences:** DTAs dependent on future earnings are already subject to limitations under U.S. Basel recommends that DTAs related to timing differences should not exceed 10% of Tier 1 common, and 15% when combined with the above and below items.
- **Mortgage Servicing Rights (MSR):** An MSR is the balance sheet value a bank places on its right to service its current mortgage servicing portfolio. Under Basel 3, this would be capped at 10% of Tier 1 common, and 15% when combined with the two items above.

Additional items that may impact capital levels in the U.S. include:

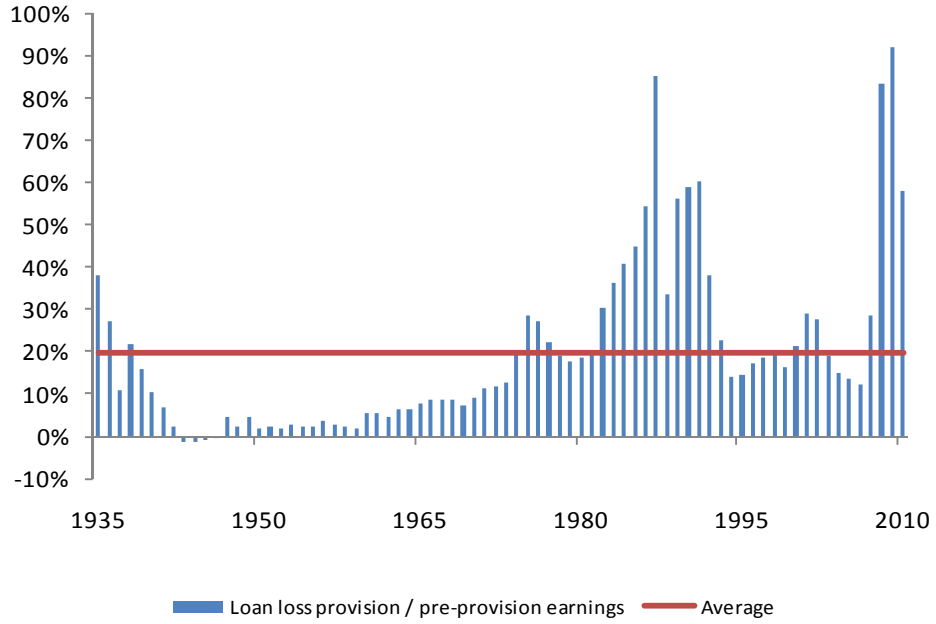
- **Changes to RWA weightings:** Recommended changes to risk weighted assets are not yet known, but it's likely that banks will see increases in weightings for trading books.
- **Defined pension benefits:** Under the recommendations, defined benefit pension assets should be removed while liabilities should remain.

Credit

Credit risk is the risk that a bank will not be repaid in full (principal and interest) by borrowers and/or counterparties. While banks are primarily exposed to credit risk through the process of making and holding loans on their balance sheets, credit risk arises from other sources including holding securities and entering into certain derivative contracts. Credit losses are one of the quickest ways for banks earnings/capital to be offset/depleted—which is the primary reason why it's so important for banks to be able to measure and manage this risk.

Aggregate industry credit losses relative to pre-provision earnings were the highest in 2009 going back to the mid-1930s (the year following the creation of the FDIC). The second highest provision expense on this basis was in 1987. See Figure 43.

Figure 43: Provision expense / pre-tax pre-provision earnings



Source: FDIC

Measuring Bank Credit Risk

The most commonly watched metrics include net charge-offs as a percentage of loans, NPLs as a percentage of loans, NPAs as a percentage of total assets, loan loss provision as a percentage of net charge-offs, loan loss reserves to net charge-offs and loan loss reserves to loans. We explain each one in more detail below.

Net charge-offs (NCOs)

A bank takes a charge-off on a loan when it is deemed that the full principal and interest owed by the borrower is uncollectible. When a bank charges off a loan it recognizes the loss and the loan value is marked down accordingly on the balance sheet. Note that only the portion of the loan that is determined to be uncollectable will be charged off. In other words the loan is charged off to its net realizable value. NCOs are the net amount of the gross charge-offs and recoveries from previous charge-offs realized in a given period.

NCOs / average loans

The net charge-off to average loan ratio measures the percentage of loans that are charged off in a given time period. (Note that this ratio is measured on an annualized basis). It is one

of the most fundamental ways to measure credit risk at a bank. In Figure 44 we show historical charge-off rates by loan category going back to 1985 for the largest 100 U.S. commercial banks by assets. While total charge-offs have averaged 93bps over the past 25 years, loss rates have increased meaningfully since 1Q07 (when charge-offs were under 50bps on average) to a high of almost 340bps in 4Q09.

Additionally, there is a wide range of loss rates for different loan types. Historically, residential real estate loan losses have been low (averaging just 15-20bps) which reflects both the well collateralized nature of these loans and consumers traditionally defaulting on their mortgages as a last resort (given their unwillingness to give up their home). However, loss rates have increased meaningfully over the past three years. This largely reflects the loosening of underwriting standards by many lending institutions (i.e. widespread use of subprime/Alt-A mortgage products), substantial declines in home prices, and an overall weak economy (i.e. high unemployment). In contrast, credit card loans have consistently had higher loss rates, which primarily reflect the fact that they are unsecured.

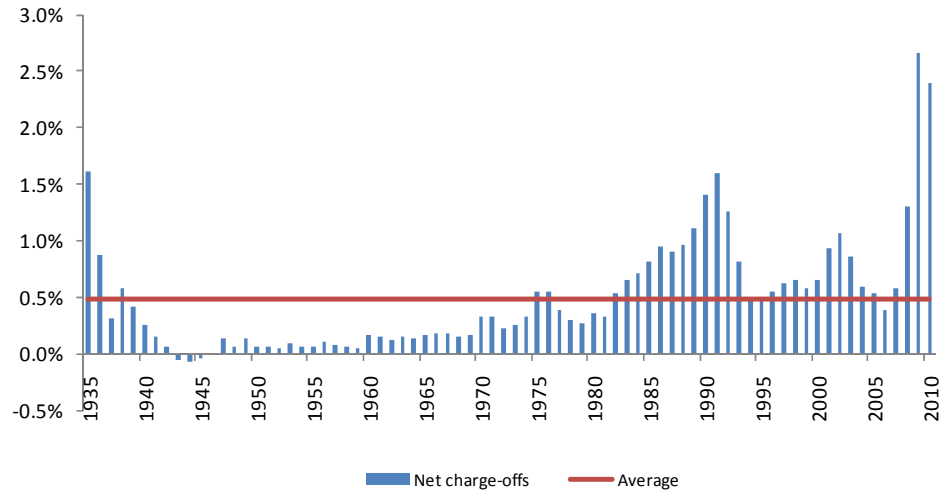
Figure 44: Historical charge-off rates (as a % of average loans) by loan segment

	Real Estate			Consumer				
Year	Residential	Commercial	Agricultural	Credit Card	Other consumer	Business	Leases	Total
1985	NA	NA	3.56%	2.65%	0.74%	1.02%	0.66%	0.79%
1986	NA	NA	3.20%	3.50%	0.90%	1.16%	0.61%	0.94%
1987	NA	NA	2.26%	3.50%	0.86%	0.91%	0.76%	0.92%
1988	NA	NA	-0.12%	3.48%	0.85%	0.94%	0.40%	1.19%
1989	NA	NA	0.09%	3.23%	1.04%	0.99%	0.46%	1.46%
1990	NA	NA	-0.32%	3.52%	1.33%	1.26%	0.65%	1.81%
1991	0.15%	2.95%	0.64%	4.99%	1.40%	1.79%	0.76%	2.00%
1992	0.29%	3.51%	0.31%	5.17%	1.22%	1.33%	0.68%	1.59%
1993	0.26%	2.15%	0.17%	4.09%	0.84%	0.73%	0.39%	1.05%
1994	0.22%	1.06%	0.45%	3.34%	0.70%	0.20%	0.08%	0.59%
1995	0.16%	0.35%	-0.04%	3.50%	0.82%	0.20%	0.10%	0.50%
1996	0.12%	0.13%	0.07%	4.38%	1.04%	0.19%	0.21%	0.58%
1997	0.10%	-0.05%	0.14%	4.93%	1.17%	0.22%	0.24%	0.64%
1998	0.08%	-0.03%	0.14%	4.90%	1.15%	0.38%	0.25%	0.69%
1999	0.14%	0.02%	0.46%	4.43%	1.18%	0.56%	0.31%	0.66%
2000	0.13%	0.05%	0.52%	4.21%	1.35%	0.81%	0.29%	0.73%
2001	0.29%	0.15%	1.08%	4.92%	1.41%	1.49%	0.63%	1.04%
2002	0.17%	0.15%	0.87%	6.18%	1.61%	1.92%	1.06%	1.25%
2003	0.22%	0.12%	0.43%	5.52%	1.55%	1.36%	0.85%	0.99%
2004	0.11%	0.07%	0.25%	5.02%	1.41%	0.50%	0.40%	0.69%
2005	0.08%	0.04%	0.01%	4.83%	1.51%	0.20%	0.58%	0.64%
2006	0.11%	0.06%	0.15%	3.69%	1.15%	0.25%	0.15%	0.48%
2007	0.28%	0.18%	0.09%	3.99%	1.69%	0.49%	0.21%	0.68%
2008	1.44%	1.34%	0.24%	5.44%	2.51%	0.98%	0.45%	1.57%
2009	2.65%	2.48%	0.88%	9.50%	3.30%	2.35%	1.18%	2.93%
2010	2.35%	2.68%	2.05%	9.39%	2.20%	1.70%	0.68%	2.97%
Median	**0.17%**	**0.15%**	**0.28%**	**4.40%**	**1.20%**	**0.92%**	**0.45%**	**0.93%**

Source: Federal Reserve

Since 1935, annual net charge-offs at the banks have averaged about 50bps and are currently near the highest levels they've been since the mid-1930's. See Figure 45.

Figure 45: Net-charge-offs (% of loans)



Source: FDIC

Nonperforming loans (NPLs)

Generally, when a loan is 90-days past due, a bank will classify it as nonperforming (or nonaccruing) unless it is well-secured and in the collection process. A bank may also place loans on nonaccrual status when payment is not past due if management has doubts about the borrower's ability to comply with repayment terms. When a loan is placed on nonaccrual status the bank will stop accruing interest on the loan, and any interest that has been accrued, but not collected is reversed out and charged against the bank's loan loss reserve balance. Any subsequent payments are generally applied to the loan's principal balance.

NPLs / loans

Given most nonperforming loans will eventually lead to charge-offs, this ratio is typically used to help gauge potential future credit losses at banks. However, this ratio can be misleading when comparing it across different banks given not all NPLs will have the same loss content. For example, some nonaccrual loans will return to performing status, some nonaccrual loans are written down more than others (which in part depends on management's judgment), while other nonaccrual loans could be well enough collateralized to the point where a bank may not take any losses after repossessing and selling the underlying collateral.

Nonperforming assets (NPAs)

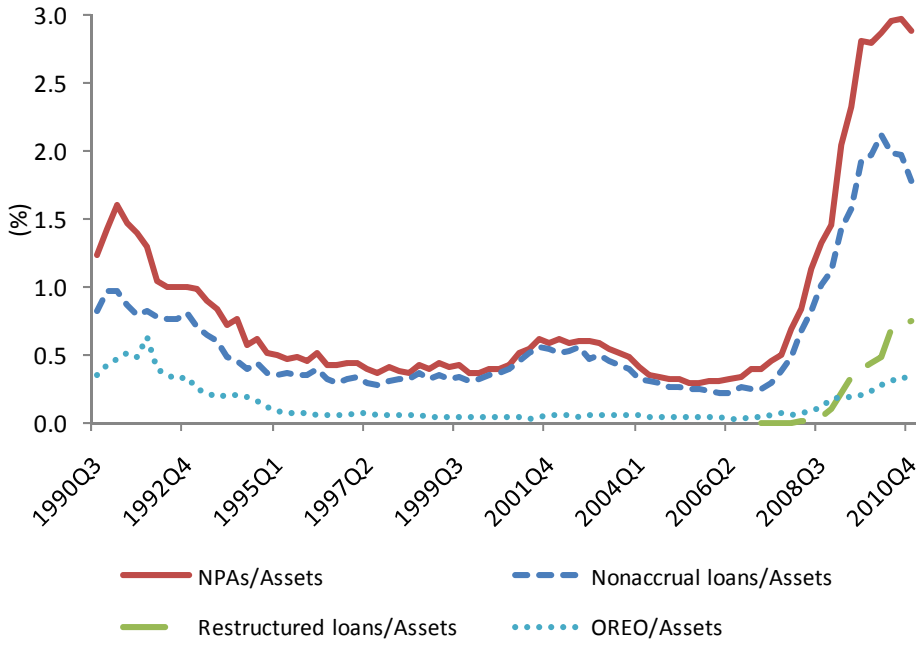
Nonperforming assets (NPAs) include both nonperforming loans and other real estate owned (OREO), which primarily consists of foreclosed properties a bank has repossessed. NPLs are typically sold, become performing again (and reclassified into accruing status), or end up in a bank's OREO portfolio (as hard assets vs. previously loans secured by those assets). Banks are responsible for keeping up their portfolio of foreclosed property, which includes paying property taxes and maintenance fees. Banks also incur other expenses directly related to their OREO portfolios (such as legal and the cost of additional personnel). In total, these expenses are estimated to be 10% of the OREO portfolio on an annual basis.

NPAs / total assets

Similar to NPLs to loans, nonperforming assets to total assets is used to help gauge potential future credit losses at banks. Many analysts/investors look at a modified NPA metric that includes a banks troubled debt restructurings (TDRs) which are loans to distressed borrowers whose terms have been modified (discussed in more detail below). Similar to NPLs and OREO, the potential loss content on these loans differs from bank to bank.

NPAs (including TDRs) have increased meaningfully to just under 3% as of 4Q10 from the recent low of 0.30% in 3Q05 (and compares to the 20-year average of 0.80%). Over the past few quarters we have seen an increase in restructured loans and OREO balances. So while nonaccrual loans have actually declined over the past few quarters, NPAs have remained elevated driven by an increase in restructured loans (which now represent 0.75% of assets on average at the banks we track) and OREO (which now represents ~0.30% of assets). See Figure 46. Given a continued emphasis on mortgage modifications (by regulators and banks themselves) we expect restructured loans to continue to increase from current levels over the next few quarters. With that said, while TDRs are likely to increase from here, it's unclear what this means for future credit losses related to aggregate nonperforming loans.

Figure 46: NPAs/assets and TDRs



Source: SNL
Data set include: BAC, JPM, C, WFC, USB, PNC, STI, COF, BBT, RF, FITB, KEY, MTB, CMA, MI, HBAN, ZION, FHN and TCB

Loan restructurings

A bank will restructure a loan (i.e. modify the terms of a loan) in order to minimize an eventual loss caused by: 1) a borrower defaulting on a loan; or 2) prepayment of a loan resulting from a decrease in market interest rates (refinancing). In the first case, a bank believes that by modifying a loan it can maximize recovery of its investment. In the second case, failing to restructure a loan could lead to losing a customer who can refinance elsewhere.

Troubled debt restructurings (TDRs)

The restructuring of a loan is considered a troubled debt restructuring (TDR) if a bank—for economic or legal reasons related to a borrower's financial difficulties—grants a concession that it otherwise would not have considered. A TDR may include: 1) modification of the terms of the loan such as reduction of the interest rate, extension of the maturity date, reduction of principal or reduction of accrued interest; 2) transfer of assets (real estate, receivables, etc.) from the borrower to the bank; or 3) issuance of an equity interest to the bank.

A loan can be restructured before or after it matures or becomes nonaccrual. For a loan that is on accrual status at the time of restructuring, a bank needs to decide whether the loan should be placed on nonaccrual. If a loan is nonaccrual at the time it is restructured, its status can be reassessed based on the borrower's sustained repayment performance for at least six

months and eventually the loan can be returned to accrual status. Not all banks return nonperforming TDRs to accruing status once they have sustained payment performance which makes it more difficult to compare one bank's TDRs with another's.

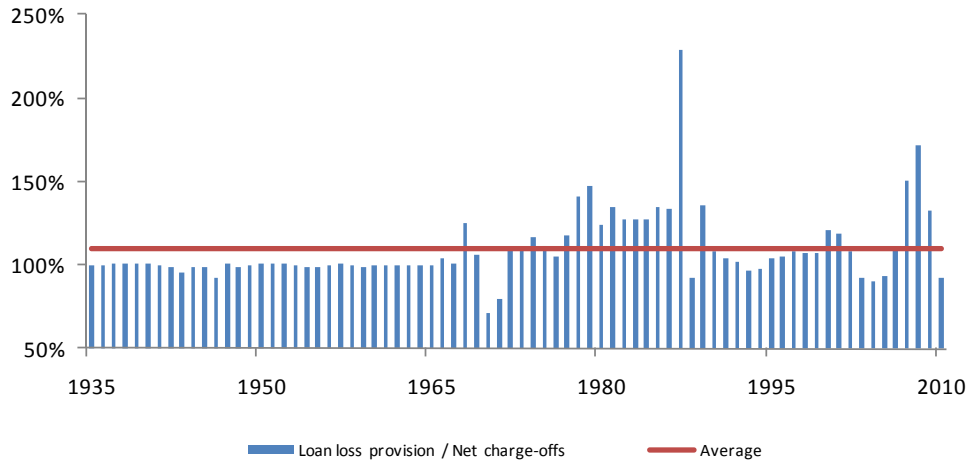
When classifying loans as TDRs, banks typically incur losses (through increased provision expense/reduced earnings) to build a loss reserves for these loans. Such a loss has to be recognized at the moment the loan is restructured.

Given the varying treatment/classification and disclosures regarding restructured loans and TDRs by the banks, new regulatory guidance will essentially require all restructured loans to be classified as TDRs as of 3Q11. This is likely to cause a spike in TDRs in 3Q, with banks that have higher risk portfolios (subprime auto, credit card) likely seeing the largest increases.

Loan loss provision expense

While net charge-offs represent the actual loss incurred by a bank in a given period, loan loss provision is the credit expense that flows through a bank's income statement. Generally, when a bank incurs a provision expense it serves the function of adding to its loan loss reserves, while a net charge-off reduces a bank's loan loss reserves. Note that when a bank takes a charge-off on a loan, the loss associated with that charge-off has already been accounted for in the bank's income statement and balance sheet. When a bank's provision expense is greater than net charge-offs in a given period, the bank is building its loan loss reserve and points to increased charge-offs in future periods. See Figure 47. Note that any bar in the chart that is greater than 100% represents reserve build.

Figure 47: Loan loss provision expense / net charge-offs



Source: FDIC

Allowance for loan losses (i.e. loan loss reserves)

A bank's allowance for loan losses represents management's estimate of probable or expected credit losses inherent in a held-to-maturity loan portfolio (banks do not hold reserves against loans held-for-sale as expectations for credit losses are accounted for in the fair value mark the loan is carried at). The loan loss reserve (LLR) is a contra asset (to gross loans) that is reduced when a loan is determined to be uncollectible and charged off. Any subsequent recoveries on loans already charged-off are credited back to the bank's reserves.

Banks consider a variety of factors when estimating the appropriate size for their loan loss reserve balances. These include historical loss experience on loans with similar risk characteristics, estimated defaults based on portfolio trends, current delinquency rates, economic, political and regulatory conditions, credit scores of borrowers, as well as the credit

risk associated with specific markets and industries. Additionally, for commercial credits over a certain size (e.g. $2.5m), a bank may set aside a specific reserve, after considering expected cash flows and estimated collateral values associated with that credit.

LLR methodologies are pro-cyclical—magnifying the financial impact of credit cycles
Current accounting standards are considered to be pro-cyclical—in that they require banks to increase provisions during the point in a credit cycle when it is most difficult to do so (i.e. when credit losses are high). As a result, this magnifies the financial impact of a credit-down cycle, further pressuring bank earnings and capital at a time when both are most needed. On the other hand, during long periods of positive economic trends and low credit losses, bank loan loss provisions are lower given lower credit losses and release of credit reserves.

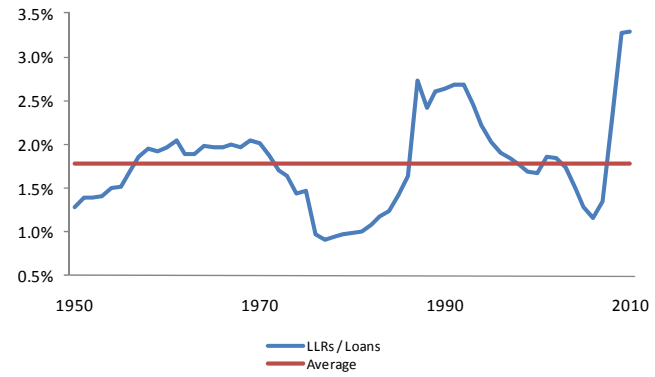
The reason for this pro-cyclicality as it relates to bank provisioning methodology is that banks take a provision expense only when a loss has been "incurred" or if it can be documented that a loss is probable and it can be reasonably estimated. This is typically determined by using historical loss rates and recent loss experience with a particular loan type.

This issue is recognized by many banks and their regulators—including the Comptroller of the Currency, John Dugan. Mr. Dugan has spoken in favor of loan loss reserve methodologies that are more counter-cyclical and is a proponent of banks using more non-historical, forward-looking judgmental factors when determining appropriate levels of provisions/reserves.

Reserves/loans and reserves/net charge-offs
Assuming two banks have the same loan portfolios, a bank with a higher reserve/loan ratio will be better able to absorb future credit losses. However, the credit riskiness of banks' loan portfolios can vary materially bank-to-bank and thus higher reserves may also indicate higher inherent credit risk in the loan portfolio—which will ultimately lead to higher future losses.

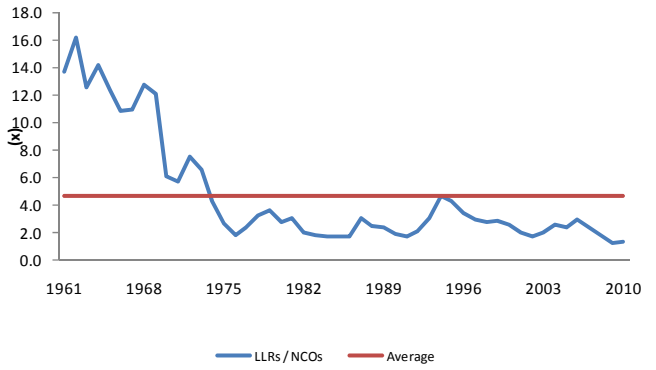
Up until recently, banks have been building reserves (with reserves/loans increasing from 1.2% in 2006 to 3.3% as of the end of 2010). However, in proportion to net charge-offs, reserves have actually declined over the past few years. At the end of 2010, reserves represented just 1.4x net charge-offs vs. the historical average of 4.7x. This means that the banking industry's aggregate reserves, would in theory only last 1.4 years before being completely depleted from future net charge-offs (assuming the current level of net charge-offs remains constant in the future). See Figures 48 and 49.

Figure 48: Loan loss reserves / loans



Source: FDIC

Figure 49: Loan loss reserves / net charge-offs



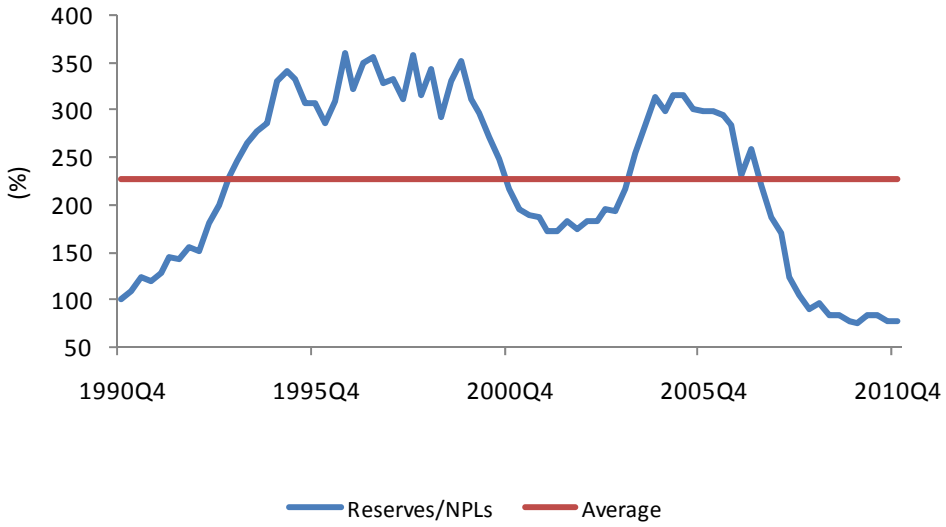
Source: FDIC

Reserves / nonperforming loans (NPLs)

Another common credit quality metric used in measuring credit risk at banks is loan loss reserves-to-nonperforming loans (LLRs/NPLs). Since late 2004, banks' loan loss reserves relative to NPLs have been declining, reflecting nonperforming loan balances that have been increasing faster than banks have been adding to reserves. See Figure 50.

When evaluating a bank's reserves to NPLs, it is important to keep in mind that not all NPLs are "created equal" and different banks will have differing amounts of unrecognized loss content in their NPLs. For example, ultimate losses will depend on the type of NPL and the collateral backing it. Additionally, some NPLs have been written down to net realizable value (through charge-offs), while others have specific reserves held against them (which all else being equal would increase the ratio). Additionally, TDRs will have a different loss content than nonaccrual loans (note that some analyst/investors lump TDRs into the NPL category). Lastly, differing charge-off policies should be considered when evaluating coverage ratios.

Figure 50: Reserves / nonperforming loans

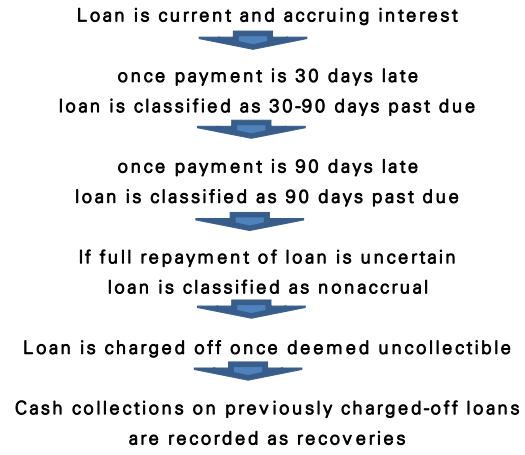


Source: SNL

Different stages of non-current loans

In Figure 51 we highlight the stages of a bad loan.

Figure 51: Transition from a current loan to charge-off



Source: Deutsche Bank

When different loan types are charged off

- Unsecured consumer loans – Losses on unsecured consumer loans are recognized at 120-days past due (though some banks recognize losses at 90-days past due).
- Secured consumer loans – Secured consumer loans (including residential real estate) are typically charged off to net realizable value at either 120 or 180 days delinquent.
- Commercial/CRE loans – Typically placed on nonaccrual status when principal or interest is past due 90 days or more unless the loan is both secured by sufficient collateral and the loan is in the process of collection. Accordingly, secured loans may be charged down or reserves established to the estimated value of the collateral.

A Snapshot of Past Recessions/Credit Cycles

1970s-1980s - Rising inflation in the late 1970's pushed up short-term interest rates. In the early 1980's, high and volatile rates had a negative impact on thrifts—which operated with maturity mismatches between their assets and liabilities. Additionally, the government was deregulating and relaxing supervisions and controls. A number of these factors and changes in the tax code made investments in commercial real estate (CRE) more attractive—helping to lead to a CRE boom. In the mid-1980s, the government revoked CRE tax benefits and left the market flooded with CRE supply without the appropriate demand. By the end of the 1980s, a combination of factors caused a crash in the equity and high-yield bond markets.

