

RESEARCH PAPER

PRODUCTS
(OF INTEREST)

Credit Linked Assets – harness credit risk & deliver stable returns

By Peter Lucas, Executive Director, Macquarie Bank

In recent years, there has been an extraordinary increase in the range of fixed income style assets available to include in portfolios. Harnessing credit risk for income has been a focus for innovation and creativity in capital markets, and many products have been heavily structured. Despite many variations in approach, one common theme has been the use of leverage to enhance potential returns. This paper explores the assets used in structured credit transactions. It looks at key characteristics of these asset types and structures that can be used to deliver both income and growth solutions. It also discusses the mechanics of leverage as it applies to these structures including how best to set leverage levels across the different asset classes.

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Prior to analysing the various securities underlying structured credit products, it is worth a quick revision of credit risk. Simply relying on credit ratings provided by rating agencies will only provide part of the story when trying to assess credit risk.

Credit risk is the risk a borrower fails to make repayments of principal and meet interest payments. The degree of credit risk will determine the terms on which a borrower is able to access a loan. Lenders will adjust interest rates, the level of collateral required, and require more or less stringent covenants to try and match risk to reward.

The most widely recognised attempt to measure credit risk is the credit ratings provided by credit rating agencies (Figure 1). It is important to realise the credit ratings assigned to a borrower are the agencies' attempts to quantify the probability the borrower will default. The ratings do not attempt to measure the extent of the eventual loss a lender may suffer in the event of a default. Figure 2 highlights the significance of this. The credit losses suffered by a lender are a function of both the number of defaulting loans and the extent of any recovery on a defaulting loan. For example, a defaulting loan fully secured by property and on which there is a full recovery results in a zero credit loss.

Ratings agencies consider a wide range of qualitative

and quantitative information when assigning a credit rating. Is the borrower a price leader or a price taker? How good is the management team? Is the industry in which the borrower participates vulnerable to external shocks? Can the borrower pass on increases in costs of inputs to their customers? These are examples of the type of qualitative information that agencies consider.

The two most widely used quantitative tools are interest coverage and gearing ratios.

Interest coverage attempts to measure how much a borrower's cashflow exceeds (covers) the annual interest bill. It is often defined as earnings before interest, taxes, depreciation and amortisation (EBITDA) divided by annual interest expense. A variation on this theme is to subtract capital expenditure from EBITDA and see how many times this net cashflow covers the annual interest bill. The logic is the recognition that, for many companies, ongoing capital expenditure is essential to be able to continue to generate revenues.

The gearing ratio measures financial leverage – that is, the amount of interest-bearing debt the company has in relation to the value of its debt plus equity.

Figure 3 (overpage) provides summary financial data for three airlines, highlighting the different credit risk each represents as a borrower, based purely on these quantitative measures. What do these historical figures tell you about the airlines' ability to pay debt as it falls due? Singapore Airlines' annual interest bill is a small fraction of annual cash flow, and the debt taken

Figure 1: Rating agency credit risk measures

| CREDIT QUALITY | MOODY'S | S&P | FITCH |
|----------------------------|---------|------------------|------------------|
| HIGHEST | Aaa | AAA | AAA |
| VERY HIGH | Aa | AA | AA |
| HIGH | A | A | A |
| INVESTMENT GRADE | Baa | BBB | BBB |
| HIGH YIELD/ SPECULATIVE | Ba | BB | BB |
| HIGHLY SPECULATIVE | B, Caa | B, CCC, CC, C | B, CCC, CC, C |
| DEFAULT | Ca, C | D | DDD, DD, D |

Source: Moody's Investor Services, Standard & Poor's, Fitch Ratings

Figure 2: US debt recovery rates following default

| CATEGORY | RECOVERY RATE (%) |
|---------------------------|-------------------|
| SENIOR LOANS | 77.5 |
| SENIOR SECURED NOTES | 57.4 |
| SENIOR UNSECURED NOTES | 44.9 |
| SENIOR SUBORDINATED NOTES | 39.1 |
| SUBORDINATED NOTES | 32.0 |
| JUNIOR SUBORDINATED NOTES | 28.9 |

Notes: Recovery rates for 1982-2004

Source: S&P LossStats™ Database.



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on represents less than 15% of total assets. The airline could have a materially worse operating result next year and still be able to generate enough cash to service its debt – and, even if it couldn't, lenders should have a fair chance of recovering the debt as there is a large surplus of assets over debt (at least according to accounting book values). Qantas has a healthy surplus of cash flow over annual interest bill and has an approximate 50:50 debt to equity ratio – not as strong as Singapore Airlines from a credit perspective, but healthy nevertheless and hence it has been rated investment grade by S&P, signifying a low probability of default. Delta Airlines on the other hand is not generating enough cash to meet its normal operating costs (let alone interest payments) and has a deficiency of shareholders funds. It is no surprise that it is currently in Chapter 11 Bankruptcy protection.

