The Euromoney International Debt Capital Markets Handbook 2003

A special review by Moorad Choudhry
Sales and marketing, EMEA structured finance services, JPMorgan Chase Bank

Combining securitisation and trading in credit derivatives: an analysis of the managed synthetic CDO

JPMorgan Chase Bank

The collateralised debt obligation (CDO) was a natural advancement of securitisation technology, first introduced in 1988. A CDO is essentially a structured finance product in which a distinct legal entity known as a special purpose vehicle issues bonds or notes against an investment in cashflows of an underlying pool of assets. These assets can be bonds, commercial bank loans or a mixture of both bonds and loans. Originally CDOs were developed as repackaging structures for high-yield bonds and illiquid instruments such as certain convertible bonds, but they have developed into sophisticated investment management vehicles in their own right.

Through the 1990s CDOs were the fastest growing asset class in the asset-backed securities market, due to a number of features that made them attractive to issuers and investors alike. A subsequent development was the *synthetic* CDO, a structure that uses credit derivatives in its construction, and which is the subject of this article.

THE CDO AS A SECURITISED PRODUCT

A *cashflow* CDO is represented by an issue of notes whose interest and principal payments are linked to the performance of the underlying assets of the structure. There are many similarities between CDOs and other asset-backed securities (ABS). The key difference between them is that the underlying collateral pool in a CDO is generally (though not always) actively managed by a collateral portfolio manager. Generally CDOs feature a multi-tranche overlying note structure, with a number of issued securities, most or all of which are rated by one or more of the public credit ratings agencies.

The priority of payment of the issued securities reflects the credit rating for each note, with the most senior note being the highest rated. The term *waterfall* is used to refer to the order of cashflow payments. Sufficient underlying cash flows must be generated by the issuing vehicle in order to meet third-party agency fees and all note issue liabilities.

CDOs exist in two main types, *balance sheet* CDOs and *arbitrage* CDOs. Balance sheet CDOs are most akin to a traditional securitisation; they are created to remove assets from the balance sheet of the originating bank or financial institution, usually to reduce regulatory capital requirements, increase return on capital or free up lending lines. An arbitrage CDO is created when the originator, who may be a bank or fund manager, wishes to exploit the yield differential between the underlying assets and the overlying notes. This may be achieved by active management of the underlying portfolio, which might consist of high-yielding or emerging market bonds. Arbitrage CDOs are categorised further into *cash flow* and *market value* CDOs.

Banks and financial institutions use CDOs to diversify their sources of funding, to manage portfolio risk and to obtain regulatory capital relief. Investors are attracted to the senior notes in a transaction because these allow then to earn relatively high yields compared to other asset-backed bonds of a similar credit rating. Other advantages for investors include:

- exposure to a diversified range of credits, some of which an investor may be unable to access in the cash market due to regulatory restrictions or illiquidity;
- access to the fund management and credit analysis skills of the portfolio manager; and
- generally, a lower level of uncertainty and risk exposure compared to a single bond of similar rating.

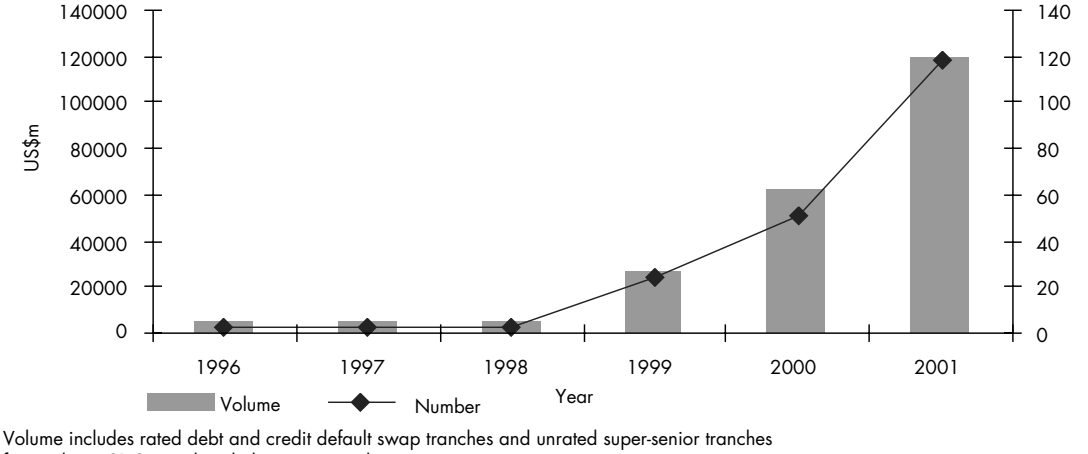
A good overview of CDOs is given in Fabozzi and Goodman (2001).

