

FIXED-INCOME BASICS

HWZ Finance
© Benno Weber 2005, benno@benno.ch

1

Inhalt

1. Einführung
2. Zinseszinsrechnung und Abdiskontierung
3. Duration und Konvexität
4. Zinskurve
5. Reale und nominale Anleihen
6. Kredit
7. Spezialfälle
8. Praktisches Obligationen-Management

2

1.1 Begriffe

- Fixed Income
- Obligation
- Anleihen
- Kapitalmarkt
- Renten
- Bonds
- Buoni/Bonos

3

1.2 Grösse der globalen Bondmärkte

Figure 1. Size of Major Bond Markets at Year-End 1998 (Nominal Value Outstanding: Billions of U.S. Dollars or Equivalent)^a

| Bond Market | Total Publicly Issued | As a Pct. of Public Issues in All | Central Govt. | Central Agency & Govt. Guaranty | State & Local Govt. | Corporate & Other Convertible | Other Domestic Publicly Issued | Foreign Issued | Int'l Bonds ^b | | Private Placement Underwritten |
|------------------------|-----------------------------|--|------------------|--|---------------------------|-------------------------------------|---|-------------------|------------------------------|------------------------------|--------------------------------------|
| | | | | | | | | | Euro- | Placements | |
| U.S. Dollar | \$12,475.7 | 49.0% | \$2,664.5 | \$3,320.5 | \$1,140.5 | \$3,051.0 | \$605.5 | \$261.5 | \$1,423.3 | — | — |
| Japanese Yen | 3,023.7 | 15.4 | 2,291.7 | 178.7 | 113.0 | 498.0 | 492.3 | 86.2 | 262.9 | \$699.2 | — |
| Deutschemark | 2,578.5 | 10.1 | 741.5 | 40.7 | 73.5 | 4.8 | 1,347.7 | — | \$370.4 ^c | — | \$36.8 |
| Italian Lira | 1,461.7 | 5.7 | 1,046.7 | 14.7 | — | 5.9 | 263.8 | 5.1 | 125.4 | — | — |
| French Franc | 1,074.7 | 4.2 | 546.8 | 176.1 | 2.6 | 130.7 | — | 4.7 | 205.9 | — | — |
| U.K. Sterling | 789.8 | 3.1 | 451.3 | — | 0.2 | 65.4 | — | 5.6 | 277.3 | — | — |
| Dutch Guilder | 441.9 | 1.7 | 184.0 | — | 1.2 | 153.4 | — | 2.8 | 100.6 | 57.6 | — |
| Canadian Dollar | 432.2 | 1.7 | 195.6 | — | 113.0 | 72.7 | 0.7 | 0.4 | 49.9 | — | — |
| Belgian Franc | 369.0 | 1.4 | 212.0 | 11.1 | — | 14.2 | 81.1 | 45.2 | 5.3 | — | — |
| Danish Krone | 299.6 | 1.2 | 96.3 | — | — | — | 190.0 | — | 12.5 | — | — |
| Spanish Peseta | 263.0 | 1.1 | 210.1 | — | 11.1 | 19.3 | 17.3 | 20.2 | — | — | — |
| Swiss Franc | 264.3 | 1.0 | 33.2 | — | 20.0 | 33.6 | 65.5 | 112.2 | — | 29.1 | — |
| European Currency Unit | 217.4 | 0.9 | 74.1 | — | — | — | — | — | — | 142.3 | — |
| Swedish Krona | 200.0 | 0.8 | 100.3 | — | 1.0 | 10.6 | 92.1 | — | 4.0 | — | — |
| Austrian Schilling | 144.9 | 0.6 | 70.5 | 2.2 | — | 4.4 | 65.8 | 2.0 | — | 1.5 | — |
| Australian Dollar | 124.3 | 0.5 | 49.1 | 24.6 | — | 22.6 | — | 1.4 | 26.7 | — | — |
| Greek Drachma | 85.0 | 0.3 | 79.2 | — | — | — | — | 1.3 | 4.6 | — | — |
| South African Rand | 73.1 | 0.3 | 54.4 | 10.8 | 1.7 | — | — | — | 6.2 | — | — |
| Portuguese Escudo | 68.8 | 0.3 | 35.3 | — | 1.2 | 9.3 | 13.1 | 10.9 | — | — | — |
| Finnish Markka | 62.7 | 0.2 | 48.2 | — | 0.7 | 4.0 | 7.4 | — | 2.4 | — | — |
| Norwegian Krone | 55.5 | 0.2 | 17.6 | 3.5 | 5.7 | 3.4 | 23.3 | 0.4 | 1.7 | — | — |
| Irish Punt | 26.8 | 0.1 | 24.0 | 0.8 | — | 1.1 | — | 0.1 | 0.7 | — | — |
| New Zealand Dollar | 23.7 | 0.1 | 9.5 | 1.0 | — | 2.5 | — | 0.0 | 10.7 | — | — |
| Total | \$25,484.4 | 100.0% | \$9,235.7 | \$3,784.7 | \$1,500.1 | \$4,103.6 | \$3,266.4 | \$560.0 | \$3,033.9^d | \$3,033.9^d | \$1,324.1^e |

Sector as a Pct. of

Public Issues in all MIBs

100.0%

36.2%

14.9%

5.9%

16.1%

12.0%

2.2%

11.9%

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

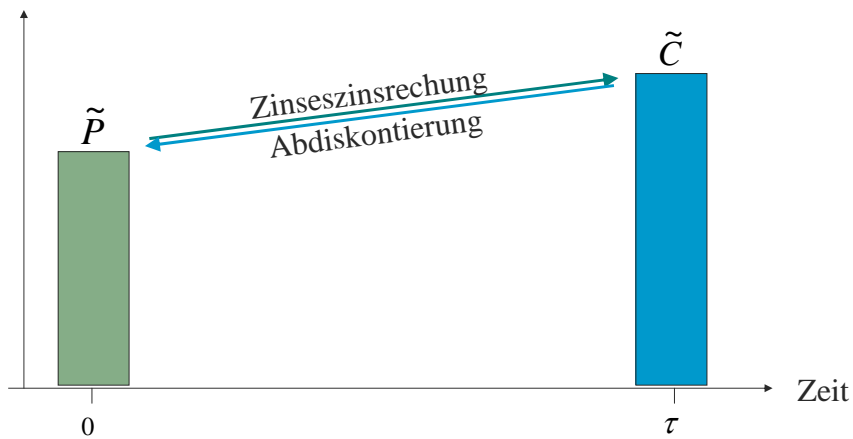
—

—

Source: Citigroup

4

2.1 Zinseszins und Abdiskontierung



5

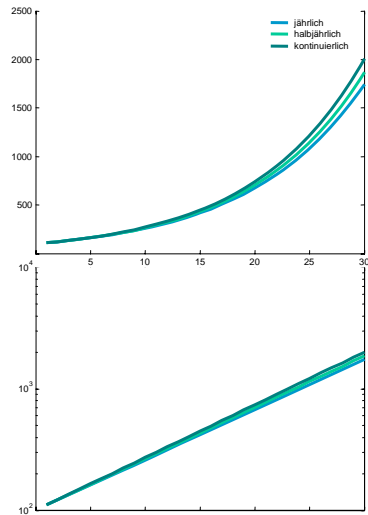
2.2 Formeln für Zinseszins und Abdiskontierung

| | Jährlich | Halbjährlich | Kontinuierlich |
|------------------------------|--|---|------------------------------------|
| Zinseszins (PV → CF) | $C_\tau = P_\tau \cdot (1 + r)^\tau$ | $C_\tau = P_\tau \left(1 + \frac{r}{2}\right)^{2 \cdot \tau}$ | $C_\tau = P_\tau \cdot e^{r\tau}$ |
| Abdiskontierung (CF → PV) | $P_\tau = \frac{C_\tau}{(1 + r)^\tau}$ | $P_\tau = \frac{C_\tau}{\left(1 + \frac{r}{2}\right)^{2 \cdot \tau}}$ | $P_\tau = C_\tau \cdot e^{-r\tau}$ |
| Wo? | Europa, Schweiz | USA, UK, Australien, Japan | Elegante Theorie |

6

2.3 Beispiel Zinseszinsrechnung

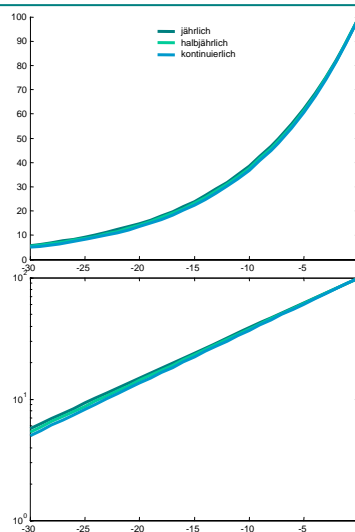
| Zeitpunkt | Zins 10% | | |
|-----------|----------|--------------|----------------|
| | jährlich | halbjährlich | kontinuierlich |
| 0 | 100.00 | 100.00 | 100.00 |
| 1 | 110.00 | 110.25 | 110.52 |
| 2 | 121.00 | 121.55 | 122.14 |
| 3 | 133.10 | 134.01 | 134.99 |
| 4 | 146.41 | 147.75 | 149.18 |
| 5 | 161.05 | 162.89 | 164.87 |
| 6 | 177.16 | 179.59 | 182.21 |
| 7 | 194.87 | 197.99 | 201.38 |
| 8 | 214.36 | 218.29 | 222.55 |
| 9 | 235.79 | 240.66 | 245.96 |
| 10 | 259.37 | 265.33 | 271.83 |
| 11 | 285.31 | 292.53 | 300.42 |
| 12 | 313.84 | 322.51 | 332.01 |
| 13 | 345.23 | 355.57 | 366.93 |
| 14 | 379.75 | 392.01 | 405.52 |
| 15 | 417.72 | 432.19 | 448.17 |
| 16 | 459.50 | 476.49 | 495.30 |
| 17 | 505.45 | 525.33 | 547.39 |
| 18 | 555.99 | 579.18 | 604.96 |
| 19 | 611.59 | 638.55 | 668.59 |
| 20 | 672.75 | 704.00 | 738.91 |
| 21 | 740.02 | 776.16 | 816.62 |
| 22 | 814.03 | 855.72 | 902.50 |
| 23 | 895.43 | 943.43 | 997.42 |
| 24 | 984.97 | 1040.13 | 1102.32 |
| 25 | 1083.47 | 1146.74 | 1218.25 |
| 26 | 1191.82 | 1264.28 | 1346.37 |
| 27 | 1311.00 | 1393.87 | 1487.97 |
| 28 | 1442.10 | 1536.74 | 1644.46 |
| 29 | 1586.31 | 1694.26 | 1817.41 |
| 30 | 1744.94 | 1867.92 | 2008.55 |



7

2.4 Beispiel Abdiskontierung

| Zeitpunkt | Zins 10% | | |
|-----------|----------|--------------|----------------|
| | jährlich | halbjährlich | kontinuierlich |
| 0 | 100.00 | 100.00 | 100.00 |
| -1 | 90.91 | 90.70 | 90.48 |
| -2 | 82.64 | 82.27 | 81.87 |
| -3 | 75.13 | 74.62 | 74.08 |
| -4 | 68.30 | 67.68 | 67.03 |
| -5 | 62.09 | 61.39 | 60.65 |
| -6 | 56.45 | 55.68 | 54.88 |
| -7 | 51.32 | 50.51 | 49.66 |
| -8 | 46.65 | 45.81 | 44.93 |
| -9 | 42.41 | 41.55 | 40.66 |
| -10 | 38.55 | 37.69 | 36.79 |
| -11 | 35.05 | 34.18 | 33.29 |
| -12 | 31.86 | 31.01 | 30.12 |
| -13 | 28.97 | 28.12 | 27.25 |
| -14 | 26.33 | 25.51 | 24.66 |
| -15 | 23.94 | 23.14 | 22.31 |
| -16 | 21.76 | 20.99 | 20.19 |
| -17 | 19.78 | 19.04 | 18.27 |
| -18 | 17.99 | 17.27 | 16.53 |
| -19 | 16.35 | 15.66 | 14.96 |
| -20 | 14.86 | 14.20 | 13.53 |
| -21 | 13.51 | 12.88 | 12.25 |
| -22 | 12.28 | 11.69 | 11.08 |
| -23 | 11.17 | 10.60 | 10.03 |
| -24 | 10.15 | 9.61 | 9.07 |
| -25 | 9.23 | 8.72 | 8.21 |
| -26 | 8.39 | 7.91 | 7.43 |
| -27 | 7.63 | 7.17 | 6.72 |
| -28 | 6.93 | 6.51 | 6.08 |
| -29 | 6.30 | 5.90 | 5.50 |
| -30 | 5.73 | 5.35 | 4.98 |



8

2.5 Der Diskontfaktor

Statt mit unterschiedlichen Formeln zu arbeiten, können wir auch schreiben

$$P_\tau = C_\tau \cdot \delta_\tau$$

wobei

$$\delta_\tau = \frac{1}{(1+r)^\tau} \quad (\text{bei jährlicher Verrechnung})$$

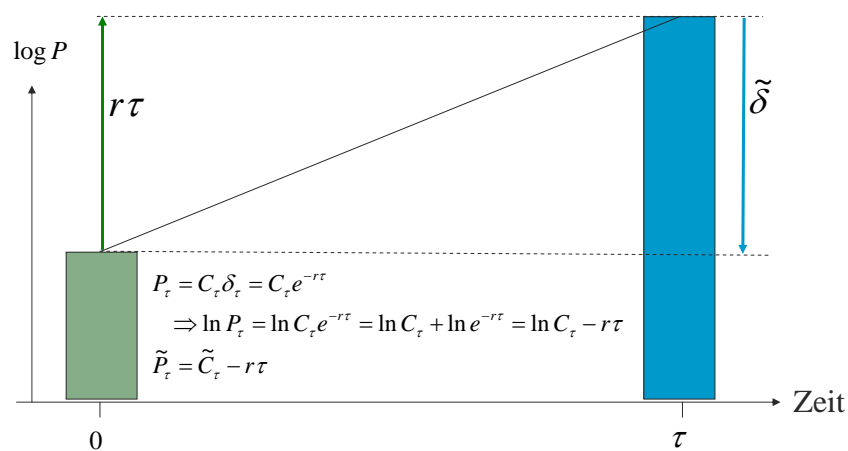
$$\delta_\tau = \frac{1}{\left(1 + \frac{r}{h}\right)^{h\tau}} \quad (\text{bei Verrechnung } h \text{ mal pro Jahr})$$

$$\delta_\tau = e^{-r\tau} \quad (\text{bei kontinuierlicher Verrechnung})$$

Beachte: der Diskontfaktor δ entspricht dem Preis eines Zerobonds mit Kapital 1.

