

Inflation or Deflation

**What impact do they have on
the financial situation of a pension fund?**

Presentation to the EPFIF, December 15th, 2009

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▶ **Strategic view:**

How does inflation and deflation affect the financial situation of pension funds?

▶ **Tactical view:**

To hedge or not to hedge? That's the question!

Strategic view: Fundamentals (1)

- Changes in **expectation about inflation** lead to **adjustments of interest rates**, implying value changes of **interest rate sensitive assets and liabilities**.



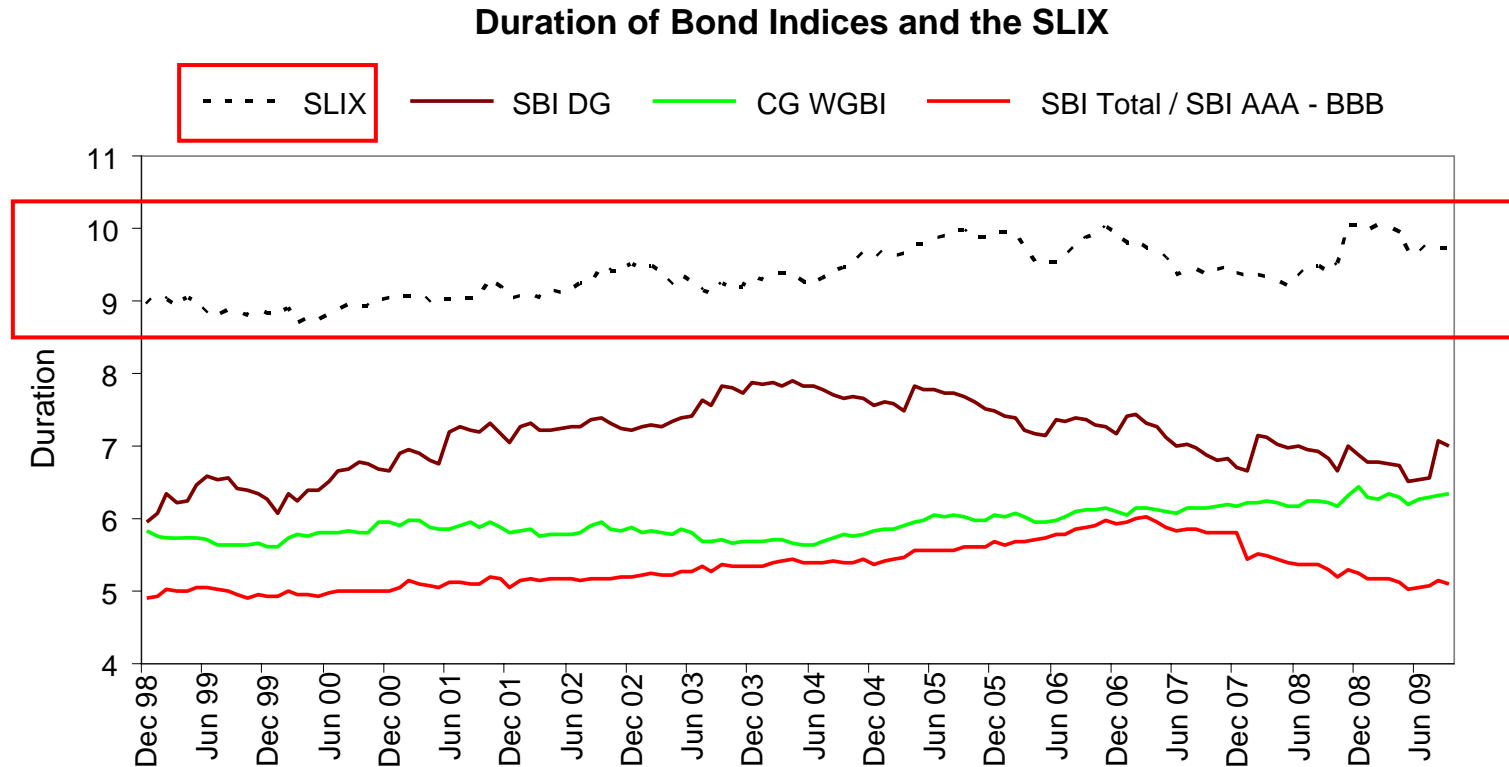
- Following positions in pension funds' balance sheets are affected the most:
 - Bonds (assets)
 - Liabilities: Liabilities of pension funds can be interpreted as being short in bonds (issued long term bonds).
- ▶ ***Inflation implies rising interest rates and affects not only the asset side but also the liabilities of a pension fund.***

