Higher capital costs hinder loan growth

Higher capital is already hurting loan demand, with more to come
US banks are holding more capital in response to the tighter capital and balance sheet rules regulators have already put in place, and perhaps in anticipation of even greater capital requirements yet to come. Higher capital levels have raised the cost of making loans, which has, in turn, raised the costs faced by many bank customers and slowed loan growth.

While this trend can be seen across a variety of loan markets, in this piece we focus on corporate lending. We estimate that the yield spread for a Commercial and Industrial (C&I) borrower is 200 basis points (bp) higher today than it was in the decade leading up to 2007, and that every 100 bp increase in this spread causes demand for these loans to decline by more than 9%.

A higher cost of bank capital affects small firms disproportionately
The adjustment process to higher bank capital costs is not yet over. It has already led, not only to an ongoing drag on bank loan growth, but also to competitiveness issues for small- and mid-sized corporate bank customers who lack alternatives to bank financing. This shift will likely increase the share of financing from public debt markets at the expense of the bank loan market, while also favoring the long-run growth of large multinationals over that of small and medium-sized enterprises.

C and JPM are likely to benefit from the “bond-for-bank-loan” trend
We continue to favor Citigroup (C; CL Buy) and J.P. Morgan (JPM; CL Buy), as both firms: (1) are expected to benefit in the near term from expanding global capital markets activity; (2) have limited exposure to small- to mid-sized corporate borrowers (7% for JPM, 4% for C’s US loans); and (3) are attractively valued on tangible book (1.4X for JPM, 0.9X for C) and have superior capital ratios (9.5% tier one common ratio for JPM, 10.3% for C). Citigroup also benefits from sizeable exposure outside the United States relative to its regional peers, supporting above average mid-term growth prospects.

Richard Ramsden
(212) 357-9981 richard.ramsden@gs.com
Goldman Sachs & Co.

Charles P. Himmelberg
(917) 343-3218 charles.himmelberg@gs.com
Goldman Sachs & Co.

David Greely
(212) 902-2850 david.greely@gs.com
Goldman Sachs & Co.

Anne Brennan
(212) 902-9757 anne.brennan@gs.com
Goldman Sachs & Co.

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Higher capital costs hinder loan growth

The global banking industry has faced higher regulatory capital requirements over the past 18 months. In the United States, the required minimum for tier one common capital has risen from the 4% required in the May 2009 US Treasury “stress test” to the 7% level announced by the Basel Committee in September 2010. The effective minimum continues to rise, with recent capital raises by European banks as well as requirements set by Swiss regulators pointing to nearly 10% as the new standard. This 2- to 3-fold increase has brought US banks’ tier one capital ratios to their highest level in recent history (see Exhibit 1). The increase has been compounded by changes in risk-weighted asset calculations, which increase the capital intensity of holding assets, as well as by an improvement in the quality of capital, with banks now forced to hold more tier one capital in the form of common equity.

The new capital requirements in the United States have not yet been finalized, but regulators may well put in place surcharges for systemically important financial institutions. Given that the top five banks in the United States hold almost 60% of total system-wide assets, systemically important charges would affect only a small number of banks, but the majority of bank-held assets.

Exhibit 1: Capital ratios have increased substantially in recent quarters

![Graph showing capital ratios over time]

Source: SNL Financial, Goldman Sachs Research.

The effects of higher capital requirements are visible in a number of ways. First, the amount of credit banks can extend has declined. The process of loan shrinkage is well underway: total managed loans – loans held by banks on their balance sheets, as well as in securitized form – have already declined by over $1 trillion or about 10% since peaking at $9 trillion in late 2009, and they continue to decline at a rate of 1% to 4% per quarter (see Exhibit 2). This trend is quite contrary to the usual historical pattern, which normally sees

1 US banks currently have on average a tier one capital ratio of about 9%, up substantially from the nearly 6% pre-crisis level.

2 Of the $1 trillion reduction in loans that has occurred thus far, C&I loans and credit card loans accounted for $380 billion, with net charge-offs (the net value of loans that are deemed unlikely to be repaid) accounting for another $300 billion. Within the net charge-off category, the bulk of the reductions have come from loans that are secured by one-to-four family properties and from consumer loans, especially credit card loans.
loan growth returning within 50 weeks of the peak. This time, however, loan growth continues to decline more than 90 weeks past the peak (see Exhibit 3).