9

2.6 Eleganz durch Logs



10

2.7 Zerobonds

DES N207 Govt DES

STRIPS \$ 05/15/25 36,401 / 36,544 (5.09 /07) BBT @ 9:54

SECURITY DISPLAY

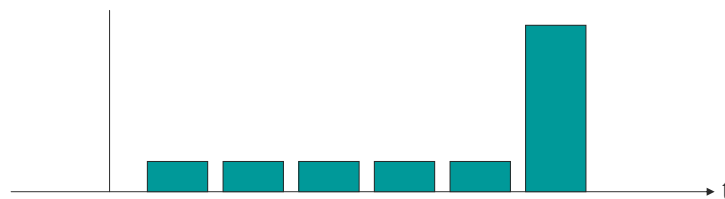
| SECURITY INFORMATION | ISSUER INFO | REDEMPTION INFO |
|--------------------------------|-----------------------|---------------------|
| CPN TYPE NONE | NAME STRIPS | MATURITY DT 5/15/25 |
| MTY/REFUND TYP NORMAL | TYPE US GOVT NATIONAL | NEXT CALL DT |
| CALC TYP (1)STREET CONVENTION | | WORKOUT DT 5/15/25 |
| DAY COUNT(1)ACT/ACT | | RISK FACTOR 7.14 |
| MARKET ISS US GOVT | | |
| COUNTRY/CURR USA/ DOL | | |
| SECURITY TYPE USW | | |
| AMT UNSTRIPPED 1(MM) | | |
| AMT STRIPPED 1(MM) | | |
| MIN PIECE .01 | | |
| | IDENTIFICATION #'s | ISSUANCE INFO |
| | CUSIP 912833LV0 | ISSUE DATE 11/15/96 |
| | MLNUM H2E75 | |
| | ISIN US912833LV09 | |
| | | PRC @ ISSUE |

LISTED: AMEX.

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7900 Germany 49 69 320410
Hong Kong 852 2377 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2005 Bloomberg L.P.
6681-1280-3 31-Mar-05 9:58:38

11

2.8 Mittelfluss einer normalen Anleihe



Attribute

- Verfall
- Coupon
- Couponhäufigkeit
- Marchzins-Verrechnungsart
- Schuldner / Emittent (+ Seniorität)
- Zusätzliche Infos (nicht notwendig): ISIN, CUSIP, Rating, Betrag ausstehend ...

12

2.9 Beispiel einer Anleihe

DES N207 Corp DES

SECURITY DESCRIPTION Page 1/1
 SWISS (GOVT) SWISS 3 ¾ 06/15 112.2100/112.3300 (2.38/2.37) BGN @ 8:05

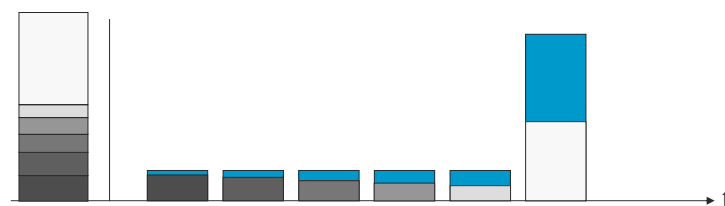
| ISSUER INFORMATION | | IDENTIFIERS | | 1) Additional Sec Info |
|----------------------|---------------------|---------------------|----------------------|------------------------|
| Name | SWITZERLAND | ISIN | CH0012385596 | 2) Identifiers |
| Type | Sovereign | Valoren | 00123855B | 3) Ratings |
| Market of Issue | DOMESTIC | Sedol 1 | 7178524 | 4) Sec. Specific News |
| SECURITY INFORMATION | | RATINGS | | 5) Custom Notes |
| Country | CH | Currency | CHF | 6) Issuer Information |
| Collateral Type | BONDS | Moody's | Aaa | 7) ALLO |
| Calc Typ | 129/ISMA CONVENTION | S&P | AAA | 8) Pricing Sources |
| | | Fitch | AAA | 9) Related Securities |
| Maturity | 6/10/2015 Series | ISSUE SIZE | | 10) Corporate Actions |
| NORMAL | | Amt Issued | CHF 2,784,150.00 (M) | |
| Coupon | 3 ¾ FIXED | Amt Outstanding | CHF 2,784,150.00 (M) | |
| ANNUAL | GERMAN:30/360 | Min Piece/Increment | 1,000.00/ 1,000.00 | |
| Announcement Dt | 5/22/01 | Par Amount | 1,000.00 | |
| Int. Accrual Dt | 6/11/01 | | | |
| 1st Settle Date | 6/11/01 | | | |
| 1st Coupon Date | 6/10/02 | | | |
| Iss Pr | 99.9000 | | | |
| | | | | 65) Old DES |
| NO PROSPECTUS | | EBS (SWISS) | | 66) Send as Attachment |

S&L,IBLN,DMN,TRANCHES.(S#100MM NOT PLACED).SEE (CACX <GD>) FOR INCREASE HISTORY.

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2577 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2005 Bloomberg L.P.
 6691-1200-1 30-Mar-05 9:59:17

13

2.10 Bewertung einer normalen Anleihe



$$P_D = \sum_{\tau} \frac{C_{\tau}}{(1+r_{\tau})^{\tau}} = \sum_{\tau} P_{\tau} = \sum_{\tau} \delta_{\tau} C_{\tau}$$

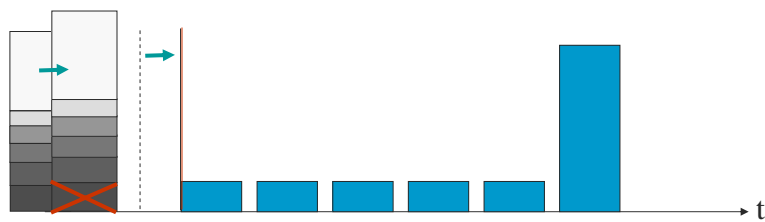
14

2.11 Beispiel Bewertung normaler Bond

| Laufzeit | 10 | Jahr | C_t | δ | P_t |
|----------|-----|------|-------|----------|---------------|
| Zins | 5% | 1 | 6 | 0.9524 | 5.714 |
| Coupon | 6% | 2 | 6 | 0.9070 | 5.442 |
| Kapital | 100 | 3 | 6 | 0.8638 | 5.183 |
| | | 4 | 6 | 0.8227 | 4.936 |
| | | 5 | 6 | 0.7835 | 4.701 |
| | | 6 | 6 | 0.7462 | 4.477 |
| | | 7 | 6 | 0.7107 | 4.264 |
| | | 8 | 6 | 0.6768 | 4.061 |
| | | 9 | 6 | 0.6446 | 3.868 |
| | | 10 | 106 | 0.6139 | <u>65.075</u> |
| | | | | 107.722 | |

15

2.12 Preis während der Coupon-Perioden

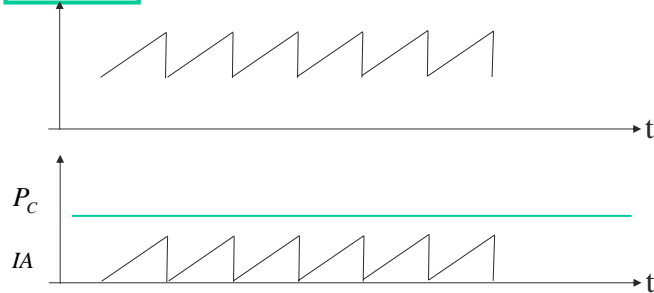


- Nach Auszahlung des Coupons bleiben Mittelflüsse fix, aber die Abdiskontierungsperiode bis zu jedem Fluss verkleinert sich \Rightarrow (schmutziger) Preis [= Gegenwartswert der Mittelflüsse] steigt
- Bei Auszahlung des Coupons sinkt der Gesamtwert
- Usw.

16

2.13 Marchzinsen

$$P_D = I_a + P_C$$



Marchzins (I_a) = Methode, um aus dem schmutzigen Preis (P_D) den Couponeffekt herauszufiltern. Normalerweise wird der saubere Preis (P_C) ausgewiesen.

17

2.14 Trade Ticket mit Marchzinsen

BTT P105 t Corp BTT
 Enter 1 <GO> to accept, 99 <GO> for options. LON 3/31/05 14:04
 As of 3/31/05 14:04:23

TEST1 TRADE TICKET
 SWISS 3 1/2 08/07/10 CH0006809906

BUY 100 (m)

Price 108.91 Yield 1.736768% Yield to 8/ 7/10 at 100

Settlement 4/ 5/05 CORP

Broker CREDIS CREDIT SUISSE BANK

| | | | |
|------------------------|------|-----|------------|
| Broker Commission Code | Rate | CHF | Trade Flat |
| Stamp Duty | | CHF | |
| Withholding Tax | | CHF | |
| Clearing Fee | | CHF | Reason |
| Exchange Fee | | CHF | |

EUR/CLEAR
 CEDEL
 ORDER TIME
 EXEC TIME

BROKER
 NEW ISSUE
 NOTES

| | | | |
|-------------------|-----|------------|------------------|
| Principal | CHF | 108,910.00 | Principal/Agency |
| Accrued (238) | | 2,313.89 | |
| Transaction Costs | | 0.00 | Settlement Loc |
| Total | CHF | 111,223.89 | |

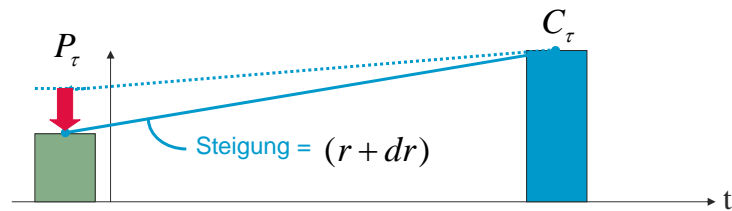
Total Position 100

View in CHF Rate 1.000000 Invert (Y/N)

Australia 61 2 9277 8600 Brazil 5511 3048 4500 Europe 44 20 7830 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2005 Bloomberg L.P.
 6691-1200-3 31-Mar-05 15:04:53

18

3.1 Wie verändert sich der Preis, wenn die Zinsen steigen?



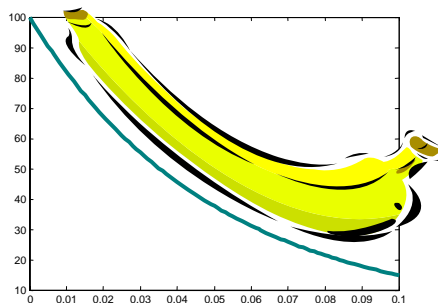
- Fixer Mittelfluss, aber steilere Abdiskontierung
⇒ Preis fällt
- Preis-Effekt grösser, je länger die Laufzeit

19

3.2 Illustration Preiseffekt von Zinsen

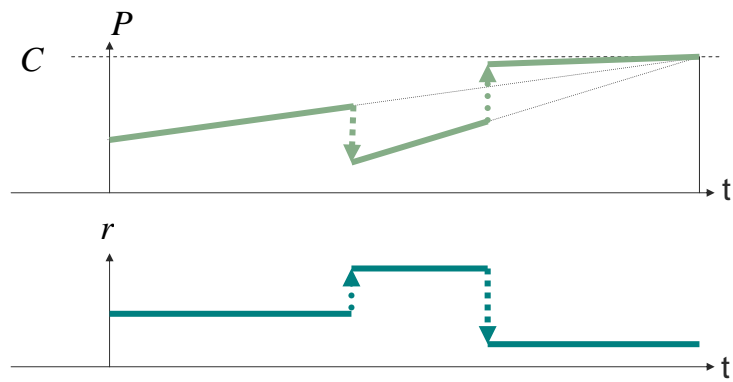
- Beispiel 20-jähriger Zerobond

| | |
|--------------|--------|
| □ $r=0\%$: | 100.00 |
| □ $r=1\%$: | 81.95 |
| □ $r=2\%$: | 67.30 |
| □ $r=3\%$: | 55.37 |
| □ $r=4\%$: | 45.64 |
| □ $r=5\%$: | 37.69 |
| □ $r=6\%$: | 31.18 |
| □ $r=7\%$: | 25.84 |
| □ $r=8\%$: | 21.45 |
| □ $r=9\%$: | 17.84 |
| □ $r=10\%$: | 14.86 |

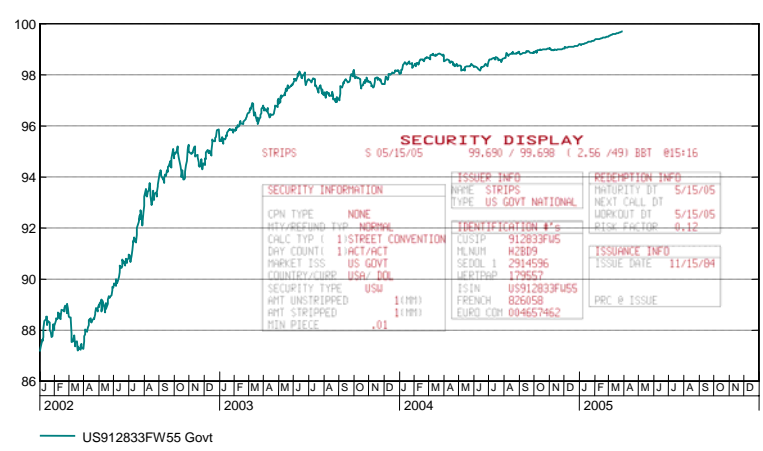


20

3.3 Preisentwicklung Zerobond

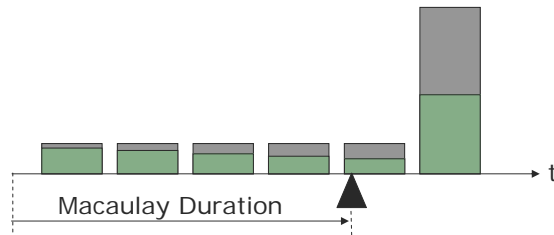


3.4 Illustration Preisentwicklung Zerobond



3.5 Macaulay Duration

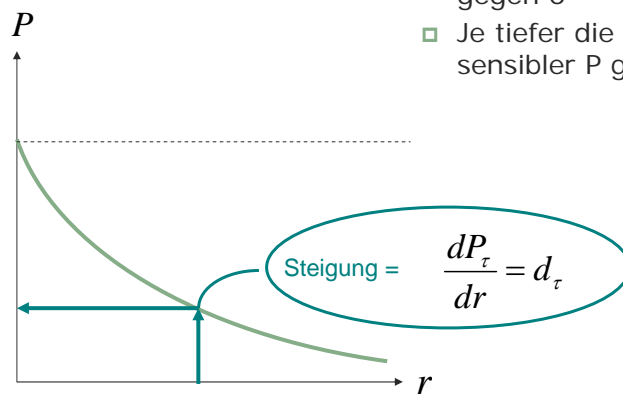
$$D_{Macaulay} = \frac{1}{P_D} \sum_{\tau} \frac{\tau \cdot C_{\tau}}{(1+r)^{\tau}} = \sum_{\tau} \tau \cdot \frac{P_{\tau}}{P}$$



23

3.6 Steigung der Preis/Rendite-Beziehung

- P geht asymptotisch gegen 0
- Je tiefer die Zinsen, umso sensibler P gegenüber r



24

3.7 Herleitung von d und D_{mod}

$$d_{\tau} = \frac{dP_{\tau}}{dr} = \frac{-\tau \cdot C_{\tau}}{(1+r)^{\tau+1}}$$

Um wieviel Franken **verändert sich** der Wert eines **Mittelflusses**, wenn r um 1% steigt?

$$d = \sum_{\tau} d_{\tau} = \frac{dP_D}{dr} = \sum_{\tau} \frac{-\tau \cdot C_{\tau}}{(1+r)^{\tau+1}}$$

$$= \frac{-1}{(1+r)} \sum_{\tau} \frac{\tau \cdot C_{\tau}}{(1+r)^{\tau}}$$

Um wieviel Franken **verändert sich** der Wert einer normalen **Anleihe** (= mehrere Mittelflüsse), wenn r um 1% steigt?

$$D_{\text{mod}} = \frac{-1}{P_D} \cdot d = \frac{-1}{P_D} \cdot \frac{dP_D}{dr}$$

$$= \frac{1}{P_D \cdot (1+r)} \sum_{\tau} \frac{\tau \cdot C_{\tau}}{(1+r)^{\tau}}$$

Um **wieviel Prozent fällt** der Wert einer normalen **Anleihe** (= mehrere Mittelflüsse), wenn r um 1% steigt?

