Bonds – Investment Dead Wood or Holy Grail

An Overview of the Issues

Dr. Franz Schumacher, Partner
PPCmetrics AG

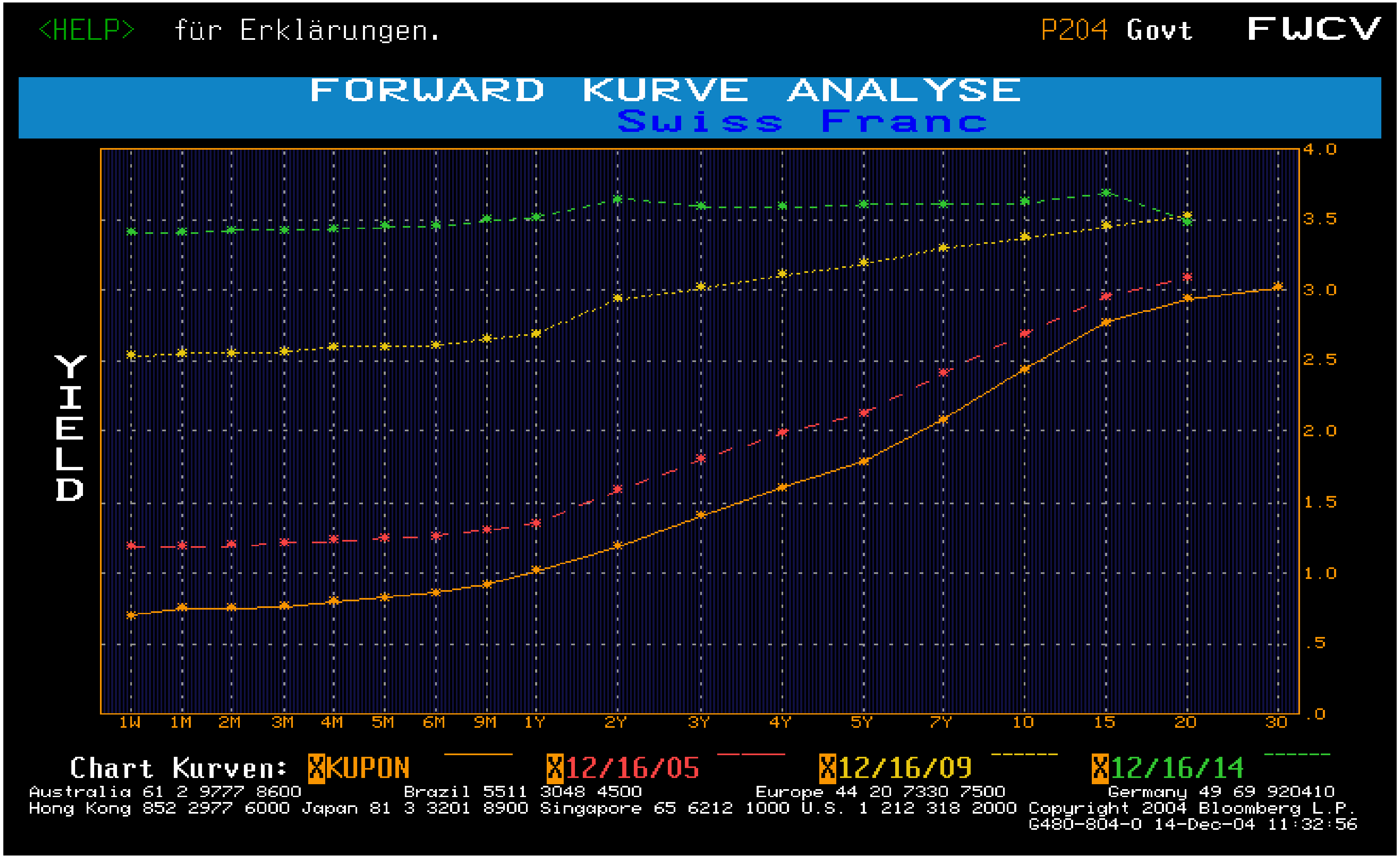
Overview

- The bond market situation is dire! Let’s get out of here!