Exhibit 2: Loan shrinkage has been persistent: loans continue to shrink at roughly 1% per quarter

Exhibit 3: Loan growth continues to decline, more than 90 weeks past the peak

Source: Federal Reserve.
Higher capital requirements will continue to drive this trend. We estimate that every 100 bp increase in tier one common capital above current levels will require US bank balance sheets to contract by an aggregate of roughly $1.5 trillion. This translates into a reduction in the amount of credit banks would otherwise be able to lend of about $840 billion.\(^3\)

Second, banks are passing higher capital costs on to their customers, in order to maintain their returns on equity (ROEs). In the pre-crisis world, US banks averaged a full-cycle ROE of about 14%.\(^4\) While global capital providers may be willing to accept slightly lower returns from banks in the post-crisis world, there is a limit to how low these returns can be, as capital providers can and will allocate capital to sectors with higher returns.

This passing on of costs to customers is playing out in real time. It can be seen not only in new charges for services that were previously “free” – like checking – but also in the cost of credit. Our work shows that the cost of credit for an equivalent quality C&I borrower is about 200 bp higher today than it was on average in the decade leading up to 2007 (see Exhibit 4).\(^5\)

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**Exhibit 4: Syndicated loan spreads remain highly elevated after controlling for the quality of borrowers**

Chart shows our estimated residual spread of new syndicated loans after controlling for firm leverage, capital intensity & size, as well as for the size of the loan

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\(^3\) Our analysis assumes that bank credit is risk-weighted at 56% of assets.

\(^4\) We use the FDIC’s US average bank ROE from 1992 through 2006 of 14%.

\(^5\) We use a regression model with a sample of over 1,000 syndicated loans over the course of two decades in our analysis of the C&I market. Our model controls for both the differing characteristics of these loans – such as their size and type – and for the differing quality of borrowers – such as their size, capital intensity ratio and leverage ratio.
Not surprisingly, the higher price of loans is suppressing C&I loan demand growth. Exhibit 5 plots the year-on-year change in C&I loans against the spread on C&I loans over LIBOR. This plot reveals a clear, inverse relationship between price and quantity, which is precisely the relationship one would expect to see if these changes were being driven primarily by changes in loan supply (or equivalently, shifts along the demand curve). The most pronounced inverse change in price and quantity occurs during the recent financial crisis, which is also consistent with the notion that this correlation is being driven by shocks to bank capital (translating to loan supply), rather than by shocks to the growth outlook (translating to loan demand). In short, a simple plot of the data provides convincing evidence that shocks to bank capital are an important driver of loan pricing and changes in C&I lending.

The magnitude of this relationship is surprisingly strong. A simple regression of C&I lending on loan spreads suggests that a 100 bp increase in spreads causes loan demand to fall by 3.3% per quarter. Cumulating this impact over time would obviously imply a larger impact. Thus, to quantify the impact of a sustained shock, we estimate a more sophisticated model designed to capture the dynamics of C&I loan demand (see Appendix A for details). This model suggests that a sustained 100 bp increase in loan pricing could eventually lower C&I loan demand by as much as 40%.

While this estimate is larger than the 25% decline in C&I loans that we have so far observed from the peak of the current cycle, it does not strike us implausibly large. This is because as we show below, large corporate borrowers are aggressively substituting away from bank funding by utilizing public bond markets. For as long as pressures on bank capital continue, bank lending will remain at a competitive disadvantage to other sources of funding.

Exhibit 5: C&I loan growth exhibits a striking negative correlation to loan pricing...
% change qoq (left axis); % per annum (right axis)

Source: FRB, Haver, and Goldman Sachs Research.
A higher cost of bank capital affects small firms disproportionately

As the cost of borrowing from US banks has risen, some borrowers have looked to alternate sources of financing. This substitution effect can be seen in the corporate borrowing markets, and it is especially visible among smaller firms. Loan spreads are higher for smaller firms than for larger firms (for the same quality borrower). Moreover, the crisis has had a disproportionate impact on smaller firms: since mid-2008, the cost of borrowing has risen by about 100 bp for large firms, but it has risen by nearly twice this amount for smaller firms (see Exhibit 6). The Fed’s most recent senior loan officer survey indicates that loan demand is still declining, especially among smaller firms.