- 1973-1975 – The recession in 1973-1975 can be characterized as a period of stagflation (with both high unemployment and high inflation)—which was caused in large part by high government spending related to the Vietnam War and a large increase in oil prices by OPEC. Over this time period, unemployment increased from 5.1% in early 1974 to 9.0% in May 1975, while GDP declined 3.2% and inflation reached 9.1% in 1975.
- 1981-1982 – The recession of the early-1980s was primarily driven by contractionary monetary policy in an effort to control the high inflation at the time. Inflation increased to 11.3% in 1979 and 13.5% in 1980, while unemployment peaked at 10.8% in 1982 at the same time GDP declined by 2.7% (from July 1981 to November 1982). In addition to the recession, credit losses at the banks increased meaningfully starting in the early-1980's, reflecting an over-investment by banks in commercial real estate, among other speculative lending, as well as deregulation of the industry (as the Depository Institutions Deregulation and Monetary Control Act of 1980 phased out a number of restrictions on banks' financial practices, broadened lending powers, and raised the deposit insurance limit from $40k to $100k—raising the problem of moral hazard).

1990-2009 – While a banking crisis occurred both at the beginning and end of this 20 year period, the rest of the period represented one of the best environments for banks given several positive macroeconomic trends from the early 1990s-2006. These include rising leverage, loosening of credit underwriting standards, and decreasing political/regulatory risks.

- 1990-1991 – The recession in the early 1990s reflected debt accumulation in the 1980s, new banking regulation that followed the S&L Crisis and growing pessimism on the part of consumers. Unemployment increased to a peak of 7.8% in 1992, government budgetary deficits expanded, and the US saw sluggish GDP growth through late 1992.
- Early-2000s – The recession of 2001-2002 was driven by the collapse of the dot-com bubble, corporate accounting scandals, and a sharp fall in business expenditures. However, employment remained relatively strong and home prices continued to rise.
- 2007-2009 – The late-2000s recession is considered by many to be the largest downturn since the Great Depression. The coinciding financial crisis can be linked to the bursting of the U.S. housing market, which caused securities tied to real estate to fall in value, and put capital/liquidity pressure on financial institutions globally. From the beginning of 2008 through mid-2009 the U.S. unemployment rate increased from 4.9% to 10.1%.

Liquidity

Capital is King, But Liquidity Rules

While strong capital ratios are a key ingredient to generating public confidence in a banking institution and for a stable banking system as a whole, as the global financial crisis has shown us, it is not sufficient by itself. Having ample liquidity is equally important. This can be seen with a number of the failed banks/financial institutions or forced sales (e.g. Bear Stearns, Lehman Brothers, National City, Wachovia, etc.). While many had adequate capital levels at the time of failure/takeover, it was the lack of public confidence and the resulting inability to rollover short term borrowings (i.e. lack of liquidity) that ultimately caused them to fail and/or be taken over by competing institutions.

What is liquidity?
Liquidity can be defined as the ability of a bank to fund cash demands at a reasonable cost—which most commonly takes the form of deposit withdrawals and new loan demand (including drawdowns of existing lending commitments). Banks are inherently exposed to liquidity risk given their basic balance sheet structure. They are funded with short-term liabilities (a high proportion of which is in the form of demand deposits and money market debt—which can be withdrawn at any time), while the majority of their asset base is comprised of longer term loans and securities.

Assets and liabilities used for liquidity management
There are a variety of different securities/borrowings a bank can use to manage its liquidity position. Deciding which is best depends on bank specific circumstances, such as how fast the bank needs the funds and for how long, the cost of a certain type of liquidity vs. alternative liquidity options, a bank's view on monetary policy (more specifically where they anticipate interest rates going), and lastly any regulations on certain liquidity sources.

- Assets: In addition to primary liquidity reserves (which include vault cash and deposits held at the Federal Reserve) a bank will hold secondary reserves which are above and beyond regulatory requirements. Secondary reserves (typically the most liquid assets on a bank's balance sheet) include Treasury-bills, Federal funds sold, reverse repurchase agreements, deposits placed with correspondent banks, negotiable CDs and government backed securities.
- Liabilities: The primary types of borrowings used for liability liquidity management are Federal funds purchased, repurchase agreements, jumbo CDs, FHLB borrowings and Fed discount window borrowings.

How a bank manages its liquidity position
A bank can manage its liquidity needs by either having a sufficient amount of liquid assets on its balance sheet which it can convert to cash when needed (i.e. asset liquidity management) or by having access to external funds through borrowing (i.e. liability liquidity management). Most banks will use a combination of asset and liability management. However smaller banks will generally emphasize asset liquidity, as it is less risky than depending on borrowing to support liquidity needs. On the other hand larger banks will place a greater emphasis on liability management, given they are generally more active in money markets and as a result can access external funds at more attractive terms relative to smaller banks.

Liability liquidity management offers the potential for higher returns…
When comparing the positives and negatives of both strategies, liability management generally has the advantage in that it has the potential to produce higher returns for banks. This is because banks that use liability management have the ability to shift their asset bases

from relatively low yielding, short-term money market instruments to less liquid, higher-yielding, longer-term loans and securities. Additionally, liability management gives banks more flexibility to adjust borrowings as needed (the supply of liquidity is easily managed by simply increasing or decreasing the interest rate offered on new borrowings) rather than needing to carry low yielding, liquid assets on balance sheet in case a liquidity need arises (which can have a meaningful opportunity cost associated with it).

…but it carries with it higher risk

Liability liquidity management is riskier in that the bank is taking on more debt, is faced with greater interest rate risk (potential for higher borrowing costs) and credit/interest rate risk (given a greater portion of the balance sheet is in loans and longer term securities). Lastly, a bank that emphasizes borrowing for liquidity needs doesn't have complete control over the availability of liquidity when it may be most needed, as the need for liquidity usually comes about when it is the most expensive and the hardest to come by.

Managing liquidity in a distressed situation

While liability liquidity management offers a number of advantages to banks in a normal operating environment (primarily in the form of higher ROAs), its primary downfall is its lack of dependency in a stressed situation (either macro driven or bank specific). Under such a scenario, a bank would likely need to depend on asset liquidity given its ability to borrow may be impaired. For this reason, having an ample amount of asset liquidity is important for public confidence and can be viewed as a type of liquidity reserve.

Interest rate risk associated with liquidity management

Changes in interest rates could have a meaningful impact on a bank's liquidity. Higher interest rates generally increases the cost of liquidity for banks, as higher rates increases borrowing cost and reduces the value of assets that banks are trying to sell to convert to cash—both of which would impact profitability. Additional implications of higher interest rates include: 1) deposit withdrawals might pick up as depositors look for better returns elsewhere (a liquidity drain); 2) some loan customers with existing commitments to borrow might look to drawdown their lines at lower rates (a liquidity drain); or 3) on the other hand new loan demand may decline (a net boost to liquidity).

Higher asset liquidity levels have pressured bank NIMs recently

While it is crucial for banks to have adequate liquidity levels to meet cash demands of customers, the more asset liquidity a bank carries, the more it will reduce profitability ratios. More recently, banks' net interest margins have been pressured from having elevated levels of "excess liquidity" (which for most banks take the form of excess funds deposited at the Federal Reserve). While this is primarily driven by a combination of strong deposit inflows and weak loan demand (which forced banks to park excess funds in low-yielding, near-cash assets, such as deposits at the Federal Reserve), it also likely reflects banks being a bit more conservative in their management of liquidity levels.

How Banks Estimate Liquidity Needs

There are a number of methods banks use to estimate future liquidity needs. Some of the more common methods used include the sources and uses of funds method, the structure of funds method, market signal method, as well as looking at a variety of liquidity ratios. Unfortunately, for outside investors/analysts only the market signal method and certain liquidity ratios can be used as tools to gauge liquidity risk as the remainder use internal forecasts/information. We explain each method in more detail below.

1) Sources and uses of funds method

This method requires management to forecast loan and deposit trends (supply and demand of each) over a certain time period to estimate whether a bank will have excess liquidity (i.e. a

liquidity surplus) or have a liquidity shortfall (or deficit) and by how much. If a bank has a surplus it then needs to decide how the excess liquidity will be invested. If there is a deficit, the bank must raise funds in the most cost efficient manner.

2) Structure of funds method

With this method, a bank will group its different funding sources based on the likelihood of them being withdrawn. The next step is for the bank to decide on an appropriate liquidity reserve for each category (where the reserve will be larger for the funding categories that have a greater chance of being withdrawn). Additionally, a bank will need to have liquidity reserves for any new loan demand that may come about during a given time period.

3) Market indicators

This method takes into account a number of different market signals that may point to liquidity issues—including poor stock performance, widening credit spreads, a pickup in Fed discount window borrowing, the bank incurring losses on the sale of assets (in order to meet liquidity needs), and any signs of creditors (including depositors) withdrawing money from the bank (which shows a lack of public confidence).

4) Liquidity ratios

Management as well as investors/analysts look at a bank's liquidity metrics and compare them to both historical trends and to peers. It's important to look at more than just one liquidity metric in order to get a better sense of a bank's liquidity position. Some of the more common, publicly available, ratios include:

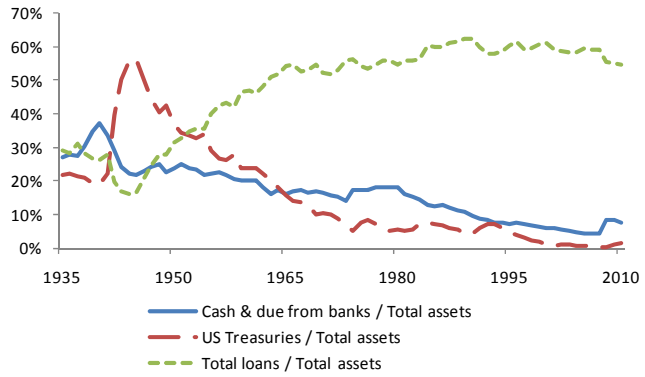
- Cash ratio: (Cash and due from banks / total assets). Cash and due from banks represents cash on hand and receivables from, or short-term loans to, other banks and/or financial institutions. The larger a bank's cash position is the better its liquidity position.
- Net federal funds and repurchase agreements ratio: (((Fed funds sold + reverse repos) – (Fed funds purchased + repos)) / total assets). This ratio shows whether a bank is a net lender or borrower in the overnight/short-term market relative to the size of the institution. The more positive this ratio is (the more the bank is a lender—a positive sign of a bank's liquidity position), the better a bank's liquidity position, and vice-versa.
- Liquid securities ratio: (US government securities / total assets). This ratio compares the amount of US Treasuries and government backed securities to total assets. Since government securities are typically the most liquid securities a bank can hold, the higher this ratio is, the greater a bank's liquidity position is.
- Pledged securities / total securities: Pledged securities are securities that are pledged most commonly as collateral for deposits/borrowings and/or derivatives. As a result, pledged securities cannot be counted on as a source of liquidity. As such, the greater amount of pledged securities a bank has, the worse its liquidity position is.
- Loans and leases / total assets: This ratio shows the amount of loans and leases a bank has relative to its total asset base. Since loans and leases are typically the most illiquid of a bank's assets, the higher this ratio is, the worse a bank's liquidity position is.
- Loans / deposits: This ratio shows how much of a bank's loan portfolio is being funded by deposits (which are typically considered more stable funding vs. borrowings). The lower this ratio is, the less reliance a bank has on non-deposit funding; and thus has a better liquidity position.
- Loans / non-deposit liabilities: The inverse of a loan to deposit ratio. The lower the ratio the more a bank is relying on borrowed funding and the worse its liquidity position is.
- Unused loan commitments / total assets: Since unused loan commitments represent a commitment by the bank to lend (a cash demand), the higher a bank's unused loan commitments are the greater the bank's liquidity needs will likely be.

- **Small denomination deposits / total assets:** (All deposits, excluding deposits >$250k / total assets). Since deposits greater than $250k are generally not covered by FDIC deposit insurance, they are more likely to be withdrawn with any sign of stress at the bank. As such, these deposits are considered to be less stable than core deposits. A greater amount of core deposits typically indicates a better liquidity position.
- **Demand deposits / time deposits**: This ratio measures how stable a bank's deposit base is. Since demand deposits can be immediately withdrawn and time deposits have fixed maturities, the lower the ratio the greater the liquidity position a bank has.
- **Brokered deposits / total deposits**: Brokered deposits are deposits placed at a bank by a broker, where the broker shops on behalf of its clients, for the bank paying the highest yield on deposits/CDs. Brokered deposits are purely rate based and as a result are considered the least stable type of deposit. As such, the higher a bank's brokered deposit ratio, the worse its liquidity position.
- **Short term assets / volatile liabilities:** Short term assets are considered a bank's most liquid assets and include cash and due from banks, Fed funds sold, short term securities, and reverse repurchase agreements. Volatile liabilities are a bank's most unstable sources of funding and include brokered deposits, large CDs, deposits in foreign offices, Fed funds purchased and repurchase agreements. This ratio measures how much of a bank's most unstable funding sources can be covered by its most liquid assets. The greater this ratio is, the better liquidity position a bank has.

Bank Liquidity Ratios Have Deteriorated Over Time

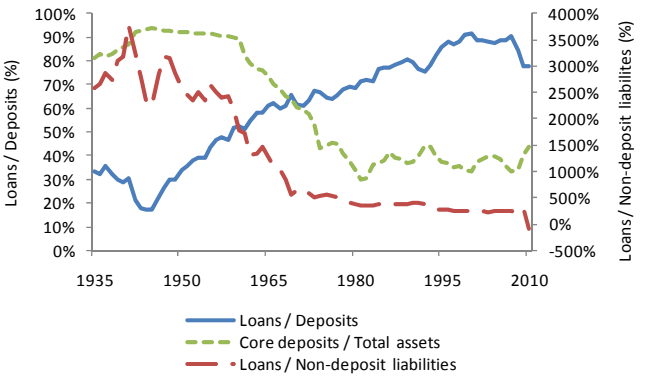
Liquidity in the US banking industry has declined over the past few decades—in particular as it relates to asset liquidity. Some of the more common explanations for this trend include: 1) banks have better access to a greater amount of liquidity sources; 2) industry consolidation (with fewer and larger banks in the industry there is a greater chance that cash outflows from one customer will result in cash inflows from another customer at the same bank—resulting in no change to the bank's liquidity position); 3) a deposit mix shift towards longer maturity deposits (which lowers liquidity requirements); 4) a decline in the Federal Reserve's legal reserve requirements; 5) banks have a greater ability to anticipate liquidity needs given technological advances; 6) a more stable economic outlook (up until the global financial downturn) which lowers the need for liquidity reserves. Figures 52 and 53 highlight liquidity trends for the aggregate commercial banking industry.

Figure 52: Asset liquidity trends deteriorated over time



Source: FDIC

Figure 53: Liability liquidity metrics deteriorated as well



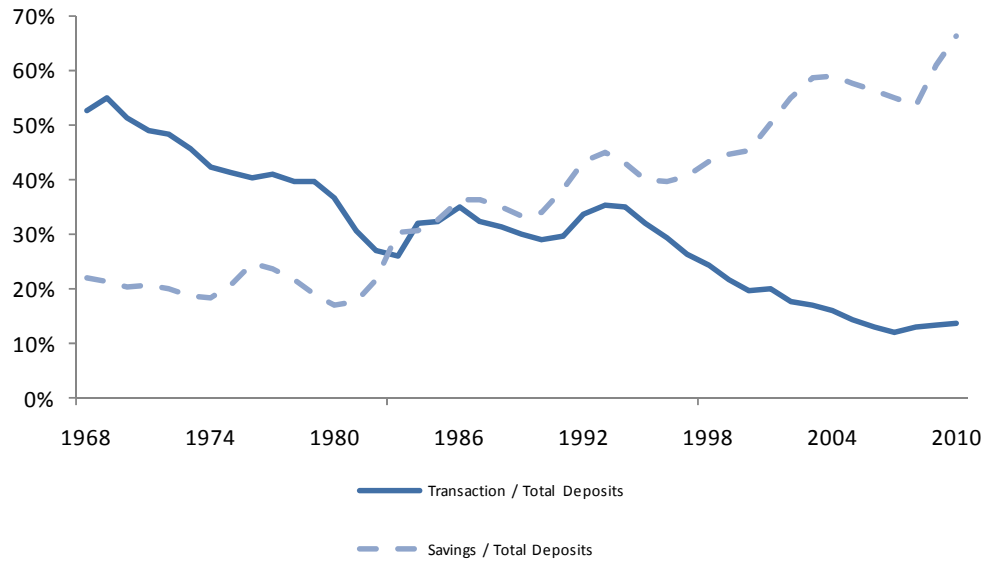
Source: FDIC

Legal Reserve Requirements

Legal reserves represent the amount of vault cash and deposits held at the Federal Reserve that a bank is required to hold to support its deposits. This requirement applies to all banks including commercial and savings banks, S&L's, credit unions and foreign bank branches and affiliates. As of 12/31/10 legal reserves (cash) were required to be 3% of transaction deposits (checking accounts, NOW accounts, etc.) from $10.7m to $58.8m and 10% of transaction deposits above $58.8m. Note that there are no reserve requirements for transaction deposits under $10.7m. Additionally, there are currently no reserve requirements for non-transaction deposits, such as savings and time deposits. Above and beyond regulatory liquidity requirements, banks also hold secondary reserves in the form of near-cash assets.

As one can see from Figure 54, the long-term trend has been a decline in transaction deposits and increase in savings deposits—which has in turn led to lower aggregate industry required legal reserves on deposits at the Fed (as a percentage of total deposits). This is in part due to banks putting a greater emphasis on deposit types that don't require legal reserves to be held against them—in effect lowering the overall cost of deposits for banks.

Figure 54: Historical transaction/savings deposit trends



Source: FDIC

More Stringent Liquidity Regulations Likely in the Future

As a result of the financial crisis, many banks were faced with liquidity issues which forced central banks/governments to step in with a variety of liquidity support systems to prevent a systemic liquidity crisis, including support of money markets and in some cases individual institutions. In reaction to this (and the fact that there were no universal international liquidity standards) in December 2009 the Basel Committee on Banking Supervision issued a proposal for two new minimum standards as it relates to bank liquidity. The first is the Liquidity Coverage Ratio (LCR) which is focused on the adequacy of a bank's short-term liquidity position. Specifically that a bank maintains a sufficient amount of high quality, liquid assets (with a focus on cash and government bonds) in order to cover an acute liquidity stress scenario lasting 30 days.

The second is the Net Stable Funding (NSF) Ratio which focuses on the longer-term liquidity profile of a bank. This attempts to put in place a minimum amount of stable funding (which broadly includes capital, high quality deposits and term debt) relative to the liquidity profile of

a bank's assets (taking into account both on- and off-balance sheet exposures) and provide incentives for banks to move away from short-term funding and towards more stable, longer-term funding. A key takeaway of this standard is that it would require the funding of all loans with maturities of one year or more with stable funding sources.

Liquidity Coverage Ratio

According to the Basel Committee the Liquidity Coverage Ratio (LCR) "identifies the amount of unencumbered, high quality liquid assets an institution holds that can be converted into cash to meet its liquidity needs for a 30-day time horizon under an acute liquidity stress scenario (as it relates to both bank specific and systemic shocks). At a minimum, a bank would need to hold liquid assets that are at least equal to the estimated net cash outflows in such a scenario. The stress scenario incorporates many of the shocks experienced during the global financial crisis into one acute stress situation—including:

- A three notch downgrade in the institution's public credit rating;
- Run-off of a proportion of retail deposits;
- A loss of unsecured wholesale funding capacity and reductions of potential sources of secured funding on a term basis;
- Loss of secured, short-term financing transactions for all but high quality liquid assets;
- Increases in market volatility that impacts the quality of collateral or potential future exposures of derivative positions, thus requiring larger collateral haircuts or additional collateral;
- Unscheduled draws on all of the institution's committed but unused credit and liquidity facilities; and
- The need for the institution to fund balance sheet growth arising from non-contractual obligations honored in the interest of mitigating reputational risk."

What qualifies as a "high quality, liquid asset"?
According to the Basel Committee, "To qualify as a high quality liquid asset, an asset should be liquid in markets during a time of stress and, ideally, be central bank eligible." A narrow definition of what assets would qualify includes cash, central bank reserves and government debt. A broader definition would include a proportion of high quality corporate bonds and/or covered bonds—though the following limitations would apply: 1) they would receive substantial haircuts (20% or 40% depending on credit quality); 2) they would not comprise more than 50% of the overall stock; and 3) the portfolio would have to be diversified. Liquid assets must be unencumbered and should be managed with the clear and sole intent for use as a source of contingent funds.

Calculating cash outflows under the stressed scenario
Under a liquidity stress scenario the Basel assumes the following fund withdrawals:

- Retail Deposits – "Stable retail deposits" would have at least a 7.5% run-off factor, while "less stable retail deposits" would have a minimum 15% run-off factor. Stable retail deposits are defined as deposits placed at a bank by a "natural" person (as opposed to a legal entity) that are covered by deposit insurance and where the depositor has a relationship with the bank or are transactional accounts where salaries are automatically credited. Less stable deposits could include deposits which are not covered by deposit insurance, high value-deposits, deposits of sophisticated or high net-worth individuals, deposits which can be withdrawn quickly, or foreign currency deposits.
- Unsecured wholesale funding (including commercial deposits) – Unsecured wholesale funding provided by small business customers would have a 7.5%, 15%, or higher run-

off factor, depending on whether they are considered "stable" or "less stable" (see description of both above). Unsecured wholesale funding provided by non-financial corporate customers, sovereigns, central banks and public sector entities that are held for operational purposes assume a 25% run-off factor. (Note that the portion of these deposits covered by the FDIC can receive the same treatment as stable retail deposits). Funding provided by non-financial corporate customers not held for operational purposes assume a 75% run-off factor. Lastly, funding provided by other legal entity customers (and includes all notes, bonds, and other debt securities) assumes a 100% run-off factor.

Figure 55: Liquidity Coverage Ratio

Liquidity Coverage Ratio (> 100%)	=	Stock of high quality liquid assets / Net cash outflows over a 30-day time period	=	Cash, central bank reserves, gov't bonds / Stressed fund outflows: 7.5% stable retail deposits; 15% less stable retail deposits; 25% corporate deposits; 100% net wholesale funding

Source: Bank for International Settlements

Implications on the US banks if implemented

If a liquidity coverage ratio of 100% is implemented, banks will need to have a higher proportion of their assets in high quality liquid assets (i.e. cash, government bonds and some corporate bonds)—which will likely lead to lower net interest margins and returns, as well as lower future loan growth, resulting in lower credit availability for the overall economy. See Figure 55.

Net Stable Funding Ratio

The Net Stable Funding (NSF) Ratio measures the amount of a bank's longer-term, stable sources of funding relative to the liquidity profile of its assets. Under this liquidity standard a bank would be required to have available stable funding (ASF) that is greater than its required funding over a one-year time horizon. According to the Basel Committee, "Stable funding is defined as those types and amounts of equity and liability financing expected to be reliable sources of funds over a one-year time horizon under conditions of extended stress—specifically including: 1) capital; 2) preferred stock with a maturity of at least one year; 3) liabilities with maturities of at least one year; and 4) the portion of "stable" non-maturity deposits and/or term deposits with maturities of less than one year that would be expected to stay with the institution for an extended period in a company specific stress event." See Figure 56.

This standard is meant to promote incentives for banks to move away from short-term funding and towards more stable, longer-term funding. In particular the NSF Ratio standard is structured to ensure that investment banking inventories, off-balance sheet exposures, securitization pipelines and other assets and activities are funded with at least a minimum amount of stable liabilities in relation to their liquidity risk profiles.

Figure 56: Net stable funding ratio

Stable Funding Ratio (> 100%)	=	Stable funding / Stable funding requirement	=	Tier 1 capital + term debt + weighted deposits / Weighted loans + trading book assets + other assets; Inter-bank and cash 0% weighting

Source: Bank for International Settlements

Components and weightings of available stable funding sources

A bank's available stable funding (ASF) is determined by taking the sum of the different funding components multiplied by its ASF factor (or weighting). See Figure 57 for a summary of ASF components and weightings.

Figure 57: Components of available stable funding and associated ASF factors

ASF Factor	Components of ASF Category
100%	--The total amount of capital, including both Tier 1 and Tier 2 as defined in existing global capital standards issued by the Committee. --The total amount of any preferred stock not included in Tier 2 that has an effective maturity of one year or greater taking into account any explicit or embedded options that would reduce the expected maturity to less than one year. --The total amount of secured and unsecured borrowings and liabilities (including term deposits) with effective maturities of one year or greater excluding any instruments with explicit or embedded options that would reduce the expected maturity to less than one year.
85%	--"Stable" non-maturity retail deposits and/or term retail deposits (as defined in the LCR) with residual maturities of less than one year. --"Stable" unsecured wholesale funding, non-maturity deposits and/or term deposits with a residual maturity of less than one year, provided by small business customers (as defined in the LCR). This category consists of deposits and other extensions of funds made by non-financial small business customers of the borrowing institution that are generally considered as having similar liquidity risk characteristics to retail accounts, provided the total aggregated funding raised from one small business customer is less than €1m (on a consolidated basis where applicable).
70%	--"Less stable" (as defined in the LCR) non-maturity retail deposits and/or term retail deposits with residual maturities of less than one year. --"Less stable" (as defined in the LCR) unsecured wholesale funding, non-maturity deposits and/or term deposits with a residual maturity of less than one year, provided by small business customers (as defined above). --Less stable deposits, as outlined in the LCR and determined by each jurisdiction, could include deposits which are not covered by effective deposit insurance, higher value-deposits, deposits of sophisticated or high net worth individuals and deposits which can be withdrawn quickly (e.g. internet deposits) and foreign currency deposits.
50%	--Unsecured wholesale funding, non-maturity deposits and/or term deposits with a residual maturity of less than one year, provided by non-financial corporate customers.
0%	--All other liabilities and equity categories not included in the above categories.

Source: Basel Committee on Banking Supervision

Required stable funding (RSF)

Required stable funding (RSF) is determined by summing the value of a bank's assets (including off-balance sheet exposures), multiplied by that asset/off-balance sheet exposures RSF factor. The RSF factor for each asset should be thought of as the amount of that item that should be supported with stable funding. The more liquid an asset is, the less stable funding is required, and thus it will have a lower RSF factor.

In Figure 58 we summarize the composition of asset categories and associated required stable funding weightings.

Figure 58: Summary composition of asset categories and associated RSF factors

RSF Factor	Composition of Asset Categories
0%	--Cash, money market instruments. --Securities with effective remaining maturities of less than one year. --Outstanding loans to financial entities having effective maturities of less than one year.
5%	--Unencumbered marketable securities with residual maturities greater than or equal to one year representing claims on sovereigns, central banks, BIS, IMF, EC, non-central government PSEs or multilateral development banks which are rated AA or higher and are assigned a 0% risk weight under the Basel II standardized approach, provided that active repo-markets exist for these securities.
20%	--Unencumbered corporate bonds (or covered bonds) rated at least AA with an effective maturity of greater than or equal to one year which are traded in deep, active and liquid markets and which also have a demonstrated history of being a reliable liquidity source in a stressed market environment.
50%	--Gold --Unencumbered equity securities listed on a major exchange and included in a large capital market index and unencumbered corporate bonds (or covered bonds) rated AA- to A- with an effective maturity of greater than or equal to one year, which are traded in deep, active and liquid markets and which also have a demonstrated history of being reliable liquidity source in a stressed market environment. --Loans to non-financial corporate clients having residual maturity of less than one year.
85%	--Loans to retail clients having a residual maturity of less than one year.
100%	--All other assets.

Source: Basel Committee on Banking Supervision

What implications could this standard have on the banks?

