Modelación de productos estructurados con garantías

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Guaranteed Investments

- They guarantee principal.
- They obtain exposure to a reference portfolio, which may consist of certain assets, indices, or funds.
- If the performance of the assets is good, investors collect a portion of the returns.
- If the performance is bad, investors get their money back.

Guaranteed vs. non-guarantees

- There are two main reasons for a guarantee:
  - Regulatory environments
  - Risk perceptions (not to confuse with risk appetite)

- Guarantees are obtainable by setting aside an interest-earning portion of the assets, and investing the remainder at higher levels of leverage, through a variety of different instruments.

Guarantees, … and guarantees

- Some guarantees are provided by well-rated banks.

- Others are not; they may be provided by the management company. In this case, the guarantee means very little, as the management company will vanish if returns are not satisfactory.

We will be assuming a AAA-rated guarantee.

Anatomy of a guarantee

- A maturity date.
- A portion of the investor's assets are used to purchase a zero coupon bond, maturing at the note expiration.
- The remaining assets are invested, with leverage, to obtain exposure to the reference portfolio. This can be achieved through
  - Non-recourse loan (A fully hedged call option)
  - A call option
  - a CPPI option
  - CFO's

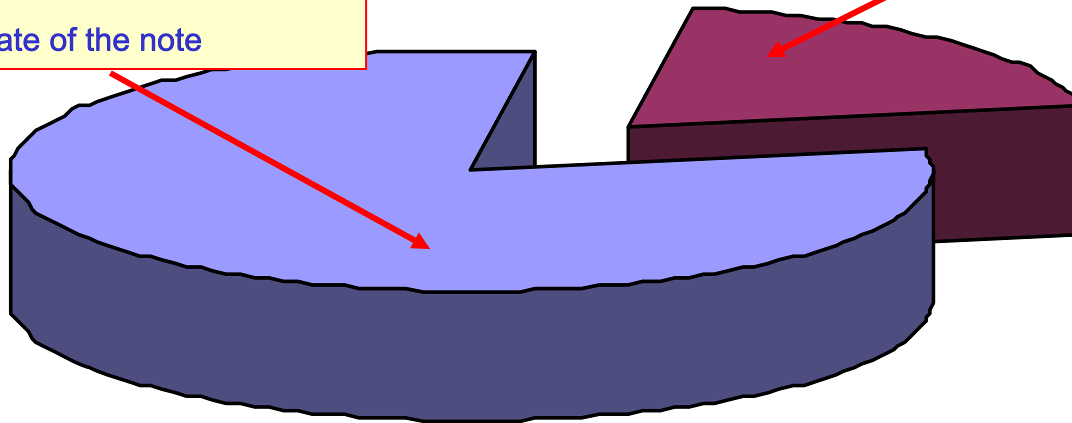
Anatomy of a guanrantee

Guarantees principal in the future:

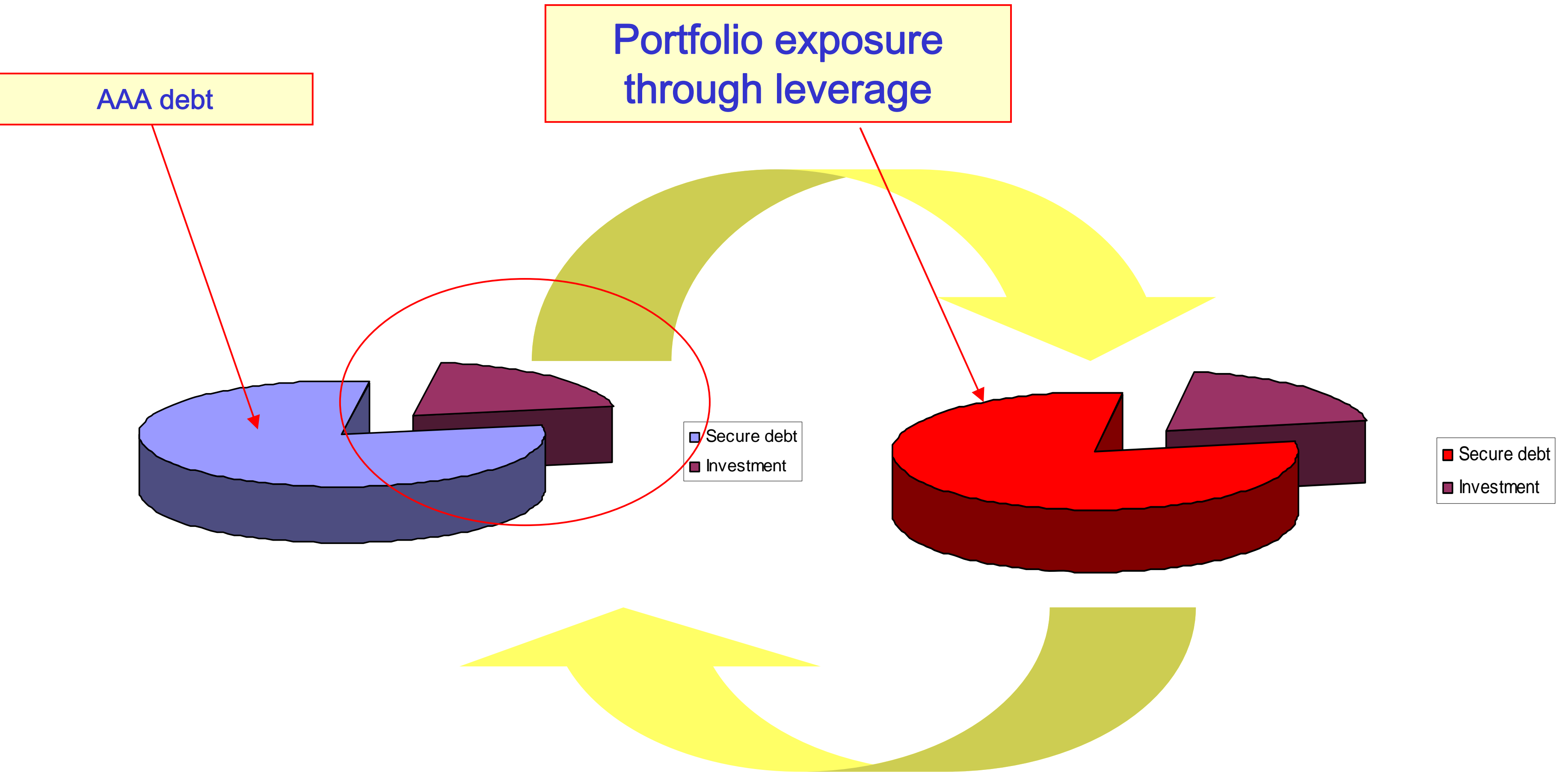
How much is needed is determined by

- Interest rates
- Maturity date of the note

Obtains exposure to the Reference Portfolio



Risk arbitrage



Different risk views generates fees

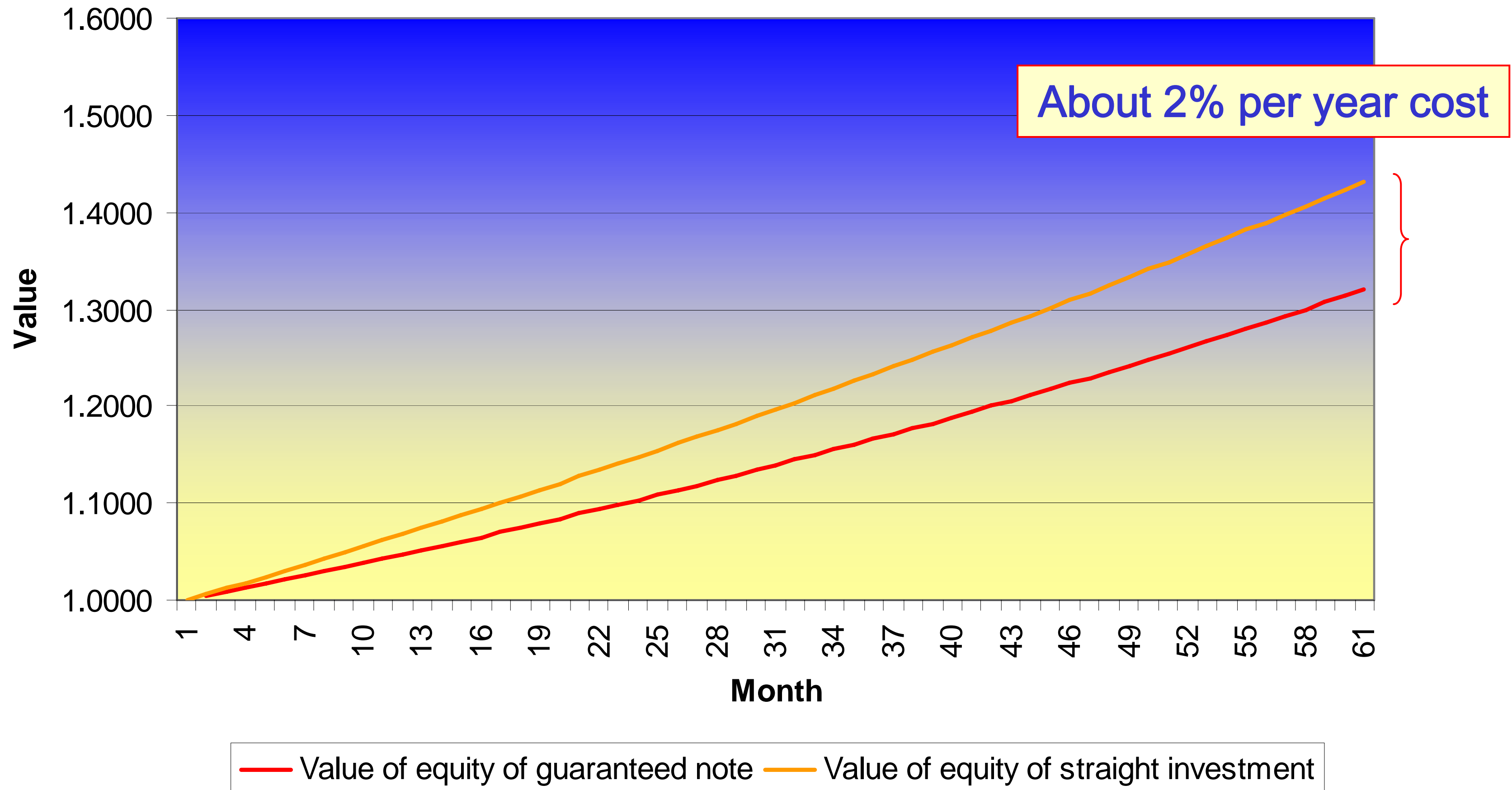
Example

- An underlying hedge fund portfolio that produces 60bps/month
- Interest rates at 25bps per month
- A 5 year note that guarantees principal
- No management or performance fees

Non-recourse loan

- Typically, in this case the issuer borrows and invests the entire notional on the underlying hedge fund portfolio.
- Fees hover around the 1% spread mark over LIBOR.
