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Introduction

BNP Paribas is one of the world’s ten largest banks¹, with total assets of $1.26 trillion and 138,000 employees in 88 countries. A truly global bank, BNP Paribas serves 14,000 corporate and institutional clients and 20 million retail customers around the world.

The Equities & Derivatives group at BNP Paribas employs more than 800 front-office professionals across five regional platforms:

- London
- Paris
- New York
- Tokyo
- Hong Kong

BNP Paribas is a market leader in the equity derivatives space. The group has a full range of structuring, sales and trading capabilities with leading positions in equity and fund derivatives and in equity finance.

Our widely acknowledged trading and quantitative research capabilities ensure our products are priced in an innovative and efficient way, making us competitive on every deal.

A leader in Structured Products

BNP Paribas is an established leader in structured products (rated Aa2/AA), providing solutions to retail distributors, banks and institutional investors around the world.

The range of structured products issued over the last several years has expanded significantly, both in terms of underlying assets and payoff structures. Structured Products designed by BNP Paribas Equities & Derivatives are often linked to equity, through shares or indices (basket or single) but may also be linked to commodities, mutual funds, hedge funds, foreign exchange, interest rates, inflation and other alternative assets. This expansion beyond traditional underlying assets allows the investor to gain access to a wider range of diversification opportunities.
BNP Paribas has a whole team of experienced structurers offering an impressive breadth of product expertise. With the design of future structured products in mind, BNP Paribas is constantly developing and introducing new products that complement investors’ traditional portfolios, which often consist of a mix of equity and fixed income securities. Structured products can be constructed to provide investors with new means of enhancing their existing portfolios and gain access to new markets and diverse asset classes, whilst providing asset protection and yield enhancement.

The BNP Paribas Guide to Structured Products is designed to introduce the reader to Structured Products and how they can enable them to meet their dynamic and distinct investment objectives. The guide begins with the range of design options available, and then explains the basic mechanism of structured products: the marriage of a fixed income security, the zero-coupon bond and an option-like instrument. The guide then provides examples of product structures with an illustration of the associated payoffs. In the appendix, you will find an overview of options, the building blocks of structured product design.

1 According to the Forbes Global 2000 league tables, February 2006.
Structured Product Design

The strength of a structured product lies in its flexibility and tailored approach to investing. In their simplest form, structured products offer investors full or partial capital protection coupled with an equity-linked performance and a variable degree of leverage. They are commonly used as a portfolio enhancement tool to increase returns while limiting the risk of capital loss. Equity derivatives can be extensively customized to meet a specific investor’s risk/return profile and investment objectives. These objectives may include capital protection, diversification, yield enhancement, leverage, regular income, tax/regulation optimization, and access to non-traditional asset classes, among others.

The most common structured product comprises two components:

1. A fixed income security, the zero-coupon bond, which guarantees part or all of the invested principal will be reimbursed.

2. An option-like instrument, which provides a payoff in addition to the fixed income payments. This additional payoff is linked to the performance of an underlying asset, taking the form of either regular coupons or a one-off gain at maturity.

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<th>Distributor Needs</th>
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<td>Product Preference</td>
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<td>Internal Constraints</td>
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<td>Target Fees</td>
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<th>Market Outlook</th>
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<td>Bearish</td>
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<tr>
<td>Sideways</td>
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<td>High Volatility</td>
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<tr>
<td>Low Volatility</td>
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</tbody>
</table>
Why use Structured Products?

Strategies

Structured products can be tailor-made to meet specific investor’s requirements. Different investment strategies can be adopted, including the following:

- **Protection** – protect the portfolio by hedging the risks of existing investments.
- **Enhancement** – increase the portfolio’s return while controlling risks, whereby the structure is designed to enhance the equity return with leverage.
- **Diversification** – diversify with the adjustable risk/return profiles and market cycle optimization capabilities of structured products.

- **Market views** – exploit a market view with more freedom and flexibility.
- **Growth** – capitalize on the market upside while protecting the downside.
- **Income** – benefit from periodic returns with limited risks. This ‘income’ type of structure is built to deliver coupons while protecting capital.

Structured products - an attractive alternative

![Graph showing risk vs. return for different asset classes]

- Options and Futures
- Equities
- Capital protected equity bonds
- Government Bonds
How do Structured Products Work?

In its most basic form, an equity derivative structured product consists of a zero-coupon bond, purchased at a discount, and an option. At maturity, the zero-coupon bond will be redeemed at par, thereby providing capital protection to the investor.

The option, which offers the investor participation in the equity market, pays out the performance of the underlying at maturity, if it is above the strike price (call option).
Example

An investor wants to invest USD 100 over five years, with full capital protection, and exposure to the S&P 500 index upside.

With a five-year US Treasury rate at 4.8, a five-year zero coupon bond is worth 79.1, i.e., 100 in five years is worth 79.1 now. That leaves the structure provider with 20.9 (100 - 79.1) to purchase an option on the S&P 500 and pay for administration costs and commission.

Assuming a five-year S&P 500 Call option costs 23.6, and adding 2 for administration and margin costs, the investor will benefit from an 80% \([20.9 - 2]/23.6\) participation in the S&P 500 upside, while having 100 of his capital protected at maturity.

- **Optimistic Scenario** – if the S&P 500 goes up by 40% over the five years, the investor will achieve a return of 32% (80% x 40%) on top of his initial capital. Redemption at maturity = 132% of principal.
- **Pessimistic Scenario** – if the S&P 500 is down by 30% after five years, the investor will receive 100% of his capital at maturity.
Structured Products at your service

Equity derivatives have continuously evolved since 1992, both in terms of structures (complex combinations, multi-underlyings and exotic features) and form (adapting to new tax laws).

Recently, volatile equity markets and lower interest rates have forced structured products providers to be even more innovative.

As one of the world’s top players in Equity Derivatives, BNP Paribas continues to be a structural innovator. In fast-changing markets, BNP Paribas professionals have an in-depth knowledge of tax and legal matters, with a history of providing Investors with optimal solutions to meet their requirements.

Structured Products from BNP Paribas offer investors an alternative to traditional investment vehicles whatever the investment objective, structured products can provide an improved solution over traditional investments.

Here we present the structured products that we believe serve your needs as an investor:

- Growth Products
- Income Products
- Market Neutral Products
- Commodity-linked Products
- Hybrid Products
- Fund-linked Products
- Systematic Strategies
How to use this handbook

Market-scenario indicator

FOR EXAMPLE,

Means the product is best suited for moderately bearish markets

Means the product is best suited for flat to moderately bullish markets

Means the product is best suited for uncertain markets

Means the product is best suited for uncertain, volatile markets.

Risk Indicator

Means the product offers full capital protection plus a minimum return

Means the product offers full capital protection

Means the capital offers partial capital protection, i.e. a part of the initial capital invested is protected no matter what

Means the product offers soft capital protection, i.e. the initial capital invested (or part of it) is protected unless a worst-case scenario happens

Means the product offers no capital protection
Growth Products

*Growth structured products are positioned as efficient alternatives to direct equity investments, offering investors the highest possible market exposure with limited or no downside risk.*

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**Magic Asian**

**Principles**

- The Magic Asian structure is linked to a basket of underlyings, providing full capital protection at maturity.
- At maturity, the final payoff is the average of the past performances, which are calculated as follow:
  - Individual positive performances are floored at a pre-determined level and uncapped.
  - Individual negative performances are taken at their observed level.

**Benefits**

- Easy high return for moderate performances.
- No cap on performances.
- A fixed coupon is paid on the first year, giving time to the markets to recover.
- Asian feature (see Appendix) to avoid the “bell shape” effect.
Example

- An investor purchases a 5-year Magic Asian on a basket of 20 shares, with semesterly fixings. For each fixing, the basket performance is computed as the average of the shares performance, with positive performance being floored at 20%.

- Here are the recorded performances for three shares at date 1:

Risks

- Investors might not benefit of the whole rise of the underlyings, due to the averaging of performances.

- Capital is protected only if the product is held until maturity.
Principles

The Captibasket structure allows the investor to get exposure to an underlying’s upside up to a given level.

If, at any time, the underlying increases above a pre-determined barrier, its performance is frozen at that level, no matter how sharply it may fall afterwards. This lock-in system secures profits against market reversals.