25

3.8 Macaulay versus Modifizierte Duration

Bei jährlicher Zinsverrechnung gilt:

$$D_{\text{mod}} = \frac{D_{\text{Mac}}}{(1+r)}$$

Macaulay-Duration

- Misst durchschnittliche Zeit bis Verfall
- „Altes“ Sensitivitätsmass
- Eng verwandt, aber selber kein Risikomass

Modifizierte Duration:

- Misst Sensitivität des (schmutzigen) Preises gegenüber Zinsbewegungen
- Deshalb geeignet als Risikomass
- Kann aus Macaulay Duration abgeleitet werden

Beachte:

halbjährlicher Verrechnung $D_{\text{mod}} = \frac{D_{\text{Mac}}}{(1+r/2)}$

kontinuierliche Verrechnung $D_{\text{mod}} = D_{\text{Mac}}$

26

3.9 Beispiel zur Berechnung Duration

| period | C _τ | δ _τ | P _τ | τ*P _τ | |
|--------|---|----------------|------------------|------------------|---|
| 1 | 5 | 0.9615 | 4.8077 | 4.8077 | ← $\frac{\tau \cdot C_{\tau}}{(1+r)^{\tau}}$ |
| 2 | 5 | 0.9246 | 4.6228 | 9.2456 | |
| 3 | 105 | 0.8890 | 93.3446 | 280.0339 | |
| Total | | | 102.77509 | 294.0871 | ← $\sum_{\tau} \frac{\tau \cdot C_{\tau}}{(1+r)^{\tau}}$ |
| | $P_D = \sum_{\tau} \frac{C_{\tau}}{(1+r)^{\tau}}$ | | Macaulay | 2.8615 | ← $\frac{1}{P_D} \sum_{\tau} \frac{\tau \cdot C_{\tau}}{(1+r)^{\tau}}$ |
| | | | Modified | 2.7514 | ← $\frac{1}{P_D(1+r)} \sum_{\tau} \frac{\tau \cdot C_{\tau}}{(1+r)^{\tau}}$ |

27

3.10 Schätzung des Zinseffekts auf Preis einer Anleihe

$$D_{\text{mod}} = \frac{-1}{P_D} \cdot \frac{dP_D}{dr} \Rightarrow \frac{dP_D}{P_D} = -D_{\text{mod}} \cdot dr$$

$$\frac{\Delta P_D}{P_D} \approx -D_{\text{mod}} \cdot \Delta r$$

28

3.11 Beispiel zur Schätzung Duration-Effekt

... Rendite steigt auf 5%, dann verändert sich P_D um ...

$$\Delta r = 1.0000\%$$

$$D_{\text{mod}} = 2.7514$$

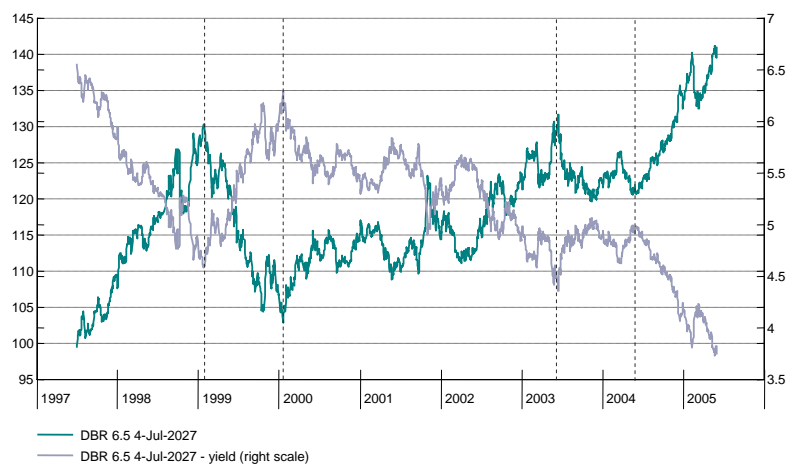
$$\Rightarrow -D_{\text{mod}} \cdot \Delta r = -2.7514\%$$

... d.h. P_D fällt auf ...

$$102.77509 \cdot (1 - 2.7514\%) = 99.9473$$

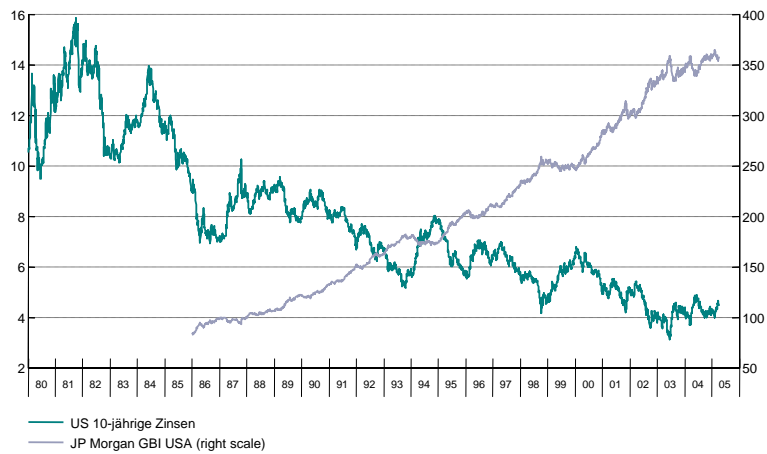
29

3.12 Renditen vs Preis



30

3.13 Renditen vs Bondindex



31

3.14 Duration eines Portfolios

Grundsatz: Die Duration eines Obligationen-Portfolios ist die gewichtete Duration der Obligationen im Portfolio.

$$D_{pf} = \frac{\sum_i N_i P_{D,i} D_i}{\sum_i N_i P_{D,i}} = \sum_i \left(\frac{N_i P_{D,i}}{\sum_j N_j P_{D,j}} \right) \cdot D_i = \sum_i w_i \cdot D_i = \frac{d_{pf}}{V_{pf}}$$

32

3.15 Duration eines Portfolios - Beispiel

| | N | Pc | la | Pd | D | V | d |
|---|-----------|--------|------|--------|------|-----------|------------|
| A | 1'000'000 | 105.42 | 1.22 | 106.64 | 4.56 | 1'066'400 | 4'862'784 |
| B | 500'000 | 99.86 | 2.60 | 102.46 | 4.22 | 512'300 | 2'161'906 |
| C | 2'000'000 | 102.10 | 0.56 | 102.66 | 5.13 | 2'053'200 | 10'532'916 |
| D | 1'500'000 | 100.00 | 2.55 | 102.55 | 5.42 | 1'538'250 | 8'337'315 |
| E | 350'000 | 101.99 | 1.01 | 103.00 | 6.01 | 360'500 | 2'166'605 |
| F | 1'500'000 | 100.59 | 1.20 | 101.79 | 6.11 | 1'526'850 | 9'329'054 |
| | | | | | | 7'057'500 | 37'390'580 |

$P_d = P_c + I_a$ $V_i = \frac{N_i \cdot P_d}{100}$ $d_i = V_i \cdot D_i$

$V_{pf} = \sum_i V_i$ $d_{pf} = \sum_i d_i$

$D_{pf} = \frac{d_{pf}}{V_{pf}}$

33

3.16 Immunisierung

- Immunisierung: Duration des Portfolios = Duration der zu finanzierenden Verbindlichkeiten)
- D.h. Zielduration erreichen mit verfügbaren Obligationen.
- Für 2 mögliche Obligationen:

$$D_p = w_1 \cdot D_1 + (1 - w_1) \cdot D_2 \Rightarrow w_1 = \frac{D_p - D_2}{D_1 - D_2}$$

- Resultat: Gesamtportfolio reagiert nicht auf Zinsveränderung („immunisiert“)
- Problem: (1) nur für kleine Veränderungen, (2) nur parallele Veränderungen

3.17 Immunisierung – Beispiel

| | | | | |
|--------------|-----------|------|-------|--------|
| Kapital | 1,000,000 | | | |
| Zielduration | 6 | | | |
| | Pc | la | D | Pd |
| Bond A | 101.22 | 3.25 | 5.46 | 104.47 |
| Bond B | 99.87 | 2.01 | 10.21 | 101.88 |

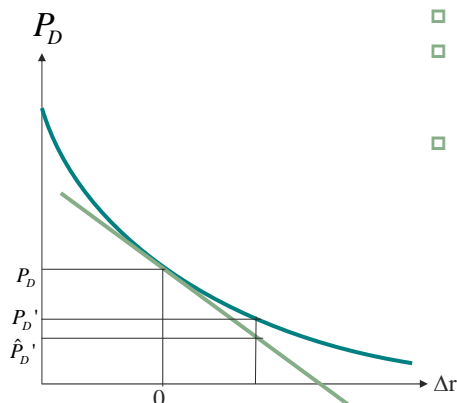
$$w_1 = \frac{D_P - D_2}{D_1 - D_2} = \frac{6 - 10.21}{5.46 - 10.21} = \frac{-4.21}{-4.75} = .8863$$

$$N_1 = \frac{K \cdot w_1}{P_{d1}} = \frac{1'000'000 \cdot .8863}{104.47\%} = 848'392$$

$$N_2 = \frac{K \cdot (1 - w_1)}{P_{d1}} = \frac{1'000'000 \cdot .2137}{101.88\%} = 111'586$$

35

3.18 Duration als Approximation



- Ausgangspunkt P_D
- Durationsmethode schätzt Preisveränderung entlang der Geraden
- Dabei verfehlt sie den korrekten Preis
 - Fehler entsteht aus konvexer Preisformel
 - Fehler ist immer negativ
 - Je grösser Δr , desto grösser der Fehler

$$\hat{P}_D = P_D \cdot (1 - D_{mod} \cdot \Delta r) = P_D - (D_{mod} \cdot P_D) \cdot \Delta r$$

36

3.19 Konvexitätsmass verbessert die Approximation

$$K = \frac{1}{P_D} \sum \frac{\tau(\tau+1) \cdot CF_\tau}{(1+y)^{\tau+2}} \Rightarrow \boxed{\frac{\Delta P_D}{P_D} \approx -D_{\text{mod}} \cdot \Delta y + \frac{1}{2} \cdot K \cdot (\Delta y)^2}$$

- Formel für K hergeleitet aus zweiter Ableitung
- Erweiterte Formel entspricht einer Taylor-Reihe 2. Grades
- Beschränkte Relevanz in der Praxis

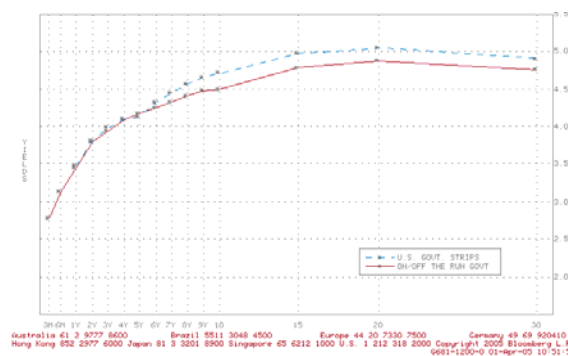
37

4.1 Definition der Spotkurve

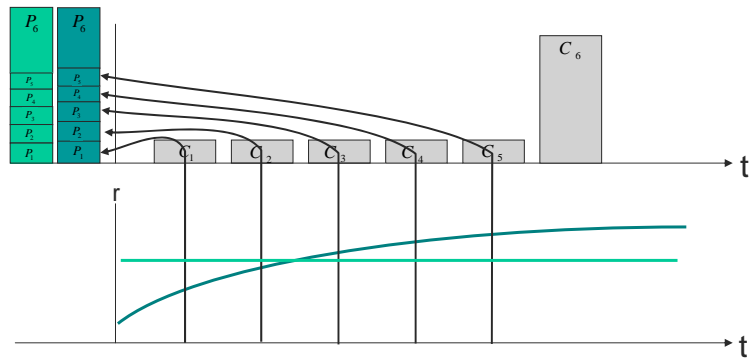
Spotrate = Der Zinssatz, der für die Abdiskontierung eines einzelnen Mittelfluss verwendet wird (= Zerorate)

Spotkurve = Verhältnis von Zeit bis zum Mittelfluss und der entsprechenden Spotrate

⇒ aus r wird r_τ



4.2 Rendite und Parkurve



Rendite Diskontsatz auf normale Anleihe, so dass PV aller Mittelflüsse bei Diskontierung mit Diskontsatz = Preis der Anleihe [Yield]

Parkurve Zinskurve aus Anleihen, bei denen Rendite = Couponrate

39

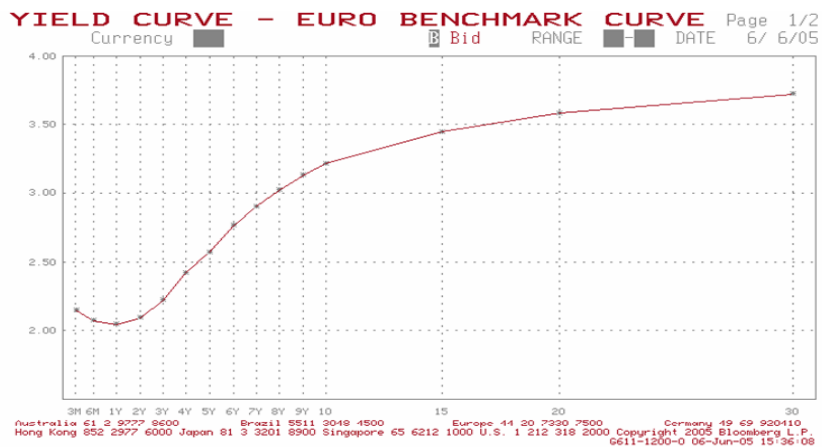
4.3 Quasi-modifizierte Duration / Z-Duration

$$D_{\text{modified}} = \frac{1}{P_D} \sum_{\tau} \frac{\tau \cdot C_{\tau}}{(1+r)^{\tau+1}} \quad \text{bzw} \quad \frac{1}{P_D} \sum_{\tau} \tau \cdot e^{-r \cdot \tau}$$

$$D_{\text{quasi-modified}} = \frac{1}{P_D} \sum_{\tau} \frac{\tau \cdot C_{\tau}}{(1+r_{\tau})^{\tau+1}} \quad \text{bzw} \quad \frac{1}{P_D} \sum_{\tau} \tau \cdot e^{-r_{\tau} \cdot \tau}$$

40

4.4 „Zinskurve“ / „Benchmarkkurve“



41

4.5 „Zinskurve“ / „Benchmarkkurve“ (Forts.)