Strategic view: Fundamentals (2)

- Why do changes in expectation lead to adjustments in interest rate level? (Fisher-Effect)
- Intuition given in the following situation:
 - An investor is willing to buy a bond under following conditions:
 - *Yield to maturity: 2%*
 - *Expected inflation: 1%*
 - Now, let's assume an expected inflation of 3%:
 - Investors are no longer willing to buy the bond under the same conditions (real loss). Anyway, bond issuers need new capital, therefore they have to adjust their conditions i.e. interest rates have to be more attractive for the investors.
 - *Yield to maturity: 4%*
 - *Expected inflation: 3%*

- Determining the duration of the **asset side** is usually possible. There are different data providers supplying information about duration of bonds as well as bond indices.
- Obtaining the duration on the **liability side** (interpretation of pensions as issued bonds) of a pension fund is more difficult. The **SLIX (Swiss Liability Index)** is a helpful tool to get an idea about the duration of the liabilities of a Swiss pension fund. The SLIX-Index shows the market value of the pensions of a representative pension funds.

Strategic view: Duration (2)

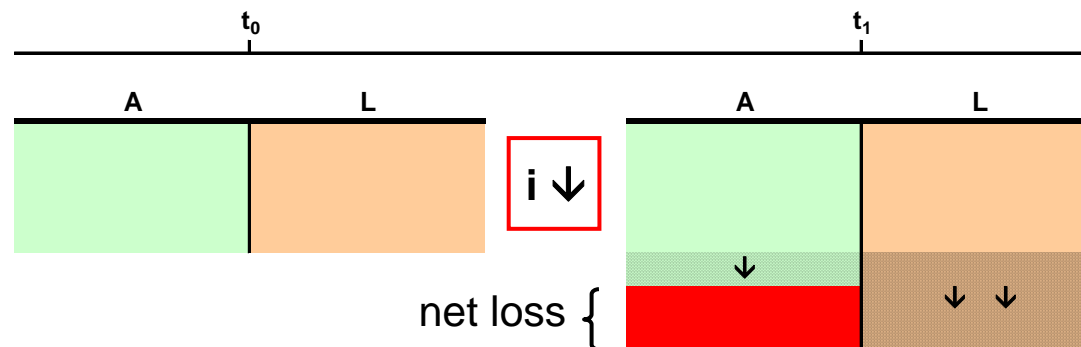


- There is a **significant difference** between the duration of the widely used benchmarks on the asset side and the duration of the liabilities represented by the SLIX.
- ▶ ***Usually, the duration of the liabilities is higher than the duration of the assets of a pension fund.***

Strategic view: Deflation (1)