SYNTHETIC CDOS

The ongoing development of securitisation technology has resulted in more complex structures, illustrated perfectly by the synthetic CDO. These were introduced to meet differing needs of originators, for whom credit risk transfer is of more importance than funding considerations. Compared with conventional cashflow deals, which feature an actual transfer of ownership or *true sale* of

Exhibit 1

CDO market volume growth in Europe



Volume includes rated debt and credit default swap tranches and unrated super-senior tranches for synthetic CDOs, and exclude equity tranches

Source: Moody's

the underlying assets to a separately incorporated legal entity, a synthetic securitisation structure is engineered so that the credit risk of the assets is transferred by the originator of the transaction, from itself to the investors, by means of credit derivative instruments. The originator is therefore the credit protection buyer and investors are the credit protection sellers. This credit risk transfer may be undertaken either directly or via an SPV.

Using this approach, underlying or *reference* assets are not necessarily moved off the originator's balance sheet, and the primary objective is to achieve risk transfer rather than balance sheet funding. The synthetic structure enables removal of credit exposure without asset transfer, so may be adopted for risk management and regulatory capital relief purposes.

The first synthetic deals were originated in the US market, while the first deals in Europe were originated in 1998. The growth in Europe has been rapid; the total value of cash and synthetic deals in Europe in 2001 approached US$120bn, and a growing share of this total has been of synthetic deals. Exhibit 1 illustrates market volume in Europe.

Motivations

Differences between synthetic and cash CDOs are perhaps best assessed using the different cost-benefit economics of issuing each version. The motivations behind the issue of each type usually also differ.

The originators of the first synthetic deals were banks who wished to manage the credit risk exposure of their loan books, without having to resort to the administrative burden of true sale cash securitisation. They are a natural progression of credit derivative structures, with single name credit default swaps being replaced by portfolio default swaps. In their partially funded form they can be "de-linked" from the sponsoring institution, so that investors do not have any credit exposure to the sponsor. The first deals were introduced (in 1998) at a time when widening credit spreads and the worsening of credit quality among originating firms meant that investors were sellers of those cash CDOs that had retained a credit linkage to the sponsor.

The economic advantage of issuing a synthetic versus a cash CDO can be significant. Put simply, the net benefit to the originator is the gain in regulatory capital cost, minus the cost of paying for credit protection on the credit default swap side. In a partially funded structure, a sponsoring bank will obtain full capital relief when note proceeds are invested in 0% risk weighted collateral such as treasuries or gilts. The super senior swap portion will carry a 20% risk weighting.[1] In fact a moment's thought should make clear to us that a synthetic deal would be cheaper: where credit default swaps are used, the sponsor pays a basis point fee, which for AAA security might be in the range 10bps-30bps, depending on the stage of the credit cycle.

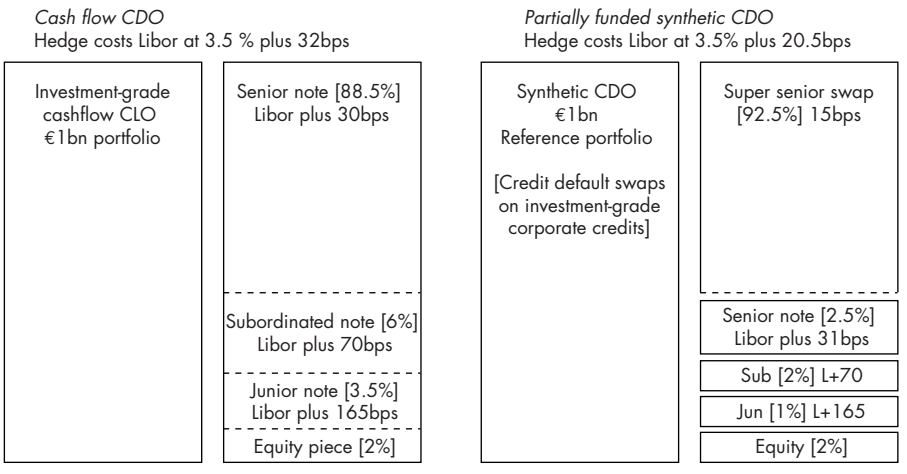
In a cash structure where bonds are issued, the cost to the sponsor would be the benchmark yield plus the credit spread, which would be higher compared to the default swap premium. This is illustrated in the example shown in Exhibit 2, where we assume certain spreads and premiums in comparing a partially funded synthetic deal with a cash deal. The assumptions are:

- that the super senior credit swap cost is 15bps, and carries a 20% risk weight;
- the equity piece retains a 100% risk-weighting; and
- the synthetic CDO invests note proceeds in sovereign collateral that pays sub-Libor.

Synthetic deals can be unfunded, partially funded or fully funded. An unfunded CDO would be comprised wholly of credit default swaps, while fully funded structures would be

Exhibit 2

Synthetic and cash CDOs



Regulatory capital relief
Cash CDO
Capital charge on assets reduces from 8% (100% RW) to 2% (equity piece only now 100% RW)
Regulatory capital relief is 6%
Synthetic CDO
Capital charge on assets reduces from 8% (100% RW) to 3.48% (equity piece plus super senior swap at 20% RW)
Regulatory capital relief is 4.52%

Source: Moody's

arranged so that the entire credit risk of the reference portfolio was transferred through the issue of credit-linked notes.

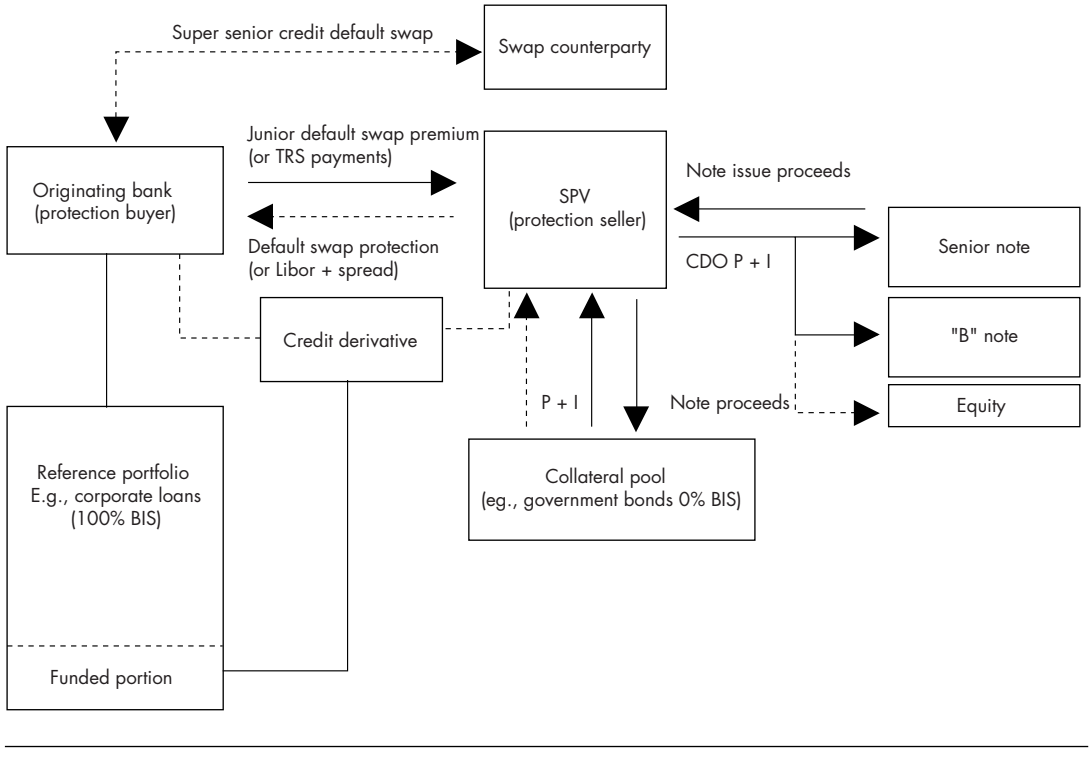
A generic synthetic CDO structure is shown in Exhibit 3. In this generic structure, the credit risk of the reference assets is transferred to the issuer SPV and ultimately the investors, by means of the credit default swap and an issue of credit-linked notes. In the default swap arrangement, the risk transfer is undertaken in return for the swap premium, which is then paid to investors by the issuer. Proceeds from the note issue are invested in risk-free collateral rather than passed on to the originator, in order to de-link the credit ratings of the notes from the rating of the originator.

