



Structured Products Today

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Characterization

- ◆ There is no universally agreed definition of a structured product
 - possible definitions include the following categories

Nonlinearity

CDOs, CLOs

Equity structured notes embedding options

Nontraditional factors

Notes with coupon indexed to volatility

CMDS

Strategy notes

Investments with payoff indexed to the performance of a strategy (e.g. long/short credit)

- ◆ This presentation will focus on structured credit assets

Risk management objectives

Role of Structured Products in Risk Management

- ◆ Structured (credit) products are used by institutional investors to achieve risk and capital management objectives:

Asset/liability matching

Certain institutions (e.g. life insurance) have highly nonlinear liabilities

Economic capital

Maximize the return on economic capital

Regulatory capital

Optimize the regulatory capital requirements (e.g. Basel 2, Solvency 2)

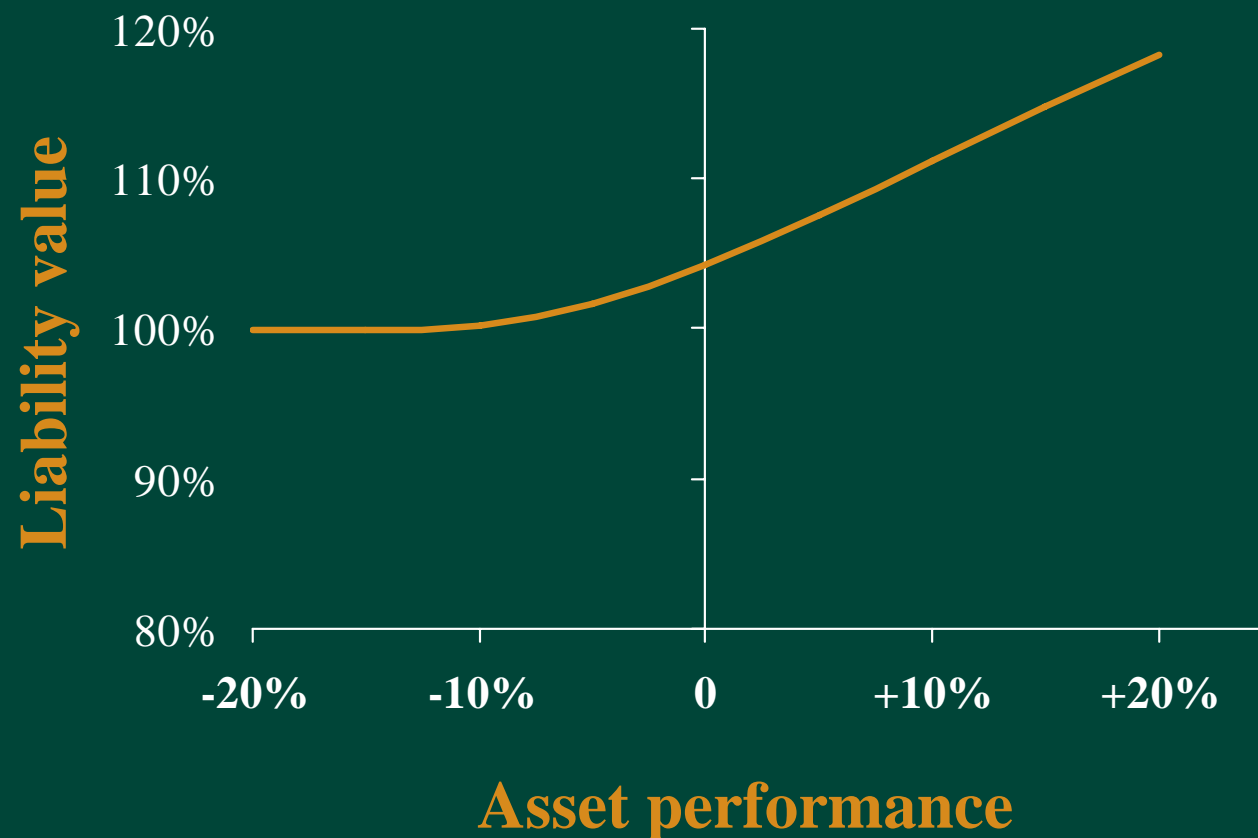
Liquidity management

Institutions with strict liquidity constraints (e.g. banks, reinsurance) may seek to minimize cash usage using leverage

Asset/Liability Matching

- ◆ The liabilities of financial institutions are typically nonlinear: bank deposits, with-profit life liabilities

Example: life insurance liabilities



With-profit policies typically offer minimum return guarantees as well as upside profit participation, resulting in a high degree of convexity in liabilities

Economic Capital

- ◆ Banks, insurance companies, and pension funds typically base their assessment of capital requirement on a VaR approach.
- ◆ Nonlinear payoffs tend to dominate in terms of return on capital.