The final basket performance will be calculated as the average of each individual share performance, including locked performances, with full capital protection.

Benefits

- Optimisation of the performance of shares with a cyclical performance, avoiding “bell curves” (i.e. a sharp rise followed by a sharp fall) thanks to the lock-in system.
- Opportunity to benefit from a temporary rebound.
- Basket diversification which enables the investor to take advantage of different assets’ market cycles or sector rotation.
Example

- An investor purchases a 5-year Captibasket on a basket of 8 shares, offering 100% participation at maturity with a +45% performance lock-in level.

- Each share that reaches the +45% barrier at the end of each year is locked for good at that level, no matter how it may fall or rise afterwards. The investor receives the average of all share performances at the end of the five years, on top of principal, with full capital protection.

Risks

- Investors may not benefit from the whole rise of the underlying shares.

- Capital is protected only if the product is held until maturity.
Himalaya

Principles

Himalaya is a structure providing exposure to a basket of several different underlyings, and offering geographical or asset class diversification. At each observation date, the performance of the best performing underlying is locked-in. This underlying is then permanently removed from the basket. At maturity, the investor receives the average of the locked-in performances.

Benefits

- **Optimized performance** given the automatic selection of each year's best underlying performance.
- **Protection** against market downturns due to the lock-in feature (capturing the best-performing index).
- **Benefit** from sector rotation, market cycles and efficient asset class diversification.
- **Limited risk**, as only the best performances are averaged.

Example

- An investor purchases a 5-year Himalaya 100% indexed on a basket of 10 shares.
- Every sixth month, the best performance within the basket is locked and the corresponding index is removed from the basket. At maturity, the investor receives the weighted average of the locked performances.

Risks

- Once a performance is locked, any additional appreciation of the underlying will not contribute to the product's performance.
- Capital is protected only if the product is held until maturity.
### Himalaya scenarios

#### Optimistic scenario

<table>
<thead>
<tr>
<th>Months</th>
<th>Share 1</th>
<th>Share 2</th>
<th>Share 3</th>
<th>Share 4</th>
<th>Share 5</th>
<th>Share 6</th>
<th>Share 7</th>
<th>Share 8</th>
<th>Share 9</th>
<th>Share 10</th>
<th>Locked-in Performance</th>
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<td>15%</td>
<td>10%</td>
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**FINAL PERFORMANCE**

|          | Equally weighted average of performances | 45% |

#### Pessimistic scenario

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<tr>
<th>Months</th>
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**FINAL PERFORMANCE**

|          | Minimum average performance: 0% | 0% |
Lookback

Principles

The Lookback mechanism records the highest performance of an underlying over either whole or part of the investment period.

Generally speaking, at maturity, the redemption premium is either the average of the best performances or the highest performance, as recorded in the last years, multiplied or not by a gearing, with full capital protection.

Benefits

- Optimised geared performance over the last years of investments.
- A very simple mechanism to record individual performance and make the most of each share in the underlying basket.
- A capital guarantee providing minimum risk for the investor.
Example

- An investor purchases a six-year lookback on the FTSE 100, with monthly observation.
- At maturity, the investor gets 90% of the highest performance of the FTSE over the investment period, with full capital protection.

Risks

- Investors might not benefit from the whole rise of an individual share, due to the capped performance and to the averaging with other shares.
- Capital is protected only if the product is held until maturity.

Lookback scenarios

Optimistic Scenario
Redemption amount = 100% + 90% * 108% = 187% Capital

Pessimistic Scenario
Redemption amount = 100% Capital
Starlight

Principles

The Starlight structure offers the investor an early redemption at an attractive annual yield if the underlying breaches a pre-determined barrier at any observation date during the investment period.

It also allows investors to get full exposure to the underlying’s upside, up to the barrier, with full capital protection at maturity.

Benefits

- Possible early redemption to avoid capital lock up over the whole period.
- Higher participation on the upside than a plain vanilla call in case of moderate growth.
- Strong annual returns in case of market rebound.
Example

- An investor purchases a 6-year Starlight on the FTSE 100.
- At the end of year 3, if the FTSE is at or above 110% of its initial level, an early redemption occurs with a 20% coupon. Similar early redemption features for year 4 and 5.
- At maturity, the product redeems 100% plus the positive average growth of FTSE 100, computed as the average of the monthly performances of the FTSE 100 during the last year.

Risks

- Investors might not benefit from the whole rise of the underlying in case of very bullish scenarios.
- Capital is protected only if the product is held until maturity.

### Starlight investment

<table>
<thead>
<tr>
<th>Initial Investment</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Maturity</th>
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<tbody>
<tr>
<td>100</td>
<td>FTSE has risen by 10% or more.</td>
<td>FTSE has risen by 15% or more.</td>
<td>FTSE has risen by 20% or more.</td>
<td>Receive 100% of capital growth in the FTSE 100, with final year averaging.</td>
</tr>
<tr>
<td></td>
<td>Receive 20% return and closure of investment</td>
<td>Receive 30% return and closure of investment</td>
<td>Receive 40% return and closure of investment</td>
<td>Capital protected if FTSE under-performs.</td>
</tr>
<tr>
<td></td>
<td>Total Return 120</td>
<td>Total Return 130</td>
<td>Total Return 146</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Investment continues if FTSE growth is less than 10%</td>
<td>Investment continues if FTSE growth is less than 15%</td>
<td>Investment continues if FTSE growth is less than 20%</td>
<td></td>
</tr>
</tbody>
</table>
Titan

Principles

The Titan structure enables investors to participate in an underlying at a rate equal to the underlying’s performance, thus returning the square of the performance.

If the underlying does not perform over a first pre-determined barrier, the exposure is fixed at 100%. On the other hand, if the underlying over-performs a second pre-determined barrier, the exposure is frozen at the level of the barrier.

Titan also provides a full capital protection at maturity.

Benefits

- Titan offers the opportunity to over-perform equities if markets are booming.
- Maximum leverage effect, since the performance is squared, in case of strong rebound.
Example

- An investor buys an 8-year Titan, with minimum 100% up to 200% participation in a share basket and 100% principal protection at maturity.

Risks

- If markets are moderately bullish, investors do not benefit from the leverage effect.
- Capital is protected only if the product is held until maturity.

<table>
<thead>
<tr>
<th>Basket Performance</th>
<th>Participation</th>
<th>Final Performance (Participation x Performance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>150%</td>
<td>150%</td>
<td>225%</td>
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<tr>
<td>200%</td>
<td>200%</td>
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<td>250%</td>
<td>200%</td>
<td>500%</td>
</tr>
<tr>
<td>-20%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Certificate Plus

Principles

The Certificate Plus structure provides 100% participation in the underlying performance with an ensured minimum return, provided the underlying has never reached a knock-out barrier during the investment period.

Otherwise, Certificate Plus pays back the underlying performance at maturity.

Benefits

- **Always better performance than the underlying:** Certificate Plus will always at least track the underlying’s performance with a potential to outperform it due to the ensured minimum return.
- High potential redemption, even if the market does not perform.

Variation with Best-of feature on a basket of underlyings

Principles

If none of the underlyings has ever reached a low barrier, there is a full participation in the uncapped upside of the best-performing underlying over the product’s life. Otherwise, the investor receives the final performance of the first index to reach the barrier.

Additional benefits

- Uncapped exposure to a well-diversified basket.
- Potentially 100% of the best performer on top of initial capital.
Example

An investor buys a 3-year Certificate Plus in Euro on DJ Eurostoxx 50, with a 10% minimum return and a 65% down barrier.

Risks

- Limited capital protection - if the price of the underlying decreases below the barrier at any time during the life of the product, the redemption at maturity may be less than the original amount invested.

Certificate Plus scenarios

- Optimistic: Return = +38%
- Neutral: Return = -8%
- Pessimistic: Return = +10%
Income Products

Income structured products are high-yield and alternatives to fixed income investments. They usually redeem principal at maturity and offer an equity-linked coupon, which can be fixed or conditional, or a combination of both.

The structures are designed for investors seeking above-market returns and 100% capital protection in a climate of market uncertainty. More dynamic structures offer less risk-averse investors enhanced returns in exchange for lower principal protection.