If deposits cannot be grown fast enough to keep up with asset demand, then banks will need to turn to long-term debt, which will in turn reduce NIMs/profitability. Additionally, asset growth will likely slow as a result.

Bank Regulation

Regulation has become a widely discussed topic over the last several years with government intervention in 2008 (TARP and other programs) and the passage of Dodd-Frank. Regulation is not a new thing, however, as it has been shaping the industry since the early 1900s.

Why Banks Are Regulated

- Reduces the risk of wide-spread bank failures. Given the important role banks play in society, wide-spread bank failures could be detrimental. The smooth functioning of the economy is dependent on the function that banks provide—specifically the supply of credit, safe keeping of deposits, and providing access to these deposits.
- Protect against deposit insurance losses. Banks are capitalized differently than other industries. While non-bank institutions rely on debt and equity as sources of capital, banks rely on customer deposits (76% of liabilities at 2/28/11).

  Banks' deposits are insured by the FDIC through an insurance pool funded by premiums paid by banks. Deposit insurance gives depositors (which are equivalent to lenders/bondholders and shareholders in traditional businesses) little incentive to perform due diligence on the banks they have accounts with, creating a moral hazard. This ultimately leaves the window open for banks to take excessive risk (while likely not fully paying the price in terms of higher funding costs) at the expense of other banks (indirectly through the deposit fund) and taxpayers if the problem becomes systemic.
- Achieve certain social goals. These include a banking system that finances economic growth, impartially allocates credit and meets the needs of customers/communities. The Community Reinvestment Act of 1977 is an example of this.

Who Are the US Bank Regulators?

There are three primary federal bank regulators including the Federal Reserve System (FRS), the Federal Deposit Insurance Corporation (FDIC) and the Office of the Comptroller of the Currency (OCC). State banking commissions are the primary regulators of banks in the US at the state level. Additionally, like other publicly traded companies, publicly traded financial institutions have regulatory reporting requirements under the SEC.

The Federal Reserve System: During the 19th century and beginning of the 20th century, the U.S. banking system experienced a number of financial panics that led to bank failures. A severe crisis in 1907 led to the creation of the Federal Reserve in 1913 with the signing of the Federal Reserve Act. The Federal Reserve is the central bank of the US, which is independent of the government (other than oversight by the Congress). Over the years, the role of the Federal Reserve has expanded and currently includes:

- Conducting monetary policy by influencing the money supply in the U.S. in an attempt to maintain full employment and keep inflation under control. The Fed uses open market operations, reserve requirements and the discount window to affect interest rates.
- Maintaining stability in the financial system and containing the risk of systemic failures.
- Providing financial services to the U.S. government, the public, financial institutions, and foreign institutions.
- Supervising and regulating banking institutions to ensure the soundness of the banking system and to protect consumers. The Fed has primary supervising authority for state banks that become members of the FRS (state member banks). State banks that are not member banks are supervised by the FDIC. The OCC supervises national banks, which must all become members of the FRS.

The Federal Reserve has supervisory authority of all bank holding companies (which are companies that have controlling interest in banks) regardless of whether the subsidiary banks of the holding company are national banks, state member banks, or state nonmember banks. The Federal Reserve's responsibility includes reviewing the holding companies' operations, risk-management policies/systems, and capital levels to ensure that its deposits are safe. The Federal Reserve was given the responsibility of implementing the many consumer protection laws passed by Congress. Other areas of regulation that fall under the Federal Reserve's umbrella are included in Figure 59.

Table 59: Federal Reserve regulations

REG	Title
A	Extensions of Credit by Federal Reserve Banks
B	Equal Credit Opportunity
C	Home Mortgage Disclosure
D	Reserve Requirements of Depository Institutions
E	Electronic Fund Transfers
F	Limitations on Interbank Liabilities
G	Disclosure and Reporting of CRA-Related Agreements
H	Membership of State Banking Institutions in the Federal Reserve System
I	Issue and Cancellation of Federal Reserve Bank Capital Stock
	Collection of Checks and Other Items by Federal Reserve Banks and Funds
J	Transfer through Fedwire
K	International Banking Operations
L	Management Official Interlock
M	Consumer Leasing
N	Relations with Foreign Banks and Bankers
	Loans to Executive Officers, Directors, and Principal Shareholders of Member
O	Banks
P	Privacy of Consumer Financial Information
Q	Prohibition Against the Payment of Interest on Demand Deposits
	Reimbursement for Providing Financial Records; Recordkeeping Requirements
S	for Certain Financial Records
T	Credit by Brokers and Dealers
	Credit by Banks and Persons other than Brokers or Dealers for the Purpose of
U	Purchasing or Carrying Margin Stock
V	Fair Credit Reporting (Proposed)
W	Transactions between Member Banks and their Affiliates
X	Borrowers of Securities Credit
Y	Bank Holding Companies and Change in Bank Control
Z	Truth in Lending
AA	Unfair or Deceptive Acts or Practices
BB	Community Reinvestment
CC	Availability of Funds and Collection of Checks
DD	Truth in Savings
EE	Netting Eligibility for Financial Institutions
FF	Obtaining and Using Medical Information in Connection with Credit

Source: Federal Reserve

The Federal Deposit Insurance Corporation (FDIC): is a government agency created in 1933 to increase the public's confidence in the banking system by providing deposit insurance. The FDIC's responsibilities have expanded over time to include acquiring and disposing of failed and troubled banks including by selling their deposits to other institutions.

The FDIC directly supervises 4,900 banks/savings banks, which is over half the banking institutions in the U.S. The FDIC is the primary federal regulator for state banks that decide not to become members of the FRS. Recall that banks chartered by states have the option of becoming a member of the FRS. The FDIC serves as the back-up regulator for all other insured banks and thrifts. Additionally, it also examines banks for compliance with consumer protection laws and the Community Reinvestment Act.

Deposits are currently insured up to $250K per depositor at each bank/thrift the FDIC insures. The covered deposit limit was temporarily increased to $250K from $100K in October 2008 to increase confidence in the banking system, and permanently increased to this level under Dodd-Frank. The covered deposit limit for non-interest bearing deposit transaction accounts was temporarily limitless until year-end 2009 (although some banks opted to extend). IRAs and certain other retirement accounts will also remain insured up to $250K.

FDIC insurance premiums: As of April 1st, 2011 all insured depositories will pay FDIC deposit insurance premiums under the new assessment methodology required under Dodd-Frank. Banks previously paid quarterly insurance premiums based on the size of their domestic deposit base, but now will pay premiums based on the size of their entire funding base (defined as average consolidated total assets less tangible common equity under the new rule). Regulators thought the old system did not accurately reflect the risks to the FDIC's deposit insurance fund and also thought it skewed the burden of maintaining the fund's balance to smaller banks which are largely deposit funded.

- The New System: In addition to changing the base from deposits to assets less TCE, the new rule creates a separate risk-based assessment system for large insured depository institutions (assets > $10b) and highly complex institutions. The new assessment keeps the incentive for banks to issue long-term unsecured debt (which reduces risk to the deposit insurance fund) and keeps the adjustment for brokered deposits (but exempts banks that are well capitalized and have strong CAMELS ratings). The new methodology is expected to be revenue neutral to the FDIC, but increase the share of assessments paid by large banks. The FDIC estimates the share of assessments paid by large banks could increase from 70% to 79%. Given the overall assessment base under the new methodology is larger than the old (we estimate $12.3 trillion for the new base vs. $7.7 trillion under the old), assessment rates (in bps) are lowered under the new system.

  Assessment rates will range from 5-35bps and total base assessments after adjustments will range from 2.5-45bps of the new base. The same ranges will apply for large banks/highly complex institutions, but they will not be assigned into risk categories (which had been partially based on credit ratings). The new scorecards that differentiate large banks and highly complex institutions (which are viewed slightly different from large banks by the FDIC) are based on CAMELS ratings and forward looking financial measures. Banker's banks and custodial banks may deduct low risk, liquid assets from their assessment base. The assessment base for these banks excludes all 0% Basel risk-weighted assets and 50% of 20% risk-weighted assets (subject to some limitations). See Figures 60 and 61 for a breakdown of FDIC base assessment rates, adjustments for small and large banks, and the scoring system for large banks.

Figure 60: New FDIC insurance assessment rates

(bps)	Risk Category I	Risk Category II	Risk Category III	Risk Category IV	Large & Highly Complex Institutions
Initial base assessment rate	5-9	14	23	35	5-35
Unsecured debt adjustment	(4.5)-0	(5)-0	(5)-0	(5)-0	(5)-0
Brokered deposit adjustment	0-10	0-10	0-10	0-10	0-10
Total base assessment rate	2.5-9	9-24	18-33	30-45	2.5-45

Source: FDIC

Figure 61: Scoring system for large banks

	Measure Weights	Component Weights
Performance Score		
Weighted Average CAMELS Rating	100%	30%
Ability to Withstand Asset-Related Stress		50%
Tier 1 Leverage Ratio	10%	
Concentration Measure	35%	
Core Earnings/Average Quarter-End Total Assets	20%	
Credit Quality Measure	35%	
Ability to Withstand Funding-Related Stress		20%
Core Deposits/Total Liabilities	60%	
Balance Sheet Liquidity Ratio	40%	
Loss Severity Score		
Loss Severity Measure		100%

Source: FDIC

Note: The scoring system for highly complex institutions includes a small weighting (4%) for average short term funding to average total assets.

- The Old System: Banks previously paid insurance premiums based on the size of their domestic deposit base and in amounts determined by their risk assessments. There are four risk categories (I-IV), which are based on banks' capital ratios and supervisory ratings (CAMELS). Banks with CAMELS ratings of 1 or 2 typically fall into Supervisory Group A, those with a rating of 3 are in B, and 4- 5, in C. A well-capitalized bank with a CAMELS rating of I or 2 would typically fall into Risk Category I, while an undercapitalized bank with a 4 or 5 CAMELS rating would fall into Risk Category IV and pay 45bps (or cents) of insurance annually for every $100 in deposits. See Figure 62 for breakdown of assessment rates.

Figure 62: Old FDIC insurance premium assessment rates

Capital Category	Supervisory Group		
	A	B	C
1. Well Capitalized	I 12 – 16 bps	II 22 bps	III 32 bps
2. Adequately Capitalized	II 22 bps		
3. Undercapitalized	III 32 bps		IV 45 bps

Source: FDIC

Based on banks' risk categories determined using the above figure, assessment rates are adjusted up or down based on the composition of a bank's capital structure as detailed in Figure 63. Brokered deposits, which are typically higher rate deposits, are more expensive to insure than other deposits; while the presence of unsecured debt in a bank's capital structure actually reduces the cost of insurance.

Figure 63: Old FDIC insurance premium assessment rates

	Risk Category I	Risk Category II	Risk Category III	Risk Category IV
Initial Base Assessment Rate	12 – 16	22	32	45
Unsecured Debt Adjustment (added)	-5 to 0	-5 to 0	-5 to 0	-5 to 0
Secured Liability Adjustment (added)	0 to 8	0 to 11	0 to 16	0 to 22.5
Brokered Deposit Adjustment (added)	N/A	0 to 10	0 to 10	0 to 10
Total Base Assessment Rate	7 to 24.0	17 to 43.0	27 to 58.0	40 to 77.5
Assessment rates are annual rates in basis points - or cents per $100 of deposit insurance assessment base.				

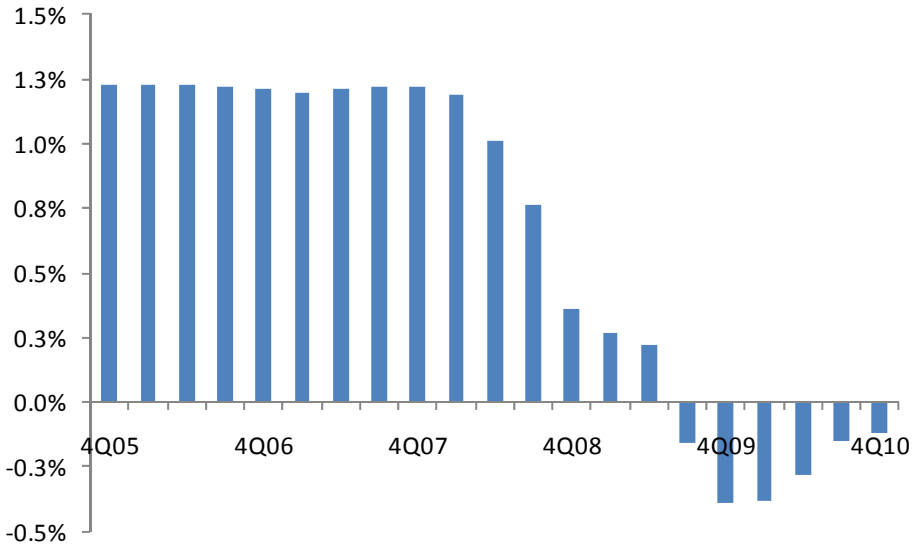
Source: FDIC

FDIC's Deposit Insurance Fund (DIF) still in the red, but liquidity much improved

FDIC assessment rates have increased over time to keep the FDIC insurance fund sound. In May 2009, the FDIC imposed a 5bp special assessment on each insured depository's assets (less Tier 1 capital) to help replenish the insurance fund which had suffered losses in light of the recent financial crisis. At year-end 2010, the DIF had a negative balance of $7.4b or -0.12% of insured deposits (improving from -$20.9b or 0.39% of insured deposits a year ago). See Figure 64. While the DIF balance remains in the red, the FDIC has ample liquidity to meet its needs given the fact that in 2009, it required banks to pre-pay three years of insurance premiums (factoring in a 5%/yr increase) through 2012 which provided $46b of cash inflows.

Under Dodd-Frank, the FDIC will not issue dividends to member banks once the deposit insurance fund reaches 1.5%. However, assessments will be lowered when the fund reaches 1.5%, 2% and 2.5%.

Figure 64: FDIC Deposit insurance fund reserve ratios (% of insured deposits)



Source: FDIC

The Office of the Comptroller of the Currency (OCC): The OCC was established in 1863 as part of the U.S. Department of the Treasury. Under the National Currency Act of 1863 and National Bank Act of 1864, the OCC was given the power to authorize bank charters, regulate and supervise all national banks in the U.S. (currently more than 1,500) and supervise the federal branches of foreign banks (currently about 50). In total, these banks accounted for almost two-thirds of the assets of commercial banks in the U.S. at 12/31/10. The OCC is headed by the Comptroller, who is appointed by the president. The OCC is funded mostly through assessments on national banks.

The OCC has the regulatory power to:

- Examine national banks (and federal branches of foreign banks).
- Approve/deny applications for new charters, branches, capital or other changes in the corporate structure.
- Take supervisory actions against banks that don't comply with laws or that have unsound banking practices. The OCC can remove executives, negotiate changes in banking practices and issue cease and desist orders.
- Issue rules/regulations governing banking practices (lending, investing, etc).
- Note that under Dodd-Frank, the Office of Thrift Supervision is terminated and its authority is transferred to the OCC.

Note that the OCC does not release information from its bank safety and soundness examinations to the public.

Below is a summary of Regulators in the U.S. and types of banks they regulate.

Figure 65: Summary of regulatory agencies and jurisdictions

Type of Bank	Regulator
Bank holding companies/financial holding companies	FR
Nonbank subsidiaries of bank holding companies	FR/Non-bank regulator (if any)
National banks	OCC
State banks	
Members	FR
Nonmembers	FDIC
Savings banks	FDIC/FR/Office of Thrift Supervision
Foreign banks (with direct operations in the U.S.)*	
Branches and agencies	
State-licensed	FR/FDIC
Federal licensed	OCC/FR/FDIC

Source: Federal Reserve
**This compares with foreign banks with indirect ownership of branches through ownership of U.S. banks.*

Regulatory Filings and Ratings System

The Federal Financial Institutions Examination Council (FFIEC): Established in 1978, the FFIEC is an interagency institution authorized by the FRS, FDIC, OCC, National Credit Union Administration and Office of Thrift Supervision, to set uniform reporting standards for banks (as well as Credit Unions/Thrifts) in the U.S. The FFIEC adopted the Uniform Financial Institutions Ratings System (UFIRS) in November 1979.

- Report of Condition and Income (Call Report): One of the quarterly filings banks in the U.S. are required to file is the Report of Condition and Income, also referred to as the Call Report. Every national bank, state member bank and insured nonmember bank is required to file a Call Report as of the close of business on the last day of each quarter within 20 days of the quarters close. The FDIC is responsible for collecting, checking for accuracy and storing Call Report data for all institutions it has authority over (insured national banks, state nonmember commercial banks and state-chartered savings banks). Call reports include detailed income statement, balance sheets, credit statistics (NPAs, NCOs, reserves, delinquencies, etc) and much more information. The general public has access to this data on the FFIEC's web site.
- FR Y-9Cs: are the consolidated financial reports for bank-holding companies which are filed on a quarterly basis. These reports are generally filed for all bank holding companies in the U.S. that have consolidated assets of $500m or more. The reports include basic financial data that you would find on an income statement and balance sheet as well as off balance sheet items. Data in these reports is very useful because it is uniform from bank to bank (vs. GAAP filings –10Ks, 10Qs – where there is some leeway in reporting). The general public can access these reports in the FFIEC's website.

The Uniform Financial Institutions Rating System (CAMELS): is a system used by regulators to evaluate the soundness of financial institutions on a uniform basis. The Federal Reserve, the FDIC and OCC (and Office of Thrift Supervision) are all required to use the CAMELS system. CAMELS stands for:

- C–Capital Adequacy: Capital levels are rated on a number of factors and take into consideration a bank's current financial condition, including quality of assets, loan loss reserve levels, earnings and capital distribution history, access to capital markets and adherence to regulatory capital requirements. See page 33 for more details on regulatory capital requirements.

- A–Asset Quality: Rating based on the amount of problem assets including nonperforming, delinquent and restructured loans, diversification, management's portfolio management abilities and other factors.
- M–Management: Performance of management in terms of monitoring bank activities, developing written policies and procedures, history of responding to risks, overall performance of the bank, both financial and in terms of maintenance of other CAMELS ratings and other factors.
- E–Earnings: The ability of core earnings to cover losses, profitability margins, adequacy of budgeting process, earnings exposure to market risks and other factors.
- L–Liquidity: The ability to generate cash or turn assets into cash. Liquidity ratings are a factor of sources and size of funds to meet near-term obligations, maturity schedules of assets and liabilities, diversification of funding sources, access to short terms funding and other factors. See page 54 for more details on liquidity and regulation.
- S–Sensitivity to Market Risks (which was an add-on to the original system). Earnings exposure to changes in interest rates and foreign exchange and ability of management to deal with this.

All banks are assigned a CAMELS rating based on combinations of ratings of the six components listed above. Composite ratings range from 1 (strongest bank) to 5 (banks in serious danger of failing), with 3 being less than satisfactory and 4-5 being troubled banks subject to more stringent supervision, legal actions, additional reporting requirements, frequent examinations, and/or monetary penalties. These ratings are not publically available.

Important Legislative Actions in Banking

National Currency Act of 1863 /National Bank Act of 1864: State banks were the first types of banks chartered in the U.S. These two acts created a national banking system and gave the OCC the authority to charter, regulate and supervise national banks. One of the important results of these acts was that interest rate limits were placed on deposits to prevent anticompetitive behavior.

Banking Act of 1933 (the Glass-Steagall Act): On June 16th, 1933, during the Great Depression and after 4,000 banks had already failed that year, the Banking Act of 1933 was enacted. Included in the Act was:

- Creation of the Federal Deposit Insurance Corporation: (which was expected to be a temporary agency) to raise public confidence in the banks. Note that the Banking Act of 1935 made the FDIC a permanent agency of the government. The FDIC received a $289m loan from the U.S. Treasury and Federal Reserve and deposit insurance went into effect on January 1, 1924. The insured deposit limit was set at $2,500 and insured banks were charged a premium of 0.12% of domestic deposits to support this activity.
- Separation of Commercial and Investment Banking: Additionally, in attempt to reduce bank risk and to increase public confidence in the banking system, the Act called for the separation of commercial and investment banks (which was thought to add risk and conflicts of interest). At the time the Act was passed, banks were forced to decide which side of banking they would remain active in.

Additional results of the Act:

- The FDIC received authority to regulate state nonmember banks.
- Minimum capital requirements for national banks were increased.
- The Federal Reserve was given authority to regulate the interest paid on time deposits. The Banking Act of 1935 gave them authority over rates on savings deposits.

- Payment of interest on demand deposits was prohibited (reversed under Dodd-Frank).

Federal Deposit Insurance Act of 1950: The Act revised earlier FDIC legislations into one Act. The Act authorized the FDIC to examine national and state member banks to determine risk (for the purpose of deposit insurance) and gave it the authority to lend to any insured bank in danger of closing (if the bank was essential to the local community).

Bank Holding Company Act of 1956: The Act prohibited the expansion of bank holding companies into "non-banking activities", including through its subsidiaries. As a result of loopholes under the prohibition of bank holding companies engaging in "non-banking activities" (leading to rapid growth in conglomerate companies), the Bank Holding Company Amendment (BHCA) of 1970 was passed, which required Federal Reserve Board approval for the creation of BHCs.

Additionally, the Act prohibited bank holding companies located in one state from acquiring banks in another state unless the other state's laws allowed it. This essentially gave control of bank holding companies to the states. Maine was the first state (in 1975) to allow for out of state bank holding companies to acquire banks in its state. These barriers weren't fully removed on a national level until 1994.

Community Reinvestment Act (CRA) of 1977: This Act directed banks and S&Ls to meet the credit needs of their communities, including low/moderate-income neighborhoods. The CRA requires that federal regulators (OCC, FDIC FRS) assess each banks record in fulfilling its obligations to the community, which is considered when evaluating applications for charters or for approval of bank mergers, acquisitions, and branch openings. The Gramm-Leach-Bliley Act of 1999 (discussed below) amended this Act to require that all insured depository institutions of a holding company receive satisfactory CRA ratings before a financial holding company can be formed.

Depository Institutions Deregulation and Monetary Control Act of 1980: Passed in response to the savings and loan crisis, the Act called for the phasing out of Regulation Q, which put interest rate caps on time and savings deposit rates at all depository institutions. With interest rates rising to near 20% from the 1970s to 1980s, Reg. Q placed regulated depository institutions at a significant disadvantage to money market mutual funds (that had no limitations), leading to deposit outflows. Additional results of the Act were:

- Negotiable order of Withdrawal (NOW) Accounts: All depository institutions were authorized to offer NOW accounts (interest bearing checking accounts). Institutions were previously prohibited from paying interest on checking accounts.
- Uniform Reserve Requirements: Reserve requirements were extended to all depository institutions, commercial banks, savings banks and others.

Depository Institutions Act of 1982 (Garn-St Germain): Expanded the FDIC's powers to assist troubled banks. The purpose of the Act was largely to give S&Ls more freedom as to what asset classes they could hold on their balance sheets. Additional results of the Act were:

- Less Restrictive Rules for Acquisitions of Troubled/Failed Banks: Prior to this Act, the FDIC had a difficult time finding acquirers of troubled institutions due to laws prohibiting interstate acquisitions and limitations on acquisitions of banks by other types of financial institutions. This Act ordered acquisition preferences (giving priority of acquisition to the same type of institution in the same state up to the worst case scenario, different type of institution in a different state) to streamline the process.
- Creation of Money Market Deposit Accounts: to compete with money market mutual funds.

International Lending Supervision Act of 1983: This Act directed all banking regulatory agencies to ensure that all banking institutions maintained adequate capital levels. In 1984, Continental Illinois National Bank, with $34b in assets, became the largest bank to fail and regulators provided a $2b assistance package and the FDIC promised to protect all its depositors and creditors regardless of the $100K limit as the bank was deemed "too big to fail". Banking regulators subsequently (and individually) published new uniform capital standards and minimum capital requirements (with a minimum primary capital requirement of 5%) for individual institutions and more importantly were able to enforce them using the courts (previously, regulators could only rely on persuasion). In 1985, the three federal bank regulators agreed to uniformly apply a 5.5% minimum primary capital requirement.

Competitive Equality Banking Act of 1987 (CEBA): This is the first legislation that explicitly stated that insured deposits are backed by the full faith and credit of the U.S. government.

Group of Ten (G-10) countries adopts Basel I (1988): The central bank governors and G-10 countries adopted the Basel Capital Accord (Basel I Accord), which provides suggested guidelines for capital adequacy. See page 36 in the capital section for more information.

Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA): This Act increased the overall authority of the FDIC and recapitalized its insurance fund by providing the FDIC with a $30b credit line from the Treasury (vs. previous $5b) and the FDIC was authorized to impose special assessments (like the ones charged in 2009 to replenish the insurance fund). Additional results of the Act:

- Risk-Based Deposit Insurance Premiums: The FDIC was to apply risk-based deposit insurance premiums (vs. a previous flat rate) and to promptly close problem and failing banks when their primary capital levels dropped below 2% in the least costly method to the insurance fund.
- Too Big To Fail: Significant restrictions were placed on deeming banks "too big to fail", now requiring approval of the President of the U.S. The FDIC had previously been able to step into troubled bank situations and guarantee all deposits as it saw fit.
- Restriction on Brokered Deposits: Covered brokered deposits and the solicitation of deposits and called for bank regulators to perform annual safety and soundness reviews.

Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994: Permitted bank holding companies to acquire banks in any state, permits interstate mergers subject to concentration limits and state laws and allows foreign banks to branch the same way as U.S. banks (overturning most of the McFadden Act). See page 74 for the impact this Act had on M&A.

Gramm-Leach-Bliley Act of 1999 (Financial Modernization Act of 1999): Repealed the last provisions of the Glass Steagall Act of 1933 which separated commercial and investment banking. This Act created a new financial holding company that was authorized to underwrite/sell insurance and securities, conduct commercial and merchant banking, invest in certain types of real estate activities previously prohibited, and allowed national banks to underwrite municipal bonds. See page 72 for the impact this Act had on M&A.

Emergency Economic Stabilization Act (2008): The Act was intended to increase market stability, improve the strength of financial institutions, and enhance market liquidity. Under the Troubled Asset Relief Program (part of the Act) the Treasury was allocated $700b to purchase mortgage backed securities from banks to increase liquidity (although this never happened). Instead, on October 14, 2008, $250b of these funds was allocated to purchasing senior preferred shares of banks which increased capital and provide much needed liquidity. The Act also authorized a temporary increase in FDIC deposit insurance limit to $250K until December 2009. The limit increase was subsequently extended through December 31, 2013 and made permanent under Dodd-Frank.

Credit Card Accountability Responsibility and Disclosure (CARD) Act of 2009: The Act was enacted in May 2009 and provides for reform related to credit card industry practices—including: 1) significantly restricting banks' ability to change interest rates and assess fees to reflect individual consumer risk; 2) defines standard payment dates and prohibits banks from allocating payments in ways that maximize interest charges; and 3) requires banks to inform its cardholders in advance on any change in interest rates, fees or other terms of the card and to give them the option to cancel the card before new terms go into effect.

Regulation E: In late 2009, the Federal Reserve issued amendments to Regulation E, which among other things limits a bank's ability to charge overdraft fees on ATM and debit card transactions that overdraw a consumer's account. According to the new regulation, banks are now required to obtain a consumer's consent (essentially opting in to the banks overdraft program) before they can charge any overdraft fees. The new Fed rules went into effect on July 1, 2010 for accounts opened on or after that date, and on August 15, 2010, for previously existing accounts. According to the FDIC, approximately 50% of overdraft fees come from point of sale (POS)/debit and ATM transactions.