If the collateral pool was not established, a downgrade of the sponsor could result in a downgrade of the issued notes. Investors in the notes expose themselves to the credit risk of the reference assets, and if there are no credit events they will earn returns at least the equal of the collateral assets and the default swap premium. If the notes are credit-linked, they will also earn excess returns based on the performance of the reference portfolio. If there are credit events, the issuer will deliver the assets to the swap counterparty and will pay the nominal value of the assets to the originator out of the collateral pool. Credit default swaps are unfunded credit derivatives, while CLNs are funded credit derivatives where the protection seller (the investors) fund the value of the reference assets up-front, and will receive a reduced return on occurrence of a credit event.

Exhibit 4 shows a yield comparison of different asset classes in European structured products during February 2002. Exhibit 5 illustrates, for a selected number of synthetic CDOs closed during 2001-2002, the regression of the AAA-rated note spreads against expected maturity. This shows an

Exhibit 3

Synthetic CDO structure



Source: Author's notes

adjusted R^2 of 0.82, which suggests that for a set of AAA-rated securities, the term to maturity is not the only consideration for investors. Other factors that may explain the difference in yields include how the expertise of the asset manager is perceived, level of secondary market liquidity and the placing power of the arranger of the transaction.

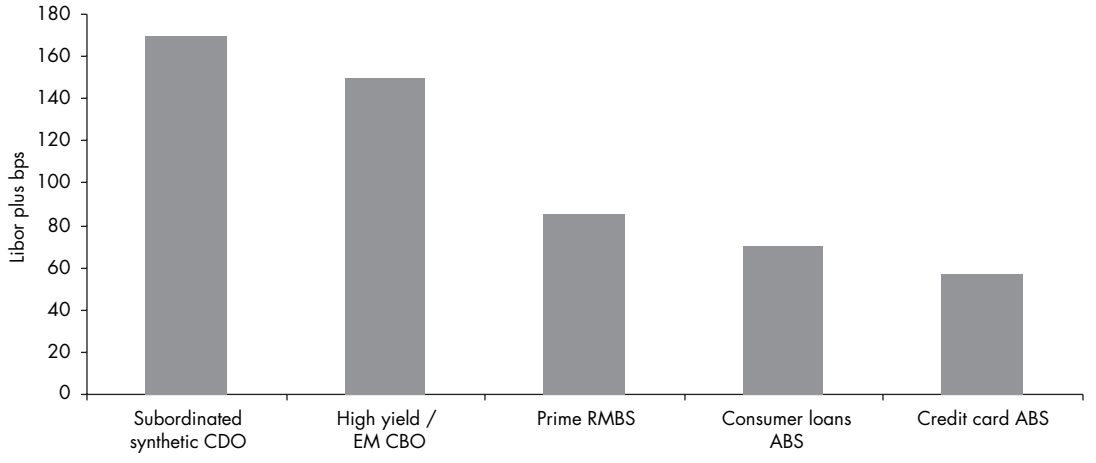
THE MANAGED SYNTHETIC CDO

Managed synthetic CDOs are the latest variant of synthetic CDO structure.[2] They are similar to the partially funded deals we described earlier except that the reference asset pool of credit derivatives is actively traded by the sponsoring investment manager. It is the maturing market in credit default swaps, and resulting liquidity in a large number of corporate credits, that has facilitated the introduction of the managed synthetic CDO. With this structure, originators can use credit derivatives to arbitrage cash and synthetic liabilities, as well as leverage off their expertise in credit trading to generate profit.

