

# Are structured products rising from the ashes?



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# Contents

- Introduction
- Definition of structured products
  - Market organisation
  - A few typical examples
- Rise and fall of structured products
  - Historical overview
  - Impact of crisis
    - Did they get too complex? What was their role (if any) in the crisis?
  - What's been happening since the crisis?
- Annex: Structured Products Terminology

## Definition of structured products

- What structured products are...
  - Hybrid and flexible investment vehicle
  - May or may not guarantee or protect invested capital at maturity
  - Fixed or variable return linked to the performance of an underlying asset
  - Underlying asset may be a combination of financial instruments (classic and derivative)
- What structured products are not...

## Definition of structured products

- A structured product is composed of at least two financial instruments

Option component



- One or more options
- Option positions might be 'long' or 'short'

Interest Rate  
Component



- Equivalent to a zero-coupon bond
- Funding (which depends on the quality of the issuer) used to finance the 'long' position of option(s) and/or any coupons paid by the structured product

## Why invest in structured products?

- Structured products are a way of changing the risk profile of a certain asset class
  - Client wary of stock markets can be persuaded to invest in a capital-protected note
  - Bond-only investors can be persuaded to move into reverse convertibles – some equity risk. May still receive high coupons

## How is the SP market organised?

### Issuer

Collects funds for their treasury and quotes a funding level that depends on their funding needs (maturity)

### Structurer

Creates 'intelligent' structured products that are a showcase for their asset management's views or the views of a specific investor (taylor-made)

### Trader

Keeps the option trading books and hedges the risk parameters (Greeks) of the bank's option positions traded with the structurer

### Investor

Looking for investment that corresponds to their views /expectations and risk profile. Investor also needs to be aware that 'capital protection' is directly linked to the risk of issuer default (re: Lehman)

## Example

- 5Y Capital-Protected Note linked to DJ Eurostoxx 50



Issuer:	AA-rated bank
Currency:	EUR
Payment Date:	30/06/2010
Maturity:	30/06/2015
Underlying index:	Dow Jones EuroStoxx 50 Index
Strike price:	2,704.80 (closing level of the underlying index on 23/06/2010)
Redemption at maturity:	100% + Max (0%-80% x Performance of underlying index)
Performance of underlying index:	Arithmetical average of the closing levels of the underlying index with quarterly observations over the last 24 months of life of the note
Denomination:	€ 1,000
ISIN:	XS0000000000

# Mechanism of a Capital-Protected Note

Option component

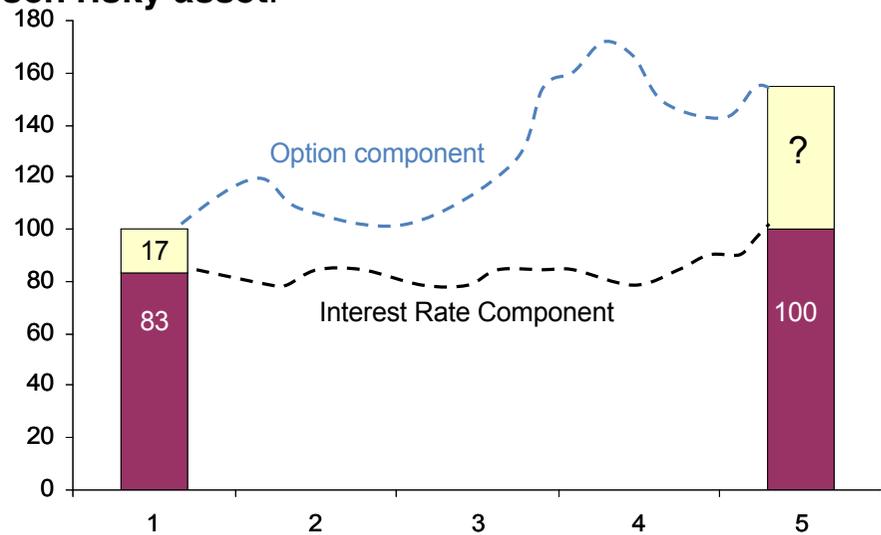
- Long a Call option
- "Right to Buy the Underlying at the Strike Price"

Interest Rate Component

- Equivalent to a zero-coupon bond

- **Interest rate component** is used to guarantee the invested capital at maturity. Part of the client's initial money is invested in a zero-coupon bond, which will be worth 100% of the invested capital at maturity.
- The remainder of the initial money is invested in a **call option** allowing the investor to **participate in the performance of a chosen risky asset**.