While the rating agencies will take regard of both qualitative and quantitative factors associated with the borrowers rated, perhaps the best predictor of default rates is the interest coverage ratio. Figure 4 highlights the relationship between default rates and interest cover rates for senior secured loans for the period since January 1992. The interest cover ratios are for new loans written in each year in question and the default rates are the percentage of total loans defaulting in the relevant year. It highlights several issues. In times of very low default rates, when times were good and money was "free", banks wrote new loans with relatively low interest cover

ratios. A few years later, as the economy slowed, default rates spiked as borrowers' ability to service their debt was strained to breaking point by weaker cash flows. In response to the high level of defaults, banks tightened credit standards and new loans were written with better interest coverage ratios. The high defaults washed out of the system. This is not rocket science, of course. But it does raise the question – why do banks lend money to borrowers when the prospective borrowers' annual cash flow is only just managing to cover their annual interest expense (in 1996, EBITDA less Capex was 1.1 times the annual interest bill). Suffice it to say that when the supply of money for new loans increases, lenders will write business on increasingly aggressive terms and with less regard to downside. When loans written with low interest coverage are combined with an economic downturn that reduces cashflows, default rates spike.

An analysis of different debt securities

The range of available fixed income investments covers almost the entire risk spectrum, from securities that are generally viewed as risk free (government bonds) to leveraged portfolios of high yield bonds targeting returns above 20%. Below is a brief description of the key characteristics of a selection of debt securities, in particular those that have been used to drive returns in some recent structured credit investments.

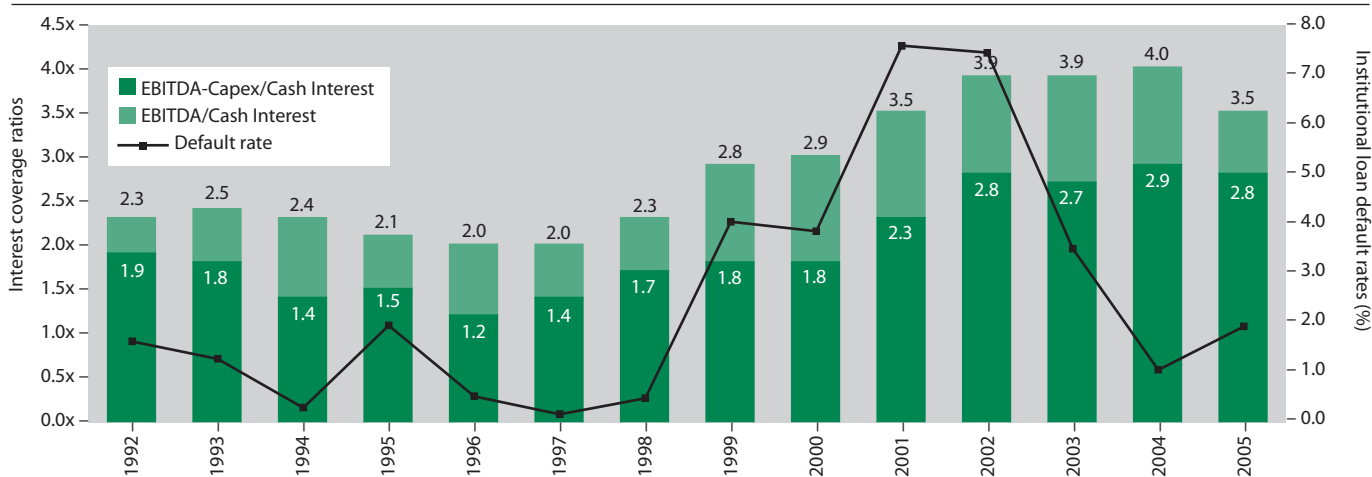
Investment grade bonds – these are unsecured, fixed rate bonds issued by investment grade companies (companies bearing a credit rating of BBB- or higher). Investment grade bonds offer a fixed rate coupon, therefore investors are exposed to interest rate risk. Also, as unsecured obligations of the borrower, if the borrower fails to make principal or interest payments, the amount recovered by the lender tends to be lower than is the case for secured loans. Between 1982 and 2004, recoveries on defaulting investment grade bonds averaged approximately 45 cents in the dollar and there have been spectacular defaults by investment grade borrowers where recoveries were negligible (for