The advantages for investors are the same as with earlier generations of CDOs, except that with active trading they are gaining a still-larger exposure to the abilities of the investment manager. The underlying asset pool is, again, a portfolio of credit default swaps. However these are now dynamically managed and actively

Exhibit 4

Comparing CDO yields to other securitisation asset classes - euro assets, February 2002

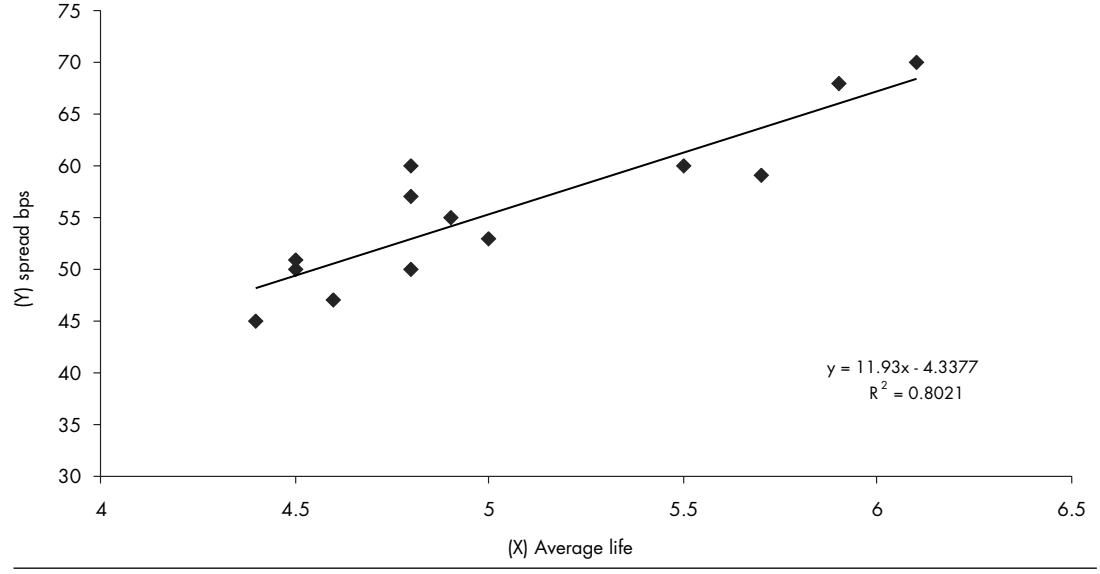


Source: Bloomberg

traded, under specified guidelines. Thus there is greater flexibility for the sponsor, and the vehicle will record trading gains or losses as a result of credit derivative trading. In most structures, the investment manager can only buy protection (short credit) in order to offset an existing sold protection default swap. For other deals, this restriction is removed and the investment manager can buy or sell credit derivatives to reflect its view.

Exhibit 5

AAA spreads as of February 2002 (selected European CDO deals)



Source: Bloomberg

Structure

The structure of the managed synthetic is similar to the partially funded synthetic CDO, with a separate legally incorporated SPV.[3] On the liability side there is an issue of notes, with note proceeds invested in collateral or eligible investments. This is one or a combination of the following:

- a bank deposit account or guaranteed investment contract (GIC) which pays a pre-specified rate of interest;[4]
- risk-free bonds such as US Treasury securities, German Pfandbriefe or AAA-rated bonds such as credit-card ABS senior notes;
- a repo agreement with risk-free collateral;
- a liquidity facility with a AA-rated bank;
- a market-sensitive debt instrument, often enhanced with the repo or liquidity arrangement described above.

On the asset side the SPV enters into credit default swaps and/or total return swaps, selling protection to the sponsor. The investment manager or collateral manager can trade in and out of credit default swaps after the transaction has closed in the market.[5] The SPV enters into credit derivatives via a single basket credit default swap to one swap counterparty, written on a portfolio of reference assets, or via multiple single-name credit swaps with a number of swap counterparties.

The latter arrangement is more common and is referred to as a *multiple dealer* CDO. A percentage of the reference portfolio will be identified at the start of work on the transaction, with the remainder of the entities being selected during the ramp-up period ahead of closing. The SPV enters into the other side of the credit default swaps by selling protection to one of the swap counterparties on specific reference entities. Thereafter the investment manager can trade out of this exposure in the following ways:

- buying credit protection from another swap counterparty on the same reference entity. This offsets the existing exposure, but there may be residual risk exposure unless premium dates are matched exactly or if there is a default in both the reference entity and the swap counterparty;
- unwinding or terminating the swap with the counterparty;
- buying credit protection on a reference asset that is outside the portfolio. This is uncommon as it will leave residual exposures and may affect premium spread gains.