Example: return on economic capital of iTraxx tranches

	Tranche	Spread	Expected return	Economic capital	Return on capital
Equity	0%-3%	1602bps	1106bps	100.0%	11.1%
	3%-6%	451bps	420bps	43.0%	9.8%
Mezzanine	6%-9%	288bps	282bps	30.3%	9.3%
	9%-12%	185bps	184bps	21.7%	8.5%
Senior	12%-22%	114bps	114bps	15.9%	7.1%
Super-senior	22%-100%	43bps	43bps	4.0%	10.6%
Whole portfolio	0%-100%	106bps	91bps	9.3%	9.8%

Regulatory Capital

- ◆ The amount of capital required by regulation against credit investments is typically a function of rating (e.g. Basel II)
- ◆ Under this approach, the return on regulatory capital of a credit portfolio can be optimized by tranching.

Example: Basel II return on capital

	Basel I	Basel II, standardized	Senior, granular	Base case, granulae	Non-granular
AAA	100% / 50%	20%	7%	12%	20%
AA	100%	20%	8%	15%	25%
A+	100%	50%	10%	18%	35%
A	100%	50%	12%	20%	35%
A-	100%	50%	20%	35%	35%
BBB+	100%	100%	35%	50%	50%
BBB	100%	100%	60%	75%	75%
BBB-	100%	100%		100%	

Liquidity Management

- ◆ The overall liquidity of a credit portfolio may be enhanced by decomposing the portfolio into (i) highly liquid instruments; and (ii) high return, less liquid structures.

Example of liquidity solution

*€100m
investment in
portfolio with
limited liquidity
(e.g. SME loans,
corporate
credit, ...)*