Figure 3: An example of credit quality – airlines

| | SINGAPORE AIRLINES | QANTAS AIRWAYS | DELT AIR LINES |
|--------------------------|--------------------|----------------|-----------------------|
| EBITDA/TOTAL INTEREST | 14.47x | 3.96x | -1.07x |
| DEBT TO DEBT PLUS EQUITY | 14.3% | 48.9% | -ve shareholder funds |
| S&P CREDIT RATING | Not rated | BBB+ | CC |
| FYE | March 2006 | June 2005 | December 2005 |

Source: Bloomberg

Figure 4: Interest coverage ratios and US senior loan default rates – 1992-2005



Source: S&P Leveraged Commentary and Data, S&P/LSTA Leveraged Loan Index, Credit Suisse Leveraged Finance Strategy Outlook 2006

example, WorldCom and Parmalat). Offsetting this is that the default rates for investment grade debt are well below default rates for sub-investment grade debt. From 1980 to 2003, the cumulative average default rate over five years for investment grade bonds (bonds rated AAA to BBB-) was 1.31% (approximately 0.26% per annum). Including lower rated investment grade bonds (BBB rated), the five-year cumulative default rate was only 2.38% (approximately 0.48% per annum).¹

High yield bonds – further along the risk spectrum, high yield bonds offer lenders a high yield for lending to sub-investment grade borrowers (those with BB+ credit ratings and lower). These bonds are also fixed rate, unsecured obligations of the lender. As they are issued by companies with lower credit ratings (that is, they are more speculative), not surprisingly, they have higher default rates. From 1980 to 2003, the five-year cumulative default rate for high yield bonds was 21.58% (approximately 5.4% per annum) and average recoveries on high yield bond defaults were lower than recoveries on investment grade bonds. This reflects that borrowers are more highly geared and that many of the companies that issue high yield bonds also issue senior secured loans (discussed below), and the senior lenders take security over all of the assets of the borrower so, in theory, high yield lenders do not receive anything until all senior debt has been repaid.²

Senior secured loans – these loans are made by banks to their corporate borrowing clients with sub-investment grade credit ratings, hence these bonds have a higher probability of default than investment grade bonds. However, lenders have a very different experience to investment grade bond lenders should a default occur.

These loans represent the first obligation to be repaid in the event of default, ranking ahead of equity but also ahead of unsecured debt such as high yield bonds. “Secured” refers to the fact that the borrower has pledged all of its assets to the lender to support its obligation to repay. Senior secured loans are floating rate instruments, may be repaid at any time by the borrower, and generally include a series of financial covenants, a dictionary definition of which is a “solemn promise”. An example of a covenant in a senior secured loan would be an undertaking by the borrower to maintain a certain level of interest coverage. The consequence of breaking this would be that the borrower is technically in default (notwithstanding that the borrower may be continuing to make all loan payments), giving the lender the right to actions such as preventing any dividends being paid to equity investors, sweeping surplus cash to accelerate loan repayments, forcing the sale of assets, curtailing capital expenditure, and so on. The benefit of covenants is clear – they provide lenders with early warnings of financial deterioration and the opportunity for early intervention.

Because senior secured loans are made to sub-investment grade borrowers, these bonds experience higher rates of default. However, because they are

secured, they also experience higher recovery rates. From 1992 to 2005, default rates averaged 2.6% per annum however recoveries averaged 82%.³

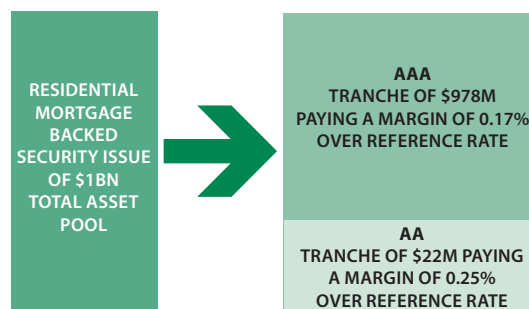
Asset-backed securities – these are bonds backed by pools of assets. A special purpose trust is set up to own the assets and the acquisition is funded by the asset-backed securities. The assets being used to generate the cash flows to service the debt have been sold into the special purpose trust by the financial institutions that originated the assets and include residential mortgages, commercial mortgages, credit card receivables, student housing loans, and lease receivables. The asset-backed securities are typically tranching into different repayment priorities and will carry different credit ratings. Figure 5 provides an indicative profile of the asset-backed securities that might be issued out of a residential mortgage-backed trust. Default and recovery statistics for asset-backed securities will vary according to the underlying asset type, but for any given credit rating band will have default rates broadly similar to that for bonds rated investment grade.

