CREDIT DERIVATIVES

- CONCEPTS

- STATE OF THE ART : CUSTOMIZED CONTRACTS

- MARKET POTENTIAL FOR GENERIC CONTRACTS

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DIMENSIONS OF RISK FOR FIXED INCOME PORTFOLIOS

- INTEREST RATE RISK
- CURRENCY EXPOSURE
- CREDIT RISK

RISK MANAGEMENT TOOLS

- INTEREST RATE AND CURRENCY RISK CAN BE EFFECTIVELY MANAGED
- HIGHLY DEVELOPED GLOBAL INTEREST RATE FUTURES AND OPTIONS MARKET
- CURRENCY OPTIONS AND FUTURES
- NO FORMAL DERIVATIVES MARKET FOR CREDIT RISK
- CREDIT IS THE LAST MAJOR COMPONENT OF RISK FOR FIXED INCOME YET TO BE SEGREGATED

MARKET POTENTIAL FOR CREDIT DERIVATIVES

- ENORMOUS
- AGGREGATE VALUE OF U.S. CORPORATE LOANS AND BONDS $1.6 TRILLION
- CORPORATE BOND INVESTORS
    - HEDGE CREDIT RISK OF PORTFOLIO
    - TAKE ON EXPOSURE TO CORPORATE BOND SPREADS
- CORPORATE BOND ISSUERS
    - SPREAD LOCKS
    - SPREAD OPTIONS
- CORPORATE LOAN BORROWERS AND INVESTORS

PIONEERING EFFORTS IN CREDIT DERIVATIVES

- MOST ACTIVITY TO DATE IN CORPORATE LOAN MARKET

- LIMITED TO CREDIT OF A SPECIFIC INSTRUMENT OR BASKET

- HIGHLY CUSTOMIZED, ONE-SIDED TRANSACTIONS

- NOT APPLICABLE TO GENERAL PORTFOLIO MANAGEMENT

- LACK FLEXIBILITY TO MANAGE WIDENING AND NARROWING OF SPREADS ACROSS INDUSTRY OR RATING CLASS

CREDIT DERIVATIVES BASED ON GENERIC SPREADS

- OFFER CONSIDERABLE ADVANTAGE OVER OPTIONS, FUTURES, AND SWAPS LIMITED TO CREDIT ON SPECIFIC INSTRUMENT

- TARGETED ACROSS MAJOR RATING AND INDUSTRY CLASSIFICATIONS

    - AAA, AA, A, BBB, BB, B

    - INDUSTRIAL, FINANCE, TELEPHONE, UTILITIES, TRANSPORTATION

- TWO SIDED OPTION AND FUTURES CONTRACTS

CURRENT STATE OF AFFAIRS

- LARGER MONEY CENTER BANKS MAKING FORAYS INTO HIGH YIELD LOAN DERIVATIVES

- INVESTMENT BANKING HOUSES ALSO TRYING TO DEVELOP MARKET FOR

    - OPTIONS

    - SWAPS

    - SYNTHETIC SECURITIES

- FINANCIAL ENGINEERING IS BEING EXTENDED TO THE DIMENSION OF CREDIT FOR CORPORATE LOAN MARKET

INTERMEDIARIES

- J.P. MORGAN
- BANKERS TRUST
- LEHMAN BROTHERS
- MERRILL LYNCH
- CITIBANK
- GOLDMAN SACHS

APPLICATIONS FOR CREDIT DERIVATIVES IN LOAN MARKET

- <u>ASSET ALLOCATION:</u> ALLOW NONBANK INVESTORS TO PARTICIPATE IN LENDING MARKET WITHOUT BUYING LOANS
- <u>RISK MANAGEMENT</u>: REDUCE EXPOSURE TO OBLIGOR OR SECTOR WITHOUT ACTUAL LOAN SALE
- <u>SPECULATION</u>: ACQUIRE EXPOSURE TO OBLIGOR OR MARKET SEGMENT