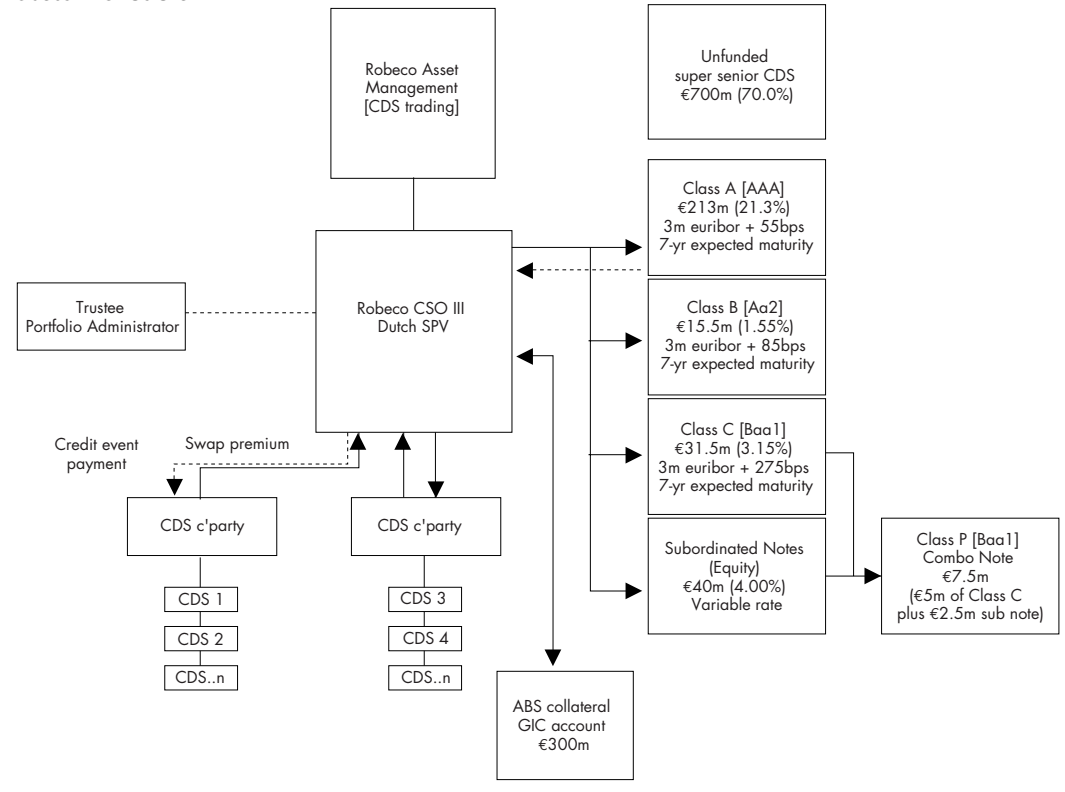
The collateral manager actively manages the portfolio within specified guidelines, the decisions being made by the investment manager. Initially the manager's opportunity to trade may be extensive, but this will be curtailed if there are losses. Trading guidelines will extend to both individual credit default swaps and at the portfolio level.

As with earlier structures, credit default swaps may be cash settled or physically settled, with physical settlement being more common in a managed synthetic deal. In a multiple dealer CDO the legal documentation must be in place with all names on the counterparty dealer list, which may add to legal costs as standardisation may be difficult. Investors who are interested in this structure are seeking to benefit from the following advantages compared to static synthetic deals:

- active management of the reference portfolio and the trading expertise of the investment manager in the corporate credit market;
- a multiple dealer arrangement, so that the investment manager can obtain the most competitive prices for default swaps;
- under physical settlement, the investment manager (via the SPV) has the ability to

Exhibit 6

Robeco III structure



Source: Robeco and Moody's

obtain the highest recovery value for the reference asset.

We now consider a specific managed synthetic deal, Robeco CSO III.

CASE STUDY: ROBECO CSO III B.V.