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.
- Interest on demand deposits: The Act repeals the prohibition on banks paying interest on these deposits.
- 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. As of May 2011, the Federal Reserve has proposed a 12 cent per transaction limit (vs. currently $0.44 on average) on banks with assets over $15b which would reduce interchange revenue by 75-80% on average. However, Congress is currently considering delaying the implementation for up to two years to study the

effects on the consumer (given many banks are ending free checking to compensate for lost revenue) and impact on smaller banks (which were not intended to be affected). Note that TCF Financial (TCB) currently has a case pending against the Fed claiming that the new rule is unconstitutional.

- 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 will be changing its assessment calculations on April 1, 2011, which will shift the burden of replenishing the insurance fund to large banks.

Costs/Benefits of Regulation

Costs:

- FDIC deposit insurance premiums: As previously discussed, banks pay deposit insurance premiums to the FDIC to maintain an insurance fund that is used to insure deposits in order to promote public confidence in the banking system.
- Deposits held at the Fed: Reserve requirements are the amount of funds that banks (and other depository institutions) must hold in reserve against specific deposits. The Board of Governors of the Federal Reserve has the sole authority to make changes to reserve requirements. Depository institutions must hold reserves in the form of vault cash or deposits with Federal Reserve Banks which restricts bank investment therefore lowering interest income. Note that in October 2008, the Federal Reserve began paying interest on required reserves and excess balances, which significantly reduced banks' opportunity cost of deploying these funds.
- Related staff expense: Banks have staff on hand (auditors/lawyers) to deal with regulatory reporting requirements.
- Pressure to lend: Regulation has not only imposed rules that are intended to keep the system safe and sound, but has also pushed a social agenda in some cases. The CRA was signed into law to encourage lending to borrowers in low and moderate income neighborhoods. While the law emphasized lending in a safe and sound manner, a bank's history of lending in this space is taken into consideration by regulators when they look to expand or are involved in M&A.

Benefits:

- Less competitive: Certain regulatory requirements create barriers to entry that benefit existing banks. Additionally, regulation prevents non-bank financial institutions from competing with banks in certain areas.
- Lower funding costs: The FDIC guarantee on deposits brings funding costs down and makes it easier for banks to raise funds to grow their balance sheets. Additionally, implied backing from the U.S. makes this backstop even stronger.
- Higher leverage: Leverage in other industries does not approach that of banks. Regulation gives investors more confidence in the system which enables banks to raise capital when needed.

Competitive Landscape

Below we provide an overview of how banking trends (including the number of banks and asset/deposit market share) have changed over the last 30-40 years, including from M&A, deregulation and bank failures. We also discuss potential drivers of M&A going forward.

How Large is the Banking Industry

Although the U.S. banking industry has been around for the last two hundred years, it's very different than many other mature industries due to its long history of regulation. Today, there are 977 publicly traded US banks, with $1 trillion in total market capitalization and $11 trillion in total assets. Financial stocks comprise the second largest sector allocation in the S&P 500 Index with 16% of its total holdings (behind Information Technology with 19%). Within the financial sector, commercial banks account for 3% of the S&P 500. Given our coverage of large cap commercial banks in the United States, most of our discussion will focus on this area.

Comprising $10 trillion in total financial assets at 12/31/10 (vs. $4 trillion at 12/31/90), commercial banks represented 28% of the U.S. financial sector vs. 40% at 12/31/90 according to Federal Reserve data (see Figure 66). While the financial sector measured by total financial assets has grown by almost 4X over this period (to $37 trillion from $10 trillion in 1990), growth in commercial banking has been a bit more modest, outpaced by stronger growth in securitizations (agency- and GSE-backed mortgage pools, ABS issuers and GSEs).

Figure 66: U.S. Financial sectors by total financial assets

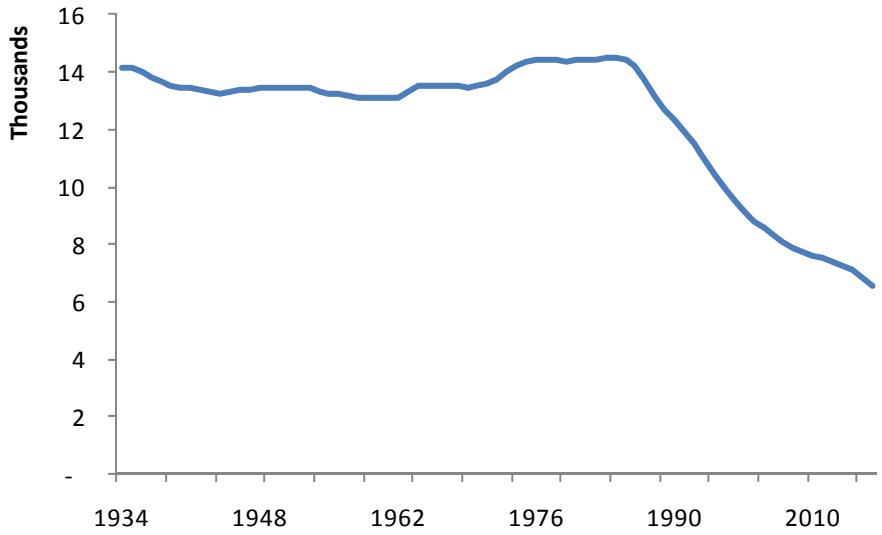
	12/31/2010		12/31/1990		Δ
($ billions)	$	%	$	%	bps
Commercial banking	10,262	27.5%	3,949	39.7%	-1220
U.S.-chartered commercial banks	8,254	22.1%	2,467	24.8%	-268
Savings institutions	1,087	2.9%	1,177	11.8%	-891
Foreign banking offices in the U.S.	753	2.0%	271	2.7%	-70
Bank holding companies	98	0.3%	13	0.1%	13
Banks in U.S.-affiliated areas	69	0.2%	22	0.2%	-3
GSE, Agency and GSE-backed mortgage pools	7,477	20.0%	1,394	14.0%	602
ABS issuers	2,402	6.4%	250	2.5%	392
Mutual funds	3,027	8.1%	360	3.6%	449
Money market mutual funds	1,621	4.3%	371	3.7%	61
Monetary authority	2,259	6.1%	241	2.4%	363
Finance companies	1,492	4.0%	565	5.7%	-168
Private pension funds	1,170	3.1%	464	4.7%	-153
Funding corporations	906	2.4%	133	1.3%	109
Insurance (Life and other)	4,012	10.7%	1,479	14.9%	-411
State and local govt retirement funds	955	2.6%	402	4.0%	-148
Other	1,747	4.7%	341	3.4%	125
Financial Sector Total Assets	**37,329**	**100.0%**	**9,950**	**100.0%**	

Source: Federal Reserve

The number of banks continues to decline

There has always been a lot of competition in the banking space as a result of early regulation that restricted geographic and product expansion. Over the 40-50 year period following the Great Depression through the late 1980s, the number of banks remained fairly constant. However, the banking industry has become more consolidated over the past 30-40 years, with the number of banks contracting by 55% since 1984 through 12/31/10 (from 14,507 to 6,529), due to several factors including deregulation (which sparked M&A) and bank failures (see Figure 67).

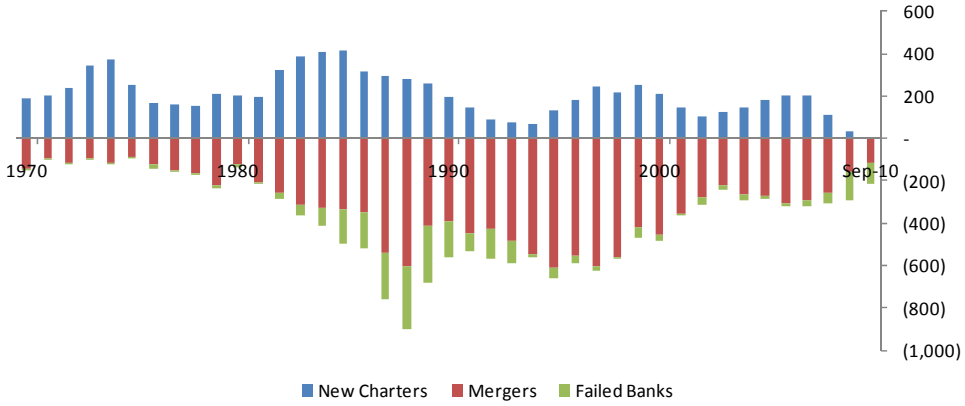
Figure 67: Number of commercial banks in the U.S.



Source: FDIC

The largest driver behind the reduction in banks since 1984 has been unassisted mergers, with 10,142 completed through the end of 4Q10, followed by bank failures and assisted mergers at 2,155. The number of new bank charters (including conversions) issued over this time period was 4,630 (see Figure 68).

Figure 68: Change in total banking institutions



Source: FDIC

The number of bank failures so far during the most recent banking crisis is still relatively small (305 since 2007) compared with the numbers experienced in the mid 1980s and early 1990s during the savings and loan crisis.

The Savings and Loan Crisis

Savings and loans (S&L) associations (also known as Thrifts) are financial institutions that specialize in savings deposits and making mortgages and other loans (but don't have the breadth of products that banks do). S&L's deposits were insured by the Federal Savings and Loan Insurance Corporation (FSLIC) through 1989. A number of regulatory changes in the industry starting in the 1970s along with negative economic factors led to one of the largest financial crisis since the Great Depression. Some of the drivers of the crisis included:

- Interest rates and asset liability duration mismatch: High and volatile interest rates in the late 1970s and early 1980s exposed S&Ls to high levels of interest rate risk caused by mismatches in asset/liability durations. During this time period, inflation and short term interest rates rose rapidly (approaching 20% in the early 1980s), which led to large bank losses as banks were funding longer term, lower-rate, speculative mortgages with shorter term high rate borrowing. Additionally, many homeowners defaulted on their mortgages, leading to additional losses.
- Deposit rates: In response to continued rate wars between S&Ls and commercial banks in the early 1960s, Congress passed the Interest Rate Control Act of 1966, which placed interest rate limits on savings accounts at S&Ls (previously only commercial banks were subject to caps). The high inflationary environment in the late 1970s put significant pressure on S&Ls as they faced large deposit withdrawals as rates increased. In response to this, in 1980 Congress passed the Depository Institutions Deregulation and Monetary Control Act which, among other things, phased out the interest rate limits and allowed S&Ls to invest up to 20% of their assets in non-traditional investments. This, along with an increase of the insured deposit limit (to $100K) resulted in a moral hazard issue (with large inflows of deposits and little due diligence on the part of depositors).
- Brokered deposit: Developments in this market provided an increased supply of deposits to those banks looking to grow their balance sheets. Given the higher cost of brokered deposits, higher yields needed to be achieved on investments for profits to be made. S&Ls began focusing on lower quality/higher risk loans.
- New investments: Deregulation of depository institutions permitted S&Ls to enter into new, riskier loan markets. Beginning in 1982, S&Ls began moving from traditional home loan financing to direct investment in real estate, equity securities, service corporations and other riskier areas. Additionally, a large part of S&L assets were in the form of acquisition, development and constructions (ADC) loans (riskier loans) which, for S&Ls, received favorable accounting treatment.
- Capital requirements: Reduced regulatory capital requirements which allowed S&Ls to use alternative accounting practices to increase reported capital levels.
- Ease of entry: Excessive and easy chartering of new S&Ls during the 1980s, which were often run by inexperienced managers.
- Tax laws: Withdrawal of federal tax laws in 1986 (enacted in 1981) removed real-estate investment tax shelters, which decreased the value of the corresponding assets and contributed to the bursting of the real estate bubble.

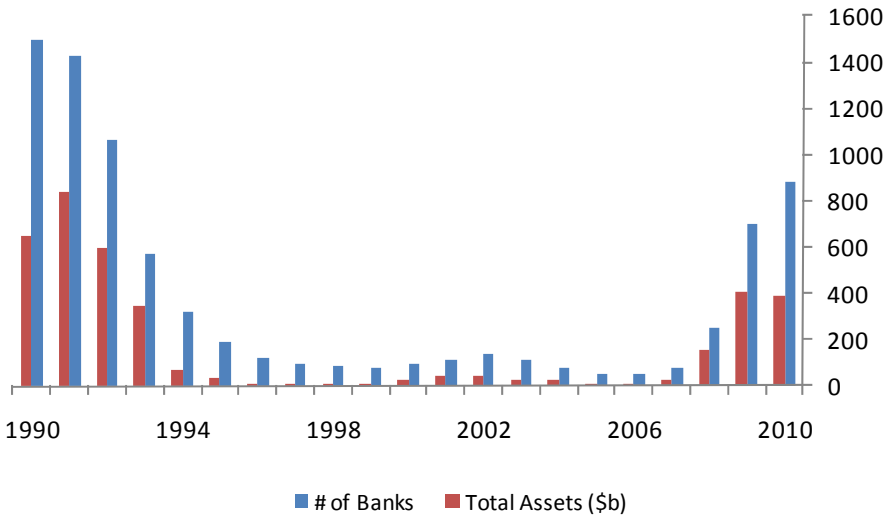
The end result of the crisis was 1,043 failed S&Ls with total assets of $519 billion. The combined total cost for all direct and indirect losses of FSLIC's and RTC's resolutions was an estimated $153 billion. Congress was forced to provide funding for the insolvent S&L insurance fund (FSLIC) to prevent further deterioration. In 1989, The Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) was passed, which abolished the Federal Home Loan Bank Board (regulator of S&Ls) and FSLIC and replaced them with the Office of Thrift Supervision (OTS) and the Savings Association Insurance Fund (which was administrated by the FDIC). The OTS took over responsibility of chartering, regulating, examining and supervising S&Ls. Additionally, FIRREA established the Resolution Trust Corporation (RTC) primarily to dispose of failed S&Ls taken over by regulators, defined new capital/reserve requirements, allowed banks to acquire S&Ls and established new regulation for real estate appraisals.

Recovery from current crisis well on its way, but problem institutions at highs

While it seems that the Federal Reserve, through extraordinary actions, held off what could have been a more severe downturn in the banking industry starting in late 2007, there are still a number of banks that are operating on the verge of failure. As of 12/31/10, the FDIC deemed 884 banks (with total assets of $390 billion) problem institutions (see Figure 69).

Additional stress in the economy and further erosion of credit quality at these banks could lead to additional industry consolidation.

Figure 69: Problem institutions

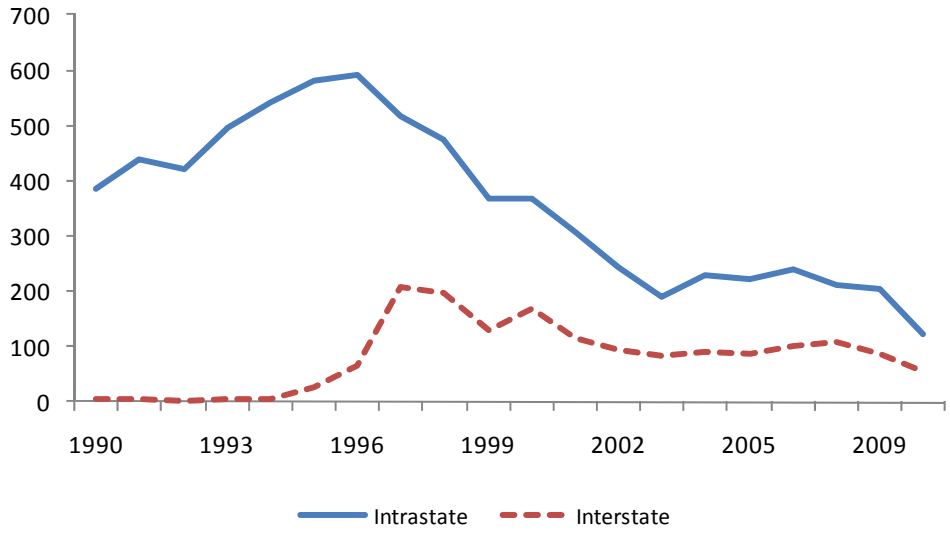


Source: FDIC

Deregulation sparked consolidation

Deregulation has played a large role in shaping the banking industry over the last 20 years, with commercial banks gaining entry into new markets, both geographically and in terms of product offerings. One of the more significant regulatory changes in banking started in the 1950s with states' relaxing restrictions on interstate banking and branching. The positive effects were mostly felt however, with the passage of the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994, which required all states to allow interstate acquisitions and branching by 1995. As seen in Figure 70 the banking industry experienced a significant rise in interstate M&A volume and continued consolidation after its enactment. Note that with the passage of Dodd-Frank, banks are now required to maintain higher capital levels to complete interstate acquisitions.

Figure 70: Bank mergers (intrastate vs. interstate)



Source: FDIC

The Gramm-Leach Bliley (GLB) Act (1999), which repealed sections of the Glass-Steagall Act (GSA), allowed for mergers between commercial and investment banks, eliminated the prohibition of banks' underwriting of insurance (under the Bank Holding Company Act of 1956), permitted bank holding companies to conduct activities that were deemed complementary to banking, and allowed bank-owned subsidiaries to underwrite securities (up to a certain percentage of assets). The GSA had also limited banks' income attributable to securities to 10% of income. The repeal of much of the GSA allowed for expansion of the traditional banking business and accelerated M&A, creating larger (and several mega-size) banks. The repeal of the GSA opened the doors for Travelers' $82b merger with Citicorp.

Other notable bank deals announced in 1998 were Northwest/Wells Fargo, Bank One/First Chicago NBD, and Nations Bank/BankAmerica. Note that under Dodd-Frank, banks will be taking a step back towards the traditional banking model with limitations/prohibitions behind proprietary trading, private equity investments and acquiring nonbank entities. See discussion on Dodd-Frank on page 69 for additional information.

Larger banks continued to gain market share over the last 20 years

The commercial banking industry has become extremely concentrated at the top end, much of this occurring over the last 20 years. Of the 6,529 commercial banks in the U.S. at 12/31/10, 86 had over $10b in assets. However, these banks accounted for 81% of industry assets (see Figures 71 and 72).

Figure 71: Number of commercial banks (12/31/10)

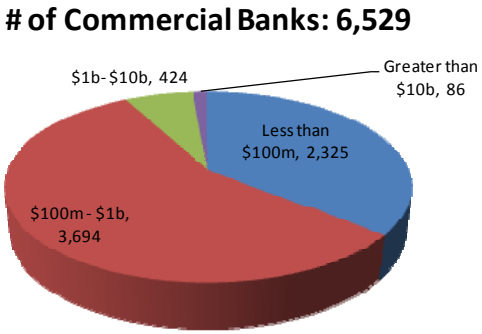
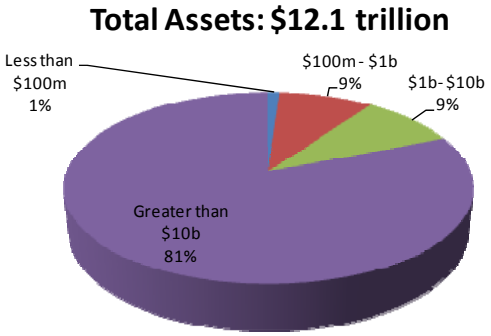


Figure 72: Assets held at commercial banks (12/31/10)



Source: FDIC

The top 10 banks by assets have grown by almost 9x over the last 20 years vs. 4x for banks in general. Continued merger activity between large banks over the last 20 years has created increasingly larger banks. Figure 73 shows that the top 10 banks (including savings banks) accounted for 31% of the industry's total assets in 1990. Twenty years later, the top 10 banks account for 66% of the industry's total assets. Some of this increase in industry concentration can, in our view, be attributed to market share gains, but the majority has likely been driven by M&A.

Figure 73: Top 10 banks by assets

	12/31/2010 Total Assets ($ billion)	% of Industry		12/31/2000 Total Assets ($ billion)	% of Industry		12/31/1990 Total Assets ($ billion)	% of Industry
1 Bank of America	2,265	17%	1 Citigroup	902	12%	1 Citicorp	217	7%
2 JPMorgan Chase	2,118	16%	2 JPMorgan Chase	715	10%	2 JPMorgan	136	4%
3 Citigroup	1,914	14%	3 Bank of America	643	9%	3 Bank America	116	4%
4 Wells Fargo	1,258	9%	4 Wells Fargo	272	4%	4 NationsBank	111	3%
5 U.S. Bancorp	308	2%	5 Bank One	269	4%	5 Chase Manhattan	98	3%
6 PNC	264	2%	6 Wachovia	254	3%	6 J.P. Morgan & Co	93	3%
7 Bank of New York	247	2%	7 FleetBoston	219	3%	7 Security Pacific	85	3%
8 Capital One	173	1%	8 U.S. Bancorp	165	2%	8 Manufacturers Hanc	62	2%
9 Suntrust	157	1%	9 SunTrust Banks	104	1%	9 Bank One	57	2%
10 State Street	132	1%	10 National City	89	1%	10 Wells Fargo	56	2%
Top 10	8,836	66%	Top 10	3,632	49%	Top 10	1,031	31%
Total Industry	13,331	100%	Total Industry	7,463	100%	Total Industry	3,311	100%

Source: SNL

Some banks have been flirting with deposit market share limits

Deposits at the top 10 banks have grown by over 6x over the last 20 years vs. 3.5x at banks in general. Mergers have created increasingly larger banks (as detailed above) and some are now approaching regulatory limits. The Riegle-Neal Act of 1994 created a 10% cap on national deposits (and 30% cap on state deposits for those without stated limits) that any one bank could hold if reached via acquisition. Regulators also limit mergers that would result in banks gaining extreme market share concentration in any given metropolitan statistical area (MSA). The FDIC uses the Herfindahl-Hirshman Index (HHI) to measure market concentration. The HHI is calculated by summing the square of each banks share of deposits in an MSA. The FDIC will review proposed mergers that would result in post-merger HHIs in a given MSA that are 1,800 points or more, unless they reflect an increase of less than 200 points from the pre-merger HHI (see Figure 74).

Figure 74: Top 10 banks by deposits

	12/31/2010 Total Deposits ($ billion)	% of Industry		12/31/2000 Total Deposits ($ billion)	% of Industry		12/31/1990 Total Deposits ($ billion)	% of Industry
1 Bank of America	1,010	10.7%	1 Bank of America	364	8.7%	1 Citicorp	142	5.4%
2 JPMorgan Chase	930	9.9%	2 Citigroup	301	7.2%	2 NationsBank	92	3.5%
3 Citigroup	845	9.0%	3 JPMorgan Chase	279	6.7%	3 JPMorgan	89	3.4%
4 Wells Fargo	848	9.0%	4 Wells Fargo	170	4.1%	4 Bank America	89	3.4%
5 PNC	183	1.9%	5 Bank One	167	4.0%	5 Chase Manhattan	71	2.7%
6 U.S. Bancorp	204	2.2%	6 Wachovia	143	3.4%	6 Security Pacific	58	2.2%
7 BNY Mellon	145	1.5%	7 FleetBoston	129	3.1%	7 Bank One	45	1.7%
8 SunTrust Banks	123	1.3%	8 U.S. Bancorp	110	2.6%	8 First Interstate	43	1.6%
9 Capital One Financi	122	1.3%	9 SunTrust Banks	70	1.7%	9 Wells Fargo	43	1.6%
10 BB&T	107	1.1%	10 BNY Mellon	56	1.3%	10 KeyCorp	41	1.5%
Top 10	4,519	48.0%	Top 10	1,788	42.8%	Top 10	714	26.9%
Total Industry	9,423	100%	Total Industry	4,179	100%	Total Industry	2,650	100%

Source: SNL

Historical M&A activity and pricing

Since 1987 there have been 920 bank acquisitions with deal values exceeding $100m, with the majority falling into the $100m to $500m range (671 deals totaling $139b). However, accounting for only 24 deals over this period, acquisitions exceeding $10b in value accounted for a majority of deal activity since 1987 ($612b of the $1.2 trillion total). The average price to book of completed and pending deals was 2.4x, price to tangible book 2.9x and price to LTM earnings 19.6x. On average, deals were priced at a 23% premium to the target banks core deposits. See Figure 75 for a breakdown of M&A statistics.

Figure 75: Summary M&A statistics (deal activity since 1987)

Deal Size	Number of Deals	Total Deal Value ($b)	Seller Total Assets ($b)	Premium to Previous Day's Close	Price / Book	Price / Tangible Book	Price / LTM Earnings	Premium / Core Deposits
$10b +	24	612	3,105	13%	2.9	3.7	17.6	35%
$5b-10b	22	159	1,002	22%	2.7	3.1	20.8	23%
$2b-$5b	41	128	1,031	23%	2.2	3.0	18.6	25%
$1b-$2b	57	80	594	21%	2.2	2.5	21.2	18%
$500m-$1b	105	74	467	18%	2.2	2.5	19.5	18%
$100m-$500m	671	139	867	22%	2.1	2.4	19.9	17%
Average/Total	920	1,191	7,067	20%	2.4	2.9	19.6	23%

Source: SNL

A few notable mergers

Bank of America (previously NationsBank) as we know it today is a product of several dozen bank/thrift/specialty finance company acquisitions over the last 20 years, most notably, Boatmen's Bancshares ($41b in assets) in 1996, Barnett Banks ($44b in assets) in 1997, BankAmerica ($260b in assets) in 1998, FleetBoston ($196b in assets) in 2004, MBNA ($63b in assets) in 2006, LaSalle ($124b in assets) in 2007, and most recently Countrywide ($209b in assets) in 2008 and Merrill Lynch ($966b in assets) in 2009.

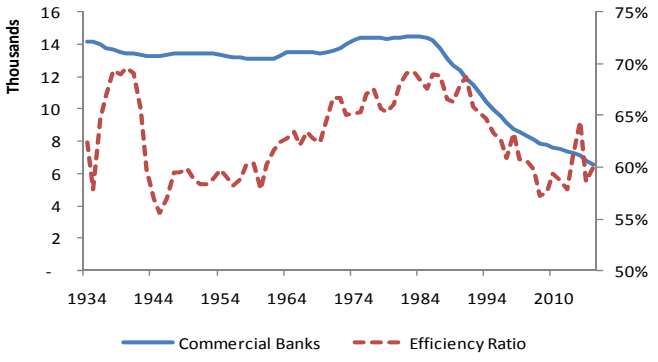
JPMorgan Chase is a consolidation of numerous bank/thrift/insurance/specialty finance/ and insurance companies including Manufacturers Hanover ($61b in assets) in 1991, which was acquired by Chemical Banking Corp, Chase Manhattan ($119b in assets) in 1996, Bank One ($290b in assets) in 2004 and most recently Bear Stearns ($395b in assets) and Washington Mutual ($160b) in 2008.

See Appendix B for a summary of all M&A activity (deal size exceeding $1b) since 1987.

Do deals work?

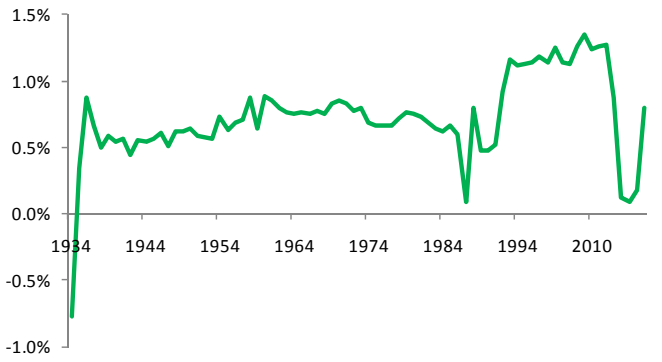
While bank efficiency ratios have in general fallen and ROAs have risen (except during the recent crisis) since the early 1980s when we began to see a decline in the number of banks (through failures and mergers), the correlations are likely more of a factor of the failure of banks with high expense ratios (lower ROAs) rather than increased efficiencies (cost saves and synergies) from mergers. See Figures 76 and 77 for a comparison of efficiency ratios, ROAs and number of banks.

Figure 76: # of commercial banks vs. efficiency ratio



Source: FDIC

Figure 77: Bank ROAs



Source: FDIC

Dodd-Frank and What it Means for M&A

Some would argue increased regulation will lead to more M&A (higher regulatory-related costs is one reason cited). On the other hand, larger banks may be required to hold more capital and liquidity than smaller banks—reducing the motivation to get bigger via M&A.