NEW MARKET

- PAST 6-12 MONTHS
- HIGH YIELD LOAN MOST ACTIVE AREA
- SEVERAL BILLION DOLLARS IN TRANSACTIONS ALREADY COMPLETED

LOAN CREDIT DERIVATIVES

- DIRECT LOAN SWAPS
    - SINGLE
    - BASKET
- LOAN FOR BOND SWAPS
    - ALLOWS BANK THAT HOLDS LOAN TO SHORT BOND OF SAME ISSUER
    - POTENTIAL LOAN LOSSES OFFSET BY PARALLEL DROP IN BOND PRICE SHOULD CREDIT QUALITY DECLINE
- STRUCTURED NOTES

TYPICAL CONTRACT

- SIMPLE, CUSTOMIZED TRANSACTION
- RETURN TIED TO UNDERLYING ASSET OR BASKET
- <u>LONG</u>: INVESTOR PURCHASES RETURN ON ASSET/BASKET FOR SPECIFIED TIME FOR A FIXED SPREAD
- <u>SHORT</u>: SELLS RETURN ON ASSET OR BASKET FOR SPECIFIED PERIOD

LOAN SWAP AGREEMENT

- EXCHANGE OF CASH FLOWS
    - SINGLE LOAN
    - PORTFOLIO OF LOANS
    - LOAN INDEX
- PURCHASERS BUY CASH FLOWS AND UPSIDE POTENTIAL
- SELLER RECEIVES FIXED SPREAD AND TRANSFERS RISK OF DETERIORATION IN CREDIT

COUNTERPARTY RISK

- COMPARABLE TO OTHER OTC AND SWAP MARKETS
- MAJOR RISK IS CREDITWORTHINESS OF INSTITUTION ON OPPOSING SIDE OF TRANSACTION
- MARKET SEEKING OUT HIGHLY RATED FINANCIAL INSTITUTIONS OR PENSION FUNDS

SINGLE LOAN

- LONG INVESTOR PAYS TO COUNTERPARTY LIBOR PLUS A CONTRACTED SPREAD
- LONG ALSO PAYS ANY DECLINE IN LOAN VALUES OVER DESIGNATED PERIOD
- LONG INVESTOR RECEIVES LIBOR PLUS SPREAD ON LOAN(S) PLUS ANY INCREASE IN PRICE OF LOAN
- BUYER IS PROVIDING GUARANTEE AGAINST LOSSES
- RECEIVES INCREMENTAL RETURN OF 100-150 BASIS POINTS (e.g. LIBOR PLUS 250 LESS FIXED SPREAD OF 100-150 BASIS POINTS)

STRUCTURED NOTES: CITIBANK MINI'S

- MULTIPLE ISSUER NOTE INSTRUMENTS
- 5 YEAR STRUCTURED NOTE WITH PRINCIPAL REPAYMENT LINKED TO A BASKET OF 5 BBB-RATED BONDS
- STRUCTURED NOTE PAYS HIGHER YIELD THAN ANY OF UNDERLYING BONDS
- IF ANY BOND IN BASKET DEFAULTS NOTE IS TERMINATED
- INVESTOR RECEIVES REDUCED PRINCIPAL REFLECTING LOWER MARKET VALUE OF BOND

CITIBANK MINI EXAMPLE

- $25 mm NOTE
- DEFAULTED BOND TRADING AT 55
- REPAY VALUE OF NOTE

$$= [1-(100-55)/100] * \$25mm$$

$$= \$13.75 \text{ mm}$$

LOAN FOR BOND SWAP

- BANK HEDGES AGAINST DECLINING LOAN VALUE BY SELLING SHORT SUBORDINATED BOND OF THE SAME COMPANY
- BANK PAYS OPTION ADJUSTED SPREAD OF BOND PLUS APPRECIATION IN VALUE
- BENEFITS FROM A DECLINE IN BOND PRICE
- HEDGE RATIO ADJUSTED TO REFLECT HIGHER RECOVERY RATES FOR LOANS