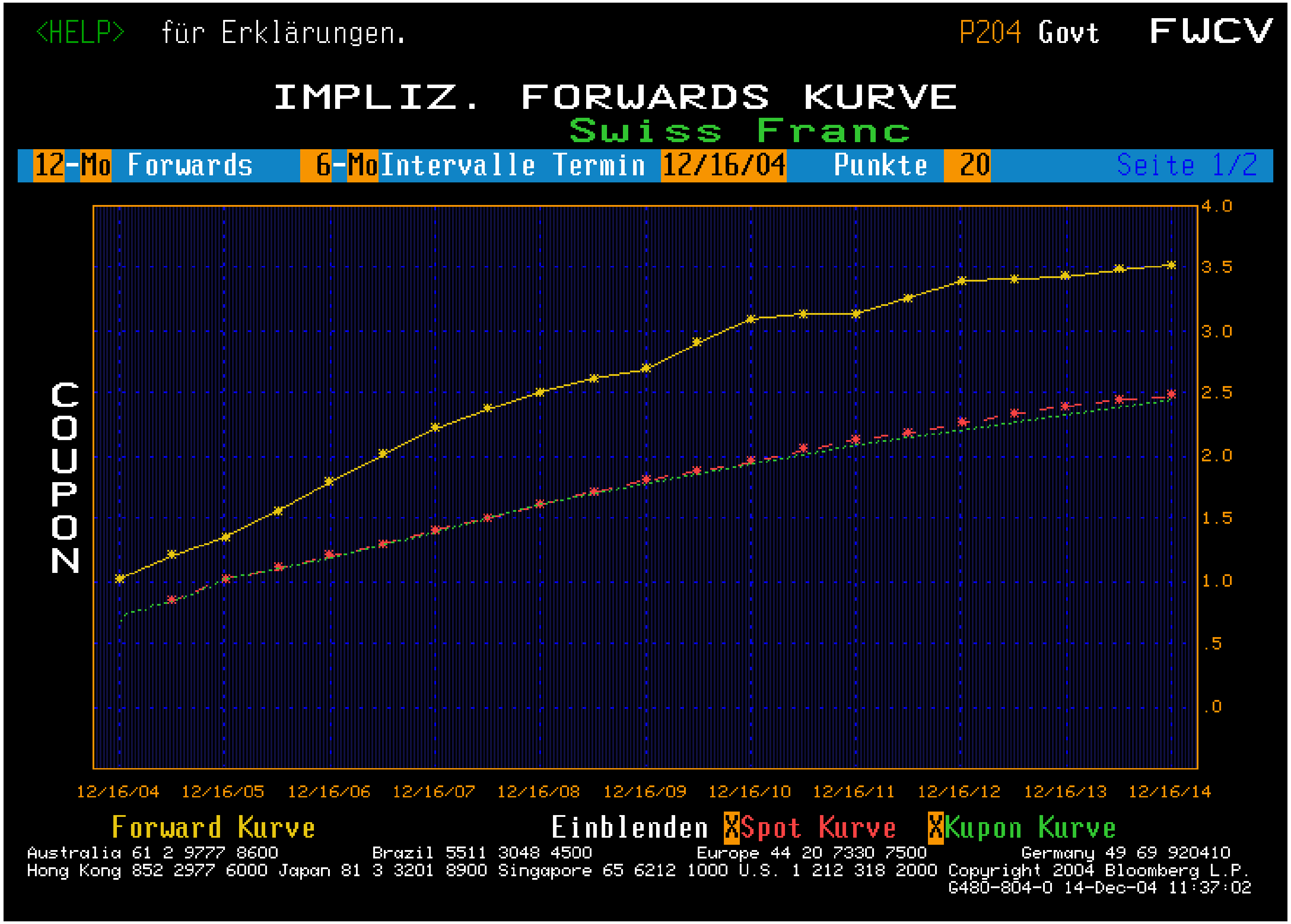
- But wait a minute! Is there a rational way to go forward?

- If yes: What are stumbling blocks?

Market View: CHF Yield Curve Today & TMR



Market View: Expected 1-Year Rate



CHF Interest Rates

- Interest rates are at historic lows.
- Forward curve indicates that markets do NOT anticipate rate rises.
- Interest rates are all below the required returns for defined benefit plans.
- Returns this year were about good though: Yields by end of November were 4.7% (SBI)!
- A reason to be pleased? We will see!

Market View And Market Positioning

- Interest rates are at a historic low.
- They cannot go much lower.
- Current yields do not compensate/protect against sudden interest increases.
- You have to reduce your exposure to bonds – thereby reducing your duration for this investment to zero.
- For the remaining investments, you have to go short duration relative to your benchmark.