- For a 5-year note, the associated cost is about 2% per annum, equivalent to a BB-rated bond.
- Costs vary as a function of interest rates.

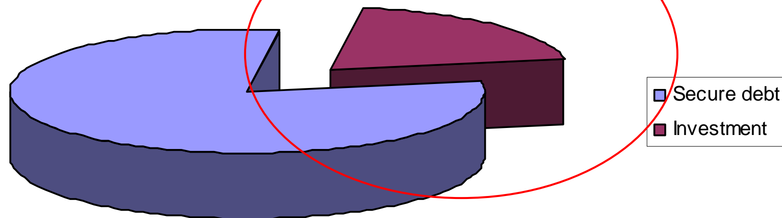
Non-recourse loan

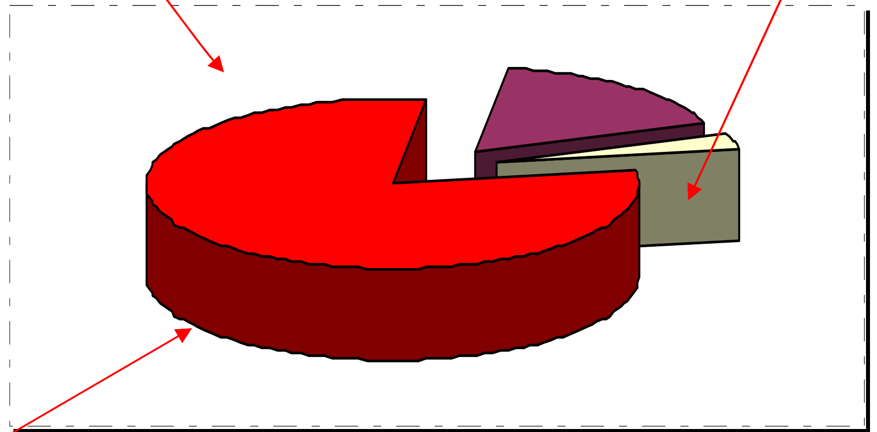


Call option

Equity is used to purchase a call option at-the-money

Fees





Strike price

Call Option

- The payoff is not path dependent, or dependent on interest rate evolution.
- They provide a better alternative to the investor, but can be hard to structure for the underwriter:

  liquidity is a must.
- Price is driven by volatility: observed or assumed.