Ariane

Principles

The Ariane structure pays at each specified date a minimum fixed coupon plus a variable coupon which decreases with the number of shares within the basket that breach a pre-set down barrier during the product’s life, with a full capital protection at maturity.

Benefits

- High coupons, still above risk-free rates even if one or two shares drop significantly.
- No “all or nothing” gain profile: several opportunities to get a nice coupon.
- Minimum return secured.
Example

- An investor purchases a 5-year Ariane on a basket of 20 shares, offering a variable coupon of up to 10% each year, depending on the number of shares within the basket that decreased by 20% or more over the previous year.

Risks

- In case markets drop significantly and volatility goes up, the investor may only get the minimum protected coupons.
- Capital is protected only if the product is held until maturity.

---

<table>
<thead>
<tr>
<th>Number of stocks having decreased by 20% or more over the year</th>
<th>Coupon paid each year</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>12%</td>
</tr>
<tr>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>4</td>
<td>4%</td>
</tr>
<tr>
<td>More than 4</td>
<td>2%</td>
</tr>
</tbody>
</table>
Cliquet

Principles

The Cliquet structure returns at maturity the sum of the periodic positive performances of the underlying or basket of underlyings, with a periodic restriking of the reference level.

There is a possibility of a floor and a cap of the performances.

Capital is fully protected at maturity.

Benefits

- By locking each month’s performance, the Cliquet structure protects the investor from a last-minute downturn of the underlying.

- The Cliquet structure can have high positive returns even if the underlying has always traded below its initial level, thanks to the periodic restriking.
Example

- An investor purchases a 2-year Cliquet on Dow Jones Eurostoxx Select Dividend 30 Index. The final return at maturity is the sum of the monthly returns over the two year period where the two top months are replaced with the average index monthly return (with the average including the two highest months).

Risks

- Investors might not benefit of the whole rise of the underlying, due to the periodic restriking.
- Capital is protected only if the product is held until maturity.
Coupon Driver

**Principles**

The Coupon driver structure pays a yearly coupon, linked to the performance of a basket of underlying assets, with a full capital protection at maturity.

Yearly coupons are calculated as follows:

At each yearly anniversary date, the level of each share is compared to its initial level.

The X-best performing shares in the basket are set at a fixed performance, and the remaining ones are taken at their level of performance, with or without a cap, X being a number fixed in advance.

The annual coupon is the positive performance of the basket and it might even be floored at a pre-determined positive performance.

**Benefits**

- Coupons are floored at 0% and uncapped.
- High returns, over-performing the basket performance, can be achieved in flat or moderately growing markets.
Example

- An investor purchases a 5-year Coupon Driver, linked to a basket of 20 shares. The 17 best performing shares in the basket are set at +7.5% performance. The 3 remaining shares are taken at their level of performance and capped at +7.5%.

- The average of the share performance is floored at +1%.

- In this particular example, the last 4 shares are set to the cap whatever happens.

Risks

- Investors might not benefit from the whole rise of the underlyings, due to the fixed performance for the best performing assets.

- Capital is protected only if the product is held until maturity.

### Coupon driver performance

<table>
<thead>
<tr>
<th>Performance Year 1</th>
<th>Performance recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novartis N</td>
<td>6%</td>
</tr>
<tr>
<td>AXA</td>
<td>7%</td>
</tr>
<tr>
<td>Unilever Cert</td>
<td>-1%</td>
</tr>
<tr>
<td>Telefonica</td>
<td>6%</td>
</tr>
<tr>
<td>UBS</td>
<td>4%</td>
</tr>
<tr>
<td>BNP Paribas</td>
<td>12%</td>
</tr>
<tr>
<td>Nestlé N</td>
<td>9%</td>
</tr>
<tr>
<td>ING</td>
<td>16%</td>
</tr>
<tr>
<td>Banco San Central Hispano</td>
<td>3%</td>
</tr>
<tr>
<td>Swiss Reinsurance N</td>
<td>-10%</td>
</tr>
<tr>
<td>United Utilities</td>
<td>3%</td>
</tr>
<tr>
<td>Veolia Environnement</td>
<td>11%</td>
</tr>
<tr>
<td>Centrica</td>
<td>7%</td>
</tr>
<tr>
<td>Stora Enso Oyj R</td>
<td>1%</td>
</tr>
<tr>
<td>East Japan Railway Co</td>
<td>6%</td>
</tr>
<tr>
<td>Starbucks Corp</td>
<td>9%</td>
</tr>
<tr>
<td>Sever Trent</td>
<td>-2%</td>
</tr>
<tr>
<td>UPM Kymmene</td>
<td>-20%</td>
</tr>
<tr>
<td>Essilor</td>
<td>4%</td>
</tr>
<tr>
<td>Kelda Group Plc</td>
<td>13%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>4.20%</strong></td>
</tr>
</tbody>
</table>
Stellar

Principles

The Stellar structure is designed to boost long-term portfolio returns. It offers enhanced equity-linked annual coupons over the investment period and often guarantees a minimum return via fixed annual coupons over the first few years or via floored variable coupons.

The variable equity-linked annual coupons are equal to the capped positive individual performance of an underlying or basket of underlyings, with all performances computed since inception, and no re-striking.

Benefits

- High periodic and easily achievable coupon payments.
- No re-strike – at each annual observation date, each underlying’s performance is measured against its initial level.
- Minimum return – floored variable coupons.
- Potentially high variable coupons – even in moderately growing markets.
- Security at maturity – with 100% capital protection in addition to the minimum return.
Example

- An investor buys a 5-year Stellar on a basket based on 15 blue chips.
- It offers variable coupons equal to the basket's performance each year, each share being floored at 2.5% and capped at 7%.
- For the graph below, we considered a basket of only 5 shares.

Risks

- Any increase in the price of the underlying beyond the cap will not increase the annual return.
- Capital is protected only if the product is held until maturity.
Predator

Principles

The Predator structure pays a fixed annual coupon during the first X years and then a variable annual coupon for the remaining Y years.

At the end of each variable coupon year, each share whose performance is equal or better than its initial level is locked-in at a fixed performance until the end of the investment.

The amount of the variable coupon is calculated as the average of both the locked-in and the other performances.

Benefits

- Predator has a security locking-in mechanism in order to lock-in any rise in the underlying shares until investment terminates. If a share performance doesn't go down versus its initial level, its performance is locked-in at a fixed level until the end of the investment.

- There is no re-strike, as the performance is measured against its initial level.
**Example**

- For a 5-year Predator based on a basket of 20 shares, a fixed 5%-coupon is paid at the end of the first year. The fixed performance to which the share is locked if it performs better than its initial level is set at +9%.
- Here is a graphic example for one particular share.

**Risks**

- Investors might not benefit from the whole rise of the underlyings, due to the locking-in mechanism.
- Capital is protected only if the product is held until maturity.
Neptune

Principles
During the first phase of X years, the Neptune structure pays a fixed annual coupon. At the end of each remaining year, a conditional fixed coupon is paid if the underlying closes above its initial level. There is furthermore a possibility of early redemption if the underlying closes above a pre-set barrier. Otherwise, no coupon is paid and there is no early redemption.

At maturity, if the index closes above a down barrier, capital is fully redeemed.

Otherwise, the investor fully participates in the final performance of the index.

Benefits
- Fixed annual coupons for the first X years.
- High and easily achievable annual return even in the case of a flat market.
- Possible early redemption at the end of each year.
- Capital protection if the index does not fall significantly.
**Example**

- An investor purchases a 6-year Neptune indexed on FTSE 100, with a 8% fixed coupon the first year, 8% the following years if FTSE 100 closes at or above its initial level. The early redemption barrier is set at 108% of the index's initial level and there is a capital protection down to a 50% barrier.

**Risks**

- Possibility of no cash-flow during the second phase with no coupon and no early redemption if the index performs poorly against its initial level.
- Limited capital protection: if the index goes below a down barrier, the investor suffers a capital loss.

---

**Neptune investment**

- Total redeemed = 124% Capital Invested
- Total redeemed = 116% Capital Invested
- Total redeemed = 71+8% = 79% Capital Invested

- Optimistic Scenario
- Neutral Scenario
- Pessimistic Scenario
- Down Barrier
Reverse Convertible

Principles
A Reverse Convertible is a short-term investment combining a high coupon with exposure to equity. The Reverse Convertible offers a guaranteed coupon and conditionally returns the principal, dependent on the performance of the underlying equity. The principal is 100% protected down to a pre-determined barrier.