Even as the terms of bank lending remain tight, the public bond market has recovered much faster, and pricing is now considerably more attractive in this market. High-yield spreads have, for example, come down about 700 bp from the peak (see Exhibit 7). Moreover, other factors, including availability and terms, enhance the attractiveness of bond financing today. And because bonds usually carry fixed rate coupons (while bank loans usually carry floating rate coupons), bond financing can protect borrowers from future increases in interest rates.

Exhibit 6: The cost of borrowing has disproportionately affected smaller firms

Source: Dealogic, CapIQ, Goldman Sachs Research.

Exhibit 7: Pricing has improved in the high-yield bond market

Among many smaller firms, the tighter terms, pricing and availability of new bank loans have resulted in a “bond-for-bank-loan” take-out movement in which corporate borrowers are shifting their capital structure away from bank loans, in some cases significantly. In fact, we estimate that roughly 45% of the reduction in C&I loans since the end of 2008 reflects a shift from bank term loans to bond market financing (see Exhibit 8). Further, as we show in Exhibit 9, bank-loan-to-debt conversions have picked up at the same time as the C&I yield spread has widened.

Exhibit 8: A sizable portion of C&I loans has been replaced with bonds

<table>
<thead>
<tr>
<th>Impact</th>
<th>$bn</th>
<th>% total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4Q08 C&amp;I loans</td>
<td>1,602</td>
<td></td>
</tr>
<tr>
<td>Impact of low utilization rates</td>
<td>176</td>
<td>47%</td>
</tr>
<tr>
<td>Impact of bond-for-loan take-outs</td>
<td>168</td>
<td>45%</td>
</tr>
<tr>
<td>All other impacts</td>
<td>31</td>
<td>8%</td>
</tr>
<tr>
<td>Total decline since 2008 YE</td>
<td>375</td>
<td>100%</td>
</tr>
<tr>
<td>% change</td>
<td>-23%</td>
<td></td>
</tr>
<tr>
<td>Current C&amp;I loans</td>
<td>1,226</td>
<td></td>
</tr>
</tbody>
</table>

Note: estimates for C&I loans derived from H.8 data, utilization rates estimated, bond-for-loan take-out issuance from S&P LCD Research.

Source: Goldman Sachs Research.
Exhibit 9: Bank-loan-to-debt conversions have picked up as C&I spreads have widened

This shift is taking place principally in the high-yield markets, where issuers in many sectors have substituted bond market financing for bank loans. This has led to record high-yield bond issuance volumes, as well as a surge in the proportion of high-yield issuers paying down bank debt and a rise in first-time issuance by firms that were previously entirely reliant on bank debt. The trend is visible in a wide range of sectors, including Technology, Healthcare, Paper & Packaging, Telecommunications, Gaming, Chemicals, Cable/Satellite and Aircraft Leasing.

High-yield issuers of all sizes have participated in this trend, ranging from business services company Stream Global Services, with $70 million in annual EBITDA, to much larger companies including hospital company HCA, which has in excess of $5 billion in EBITDA. In many instances, smaller issuers have issued secured bonds, while some larger issuers are able to borrow on both a secured and unsecured basis in the bond market.