The assumption is that 83% of the capital needs to be invested in the interest rate component to guarantee the capital at maturity



## Example

- 1Y Sweet Reverse Convertible on Arcelor Mittal



Issuer:	AA-rated Bank
Currency:	EUR
Payment Date:	30/06/2010
Maturity:	30/06/2011
Underlying Share:	Arcelor Mittal
Strike Price:	€ 24,965 (closing level of the underlying index on 23/06/2010)
Coupon:	8.00%
Barrier:	€ 12,4825 (50% of Strike price, observed only at maturity (European))
Redemption at maturity:	If at maturity, closing level of the Underlying Share > Barrier:100% Otherwise, redemption in (Denomination/Strike) Underlying Shares. Fractions paid in cash.
Denomination:	€ 1,000
ISIN:	XS0000000000

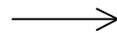
## Mechanism of a Sweet Reverse Convertible

Option component



- Short a Put option with a Knock-in Barrier
- 'Obligation to buy the Underlying at the Strike Price if buyer exercises the right to sell'

Interest Rate  
Component



- Equivalent to a one-year bond
- Applied to the invested capital and the premium generated by the sale of the option component

- **Option component** used to generate a coupon that is substantially higher than the interest rate offered in the money market. The structurer **sells a put option** on the underlying share, giving the buyer of the option the right to sell the share at the strike price.
- The money from the sale of the put option + initial capital is then invested in a one-year bond, the **interest rate component**, which will generate 100% of the initial capital and the high coupon at maturity.
- **However this is not a capital guaranteed product** - if at maturity the barrier level of the put option is reached, the buyer of the put option has the right to sell their shares at the strike price and the investor is forced to use the 100% of initially invested capital to buy the underlying shares at a significantly higher price than current market conditions!

### Taking the previous example:

- if at maturity the Arcelor Mittal share is worth €17, the client receives 100% of his capital + 8% coupon (per denomination €1,000 + €80)
- if however at maturity the Arcelor Mittal share is worth €10, the client receives the 8% coupon and the predefined number of shares (Denomination/Strike price), i.e. €80 + 40 shares (now worth €400!)

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## History and origins

- Options originated out of individual needs for supplies of goods and commodities
- Their *raison d'être* is to reduce risks associated with delivery and price of securities covered by bilateral contracts
- Options first used by a Greek mathematician (Thales) around 640BC
- 1670: options used in Amsterdam for
  - Securitisation of harvest prices (delivery of tulip bulbs)
- In 1973, 3 mathematicians, Myron Scholes, Fischer Black and Robert Merton, developed the famous Black and Scholes equation, used up until today to compute the value of options
- In same year, the Chicago Board Options Exchange became the first stock market in the world for standardised option contracts
- Until the beginning of the 1980s, not much international management and currencies employed were identical to those of the underlyings

## History and origins

- Since 1990, development of international operations - options increasingly used in portfolio management
  - Initially, primarily for hedging and later for trading and structured products
- First structured products appeared after options products had become more accessible and widely used
  - Response to needs of asset management
- Today these are widely available financial instruments used in many fields
- More mathematical pricing models developed from 1990 onwards
  - At first, mainly for institutional investors
- Structured products more widely available to retail investors from 1995 onwards
- Increasingly complex over time and linked to a wide variety of underlying assets