- **Effects of deflation**

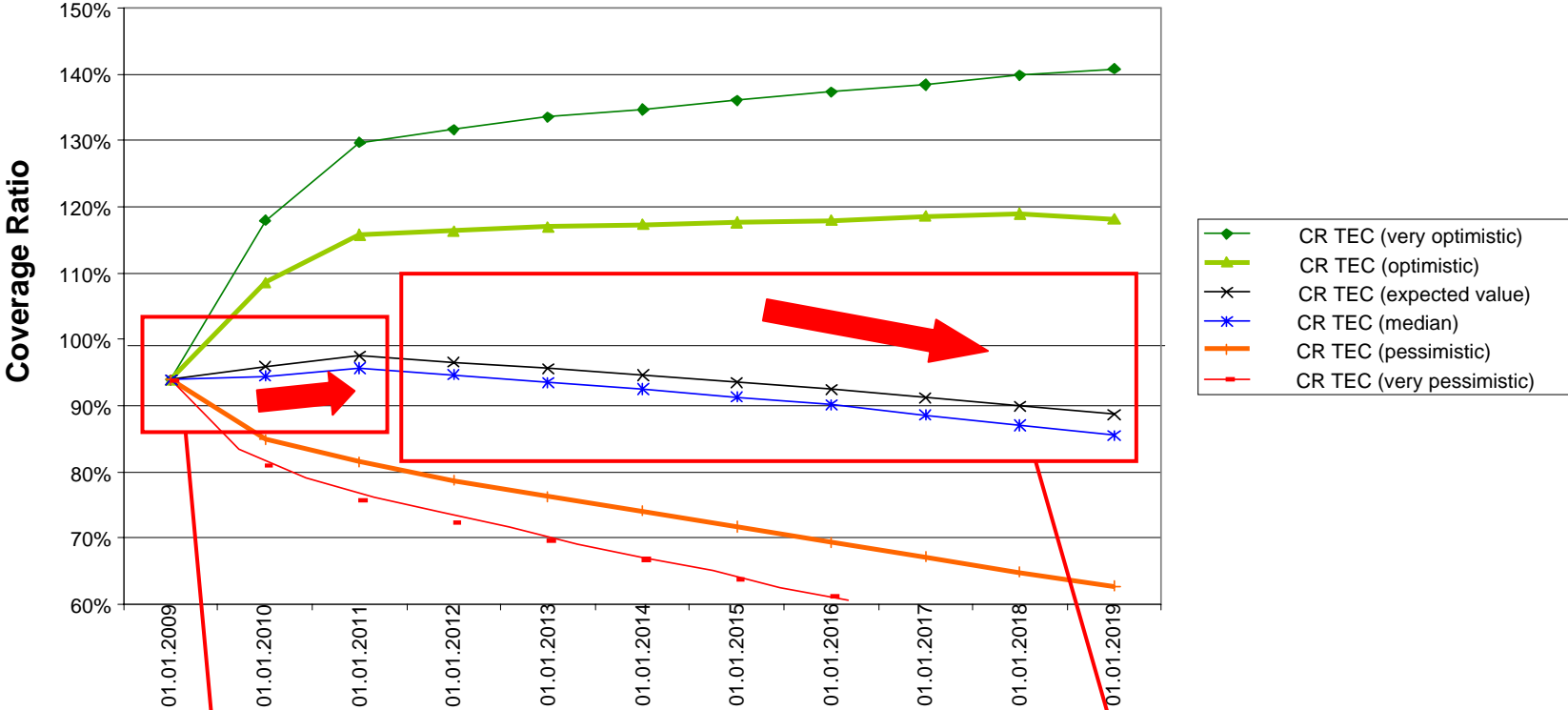
- Lower interest rates leads to lower expected returns.
- Short-term profits on bonds → more attractive relative to the risk free rate.
- Liabilities are fixed → present value of all liabilities is higher due to lower discount rate.



► ***In the long run profits on the assets side (bonds) are lower than the losses due to higher present values of liabilities, leading to a decreasing coverage ratio.***

Strategic view: Deflation (2)

Simulation (Coverage Ratio)
 (without any reorganizational measures; Scenario "Deflation")



Short term increase of the coverage ratio due to short-term profits on bonds (asset side)

Long-term losses on the liability side
 → decreasing coverage ratio

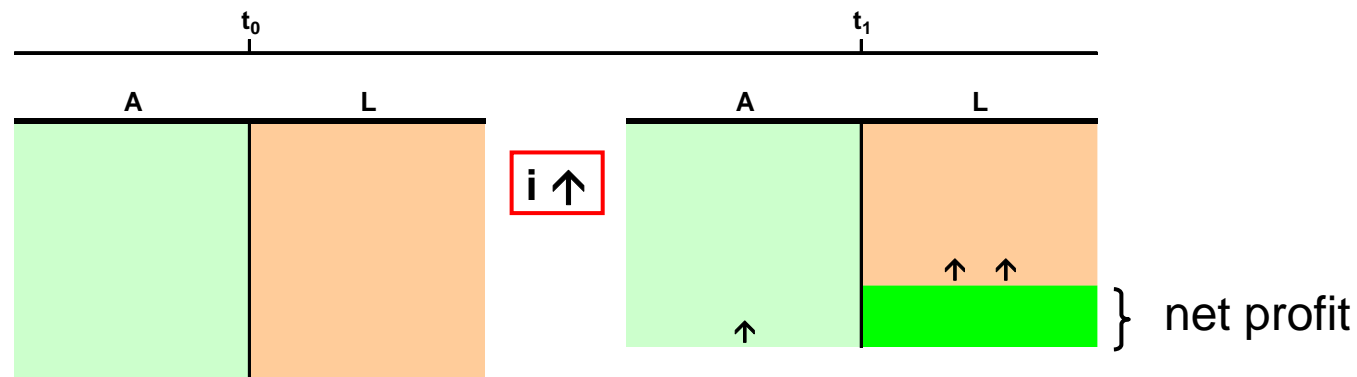
- **Effects of deflation**

- Shrinking coverage ratio
- Pension funds need to bear more risk to achieve the same expected returns on the financial markets (lower risk free rate).
- Financing the pensions becomes increasingly difficult.
- Retirees profit because the conversion rate (“Umwandlungssatz”) is too high.
- ▶ ***Deflation has severe consequences for the financial situation of pension funds in the long run.***
- ▶ ***In a deflation scenario, steps have to be taken quickly to stabilize the financial situation of a pension fund (e.g. to lower the conversion rate).***