*€75m highly
liquid
investments*

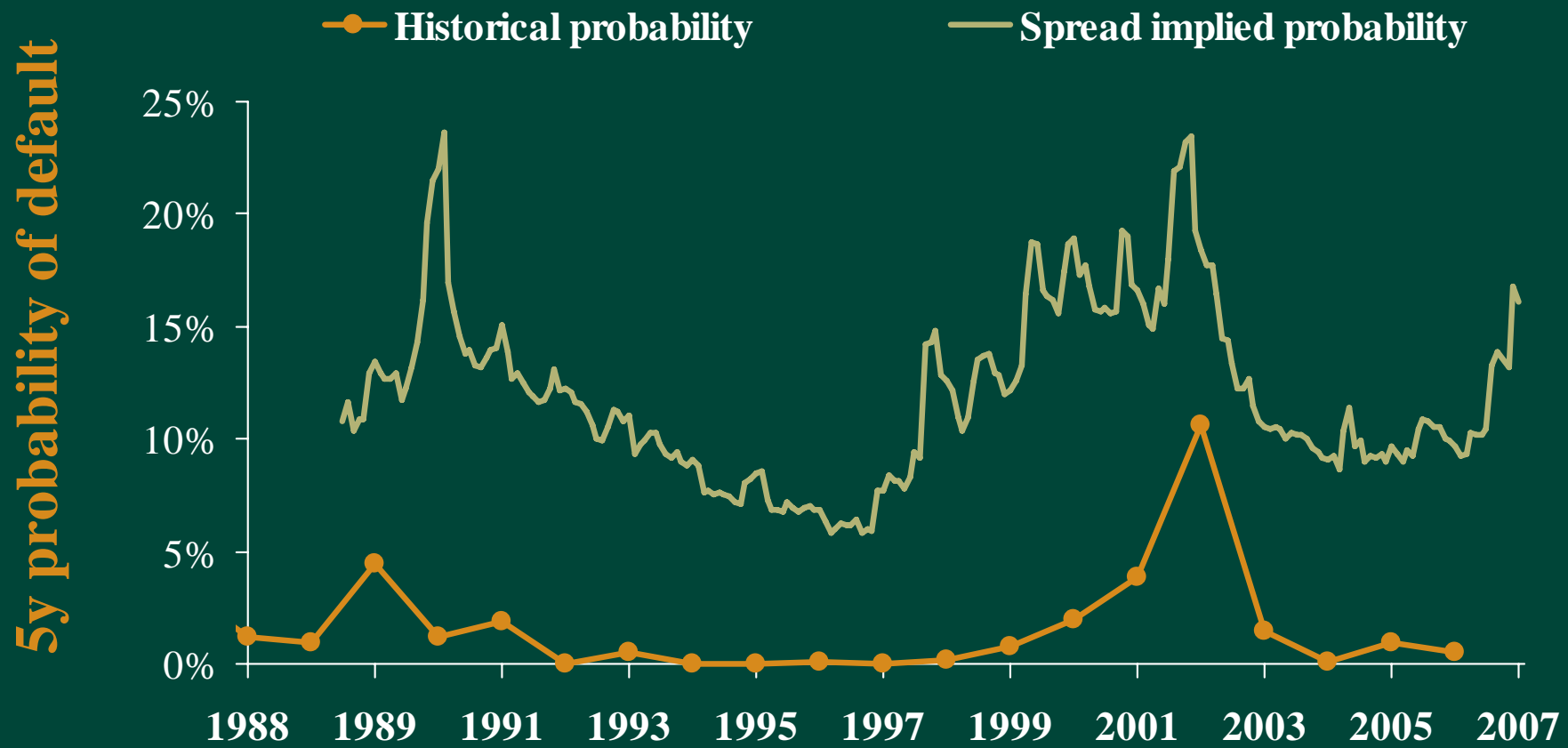
*€25m leveraged
products*

Yield enhancement

Risk Premium

- ◆ Asset classes such as credit remunerate the risk taken by investors with a risk premium

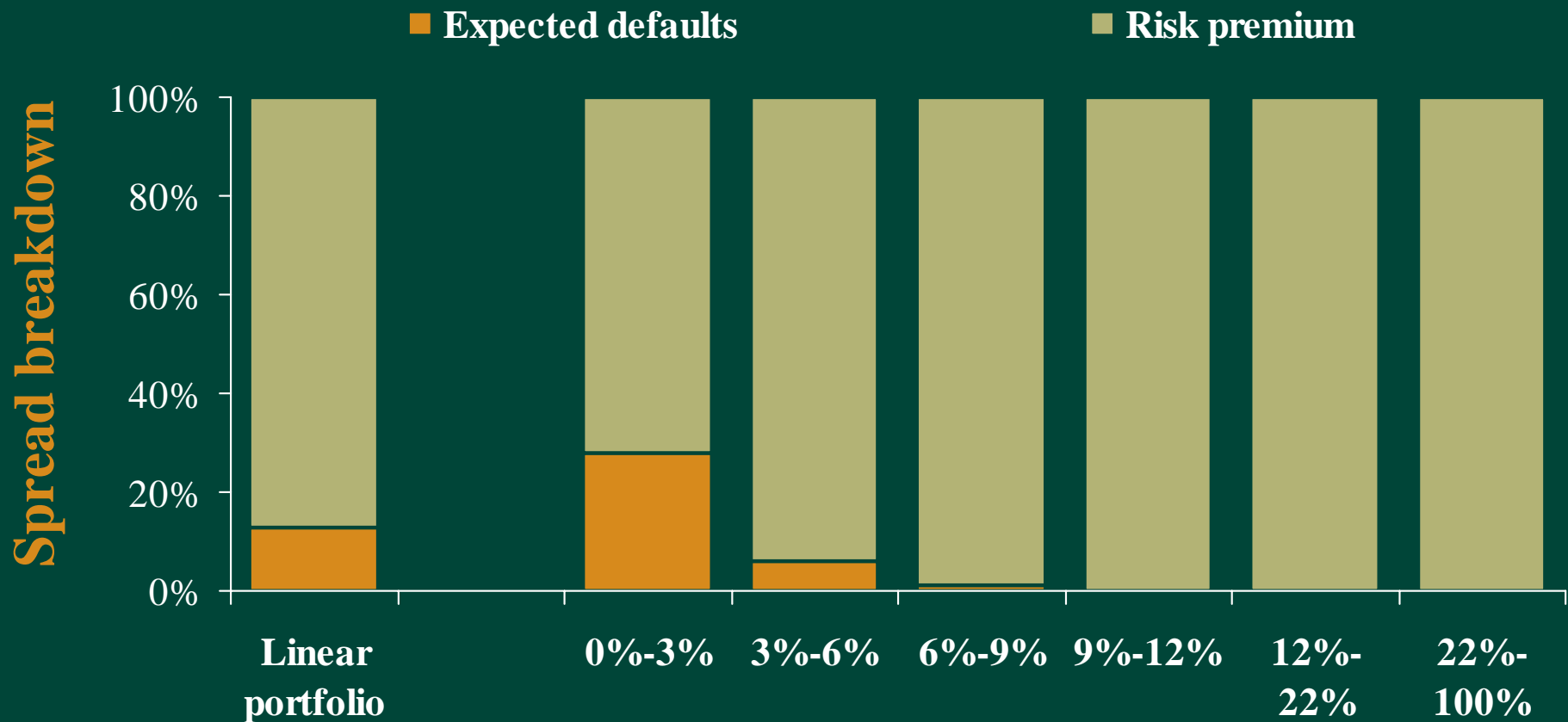
Example: risk premium on 5y Baa U.S. corporate credit