## What about ABS?

- ABS = Asset Backed Securities
- Fixed- or floating-rate bonds backed by loans
- Loans can be of widely varying quality
- ABS backed by subprime mortgages were the problem
- ABS structures became very adventurous:  
eg, ABS backed by credit cards, shipping loans, even ABS backed by other ABS!!
- But: ABS = Structured Investments  $\neq$  Structured Retail Products

## Impact of the crisis

- Lumping together of structured retail products and Subprime ABS in the media - everything called 'Structured Products'
  - Retail investors panic
- Bank defaults raised doubts about 'Capital Guarantees', up until then taken for granted
  - Unclear termsheets and misselling forced some banks to take losses and pay back investors even though it was the issuers who had defaulted
- Volumes of Structured Retail Products sharply down in the immediate aftermath of the Lehman bankruptcy as general flight to quality took place
- Dismantling and restructuring of Structured Products teams across the banking world

## Impact of the crisis

What's been happening since the crisis?

- Products becoming much less complex
- Low interest rate/high volatility environment
  - Capital-guaranteed products in demand but expensive
  - European defensive barriers have risen in popularity
- After Kerviel debacle at Société Générale, Risk Management departments now under more pressure to reprice products and check accuracy of hedges
- Compliance and Legal departments require more insight into documentation. Crisis generated client complaints – not fully informed of all the risks of their investments
- Discussions in political circles of whether to list all Structured Products and scale down the over-the-counter market as much as possible

## Quiz time

- What is the difference between?
  - Autocall
  - Phoenix
  - Athena

## Answer!

- They're all the same!
- different terminologies used at different Banks
  - Phoenix (Société Générale)
  - Athena (BNP)
  - Autocall (Banque de Luxembourg)

## What's a Phoenix then?

- 3Y Phoenix on DJ Eurostoxx 50



Issuer:	AA rated Bank
Payment Date:	28/06/2010
Maturity:	28/06/2013
Underlying Index:	DJ Eurostoxx 50
Strike Price:	2768.27 (closing level of the underlying index on 21/06/2010)
Autocall	If the Underlying closes > 100% of Strike Price at the end of one year, the product will stop immediately and the client will receive the following: Y1: 114%; Y2: 128%; Y3:142%
Barrier:	1660.962 (60% of Strike price, observed only at maturity (European))
Redemption at maturity:	If at maturity, no Autocall has taken place, the closing level of the Underlying Index > Barrier :100% Otherwise, redemption in cash according to the following formula: (Final Price of Underlying Index/Strike Price)



# Annex

## Structured products terminology

## Some key terminology

- Capital-protected / Protection du capital
  - Initial invested capital is fully protected at maturity unless the Issuer defaults
- Capital-at-risk / Capital à risque
  - Initial invested capital is either partially protected at maturity or has no capital protection at all
- Underlying / Sous-jacent
  - Risky asset on which the structured product is linked
- Primary Market / Marché primaire
  - Initial issue – the period during which the product is sold prior to its Payment date
- Secondary Market / Marché secondaire
  - Trading after the Payment date. Product can be sold either over-the-counter or on a stock exchange
- Strike / Prix d'exercice
  - Price of the Underlying at the Strike Date
- Strike Date / Date de fixation du prix d'exercice
  - Date at which the initial level of the Underlying is fixed
- Payment date / Date de paiement
  - Date on which the structured product is launched which generally coincides with the start of the secondary market
- Expiry date / Date d'expiration
  - Date on which the final Level of the Underlying is fixed and then compared to the Strike
- Maturity date / Maturité
  - Last day of life of the investment
- Guaranteed coupon / Coupon garanti
  - One or several coupons are guaranteed to be paid at maturity or during the life of the investment
- Risky coupon / Coupon à risque
  - Pre-defined coupons that may be paid during the life of the investment if certain conditions are fulfilled
- Callable / “Callable”
  - The issuer may redeem the structured product at predefined dates at a predefined price
- Autocallable / “Autocallable”
  - If certain conditions are fulfilled at some predefined dates, the product will be redeemed automatically at a predefined price