Below, we highlight some potential negative impacts on M&A activity.

- Higher capital requirements: Besides the phasing out of TruPS from Tier 1 capital by year-end 2015, the Collins Amendment of Dodd-Frank calls for regulators to impose minimum leverage and risk-based capital requirements on banks and requires them to build in countercyclical measures (capital should increase in times of economic expansion and decrease in times of economic contraction).

  Basel 3 recommends a minimum Tier 1 common ratio of 4.5% by January 2015, up to a 2.5% countercyclical buffer (bringing the base requirement to ~7%) and an additional buffer for banks deemed to be systemically important (which could be up to 300bps).

  Under Dodd-Frank, bank holding companies and insured depository institutions need to be well capitalized and well managed before making interstate acquisitions vs. adequately capitalized and adequately managed previously under the Bank Holding Company Act of 1956 and Bank Merger Act of 1960.

- Concentration limits on liabilities: To address the too-big-to-fail issue, Dodd-Frank establishes size limits for insured depository institutions. While details of the rule have yet to be finalized, the rule states that no bank or systemically important firm could acquire another institution if the resulting consolidated liabilities would exceed 10% of the national total. There are likely to be adjustments for certain liabilities in the final rule but as of 12/31/10, BAC, JPM, C and WFC accounted for 18%, 17%, 15% and 9% respectively of total industry-wide liabilities based on FDIC data. The next largest were at USB, PNC and BK, each at 2%. The law does allow regulators to lift the restriction when dealing with depository institutions that are near to or in default.

- Systemic Risk: Under Dodd-Frank, regulators must determine if an acquisition would increase the systemic risk an individual financial institution would pose before approving a deal. Note that in February 2011, the Federal Reserve (unofficially) identified 35 large banks that may pose systemic risk to the economy that it stated should be subject to greater regulatory scrutiny under the Dodd-Frank Act as a result.

However, certain aspects of regulation under Dodd-Frank (notably higher capital requirements, increased costs related to regulation and limitations of banks ability to grow outside the traditional banking space) could increase the likelihood of M&A occurring.

Securitizations

The Role of Securitizations

Securitizations play a major role in the financial markets, providing a supply of funds for all types of loans including auto, credit card, corporate loans and mortgage (both residential and commercial) through the creation of asset-backed securities. Prior to when the securitizations market began, most loans (and risk) remained on banks' balance sheets, somewhat limiting the supply of credit to potential borrowers. At the time, individual mortgages were not attractive investments to investors because of the size of the mortgages (concentration risk for most individual investors), lack of diversification, extension/prepayment risk (investors did not know how long loans would be outstanding) and the long stated life of mortgages (30 years for residential). When properly constructed, securitizations are beneficial to all players in the market, with borrowers (home/property buyer) getting mortgages and at more attractive rates (due to increase in supply of funds), originators earning fees and investors earning a yield.

What is a Mortgage Backed Security and How Are They Created

The most common type of securitization is a mortgage backed security (MBS). An MBS is a type of asset-backed security that has claim on the cash flows (principal and interest) of pools of mortgage loans. The mortgages can be either residential (forming RMBS) or commercial (CMBS). Comprising $10.5 trillion in assets at the end of 2010 (up from $1.5 trillion in 1985), home mortgages represent the largest mortgage market in the U.S. (see Figure 78 below).

Figure 78: Mortgage Assets in the U.S. 1985-2010 ($b):

	1985		2010		
Type of mortgage	$	% of total	$	% of total	Growth
Home	1,526	64%	10,546	76%	591%
Multifamily residential	206	9%	841	6%	308%
Commercial	542	23%	2,313	17%	327%
Farm	94	4%	133	1%	41%
Total	2,368	100%	13,833	100%	484%

Source: Federal Reserve

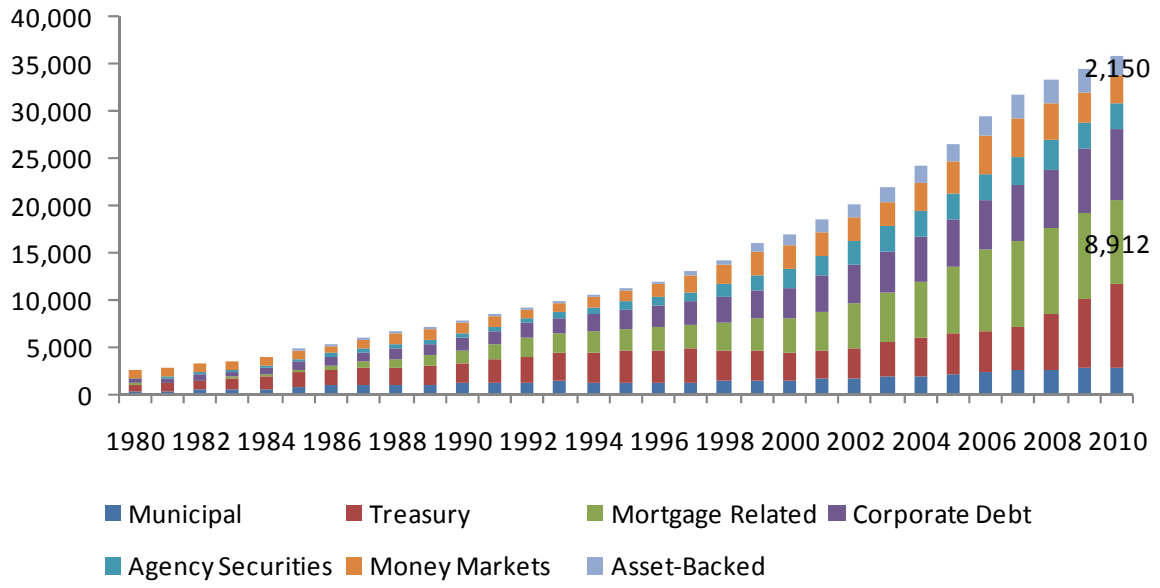
Mortgages originated by banks are typically gathered into pools and sold to investors. The most basic type of MBS is a pass-through security where investors are entitled to a pro-rata share of all interest and principal payments on a pool of mortgages. Although mortgage specific risk is greatly reduced by packaging mortgages into these securities (through diversification), the inherent risks associated with the underlying mortgages (pre-payment and extension risk) remain. These risks kept many investors out of the mortgage market until the creation of collateralized mortgage obligations (CMOs) in the 1980s.

Under the CMO structure, mortgages are packaged into pools which are then broken down into tranches (based on repayment priority). This structure made investing in MBS a lot more attractive to investors and opened the market up to a rapid expansion of capital investment (and mortgage originations). Investors that were looking for more predictable streams of periodic payments on their investment would choose a more senior (and lower yielding) tranche while those looking for higher returns would choose a more risky tranche where cash flows were less certain.

MBS share of the bond market has grown

At the end of 2010, mortgage-related securities accounted for 25% ($8.9 trillion) of the $36 trillion bond market in the U.S., up from 17% in 1990. Asset-backed securities (ex. mortgages) accounted for 6% at 12/31/10 compared with 1% in 1990 and U.S. Treasuries, 25% vs. 29% in 1990. See Figure 79 below.

Figure 79: Composition of US bond market: ($ billions)



Source: SIFMA

Who Are the Players in the Securitization Market

Originator: the originator is the owner of the loans (mortgages, auto loans, etc.) that it is looking to convert into cash to get them off balance sheet. Mortgages brokers are sometimes used in the origination process which increases banks (or originators) exposure to potential borrowers. Many banks used independent mortgage brokers to source mortgages through the rapid expansion of credit between 2001 and 2007.

- Loan repurchases. Originators sign contracts with lenders to agree to repurchase loans under certain circumstances, usually in the case of fraud. These contracts were largely overlooked until mortgage delinquencies and defaults started to pick up in 2007 with the downturn in the housing market and overall economy. Throughout 2010, banks greatly increased their reserves for potential mortgage repurchase losses which have come with a rapid increase in repurchase requests over the last couple of years.

Special purpose entities (SPEs): An SPE is a legal entity that, for the purpose of securitizations, is usually a trust. Originators sell loans into SPEs which legally transfers the assets to a bankruptcy-remote entity. This ensures the loans are removed from the originator's balance sheet and no longer at risk should an originator declare bankruptcy. The contents of the SPE become owned by holders of the newly issued MBS (or other securitization).

- Sponsor (structuring agent): The sponsors (typically banks) provide the structuring and modeling of cash flows of the new mortgage-backed securities.
- Rating Agencies: Ratings agencies issue ratings on mortgage backed securities. Many institutions have restrictions that prevent them from purchasing unrated securities.

Without ratings, many institutions would not have access to this market and the market would likely be much smaller than it is today.

Trustee: Is the manager of the trust (SPE) that is responsible for protecting the interests of investors in the newly formed securitization. The trustee is also responsible for appointing a servicer to service the pool of mortgages and allocating the proper cash flows to investors.

- Servicer: A servicer's responsibility is to collect scheduled payments from borrowers (homeowners), which it then forwards to the trustee.

Underwriter: The underwriter is responsible for marketing and distributing securities to investors.

Investors: Investors purchase securities from underwriter for a share of cash flows from the SPE.

Note that banks often play multiple roles in the securitization process.

The History of Mortgage Backed Securities

In general, the purpose of the government agencies was to expand home ownership in the U.S. without burdening taxpayers (through direct loans and subsidies from the government). The GSEs provide a mechanism by which capital could be sourced to fund the origination of home loans. Historically, GSEs dealt with prime mortgages that conformed to a set of criteria, including good credit (which was documented) and of a certain size (must be conforming –no jumbo). Mortgages that fell outside this area (subprime and jumbo loans) were originated and held onto by banks or securitized in the private market.

The Federal National Mortgage Association (Fannie Mae) is a GSE that was created by Congress in 1938 to help mortgage lenders access capital. Its stated purpose was to provide liquidity, stability and affordability to the housing and mortgage markets. Fannie Mae operates in the secondary mortgage market, working with mortgage bankers and brokers to provide funds to lend. In 1968, Fannie Mae was split into two corporations, Ginnie Mae, which was to be backed by the full faith and credit of the U.S. government, and Fannie Mae which became a private company.

The two lines of Fannie Mae's business are:

- Portfolio Investment: in which it buys mortgages and MBS as investments and funds those purchases with debt issued in the U.S. and abroad (which is held my many banks).
- Credit Guaranty: which involves guaranteeing the credit performance of single family and multifamily loans at no charge.

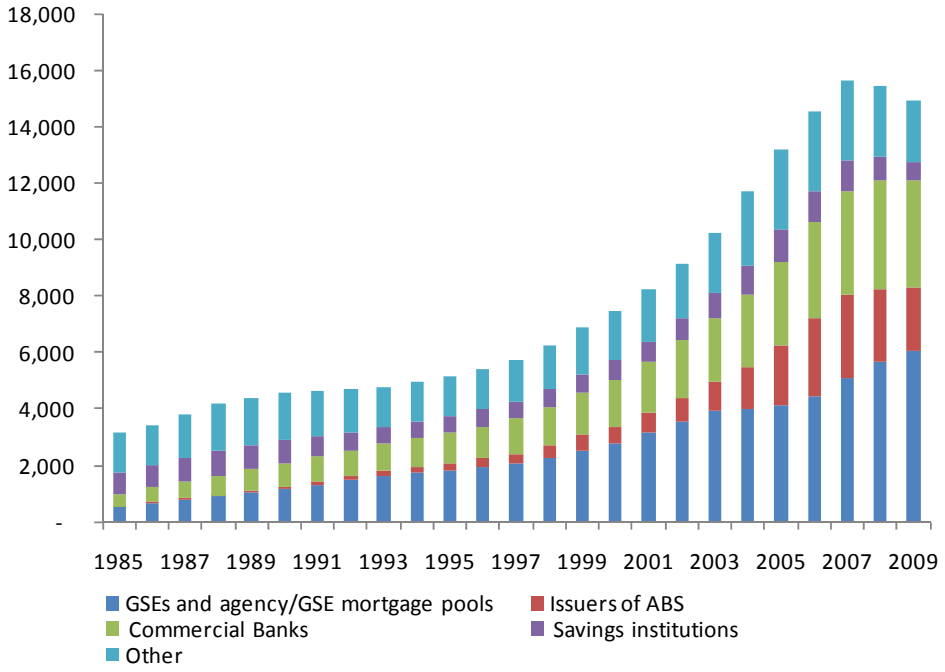
The Federal Home Loan Mortgage Corporation (Freddie Mac) was established by Congress in 1970 to facilitate a secondary market for mortgages. It also became privately owned in 1989. Through September of 2008, both Fannie Mae and Freddie Mac were privately owned but benefited from an implicit guarantee from the U.S. government with special authority to borrow from the Treasury. Due to substantial losses incurred during the financial crisis starting in 2007, both Fannie and Freddie were placed under government conservatorship. As of April 2011, both Fannie and Freddie remain in conservatorship and their future is unknown. Given the mortgage markets (and banks') dependence on the GSEs (currently 90%+ of home mortgage originations in the U.S. use GSEs), any type of restructuring of the system will be closely watched.

Ginnie Mae guarantees securities backed by single- and multifamily-homes insured by government agencies. Ginnie Mae does not purchase, issue or sell securities. Private

institutions approved by Ginnie Mae, originate and pool mortgages and sell securities as Ginnie Mae MBS. Ginnie Mae guarantees the timely principal and interest payments of pools of mortgages which enables lenders to make mortgages at affordable rates. Ginnie Mae securities remain backed by the full faith and credit of the U.S. government.

The mortgage backed securities market started in 1970 with GNMA guaranteeing the first mortgage backed security. Through the 1970s, the mortgage market was dominated by savings and loan institutions (SNLs) which held approximately 60% of mortgage debt in 1978 before their market share fell throughout the SNL crisis (discussed in more detail on page 72). As the mortgage market expanded (including rapidly after 2000), SNLs lost share to the GSEs. GSEs relied on commercial and investment banks to help package and sell securities. The private MBS market remained fairly quiet until the late 1980s/early 1990s as a result of the S&L crisis and until the enactment of the Tax Reform Act of 1986 (and corresponding creation of CMOs). This Act solved tax-related issues associated with originating and selling mortgages into pools. Issuers of ABS began growing their businesses in the early 1990s. See Figure 80 below for MBS market share changes between 1985 and 2009.

Figure 80: Mortgage assets in the U.S. ($ billions) 1985-2009



Source: Federal Reserve

At the end of 2009, savings institutions held less than 4% of mortgage assets vs. 32% in 1985. GSEs/agencies and GSE mortgage pools were the largest holders of mortgage assets, at 42% ($6 trillion), up from 22% in 1985. Commercial banks and issuers of asset-backed securities (largely investment banks) combined accounted for 42% ($6 trillion) of the market, up from 19% ($450b) in 1985 (see Figure 81).

Figure 81: Mortgage assets in the U.S. 1985-2009

($ millions)	12/31/1985	% of total	12/31/2009	% of total	Growth
GSEs and agency/GSE mortgage pools	527,598	22%	6,079,735	42%	1052%
Commercial banking	431,234	18%	3,818,982	27%	786%
Issuers of asset-backed securities	24,580	1%	2,215,603	15%	8914%
Savings institutions	765,654	32%	633,327	4%	-17%
Finance companies and REITs	59,248	3%	460,866	3%	678%
Insurance companies	175,136	7%	334,719	2%	91%
Credit unions home mortgage assets	11,086	0%	316,679	2%	2757%
Federal, state and local government	127,511	5%	269,893	2%	112%
Households/nonprofits/nonfinancial businesses	216,482	9%	148,816	1%	-31%
Pension and state/local govt. retirement funds	29,325	1%	28,414	0%	-3%
Total mortgage assets	**2,367,854**	**100%**	**14,307,034**	**100%**	**504%**

Source: Federal Reserve

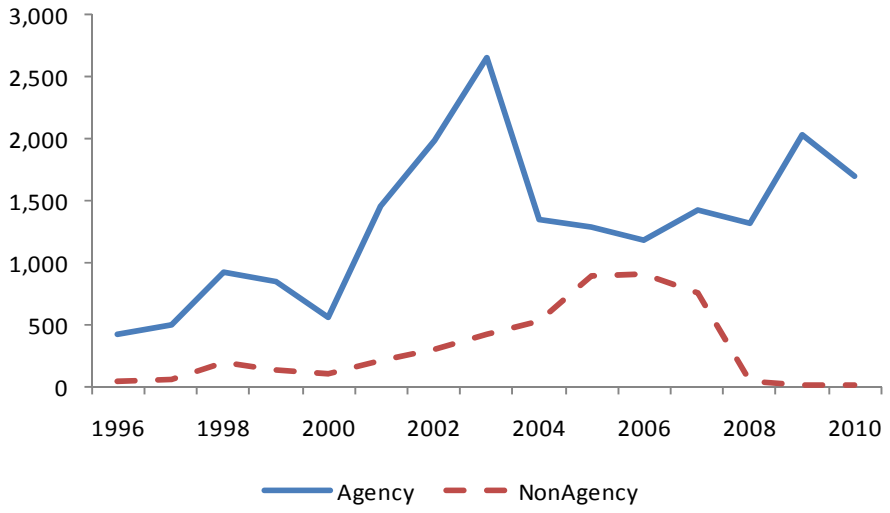
Besides being a source of fee revenue for banks (including servicing, underwriting and other), mortgage backed securities play an integral role in banks business models, providing a source of investments and a mechanism for managing interest rate exposure. At the end of 2010, securities portfolios accounted for 17% of banks' asset bases (based on banks under coverage), 71% of which was in the form of residential MBS.

Start of the subprime crisis

Starting in the early 2000s, with the onset of low interest rates (at the end of the dot com era), banks began to hold onto a large percentages of the MBS they originated to capture the spread. With the demand for MBS rising and supply of conforming loans limited, banks began to securitize subprime loans. These securitizations were structured similarly to agency MBS, but with lower quality mortgages and lacked an agency guaranty so there was more risk involved. The risk involved with individual securities was largely overlooked due to the historical track record of real estate, which for the most part always increased in value over the longer term and was at the time, in a very strong uptrend.

The securitization of conforming (agency) loans peaked sometime in 2003, while the private securitizations of subprime and other non-conforming loans continued through 2007 until the collapse of this market. Today, the non-agency securitization market is essentially closed, with newly originated nonconforming loans (which are few) remaining on banks' balance sheets. Conforming loans continue to be originated through the agencies (see Figure 82).

Figure 82: Mortgage backed securities issued ($ billions)



Source: SIFMA

Changes in the Securitization Markets

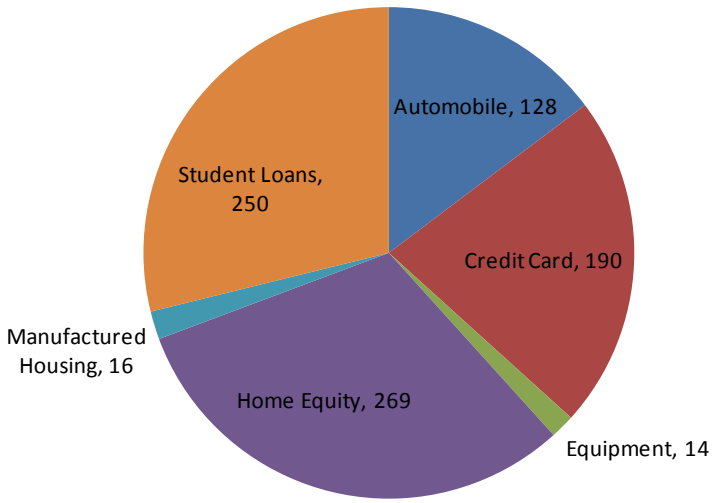
Government purchases: In November 2008, the Federal Reserve announced its program to purchase agency mortgage backed securities, which it later indicated would include purchases of up to $1.25 trillion starting in January 2009 and ending by the end of 2009. The program was extended and gradually phased out, ending at the end of 1Q10. The purpose of this program was 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). As of April 2011, the Fed has yet to sell these securities and is looking for a rebound in the economy/reduction in unemployment figures to do so.

Potential regulation: Although the details of the rule have yet to be finalized, Dodd-Frank calls for originators of securitizations to hold 5% of each security (without hedging) to ensure they have a vested interest in their success. This in itself could prevent the securitization markets from returning to the levels they were at several years ago. A potential positive could be that given the lack of loan demand in the market, banks could see increased opportunities to grow balance sheets (with potentially higher yielding securities) once the market rebounds as a result of fewer loans being securitized. We have yet to see signs this is occurring.

Other Types of ABS

Although much smaller in size than the residential mortgage backed securities market, other asset types also benefit from the securitization process. As of 3/30/11, $866b of asset backed securities were outstanding including auto, credit card, equipment, home equity, manufactured housing and student loans. Note that another $1.2b of these assets was collateral for CDOs. See Figure 83 for a breakdown of other outstanding ABS

Figure 83: Other types of ABS ($ billions)



Source: SIFMA

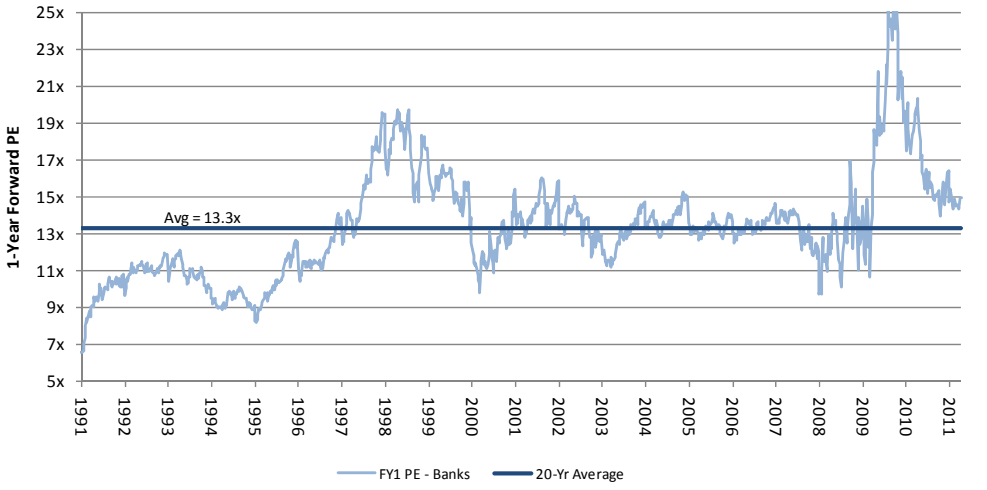
Bank Stocks: How They Are Valued

Bank stocks can be valued using a number of different metrics, with investors relying more on certain metrics more than others depending on the operating environment (including what point in the credit cycle they are in). Banks are valued, for the most part, based on their earnings power and expected growth. Like other financials (brokers, property-casualty insurers, and life insurers), they are also valued based on book value.

Price to Earnings (PE ratio)

In a normal operating environment, bank stocks can be valued based on their price to earnings ratios (PE), which is calculated by dividing a bank's stock price by its earnings per share (which can be based on trailing or forecasted earnings). On average, banks have traded at about 13x 1-year forward EPS over the past 20 years (in other words, the stock price is generally worth about 13x forecasted earnings per share in the following year). See Figure 84. During 1997-1999, valuations were particularly high given a surge in M&A and generally robust capital markets. They then leveled off in 2000, but peaked again in 2001-2002 following the bursting of the tech bubble and subsequently became range bound through the beginning of the recent credit crisis in mid-2007 (with FY1 PE range bound between 13x and 15x over this period). In 2009, FY1 PE ratios spiked considerably above their historical average given much lower forecasted EPS estimates combined with a large bounce in stock prices off their March 2008 lows.

Figure 84: 1-year forward PE ratios for banks



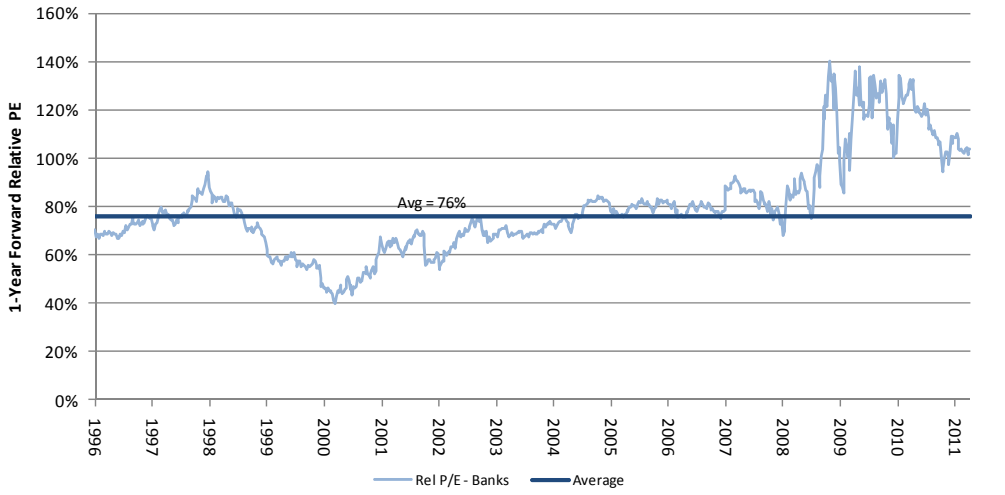
Banks include: ASBC, BAC, BBT, BOKF ,BPOP, C, CBSH, CFR, CMA, COF, CYN, FBP, FCNCA, FHN, FITB, FULT, HBAN, JPM, KEY, MI, MTB, PNC, RF, SNV, STI, TCB, USB, WBS, WFC, ZION

Source: CapitalIQ,SNL, Deutsche Bank

Relative PE (1-year forward)

The relative price to forward earnings ratio for the bank group (or the FY1 PE ratio of banks as a proportion of the S&P 500 FY1 PE) has been roughly 75-80% on average over the past 15 years. See Figure 85. We believe this is due in large part to the perception that banks have always been more difficult to understand. For example, the uncertainty of loan loss provisions/reserve adequacy (i.e. unlike other industries, banks' real cost of goods sold are unknown and can be meaningfully higher than expected). In addition, risks being taken on the asset-side varies widely across each bank (unlike other industries, the output/production process is not completely transparent and varies significantly across similar products).

Figure 85: 1-year forward relative PE ratios for banks

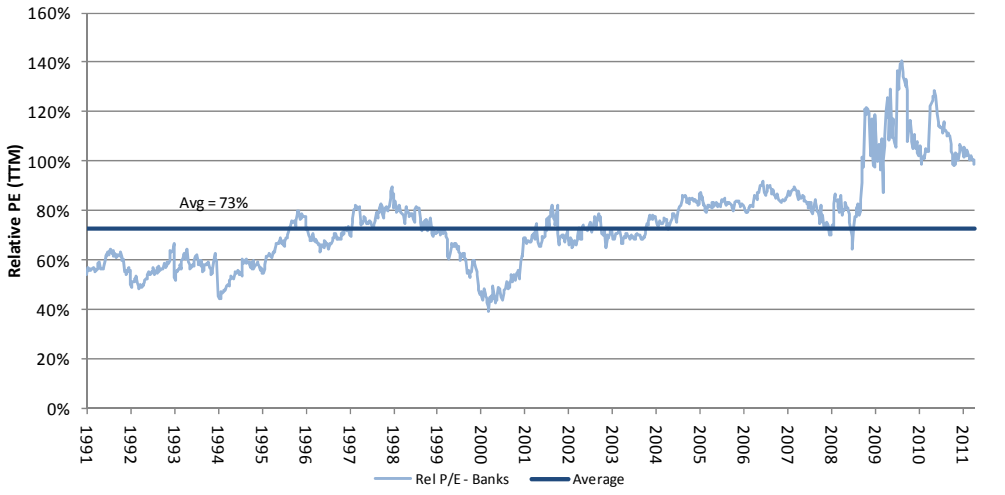


Relative P/E ratio is defined as the absolute P/E of bank stocks vs. the absolute P/E of the S&P 500 index.
Banks include: ASBC, BAC, BBT, BOKF ,BPOP, C, CBSH, CFR, CMA, COF, CYN, FBP, FCNCA, FHN, FITB, FULT, HBAN, JPM, KEY, MI, MTB, PNC, RF, SNV, STI, TCB, USB, WBS, WFC, ZION
Source: CapitalIQ,SNL, Deutsche Bank

Relative PE (TTM)

Based on the relative trailing twelve month (TTM) PE ratio (or the PE ratio of banks based on trailing 12-month earnings as a proportion of the overall market PE), banks have historically traded at a ~30% discount to the market on average over the past 20 years (see Figure 86) vs. ~25% on average on a forward PE basis.