The latest manifestation of synthetic securitisation technology is the managed synthetic CDO or CSO. In Europe these have been originated by fund managers, with the first example being issued in 2001. Although they are, in effect, investment vehicles, the disciplines required to manage what is termed a "structured credit product" is not necessarily identical to those required for a corporate bond fund.

Investment bank arrangers are apt to suggest that a track record in credit derivatives trading is an essential pre-requisite to being a successful CSO manager. There is an element of reputational risk at stake if a CDO suffers a downgrade; for example during 2001 Moody's downgraded elements of 83 separate CDO deals, across 174 tranches, as underlying pools of investment-grade and high-yield corporate bonds experienced default.[6] Thus managing a CDO presents a high-profile record of a fund manager's performance.

Within Europe during 2001 and 2002 fund managers that originated managed synthetic deals included Robeco, Cheyne Capital Management, BAREP Asset management and Axa Investment Managers. In the second part of this article we look at the Robeco III managed synthetic CDO.

Robeco CSO III B.V.

The Robeco III CDO is described as the first stand-alone, multiple dealer managed synthetic CDO in Europe. It is a €1bn structure sponsored and managed by Robeco Asset Management, based in Rotterdam, Netherlands. The manager can trade in credit default swaps but is limited to purchasing swaps only in order to offset an existing sold protection swap. The motivation behind structuring the transaction was partly the liquidity and depth of the credit derivatives market for European corporate credits, deemed to be greater than the equivalent cash market bonds for the same names. [7]

Name	Robeco CSO III B.V.
Manager	Robeco Institutional Asset Management B.V.
Arrangers	JPMorgan Chase Bank / Robeco Alternative Investments
Closing date	December 15, 2001
Maturity	September 2008
Portfolio	€1bn of credit default swaps
Portfolio administrator	JPMorgan Institutional Trust Services

Other collateral managers in Europe have adopted similar structures to Robeco III. The principal innovation of the vehicle is the method by which the credit default swaps are managed, under a dynamically managed reference portfolio. The addition or offsetting of swaps at different spread levels creates trading gains or losses for the vehicle. The choice of reference credits on which swaps are written must, as expected with a CDO, follow a number of criteria set by the ratings agency, including diversity score, rating factor, weighted average spread, geographical and industry concentration, among others.

The reference portfolio is comprised of between 100 and 130 reference credits, of which at least 90% must be at investment grade rating. The minimum permitted weighted average credit rating at any time is Baa2; on issue the average rating factor was 250-260. The structure is 70% unfunded, as shown in Exhibit 6. The remaining 30% is funded through the issue of credit-linked notes, and after payment of the initial fees and expenses of the issuer, the proceeds of the note issue are invested in the following as collateral:

- €220m invested in a unique ABS security, a credit card-backed bond issued by MBNA Bank and rated AAA, which has a scheduled maturity of September 2008;
- €80m invested in a series of "guaranteed investment contracts" (GIC) paying an average rate of Libor minus 10bps.

The structure is of interest to investors who wish to exploit the liquidity of the credit derivative market for European credits that are not well represented in the cash markets. Investors who wish to diversify across the market can also leverage the expertise of the CDO manager in the synthetic credit market.

Portfolio trading

Upon closure of the transaction, the issuer enters into credit default swaps with counterparties among a pre-selected list of seven swap dealers, building up over the ramp-up period to a maximum of €1bn notional of swaps. At this point the portfolio of default swaps is dynamic, as the issuer may enter into additional default swaps, and unwind or offset existing swaps. The decisions on when and which swaps to trade is taken by the portfolio manager. The issuer sells credit protection through the network of established counterparties; it may buy protection but only to remove an existing reference entity exposure. The sale of credit

Exhibit 7
Robeco CSO III BV tranching structure

Class	*Amount €m*	*%*	*Rating*	*Type*	*Coupon*
Class A	213	21.30%	AAA	Floating	3m euribor + 0.55%
Class B	15.5	1.55%	Aa2	Floating	3m euribor + 0.85%
Class C	31.5	3.15%	Baa1	Floating	3m euribor + 2.75%
Subordinated	40	4.00%	NR	Variable	
Class P	7.5		Baa1	Variable	

Source: Moody's

protection adds a new credit default swap to the portfolio, whereas buying a swap to offset an existing exposure adds a new swap but nets out the exposure. This trading leads to trading gains or losses. Trading gains are to the benefit of the vehicle and will increase the value of the collateral pool.