Emerging market debt – this debt is issued by emerging countries (for example those in Latin America, Eastern Europe, Africa and parts of Asia). It carries greater credit risk compared to sovereign debt issued by higher rated industrialised countries, and so carries a higher credit spread. It tends to be fixed rate and long term. Emerging market countries are characterised by an underdeveloped or developing commercial and financial infrastructure, with significant potential for economic growth. Debt ratings are below investment grade and the country may have a recent history of defaulting or rescheduling government debt.

Risk and return

Figure 6 (overpage) highlights historical returns across the credit spectrum and the risk incurred to achieve those return. The JPM Emerging Markets Index tracks the total returns for US dollar-denominated debt issued by thirty two emerging markets nations. The Lehman Aggregate Bond Index tracks the performance of investment grade bonds. The Credit Suisse High Yield Index shows the performance of high yield or “junk bonds”. The Merrill Lynch ABS Index shows

Figure 5: Residential mortgage-backed security



Source: Macquarie Bank Ltd

the performance of a range of asset-based security asset classes that have investment grade ratings. The Credit Suisse Leveraged Loan Index provides performance data for sub-investment grade senior secured loans.

For the period in question, emerging market debt provided the highest returns, with the highest volatility. However, the standout in terms of risk/return trade off was senior secured loans, generating a reasonable headline return, but doing so with low volatility.

This is obviously historical data and does not shed light on what the future holds. One thing is certain, however – the future will not be the same as the past. Senior secured loans have been a standout performer in the period shown, resulting in record investment inflows and therefore falling credit spreads. However, the market has retained credit discipline and the interest cover ratios of loans being written in the current environment is holding at very sound levels.

Like other asset classes, credit markets provide a range of investment opportunities and identifying the best one is easy with 20:20 hindsight. Active management of credit exposures by an experienced manager will provide the potential to access the best opportunities.

Determining how much of any given credit-linked asset should be included in a portfolio is a question beyond the scope of this paper. However, an examination of the return correlations between these credit-linked asset classes (Figure 7) highlights that there is potential

to generate diversification benefits even within the fixed income basket of diversified portfolios.

Why is the use of leverage appropriate?

This paper has explored several ways to access credit risk to derive returns. Leverage can be used to enhance those returns. Introducing leverage to investment propositions can give rise to a degree of nervousness – leverage increases risk. However, if ever there was an asset class that could tolerate more leverage than we are used to, it is loans and bonds. Consider the four big banks here in Australia. Each has a Tier One capital ratio of about 10%, meaning that their shareholders equity accounts for 10% of their total assets, while the remaining 90% is funded by borrowings.

To further amplify this point, consider two baskets of assets. The first is comprised of \$100 million of floating rate AAA rated securities. The second is comprised of \$100 million of sub-investment grade, floating rate bonds. Assuming the market is willing to lend money to acquire these baskets of securities, how much is it appropriate to borrow to buy them? It is difficult to answer this question with a “one size fits all” response. It will depend on your overall risk tolerance but, generally speaking, you will be much more comfortable borrowing more to invest in the AAA rated basket than the sub-investment grade basket. Put another way, a lower level of risk inherent in the assets will allow you to add more risk via leverage. Even if you took the opposite view and wanted to borrow more to buy the sub-investment grade basket, the market would not lend you as much to buy it. As of early August 2006, the market would lend \$99 million to buy \$100 million of AAA rated and AA rated securities, and approximately \$85 million to buy \$100 million of sub-investment grade securities.

How do you determine the right amount of leverage for a given basket of securities? The answer depends on a range of factors including the cost of the leverage (it does not make sense to use leverage if it costs more than the assets you are looking to acquire). A very useful tool is the historical performance of the asset class, focusing in particular on the volatility of returns.

For example, Figure 8 presents the unleveraged

Figure 6: Asset class annualised returns and volatility 1992-2005

| | AVG RETURN (%PA) | STD DEVIATION (%PA) ¹ | SHARPE RATIO |
|------------------------------------|------------------|----------------------------------|--------------|
| JPM EMERGING MARKETS INDEX | 16.34 | 17.40 | 0.79 |
| LEHMAN AGGREGATE BOND INDEX | 6.74 | 4.11 | 0.72 |
| CREDIT SUISSE HIGH YIELD INDEX | 8.95 | 6.59 | 0.80 |
| MERRILL LYNCH ABS INDEX | 6.05 | 2.26 | 0.98 |
| CREDIT SUISSE LEVERAGED LOAN INDEX | 6.71 | 2.36 | 1.22 |