CPPI Options

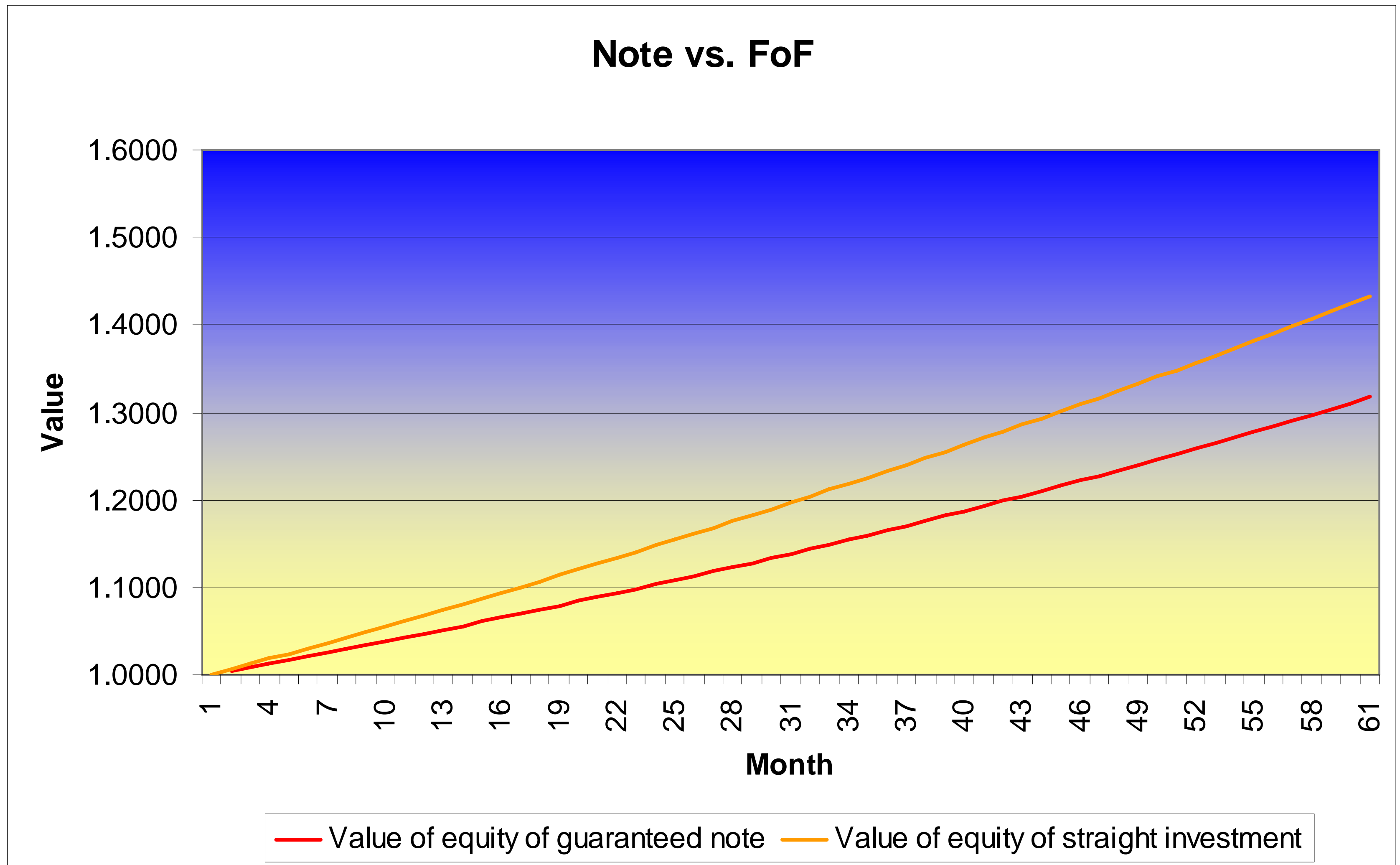
- The strike price is increased when fund performance is negative; every time the fund loses 5%, the strike price is increased.
- The strike price is lowered when fund performance is good; the objective is to keep the delta constant.
- The strike price is increased when interest rates increase, and is lowered when interest rates decrease.