Broadly speaking, the response to a higher cost of bank loans manifests itself in the high-yield markets in several ways:

First, existing public market borrowers have decreased their reliance on bank lending and increased their borrowing in the public markets. Over the past two years, for example, MGM Resorts International has issued $4 billion in a mix of secured and unsecured bonds to repay bank debt and near-dated bonds, while Harrah’s Entertainment has issued almost $3 billion for a similar purpose. Firms inTelecommunications, Healthcare, Chemicals, Paper/Packaging and Cable/Satellite have done similar (though smaller) transactions (see Exhibit 10).
Exhibit 10: Illustrative examples of firms that have borrowed in public markets to repay bank debt

<table>
<thead>
<tr>
<th>Company</th>
<th>Sector</th>
<th>LTM EBITDA (mn)</th>
<th>Recent bond issuance (mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virgin Media</td>
<td>Cable/Satellite</td>
<td>£1,500</td>
<td>£2,500</td>
</tr>
<tr>
<td>American Casino &amp; Entertainment</td>
<td>Gaming/Lodging</td>
<td>$62</td>
<td>$375</td>
</tr>
<tr>
<td>Boyd Gaming Corp</td>
<td>Gaming/Lodging</td>
<td>$324</td>
<td>$500</td>
</tr>
<tr>
<td>Harrah’s Entertainment (OpCo only)</td>
<td>Gaming/Lodging</td>
<td>$1,432</td>
<td>$3,000</td>
</tr>
<tr>
<td>MGM Resorts</td>
<td>Gaming/Lodging</td>
<td>$1,137</td>
<td>$4,000</td>
</tr>
<tr>
<td>Mohegan Tribal Gaming Authority</td>
<td>Gaming/Lodging</td>
<td>$292</td>
<td>$200</td>
</tr>
<tr>
<td>Boston Scientific</td>
<td>Healthcare</td>
<td>$2,058</td>
<td>$2,000</td>
</tr>
<tr>
<td>HCA</td>
<td>Healthcare</td>
<td>$5,680</td>
<td>$1,400</td>
</tr>
<tr>
<td>Life Technologies</td>
<td>Healthcare</td>
<td>$1,268</td>
<td>$1,500</td>
</tr>
<tr>
<td>St. Jude Medical</td>
<td>Healthcare</td>
<td>$1,434</td>
<td>$450</td>
</tr>
<tr>
<td>Georgia-Pacific</td>
<td>Paper and packaging</td>
<td>$3,280</td>
<td>$1,250</td>
</tr>
<tr>
<td>Cincinnati Bell</td>
<td>Telecom</td>
<td>$499</td>
<td>$750</td>
</tr>
<tr>
<td>Global Crossing Ltd.</td>
<td>Telecom</td>
<td>$362</td>
<td>$750</td>
</tr>
<tr>
<td>Integra Telecom</td>
<td>Telecom</td>
<td>N/A</td>
<td>$475</td>
</tr>
<tr>
<td>Leap Wireless</td>
<td>Telecom</td>
<td>$548</td>
<td>$1,100</td>
</tr>
</tbody>
</table>

Notes:
(1) Virgin Media used £1,700 to repay bank debt while some of the proceeds were also used to pay off existing bonds.
(2) American Casino & Entertainment is a GS affiliate.
(3) Integra Telecom is a GS affiliate.

Source: Company filings, Bloomberg.

This group also includes a number of large LBOs from 2005-2007, which now find themselves holding too much debt relative to their cash flow and facing upcoming maturities in the next few years (see Exhibit 11).

Exhibit 11: Illustrative examples of bond issuances from large LBOs

<table>
<thead>
<tr>
<th>Company</th>
<th>LTM EBITDA (mn)</th>
<th>Recent bond issuance (mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHC Helicopter</td>
<td>$233</td>
<td>$1,100</td>
</tr>
<tr>
<td>Edgen Murray</td>
<td>$44</td>
<td>$465</td>
</tr>
<tr>
<td>Expro</td>
<td>$270</td>
<td>$1,400</td>
</tr>
<tr>
<td>McJunkin</td>
<td>$236</td>
<td>$1,050</td>
</tr>
<tr>
<td>Greektown Superholdings</td>
<td>N/A</td>
<td>$385</td>
</tr>
<tr>
<td>AbitibiBowater</td>
<td>Paper and packaging</td>
<td>$850</td>
</tr>
<tr>
<td>First Data</td>
<td>Technology</td>
<td>$1,993</td>
</tr>
<tr>
<td>Freescale Semiconductor Holdings</td>
<td>Technology</td>
<td>$844</td>
</tr>
<tr>
<td>NXP Semiconductors</td>
<td>Technology</td>
<td>$1,002</td>
</tr>
</tbody>
</table>

Notes:
(1) Expro is partially owned by GS Capital Partners.
(2) McJunkin is partially owned by GS Capital Partners.
(3) Greektown Superholdings is private; they have not filed financials since the bankruptcy.