Benefits
- Short term investment – maturities range from three months to two years.
- Attractive guaranteed coupon paid periodically – the security offers a high coupon, payable monthly, quarterly, semi-annually or annually.
- Contingent capital protection subject to a pre-determined barrier.
Example

- An investor purchases a 9-month Reverse Convertible on Lukoil, with a 12% guaranteed coupon and a continuous down barrier at 70% of initial performance.

- **Optimistic Scenario** – Lukoil never breached the barrier located at 70% of its initial level, and is up by 6% at maturity. Investors receive a 12% coupon per annum plus 100% of the principal invested.

- **Pessimistic Scenario** – Lukoil X breached the barrier and is down by 10% at maturity. The investor receives a 12% coupon per annum and the physical delivery amount of Lukoil.

Risks

- Limited capital protection – if the price of the underlying decreases over the life of the product, the number of shares awarded may be less than the original amount invested.

- Any increase in the price of the underlying will not increase the return of the Reverse Convertible.
Market Neutral Products

*Market neutral structured products are designed for investors who do not have directional market views. They are especially suited for highly volatile and uncertain market environments as they allow investors to benefit from any market trend, either bullish or bearish, with limited risk.*

**Galaxy**

**Principles**

The Galaxy product delivers full annual absolute participation in the share within a basket which has the lowest absolute performance, (distance of the final value to the previously observed value), while protecting the investor capital at maturity.

Each year, a variable floored coupon equal to this absolute performance is paid. There is a restricking of the reference level.

At maturity, the product pays the sum of the locked-in performances.

**Benefits**

- Profits in volatile market conditions.
- Unlimited upside performance, with no restriction.
Example

- An investor purchases a 5-year Galaxy on a basket of 15 blue chips.
- Each year, a coupon equal to the lowest absolute performance, floored at 2.5%, is paid.
- For clarity, the graph below only comprises three shares.

Risks

- If the worst share is flat at each year-end, final return is close to zero.
- Investors give up the performance of the remaining shares.
- Capital is protected only if the product is held until maturity.
Absolute

Principles
The Absolute structure delivers full participation in the absolute performance of an underlying versus its initial level, provided the underlying doesn’t fall below a pre-determined barrier.

At maturity, if the underlying does not breach the barrier the investor gets his capital back plus the absolute performance of the underlying, that is to say the distance from its initial level.

If the barrier is breached, the absolute mechanism is deactivated and the investor fully participates in the relative performance of the underlying.

Benefits
- Benefits from all market trends, up or down and is thus tailored for uncertain markets, for example when the investor does not know if the market increase will go on or if a correction is to occur.
- A very low barrier level until which capital is fully protected.
Example

- An investor purchases a 5-year Absolute on the Nikkei, with a 70% down-barrier.
- The return at maturity is furthermore capped at +30%.
- An early redemption feature is included. If the index closes above its initial level at the end of one of the first four years, full redemption with a 6% p.a. coupon paid.

Risks

- If the performance falls beyond the barrier, the investor suffers capital loss.

Scenario 1
Scenario 2
Scenario 3
Barrier (70%)
Redemption amount = 112% Capital
Redemption amount = 87% Capital
Redemption amount = 117.5% Capital
100%
110%
90%
80%
70%
60%
FOCUS - Efficient Frontier

Background

The object of an investment in a portfolio rather than a position in a single underlying is to diversify one’s investment, and minimize risk. Some portfolios, however, are better than others, depending on the underlying assets and their weights within the portfolio itself.

Until revolutionized by Harry Markowitz, investment portfolios were largely selected according to an individual analysis of their constituent assets. For instance selecting shares and bonds, which had attractive risk-reward profiles individually, rather than selecting an overall portfolio.

In 1952, Markowitz introduced the idea that a portfolio should be judged at the portfolio level, treating the assets as random variables. This approach enabled the calculation of expected values, standard deviations and correlations between the constituent assets, and provided the means to draw an efficient frontier - a way of optimizing a portfolio’s risk and return.

What is an efficient Frontier?

When analyzing multiple portfolio combinations, there may be many portfolios that have the same volatility. Portfolio theory assumes that for a specified volatility, a rational investor would choose the portfolio with the highest return. Similarly, there may be multiple portfolios that have the same return, and portfolio theory assumes that, for a specified level of return, a rational investor would choose the portfolio with the lowest volatility.

An efficient portfolio is the unique portfolio that has the highest expected return for a given volatility and, likewise, the lowest volatility for a given return. Point X for instance corresponds to the portfolio displaying the highest rate of return for a volatility of 10%.

Example - Efficient Frontier
Example

Adding a Structured Product: An example - the Lookback

The lookback (see Growth product section, page 16) offers return at maturity based on the highest performance of an underlying asset on any observation date, with no cap on the upside and 100% capital protection. The most obvious qualitative advantage of the lookback is to solve market-timing issues, thus avoiding stop-loss selling if a market downturn occurs. From a quantitative point of view, the Lookback can improve the efficiency of a portfolio by delivering returns close to those of equities, while lowering risk (volatility).

The inclusion of a Lookback in a portfolio of equities and bonds therefore alters the portfolio’s risk/return profile.

Incorporating the Lookback as part of an efficient frontier analysis clearly increases return for a set level of risk by approximately 50bps.

In other words, according to our model, an investment in a portfolio containing the lookback may allow an investor to gain a return 50bps higher than an equivalent lookback-free portfolio, for the same risk exposure.

BNP Paribas

Efficiency analysis provides a useful measure for determining the optimum allocation to an investor’s portfolio. The innovative employment of a structured product component as part of our efficient frontier calculations demonstrates the versatility and practicality of structured products as part of an optimized portfolio. BNP Paribas has developed unique models to conduct advanced portfolio analyses with structured products.

1 H.M Markowitz, Journal of Finance, 1952
2 The efficient frontier is the collection of all efficient portfolios. Efficient frontier portfolio constituents: Eurobond, Eurostoxx and Emerging Equities.

Efficient Frontier with Lookback
FOCUS - Commodity-linked structured products

Contrary to financial assets, commodities are not homogenous in terms of quality or grade, and a variety of references may exist to price real assets (e.g. crude oil, refined products such as gasoil, gasoline, jet fuel, etc). Therefore a range of commodity derivative instruments has been created on standardised commodities that trade on exchanges (such as the NYMEX or the IPE for oil prices).

The most liquid underlyings on which BNP Paribas can construct derivative instruments are the following: energy derivatives (crude oil and products, natural gas, coal, electricity), base metal derivatives (non-ferrous metals, LME and Comex Index, basis transactions), precious metal derivatives (gold, silver, platinum, palladium), new derivatives markets (freight, CO2 emissions, plastics), main third-party commodity indices and tailor-made indices tracking commodity futures.

Different strategies, from the simplest to the most complex, can be implemented to trade views on commodities. BNP Paribas (Crude Oil House of the Year 2005, #2 OTC Derivative Dealer on US Natural Gas 2004, #1 Crude Oil Future Broker on the IPE 2004) has developed the capacity to structure many products that allow investors to receive any payoff linked to commodity assets - they can be adapted to specific risk profiles and offer full or partial principal protection.

The first range of products offers pure commodity exposure. These products are designed for investors seeking to:

- participate in the growth of the commodity markets with no downside risk through baskets or indices.
- receive regular commodity-linked returns.
- make a quick profit on the commodity markets.
With BNP Paribas’ Commodities Stellar, you receive variable annual coupons linked to a diversified basket of equally weighted commodities. Coupons are capped at a high level but this structure can offer minimum returns.

Another range of solutions would be hybrid investments embedding commodities (see Hybrid products section). By providing exposure to assets from different classes, hybrids offer investors the opportunity to take advantage from the different economic cycles of each asset class. They provide optimum performance in any market conditions by lowering overall portfolio volatility and achieving diversification when the underlying assets are loosely correlated.