Figure 86: Relative PE ratios (TTM) for banks



Relative P/E ratio is defined as the absolute P/E of bank stocks vs. the absolute P/E of the S&P 500 index.
Banks include: ASBC, BAC, BBT, BOKF ,BPOP, C, CBSH, CFR, CMA, COF, CYN, FBP, FCNCA, FHN, FITB, FULT, HBAN, JPM, KEY, MI, MTB, PNC, RF, SNV, STI, TCB, USB, WBS, WFC, ZION
Source: CapitalIQ,SNL, Deutsche Bank

Price to Book (P/BV)

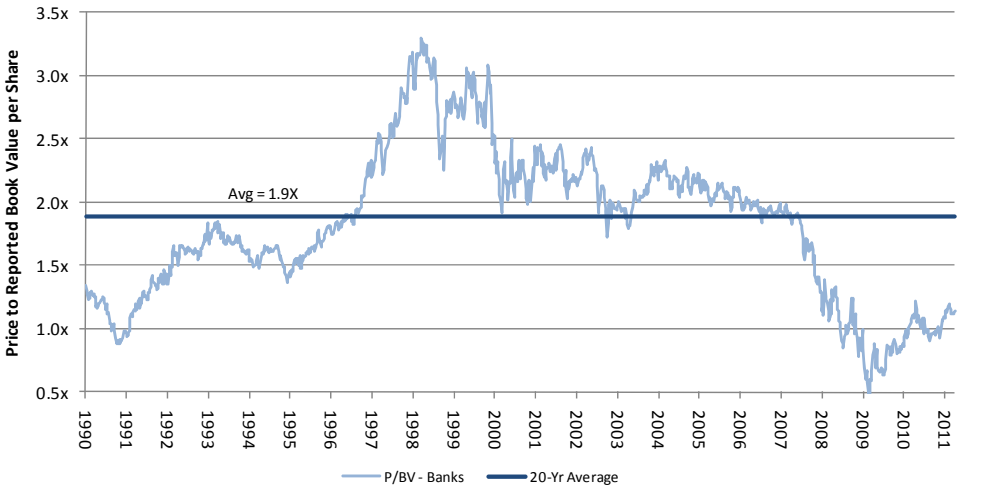
Price to book is a closely followed valuation metric in the banking industry (particularly during times of industry pressure). It is calculated by dividing the stock price by the book value per share (or reported shareholders equity divided by common shares outstanding). Book value multiples are particularly important during periods of earnings pressure (i.e. when earnings power is not viewed as normal) and when investors place more emphasis on banks' ability to remain solvent over earnings growth (such as during the recent credit crisis). Still, even in a normal environment price to book remains a widely accepted valuation measure, as book

value growth does measure a bank's ability to generate a high return on equity (ROE). Note that book value can be calculated a number of ways. By and large, book value for valuation purposes excludes preferred stock (i.e. common book value).

Price to reported book (P/B)

Price to reported book value per share excludes preferred stock but includes intangibles (i.e. goodwill and mortgage servicing rights). Banks have traded at about 1.9x reported book value on average over the past 20 years. Between 1997 and 2007, bank stocks traded above 2.0x until the most recent credit crisis began in 2007. See Figure 87. Since then, price to reported book value ratios declined steeply, bottoming out at 0.4x in early March 2008 with the collapse of Bear Stearns. Banks then traded below book value (<1.0x) between mid-2008 and 2009, during which time the market seemed to have little confidence in the actual reported book values of banks, and to a large extent, fears of additional book value erosion (given virtually no credit loss/earnings visibility at the time). As macro conditions improved and government backstop programs were put in place, investor confidence in reported book values recovered to some extent (banks trade at 1.0-1.1x reported book currently), but remain far below historical levels.

Figure 87: Price to reported book ratios for banks

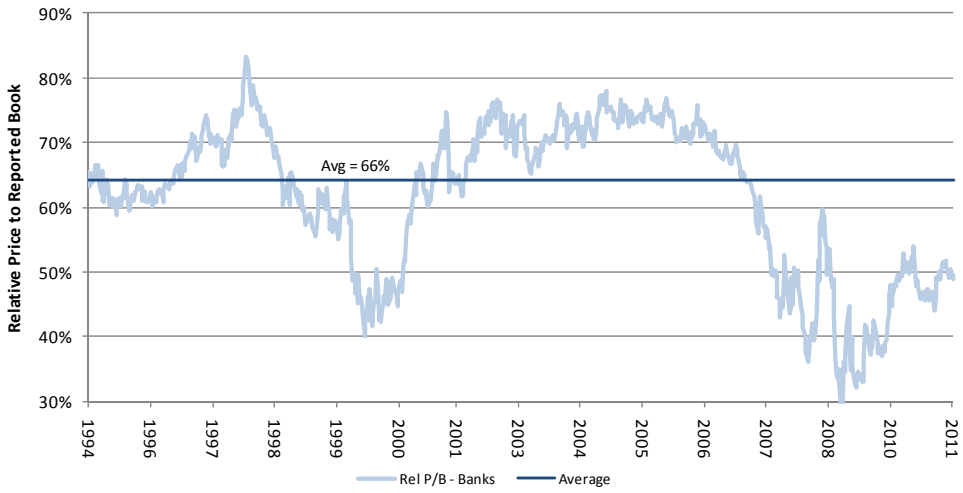


Banks include: ASBC, BAC, BBT, BOKF ,BPOP, C, CBSH, CFR, CMA, COF, CYN, FBP, FCNCA, FHN, FITB, FULT, HBAN, JPM, KEY, MI, MTB, PNC, RF, SNV, STI, TCB, USB, WBS, WFC, ZION
Source: CapitalIQ,SNL, Deutsche Bank

Relative price to reported book

On average, banks have traded at a 35-40% discount to the market on book value, and at a much steeper discount in recent years (about 50% on average since mid-2007). In addition to the normal risks associated with banks vs. other industries (which we outlined previously), we believe investors have discounted bank stocks even further given a number of additional concerns: capital uncertainties, elevated regulatory/political risks, credit uncertainty, and lower normal ROEs. There may also be lingering doubts that reported book value may still contain some negative surprises over time. In our view, price to reported book value multiples for banks may not return to normal levels for a long time. See Figure 88.

Figure 88: Relative price to reported book ratios for banks



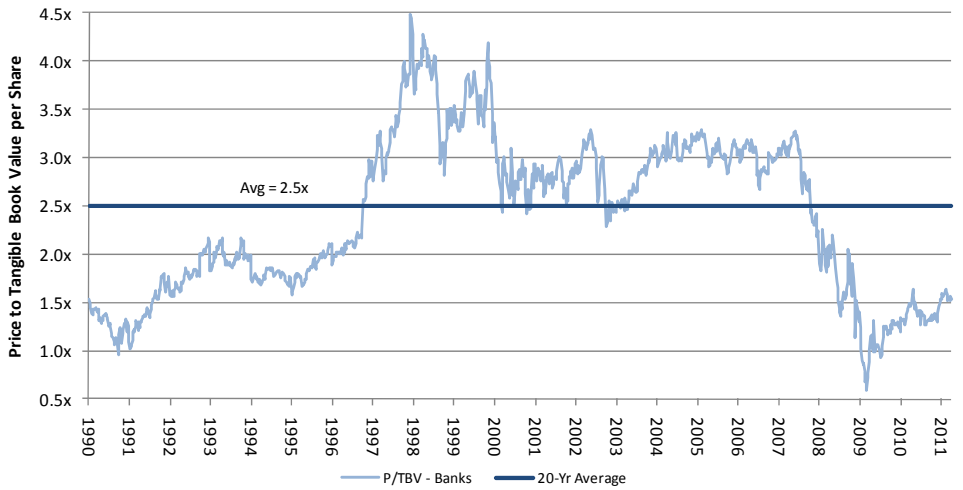
Relative P/E ratio is defined as the absolute P/E of bank stocks vs. the absolute P/E of the S&P 500 index.

Banks include: ASBC, BAC, BBT, BOKF ,BPOP, C, CBSH, CFR, CMA, COF, CYN, FBP, FCNCA, FHN, FITB, FULT, HBAN, JPM, KEY, MI, MTB, PNC, RF, SNV, STI, TCB, USB, WBS, WFC, ZION
Source: CapitalIQ,SNL, Deutsche Bank

Price to tangible book (P/TBV)

Price to tangible book value is a more conservative valuation metric that measures the premium or discount a bank stock trades relative to its tangible book value (ie common equity minus intangibles). During the recent credit crisis, it has become a widely-accepted valuation metric, as tangible common book value is often viewed as the "cleanest" measure of GAAP capital and is the closest to regulatory capital measures (Tier 1 common). Price to tangible book values generally traded above the 20-year 2.5x average over the ten years prior to the credit crisis, but banks currently trade at around 1.5x tangible book value. See Figure 89.

Figure 89: Price to tangible book ratios for banks



Banks include: ASBC, BAC, BBT, BOKF ,BPOP, C, CBSH, CFR, CMA, COF, CYN, FBP, FCNCA, FHN, FITB, FULT, HBAN, JPM, KEY, MI, MTB, PNC, RF, SNV, STI, TCB, USB, WBS, WFC, ZION

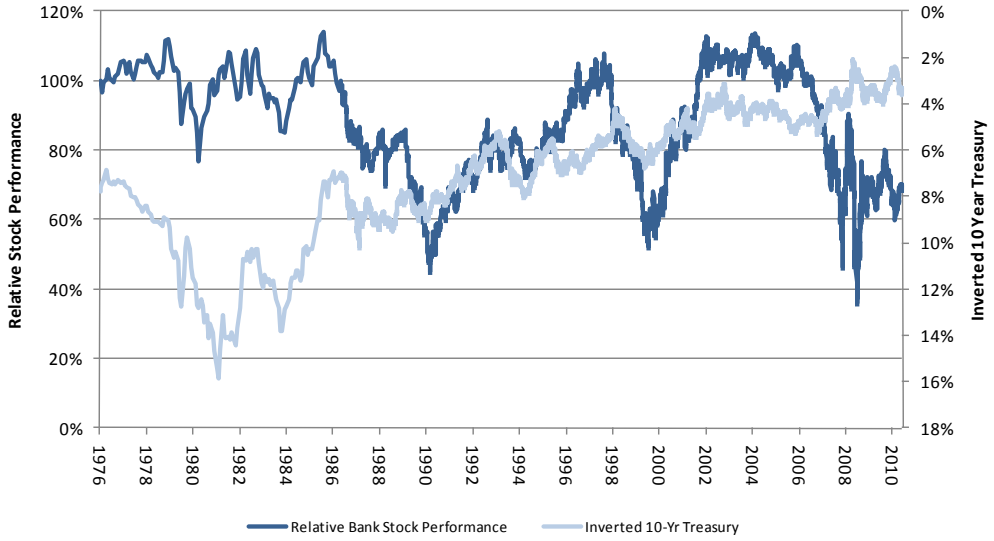
Source: CapitalIQ,SNL, Deutsche Bank

Impact from Rates on Stocks

Interest Rates vs. Stock Performance

In Figure 90, we show bank stock performance (relative to the S&P 500) vs. long-term interest rates over the past 35 years. We use the 10-year Treasury as our interest rate benchmark (which we invert to show the relationship more clearly). For relative bank stock performance, we use the S&P 500 Commercial Bank Index from 1986 onwards and the S&P Financials Index prior to 1986 (which we use as a proxy for bank stock performance). Since 1976 there has been weak correlation between interest rates and stock prices overall. However, there does seem to be fairly strong correlation during periods of meaningful changes in interest rates. In general, bank stocks underperform when rates rise materially and outperform when rates decline sharply.

Figure 90: Relative bank stock performance vs. inverted 10-year: 1976 - Present



**Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP

Bank stocks tend to move in tandem with rates when rates move sharply

We found that the relationship between relative bank stock performance and interest rate levels was stronger when interest rates moved more meaningfully (>200bps). Excluding the period during the S&L crisis, the correlation was very strong from 1979 through 1986 (over 85%). Over this time period, there were four sharp >200bp moves in rates. From 1987 to 1990, the relationship was weaker (at 19%), as rates were more bound between 7%-9% and bank stocks tended to lag the broader market.

As rates fell sharply between 1990 and 1993 (-320bps), banks outperformed the market meaningfully, leading to an 86% correlation over that time. However, the correlation fell to 48% between 1993 and 1998, as 10-year rates rose more steadily and bank stock performance was relatively in-line with the market. Over the following 10 years (from 1998 to 2007), banks outperformed the market meaningfully when the 10-year declined (and vice versa), during which time there were multiple periods of sharp >200bp rate moves—leading to an 87% correlation.

When Interest Rates Rise, Bank Stocks Generally Underperform

While macro conditions underlying each cycle of rate tightening have been different than the last, in the past 35 years, during the periods when interest rates rose meaningfully (over 100bps), bank stocks generally underperformed. For our analysis, we looked at both 2-year Treasury rates and 10-year Treasury rates.

Bank stocks under-performed during periods of rising 2-year rates

During the past 35 years, there were 13 periods when 2-year rates rose more than 100bps, during which bank stocks rose 1% on average vs. up 9% for the S&P 500. Bank stocks meaningfully underperformed the market in eight of those periods by an average of 17%. Bank stocks did outperform in five of those periods (by 5% on average). See Figure 91. Note that since mid-2008, 2-year rates haven't moved meaningfully in either direction.

We provide some additional takeaways below:

- Bank stocks significantly underperformed in seven of the nine periods when 2-year rates rose more than 150bps (underperforming by 18% on average) and outperformed in two of those periods (by 3% on average).
- Bank stocks tended to outperform the market modestly (1% on average) when rate increases were moderate (i.e. less than 150bps).
- During the seven periods that bank stocks underperformed and rates rose meaningfully, there were often significant catalysts that led to the large underperformance (i.e. market bubbles, a spike in credit losses, large NIM declines, and meaningful spread reduction).

Figure 91: Relative bank stock performance during periods of rising 2-year rates

		△ 2 yr rates	Duration	Rate Levels		Stock Performance			
From	To	(bps)	(months)	Trough	Peak	Banks	S&P 500	Rel Perf.	Comments
12/1/1976	3/2/1981	871 bps	50	5.38%	14.09%	17%	29%	-12%	S&L crisis
3/1/1983	7/2/1984	384 bps	16	9.32%	13.16%	-14%	3%	-17%	S&L crisis
9/2/1986	10/16/1987	328 bps	13	5.92%	9.20%	-5%	18%	-22%	Market bubble
3/3/1988	3/21/1989	287 bps	12	7.05%	9.92%	13%	8%	5%	
11/27/1989	4/27/1990	140 bps	5	7.64%	9.03%	-19%	-3%	-16%	Credit losses doubled
1/9/1992	3/16/1992	122 bps	2	4.62%	5.85%	5%	-3%	8%	
10/6/1992	12/2/1992	117 bps	2	3.66%	4.83%	11%	6%	5%	
10/18/1993	12/27/1994	395 bps	14	3.78%	7.73%	-12%	-2%	-10%	NIMs declined 35bps
2/14/1996	7/8/1996	164 bps	5	4.79%	6.43%	0%	0%	1%	
10/30/1998	5/19/2000	291 bps	18	4.00%	6.91%	-8%	32%	-40%	Tech bubble
11/8/2001	4/2/2002	141 bps	5	2.30%	3.71%	12%	3%	9%	
6/16/2003	6/29/2006	420 bps	36	1.08%	5.28%	25%	26%	-1%	
3/18/2008	6/13/2008	170 bps	3	1.34%	3.04%	-15%	5%	-20%	Credit crisis
	Average	**295 bps**	**14**			**1%**	**9%**	**-9%**	

** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP

Bank stocks underperformed more during periods of rising 10-year rates

Bank stocks appear to react more negatively to increases in long-term rates vs. short-term rates. In the past 35 years, during the periods when 10-year interest rates rose meaningfully, bank stocks underperformed by nearly twice as much (underperforming by 17% on average vs. 9% during increases in 2-year rates). Over that time, when 10-year rates rose more than 100bps, bank stocks declined 2% on average, while the S&P 500 rose 15% on average. Bank stocks underperformed meaningfully in nine of the 10 periods by an average of 20%. See Figure 92. We provide some additional takeaways below:

- Bank stocks underperformed in six of the seven periods when 10-year rates rose more than 200bps (by 18% on average).
- Bank stocks underperformed in all eight periods when long-term rates troughed at 8% or below (by 20% on average).

Figure 92: Relative bank stock performance during periods of rising 10-year rates

		△ 10 yr rates	Duration	Rate Levels		Stock Performance		
From	To	(bps)	(months)	Trough	Peak	Banks	S&P 500	Rel Perf.
8/31/1976	3/3/1980	498 bps	41	7.77%	12.75%	-4%	10%	-15%
6/2/1980	10/1/1981	606 bps	16	9.78%	15.84%	11%	4%	7%
3/1/1983	7/2/1984	357 bps	16	10.27%	13.84%	-14%	3%	-17%
9/2/1986	10/16/1987	332 bps	13	6.92%	10.23%	-5%	18%	-22%
2/8/1988	1/6/1989	115 bps	11	8.10%	9.25%	7%	12%	-5%
8/2/1989	4/27/1990	131 bps	9	7.75%	9.06%	-26%	-3%	-23%
8/27/1993	10/27/1994	246 bps	14	5.43%	7.89%	-6%	0%	-6%
10/6/1998	1/19/2000	259 bps	15	4.16%	6.75%	-1%	47%	-48%
6/16/2003	6/15/2007	211 bps	47	3.11%	5.22%	33%	54%	-21%
12/31/2008	6/11/2009	189 bps	5	2.05%	3.95%	-18%	5%	-24%
	Average	**294 bps**	**19**			**-2%**	**15%**	**-17%**

** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP

When Interest Rates Fall, Bank Stocks Generally Outperform

Bank stocks generally outperformed during periods of falling rates during the past 35 years (again, we use 2-year rates and 10-year rates for our analysis).

Bank stocks outperformed during periods of meaningful declines in 2-year rates

Over the past 35 years, there were 14 periods when 2-year rates declined more than 200bps, during which bank stocks rose 19% on average vs. up 12% for the S&P 500. Bank stocks outperformed the market in 10 of those periods by an average of 17%. Bank stocks did underperform in four of those periods (by 16% on average). See Figure 93. We provide some additional takeaways below:

- Bank stocks significantly outperformed in eight of the 11 periods when 2-year rates declined more than 250bps (outperforming by 20% on average) and underperformed in three of those periods (by 19% on average).
- Banks stocks outperformed in 11 of the 14 periods when 2-year rates declined more than 200bps by 30% on average.

Figure 93: Relative bank stock performance during periods of declining 2-year rates

From	To	△ 2 yr rates (bps)	Duration (months)	Rate Levels		Stock Performance			Comments
				Peak	Trough	Banks	S&P 500	Rel Perf.	
3/3/1980	6/2/1980	-615 bps	3	14.88%	8.73%	10%	-2%	12%	
9/1/1981	12/1/1981	-317 bps	3	16.46%	13.29%	11%	3%	8%	
4/1/1982	3/1/1983	-454 bps	11	14.20%	9.66%	24%	32%	-9%	
6/1/1984	9/2/1986	-656 bps	27	12.91%	6.35%	105%	68%	37%	
10/16/1987	3/3/1988	-215 bps	4	9.20%	7.05%	-17%	-10%	-7%	
3/21/1989	8/2/1989	-244 bps	4	9.92%	7.48%	23%	19%	4%	
8/27/1990	1/9/1992	-365 bps	16	8.27%	4.62%	55%	34%	21%	
3/16/1992	10/5/1992	-217 bps	7	5.85%	3.68%	2%	1%	1%	
12/27/1994	2/13/1996	-291 bps	13	7.73%	4.82%	63%	44%	20%	
4/28/1997	10/16/1998	-272 bps	17	6.54%	3.82%	23%	37%	-14%	
2/9/2000	11/8/2001	-438 bps	21	6.68%	2.30%	13%	-23%	36%	
3/26/2002	6/13/2003	-262 bps	14	3.72%	1.10%	2%	-12%	13%	
6/29/2006	4/14/2008	-353 bps	21	5.28%	1.74%	-29%	7%	-36%	Credit crisis
6/13/2008	12/17/2008	-239 bps	6	3.04%	0.65%	-17%	-32%	15%	
	Average	**-353 bps**	**12**			**19%**	**12%**	**7%**	

** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP

Bank stocks tended to outperform more with declines in longer-term rates

In the past 35 years, during the periods when 10-year interest rates fell meaningfully, bank stocks outperformed more than during the periods we saw declines in 2-year rates. Over that time, of the 12 periods when 10-year rates declined more than 100bps, bank stocks outperformed in nine of them by 13% on average, rising 27% vs. up 13% for the S&P 500. Bank stocks outperformed by 5% or more in eight of those periods by an average of 25% and outperformed in seven of the nine periods when 10-year rates declined more than 200bps (by 25% on average). See Figure 94.

Figure 94: Relative bank stock performance during periods of declining 10-year rates

From	To	△ 10 yr rates (bps)	Duration (months)	Rate Levels		Stock Performance		
				Peak	Trough	Banks	S&P 500	Rel Perf.
3/3/1980	6/2/1980	-297 bps	3	12.75%	9.78%	10%	-2%	12%
10/1/1981	12/1/1981	-271 bps	2	15.84%	13.13%	11%	9%	2%
7/1/1982	3/1/1983	-417 bps	8	14.44%	10.27%	40%	35%	5%
7/2/1984	9/2/1986	-692 bps	26	13.84%	6.92%	101%	65%	36%
10/16/1987	2/24/1988	-207 bps	4	10.23%	8.17%	-19%	-11%	-8%
1/12/1989	8/2/1989	-147 bps	7	9.23%	7.75%	31%	22%	9%
8/9/1990	9/7/1993	-344 bps	36	8.74%	5.29%	88%	36%	51%
12/27/1994	1/19/1996	-231 bps	13	7.83%	5.52%	48%	32%	15%
4/15/1997	7/7/1998	-159 bps	14	6.98%	5.39%	62%	56%	6%
2/9/2000	5/19/2003	-319 bps	39	6.61%	3.42%	21%	-35%	55%
6/15/2007	12/17/2008	-297 bps	18	5.22%	2.26%	-53%	-40%	-13%
3/26/2010	9/1/2010	-141 bps	5	3.88%	2.47%	-21%	-10%	-11%
	Average	**-293 bps**	**14**			**27%**	**13%**	**13%**

** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*
Source: Bloomberg Financial LP

Concerns over net interest margins/net interest income is a key driver of stocks
We think the focus on the net interest margin (NIM)/net interest income (net II) is a key factor driving bank stock performance. The conventional wisdom is that when rates rise, banks' NIM/net II tends to decline, as banks have historically been more liability sensitive (given that rates have been in a secular decline since the 1980s). In reality, NIM/net II could improve during a period of rising rates if banks are prepared for it.

Drivers of historical underperformance in bank stocks during rising rates
As interest rates have generally declined over the past 35 years, banks have for the most part maintained a liability sensitive balance sheet, in order words, assets (securities, loans, and mortgages) reprice slower than liabilities (debt and deposits). This has also allowed banks to take advantage of a generally steep yield curve over time. Since rising rates often lead to flattening yield curves (such as between 1999-2000), lower carry trade income contributes to a decline in NIM/net II.

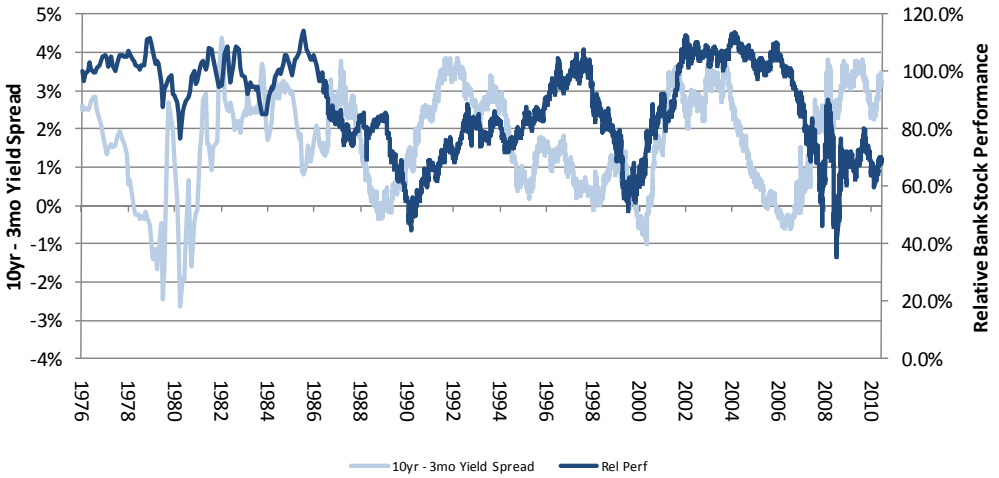
Bank stock performance varies depending on what's implied during a rate move
Sharp declines in interest rates often correspond to loosening monetary policy, which is intended to stimulate economic expansion. Eventually, falling rates leads to increasing leverage (both consumer and at the banks) and increasing output levels throughout the economy, which helps loan demand. Declining rates are often the precursors to more robust employment (as the economy expands), which lowers credit losses, as well as loosening credit underwriting standards and increasing valuations across most asset classes.

During periods of rising rates, there is generally a fear of inflation, which is a negative for banks (which we discuss in more detail below). And while rising rates often correspond to a sustained economic recovery, there is the risk of sector rotation to stocks with more earnings leverage to the recovery, lower housing demand from rising mortgage rates, and eventually, weaker capital markets and commercial loan activity from the higher cost of leverage. The risk of credit sentiment turning negative also occurs during periods of rising rates.

Why inflation is bad for banks
Rising inflation puts more pressure on bank earnings and valuations given declining net interest margins (NIMs), likely lower loan volumes, and no offset to higher operating costs. Such was the case in the early 1980s (a period characterized by high inflation) during which time bank stocks traded at 0.6x book vs. 1.3-1.4x currently. When rates move higher, NIMs by and large decline given most banks have been liability sensitive—implying banks' cost of funding would rise faster than asset yields. So as interest rates rise, asset prepayment speeds slow, which extends the duration of banks' assets. Concurrently, bank customers may move low-yielding deposits (lower cost for banks) to higher yielding products (higher cost for banks), which reduces the duration of banks' liabilities.

Yield Curve – Impact on Relative Stock Performance
We found that banks stocks tend to underperform during periods of yield curve flattening. However, the overall relationship between relative bank stock performance and the slope of the yield curve has been relatively weak over the past 35 years. In most cases, it appeared that any yield curve relationship was overshadowed by other factors driving bank stock performance such as from 1996 to 1998 (when M&A was a major driver of stronger bank performance) and the most recent credit crisis from 2007 to 2009. Still, a steep yield curve did appear to help bank stocks outperform from 2000 to 2004 and from 2009 through 2010. See Figure 95.