Strategic view: Inflation (1)

- **Effects of inflation**

- Higher interest rates lead to higher expected returns.
- Short-term losses on the asset side (bonds).
- Liabilities are fixed \rightarrow present value is lower due to higher discount rates.
- Pensions can be financed much easier (higher risk free rate).

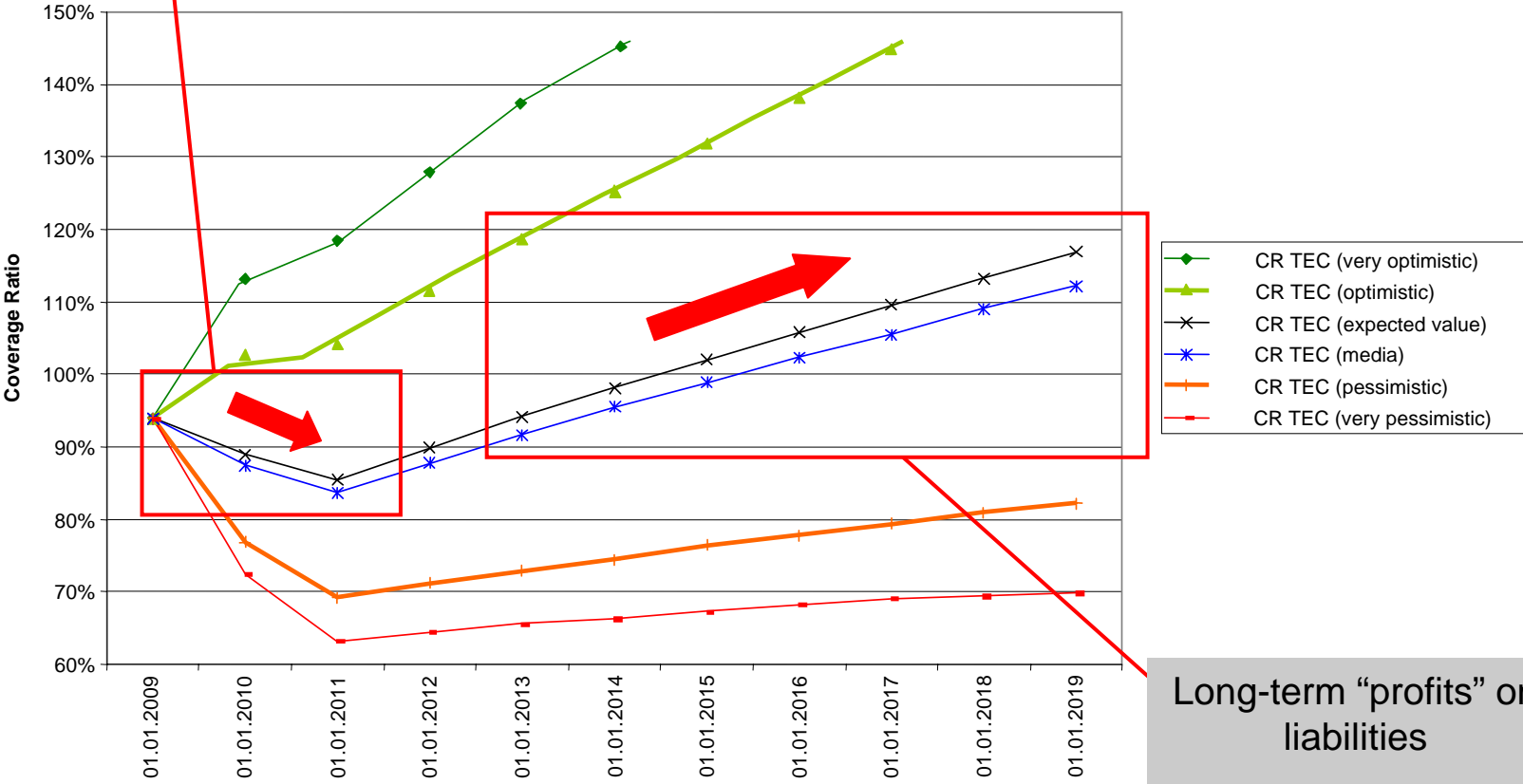


► ***In the long run losses on bonds are lower than the “profit” due to lower present values of liabilities, leading to an increasing coverage ratio.***

Strategic view: Inflation (2)

Short term decrease of the coverage ratio due to short-term losses on bonds.