Source: Company filings, Bloomberg.

Second, some companies that had in the past relied solely on bank loans are now issuing bonds for the first time. This trend is visible across most sectors, including Technology and Healthcare, where at least 10 new issuers in each sector have entered the market in recent months, as well as Energy, Cable/Satellite, Chemicals, Consumer and Restaurants (see Exhibit 12).
These first-time issuers are often smaller firms, which have typically relied on bank loans because the hurdles to entering the bond markets are quite high.\(^7\) For example, Vertellus, a chemical firm with an EBITDA of over $80 million, entered the bond market for the first time, using the proceeds from $345 million of secured bonds to refinance term loans. Some larger firms are also issuing debt for the first time. One example is Cequel Communications, a mid-cap company with roughly $550 million in EBITDA, which until 2009 had an all-bank loan debt structure of $3.1 billion. In the past year, Cequel has accessed the high yield market twice, using most of the proceeds to pay down bank debt, resulting in a capital structure that is now just 62% bank debt.

Exhibit 12: Illustrative examples of first time issuers in the bond market

<table>
<thead>
<tr>
<th>Company</th>
<th>Sector</th>
<th>LTM EBITDA (mn)</th>
<th>Recent bond issuance (mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cequel Communications</td>
<td>Cable/Satellite</td>
<td>$550</td>
<td>$1,200</td>
</tr>
<tr>
<td>Vertellus</td>
<td>Chemicals</td>
<td>$83</td>
<td>$345</td>
</tr>
<tr>
<td>Grupo Bimbo</td>
<td>Consumer</td>
<td>$1,236</td>
<td>$800</td>
</tr>
<tr>
<td>Energy Transfer Equity</td>
<td>Energy</td>
<td>$1,413</td>
<td>$1,800</td>
</tr>
<tr>
<td>Vantage Drilling</td>
<td>Energy</td>
<td>$62</td>
<td>$1,000</td>
</tr>
<tr>
<td>Capella Healthcare</td>
<td>Healthcare</td>
<td>N/A</td>
<td>$500</td>
</tr>
<tr>
<td>Genzyme</td>
<td>Healthcare</td>
<td>$1,062</td>
<td>$1,000</td>
</tr>
<tr>
<td>Adobe Systems</td>
<td>Technology</td>
<td>$1,208</td>
<td>$1,500</td>
</tr>
<tr>
<td>eBay</td>
<td>Technology</td>
<td>$2,435</td>
<td>$1,500</td>
</tr>
<tr>
<td>Fidelity National Information Services</td>
<td>Technology</td>
<td>$1,575</td>
<td>$1,100</td>
</tr>
<tr>
<td>Stream Global Services</td>
<td>Technology</td>
<td>$70</td>
<td>$200</td>
</tr>
<tr>
<td>Symantec</td>
<td>Technology</td>
<td>$1,728</td>
<td>$1,100</td>
</tr>
<tr>
<td>Trilogy International Partners</td>
<td>Telecom</td>
<td>$66</td>
<td>$370</td>
</tr>
</tbody>
</table>

Notes:
(1) Capella Healthcare does not have public financials.

Source: Company filings, Bloomberg.

Third, **some issuers may be substituting bonds for what otherwise would have been bank loans**. In some cases, this is clearly because bank financing is not available. For example, we have seen an increase in leasing company bond issuance because banks are now less interested in loaning against aircrafts. This is also true to a lesser extent in the shipping sector. In other sectors the dynamic is less obvious, but given small firms’ traditional bent toward bank financing, it appears that these new issues may be substituting for what otherwise would be bank debt.

Finally, some **non-US firms that have traditionally relied on bank debt have tapped the US public debt markets**, underscoring the extent to which relative pricing and availability have shifted in favor of multinationals. Virgin Media, for example, has reduced the share of bank debt within its capital structure from roughly 80% to about 55% over the past four years by accessing the US public debt markets. Grupo Bimbo, a Mexican food company, recently issued $800 million in senior notes, with the proceeds to be used for debt refinancing and general corporate purposes.