<HELP> for explanation. P122 Govt IYC
 Hit <PAGE> for graph or <MENU> for list of curves.
YIELD CURVE - EURO BENCHMARK CURVE Page 2/2
 DATE 6/ 6/05

| | DESCRIPTION | PRICE | SRC | UPDATE | YIELD | HEDGED YIELD |
|------|----------------------------|-----------|-----|--------|--------|--------------|
| 3MO | 1) BTF 0 08/25/05 | B 99.5300 | BGN | 15:00 | 2.1519 | 2.1519 |
| 6MO | 2) BTF 0 11/24/05 | B 99.0300 | BGN | 15:00 | 2.0742 | 2.0742 |
| 1YR | 3) BTF 0 05/11/06 | B 98.1200 | BGN | 15:32 | 2.0407 | 2.0407 |
| 2YR | 4) BKO 2 1/2 03/23/07 | B100.7000 | BGN | 15:32 | 2.0938 | 2.0938 |
| 3YR | 5) DBL 3 04/11/08 #142 | B102.1100 | BGN | 15:31 | 2.2230 | 2.2230 |
| 4YR | 6) DBL 3 1/4 04/17/09 #144 | B103.0000 | BGN | 15:32 | 2.4241 | 2.4241 |
| 5YR | 7) DBL 3 1/4 04/09/10 #145 | B103.0300 | BGN | 15:32 | 2.5736 | 2.5736 |
| 6YR | 8) DBR 5 07/04/11 | B112.3400 | BGN | 15:35 | 2.7626 | 2.7626 |
| 7YR | 9) DBR 5 07/04/12 | B113.2400 | BGN | 15:32 | 2.9006 | 2.9006 |
| 8YR | 10) DBR 3 3/4 07/04/13 | B105.1400 | BGN | 15:35 | 3.0221 | 3.0221 |
| 9YR | 11) DBR 4 1/4 07/04/14 | B108.7600 | BGN | 15:35 | 3.1251 | 3.1251 |
| 10YR | 12) DBR 3 1/4 07/04/15 | B100.2800 | BGN | 15:35 | 3.2159 | 3.2159 |
| 15YR | 13) FRTR 4 1/4 04/25/19 | B108.6600 | BGN | 15:35 | 3.4530 | 3.4530 |
| 20YR | 14) DBR 6 1/4 01/04/24 | B135.6000 | BGN | 15:35 | 3.5889 | 3.5889 |
| 30YR | 15) DBR 4 01/04/37 | B105.0400 | BGN | 15:35 | 3.7249 | 3.7249 |

To change price source for securities, use <FMPS>.

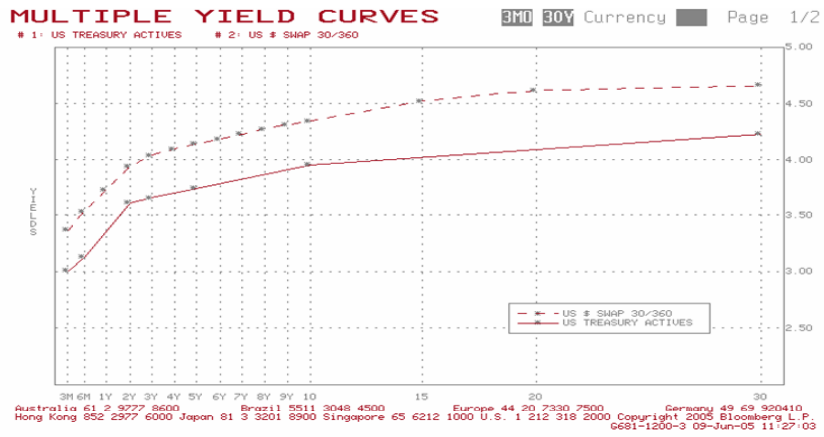
To change price source for swaps, use <XDF>.

Yields are based on next day settlement and are Conventional

Australia 61 2 9777 9600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2005 Bloomberg L.P.
 6611-1200-0 06-Jun-05 15:36:49

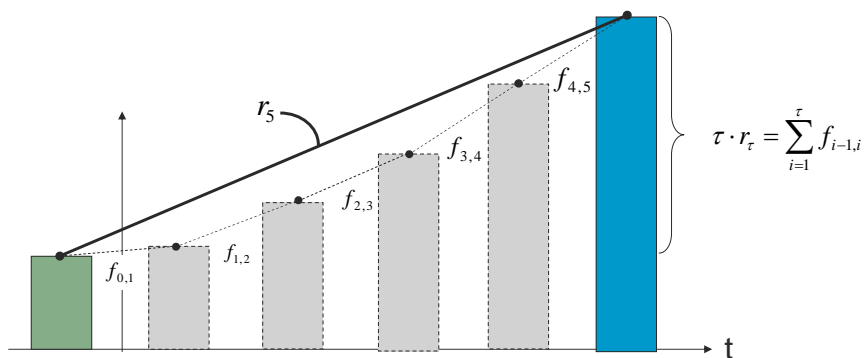
42

4.6 Benchmark versus Swapkurve



43

4.7 Forwards



44

4.8 Forward Berechnung auf Bloomberg

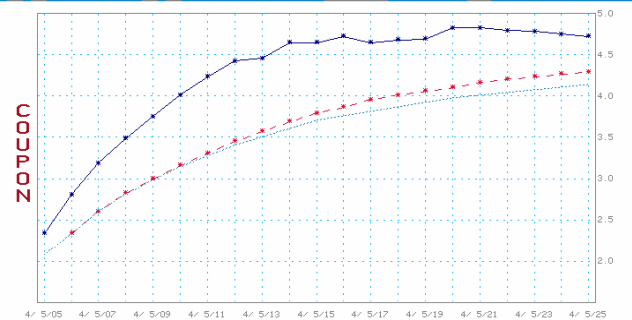
<HELP> for explanation.

N207 Govt FJCV

IMPLIED FORWARDS CURVE

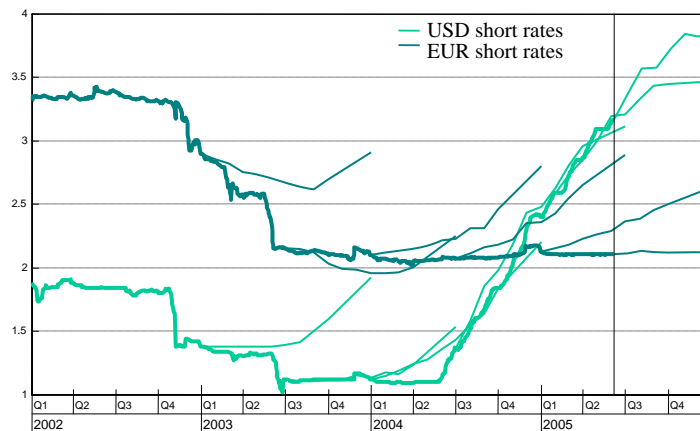
Euro

1 Yr Forwards 1 Yr Intervals Date 4/ 5/05 Points 20 Page 1/2

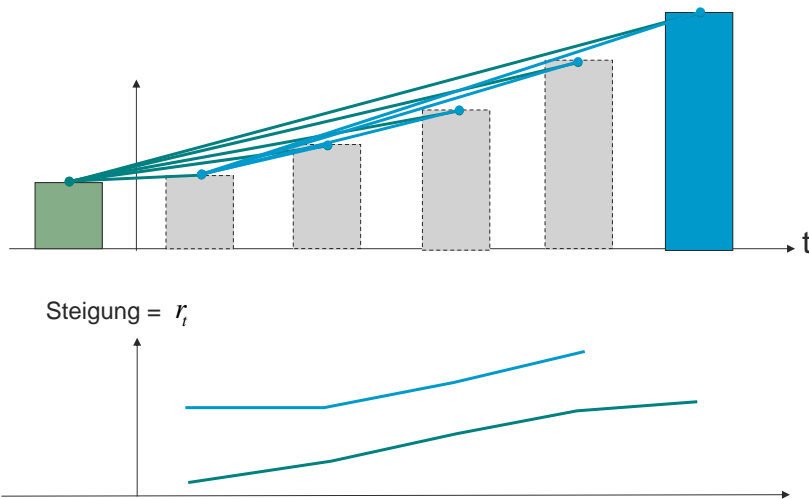


Forwards Curve Overlay Spot Curve Coupon Curve
 Australia 61 2 3177 0200 Brazil 5511 2048 4500 Europe 44 20 7230 7300 Germany 49 69 920410
 Hong Kong 852 2577 6000 Japan 81 3 3201 8500 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2005 Bloomberg L.P.
 6681-1200-0 01-Apr-05 14:17:24

4.9 Hair Charts

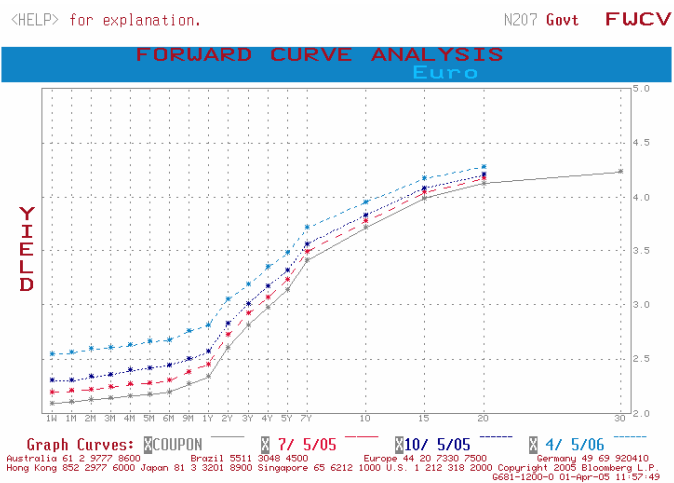


4.10 „Eingepreiste“ Zinsveränderung



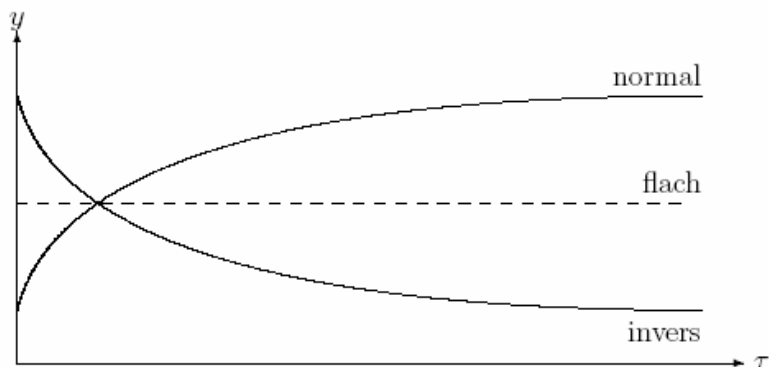
47

4.11 Forward-Curve Berechnung auf Bloomberg

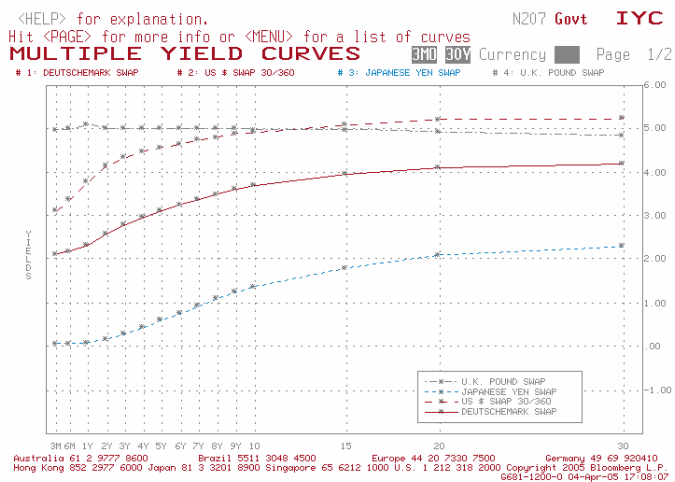


48

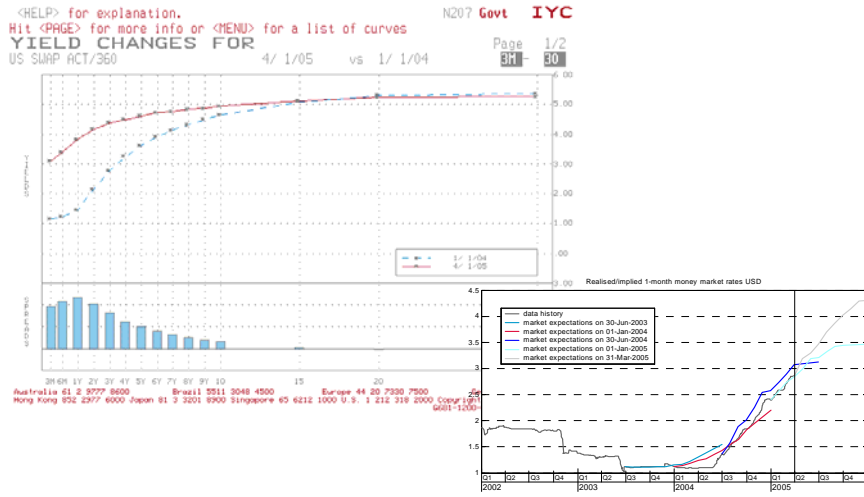
4.12 Formen der Zinskurve



4.13 Aktuelle Zinskurven



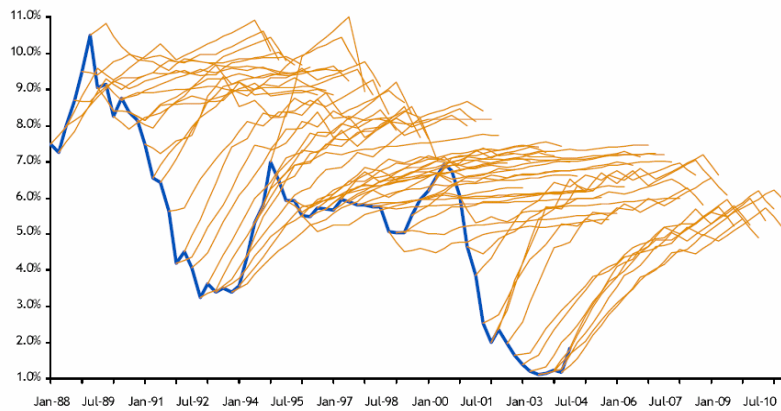
4.14 Erwartungstheorie – Beispiel USA 2004