Questions

- Is it really that simple? Why are interest rates where they are, if everybody assumes raising interest rates?

- What are the risks when implementing such a strategy?

- Who is bearing the burden, when things go wrong?

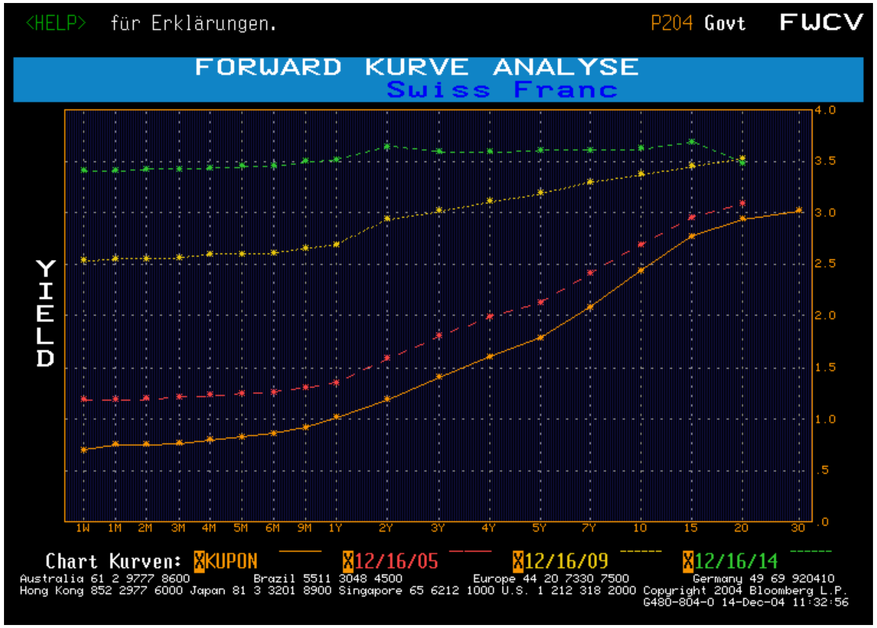
- Is taking on more investment risk the right way to go?

Some Theses

- Most pension funds do not know their real coverage ratio.
- Most pension funds take duration risk way beyond their risk capability.
- Most pension funds manage returns and not coverage ratios. They use the wrong benchmark.

The Real Coverage Ratio Is Much Lower!

- Today, most pension funds use the technical interest rate of 4% to discount their future liabilities.
- The market rates are below the 4% used.
- The net present value of liabilities is therefore ***underestimated***.
- Assets are valued at market prices.
- Therefore, the real coverage ratio is **lower** than indicated.



Is the Problem Significant?

ppc metrics

- The difference in NPV depends on
  - the duration of the liabilities and
  - the shape of the yield curve.
- Typical duration figures for defined benefit liabilities are:
  - Pensioners: 9 years (!!!)
  - Active only: 20 years (!!!)
  - Normal pension fund: Over 10 years
  - Swiss Bond Index: 5.42 years

Significant? You Bet!

ppc metrics

Laufzeit Jahre	Markt-zinsen	CHF bei 4%	Diskont-faktor	Oek. Verpflichtung	Techn. Verpflichtung	Deckungs-grad	Differenz
1	1.00%	104.00	1.0100	102.97	100	97.1%	-2.88%
2	1.20%	108.16	1.0240	105.62	100	94.7%	-5.32%
3	1.40%	112.49	1.0426	107.89	100	92.7%	-7.31%
4	1.60%	116.99	1.0656	109.79	100	91.1%	-8.92%
5	1.78%	121.67	1.0922	111.39	100	89.8%	-10.23%
6	1.98%	126.53	1.1248	112.49	100	88.9%	-11.10%
7	2.10%	131.59	1.1562	113.82	100	87.9%	-12.14%
8	2.23%	136.86	1.1930	114.72	100	87.2%	-12.83%
9	2.34%	142.33	1.2314	115.58	100	86.5%	-13.48%
10	2.45%	148.02	1.2739	116.20	100	86.1%	-13.94%
15	2.79%	180.09	1.5099	119.28	100	83.8%	-16.16%
20	2.97%	219.11	1.7939	122.14	100	81.9%	-18.13%
30	3.10%	324.34	2.4953	129.98	100	76.9%	-23.06%

The REAL coverage ratio of a typical pension fund is currently 10% to 15% lower than most pension funds would think!

Consequences

- The true risk capability depends on the amount of free reserves.