Investors can choose between many different structures on multi-asset class baskets to achieve efficient diversification and optimise the risk-return, depending on their particular objectives. For example, BNP Paribas proposes exposure to the best investment strategy out of three risk-profiles through its Profiler. (see page 54)

The features of the Commodities asset class make it an efficient tool for portfolio diversification and yield enhancement. To jump on the bandwagon of Commodities, investors can choose among numerous structures to benefit from rising trends.
Commodity-linked Products

**Wedding Cake**

**Principles**

The Wedding Cake structure pays a high fixed coupon at maturity if the underlying commodity has always traded within a pre-determined range of prices during the investment.

A moderately high coupon is paid at maturity if the underlying commodity has traded out of the first range but within a second larger range.

Capital is fully protected at maturity.

**Benefits**

- Wedding Cake is a market-neutral product, which pays a high coupon in flat markets, clearly over-performing the underlying in that case.
Example

- An investor purchases a 2-year Wedding Cake, which pays a 12% coupon at maturity if the Index Oil price has always traded between [-30%,+30%].
- Otherwise, it pays a 5% coupon at maturity if the index has always traded between [-50%,+50%]

Risks

- High volatility of the underlying will result in a low coupon being paid.
- Capital is protected only if the product is held until maturity.
Commola

Principles

The Commola structure is linked to a basket of commodities.

At maturity, well-performing assets are over-weighted, while poor-performing ones are under-weighted.

The structure can also include an Asian feature and thus pays at maturity the average performance of the basket during whole or part of the investment, with full capital protection.

Benefits

- The Commola structure surely over-performs the basket, thanks to the different gearings for good and bad performers. The condition for over-weighting a share is generally for it to perform better than its initial level, while negative performances are under-weighted.

- Risk-diversification since the product is based both on commodities and equities.
**Example**

- An investor purchases a 7-year Commola on Aluminium, Copper, Nickel, Oil and an Agricultural index, with a quarterly Asianing over the last two years of the investment.

- Commodities with a positive asianed performance are geared by 180%, while those with a negative asianed performance are geared by 30%.

**Risks**

- Capital is protected only if the product is held until maturity.

### Commola investment

![Commola investment chart](chart)

- **Beginning and end of the asianing period**

### Performance Table

<table>
<thead>
<tr>
<th></th>
<th>Performance</th>
<th>Asianed Perf.</th>
<th>Gearing</th>
<th>Total Perf.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium</td>
<td>+83%</td>
<td>+72%</td>
<td>180%</td>
<td>+130%</td>
</tr>
<tr>
<td>Copper</td>
<td>+29%</td>
<td>+24%</td>
<td>180%</td>
<td>+43%</td>
</tr>
<tr>
<td>Nickel</td>
<td>-19%</td>
<td>-14%</td>
<td>30%</td>
<td>-4%</td>
</tr>
<tr>
<td>Oil</td>
<td>+104%</td>
<td>+132%</td>
<td>180%</td>
<td>+238%</td>
</tr>
<tr>
<td>Agricultural</td>
<td>+48%</td>
<td>+46%</td>
<td>180%</td>
<td>+83%</td>
</tr>
<tr>
<td>Total Perf.</td>
<td>+49%</td>
<td>+52%</td>
<td>180%</td>
<td>+98%</td>
</tr>
</tbody>
</table>
Athena Copper

Principles

The Athena Copper offers a high coupon linked to the performance of the copper market. The performance of the copper is compared to its initial level at four quarterly observation points.

Should the underlying over-perform a strike level at any observation point, the product terminates early, returns 100% of the capital and pays a high coupon, here equal to 3% every quarter.

At maturity, as long as the value of the underlying is above 70% of its initial level, capital is 100% protected.

Otherwise, final redemption is equal to the initial investment multiplied by the ratio of the final commodity price to the initial commodity price.

Benefits

- High potential coupon even if the price of copper drops.
- Opportunity for early termination – it is possible to collect a coupon and receive initially invested capital back after only 3 months.
- Soft capital protection at maturity.

Example

**Example 1 – Early Exit**

The copper market rises strongly. Early termination at the first observation point, as the underlying is above the strike. Investor receives his capital back plus a coupon of 3% (1*3%) after one quarter – this is equivalent to a 12.55% annual coupon.

**Example 2 – High Coupon**

Markets drop initially, but recover. No early termination but, as the underlying finishes above the strike at maturity, the investor receives his capital back plus a high 12% (4*3%) coupon.

**Example 3 – Capital Protection**

The copper market drops. No early termination occurs, as the underlying fails to beat the strike at any observation point. The final level at maturity is above the barrier. The investor receives 100% of his capital back.

**Example 4 – Market Downturn**

Markets drop significantly. As the underlying finishes below the barrier, the investor receives his investment multiplied by the ratio of the final copper price to the initial price, i.e. in this case, 67% of the initial investment.
**Risks**

- Limited capital protection – if the price of the underlying decreases over the life of the product, the final redemption may be less than the original amount invested.

- A fixed contingent coupon – any increase in price of the underlying beyond the strike level will not increase return further.

- Capital is protected only if the product is held until maturity.

---

**Early Exit**

- Early Termination

**High Coupon**

- High Coupon

**Capital Protection**

- Capital Protection

**Market downturn**

- Market downturn
FOCUS - Hybrid structured products

Background

Over the last four years Hybrids have seen an explosive growth in demand from a broad range of investors, from retail clients eager to venture out of a pure equities/bonds portfolio or private banking clients and high net worth investors looking for new structured investments, through to institutionals pursuing a more accurate management of their portfolio risks.

As a result, “Hybrids”, i.e. cross-asset class investment products, have become the most rapidly growing area of derivatives and structured investment.

Hybrid structures are derivatives based on multiple and distinct asset classes, such as interest rates, exchange rates, real estate, hedge funds, commodity prices and inflation, along with equities. Bonds and equities are usually taken as primary underlyings for hybrids, their returns hedged, boosted, diversified or triggered by those of other asset classes.

Benefits

Among others, multi-underlying exposure allows the following:

- Diversification of Directional Risk - hybrid structures replicate the returns from a diversified portfolio.
- Enhance yield – obtain a higher return than normal through standard instruments, by incorporating exposure to alternative assets.
- Market views – play specific investment views across different asset classes.
- Protection – protect your overall portfolio at lower cost, and guard against ‘adjacent risks’ such as inflation and foreign exchange risk.
- Arbitrage among different asset classes - investors can take advantage of return differentials among various asset classes without putting their invested capital at risk.
Strategies

**HYBRID STRUCTURES FOR ALL INVESTMENT OBJECTIVES**

As a major derivatives house, and winner of the Structured Products Hybrid House of the Year Award 2005 and 2006, BNP Paribas has developed various hybrid payoffs to address any investor’s objective:

- **Multi-asset payoffs** – Structured Products like the Himalaya may be tailored for multiple-asset class exposure. By locking in the best performer at regular intervals, the Himalaya optimizes performance in any market condition, benefiting from the fact that distinct asset classes have different economic cycles.

- **Inflation-indexed payoffs** – structured to offer the better performance between an inflation index and an equity option.

- **Combined strategy payoffs** – some structures pay a fixed return at regular intervals, provided that short term interest rates remain at a pre-determined level. Once this level is breached, the product becomes an equity-linked payoff structure. As such, investors receive fixed returns in a low interest rate environment and then can switch to equity exposure should economic conditions become more favourable.

**BNP Paribas**

**BNP PARIBAS, WORLD LEADER IN HYBRID PRODUCTS**

Working in close partnership, BNP Paribas’ hybrid groups in Fixed Income, Commodities and the Equities & Derivatives have created a wide range of innovative structures allowing investors to benefit from the different market cycles across all asset classes.
Hybrid Products

Profiler

Principles

With the Profiler structure, three different risk-profiled portfolios are composed from a set of different asset classes. At maturity, the investor gets full participation in the best performing portfolio, with full capital protection.

There are an aggressive, a balanced and a conservative portfolio.

- **Aggressive portfolio**: mainly composed of equities and commodities and completed by less risky assets, such as bonds, rates, real estate etc.

- **Balanced portfolio**: equally composed of those different kinds of assets.

- **Conservative portfolio**: emphasis on the less risky assets.

At maturity, Profiler pays the best performance between the three different portfolios, with a full capital protection.