Larger multinationals with the flexibility to tap a variety of financing sources, including global capital markets, are clearly benefiting from lower costs and better terms in the debt

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\(^7\) Borrowing from a bank allows small companies to lower their agency costs by delegating the monitoring and renegotiating of tight, detailed loan covenants to a single intermediary, rather than to a whole host of bondholders. See “Is Bank Lending Special,” by Charles P. Himmelberg and Donald P. Morgan. In *Is Bank Lending Important for the Transmission of Monetary Policy*, edited by Joe Peek and Eric Rosengren, Federal Reserve Bank of Boston, Conference Series no. 39.
markets. For example, in recent weeks, Wal-Mart, Coca-Cola, Colgate-Palmolive and IBM have all issued debt with record or near-record low coupons, and in some cases in record sizes.

On a net basis across the economy, the pick-up in debt capital markets financing for both large and medium-sized borrowers may offset the fall in demand for bank credit. But while some smaller firms have benefitted from the more attractive terms and pricing available in the bond markets, many small and medium-sized firms may still not be able to make the shift. This suggests they disproportionately feel the impact of a higher cost of credit.

These firms are likely to grow more slowly than the larger firms and multinationals that enjoy more flexibility in financing. Slower growth among smaller and mid-sized firms may act as an overhang on economic growth and the job creation that these firms traditionally propel. And because the adjustment to higher prices and constraints on credit availability is a dynamic process, the potential ongoing rise in capital requirements means that smaller firms are likely to bear the cost for some time to come, acting as a continuing drag on bank loan growth.
C and JPM are likely to be beneficiaries of this trend

The shift towards increased reliance on capital markets financing could have a broad impact on many commercial banks that have traditionally relied on the loan market as a source of growth. Given shrinking loan portfolios and the “bond-for-bank-loan” trend, as well as continued uncertainty over the broader economic outlook, many corporate borrowers have opted to pay down debt and to refinance their bank loans in debt capital markets instead. This can be seen not only in the anecdotal evidence noted earlier, but also in C&I utilization lines, which have traditionally ranged in the 45% to 50% range, but now appear to be bottoming in the low-to-mid-30% range.

It is worth noting that outsized run-offs in loan portfolios today are another headwind to loan growth for US banks. We estimate that of the roughly $3.3 trillion in loans at the five largest commercial US banks, over $800 billion or nearly 25% are in run-off mode. Many of these run-off portfolios are being driven by strategic decisions to exit lending for certain products. We currently estimate that loan portfolios will decline by another 3% in 2010 and 2011; in order to compensate for these strategic run-offs, US GDP growth would need to equal roughly 3.5%. The Goldman Sachs US Economics team’s forecast is for US GDP growth of 2.6% in 2010 and 1.8% in 2011.

Given these trends, we favor banks that can offset the impact of loan shrinkage through increased fee generation in their capital markets businesses, such as Citigroup (C; CL Buy) and J.P. Morgan (JPM; CL Buy) and those with lower exposure to small- and mid-sized corporate lending. J.P. Morgan has just 7% of its loan portfolio in C&I lending, while Citigroup has just 4% of its US loan portfolio in C&I, putting them in a better position than some of their less diversified peers.

In addition, we expect Citigroup to generate profits of roughly $20 billion in a steady state, including unlevered ROA of about 120 bp, and an ROE of about 16%. For J.P. Morgan, we expect share gains from the company’s intra-firm cross-selling efforts to continue to drive growth, particularly in the investment banking business. Further, while J.P. Morgan has a sizeable loan run-off portfolio from the WaMu acquisition and certain Chase products, over the longer term we expect this to be partially offset by declining credit and non-credit related expenses, as well as the deployment of a large amount of capital. With strong organic earnings potential, in addition to peer-leading capital (9.5% tier one common) and reserve levels, we expect J.P. Morgan to be one of the first large-cap banks to return capital to shareholders, while still meaningfully growing book value.