51

4.15 Empirische Grenzen der reinen Erwartungstheorie

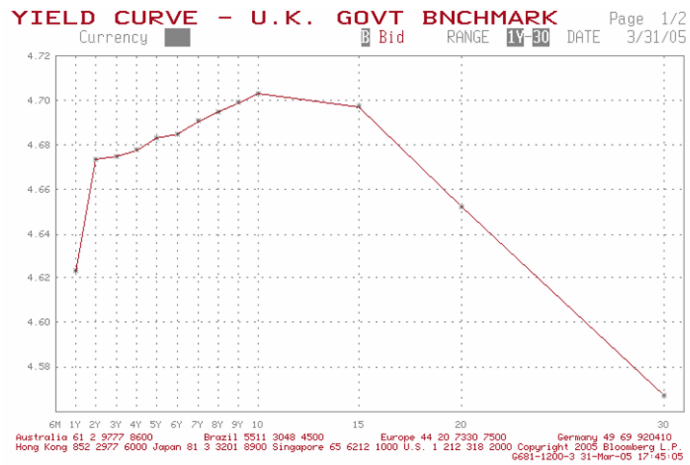
Chart 14: Hair chart: USD 6-month LIBOR spot vs. 6-month LIBOR forwards
 Quarterly data



Source: JP Morgan

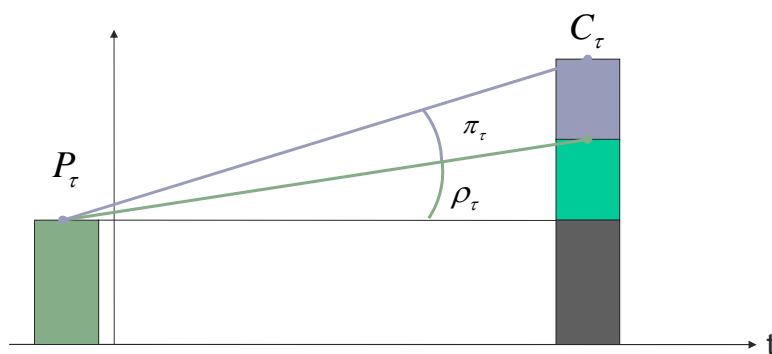
52

4.16 Preferred Habitat – Beispiel UK Mar-05



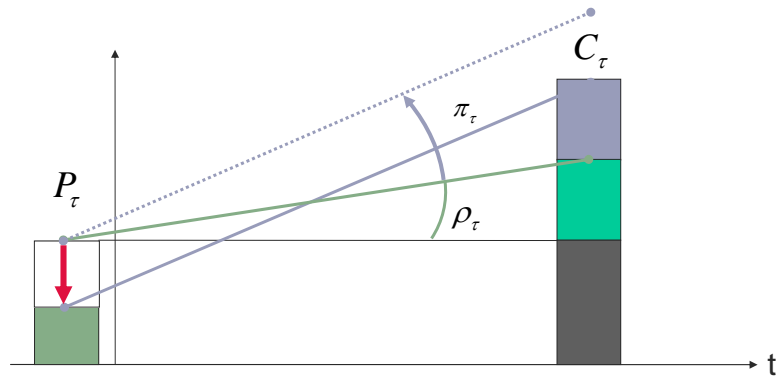
53

5.1 Zerlegung des Nominalzinses



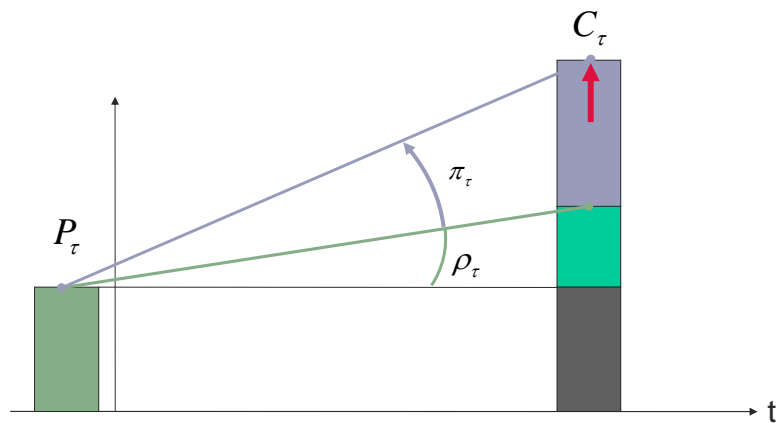
54

5.2 Effekt steigender Inflationserwartung



55

5.3 Schutz vor Inflation

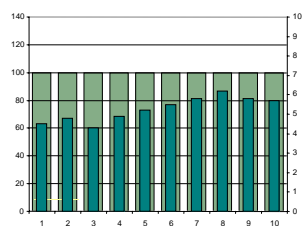


56

5.4 Mechanismen des Inflationsschutzes

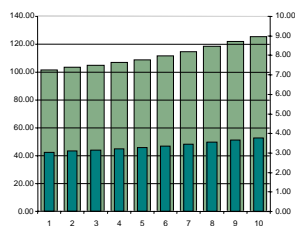
Non-Accreting Struktur

| Jahr | Inflation | Notional | Kupon |
|------|-----------|----------|-------|
| 1 | 1.5 | 100 | 4.5 |
| 2 | 1.8 | 100 | 4.8 |
| 3 | 1.3 | 100 | 4.3 |
| 4 | 1.9 | 100 | 4.9 |
| 5 | 2.2 | 100 | 5.2 |
| 6 | 2.5 | 100 | 5.5 |
| 7 | 2.8 | 100 | 5.8 |
| 8 | 3.2 | 100 | 6.2 |
| 9 | 2.8 | 100 | 5.8 |
| 10 | 2.7 | 100 | 5.7 |



Accreting Struktur

| Jahr | Inflation | Notional | Kupon |
|------|-----------|----------|----------|
| 1 | 1.5 | 101.5 | 3.045 |
| 2 | 1.8 | 103.327 | 3.09981 |
| 3 | 1.3 | 104.6703 | 3.140108 |
| 4 | 1.9 | 106.659 | 3.19977 |
| 5 | 2.2 | 109.0055 | 3.270165 |
| 6 | 2.5 | 111.7306 | 3.351919 |
| 7 | 2.8 | 114.8591 | 3.445772 |
| 8 | 3.2 | 118.5346 | 3.556037 |
| 9 | 2.8 | 121.8535 | 3.655606 |
| 10 | 2.7 | 125.1436 | 3.754307 |



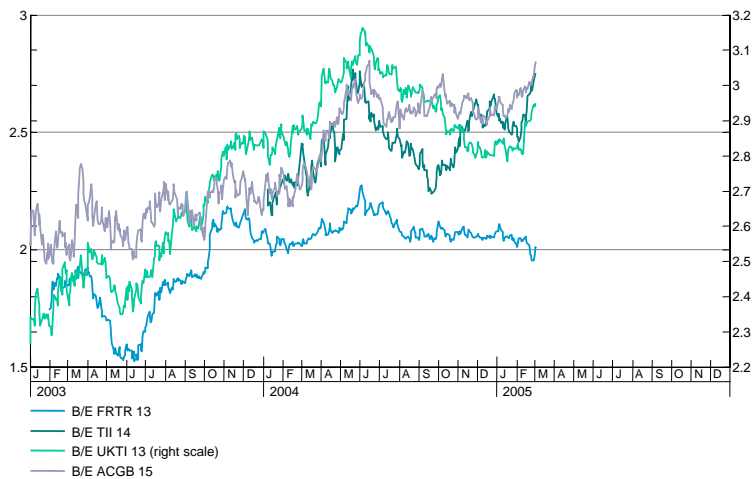
57

5.5 Szenarienanalyse

| | | |
|--|--|---|
| | <ul style="list-style-type: none"> <input type="checkbox"/> Unveränderter Realzins <input type="checkbox"/> Unveränderte Inflationserwartung | Performance einer nominalen und einer inflationsindexierten Anleihe identisch und besser im Vergleich zum Geldmarkt |
| | <ul style="list-style-type: none"> <input type="checkbox"/> Unveränderter Realzins <input type="checkbox"/> Steigende Inflationserwartung | Bessere Performance der inflationsindexierten Anleihe im Vergleich zur nominalen Anleihe und zum Geldmarkt |
| | <ul style="list-style-type: none"> <input type="checkbox"/> Unveränderter Realzins <input type="checkbox"/> Abnehmende Inflationserwartung | Schlechtere Performance im Vergleich zur nominalen Anleihe, aber besser im Vergleich zum Geldmarkt |
| | <ul style="list-style-type: none"> <input type="checkbox"/> Steigender Realzins <input type="checkbox"/> Unveränderte Inflationserwartung | Performance einer nominalen und einer inflationsindexierten Anleihe identisch und schlechter im Vergleich zum Geldmarkt |

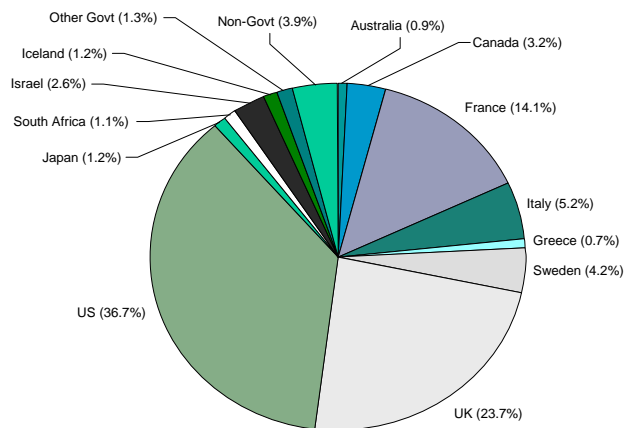
58

5.6 Entwicklung der Breakevens über die Zeit



59

5.7 Marktstruktur (Total USD 780 Mia)



Source: Barclays Capital/ Bloomberg / CSAM

60

5.8 Spielarten von inflationsgeschützten Anleihen

| | EMU | France | US | JPY | UK |
|------------|--|---------------------------------|--------------------------------------|------------------------------------|--------------------------------|
| CPI Index | Ex-tobacco HICP unrevised NSA | Ex-tobacco CPI unrevised NSA | CPI Urban Consumers unrevised NSA | Ex Fresh Food CPI unrevised NSA | RPI All Items unrevised NSA |
| Source | Eurostat | INSEE | BLS | MPM | ONS |
| Bloomberg | CPTFEMU <Index> | FRCPXTOB <Index> | CPURNSA <Index> | JCPNGENF <Index> | UKRPI <Index> |
| Principal | Indexation of principal at maturity | | | | |
| Redemption | Minimum redemption at par | | | No guarantee | |
| Coupon | Fixed Real Coupon paid on an indexed principal | | | | |
| Fixing | In arrears | | | | In advance |
| Lag | 3-months | | | | 8-months |
| Frequency | Annual | | | | Semi-annual |
| Reference | Daily | | | | Monthly |
| Taxation | Real rate + inflation | | | | Real rate only |

61

5.9 Beispiel eines Inflation-Linked Bond

SECURITY DESCRIPTION Page 1 / 1

FRANCE D.A.T.I/L FRTR 3 07/25/12 111.3500/111.4100 (1,44/1,43) BGN @12:56

| ISSUER INFORMATION | IDENTIFIERS | 1) Additional Sec Info |
|----------------------------------|-----------------------|------------------------|
| Name FRANCE (GOVT OF) | ISIN FR0000188013 | 2) Identifiers |
| Type Sovereign | Sedol 1 7241039 | 3) Ratings |
| Market of Issue EURO-ZONE | BB number EC4701925 | 4) Sec. Specific News |
| SECURITY INFORMATION | RATINGS | 5) Involved Parties |
| Country FR Currency EUR | Moody's Aaa | 6) Custom Notes |
| Collateral Type BONDS | S&P AAA | 7) Issuer Information |
| Calc Typ(1103)FRANCE I/L: STREET | Fitch AAA | 8) ALLQ |
| Maturity 7/25/2012 Series DATE | ISSUE SIZE | 9) Pricing Sources |
| NORMAL | Amt Issued | 10) Related Securities |
| Coupon 3 FIXED | EUR 14,494,000.00 (M) | |
| ANNUAL ACT/ACT | Amt Outstanding | |
| Announcement Dt 10/23/01 | EUR 14,494,000.00 (M) | |
| Int. Accrual Dt 7/25/01 | Min Piece/Increment | |
| 1st Settle Date 10/31/01 | 1.00/ 1.00 | |
| 1st Coupon Date 7/25/02 | Par Amount 1.00 | |
| Iss Pr 100.1730 | BOOK BINDER/EXCHANGE | |
| | BARCLY, DB, SG | 65) Old DES |
| | Multiple | 66) Send as Attachment |

NO PROSPECTUS

REFERENCE UNREVISED CPTFEMU <INDEX> VALUES. ORIG €6.5BLN ISS'D 10/31/01.
 ADD'L €787MM ISS'D 1/15/02. ADD'L €735MM ISS'D 2/26/02. €582MM ISS'D 5/7/02.