- The amount of free reserves is probably lower than indicated or even negative.

- Taking on more or unwanted risk does not seem to be a good way to tackle the problem.

Pension Fund Risks...

- What is the main risk for a pension fund?
  - The risk that liabilities cannot be met.
    - Illiquidity
    - Insufficient assets
- Risk drivers
  - Insurance risk (actuarial risk)
    - Death, Disability, Longevity
  - Event risk (company risk)
  - Interest rate risk (market risk)

...And How to Deal With Them

- Insurance risk
  - Diversify
  - Reserves
- Event
  - Handle individually
- Interest rate
  - Eliminate!
  - Pension funds are ideally suited to bear interest rate risk!
  - Taking on no interest rate risk is risky!!!

The Risk of Not Taking Interest Rate Risk

- Assume a duration of your liabilities of 10 years.
- Assume you invest all your assets in a passive SBI-mandate (duration 5 years).
- You run a duration risk of minus 5 years.
- Interest rates fall by 1%.
- Your asset grows by 5%!
- Your liabilities grow by 10%!

Returns or Coverage Ratio?

- Taking the example one step further:
  - Your annual report says:
    - Assets are up 5%
    - Liabilities are up 4%
    - Coverage ratio has increased!
  - The capital market says:
    - Assets are up 5%
    - Liabilities are up 10%
    - Your coverage ratio has DECREASED by -9% (5%-10%-4%)!
- **Would you put 9% of your coverage ratio into one bet?**

Key Questions I

- Knowing that your real coverage ratio limits your risk taking, what is the true neutral position?

  – The neutral position is the bond portfolio that matches your liabilities (“The matching portfolio”).

  – The key rate duration profile of your liabilities depends on the plan type (defined benefit or defined contribution).

Key Questions II

- How much capital does the pension fund require?
  - The present value of this portfolio is needed to finance your liabilities risk minimising.
  - If you want to take investment risk you need more capital or an agreement who is going to bear the risk.

Key Questions III

- I do not have enough capital to finance the risk minimising portfolio. What should I do?
  - If you invest the capital risk minimising, you will NOT meet the liabilities in the future with certainty.
  - It will please your current pensioners, if you take on investment risk to achieve higher returns. They have only upside potential. Active plan members will carry the entire risk if the strategy should go wrong.
  - See further below.

Key Questions IV

- I have enough capital to finance the risk minimising portfolio. What should I do?

  – If you invest the capital risk minimising, you will meet the liabilities in the future with certainty.

  – It will please your current pensioners, if you take on investment risk to achieve higher returns. They have only upside potential. Active plan members will carry the entire risk if the strategy should go wrong.

  – See further below.

Key Questions V

- What should I do?!
  - First, establish the real financial situation and the risk minimising portfolio for your pension fund.
  - Accept the fact that doing nothing is no option because of the asymmetric outcomes for the various interested parties.
  - Accept the fact that there are many ways to bring the pension fund back into balance. All are unpopular. A combination of measures is better than a corner solution.
  - Decide then on a risk budget relative to your risk minimising portfolio.
    - Decide who is going to bear the risk and get the benefits beforehand.
  - Allocate the risk budget
    - Beta (Correlated, persistent)
    - Alpha (Uncorrelated, not persistent)
  - Manage from the perspective of your risk minimising portfolio.

Further Pension Fund Aspects I

ppc metrics

- You cannot manage the technical coverage ratio and the capital market based ratio at the same time.
- Full capital market based analysis can move the coverage ratio into a range where you have to work out a recovery plan!
- A realistic estimate of the true financial state of the pension fund will put a restrain on claims on future excess returns.

Further Pension Fund Aspects II

- The risk minimising portfolio is certainly not the most efficient portfolio. Some risk should be taken. The risk takers should decide. The returns from such risk taking should go to the risk takers.

- The pension fund should have an investment vehicle as its neutral position. This would be the risk minimising portfolio and not the money market.

- All risk taking should occur planned. All risks must carry a risk premium.

Market Issues

- Is the market deep enough to carry all the investments?

- Are there synthetic ways to construct bond portfolios?

Dead Wood or Holy Grail

ppc metrics

- The value of your liabilities depends on CHF interest rates. Your liabilities have a positive duration.
- Money market plus is not risk minimising at all.
- 10 years plus would be a better way to go!
- Your risk minimising portfolio and benchmark consists of CHF bonds. Bonds are therefore the foundation of a sound strategy.