Benefits

- The Profiler structure ensures optimum market exposure: whatever the market fluctuations, investors automatically benefit from the best performing management strategy at term.

- Market cycles are optimised.

- The averaging of performances smoothes the evolution of the portfolio in case of market reversals.
Example

- An investor purchases a 4-year Profiler, indexed on 3 portfolios, composed as follow:

Risks

- Capital is protected only if the product is held until maturity.
- Investors might not benefit from the whole rise of the best performing asset, due to the averaging of performances.

<table>
<thead>
<tr>
<th></th>
<th>Aggressive</th>
<th>Balanced</th>
<th>Defensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equities</td>
<td>50%</td>
<td>25%</td>
<td>15%</td>
</tr>
<tr>
<td>Commodities</td>
<td>25%</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>15%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Rates</td>
<td>10%</td>
<td>35%</td>
<td>50%</td>
</tr>
</tbody>
</table>
Orion

Principles

The Orion structure is an example of combined strategy hybrid products.

It pays out a conditional fixed coupon periodically, provided short-term interest rates stay below a certain level, and switches to an equity-linked payoff once this level is breached.

The Orion structure also exists with a commodity underlying instead of short-term interest rates. The conditional fixed coupon is thus paid as long as the commodity does not breach a down barrier and switches to an equity-linked payoff once this barrier is breached.

Capital is fully protected at maturity.

Benefits

- Receive an income in excess of current money markets until the fall of the first underlying.
- Switch to equities when short-term rates reflect positive growth prospects in equity markets, i.e. benefit from a rally in equities at the earliest stage.
- For a commodity-linked Orion, switch to equities when commodities, assets traditionally negatively correlated with equities, are following a downward path, i.e. when equities should be going up.
- In adverse equity markets, continue earning fixed-interest returns.
Example

- An investor purchases an 8-year Orion, which pays 4% annual coupons as long as WTI does not breach a 85% down-barrier and then switches to an equity basket.
FOCUS - Fund Derivatives

Background

Structured products can be linked to a wide range of fund-linked assets, including mutual funds, hedge funds or funds of hedge funds (single or basket). Investment in mutual fund products provides asset diversification, access to high quality managers and strong out-performance opportunities (alpha) compared to a benchmark index. Alternatively, hedge funds can provide an efficient addition to traditional portfolios. They provide a unique investment opportunity, with low correlation to bond and equity markets.

Fund derivatives offer numerous advantages such as dynamic allocation, active investment management, access to alternative investments, and hedge funds' absolute returns.

Product Examples

CPPI
Dynamic investment strategy, which allocates portfolio investment between two categories of assets: active (fund linked assets) and defensive (cash or bonds) assets.

Black Scholes Call Options
European call options, which may be sold directly or embedded in a zero-coupon instrument to create a product whose principal is guaranteed at maturity.

What is Alpha?

Alpha reflects the difference between a fund’s actual performance and its expected performance (its benchmark). A positive alpha indicates that the fund has performed better than expected, given its level of risk relative to the market. Conversely, a negative alpha indicates the fund has under-performed expectations. Alpha is thus the return generated from selection and trading skill.

The other classic financial component of an investment’s return is the beta, which is the return generated from general market exposure.

A selection of different asset classes providing superior risk-adjusted returns is often a priority for investors, who seek to gain returns in excess of the benchmark.

Owing to active management, an investment linked to Alpha can benefit from the following:

i. decorrelation with equity markets,
ii. an absolute return orientation, and
iii. consistent performances in even adverse conditions.
Products linked to Alpha

**S&P's US Select Plus Custom Total Return Index**

Exposure to the Standard & Poor’s US Select Plus Custom Total Return Index aims to give investors access to a selected universe of mutual funds offering the best risk/return ratios. Investors may achieve diversification while benefiting from a consistent way of capturing alpha (the out-performance of the chosen mutual funds over the S&P index) over time.

**Portable Alpha**

Enhance benchmark return by importing alpha from an investment strategy or an asset class not correlated, or with low correlation, to the chosen benchmark. For instance, a fund allowing access to portable alpha allows investors to overlay long hedge fund alpha (such as the out-performance of a hedge fund over 1-month Libor) with exposure to an unassociated index.

BNP Paribas is widely recognized as a fund derivatives pioneer. The fund derivatives business was developed in 1996 and is built around a comprehensive, diversified platform and hundreds of strong client relationships. BNP Paribas’ award winning platform, ranked number one for Hedge Fund options in the Risk Inter-Dealer Rankings of 2005, maintains a leading position in the business with 60 front-office professionals managing one of the largest fund derivatives books in the world. Our proprietary risk technology provides maximum flexibility to clients in building and managing portfolios, complementing our expertise in a wide range of asset classes, including fund of hedge funds, commodity trading advisors, managed accounts, index-linked products and mutual funds.

1 BNP Paribas was granted a license by Standard & Poor’s for the S&P US Select Plus Custom Total Return Index and can sell structured products linked to the Index. “Standard & Poor’s”, “S&P” and S&PUS Select Plus Custom Total Return Index” are trademarks of the Standard & Poor’s Division of The McGraw-Hill Companies, Inc., some of which may be protected by registration in one or more territories. Any BNP Paribas structured product linked to the Index is not sponsored, managed, advised, sold or promoted by S&P.
Fund-linked Products

CPPI

Principles

Constant Proportion Portfolio Insurance (CPPI) structures are suitable for investors looking to boost their investments without putting capital at risk. CPPIs actively allocate assets over time to achieve maximum performance and safety of capital. This dynamic investment strategy facilitates greater exposure to active assets when markets rise, and overweights defensive assets when markets fall.

CPPI offers 100% capital redemption at maturity plus 100% of a basket’s positive performance. The basket is composed of an active asset (usually a fund) and a defensive asset (bonds, cash, inflation, etc.) and is actively managed to maximize returns while protecting the initially invested capital.

Over the life of the investment, exposure to the performance of the active asset may climb to over 100%. This exposure depends on the cushion (or 'distance') between the basket value and a reference level, usually bond curve. If the value of the basket drops and, as the basket approaches the level of the reference level, the dynamic basket principle allocates an increasing proportion of assets from active to defensive assets. Conversely a strong basket performance can increase the basket’s asset allocation in favour of the active asset.

Benefits

- Capital protection.
- High potential exposure to the fund performance (100% or more).
- Exposure increases with good performance and/or rise in interest rates.
Example

**Dynamic basket principle:** portfolio with variable allocation

![Graph showing portfolio value over maturity]

**How does the dynamic basket protection work?**

Risks

- If the active asset falls significantly during the life of the investment, there is a risk of de-leveraging.
- The participation rate at the outset is uncertain.
- Capital is protected only if the product is held until maturity.
ODB on Alternative Investment

Principles

An Option on a Dynamic Basket (ODB) is a Call option on a Dynamic Basket which actively allocates between an alternative asset (Fund of funds, Basket of Single Hedge Funds or a Hedge Fund Index) and a defensive asset (e.g. a money market instrument). With this dynamic investment strategy, the exposure to active assets is leveraged when markets are rising, and deleveraged when markets are falling.

The structure also ensures full capital protection at maturity.

The ODB aims to maximise the exposure to the alternative asset when it is performing well whilst protecting returns otherwise.

ODBs can be tailor made to suit investors needs by:

- Providing coupons, either paid or accumulated until maturity.
- Including a Lookback feature. The Lookback feature settles the option based on the maximum value of the Dynamic Basket during the entire lifetime of the product.

Even though the allocation mechanism is similar to the CPPI, there are two main differences. Whereas the CPPI is an investment on a basket of defensive and active assets (the capital guarantee is provided by the allocation to the defensive asset), the ODB structure is an investment on a zero-coupon bond for the capital guarantee and on a Call on a Dynamic Basket. The capital protection is thus provided outside the ODB whereas it is embedded within the cushion management of the CPPI.

The reference curve for a CPPI is the zero coupon bond reference curve in order to protect the capital, while the reference curve for an ODB is calculated with an algorithm.

The reference curve is thus not sensitive to interest rate and, contrary to the CPPI, the ODB structure guarantees a minimum allocation to the alternative asset during the whole investment period.