Australia 61 2 9777 8600 Brazil 55 11 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2004 Bloomberg L.P.
 6611-1200-0 22-Oct-04 12:59:16

62

5.10 Berechnung des indexierten Kapitals

| INFLATION-INDEXED YIELD ANALYSIS | | |
|---|-------------------|------------------------------------|
| FRANCE O.A.T./L FRTR 3 07/25/12 111.3900/111.3900 (1.44/1.44) BGN @12:52 | | |
| PRICE | 111.39 | CUSIP EC470192 REAL COUPON 3 |
| SETTLEMENT DATE | 10/27/2004 | REAL CPN ACCRUED INT 0.273000 |
| YIELD | MATURITY | ECONOMIC FACTORS |
| CALCULATIONS | 7/25/2012 | BASE CPI VALUE 7/25/2001 108.98710 |
| STREET REAL YIELD | 1.435 | REFERENCE CPI 10/27/2004 115.05161 |
| EQUIVALENT 2/YR COMPOUND | 1.430 | CPTFEMU <INDEX> 8/04 115.10000 |
| | | CPTFEMU <INDEX> 7/04 114.80000 |
| | | CPI @ LAST CPN DATE 114.93226 |
| | | FLAT INDEX RATIO 1.05455 |
| | | ACCRUED RATIO GROWTH 0.00109 |
| | | INDEX RATIO 1.05564 |
| INFLATION ASSUMPTION | 2.1158% | PAYMENT INVOICE |
| YIELD W/INFLATION ASSUMPTION | 3.571 | CURRENCY EUR Legacy/EUR 0.00000 |
| YIELD WITHOUT INFLATION | 1.425 | FACE 1000.00 M |
| | | FLAT 1174663.25 |
| | | INFLATION ACCRUAL 1214.15 |
| | | GROSS AMOUNT 1175877.40 |
| | | CPN ACCR. 94 DAYS 8160.10 |
| | | NET AMOUNT 1184037.49 |
| | | Inflation Compensation 55640.00 |
| SENSITIVITY ANALYSIS | | |
| FOR VARIOUS REAL vs NOMINAL | | |
| YIELD-BETA ASSUMPTIONS (SEE <HELP>) | | |
| YIELD-BETA ASSUMPTION | 0.000 1.000 1.000 | |
| EFFECTIVE DURATION | 0.000 6.780 6.780 | |
| RISK | 0.000 8.028 8.028 | |
| CONVEXITY | 0.000 0.554 0.554 | |
| Type <COVR> for customizable Yield Betas. | | |
| Australia 61 2 2977 8500 Brazil 5511 3040 4500 Europe 44 20 7330 7500 Germany 49 59 320410 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2004 Bloomberg L.P. 6611-1200-0 22-Oct-04 12:55:30 | | |

63

5.11 Trade Ticket für eine inflationsgeschützte Anleihe

| 2522 | | TRADE TICKET | | LON 10/22/04 12:00 | |
|---|----------|-------------------------|----------|--------------------|-------------------|
| FRTR 3 07/25/12 OATe | | As of 10/22/04 12:00:00 | | FR0000188013 | |
| BUY | | 1M (m) | | | |
| Price | 111.39 | Yield | 1.435000 | Yield to | 7/25/12 at 100 |
| Settlement | 10/27/04 | CORP | | | |
| Broker | CREDIS | CREDIT SUISSE BANK | | | |
| Broker Commission Code | | Rate | | CHF | Trade Flat |
| Stamp Duty | | | | CHF | |
| Withholding Tax | | | | CHF | |
| Clearing Fee | | | | CHF | Reason |
| Exchange Fee | | | | CHF | Ratio 1.055640000 |
| EUROCLEAR | | BROKER | | | |
| CEDEL | | NEW ISSUE | | | |
| ORDER TIME | | NOTES | | | |
| EXEC TIME | | | | | |
| Principal | EUR | 1,175,877.40 | | Principal/Agency | |
| Accrued | (94) | 8,160.10 | | | |
| Transaction Costs | | 0.00 | | Settlement Loc | |
| Total | EUR | 1,184,037.50 | | Total Position | 1M |
| View in EUR | Rate | 1.000000 | Invert | (Y/N) | |
| Australia 61 2 2977 8500 Brazil 5511 3040 4500 Europe 44 20 7330 7500 Germany 49 59 320410 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2004 Bloomberg L.P. 6611-1200-0 22-Oct-04 13:00:14 | | | | | |

64

5.12 Inflationsgeschützte Notes

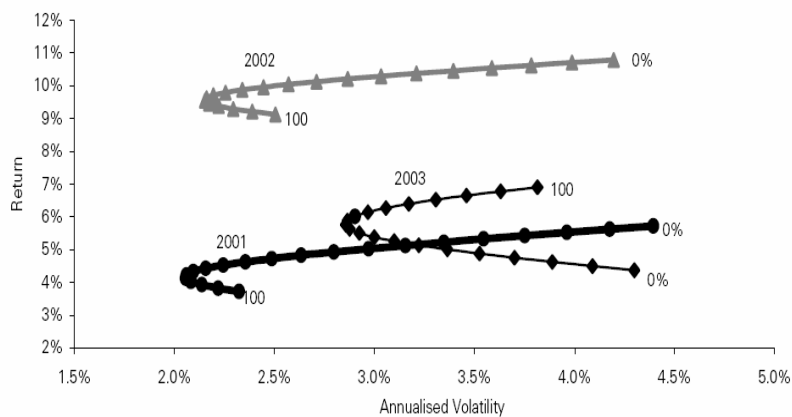
Page 1/7

| INFLATION LINKED BONDS | | | | | | | |
|------------------------|--------|-----------------|--------|-----------|---------------|------------|--------------|
| Issuer | Ticker | 1st Settle Date | Coupon | Size (MM) | Maturity Date | Term (Yrs) | Index Ticker |
| ITALY | | | | | | | |
| 1) Banca Agri Manto | BAGMA | 10/31/03 | 2,500 | 25 | 10/31/08 | 5.0 | CPTFEM |
| 2) Banca Agri Manto | BAGMA | 01/29/04 | Var | 15 | 01/29/10 | 6.0 | CPTFEM |
| 3) Mediobanca | BACRED | 06/14/02 | Var | 258 | 06/14/05 | 3.0 | HICP |
| 4) Mediobanca | BACRED | 06/10/02 | Var | 10 | 06/10/06 | 4.0 | HICP |
| 5) Mediobanca | BACRED | 07/03/02 | Var | 10 | 07/03/06 | 4.0 | HICP |
| 6) Mediobanca | BACRED | 06/18/02 | Var | 25 | 06/18/07 | 5.0 | HICP |
| 7) Mediobanca | BACRED | 06/20/02 | Var | 398.1 | 06/20/07 | 5.0 | HICP |
| 8) Mediobanca | BACRED | 08/06/02 | Var | 10 | 08/06/12 | 10.0 | HICP |
| 9) Mediobanca | BACRED | 02/28/03 | Var | 57.4 | 02/28/08 | 5.0 | CPTFEM |
| 10) Mediobanca | BACRED | 07/23/03 | Var | 200 | 07/23/08 | 5.0 | CPTFEM |
| 11) Mediobanca | BACRED | 12/23/03 | Var | 215 | 12/23/13 | 10.0 | ITCPIU |
| 12) Banca Pop Adria | BANADR | 06/20/03 | Var | 20 | 06/20/08 | 5.0 | CPTFEM |
| 13) Banca Pop Bergam | BANBER | 04/30/02 | Var | 3 | 04/30/07 | 5.0 | HICP |
| 14) Banca Pop Bergam | BANBER | 06/27/02 | Var | 12.8 | 06/27/07 | 5.0 | HICP |
| 15) Banca Pop Comm | BANBER | 06/30/03 | Var | 50 | 06/30/08 | 5.0 | CPTFEM |
| 16) Banca Pop Cremon | BANCRE | 12/30/03 | Var | 7 | 12/30/06 | 3.0 | CPTFEM |
| 17) Banca Marche | BANMAR | 04/29/02 | 5,000 | 3.5 | 04/30/07 | 5.0 | HICP |
| 18) Verona & Novara | BANVER | 06/16/03 | 3,350 | N/D | 06/16/08 | 5.0 | CPTFEM |
| 19) Verona & Novara | BANVER | 12/11/03 | Var | N/D | 12/11/08 | 5.0 | CPTFEM |

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2004 Bloomberg L.P.
9611-1030-0 01-01-04 11:15:24

65

5.13 Effiziente Grenzen für nominale und reale Anleihen

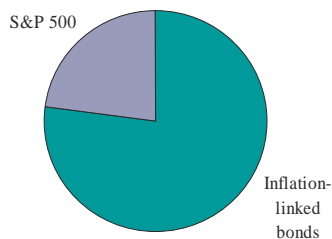


Quelle: Deutsche Bank

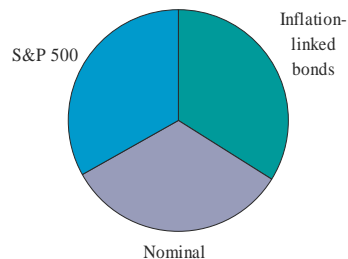
66

5.14 Optimale Portfolios

Inflations-Risikoprämie = 0



Inflations-Risikoprämie = 50 Bp



Quelle: Financial Analyst's Journal Jan/Feb 04

67

6.1 Corporate Bonds

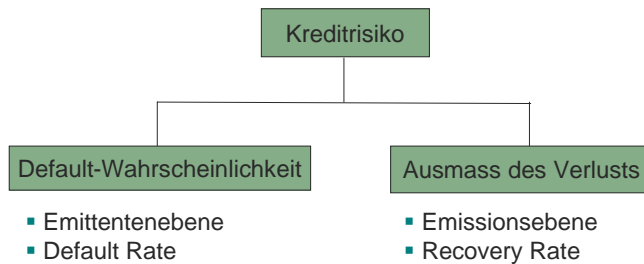
| | Total | Treasury | Agency | Local Govt | Corporate | Non Corp | MBS | Pfandbriefe | Other Mtg | ABS | CMBS | Others |
|-------------------------|-------|----------|--------|------------|-----------|----------|-------|-------------|-----------|------|------|--------|
| Count | 9792 | 946 | 1136 | 571 | 4795 | 849 | 380 | 374 | 205 | 211 | 306 | 19 |
| Market Value [%] | 100 | 49.74 | 7.49 | 2.42 | 16.81 | 4.58 | 13.07 | 2.52 | 1.9 | 0.62 | 0.77 | 0.07 |
| U.S. | | | | | | | | | | | | |
| Count | 3741 | 120 | 487 | | 2283 | 29 | 380 | | | 136 | 306 | |
| Market Value [%] | 35.54 | 9.47 | 4.03 | | 7.55 | 0.26 | 13.07 | | | 0.38 | 0.77 | |
| Europe | | | | | | | | | | | | |
| Count | 3376 | 388 | 210 | 227 | 1553 | 331 | | 374 | 205 | 69 | | 19 |
| Market Value [%] | 38.87 | 23.11 | 1.54 | 1.16 | 6.5 | 1.85 | | 2.52 | 1.9 | 0.22 | | 0.07 |
| Latin America | | | | | | | | | | | | |
| Count | 101 | 18 | | | 24 | 59 | | | | | | |
| Market Value [%] | 0.53 | 0.14 | | | 0.06 | 0.33 | | | | | | |
| Asia Pacific Rim | | | | | | | | | | | | |
| Count | 1735 | 360 | 416 | 189 | 683 | 84 | | | | 3 | | |
| Market Value [%] | 20.1 | 15.59 | 1.69 | 0.44 | 2.09 | 0.29 | | | | 0.01 | | |
| Middle East | | | | | | | | | | | | |
| Count | 15 | | | | 8 | 7 | | | | | | |
| Market Value [%] | 0.05 | | | | 0.02 | 0.03 | | | | | | |
| Others | | | | | | | | | | | | |
| Count | 18 | | | | 11 | 6 | | | | 1 | | |
| Market Value [%] | 0.05 | | | | 0.03 | 0.02 | | | | 0 | | |

Quelle: Lehman Global Aggregate Index
(Kapitalisierung USD 22 Trillionen)

68

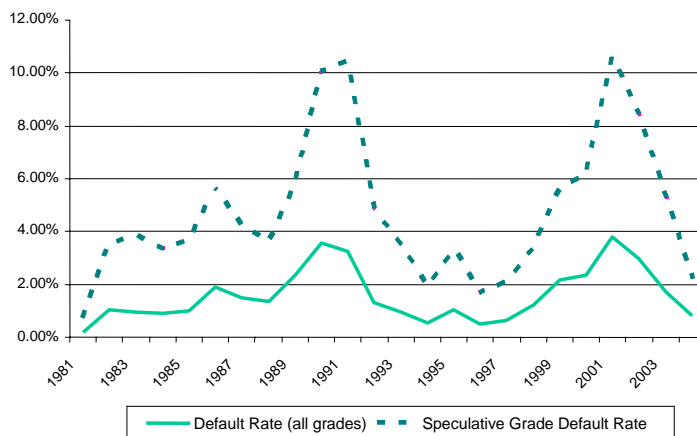
6.2 Definition Kreditrisiko

Das Kreditrisiko (auch Default Risiko) bezeichnet die Möglichkeit, dass eine Emittentin ihre Zahlungsverpflichtungen (Zinsen und Kapital) gegenüber den Obligationären nicht mehr termingerecht erfüllen kann



69

6.3 Default Raten



Quelle: Moody's, globale Default Raten (emittentenbasiert)

70

6.4 Recovery Raten



71

6.5 Einflussfaktoren auf das Default-Risiko



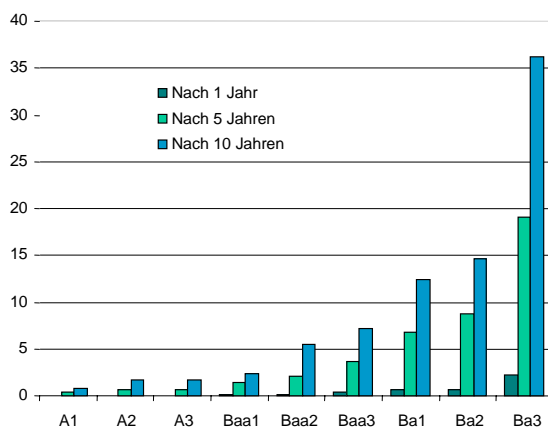
72

6.6 Ratings

| Moody's | S&P | |
|---------|------|--|
| AAA | AAA | Upper Investment Grade |
| Aa1 | AA+ | |
| Aa2 | AA | |
| Aa3 | AA- | Lower Investment Grade |
| A1 | A+ | |
| A2 | A | |
| A3 | A- | Investment Grade / High Grade |
| Baa1 | BBB+ | |
| Baa2 | BBB | |
| Baa3 | BBB- | Sub-Investment Grade High Yield Junk |
| Ba1 | BB+ | |
| Ba2 | BB | |
| Ba3 | BB- | defaulted |
| B1 | B+ | |
| ... C | ... | |
| ... | D | |