We are Conviction Buy rated on Citigroup (C, $4.30). We see 28% upside to our 12-month, $5.50 price target. Our price target is based on a 10X historical earnings multiple of our 2012 EPS estimate, discounted back at 12% for five quarters. Key risks to our price target include worse than expected credit deterioration, loan shrinkage and continued elevated mortgage repurchase and litigation costs.

We are Conviction Buy rated on J.P Morgan (JPM, $39.90). We see 28% upside to our 12-month, $51.00 price target. Our price target is based on a 10X historical earnings multiple of our 2012 EPS estimate, discounted back at 12% for five quarters. Key risks to our price target include worse-than-expected credit deterioration, loan shrinkage and continued elevated mortgage repurchase and litigation costs.

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8 Prices are as of the market close of November 9, 2010.
Appendix A: Estimating the price-elasticity of C&I loan demand

C&I loan growth has exhibited a striking negative correlation to pricing since the mid-1980s (see Exhibit 13). Over this time period, a 100 bp rise in the spread of the C&I loan rate over LIBOR has corresponded to a more than 330 bp decline in the level of C&I loans outstanding within one quarter (see Exhibit 14). This negative correlation suggests that the demand for C&I loans is highly sensitive to loan pricing, and that it has been this way for over two decades.

Typically, we think of an economic demand curve as relating a quantity to a price level, whereas the relationship above relates a rate of change in a quantity to the price level. This should not be surprising in the context of loan demand, where we would expect the stock of loans outstanding to adjust slowly over time, even as the level of new loans demanded responds quickly to loan pricing.

This suggests that we should expect C&I loan demand to adjust dynamically over time to loan pricing. In addition, we should expect C&I loan demand to be tied to the economic cycle, and therefore to both grow over time along with the economy, and to be cyclical. Capturing the cyclical behavior of loan demand is of particular importance, as we should separate the impact of loan pricing from the normal cyclical swings in loan demand.

The trend in C&I loan demand over time can be captured by noting that the level of C&I loans outstanding tends to rise with the overall level of economic activity (see Exhibit 15). Consequently, we can model the ratio of the level of C&I loans relative to the level of nominal US GDP.

The influence of the economic cycle on C&I loan demand can be captured using both the unemployment rate and the slope of the yield curve. While it could be argued that both metrics have a direct influence on loan demand, they also serve as a proxy for many other

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9 C&I loan data are from the US Federal Reserve’s H.8: Assets and Liabilities of Commercial Banks in the US, adjusted for breaks in series by Haver Analytics. C&I loan pricing data are from the US Federal Reserve’s E.2: Survey of Terms of Business Lending.
factors that move with the state of the economic cycle. Interestingly, both of these variables exhibit a strong correlation to C&I loan growth rather than levels, in the same manner as loan pricing (see Exhibit 16). This lends further support to the view that a stock adjustment in the level of total C&I loans outstanding is taking place over time.

Exhibit 15: The level of C&I loans outstanding tends to rise at the same rate over time as the level of US GDP…

Index: 4Q2007=100

Source: FRB, BEA, and Goldman Sachs Research.

Exhibit 16: … while the rate of C&I loan growth is highly cyclical, moving with the economic cycle

% both axes

Source: FRB, BLS, and Goldman Sachs Research.

The empirical relationships described above lead us to build a model of the demand for C&I loans that is based on an error-correction specification. We estimate the quarter-over-quarter percentage change in the level of C&I loans outstanding as a function of: (1) the ratio of the level of C&I loans outstanding to nominal US GDP in the prior quarter; (2) the spread between the C&I loan rate and LIBOR; (3) the US unemployment rate; and (4) the slope of the US Treasury yield curve.

We include the one-quarter lag of the ratio of C&I loans to US GDP because it captures the notion that the level of C&I loans tracks US GDP over time, but we note that the ratio of the level of C&I loans to US GDP over time will depend on loan pricing and the state of the economic cycle. We show the results of a statistical regression of C&I loan growth on these variables in Exhibit 17. The model fits the data quite well and captures 65% of the variation in quarterly loan demand growth (see Exhibits 17-18). The residual error is on the order of only 1%.