The objective is to maintain constant levels of leverage.

CPPI structures

- An easier alternative to the underwriter, who does not need to worry about interest rate evolution, liquidity or fund volatility.
- The alternative of choice, it does not seem to show clear benefits to investors for the additional cost they pose: a 1% spread, which translates to about a 2% per annum charge for a 5-year note.

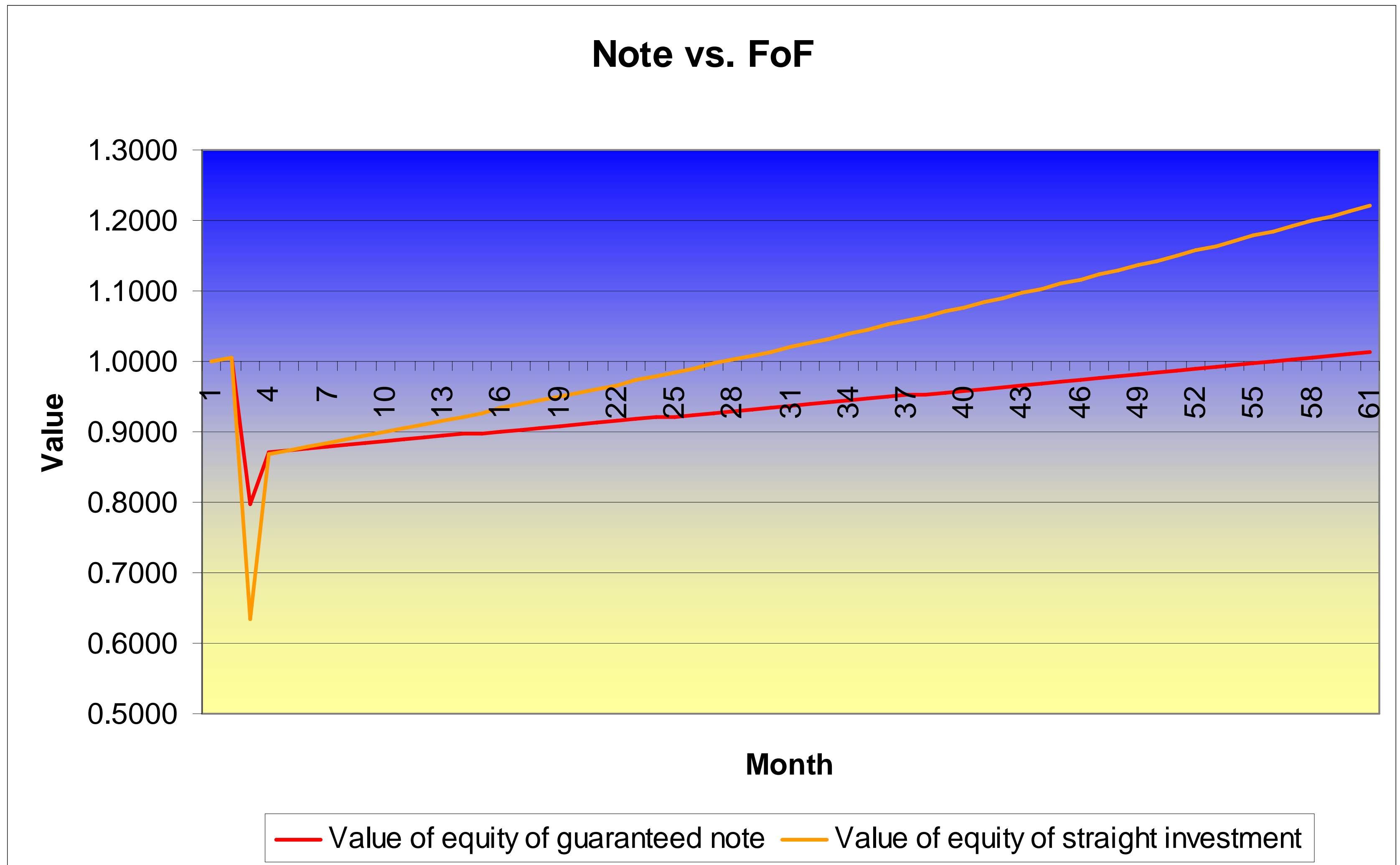
CPPI: low volatility underlying



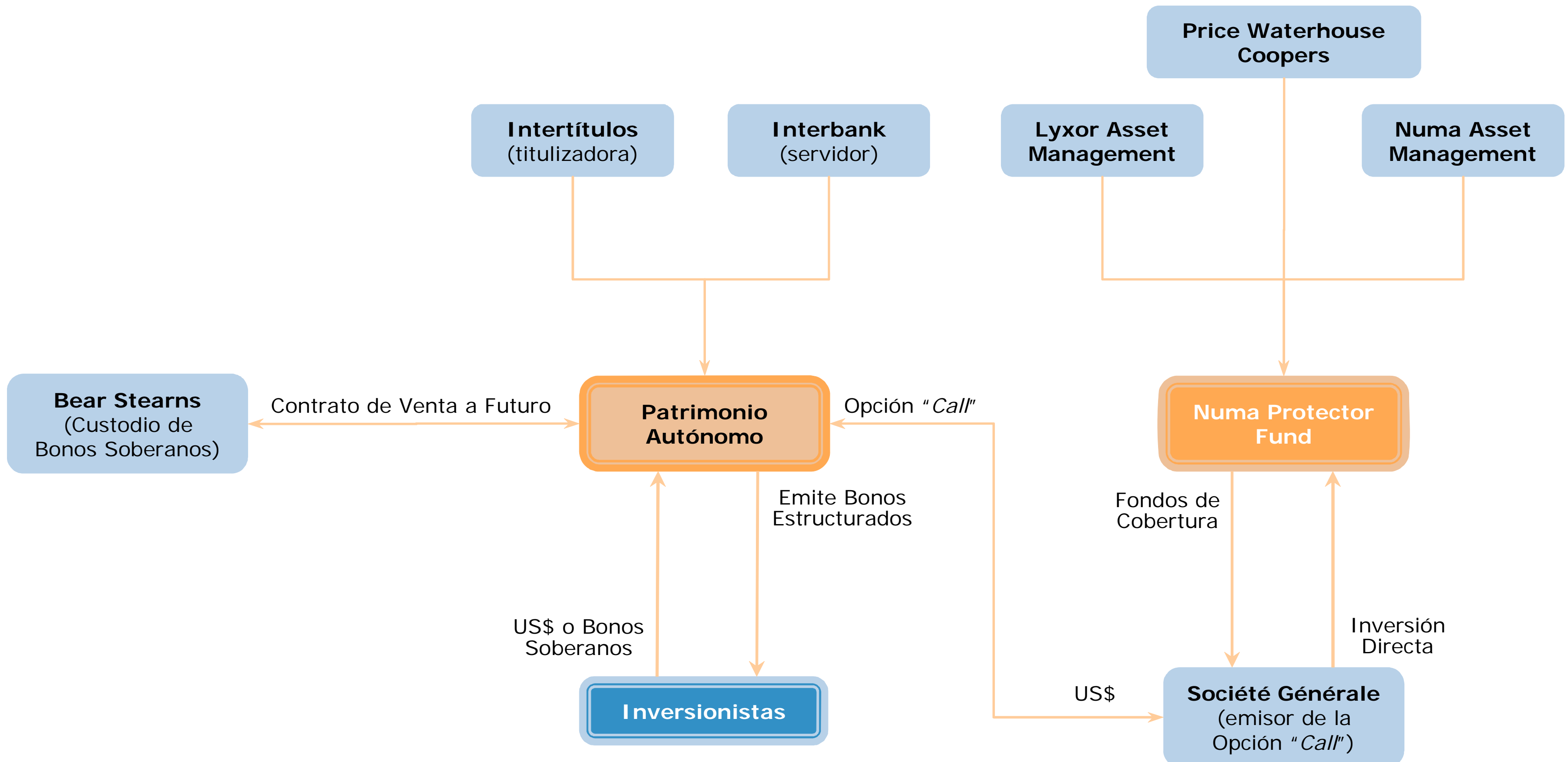
CPPI: sensitivities

- CPPI improve long terms sustained performance
- CPPI offers very adverse effects when the underlying portfolio exhibits large sudden losses.
- CPPI are designed to sell off assets when losses exceed a certain level (about 5%) making recovery from favorable performance more difficult.