Coverage Ratio (simulation)
 without any reorganizational measures; Scenario "Inflation")



Long-term "profits" on liabilities
 → increasing coverage ratio

- **Effects of inflation**

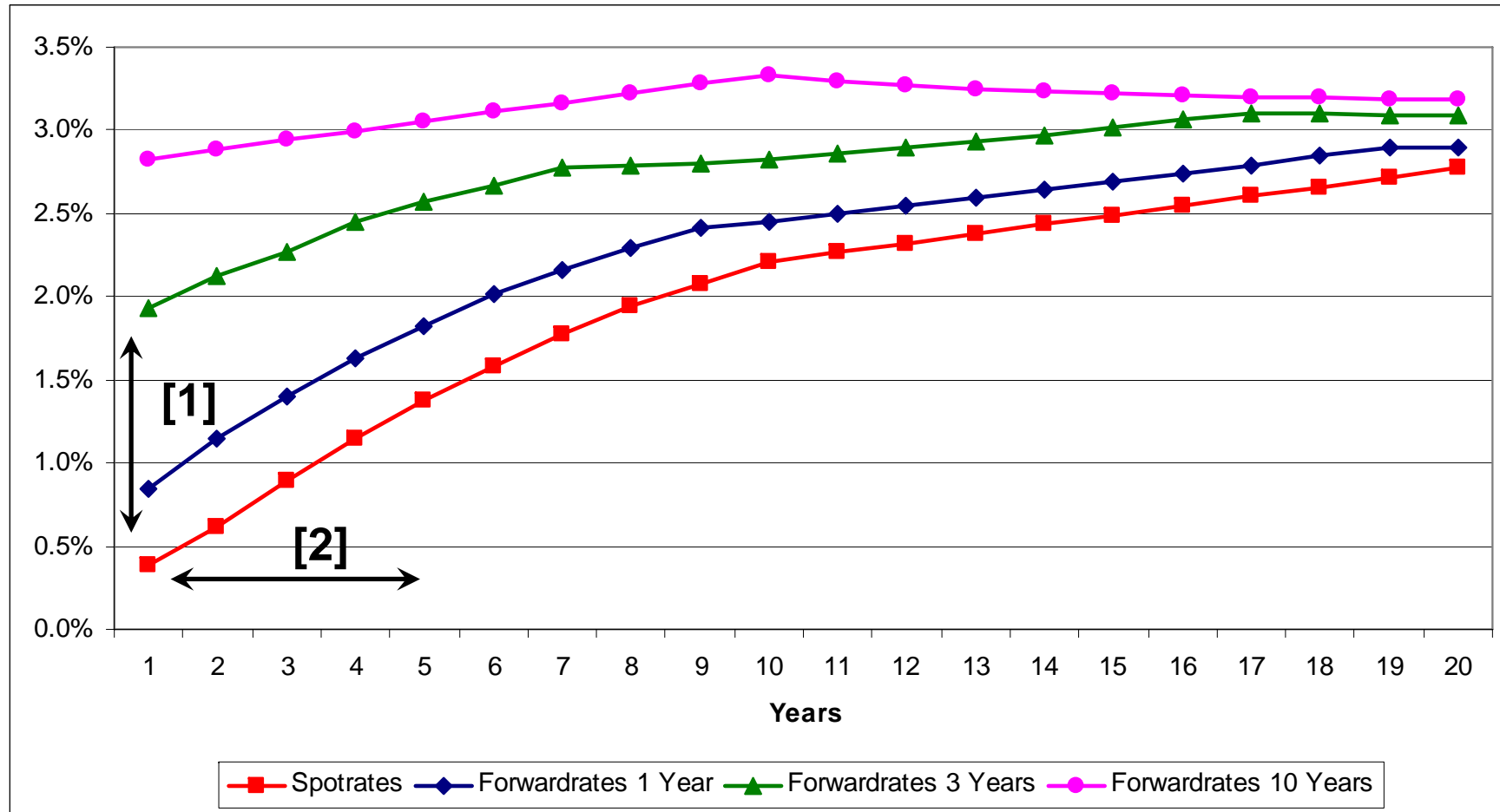
- Long term increasing coverage ratio.
- Financing the pensions is possible by taking lower risk (risk free rate is higher).
- If pensions are not adjusted to inflation changes, retirees help to recapitalize the pension funds.
- ▶ ***Inflation (rising interest rates) has positive implications for the financial situation of pension funds in the long run.***