As we show in Exhibit 18, a 100 bp increase in C&I loan pricing decreases C&I loan demand by over 230 bp within one quarter. This is slightly less than in Exhibit 14, but still very strong, and it is statistically significant even after accounting for the state of the economic cycle. Further, over the long run, if this 100 bp increase is sustained, the model suggests that C&I loan demand could eventually decline by close to 40%. The long-run effect of loan pricing on demand is determined by dividing the additive inverse of the regression coefficient on loan pricing by that on the lag of the ratio of C&I loan demand to US GDP. The coefficient on the ratio of C&I loans to US GDP in the prior quarter implies that as the ratio grows, C&I loan growth will tend to slow, which helps keep C&I loan levels tracking US GDP levels over the long run.
Exhibit 17: Within a more fully specified model of C&I loan demand, the impact of loan pricing remains strong...

Table of regression results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimate</th>
<th>Std Error</th>
<th>t-Statistic</th>
</tr>
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<tbody>
<tr>
<td>Intercept</td>
<td>-7.15</td>
<td>3.72</td>
<td>-1.92</td>
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<td>Lag of Log(Loan/GDP)</td>
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<td>0.01</td>
<td>-3.98</td>
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<td>C&amp;I yield - LIBOR</td>
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<td>0.35</td>
<td>-6.60</td>
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<tr>
<td>Unemployment rate</td>
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<td>-0.18</td>
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<tr>
<td>LIBOR - 10 yr Treasury</td>
<td>0.90</td>
<td>0.18</td>
<td>5.02</td>
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</table>

Adjusted R-square: 0.65
Standard Error: 0.95

Source: FRB, BEA, BLS, and Goldman Sachs Research.

Exhibit 18: ... this fairly simple model of C&I loan demand captures most of the movement in the data

% change quarter over quarter

This is clearly a very powerful effect. The high degree of sensitivity of C&I loan demand to loan pricing, combined with the fact that C&I loan demand is sensitive to the spread of C&I loan rates to LIBOR, rather than to the C&I loan rate itself, suggests that we are capturing an elasticity of substitution. That is, we are capturing a movement out of bank loans into other forms of financing, rather than a decline in the overall level of activity backed by C&I loans.

The long-run impact of a sustained increase in C&I loan pricing implied by the model in Exhibit 17 may seem too large, but this impact can be seen in an even simpler static model of loan demand. Exhibit 19 shows the results of a simple statistical regression of the ratio of C&I loan demand to US GDP on: (1) the spread between the C&I loan rate and LIBOR; (2) the US unemployment rate; and (3) the slope of the US Treasury yield curve. Although the fit of this model is considerably poorer than the dynamic one described above (see Exhibit 20), it shows that a 100 bp rise in C&I loan pricing lowers the demand for C&I loans by over 900 bp. Thus, even a simple estimate shows the large impact C&I loan pricing has on loan demand.
Exhibit 19: Even a simple static model of C&I loan demand shows a strong impact from loan pricing...

Table of regression results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimate</th>
<th>Std Error</th>
<th>t-Statistic</th>
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<td>Unemployment rate</td>
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<td>LIBOR - 10 yr Treasury</td>
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<tr>
<td>Adjusted R-square</td>
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</tr>
<tr>
<td>Standard Error</td>
<td>10.92</td>
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<td></td>
</tr>
</tbody>
</table>

Source: FRB, BEA, BLS, and Goldman Sachs Research.

Exhibit 20: ... although its considerably poorer fit to the data suggests that the dynamic model is preferable

$100 \times \log(\text{C&I loans/GDP})$

Source: FRB, BEA, BLS, and Goldman Sachs Research.
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The precise calculation of each metric may vary depending on the fiscal year, industry and region but the standard approach is as follows:

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Quantum

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Richard Ramsden: America-Large Banks.

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Goldman Sachs Investment Research global coverage universe

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<th>Rating Distribution</th>
<th>Global</th>
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<td>Buy</td>
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<td>Hold</td>
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<tr>
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<table>
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<tr>
<th>Investment Banking Relationships</th>
<th>Global</th>
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<td>Buy</td>
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<td>Hold</td>
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<tr>
<td>Sell</td>
<td>37%</td>
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