Source: Credit Suisse, Ibbotson Associates, Bloomberg, Credit Suisse Leveraged Finance Strategy Outlook

Figure 7: Asset class correlations – January 1992 to September 2005

| | US LONG-TERM GOV'T DEBT | MERRILL LYNCH ABS INDEX | LEHMAN AGGREGATE BOND INDEX | JPM EMERGING MARKETS INDEX | CREDIT SUISSE HIGH YIELD INDEX |
|------------------------------------|-------------------------|-------------------------|-----------------------------|----------------------------|--------------------------------|
| MERRILL LYNCH ABS INDEX | 0.81 | | | | |
| LEHMAN AGGREGATE BOND INDEX | 0.94 | 0.91 | | | |
| JPM EMERGING MARKETS INDEX | 0.32 | 0.31 | 0.40 | | |
| CREDIT SUISSE HIGH YIELD INDEX | 0.11 | 0.06 | 0.20 | 0.50 | |
| CREDIT SUISSE LEVERAGED LOAN INDEX | -0.05 | -0.14 | -0.06 | 0.04 | 0.48 |

Source: Credit Suisse, Ibbotson Associates, Credit Suisse Leveraged Finance Strategy Finance Outlook 2006

performance of the Senior Secured Loan Fund managed by Four Corners Capital Management (investment manager of a range of structured credit investments issued by Macquarie). While this period represents a little over four years of data, it does encompass the tail end of the credit crisis in 2001 and 2002 when default rates for senior secured loans were in excess of 7% per annum.⁴ A series of theoretical returns has been derived by applying varying degrees of leverage (at market costs) to the unleveraged returns. Finally, the average annualised return, standard deviation of monthly returns and Sharpe Ratio has been calculated for each scenario. Applying leverage to the fund enhanced returns without a material deterioration in the Sharpe Ratio. It is worth noting that the results are not attributable to the manager's skill in generating outperformance, but rather a result of it matching the return of the index, with less volatility. The net of fees return on an unleveraged basis was 5.8% per annum with a standard deviation of 1.1% per annum, compared to a total return and standard deviation of 5.5% per annum and 1.9% per annum respectively from the S&P/LSTA Index over the period.⁵

Conclusion

The days of having to allocate the entire fixed income component of a portfolio to government bonds or mortgage funds are gone. The range of innovative fixed income investments now available has never been greater and presents a far greater opportunity set in constructing the fixed income portfolio. There is now a substantial range of choice in underlying assets and risk profile. Selective use of leverage can be a useful tool in enhancing the returns generated from credit risk. Conservative leveraging of a range of credit-linked assets managed by experienced investment managers gives access to innovative structured credit products that were previously the domain of large institutional investors. ■

ENDNOTES

1. Standard & Poor's LossStats™ Database, 27 January 2004.
2. Standard & Poor's LossStats™ Database, 27 January 2004.
3. Standard & Poor's LossStats™ Database, 27 January 2004, Credit Suisse 1992-2004.
4. Credit Suisse *Leveraged Finance Strategy Outlook 2006*.
5. Standard & Poor's/LSTA Leveraged Loan Index.

Figure 8: Analysis of impact of leverage on returns

| SENIOR SECURED LOAN FUND MANAGED BY FOUR CORNERS CAPITAL | 1:1 LEVERAGE (50% DEBT) | 6:1 LEVERAGE (83% DEBT) | 12:1 LEVERAGE (92% DEBT) |
|---|----------------------------|----------------------------|-----------------------------|
| AVERAGE MONTHLY RETURN (%PA) | 8.22 | 20.13 | 37.99 |
| WORST ROLLING 12-MONTH RETURN (%) | 5.21 | 9.02 | 14.74 |
| STD DEVIATION (%PA) | 2.16 | 6.66 | 13.43 |
| SHARPE RATIO | 2.76 | 2.68 | 2.66 |

Notes: Performance is net of fees, since inception in February 2002 to 31 May 2006.

Source: Macquarie Bank Ltd, Four Corners Capital Management, LLC

ABOUT THE AUTHOR



Peter Lucas is an Executive Director of Macquarie Bank Ltd. He joined as an Associate Director in 1996 after four years at Qantas as Assistant Treasurer Capital Markets and nine years at KPMG in the Audit and Advisory Division. In January 1999, Peter was involved in the formation of Macquarie Financial Products, a business providing retail investors with structured investment products. Since then, he has been responsible for developing a range of investment products including the Macquarie Fusion Funds, Macquarie Fortress Notes and Macquarie reFleXion Trusts. Peter has a Commerce degree from the University of New South Wales and is an Associate of the Institute of Chartered Accountants.

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