LOAN FOR BOND SWAPS: ADDITIONAL RISKS

- SEVERAL BEYOND COUNTERPARTY RISK
- GENERAL PREPAYMENT RISK OF BANK LOANS
- BORROWER WILL REFINANCE AT LOWER SPREAD IF CREDIT QUALITY IMPROVES
- PRICES OF LOANS AND BONDS DO NOT NECESSARILIY MOVE TOGETHER
- IN SOME INSTANCES PRICES OF LOANS AND BONDS CAN MOVE IN OPPOSITE DIRECTION (e.g. STONE CONTAINER)

ARE LOANS BEST ARENA FOR CREDIT DERIVATIVES?

- BANK CULTURE
  - HISTORICALLY NOT RECEPTIVE TO INNOVATIVE PRODUCT
  - LACK OF FORMALIZED PORTFOLIO MANAGEMENT TECHNIQUES
- LOAN DERIVATIVES ARE AN IMPORTANT TOOL FOR BANKS
  - MANAGING DIVERSIFICATION
  - ADJUSTING EXPOSURES
- ASSET ALLOCATION VEHICLE FOR NONBANKS
- BROADER ARENA

GENERIC CREDIT DERIVATIVES

- CORPORATE BOND PORTFOLIO MANAGEMENT
  - HEDGING
  - RETURN ENHANCEMENT
  - ASSET ALLOCATION ACROSS SECTORS
- HEDGING CORPORATE BOND INVENTORY
- LOCKING IN CORPORATE BOND ISSUER CREDIT SPREADS

DYNAMICS OF TYPICAL LOAN SWAP

	PAYS OUT	RECEIVES	RISKS/ COSTS	BENEFITS
LONG	LIBOR PLUS A FIXED SPREAD	CASH FLOWS FROM PORTFOLIO	EXPOSURE TO LOSSES IN PORTFOLIO COUNTER-PARTY RISK	HIGHER PORJECTED CASH FLOW GAIN IN PORTFOLIO VALUE
SHORT	CASH FLOWS FROM PORTFOLIO	LIBOR PLUS FIXED SPREAD	OPPORTUNITY LOSS OF INCREMENTAL CASH FLOW AND POSITIVE CHANGES IN PORTFOLIO VALUES COUNTER-PARTY RISK	INSURANCE FROM LOSSES IN PORTFOLIO

EXAMPLE OF LOAN SWAP WITH INTERMEDIARY

	PAYS	RECEIVES	RISK/REWARD
LONG	LIBOR +125	LIBOR+250	CHANGES IN PORTFOLIO VALUE
INTERMEDIARY	LIBOR +100	LIBOR + 275	50 B.P. COUNTERPARTY RISK
SHORT	LIBOR + 275	LIBOR +100	INSURANCE

LOAN SWAP USING CITIBANK LOAN INDEX

ASSUME:

1) BUYER PAYS LIBOR PLUS 150
2) LIBOR ON 12/31/92 AT 3.00%
   LIBOR ON 6/30/93 AT 3.25%
3) BUYER RECEIVES RETURN ON CITIBANL LOAN INDEX

EXAMPLE:

NONBANK TAKES POSITION IN A SERIES OF TWO SIX MONTH LOAN SWAPS PEGGED TO THE RETURN ON THE CITIBANK LOAN INDEX

	INITIAL INDEX LEVEL	CLOSING INDEX LEVEL	INDEX RETURN	PAY	NET GAIN/ LOSS
12/31/92- 6/30/93	100.00	103.02	3.02%	2.25%	0.77%
6/30/93- 12/31/93	103.02	106.24	3.13%	2.38%	0.75%
TOTAL ANNUAL			6.24%	4.68%	1.56%