Risk Premium

- ◆ Credit tranches may be used to leverage the risk premium of the asset class

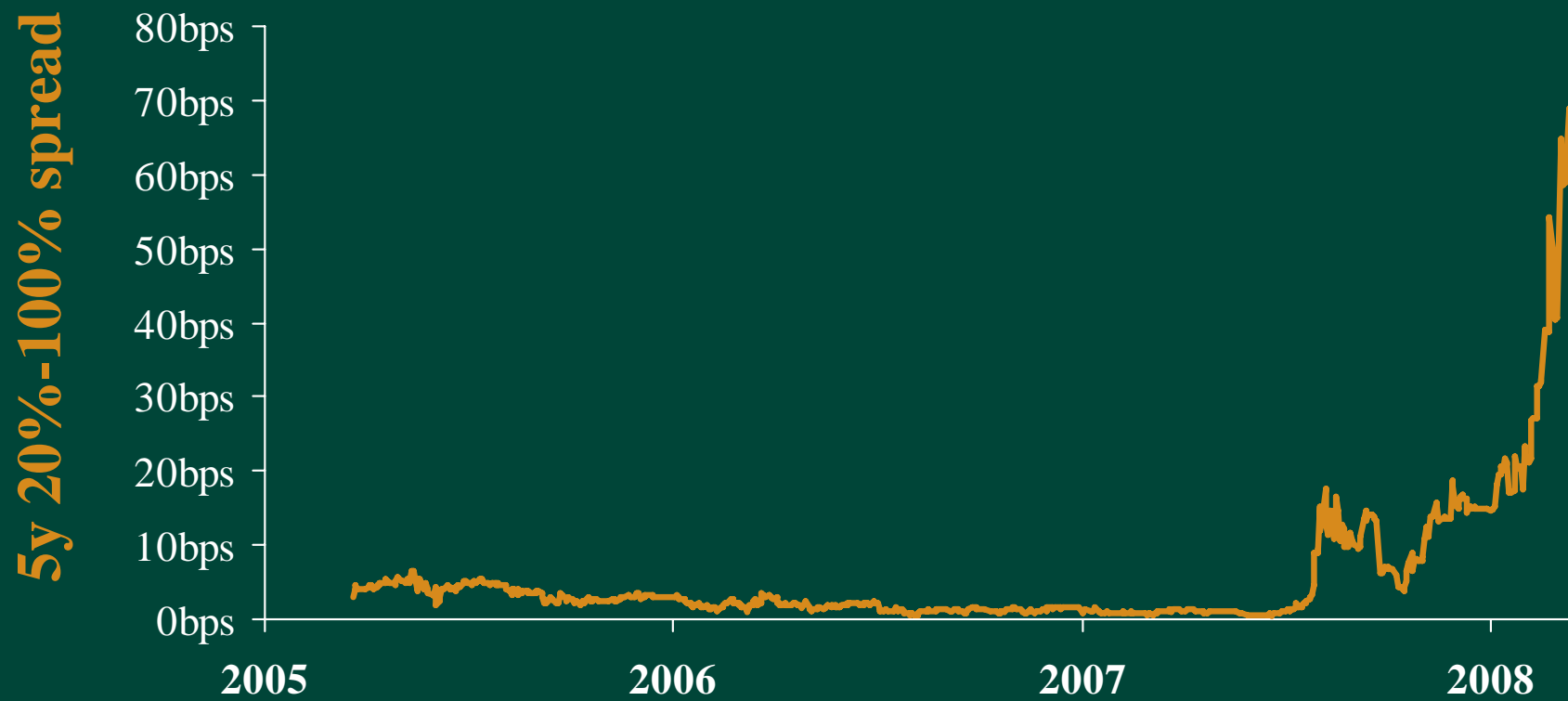
Example: decomposition of 5y iTraxx tranche spreads



Liquidity Premium

- ◆ Since the beginning of the credit crisis, the ‘liquidity premium’ remunerating investments in assets with limited liquidity has increased to unprecedented levels.

Historical time series of super senior spreads



Conclusion

Conclusion

What structured products can be expected to do...

- ◆ Tailor risk profile of asset portfolio (e.g. liability matching, optimization of return on economic capital)
- ◆ Manage liquidity risk
- ◆ Leverage risk premium / liquidity premium

... and what we must be careful to avoid

- ◆ Regulatory arbitrage
- ◆ Engage into 'liquidity transformation' (SIV)
- ◆ Confuse mark-to-market stability and low probability of default

New Structured Products

Liquidity premium

- ◆ Products taking advantage of negative basis
- ◆ Super senior tranches

Risk premium

- ◆ Highly rated asset backed instruments

Optimization of return on capital

- ◆ Structures tailored to liability needs / risk targets, with mitigation of worst-case scenarios for the asset / liability portfolio

Market-neutral strategies

- ◆ Long/short credit structures

Risk Management Challenges

- ◆ Tail correlation between credit and other asset classes
- ◆ Choice of appropriate copula for structured credit instruments
- ◆ Incorporation of liquidity in the risk model
- ◆ Estimation of risk / liquidity premium

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