73

6.7 Ratings als Indikator für Default-Risiko



Quelle: Moody's, durchschnittliche globale Default-Raten (emittentenbasiert) 1984-2004

74

6.8 Rating-Migration

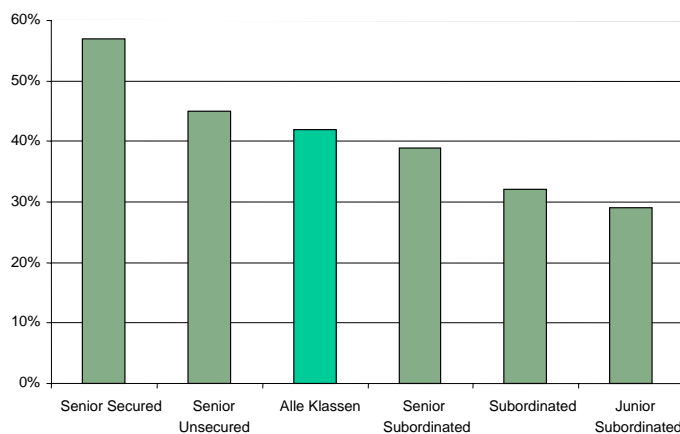
Rating am Ende eines Jahres

| | Aaa | Aa1 | Aa2 | Aa3 | A1 | A2 | A3 | Baa1 | Baa2 | Baa3 | Ba1 | Ba2 | Ba3 |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa | 86.31 | 5.92 | 2.79 | 0.41 | 0.58 | 0.21 | 0.08 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 |
| Aa1 | 1.99 | 78.03 | 8.23 | 6.40 | 1.47 | 0.26 | 0.05 | 0.10 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 |
| Aa2 | 0.64 | 3.19 | 78.43 | 8.81 | 3.13 | 1.24 | 0.48 | 0.10 | 0.06 | 0.00 | 0.00 | 0.00 | 0.03 |
| Aa3 | 0.10 | 0.59 | 3.69 | 78.48 | 8.92 | 2.99 | 0.67 | 0.22 | 0.10 | 0.08 | 0.02 | 0.02 | 0.04 |
| A1 | 0.05 | 0.10 | 0.46 | 5.58 | 77.53 | 7.88 | 2.89 | 0.70 | 0.20 | 0.07 | 0.25 | 0.15 | 0.03 |
| A2 | 0.04 | 0.04 | 0.34 | 0.76 | 5.26 | 77.26 | 7.60 | 2.95 | 0.88 | 0.47 | 0.28 | 0.07 | 0.14 |
| A3 | 0.05 | 0.12 | 0.08 | 0.18 | 1.83 | 6.82 | 74.15 | 6.89 | 3.37 | 1.26 | 0.45 | 0.13 | 0.15 |
| Baa1 | 0.04 | 0.04 | 0.13 | 0.17 | 0.23 | 2.11 | 6.63 | 72.78 | 7.79 | 3.13 | 0.95 | 0.44 | 0.21 |
| Baa2 | 0.06 | 0.10 | 0.04 | 0.16 | 0.22 | 0.62 | 3.46 | 5.74 | 73.52 | 7.08 | 1.72 | 0.54 | 0.68 |
| Baa3 | 0.05 | 0.00 | 0.03 | 0.08 | 0.18 | 0.40 | 0.68 | 3.08 | 8.22 | 69.58 | 6.16 | 2.68 | 1.73 |
| Ba1 | 0.03 | 0.00 | 0.00 | 0.03 | 0.24 | 0.21 | 0.54 | 0.96 | 3.12 | 8.62 | 64.32 | 5.14 | 4.62 |
| Ba2 | 0.00 | 0.00 | 0.04 | 0.04 | 0.04 | 0.19 | 0.11 | 0.37 | 0.81 | 2.48 | 8.96 | 62.05 | 7.74 |
| Ba3 | 0.00 | 0.02 | 0.02 | 0.00 | 0.05 | 0.14 | 0.14 | 0.21 | 0.21 | 0.67 | 2.59 | 5.77 | 64.97 |

Quelle: Moody's, durchschnittliche jährliche Veränderungsraten 1983-2004

75

6.9 Recovery hängt von Seniorität ab



Quelle: Moody's, durchschnittliche globale Recovery Raten (emittentenbasiert, 1983-2004)

76

6.10 Covered Bonds / Pfandbriefe

XS0109208172 Corp DES N207Mgt:M, KOLLER

| SECURITY DESCRIPTION | | Page 1 / 1 | |
|---|---------------------|------------------------|----------------------|
| LBW CAPITAL MKTS LBUS 1/4 03/17/06 102,3025/102,3625 (2,13/2,05) BGN @ 6/08 | | | |
| ISSUER INFORMATION | IDENTIFIERS | 1) Additional Sec Info | |
| Name LB BADEN-WUERTTEMBERG | ESIN XS0109208172 | 2) ALLO | |
| Type Regional Banks-Non US | BB number EC2377694 | 3) Corporate Actions | |
| Market of Issue Euro MTN | Common 010920817 | 4) Par Cds Spreads | |
| SECURITY INFORMATION | RATINGS | 5) Ratings | |
| Country GB | Currency EUR | Moody's Aaa | 6) Custom Notes |
| Collateral Type Bank Guaranteed | S&P AA+ | Fitch AAA | 7) Identifiers |
| Calc Typel LISTREET CONVENTION | | | 8) Fees/Restrictions |
| Maturity 3/17/2006 Series EMTN | ISSUE SIZE | 9) Sec. Specific News | |
| NORMAL | EUR 500,000.00 (M) | 10) Involved Parties | |
| Coupon 5 1/4 Fixed | EUR 500,000.00 (M) | 11) Issuer Information | |
| ANNUAL ACT/ACT | EUR 500,000.00 (M) | 12) Pricing Sources | |
| Announcement Dt 3/ 9/00 | Min Piece/Increment | 13) Related Securities | |
| Int. Accrual Dt 3/17/00 | 1,000.00/ 1,000.00 | | |
| 1st Settle Date 3/17/00 | Par Amount 1,000.00 | | |
| 1st Coupon Date 3/17/01 | 99.49 | | |
| Iss Pr 101.2000Reoffer | CSFB Multiple | 65) Old DES | |
| NO PROSPECTUS | | 66) Send as Attachment | |
| ALSO EBS, SERIATED EFF-4/26/00. | | | |

Australia 61 2 9777 8600 Brazil 5511 3046 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2008 Bloomberg L.P.
 6881-1200-0 09-Jun-05 9:49:29

DE0003519260 Corp DES N207 Corp DES

| SECURITY DESCRIPTION | | Page 1 / 1 | |
|--|---------------------|------------------------|----------------------|
| LB BADEN-WUERTT LBUS 1/4 11/03/06 104,1536/104,1536 (2,18/2,18) BEY @ 9:49 | | | |
| ISSUER INFORMATION | IDENTIFIERS | 1) Additional Sec Info | |
| Name LB BADEN-WUERTTEMBERG | ESIN DE0003519260 | 2) ALLO | |
| Type Commer Banks Non-US | Sedol 1 5992243 | 3) Corporate Actions | |
| Market of Issue Euro-Zone | BB number EC1953065 | 4) Par Cds Spreads | |
| SECURITY INFORMATION | RATINGS | 5) Ratings | |
| Country DE | Currency EUR | Moody's Aaa | 6) Custom Notes |
| Collateral Type Pfandbriefe | S&P AAA | Fitch AAA | 7) Identifiers |
| Calc Typel 60 GERMAN BONDS | | | 8) Fees/Restrictions |
| Maturity 11/ 3/2006 Series 181 | ISSUE SIZE | 9) Sec. Specific News | |
| NORMAL | EUR 300,000.00 (M) | 10) Involved Parties | |
| Coupon 5 1/4 Fixed | EUR 300,000.00 (M) | 11) Issuer Information | |
| ANNUAL ACT/ACT | EUR 300,000.00 (M) | 12) Pricing Sources | |
| Announcement Dt 11/ 2/99 | Min Piece/Increment | 13) Related Securities | |
| Int. Accrual Dt 11/ 3/99 | 1,000.00/ 1,000.00 | | |
| 1st Settle Date 11/ 3/99 | Par Amount 1,000.00 | | |
| 1st Coupon Date 11/ 3/00 | 99.5500 | | |
| Iss Pr 99.5500 | CSFB Multiple | 65) Old DES | |
| NO PROSPECTUS | LBBW STUTTGART | 66) Send as Attachment | |
| DEFFENTLICHE PFANDBRIEFE, SEC'D BY PUBLIC LOANS, ADD'L €150MM ISS'D 12/00. | | | |

Australia 61 2 9777 8600 Brazil 5511 3046 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2008 Bloomberg L.P.
 6881-1200-0 09-Jun-05 9:49:29

77

6.11 Subordination

XS0125133644 Corp DES N207 Corp DES

| SECURITY DESCRIPTION | | Page 1 / 1 | |
|---|----------------------|------------------------|----------------------|
| BARCLAYS BK PLC BACR 5 3/4 03/11 114,4219/114,6718 (2,97/2,93) BGN @ 6/08 | | | |
| ISSUER INFORMATION | IDENTIFIERS | 1) Additional Sec Info | |
| Name BARCLAYS BANK PLC | ESIN XS0125133644 | 2) ALLO | |
| Type Commer Banks Non-US | BB number EC3500039 | 3) Corporate Actions | |
| Market of Issue Euro MTN | Common 012513364 | 4) Par Cds Spreads | |
| SECURITY INFORMATION | RATINGS | 5) Ratings | |
| Country GB | Currency EUR | Moody's Aa2 | 6) Custom Notes |
| Collateral Type Sub Notes | S&P AA- | Fitch AA | 7) Identifiers |
| Calc Typel LISTREET CONVENTION | | | 8) Fees/Restrictions |
| Maturity 3/ 8/2011 Series EMTN | ISSUE SIZE | 9) Sec. Specific News | |
| NORMAL | EUR 1,000,000.00 (M) | 10) Involved Parties | |
| Coupon 5 3/4 Fixed | EUR 1,000,000.00 (M) | 11) Issuer Information | |
| ANNUAL ACT/ACT | EUR 1,000,000.00 (M) | 12) Pricing Sources | |
| Announcement Dt 2/15/01 | Min Piece/Increment | 13) Related Securities | |
| Int. Accrual Dt 3/ 8/01 | 1,000.00/ 1,000.00 | | |
| 1st Settle Date 3/ 8/01 | Par Amount 1,000.00 | | |
| 1st Coupon Date 3/ 8/02 | 99.7030 | | |
| Iss Pr 99.7030Reoffer | BARCLY Multiple | 65) Old DES | |
| S&P & FPR 96.50 vs DBR 5 1/4 11 | | 66) Send as Attachment | |
| NO PROSPECTUS | | | |
| ALSO SPREAD= 82BP OVER BTNS 6.5% 04/11. ALSO EBS. | | | |

Australia 61 2 9777 8600 Brazil 5511 3046 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2008 Bloomberg L.P.
 6881-1200-0 09-Jun-05 9:53:26

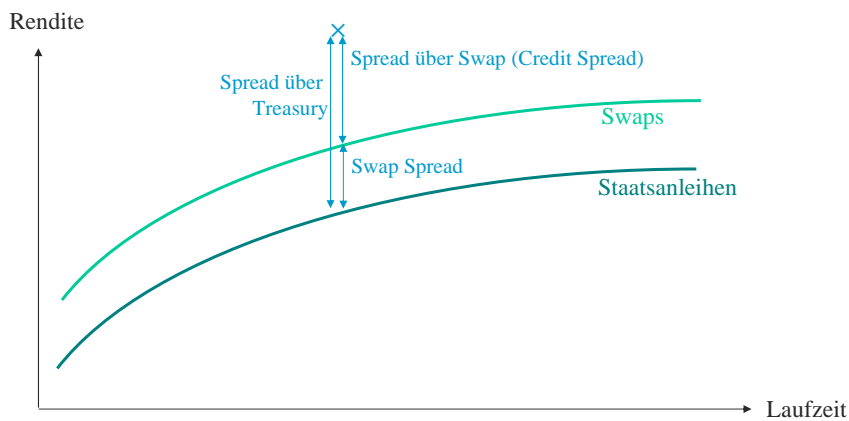
XS0131039330 Corp DES N207 Corp DES

| SECURITY DESCRIPTION | | Page 1 / 1 | |
|---|----------------------|------------------------|----------------------|
| BARCLAYS BK PLC BACR 4 3/4 06/06 102,7390/102,7890 (2,16/2,12) BGN @ 6/08 | | | |
| ISSUER INFORMATION | IDENTIFIERS | 1) Additional Sec Info | |
| Name BARCLAYS BANK PLC | ESIN XS0131039330 | 2) ALLO | |
| Type Commer Banks Non-US | BB number EC4010368 | 3) Corporate Actions | |
| Market of Issue Euro MTN | Common 013103933 | 4) Par Cds Spreads | |
| SECURITY INFORMATION | RATINGS | 5) Ratings | |
| Country GB | Currency EUR | Moody's Aa1 | 6) Custom Notes |
| Collateral Type Sr Unsub | S&P AA | Fitch AA+ | 7) Identifiers |
| Calc Typel LISTREET CONVENTION | | | 8) Fees/Restrictions |
| Maturity 6/26/2006 Series EMTN | ISSUE SIZE | 9) Sec. Specific News | |
| NORMAL | EUR 1,000,000.00 (M) | 10) Involved Parties | |
| Coupon 4 3/4 Fixed | EUR 1,000,000.00 (M) | 11) Issuer Information | |
| ANNUAL ACT/ACT | EUR 1,000,000.00 (M) | 12) Pricing Sources | |
| Announcement Dt 6/ 7/01 | Min Piece/Increment | 13) Related Securities | |
| Int. Accrual Dt 6/26/01 | 1,000.00/ 1,000.00 | | |
| 1st Settle Date 6/26/01 | Par Amount 1,000.00 | | |
| 1st Coupon Date 6/26/02 | 99.6530 | | |
| Iss Pr 100.7780Reoffer | BARCLY Multiple | 65) Old DES | |
| S&P & FPR 37.00 vs DBL 5 02/06 | | 66) Send as Attachment | |
| NO PROSPECTUS | | | |
| UNSEC'D, ALSO SPREAD=5BP OVER MID-SWAPS, ALSO EBS. | | | |