Benefits

- Optimised leverage on an alternative asset via an option structure.
- Fixed reference line - not sensitive to interest rate fluctuations.
- Guaranteed minimum investment in alternative asset at all times.
Example

- An investor purchases a 5-year ODB on a Hedge Fund Index, with an exposure to the alternative asset floored at 40% and capped at 200%.

Risks

- If the active asset falls significantly during the life of the investment, there is a risk of de-leveraging.
- The possible leverage of the structure increases the product's volatility.
- Capital is protected only if the product is held until maturity.
Systematic Strategies

Harewood Dynamic Money Market Trend

Harewood Asset Management is a management company specialising in quantitative management techniques. It is incorporated in France and has been authorised by the French regulator, AMF, since 2004. It is fully owned by the BNP Paribas Group (Moody’s Aa2, Standard & Poor’s AA).

Taking advantage of the French regulations (RIA, fonds contractuels), Harewood Asset Management can offer various UCITS funds, passively managed structured funds (e.g. CPPI), Trackers, open-ended UCITS, etc.

Harewood Asset management is able to offer a reactive, flexible and expert platform for fund management, covering the most innovative management styles.

A top-quality management benefiting from the expertise of the BNP Paribas Group.

- Fund administrator: BNP Paribas Asset Services
- Custodian: BNP Paribas Securities Services
- Fund Manager: Harewood AM
- Auditor: Barbier Frinault et Associés

Harewood Asset Management aims to offer the best quantitative strategies and constantly develops its expertise with regard to the creation and management of financial innovations. This fully-owned BNP Paribas’ subsidiary leverages on the robustness of the Group’s various players who are responsible for functions which are ancillary to its management business: fund administration, accounting...

Harewood Dynamic Money Market Trend: a simple innovative and competitive tool.

Open-ended UCITS funds, created and managed by Harewood Asset Management. Preset strategy and exposure, with the aim to achieve absolute returns. The investment strategy is quantitative and based on BNP Paribas' privileged access to options markets.

Harewood Dynamic Money Market Fund-Trend Fund has been especially designed to boost short-term returns by delivering a performance superior to the capitalised EONIA (Euro OverNight Index Average) rate by 1% in a directional market, with a minimum 1-year horizon after taking into account fees paid to the fund.

In order to reach this objective, the UCIT fund invests on the money market and seeks a performance gain provided by derivative products.
Investment Objectives

Harewood Dynamic Money Market Fund-Trend uses the financial markets’ volatility as a source of performance. The management team gives priority to absolute performance with an EONIA annualised objective of +1%. It sets up a systematic strategy with a monitored volatility objective by operating only on the most liquid markets.

In addition, the outperformance objective is coupled with decorrelation to equity markets.

Key features

- a diversification tool.
- a specific strategy regarding an allocation within a pocket of alternative investments.
- a long-term performance weakly correlated to equity markets.
- a very attractive expected return, superior to an EONIA investment.
- Low yearly volatility.
- Low risk profile.

Mechanism

The investment strategy enables the investor to boost the UCIT fund’s performance against the capitalised EONIA. It consists in setting up an active and systematic management by taking buy-positions on short-term options indexed on the DJ Eurostoxx 50 and the performance of which will be mirrored in the fund’s performance:

- Depending on market movements, a systematic sale of calls/puts (bullish/bearish markets) occurs according to a preset algorithm. This sale generates premiums which make the fund’s value increase.
- When each option reaches maturity and depending on the markets’ movements, two scenarios are possible:
  - Either the value of the underlying index is superior (respectively inferior) to the call’s (respectively put’s) strike price: options are exercised and their repurchase will make the fund’s value decrease.
  - Or the option is not exercised: no capital loss is incurred and the fund will record a net gain equal to the premium.

The invested capital is not guaranteed; nevertheless, the risk profile of the fund is limited due to its low volatility. Intervention principles are strictly defined during all the investment’s lifetime; thus there is no risk linked to future management decisions.

Advantages

- A long-lasting arbitrage strategy, independent of future investment decisions.
- Permanent availability of invested amounts thanks to daily liquidity.
- An alternative to traditional money-market funds using a different performance source.
- A tool with no legal constraints since the Harewood Money Market Fund-Trend fund is consistent with the UCITS 3 European Directive and authorised by the AMF.
Buy-write strategy

Background

There are many types of structured products. Two of the most important types are growth and income products.

The former allows taking participation in an underlying, with the pay-off being delivered at maturity and linked to the underlying's performance.

The latter pays a regular coupon, which can be either fixed or variable.

Although income products are comfortable because of the regularity of the payments, returns are not very high. To produce higher returns, those products are sometimes coupled with a buy-write strategy.

This strategy originally comes from the will to enhance the returns generated by investing in shares, the returns being the dividends.

What is a buy-write strategy

A buy-write strategy is a way of constructing a portfolio with shares and calls in order to maximise returns, coming from the income generated by the dividends and the option premiums.

With a buy-write strategy, the investor buys shares and sells calls written against those shares, which are called "covered calls".

It is risky because if the price of the shares go up, then the calls will be exercised at a strike price below their market price. However, since the investor actually owns the shares, the risk is somehow limited, the calls are said to be covered, thus their name.

If the market performs well, a buy-write strategy will most certainly under-perform, since the overall performance of the strategy is capped (the call options being exercised). However, if the market stays flat or performs poorly, such a strategy will clearly over-perform.

The BXM Index, a benchmark index created by the CBOE (Chicago Board Options Exchange) has recorded this mechanism since 2001. This index is based on selling the near-term, slightly out-of-the-money S&P 500 Index call option against the S&P 500 Index portfolio each month.

This index was created because many institutional and individual customers showed their interest to the CBOE to have an index that measures the performance of certain shares and options strategies.
Example

The UK High Income fund (maturity 6 years), which comprises four components:

- portfolio of 20 shares selected from the FTSE 100, selected under a quantitative strategy in which dividends are maximised.
- out-of-the-money call options (strike price over actual share price) written against those shares, to increase the dividends.
- portfolio insurance, a six-year put option on the FTSE 100 (partial protection, evolution of FTSE 100 might not completely match the evolution of the shares selected).
- cash accruing as a result of the receipt of dividends on the share portfolio.

Income is generated from the dividends received and the premium earned by writing options on the shares.

In return for this income, the capital appreciation potential on the shares is capped through systematic covered call writing on shares.
Appendix

Options

An option is a contract that gives its holder the right, but not the obligation, to buy or sell a fixed number of shares, at a fixed price (strike), on (for European options) or before (for American options) a given date.

Options allow investors to benefit from a leveraged participation in an asset without having to buy the asset itself.

There are different types of options: from the simplest, referred to as “plain vanilla” options, to the most complex exotic options.

A European option is an option which the buyer can exercise only on a given date, i.e. the maturity date of the option.

An American option is an option which the buyer can exercise at any time in a given period, in general between the date of entering into the contract and the expiration date.

Because an option grants the holder a right, it has value for the holder. The option value is called the premium. An option’s expiration value is its market value.

The difference between the strike price and the spot price of the underlying, if positive, is called the intrinsic value of the option.

An option is said to be ‘at-the-money’ if the underlying value currently equals the strike price. If the option has positive intrinsic value, it is said to be ‘in-the-money’; if it has zero intrinsic value, it is ‘out-of-the-money’. A call is in-the-money if the underlying value is above the strike price. A put is in-the-money if the underlying value is below the strike price.

When an investor purchases an option, the net return is the difference between the intrinsic value realised from exercising the option less the option premium paid.

On the other hand, the issuer of the option will realise the difference between the option premium and the intrinsic value of the option exercised.

Benefits of Options

- Higher returns as a percentage of money invested, which allows the buyer to lever his equity exposure through the purchase of an option.
- Limited risk (for capital protection), as the risk is limited to the premium paid for the option (if long the option).
- Possibility to make money whether the market goes up or down (unlike investing in shares where a profit is only realised if the share price rises), because derivatives are essentially a bet on which way the price of the underlying instrument is going.
Long / Short Position

Long position
Taking a long position in an asset basically means buying the asset. Any investor can take a long position on any underlying, option etc. available on the market.

Short position
On the contrary, taking a short position in an asset means selling it. To take a short position, an investor has to own/issue what he is selling (shares, options etc.) There is one exception, which is short-selling.