CPPI: vega sensitivity



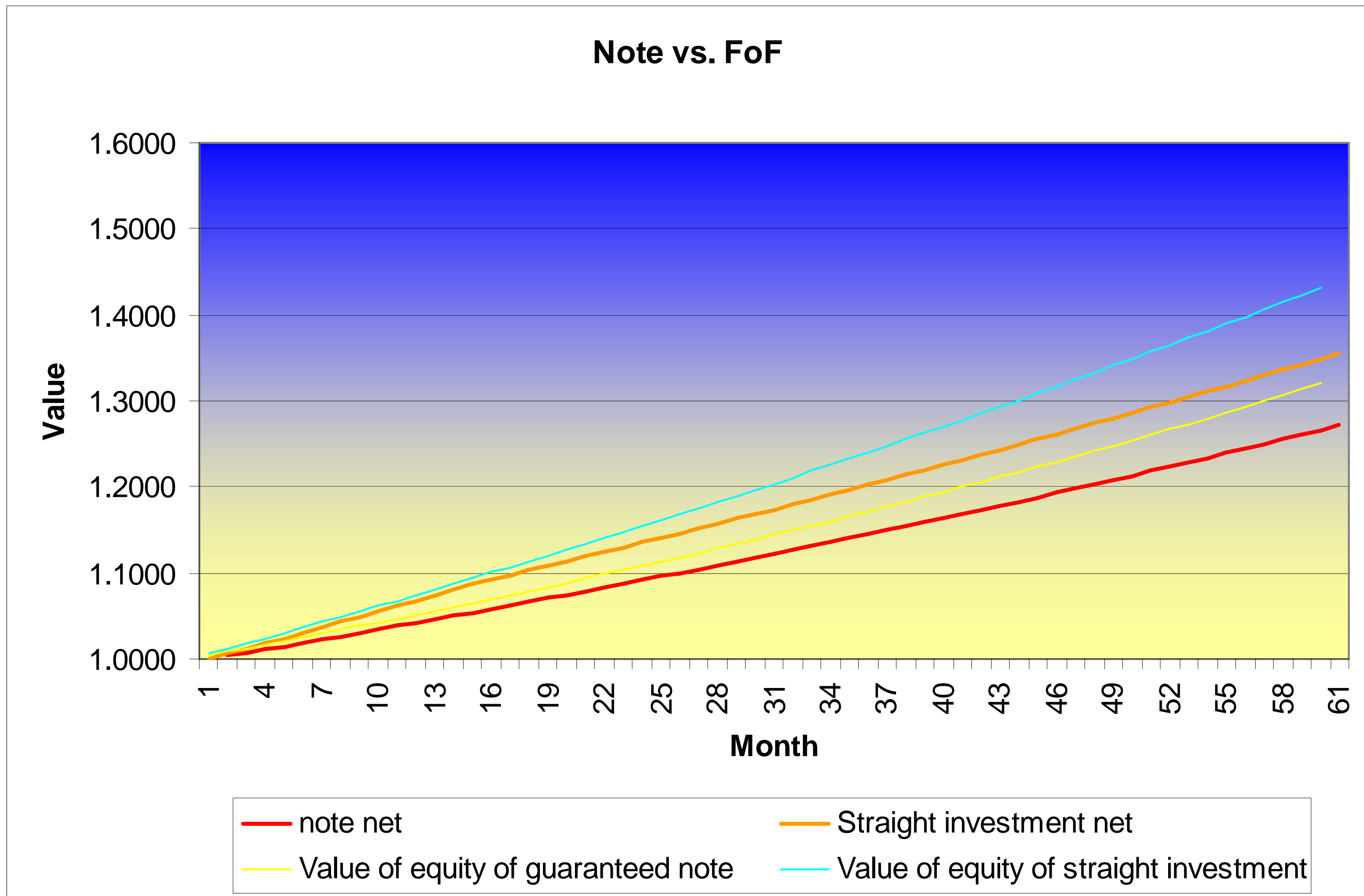
Case: NUMA protector (Peru)



Performance fee impact

- Performance fees can be established in many different ways:
  - At the note NAV level.
  - At the underlying fund performance level.
  - At the leveraged fund performance level.
- Because most of the assets are locked in a zero coupon bond, the effect of performance fees is not very severe, but it seriously affects the ability of the note to produce performance.
- However, there are notes for which the zero-coupon bond is expensive to issue. These can introduce very serious fee effects.