Each credit default swap is a vanilla single-name contract, under which the counterparty pays the regular credit protection premium to the issuer. On occurrence of a credit event for the reference entity, the counterparty will calculate a net loss amount which is paid by the issuer to the counterparty. The loss amount is defined as the difference between the nominal value of the reference entity and its market value at the time of the credit event. Payments required on the occurrence of credit events, and any trading losses arising from activity in credit default swaps, are paid out of the collateral account.

The portfolio manager must follow certain trading guidelines when adding or removing default swaps. As set out by Moody's[8], the manager may add reference credits to the portfolio only if the total credit default swap notional amount is below €1bn, and if the outstanding loss amount is below €25m. For any single obligor name, the criteria are:

- a minimum rating of Ba3 or above;
- notional limits for single name of €5m, €10m or €12.5m, depending on credit rating.

A reference credit may be removed at any time; however beyond stated loss limits, the following restrictions will apply when removing reference credits:

- there has been a fall in the reference credit default swap premium, so that trading it out creates a gain;
- the premium has increased by 25% (in other words, a kind of "stop-loss");
- the reference entity has been subject to credit rating downgrade.

Reporting

Investors track the performance of the vehicle from information in the periodic investor reports. These are prepared by the Portfolio Administrator, in consultation with the portfolio manager, and distributed on a monthly basis. A separate report is prepared on a quarterly basis and distributed on each payment date. The monthly report includes the following information:

- the principal balance of the collateral pool security;
- the value of cash held in the collateral account and reserve accounts;
- any movement of securities in the collateral account, for instance securities or eligible investments disposed of since the date of the last report;
- detail of any default in collateral securities;
- the aggregate notional value of the synthetic portfolio, and details of each reference entity

held in the portfolio (reference name, swap counterparty, trade date, maturity date, credit rating, fixed spread premium as percentage, notional amount);
- the diversity score;
- compliance test results, including weighted average rating, weighted average spread and weighted average recovery;
- the outstanding loss amount.

The investor report is sent to the issuer, swap counterparties, rating agency and noteholders.

Robeco CSO III is an innovative structure and a creative combination of securitisation technology and credit derivative instruments. Later structures have been introduced into the market that make use of total return swaps as well as credit default swaps, and also remove the restriction on shorting credit. An analysis of the vehicle illustrates how a portfolio manager can utilise the arrangement to exploit its expertise in credit trading, and its experience of the credit derivatives market, to provide attractive returns for investors. As the market in synthetic credit, in Europe at least, is frequently more liquid than the cash market for the same reference names, it is reasonable to expect more transactions of this type in the near future.

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The author would like to thank Ketul Tanna and Chee Hau at JPMorgan Chase, and Edwin Noomen at Robeco, for review comments on an earlier draft.

Notes:

1. This is as long as the counterparty is an OECD bank, which is invariably the case.
2. These are also commonly known as collateralised synthetic obligations or CSOs at in the market. *RISK* magazine has called them collateralised swap obligations, which handily also shortens to CSOs. Boggiano *et al* (2002) refer to these structures as managed variable synthetic CDOs, although the author has not come across this term in other literature.
3. We use the term SPV for *special purpose vehicle*. This is also referred to as a special purpose entity (SPE) or special purpose company (SPC).
4. A GIC has been defined either as an account that pays a fixed rate of interest for its term, or more usually an account that pays a fixed spread below Libor or euribor, usually three-month floating rolled over each interest period.
5. This term is common in the securitisation market: when notes have been priced, and placed in the market, and all legal documentation signed by all named participants, the transaction has *closed*. In effect this is the start of the transaction, and all being well all noteholders will receive interest payments during the life of the deal and principal repayment on maturity.
6. Source: CreditFlux, April 2002.
7. Source: RISK, March 2002.
8. Robeco CSO III B.V., *Pre-sale report*, Moody's Investor Service, December 7, 2001.

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Moorad Choudhry, Chris Green, Clive Kentish, Rogerio Monaco, Nick Procter, and Huw Williams.

Sales and Marketing,

EMEA Structured Finance Services,

JPMorgan Chase Bank, London, UK.