Short-selling means borrowing a security and then selling it, hoping for the price to fall. When the short-seller has to give it back, he buys cheaper what he sold earlier and keeps the difference.

Here are the classical graphs of long/short position in a call and a put, with K the strike price of the option (see next section in Appendix).
Call / Put

Principles

A plain vanilla option is an option with fairly standard exercise terms and no special clause.

There are two types of plain vanilla options: calls and puts.

A call option is an option to buy shares. Call options rise in price if the underlying shares rise in price (and fall if the underlying shares fall in price).

A put option is an option to sell shares. Put options rise in price if the underlying shares fall in price (and fall if the underlying shares rise in price).

Benefits

- Opportunity to make a profit by buying or selling the underlying at maturity.
- No obligation to sell or buy if the market conditions are not favourable.

Option Spreads

- An option spread is a position combining two or more vanilla options on the same underlying.
- Some standard combinations are detailed afterwards:
  - Call Spreads
  - Put Spreads
  - Collars
  - Straddles
  - Strangles
Call Spread

Principles

A call spread combines a long call at one strike price and a short call at a higher strike price, of identical maturities.

The potential upside is limited. A call spread, however, is a cheaper alternative to buying a plain vanilla call, because the income from selling the high-strike call offsets partly the cost of purchasing the low-strike call.

Benefits

- Lower price than a plain vanilla call.
- Suited to moderately bullish markets.
Put Spread

Principles

A put spread combines a short put at one strike price and a long put at a higher strike price, of identical maturities.

The potential upside is limited. A put spread, however, is a cheaper alternative to buying a plain vanilla put, since the income from selling the low-strike put partly offsets the cost of purchasing the high-strike put.

Benefits

- Lower price than a plain vanilla put.
- Suited to moderately bearish markets.
Straddle

Principles
A straddle combines a put and a call of same strikes and maturity, usually at the money.

Buying a straddle is a bet on high volatility. The straddle buyer will make money if the underlying moves significantly either up or down. Selling a straddle is a bet on low volatility. The straddle seller will make a profit if the underlying does not move much.

Benefits
- Strong potential upside when the underlying is highly volatile.
- Returns in bearish and bullish markets.
Strangle

Principles

A strangle is similar to a straddle (combining a put and a call of same maturity) with out-of-the-money options.

As a result, buying a strangle is cheaper than buying a straddle, but a strangle requires a greater movement of the underlying to be profitable.

Benefits

- Strong potential upside when the underlying is highly volatile.
- Returns in bearish and bullish markets.
- Lower price than a straddle.
Collar

Principles

A collar (or fence) combines either a long call and a short put, or a short call and a long put, both out-of-the-money and with the same maturity.

For a zero-cost-collar, strikes can be customized so that the call premium exactly offsets the put premium.

Strike prices are calculated so as to equate the value of both options and, hence, build a zero-cost strategy. At maturity, the investor is compensated for the drop of an underlying below the lower strike price, or abandons the rise of underlying above the higher strike price. If the underlying finishes between lower and higher strikes, payoff is nil.

Benefits

- Portfolio protection – the lower the underlying price, the greater the return.
- No transaction cost – the put purchase is financed by the sale of the call.
- Neutral transaction – if the underlying price stays within the range of the collar.

Example

Assuming a Share X level of 50 USD, a bearish investor wants to protect a Share X asset he owns and purchases a Share X one-year Zero Cost Collar. Cost is zero, for a low strike at 95% and a high strike at 105%, meaning the investor is protected when Share X goes below 95% x 50 = 47.50 USD, and stops participating in the share’s upside when Share X goes above 105% x 50 = 52.50 USD.

Bearish scenario – If, at maturity, Share X finishes at 40, the investor will receive 47.50 – 40 = 7.50 USD, which makes up for part of his 50 – 40 = 10 USD loss on Share X in his portfolio. His overall loss will be 10 – 7.50 = 2.50 USD per option (-5% return), instead of a 10 USD possible loss (-20% return), had he not purchased the zero-cost collar.

Bullish scenario – If, at maturity, Share X finishes at 65, the investor will lose 65 – 52.50 = 12.50 USD on the option. However, he will still have made 65 – 50 = 15 USD on the underlying in his portfolio, i.e. an overall return of 2.50 USD per share (+5% return).
Barrier

Principles

Barrier options are similar to vanilla options, except there is an element known as a "barrier" (or trigger). The barrier can either knock-in the option (activate), knock-out (deactivate) the option or, in some cases, do both.

Typically, the client can select the barrier rate that might be above or below the current market spot rate or the option strike price.

Due to the contingent nature of these options, barrier options premiums tend to be lower than for a corresponding vanilla option.

Example

A knock-in is an option that becomes active (is "knocked-in") if the underlying spot reaches a pre-determined barrier before maturity.

If the spot rate does not touch the barrier level during the life of the option, the owner does not receive anything.

Benefits

- Flexibility.
- Premium cost of a Barrier Option is less than that of a standard vanilla option.

Single Barrier

A single barrier is any barrier option with one barrier that, if hit, will knock-in (knock-out) the option. Single-barrier options can be further categorized into two sub-types:

Out-of-the-money barriers – this means that the option is out of the money when the barrier is hit.

In-the-money barriers – sometimes called reverse-barrier options. These are options that have intrinsic value (are in the money) when the barrier is hit.

Buying a Strangle (Long Strangle)
Asian

Principles

An Asian option (also called an average option) is an option whose payoff is linked to the average value of the underlying on a specific set of dates during the life of the option. There are two basic forms:

- An average rate option or average price option, whose payoff is the difference between the average value of the underlying during the life of the option and a fixed strike.
- An average strike option, which is like a vanilla option except that its strike is set equal to the average value of the underlying over the life of the option.

Both forms can be structured as puts or calls. Exercise is generally European.

Benefits

- Lower premium than the plain vanilla option - the volatility of the average being lower than the volatility of the underlying price.
- In volatile environments, an Asian call smoothes exceptional events - it enhances the underlying’s upside exposure, with no risk of the investor being penalized by a market downturn at maturity.
A wrapper is the legal structure within which a structured product is issued. The following criteria are considered when choosing a wrapper:

- Cost and speed of issuance
- Secondary market/Liquidity
- Market practice
- Tax treatment

The usual wrapper is a MTN (Medium-Term Note), which is quite cheap and can be issued instantly.

The following table will give you the main wrappers and their advantages / disadvantages.

<table>
<thead>
<tr>
<th>Wrapper</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over The Counter contracts (OTC)</td>
<td>Very flexible</td>
<td>Not a security, not suited for distribution</td>
</tr>
<tr>
<td></td>
<td>Almost no payoff restriction</td>
<td>No public offering</td>
</tr>
<tr>
<td></td>
<td>Credit risk can easily be mitigated by collateral arrangement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low costs</td>
<td></td>
</tr>
<tr>
<td>Medium Term Notes / Certificates / Warrants</td>
<td>A security whose settlement is very straightforward</td>
<td>Credit risk on the issuer</td>
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<tr>
<td></td>
<td>Allow for public offering</td>
<td>(unless issuance vehicle is collateralized)</td>
</tr>
<tr>
<td></td>
<td>Low costs</td>
<td></td>
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<tr>
<td>Funds</td>
<td>Investor friendly</td>
<td>Administration costs</td>
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<tr>
<td></td>
<td>Allow for public offering</td>
<td>Time to market</td>
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<td></td>
<td>Highly regulated (risk spreading rules, valuation...)</td>
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<tr>
<td></td>
<td>Can achieve eligibility to specific tax envelope</td>
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<tr>
<td>Life Insurance Policy</td>
<td>Usually provides tax advantages under certain circumstances</td>
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<tr>
<td></td>
<td></td>
<td>Administration costs</td>
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<td>Structured Deposits</td>
<td>User friendly</td>
<td>Banking network only</td>
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<td></td>
<td>Time to market</td>
<td>Not available in every jurisdictions</td>
</tr>
<tr>
<td>Islamic Wrappers</td>
<td>Open distribution to investors seeking Shari'ah compliant investments</td>
<td>Investment restrictions</td>
</tr>
</tbody>
</table>

Wrapper
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