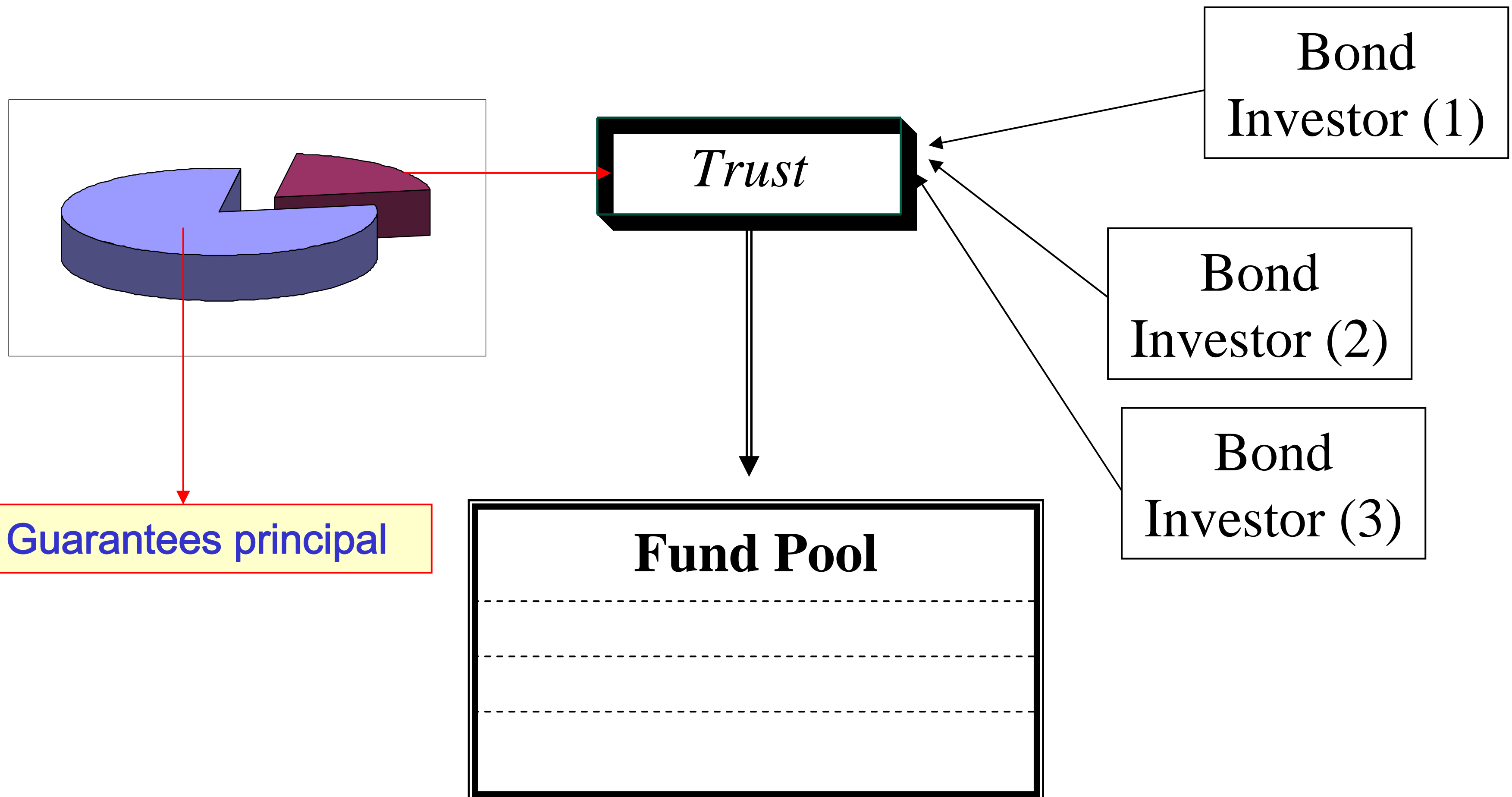
Performance fees



Alternative funding options: CFO

- Avoid the option structure by issuing debt (defaultable bonds) side by side with secured debt (risk-less bonds)
- It provides a risk transfer mechanism between counterparties with different risk views:
  - the investor, who places higher risk on the hedge fund investment
  - the bond holder, who place lower risk on the investment

Collateralized Fund Obligation (CFO)



Pros/cons

Advantages

- Equity investors are not exposed to interest rates
- Equity investors are not exposed to fund under-performance, if it is followed by a recovery.
- Bond investors diversify their credit risk exposure
- Bond investors make –on average- 50 bps above similar rated bonds

Disadvantages

- Must be rated, which an give rise to high costs.
- Equity investors can be hard to find.
- High structuring fees