Figure 95: Relative bank stock performance vs. yield curve spread



** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP

Bank stock performance was mixed during periods of yield curve flattening

There have been 11 periods since 1975 when the 10-year/3-month spread narrowed by at least 150bps. During these periods, banks stocks underperformed the market seven out of 11 times, with the greatest period of underperformance from 6/2/1980 to 12/1/1980 (26% underperformance). See Figure 96. This was driven in large part by narrower spreads implied from a flatter yield curve (a smaller gap between what a bank earns on the long end of the curve and its shorter-term funding costs).

Outperformance during periods of flattening yield curves in part reflected a still relatively steep yield curve in absolute terms, during which time the yield spread averaged about 190bp vs. 135-140bps historically. Another possible explanation of outperformance during some periods of yield curve flattening is due to generally less fear of inflation (which tends to be bad for bank earnings) and a greater expectation for less robust growth in the economy—which may be better for bank stocks once expectations of eventually lower rates begin to be priced into the bank sector (due to a weakening macro outlook).

Banks stocks tended to underperform during periods of yield curve steepening

There have been roughly 11 periods since 1990 during which the 10-year/3-month spread expanded by at least 100bps. During these periods, banks stocks underperformed six times (by 22% on average) and outperformed in five (by 15% on average). See Figure 112. We note that the credit crisis may have distorted relative stock performance during the most recent period. We also found that banks generally outperformed the market when the yield curve spread moved from negative to positive (in other words going from an inverted yield curve to a steeper yield curve) and when the average spread was the highest (i.e. 318 bps from 12/19/2008 to 4/7/2010).

Figure 96: Bank stock performance during periods of flattening/steepening yield curves since 1990

From	To	Change	Length of Flattening (Months)	Spread			Stock Performance		
				Min	Max	Avg	Banks	S&P 500	Rel Bank Perf.
3/1/1977	4/1/1980	-459 bps	38	286 bps	-173 bps	57 bps	-4%	2%	-7%
6/2/1980	12/1/1980	-536 bps	6	271 bps	-265 bps	65 bps	1%	26%	-26%
1/2/1985	2/2/1987	-198 bps	25	341 bps	143 bps	188 bps	58%	64%	-6%
10/1/1987	11/1/1989	-292 bps	25	280 bps	-12 bps	137 bps	2%	6%	-4%
11/9/1992	10/18/1993	-175 bps	11	385 bps	210 bps	298 bps	23%	12%	11%
4/19/1994	12/5/1995	-320 bps	20	337 bps	17 bps	171 bps	43%	39%	4%
6/3/1997	9/14/1998	-185 bps	16	182 bps	-3 bps	66 bps	11%	19%	-8%
1/20/2000	12/18/2000	-226 bps	11	141 bps	-86 bps	1 bps	12%	-10%	22%
4/2/2002	10/8/2002	-164 bps	6	365 bps	201 bps	293 bps	-24%	-32%	7%
5/14/2004	11/2/2006	-435 bps	30	386 bps	-49 bps	114 bps	22%	25%	-3%
1/12/2010	10/8/2010	-153 bps	9	380 bps	227 bps	314 bps	-5%	1%	-5%
	Average	**-286 bps**	18	**305 bps**	**19 bps**	**155 bps**	**13%**	**14%**	**-1%**

From	To	Change	Length of Steepening (Months)	Spread			Stock Performance		
				Min	Max	Avg	Banks	S&P 500	Rel Bank Perf.
3/3/1980	6/2/1980	516 bps	3	-245 bps	271 bps	3 bps	10%	-2%	12%
12/1/1980	1/4/1982	555 bps	13	-265 bps	290 bps	-7 bps	15%	-13%	28%
4/1/1982	9/1/1982	347 bps	5	92 bps	439 bps	218 bps	-6%	7%	-13%
4/1/1986	10/8/1987	218 bps	19	83 bps	301 bps	219 bps	-4%	33%	-37%
9/20/1989	5/4/1992	376 bps	32	8 bps	384 bps	160 bps	3%	19%	-16%
11/14/1995	5/6/1996	137 bps	6	38 bps	176 bps	84 bps	8%	8%	0%
6/16/1998	6/8/1999	105 bps	12	24 bps	130 bps	45 bps	-3%	24%	-27%
12/18/2000	3/15/2002	442 bps	15	-86 bps	356 bps	174 bps	14%	-12%	26%
12/4/2006	10/14/2008	438 bps	23	-58 bps	380 bps	97 bps	-48%	-28%	-20%
12/19/2008	4/7/2010	172 bps	16	207 bps	379 bps	318 bps	15%	34%	-20%
10/8/2010	2/8/2011	122 bps	4	227 bps	349 bps	290 bps	23%	14%	9%
	Average	**312 bps**	13	**2 bps**	**314 bps**	**146 bps**	**2%**	**8%**	**-5%**

Spread is defined as the 10-year – 3mo yield spread

** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP, CapIQ

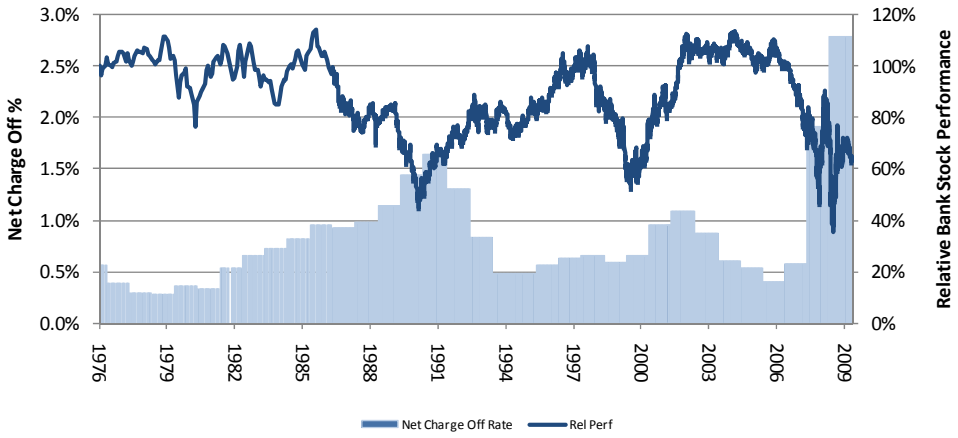
Other Factors & Bank Stocks

There are several factors that drive bank stock performance in addition to interest rates. Some of these include macro factors like unemployment and M&A. Other bank specific factors that influence stock performance include net charge-offs, reserve build/bleed, net interest margins (NIM), and securities gains/losses. In the following section, we analyze these factors and their impact on relative bank stock performance over time. Note that some of these factors will be interrelated.

Net charge-offs – Impact on Relative Stock Performance

Bank stocks generally underperform during periods of rising credit costs, which often imply more earnings pressure and occur during a weaker economy. From the 1980s through the early 1990s, annual charge-offs rates rose steadily from about 0.5% to 1.65% in 1991, during which time banks underperformed significantly (by 30-40%). And during the most recent credit crisis, we also saw a sharp decline in relative bank stock performance as credit costs rose rapidly in 2007-2009 (banks underperformed by about 40%). See Figure 97.

Figure 97: Relative bank stock performance vs. net charge-offs



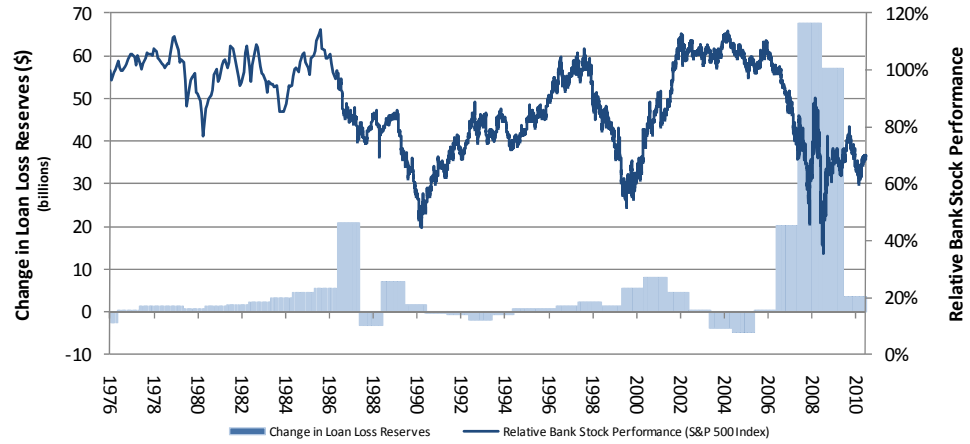
** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP,FDIC

Loan Loss Reserve Build/Bleed – Impact on Relative Stock Performance

During periods of significant loan loss reserve build, banks appear to underperform. However, we noticed that periods of loan loss reserve releases do not necessary lead to outperformance. Reserve build hurts earnings and capital as credit trends are likely deteriorating–bad for banks. Note that in that kind of environment, banks are also likely reducing risk and preserving capital/liquidity (which can be a positive). And while reserve releases do boost earnings and capital, we generally don't expect bank stock outperformance from this given most investors don't give banks credit for earnings that are driven by reserve releases. Also, reserve builds tend to be a lot larger than reserve releases (i.e. additions of $70b in 2008 and $60b in 2009 vs. the largest release of $5b in 2005). See Figure 98.

Figure 98: Relative bank stock performance vs. loan loss reserve build/bleed



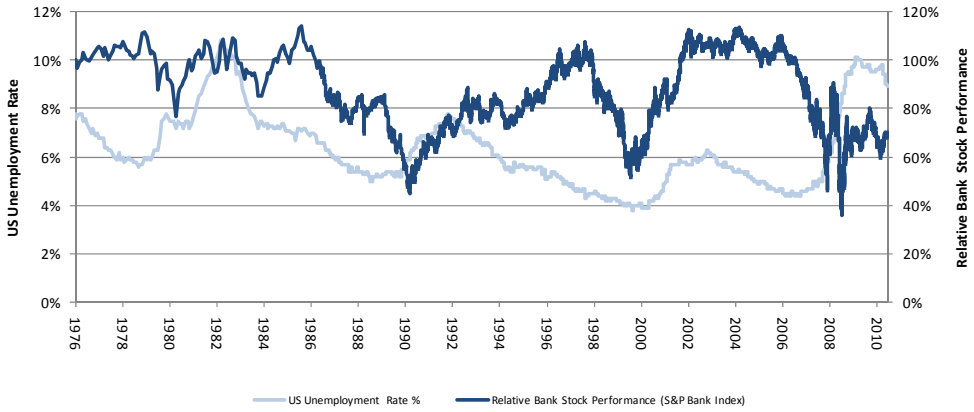
** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP, FDIC

Unemployment – Impact on Relative Stock Performance

The unemployment rate has not correlated strongly with bank stock performance, surprisingly. In fact, we found that as the unemployment declined, bank stocks tended to underperform. See Figure 99. One explanation is that periods of low unemployment correspond to a strong economy during which time inflation risk and higher interest rates are more prevalent—leading bank stocks to lag. Another factor may be that other sectors benefit more from lower levels of unemployment, which may lead to some sector rotation.

Figure 99: Relative bank stock performance vs. the US unemployment rate



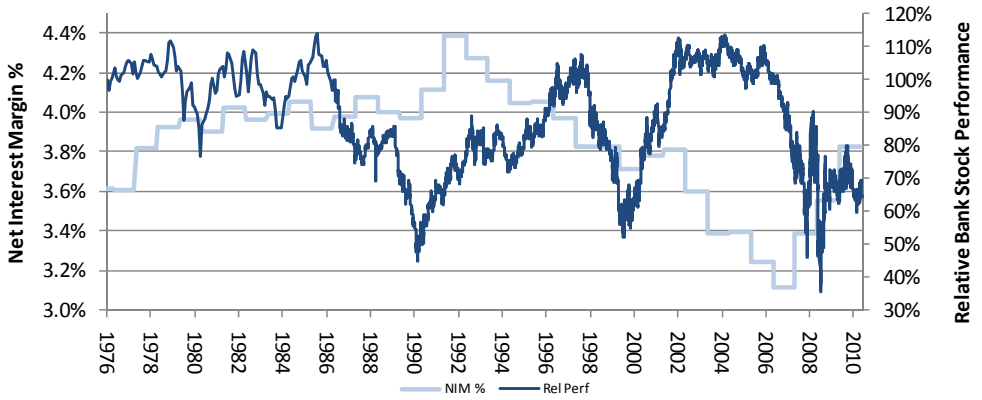
** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP, FDIC

Net Interest Margin – Impact on Relative Stock Performance

Net interest margins appear to have less of an impact on bank stock performance that what we might have expected. For instance, from the mid-1970s to the mid-1980s, NIMs rose meaningfully and bank stocks generally posted weak relative performance. In the early 1990s however, rising NIMs did appear to help drive bank stock outperformance to some extent. However, rising NIMs from 2008 to 2009 wasn't enough to overcome earnings pressure during the credit crisis. And while the NIM outlook currently has improved, we think it alone may not be enough to lead to bank stock outperformance. See Figure 100.

Figure 100: Relative bank stock performance vs. net interest margin



** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

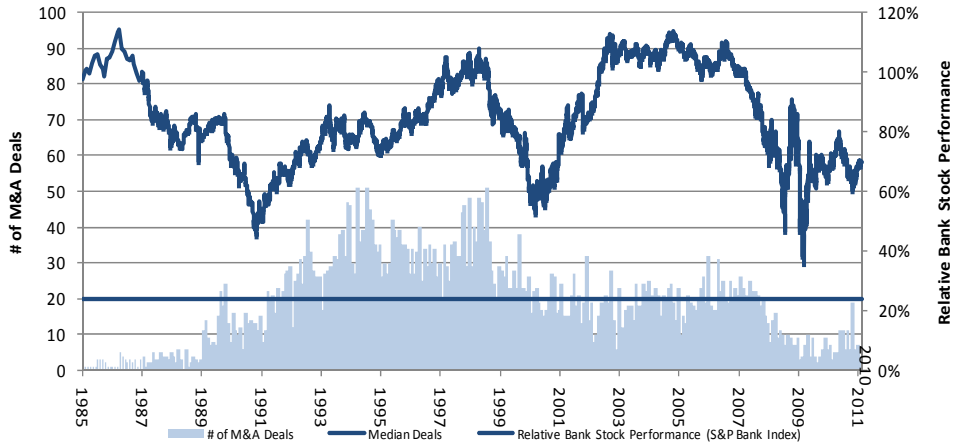
Source: Bloomberg Financial LP,FDIC

M&A Transactions – Impact on Relative Stock Performance

Although periods of lower M&A volume doesn't necessarily correspond with periods of bank stock underperformance, we found that sharp increases in bank stock outperformance did often correspond with a pickup in M&A volume. This was the case between 1997-1998, when there were 30-35 M&A transactions per month on average (vs. 20 historically), during which time stocks outperformed significantly. Deal volumes were strong again in 2006 and 2008, which again corresponded to a peak in relative bank stock outperformance.

Stock outperformance during periods of higher M&A activity is due in large part to higher premiums paid for acquired banks, which can lead to multiple expansion for some banks. The operating environment is also likely better during periods of higher M&A volumes given the prevailing view that growth opportunities are rising (to the point where banks would want to pay premiums to build their businesses). Peaks in M&A deal volume often lead to peaks in relative bank stock performance because valuations are likely at their highest and the additional M&A opportunities are perceived as too expensive—a signal that banks stocks may subsequently underperform. See Figure 101.

Figure 101: Relative bank stock performance vs. M&A deal transactions by month



** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*
Source: Bloomberg Financial LP, FDIC

Appendix A: More Interest Rates and Bank Stocks

After 2-year Rates Peak, Bank Stocks Tend to Outperform

Our analysis shows that bank stocks have historically risen more than the market during the 3-month, 6-month, and 12-month periods after 2-year rates peak. Over the past 13 periods of significantly rising rates (defined as the 2-year Treasury), bank stocks outperformed in 10 of 13 periods by 6% on average three months after interest rates peaked. Looking out six months after a peak in rates, bank stocks outperformed in 10 of 13 periods by 10% on average, while 12 months after a peak in rates, bank stocks outperformed in seven of 13 periods by 19% on average. See Figure 102. We also found that the same trends applied to 10-year rates.

Taking a closer look at some of the drivers of outperformance, banks performed well following the 1994 rate tightening cycle (after meaningful underperformance when rates rose) and after 1996 tightening (steeper yield curve, NIMs rose, and M&A rose in 1997). Significant outperformance followed after peak rates in 2002, helped by still-improving real estate markets and general asset appreciation.

Figure 102: Relative bank stock performance after peaks in 2-year interest rates

	Prior	3-Month			6-Month			12-Month		
Peak	Rel Perf.	Banks	S&P 500	Rel. Perf.	Banks	S&P 500	Rel. Perf.	Banks	S&P 500	Rel. Perf.
3/2/1981	-12%	5%	1%	4%	6%	0%	7%	5%	-8%	14%
7/2/1984	-17%	13%	9%	4%	18%	7%	11%	52%	24%	28%
10/16/1987	-22%	-24%	-18%	-7%	-20%	-9%	-11%	-9%	-7%	-2%
3/21/1989	5%	14%	11%	3%	21%	18%	2%	-2%	17%	-19%
4/27/1990	-16%	-1%	7%	-8%	-30%	-6%	-24%	8%	15%	-7%
3/16/1992	8%	6%	1%	5%	1%	3%	-3%	34%	12%	22%
12/2/1992	5%	14%	3%	11%	10%	5%	5%	7%	7%	0%
12/27/1994	-10%	10%	9%	1%	30%	20%	10%	51%	33%	18%
7/8/1996	1%	14%	5%	9%	26%	12%	14%	57%	38%	20%
5/19/2000	-40%	4%	3%	1%	5%	-4%	8%	11%	-13%	24%
4/2/2002	9%	-1%	-14%	13%	-10%	-25%	15%	-14%	-24%	10%
6/29/2006	-1%	7%	7%	-1%	9%	13%	-4%	5%	22%	-17%
6/13/2008	-20%	6%	-8%	14%	-14%	-34%	20%	-36%	-30%	-6%
	Average	5%	1%	4%	4%	0%	4%	13%	7%	7%

** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP

Bank stocks generally rose after a peak in 10-year rates; relative performance mixed

While banks stocks rose 1-2% three to six months after a peak in 10-year rates, relative performance against the S&P 500 was mixed. After three months, banks stocks outperformed by 2% on average, but underperformed by 2% on average after six months. One year after a peak in 10-year rates, bank stocks outperformed by 3% on average, but they only outperformed in five of the 10 periods. See Figure 103.

Figure 103: Relative bank stock performance after peaks in 10-year interest rates

	Prior	3-Month			6-Month			12-Month		
Peak	Rel Perf.	Banks	S&P 500	Rel. Perf.	Banks	S&P 500	Rel. Perf.	Banks	S&P 500	Rel. Perf.
3/3/1980	-15%	4%	-6%	10%	14%	7%	7%	18%	14%	4%
10/1/1981	7%	11%	9%	2%	4%	-3%	7%	-4%	3%	-7%
7/2/1984	-17%	13%	9%	4%	18%	7%	11%	52%	24%	28%
10/16/1987	-22%	-24%	-18%	-7%	-20%	-9%	-11%	-9%	-7%	-2%
1/6/1989	-5%	13%	6%	7%	22%	14%	8%	16%	25%	-10%
4/27/1990	-23%	-1%	7%	-8%	-30%	-6%	-24%	8%	15%	-7%
10/27/1994	-6%	-3%	1%	-4%	9%	11%	-2%	44%	28%	16%
1/19/2000	-48%	0%	-4%	4%	3%	4%	-1%	20%	-9%	28%
6/15/2007	-21%	-8%	-3%	-5%	-19%	-3%	-16%	-42%	-11%	-31%
6/11/2009	-24%	12%	9%	2%	14%	17%	-3%	30%	17%	13%
	Average	**2%**	**1%**	**1%**	**1%**	**4%**	**-2%**	**13%**	**10%**	**3%**

** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

After Rates Bottom, Bank Stocks Tend to Underperform

Our analysis shows that bank stocks have historically underperformed the market in the periods after 2-year rates and 10-year rates trough. We found that the underperformance was larger after a trough in 10-year rates.

Over the past 12 periods of significantly declining 10-year rates, bank stocks under-performed in seven periods by 5% on average three months after interest rates peaked. Looking out six months after a trough in the 10-year, bank stocks underperformed in seven of the 12 periods by 13% on average, and 12 months after a trough in the 10-year, bank stocks underperformed in six of the periods by 21% on average. See Figure 104.

Figure 104: Relative bank stock performance after troughs in 10-year interest rates

	Prior	3-Month			6-Month			12-Month		
Trough	Rel Perf.	Banks	S&P 500	Rel. Perf.	Banks	S&P 500	Rel. Perf.	Banks	S&P 500	Rel. Perf.
6/2/1980	12%	4%	9%	-6%	0%	15%	-14%	16%	19%	-3%
12/1/1981	2%	-6%	-10%	4%	-7%	-8%	1%	7%	6%	1%
3/1/1983	5%	18%	11%	7%	6%	10%	-4%	3%	10%	-8%
9/2/1986	36%	-10%	-1%	-8%	1%	12%	-11%	5%	31%	-26%
2/24/1988	-8%	-6%	-5%	-1%	7%	-2%	9%	15%	11%	4%
8/2/1989	9%	-10%	-3%	-7%	-23%	-5%	-18%	-27%	4%	-31%
9/7/1993	51%	-5%	1%	-6%	-6%	0%	-6%	4%	3%	2%
1/19/1996	15%	10%	5%	5%	9%	3%	5%	41%	25%	16%
7/7/1998	6%	-26%	-13%	-12%	-11%	6%	-17%	-6%	19%	-25%
5/19/2003	55%	6%	5%	1%	14%	12%	2%	14%	16%	-2%
12/17/2008	-13%	-51%	-17%	-33%	-20%	4%	-24%	-13%	21%	-34%
9/1/2010	-11%	10%	13%	-3%	35%	26%	9%	35%	26%	9%
	Average	**-5%**	**0%**	**-5%**	**0%**	**6%**	**-6%**	**8%**	**16%**	**-8%**

** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

For 2-year rates, the underperformance was less obvious. Over the past 14 periods of significantly declining rates (defined as the 2-year Treasury), bank stocks under-performed in half the periods by 12% on average three months after interest rates troughed. Looking out six months after a trough in rates, bank stocks also underperformed in six of 13 periods by 13% on average, while 12 months after a trough in rates, bank stocks underperformed in half the periods by 21% on average. See Figure 105.

Figure 105: Relative bank stock performance after troughs in 2-year interest rates

	Prior	3-Month			6-Month			12-Month		
Trough	Rel Perf.	Banks	S&P 500	Rel. Perf.	Banks	S&P 500	Rel. Perf.	Banks	S&P 500	Rel. Perf.
6/2/1980	12%	4%	9%	-6%	0%	15%	-14%	16%	19%	-3%
12/1/1981	8%	-6%	-10%	4%	-7%	-8%	1%	7%	6%	1%
3/1/1983	-9%	18%	11%	7%	6%	10%	-4%	3%	10%	-8%
9/2/1986	37%	-10%	-1%	-8%	1%	12%	-11%	5%	31%	-26%
3/3/1988	-7%	-2%	-2%	1%	5%	-2%	7%	11%	9%	2%
8/2/1989	4%	-10%	-3%	-7%	-23%	-5%	-18%	-27%	4%	-31%
1/9/1992	21%	0%	-5%	5%	15%	-1%	16%	24%	5%	19%
10/5/1992	1%	16%	7%	9%	29%	10%	19%	31%	12%	19%
2/13/1996	20%	1%	-1%	3%	7%	0%	6%	40%	18%	22%
10/16/1998	-14%	16%	18%	-1%	23%	29%	-6%	6%	28%	-22%
11/8/2001	36%	0%	-2%	3%	14%	-6%	19%	2%	-21%	23%
6/13/2003	13%	-3%	1%	-5%	7%	6%	1%	13%	12%	0%
4/14/2008	-36%	-30%	-6%	-25%	-32%	-32%	0%	-63%	-38%	-25%
12/17/2008	15%	-51%	-17%	-33%	-20%	4%	-24%	-13%	21%	-34%
	Average	**-5%**	**-1%**	**-4%**	**2%**	**1%**	**1%**	**3%**	**7%**	**-5%**

** Relative bank stock performance based on S&P 500 Commercial Bank Index vs. S&P 500 from 1986 – Present. Prior to that, the S&P Financials Index was used.*

Source: Bloomberg Financial LP

Appendix B: Historical M&A

M&A (Deal Values > $10b)

Announce Date	Seller	Buyer	Deal Value ($m)	Seller Assets ($m)	Premium to Previous Day's Close	Price / Book	Price / Tangible Book	Price / LTM Earnings	Premium / Core Deposits
10/03/2008	Wachovia Corp.	Wells Fargo & Co.	15,127	812,433	79%	23%	57%	NM	NM
04/22/2007	LaSalle Bank Corporation	Bank of America Corp.	21,000	124,638	NA	223%	359%	14.5	26%
02/16/2007	Compass Bancshares Inc.	Banco Bilbao Vizcaya Argent SA	10,164	34,200	10%	335%	452%	20.6	43%
12/03/2006	Mellon Financial Corp.	Bank of New York Co.	16,864	42,666	0%	NM	NM	NM	NA
05/24/2006	AmSouth Bancorp.	Regions Financial Corp.	10,060	52,858	0%	272%	296%	13.7	22%
05/07/2006	Golden West Financial	Wachovia Corp.	25,474	127,556	15%	277%	277%	16.5	36%
03/12/2006	North Fork Bancorp.	Capital One Financial Corp.	14,568	57,617	23%	162%	490%	15.5	34%
06/20/2004	SouthTrust Corp.	Wachovia Corp.	14,365	52,673	20%	307%	373%	19.6	39%
05/04/2004	Charter One Financial	Royal Bank of Scotland Group	10,527	41,279	25%	306%	354%	19.2	31%
01/14/2004	Bank One Corp.	J.P. Morgan Chase & Co.	58,783	290,006	15%	256%	285%	17.3	28%
10/27/2003	FleetBoston Financial Corp.	Bank of America Corp.	49,329	196,398	43%	276%	374%	22.6	31%
04/15/2001	Wachovia Corp.	First Union Corp.	13,627	74,032	7%	NM	NM	NM	NM
10/04/2000	U.S. Bancorp	Firstar Corp.	21,237	86,174	21%	266%	443%	13.8	35%
09/13/2000	J.P. Morgan & Co.	Chase Manhattan Corp.	34,423	266,323	6%	321%	344%	17.6	50%
04/30/1999	Mercantile Bancorp.	Firstar Corp.	10,670	35,579	29%	336%	446%	27.4	38%
03/14/1999	BankBoston Corp.	Fleet Financial Group	16,258	73,513	13%	NM	NM	NM	NM
06/08/1998	Wells Fargo & Co.	Norwest Corp.	34,611	94,820	9%	NM	NM	NM	NM
04/13/1998	BankAmerica Corp.	NationsBank Corp.	66,624	260,159	0%	NM	NM	NM	NM
04/13/1998	First Chicago NBD Corp.	Bank One Corp.	29,482	114,096	6%	NM	NM	NM	NM
04/05/1998	Citicorp	Travelers Group Inc.	82,536	NA	8%	NM	NM	NM	NM
11/18/1997	CoreStates Financial Corp.	First Union Corp.	17,104	47,591	17%	539%	593%	22.2	45%
08/29/1997	Barnett Banks Inc.	NationsBank Corp.	15,523	44,005	37%	399%	581%	25.2	42%
01/24/1996	First Interstate Bancorp	Wells Fargo & Co.	12,310	58,071	4%	304%	373%	13.8	18%
08/28/1995	Chase Manhattan Corp.	Chemical Banking Corporation	11,358	118,756	7%	NM	NM	NM	NM
Median			**16,561**	**74,032**	**13%**	**290%**	**373%**	**17.6**	**35%**