- ▶ ***A typical pension fund in Switzerland has a lower duration on the asset side than on the liability side.***
- ▶ ***Deflation would have severe implication on the financial situation of pensions funds.***
- ▶ ***Inflation would only in the short run lead to lower coverage ratios. In the long run inflation can help to improve the financial situation of pension funds.***

- ▶ ***Interest rates are very low at the moment. To hedge or not to hedge? That's the (tactical) question!***

- Expectations about interest rates are observable on the financial markets:
 - **Spot rates:**
 - Actual yield to maturity for different maturities (the theoretical yield on a zero-coupon treasury for different maturities)
 - **Forward rates:**
 - An interest rate which is specified now for a loan that will occur at a specified future date.
 - Forward rates are implied in the actual spot rate curve.
- ▶ ***Forward rates show today's expectations about future interest rates.***

Tactical view: Spotrates und Forwardrates (2)



Source: Spotrates SNB, October 2009; Forward rates own computations

► **The market today expects a significant increase in interest rates.**

- The actual interest rate curve is upward sloping. Hence, **market participant expect higher interest rates in the future.**
- Statements like „*Interest rates are historically low and they will rise in the future*“ are almost trivial, because that's exactly what the actual shape of the interest rate curve is telling us.
- By looking at the gap between the red and the green curve ([1] in the graph) one can conclude that the **market is expecting short term interest rate (one year) to rise** from an actual level of about 0.4% to 1.9% within the next three years.

- **Investors invested in bonds with longer maturity are compensated for taking the risk of rising interest rates.** The number [2] in the graph shows that, lowering the duration (e.g. maturity from five years to one year) gives around 1% p.a. less return.
- **Hedging interest rate risk is equivalent with lowering the duration of the bond portfolio.** Lower duration is directly linked with lower returns.
- ▶ ***From a tactical point of view, hedging is only reasonable, if the decision makers do expect interest rate to rise **more** than the market does actually expect.***

Tactical view: Hedging tools and some considerations

Instruments:

- **Lower duration** of the bonds portfolio
- **Money market** investments

- Hedging with **derivative** instruments (futures, swaps, options, ...)

- **Inflation Linked Bonds**

Considerations:

Lower duration leads to lower returns (term structure)

Lower returns (lower duration). In addition counterparty risk becomes an issue if OTC instruments (e.g. swaps) are used.

ILB do not exist for Swiss inflation (bet on USD-, EUR- and/or GBP-Inflation). ILBs are mostly issued by governments. Often the government also calculates the consumer price index...

- ▶ ***Interest rates are very low at the moment. But the market expects already a significant rise of interest rates in the future.***
- ▶ ***Holders of bonds with a longer duration are compensated for bearing the risk of rising interest rates.***
- ▶ ***Hedging makes only sense if the decision makers of the pensions fund (e.g. the investment committee) have the tactical belief that interest rates will rise more than the market expects.***

Conclusion (1)

- ▶ **Interest rate changes have an impact on the asset and liability side of a pension fund's balance sheet.**
- ▶ **Strategic view:**
 - ▶ Liabilities of pension funds can be interpreted as **issued bonds with a long duration**. The duration of the asset side is usually shorter.
 - ▶ Hedging interest rate risk leads to a even lower duration on the asset side (increased "**duration mismatch**").
 - ▶ From a strategic point of view **deflation** would be more a threat for Swiss pension funds than inflation.

▶ Tactical view:

- ▶ The actual term structure shows that the market **expects higher interest rates** in the future. Investors are **compensated** for bearing the risk of bonds with a longer duration.
- ▶ From a tactical point of view, hedging is only reasonable, if the decision makers expect interest rate to rise **more** than the rise which is already included in market prices.