Source: SNL

M&A (Deal Values $5b-$10b)

Announce Date	Seller	Buyer	Deal Value ($m)	Seller Assets ($m)	Premium to Previous Day's Close	Price / Book	Price / Tangible Book	Price / LTM Earnings	Premium / Core Deposits
12/17/2010	Marshall & Ilsley Corp.	BMO Financial Group	5,799	51,887	34%	83%	98%	NM	0%
10/24/2008	National City Corp.	PNC Financial Services Group	5,604	145,035	-19%	27%	37%	NM	-9%
10/02/2007	Commerce Bancorp Inc.	Toronto-Dominion Bank	9,157	48,176	7%	291%	307%	27.9	15%
10/08/2006	Mercantile Bankshares Corp.	PNC Financial Services Group	6,027	17,003	28%	258%	378%	20.3	43%
05/07/2004	National Commerce Finl Corp.	SunTrust Banks Inc.	7,433	23,039	22%	250%	451%	20.8	48%
02/15/2004	GreenPoint Financial Corp.	North Fork Bancorp.	6,396	22,985	-2%	298%	379%	12.1	43%
01/22/2004	Union Planters Corp.	Regions Financial Corp.	6,001	31,911	0%	NM	NM	NM	NM
05/21/2002	Golden State Bancorp Inc.	Citigroup Inc.	5,807	54,089	13%	216%	283%	13.3	20%
06/25/2001	Dime Bancorp Inc.	Washington Mutual Inc.	5,168	27,050	NA	301%	428%	30.2	34%
10/02/2000	Summit Bancorp	FleetBoston Financial Corp.	6,991	38,985	16%	236%	292%	15.2	19%
06/01/1999	First American Corp.	AmSouth Bancorp.	6,341	20,326	30%	341%	388%	28.9	38%
05/10/1999	Republic New York Corp.	HSBC Holdings plc	8,078	50,453	3%	277%	306%	51.8	16%
11/30/1998	Bankers Trust Corp.	Deutsche Bank AG	9,426	156,267	9%	214%	241%	NM	19%
07/20/1998	Crestar Financial Corp.	SunTrust Banks Inc.	9,606	26,161	31%	427%	470%	28.3	47%
07/01/1998	Firstar Holdings Corporation	Star Banc Corporation	7,357	20,384	27%	NM	NM	NM	NM
03/17/1998	H.F. Ahmanson & Co.	Washington Mutual Inc.	9,907	46,679	23%	391%	458%	22.4	29%
12/01/1997	First of America Bank Corp.	National City Corp.	7,148	21,691	36%	384%	430%	22.8	36%
03/20/1997	U.S. Bancorp	First Bank System Inc.	9,086	33,260	22%	340%	398%	19.2	30%
03/06/1997	Great Western Financial	Washington Mutual Inc.	7,006	42,875	7%	272%	308%	NM	20%
08/30/1996	Boatmen's Bancshares Inc.	NationsBank Corp.	9,750	40,683	40%	271%	299%	18.5	23%
07/12/1995	NBD Bancorp, Inc.	First Chicago Corporation	5,107	47,756	NA	NM	NM	NM	NM
06/19/1995	First Fidelity Bancorporation	First Union Corp.	5,555	35,400	32%	192%	265%	12.4	13%
Median			**6,998**	**37,192**	**22%**	**272%**	**308%**	**20.8**	**23%**

Source: SNL

M&A (Deal Values $2b-$5b)

Announce Date	Seller	Buyer	Deal Value ($m)	Seller Assets ($m)	Premium to Previous Day's Close	Price / Book	Price / Tangible Book	Price / LTM Earnings	Premium / Core Deposits
08/18/2008	UnionBanCal Corp.	Mitsubishi UFJ Finl Grp Inc	3,808	60,594	12%	215%	233%	18.7	19%
01/11/2008	Countrywide Financial Corp.	Bank of America Corp.	4,145	209,236	-8%	31%	32%	NM	NA
02/04/2007	Investors Financial Services	State Street Corp.	4,494	11,553	38%	451%	493%	28.5	65%
12/20/2006	Sky Financial Group Inc.	Huntington Bancshares Inc.	3,592	15,921	25%	200%	309%	16.3	26%
11/19/2006	U.S. Trust Corp.	Bank of America Corp.	3,300	11,116	NA	258%	425%	34.5	41%
11/19/2006	TD Banknorth Inc.	Toronto-Dominion Bank	3,201	39,917	7%	89%	499%	22.0	24%
06/12/2006	Texas Regional Bancshares Inc.	Banco Bilbao Vizcaya Argent SA	2,165	6,634	14%	324%	485%	24.3	43%
04/07/2006	BONY Retail Banking Business	JPMorgan Chase & Co.	3,100	NA	NA	NA	NA	NA	NA
10/24/2005	Independence Cmnty Bank Corp	Sovereign Bancorp Inc.	3,591	18,500	29%	152%	346%	15.7	29%
09/12/2005	Westcorp	Wachovia Corp.	3,417	16,544	5%	224%	224%	14.3	NM
03/06/2005	Hibernia Corp.	Capital One Financial Corp.	4,977	22,085	16%	231%	280%	15.3	23%
08/25/2004	Banknorth Group Inc.	TD Bank Financial Group	3,818	29,276	27%	235%	478%	17.8	31%
02/16/2004	Provident Financial Group Inc.	National City Corp.	2,134	17,018	15%	221%	246%	21.1	22%
01/21/2003	First Virginia Banks Inc.	BB&T Corp.	3,376	11,228	25%	270%	319%	18.5	27%
09/26/2002	Allfirst Financial Inc.	M&T Bank Corp.	2,880	17,311	NA	165%	302%	NM	21%
12/08/2001	United California Bank	BNP Paribas Group	2,400	10,763	NA	222%	222%	17.0	18%
05/07/2001	BancWest Corp.	BNP Paribas Group	2,483	19,419	40%	213%	339%	19.2	28%
01/26/2001	Centura Banks Inc.	Royal Bank of Canada	2,330	11,482	29%	238%	279%	23.4	24%
11/22/2000	Michigan National Corp.	ABN AMRO Holding NV	2,750	11,494	NA	191%	309%	18.4	29%
11/20/2000	Old Kent Financial Corp.	Fifth Third Bancorp	4,962	22,519	42%	303%	331%	18.4	25%
04/10/2000	First Security Corp.	Wells Fargo & Co.	2,778	22,993	16%	156%	197%	10.2	12%
01/13/2000	U.S. Trust Corp.	Charles Schwab Corp.	2,619	4,377	63%	NM	NM	36.8	68%
06/16/1999	CNB Bancshares Inc.	Fifth Third Bancorp	2,328	7,219	44%	332%	359%	33.0	37%
02/22/1998	Magna Group Inc.	Union Planters Corp.	2,239	7,075	31%	299%	392%	27.8	37%
02/08/1998	First Commercial Corp.	Regions Financial Corp.	2,705	6,887	3%	397%	422%	26.1	40%
12/07/1997	Deposit Guaranty Corp.	First American Corp.	2,693	6,839	22%	419%	541%	29.8	46%
10/20/1997	First Commerce Corporation	Bank One Corp.	3,061	9,311	22%	348%	357%	23.3	39%
07/21/1997	Signet Banking Corp.	First Union Corp.	3,323	11,853	46%	346%	363%	34.6	31%
06/24/1997	Central Fidelity Banks Inc.	Wachovia Corp.	2,303	10,570	24%	281%	302%	20.6	22%
12/19/1995	National Westminster Bancorp	Fleet Financial Group	3,260	32,309	NA	105%	155%	12.2	6%
12/12/1995	BayBanks, Inc.	BankBoston Corp.	2,047	11,525	22%	222%	234%	15.3	13%
10/10/1995	Meridian Bancorp, Inc.	CoreStates Financial Corp.	3,193	14,911	22%	213%	237%	18.3	NA
08/28/1995	Integra Financial Corp.	National City Corp.	2,112	14,811	22%	198%	209%	13.1	15%
07/10/1995	Midlantic Corporation	PNC Financial Services Group	3,043	13,634	33%	206%	227%	11.3	17%
02/21/1995	Shawmut National Corporation	Fleet Financial Group	3,697	32,399	45%	179%	194%	16.0	10%
01/28/1994	Continental Bank Corporation	BankAmerica Corp.	2,300	22,601	35%	125%	125%	6.7	5%
10/04/1993	Society Corp.	KeyCorp	4,040	25,920	0%	NM	NM	NM	NM
08/12/1991	Security Pacific Corporation	BankAmerica Corp.	4,667	80,419	43%	102%	116%	NM	2%
07/22/1991	C&S/Sovran Corporation	NCNB Corporation	4,457	49,075	20%	143%	154%	34.9	5%
07/15/1991	Manufacturers Hanover Corp.	Chemical Banking Corporation	2,143	61,329	16%	NM	NM	NM	NM
09/26/1989	Citizens & Southern Corp.	Sovran Financial Corp.	2,070	22,823	NA	NM	NM	NM	NM
Median			**3,061**	**16,232**	**23%**	**221%**	**302%**	**18.6**	**25%**

Source: SNL

M&A (Deal Values $1b-$2b)

Announce Date	Seller	Buyer	Deal Value ($m)	Seller Assets ($m)	Premium to Previous Day's Close	Price / Book	Price / Tangible Book	Price / LTM Earnings	Premium / Core Deposits
01/16/2011	Sterling Bancshares Inc.	Comerica Inc.	1,029	5,040	30%	162%	230%	NM	17%
12/21/2010	Whitney Holding Corp.	Hancock Holding Co.	1,768	11,517	47%	109%	164%	NM	7%
08/18/2010	NewAlliance Bancshares Inc.	First Niagara Finl Group	1,498	8,712	25%	102%	165%	24.6	NA
10/13/2008	Sovereign Bancorp Inc.	Banco Santander S.A.	1,910	77,321	0%	35%	68%	NM	NA
09/05/2007	Alabama National BanCorp.	Royal Bank of Canada	1,670	7,903	50%	189%	302%	19.3	25%
08/15/2007	First Charter Corp.	Fifth Third Bancorp	1,089	4,917	57%	241%	297%	22.6	27%
06/26/2007	Chittenden Corp.	People's United Financial Inc.	1,753	6,610	31%	248%	379%	20.0	28%
05/04/2007	Greater Bay Bancorp	Wells Fargo & Co.	1,477	7,382	-4%	195%	316%	19.9	23%
04/30/2007	MAF Bancorp Inc.	National City Corp.	1,918	11,120	36%	172%	277%	22.3	21%
01/29/2007	First Republic Bank	Merrill Lynch & Co.	1,784	10,713	44%	287%	339%	24.4	18%
07/26/2006	Fidelity Bankshares Inc.	National City Corp.	1,038	4,235	12%	342%	368%	30.5	NA
07/10/2006	Harbor Florida Bancshares Inc.	National City Corp.	1,104	3,214	22%	321%	324%	21.8	48%
06/26/2006	Republic Bancorp Inc.	Citizens Banking Corp.	1,034	6,244	32%	251%	254%	15.0	25%
07/11/2005	Hudson United Bancorp	TD Banknorth Inc.	1,899	8,850	14%	360%	447%	15.1	27%
07/05/2005	Amegy Bancorp Inc.	Zions Bancorp.	1,710	7,560	4%	284%	408%	23.6	31%
06/13/2005	Commercial Federal Corp.	BNP Paribas Group	1,339	10,385	34%	178%	231%	NM	16%
08/01/2004	First Natl Bkshs of FL	Fifth Third Bancorp	1,530	4,087	41%	263%	NA	42.1	NA
03/15/2004	Community First Bankshares	BNP Paribas Group	1,217	5,465	13%	333%	450%	16.5	24%
01/26/2004	Seacoast Financial Services	Sovereign Bancorp Inc.	1,100	4,477	15%	218%	396%	33.0	NA
11/24/2003	Staten Island Bancorp Inc.	Independence Comm. Bank Corp.	1,474	7,554	19%	224%	245%	16.1	35%
06/27/2003	Roslyn Bancorp Inc.	New York Community Bancorp	1,579	10,882	-3%	290%	290%	10.6	20%
02/12/2001	European American Bank	Citigroup Inc.	1,950	15,384	NA	272%	364%	14.0	16%
01/24/2001	F&M National Corp.	BB&T Corp.	1,163	3,569	47%	295%	325%	21.2	32%
11/01/2000	Imperial Bancorp	Comerica Inc.	1,289	7,442	14%	240%	242%	12.7	16%
08/21/2000	Bank United Corp.	Washington Mutual Inc.	1,527	18,198	1%	167%	185%	11.6	12%
05/17/2000	Keystone Financial Inc.	M&T Bank Corp.	1,027	7,012	33%	184%	204%	21.2	11%
03/20/2000	CCB Financial Corp.	National Commerce Bancorp.	1,921	8,186	25%	NM	NM	NM	NM
02/07/2000	One Valley Bancorp Inc.	BB&T Corp.	1,202	6,583	30%	211%	231%	14.9	17%
12/21/1999	National Bancorp of Alaska	Wells Fargo & Co.	1,099	3,060	11%	247%	250%	17.8	37%
06/21/1999	UST Corp.	Royal Bank of Scotland Group	1,412	5,930	32%	256%	283%	25.6	24%
06/01/1999	Telebanc Financial Corp.	E*TRADE Group Inc.	1,795	2,621	41%	NM	NM	NM	NM
05/17/1999	St. Paul Bancorp Inc.	Charter One Financial	1,210	5,980	16%	230%	231%	38.2	21%
06/15/1998	ALBANK Financial Corp.	Charter One Financial	1,076	4,089	43%	258%	330%	23.1	25%
05/26/1998	TR Financial Corp.	Roslyn Bancorp Inc.	1,114	4,006	47%	403%	403%	27.2	44%
04/03/1998	Long Island Bancorp Inc.	Astoria Financial Corp.	1,766	6,073	3%	299%	302%	32.1	36%
02/05/1998	First Nationwide Holdings Inc.	Golden State Bancorp Inc.	1,806	30,873	NA	NM	NM	NM	NM
01/21/1997	Dauphin Deposit Corp.	Allied Irish Banks Plc	1,357	5,971	21%	239%	246%	19.4	24%
12/23/1996	Roosevelt Financial Grp, Inc.	Mercantile Bancorp.	1,073	9,048	18%	199%	210%	27.1	13%
11/22/1996	Standard Federal Bancorp	ABN AMRO Holding NV	1,894	15,354	2%	205%	252%	39.6	14%
07/29/1996	Cal Fed Bancorp, Inc.	MacAndrews and Forbes	1,359	14,045	10%	170%	170%	11.4	9%
07/22/1996	Keystone Holdings Inc.	Washington Mutual Inc.	1,647	20,481	NA	155%	155%	NM	4%
09/11/1995	Summit Bancorporation	UJB Financial Corp.	1,134	5,512	28%	245%	250%	34.7	16%
09/05/1995	Bank South Corporation	NationsBank Corp.	1,625	7,440	16%	238%	279%	21.5	23%
08/25/1995	Fourth Financial Corporation	Boatmen's Bancshares Inc.	1,180	7,505	10%	178%	215%	17.2	11%
05/19/1995	BanCal Tri-State Corporation	Union Bank of California, NA	1,006	7,762	NA	140%	141%	5.2	7%
05/08/1995	West One Bancorp	U.S. Bancorp	1,475	8,657	22%	194%	207%	13.9	13%
02/05/1995	Michigan National Corp.	National Australia Bank	1,518	8,692	NA	179%	179%	10.1	10%
04/14/1994	First Nationwide Fed Svgs Bk	MacAndrews and Forbes	1,100	15,496	NA	85%	111%	13.3	1%
02/18/1993	MNC Financial, Inc.	NationsBank Corp.	1,361	16,925	18%	140%	148%	39.9	1%
04/14/1992	Valley National Corporation	Bank One Corp.	1,248	10,652	NA	227%	227%	32.9	8%
10/28/1991	Manufacturers National Corp.	Comerica Inc.	1,147	12,507	3%	NM	NM	NM	NM
09/13/1991	Ameritrust Corporation	Society Corp.	1,261	10,756	12%	196%	241%	NM	9%
09/25/1987	Irving Bank Corporation	Bank of New York Co.	1,450	25,640	47%	206%	208%	4.5	NA
08/31/1987	Rainier Bancorporation	Security Pacific Corporation	1,229	NA	NA	NA	NA	NA	NA
03/18/1987	Norstar Bancorp Inc.	Fleet Financial Group	1,344	NA	NA	NM	NM	NM	NM
12/15/1986	TX Commerce Bancshares, Inc.	Chemical Banking Corporation	1,092	18,942	NA	92%	NA	26.4	NA
02/07/1986	Crocker National Corporation	Wells Fargo & Co.	1,080	19,208	NA	NA	NA	NA	NA
Median			**1,357**	**7,762**	**21%**	**221%**	**248%**	**21.2**	**18%**

Source: SNL

Appendix C: Bank Terms

Alt–A Mortgage: An alternative–A mortgage is a type of mortgage that, for various reasons, is considered riskier than A–paper, or "prime," and less risky than "subprime," the riskiest category. Alt–A interest rates, which are determined by credit risk, therefore tend to be between those of prime and subprime home loans. Typically, Alt–A mortgages are characterized by borrowers with less than full documentation, lower credit scores and higher loan-to-values (LTVs).

Assets under management (AUM): Assets over which a bank has sole or shared investment authority over.

Cash recoveries: Cash recoveries used in the context of purchased impaired loans represent cash payments from customers that exceed the recorded investment on the designated impaired loan.

Charge-off: The process of removing a loan or portion of a loan from the balance sheet given that it is deemed uncollectible. Charge-offs also occur when a loan is transferred from portfolio holdings to held for sale by reducing the loan carrying amount to the fair value of the loan, if fair value is less than carrying amount.

Accretable net interest (accretable yield): The excess of cash flows expected to be collected on a purchased impaired loan over the carrying value of the loan. The accretable net interest is often recognized into interest income over the remaining life of the loan using the constant effective yield method.

Adjusted average total assets: Primarily comprised of total average quarterly (or annual) assets plus (less) unrealized losses (gains) on investment securities, less goodwill and certain other intangible assets (net of eligible deferred taxes).

Credit spread: The difference in yield between debt issues of a similar maturity. The excess of yield attributable to credit spread is often used as a measure of relative creditworthiness, with a reduction in the credit spread reflecting an improvement in the borrower's perceived creditworthiness.

Derivatives: Financial contracts whose value is derived from changes in publicly traded securities, interest rates, currency exchange rates or market indices. Derivatives cover a wide assortment of financial contracts, including but not limited to forward contracts, futures, options and swaps.

Duration of equity: An estimate of the interest rate sensitivity of the economic value of equity. A negative duration of equity is associated with asset sensitivity (i.e. positioned for rising interest rates), while a positive value implies liability sensitivity (i.e. positioned for declining interest rates). For example, if the duration of equity is +1.5 years, the economic value of equity is expected to decline by 1.5% for each 100bp increase in interest rates.

Earning assets: Assets that generate net interest income, which include, but are not limited to: Federal funds sold; resale agreements; trading securities; interest-earning deposits with banks; loans; investment securities; and certain other assets.

Effective duration: A measurement, expressed in years, that, when multiplied by a change in interest rates, would approximate the percentage change in the value of on- and off- balance sheet positions. Duration is often used as a barometer of the sensitivity of a given asset to a change in rates.

Efficiency ratio: Noninterest expense divided by total revenue.

Federal funds rate: the rate at which banks borrow overnight from the Federal Reserve to maintain their bank reserves. It is also the interest rate banks charge each other for loans.

Investment securities: Collectively, the total securities available for sale and securities held to maturity held by a bank. These can include securities in the discretionary portfolio (which is designated to provide additional yield above those securities that are matched up to certain liabilities). Investment securities can include MBS, Treasuries, etc.

Leverage ratio: Tier 1 risk-based capital divided by adjusted average total assets.

LIBOR: Acronym for London InterBank Offered Rate. LIBOR is the average interest rate charged when banks in the London wholesale money market (or interbank market) borrow unsecured funds from each other. LIBOR rates are used as a benchmark for interest rates on a global basis.

Loan loss provision: An expense incurred to account for expected credit losses on a bank's loans. A provision expense increases a bank's allowance for bad loans (customer defaults, or terms of a loan have to be renegotiated, etc), which is reduced when banks incur the actual losses through charge-offs.

Loan loss reserves: Valuation reserve against a bank's total loans on the balance sheet, representing the amount thought to be adequate to cover estimated losses in the loan portfolio. When a loan is charged off, it is removed from the loan portfolio, and its book value is deducted from loan loss reserves. Lenders also set aside reserves for nonaccrual loans, in which interest and principal payments are no longer being collected.

Loan-to-value ratio (LTV): A calculation of a loan's collateral coverage that is used both in underwriting and assessing credit risk in a lending portfolio. LTV is the sum total of loan obligations secured by collateral divided by the market value of that collateral. Market values are based on an independent valuation of the collateral. For example, an LTV of less than 90% is better secured and has less credit risk than an LTV of greater than or equal to 90%.

Mortgage servicing right (MSR): The value a bank places on its right to service a mortgage loan when the underlying loans are sold or securitized (in a situation where the bank maintains the rights to service those loans). Servicing includes collections of principal, interest and escrow payments from borrowers and accounting for and remitting these payments to investors

Net interest income: Net interest income (NII) is the difference between revenues generated by a bank's interest-bearing assets (loans and securities) and the cost of funding those assets through its liabilities (deposits and borrowings).

Net interest margin: Annualized taxable-equivalent net interest income divided by average earning assets.

Nonperforming assets: Nonperforming assets include nonaccrual loans (nonperforming loans), certain troubled debt restructured loans (if not accruing interest), foreclosed assets and other assets that do not accrue interest income.

Nonperforming loans: Troubled loans that banks designate and for which they do not accrue interest income. Nonperforming loans do not include loans held for sale or foreclosed and other assets. Nonperforming loans do not include purchased impaired loans as a bank accretes interest income for them over the expected life of the loans.

Operating leverage: The period to period dollar or percentage change in total revenue (GAAP basis) less the dollar or percentage change in noninterest expense. A positive variance indicates that revenue growth exceeded expense growth (i.e. positive operating leverage) while a negative variance implies expense growth exceeded revenue growth (i.e. negative operating leverage).

Other Real Estate Owned (OREO): Other real estate owned is most frequently a result of foreclosure on real property as a result of default by the borrower who used the property as collateral for the loan. Most items in this category are available for sale.

Other-than-temporary impairment (OTTI): When the fair value of a security is less than its amortized cost basis, an assessment is performed to determine whether the impairment is other-than-temporary. If a bank intends to sell the security or more likely than not will be required to sell the security before recovery of its amortized cost basis less any current-period credit loss, and other-than-temporary impairment is considered to have occurred.

Pretax, pre-provision earnings (PPE): Total net revenue less noninterest expense (no credit costs are taken out).

Purchase accounting accretion: Accretion of the discounts and premiums on acquired assets and liabilities. Purchase accounting accretion is recognized in net interest income over the weighted average life of the financial instruments using the constant effective yield method.

Purchased impaired loans (PCI loans): Acquired loans determined to be credit impaired under FASB ASC 310-30 (AICPA SOP 03-3). Loans are determined to be impaired if there is evidence of credit deterioration since origination and for which it is probable that all contractually required payments will not be collected.

Recovery: Cash proceeds received on a loan that a bank had previously charged off. A bank credits the amount received to the allowance for loan and lease losses. Net charge-offs are gross charge-offs in a given period less any credit recoveries.

Residential development loans: Project-specific loans to commercial customers for the construction or development of residential real estate including land, single family homes, condominiums and other residential properties. This would exclude loans to commercial customers where proceeds are for general corporate purposes whether or not such facilities are secured.

Return on average assets (ROA): Annualized net income divided by average assets.

Return on average common shareholders' equity (ROCE): Annualized net income less preferred stock dividends, including preferred stock discount accretion and redemptions, divided by average common shareholders' equity.

Risk-weighted assets (RWA): A regulatory measurement of risk-adjusted assets, as computed by the assignment of specific risk-weights (as defined by the Federal Reserve System) to assets and off-balance sheet instruments.

Securitization: The process of legally transforming financial assets into securities, which can be a source of financing for banks.

Servicing rights: An intangible asset or liability created by an obligation to service assets for others. Typical servicing rights include the right to receive a fee for collecting and forwarding payments on loans and related taxes and insurance premiums held in escrow.

Subprime loans: Although a standard industry definition for subprime loans (including subprime mortgage loans) does not exist, most banks define subprime loans as specific product offerings for higher risk borrowers, including individuals with one or a combination of high credit risk factors, such as low FICO scores, high debt to income ratios and inferior payment history.

Tier 1 common capital: Tier 1 risk-based capital, less preferred equity, less trust preferred capital securities, and less noncontrolling interests.

Tier 1 common capital ratio: Tier 1 common capital divided by period-end risk-weighted assets.

Tier 1 risk-based capital: Total shareholders' equity, plus trust preferred capital securities, plus certain non-controlling interests that are held by others; less goodwill and certain other intangible assets (net of eligible deferred taxes relating to taxable and nontaxable combinations), less equity investments in nonfinancial companies less ineligible servicing assets and less net unrealized holding losses on available for sale equity securities. Net unrealized holding gains on AFS equity/debt securities and cash flow hedge derivatives are excluded from total shareholders' equity for Tier 1 risk-based capital purposes.

Tier 1 risk-based capital ratio: Tier 1 risk-based capital divided by period-end risk-weighted assets.

Total equity: Total shareholders' equity plus non-controlling interests.

Total risk-based capital: Tier 1 risk-based capital plus qualifying subordinated debt and trust preferred securities, other non-controlling interest not qualified as Tier 1, eligible gains on available for sale equity securities and the allowance for loan and lease losses, subject to certain limitations.

Total risk-based capital ratio: Total risk-based capital divided by period-end risk-weighted assets.

Transaction deposits: The sum of interest-bearing money market deposits, interest-bearing demand deposits, and noninterest-bearing deposits.

Troubled debt restructuring (TDRs): A restructuring of a loan whereby the lender for economic or legal reasons related to the borrower's financial difficulties grants a concession to the borrower that the lender would not otherwise consider.

Value-at-risk (VaR): A statistically-based measure of risk which describes the amount of potential loss which may be incurred due to severe and adverse market movements. The measure is of the maximum loss which should not be exceeded on 99 out of 100 days.

Yield curve: A graph showing the relationship between the yields on financial instruments or market indices of the same credit quality with different maturities. For example, a "normal" or "positive" yield curve exists when long-term bonds have higher yields than short-term bonds. A "flat" yield curve exists when yields are the same for short-term and long-term bonds. A "steep" yield curve exists when yields on long-term bonds are significantly higher than on short-term bonds. An "inverted" or "negative" yield curve exists when short-term bonds have higher yields than long-term bonds.

Appendix 1

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

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

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

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

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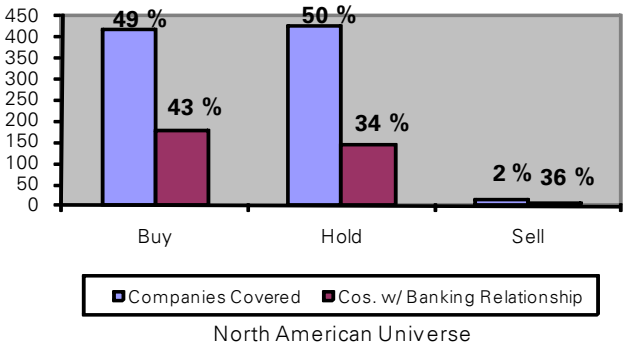

North American Universe

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