Australia 61 2 9777 8600 Brazil 5511 3046 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2008 Bloomberg L.P.
 6881-1200-0 09-Jun-05 9:53:47

78

6.12 Kreditspread



79

6.13 Spreadanalyse auf Bloomberg (YAS)

YAS N184 Corp YAS
 Enter 11<GO> for Historical Z-spreads
YIELD & SPREAD ANALYSIS CUSIPECC387074 PCS BGN

| | | | |
|---|-----------------------------------|---------------------------|--------------------------|
| PHILIPS ELEC NV PHG5 5% 05/16/08 107.7031/107.9811 (3.11/3.02) BGN 8 4/01 | SETTLE 4/ 7/05 | FACE AMT 1000 M | or PROCEEDS 1,131,167.22 |
| 1) YA YIELDS 2) YASD | RISK & PHG 5% 05/16/0 | HEDGE workout | HEDGE BOND |
| PRICE 107.981106 No Rounding | RATIOS 5/16/08 OAS | OAS | OAS |
| YIELD 3.017 % | Mod Dur 2.73 2.73 2.78 | Risk 3.084 3.093 2.887 | Convexity 0.11 0.11 0.11 |
| SPRD 37.40 bp yld-decimals 0/0 | Workout HEDGE Amount: 1,072 M | OAS HEDGE Amount: 1,072 M | |
| versus | | | |
| 3yr OBL 3 04/11/08 #142 BENCHMARK | | | |
| PRICE 101.020000 Save Delete | | | |
| YIELD 2.643 % sd: 4/ 7/05 | | | |
| Yields are: Annual | | | |
| 3) OAS SPREADS 4) ASW | 5) FPA FINANCING | | |
| OAS: 33.8 CRV# 960 VOL Opt | Repo% 2.147 (360/365) 360 Days 1 | | |
| ASW: 20.7 CRV# 153 TED: -19.5 | Int Income 157.53 Carry P&L | | |
| ASW (A/A) 21.0 ZSPR 20.4 History | Fin Cost -67.46 90.07 | | |
| CRV# 153 EURO SWAP ANNUAL | Amortiz -65.40<-> 24.67 | | |
| ISPRD 19.4 DSPRD 23.8 | Forwrd Prc 107.972099 | | |
| Yield Curve: 113 EURO BENCHMARK CURVE | Prc Drop 0.009007 | | |
| + 35 v 3.1yr (2.662 %) INTERPOLATED | Drop (bp) 0.08 | | |
| + 37 v 3yr (2.64) OBL 3 04/11/08 #142 | Accrued Interest /100 5.135616 | | |
| + 17 v 4yr (2.84) OBL 3 1/4 04/17/09 # | Number Of Days Accrued 326 | | |
| + 1 v 5yr (3.01) OBL 3 1/4 04/09/10 # | BLOOMBERG Trading System BUY SELL | | |



Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410 Hong Kong 852 2377 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2005 Bloomberg L.P. 6681-1200-0 04-Apr-05 16:31:25

80

6.14 Kredit in der Praxis

15 Currency MSG
 1<GO>DEL, 2<GO>REPLY, 3<GO>FWD, 11<GO>NEXT, 12<GO>PREV, 99<GO>MENU OF OPTIONS

From: MICHAEL KOLLER, SOCIETE GENERALE 6/ 9 12:42
 Subject: SG UTILITIES SPREAD TRACKER CASH **** MIDDAY ****
 Attachment(s): None Page 1/ 2

TEL +44 207 676 75 62   BLOOMBERG TRADING: SGBD OR ALLO
 Close Open Midday Close Daily

| | | | | | | | | | |
|-------|---|-----|----|---------|---------|---------|---------|----|--|
| EDAGR | 6 | 5/8 | 17 | A1/AA- | 76/73 | 76/72 | 76/72 | | |
| EDF | 5 | 5/8 | 33 | AA3/AA- | 54/49 | 54/49 | 53/48 | -1 | |
| ENEL | 4 | 3/4 | 18 | A1/A+ | 87/82 | 87/82 | 87/82 | | |
| ENEL | 5 | 1/4 | 24 | A1/A+ | 103/98 | 103/98 | 103/98 | | |
| ENBW | 4 | 7/8 | 25 | A3/A- | 124/119 | 124/119 | 124/119 | | |
| EWJ | 4 | 7/8 | 19 | A2/A | 99/94 | 99/94 | 98/93 | -1 | |
| GAZDF | 5 | 1/8 | 18 | AA3/AA- | 61/57 | 61/57 | 61/57 | | |
| NGGLN | 5 | | 18 | Baa1/A- | 116/111 | 117/112 | 116/112 | -1 | |
| NGGLN | 4 | 3/8 | 20 | Baa1/A- | 112/108 | 112/108 | 112/108 | | |
| RWE | 5 | 1/8 | 18 | A1/A+ | 77/73 | 77/73 | 77/73 | | |
| RWE | 5 | 3/4 | 33 | A1/A+ | 57/53 | 57/53 | 56/51 | -1 | |
| LYDE | 5 | 1/8 | 15 | A2/A- | 76/72 | 76/72 | 74/70 | -2 | |
| LYDE | 5 | 3/4 | 23 | A2/A- | 136/132 | 137/132 | 136/133 | | |
| TRNIM | 4 | 9 | 24 | AA3/AA- | 92/88 | 92/88 | 92/88 | | |

This message and any attachments (the "message") are confidential and intended solely for the address(es) Any unauthorized use or dissemination is prohibited. E-mail are susceptible alteration. Neither SOCIETE GENERALE nor any of its subsidiaries or affiliates shall be liable for the message if altered, changed or falsified. Le message et toutes les pieces jointes ("copies le message") sont confidentiels et etablis a l'intention exclusive de ses destinataires. toute utilisation ou diffusion non autorisee est interdite. Tout message electronique est susceptible d'alteration. La SOCIETE GENERALE et ses filiales declinent tout responsabilitie au titre de ce message s'il a ete altere/modifie ou falsifie.

Australia 61 2 9277 9600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2005 Bloomberg L.P.
 6681-1200-0 09-Jun-05 14:44:45

81

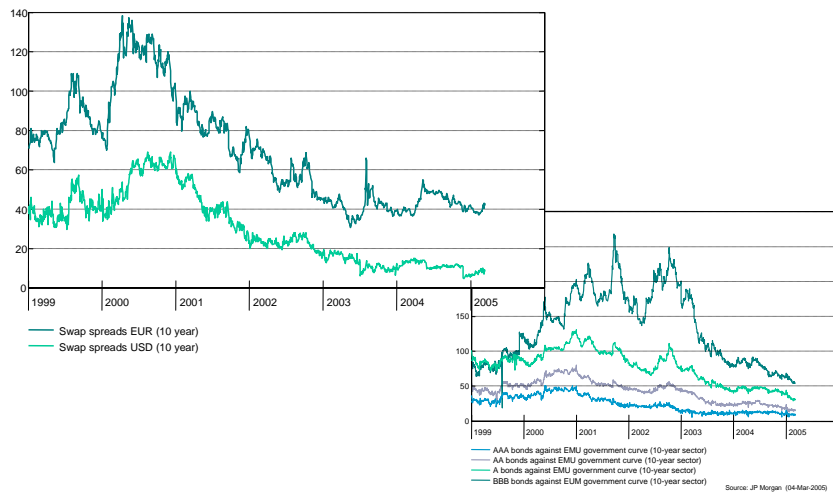
6.15 Relative Value in Kredit

BUST - Bond Universe Screening Tool (Version 2.2 - with compliments from CSAM Zurich)

| All Scores | EUR | WAB 3.5 01/27/06 | AAA | BNP | Offer | 4300K | -14 | 06/07/05 |
|----------------------------|-----|-----------------------|-----|--------------------|-----------|---------|-------|----------|
| All Relative Value Options | EUR | WAB 3.5 01/27/06 | AAA | Liquid | Offer | 0.00 | -6 | 02/02/05 |
| All Axes | EUR | AHER 5.25 02/01/06 | AA+ | Good AAA / AA | Offer | 0.00 | -6 | 02/02/05 |
| EUR | EUR | AHER 5.25 02/01/06 | AA+ | Good AAA / AA | BNP | Offer | 25.6M | -15 |
| All Sectors | EUR | WESTLB 5 02/08/06 | AA- | Commerzbank | Offer | 4200K | -9 | 06/06/05 |
| All Coupon Types | EUR | HPRES 3.5 02/17/06 | AA+ | Liquid | Offer | 0.00 | -6 | 02/02/05 |
| All Brokers | EUR | ASG 5 02/21/06 | AA | Goldman | Offer | 2550K | -4 | 06/06/05 |
| All Maturities | EUR | DEM HESLAN 6 02/21/06 | AA+ | Commerzbank | Offer | 3600K | -12 | 06/06/05 |
| AA+ | EUR | HAB 4.75 02/01/06 | AA- | Risky A / good BBB | Liquid | Offer | 0.00 | -6 |
| | EUR | SANTAN 2.75 03/12/06 | AA+ | Risky AA / good A | Liquid | Offer | 0.00 | -4 |
| | EUR | LIW 5.25 03/17/06 | AA+ | Mitsubishi | Offer | 2200K | -11 | 06/02/05 |
| | EUR | BPSP float 04/08/06 | AA | Dresdner | Two-way | 2000K | +1 | 01/28/05 |
| | EUR | FZPOW 6 04/18/06 | AA- | SoGen | Offer | 5000K | +1 | 06/06/05 |
| | EUR | LBANK 3.5 04/25/06 | AA+ | BNP | Offer | 3300K | -12 | 06/07/05 |
| | EUR | LBANK 3.5 04/25/06 | AA+ | Commerzbank | Offer | 6000K | -9 | 06/06/05 |
| | EUR | NDB 4.875 05/03/06 | AA | Commerzbank | Offer | 1600K | -7 | 06/06/05 |
| | EUR | IGA float 05/05/06 | AA- | Dresdner | Two-way | 2000K | +1 | 01/28/05 |
| | EUR | CIOTT float 05/05/06 | AA- | Dresdner | Two-way | 2000K | +2 | 01/28/05 |
| | EUR | LIBER 3 05/09/06 | AA- | HSBC | Bid | 5000K | -2 | 06/02/05 |
| | EUR | BBB 7 05/15/06 | AA+ | Commerzbank | Offer | 5200K | -5 | 06/06/05 |
| | EUR | NBCAP float 02/02/06 | AA- | Dresdner | Two-way | 2000K | +0 | 01/28/05 |
| | EUR | AHER 3.5 06/06/06 | AA+ | Liquid | Offer | 0.00 | -3 | 02/02/05 |
| | EUR | ANZ float 06/23/06 | AA- | Dresdner | Two-way | 2000K | +1 | 01/28/05 |
| | EUR | BACR 4.875 06/29/06 | AA | Good AAA / AA | Barclays | Offer | 0.00 | +4487 |
| | EUR | BAC 5.25 06/27/06 | AA- | Risky AA / good A | Barclays | Offer | 0.00 | +4277 |
| | EUR | HAB 4 06/29/06 | AA- | Risky A / good BBB | Liquid | Offer | 0.00 | -3 |
| | EUR | HPRES 4.75 06/29/06 | AA+ | Good AAA / AA | Liquid | Offer | 0.00 | -4 |
| | EUR | SCCSB float 06/06/06 | AA- | Good AAA / AA | SoGen | Offer | 5000K | -5 |
| | EUR | SEM 5 07/04/06 | AA- | Risky AA / good A | Citigroup | Offer | 1113K | +19 |
| | EUR | SEM 5 07/04/06 | AA- | Risky AA / good A | Barclays | Offer | 0.00 | +6002 |
| | EUR | SEM 5 07/04/06 | AA- | Risky AA / good A | SoGen | Offer | 1000K | -2 |
| | EUR | SEM 5 07/04/06 | AA- | Risky AA / good A | Dresdner | Two-way | 2000K | +1 |
| | EUR | HPRES 2.75 07/17/06 | AA- | Good AAA / AA | Liquid | Offer | 0.00 | -3 |
| | EUR | RBSOCH 5.25 07/19/06 | AA- | Good AAA / AA | Merril | Bid | 1000K | +7 |
| | EUR | BANGL float 06/04/06 | AA- | Good AAA / AA | Dresdner | Two-way | 2000K | +0 |
| | EUR | DANBA float 06/28/06 | AA | Good AAA / AA | Dresdner | Two-way | 2000K | +1 |
| | EUR | AHER 3.25 09/15/06 | AA+ | Good AAA / AA | Liquid | Offer | 0.00 | -2 |

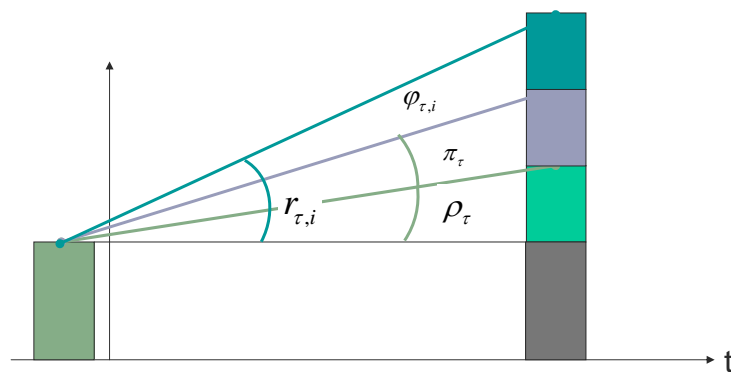
82

6.16 Entwicklung der Kredit-Spreads über die Zeit



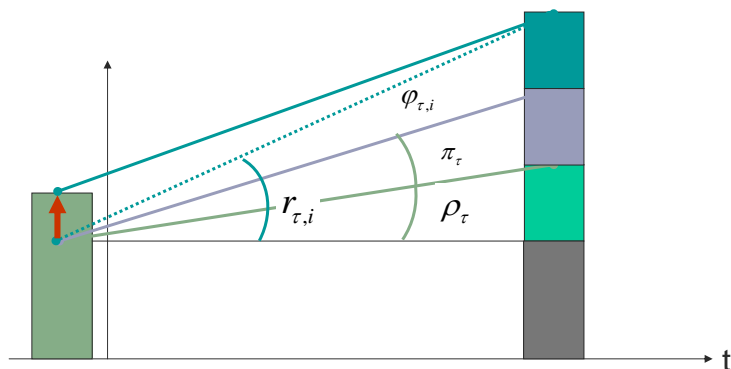
83

6.17 Zerlegung Zinsen mit Kreditrisiko



84

6.18 Kredit-Duration



85

7.1 Floaters

XS0181638023 Corp DES

P225 Corp DES

SECURITY DESCRIPTION

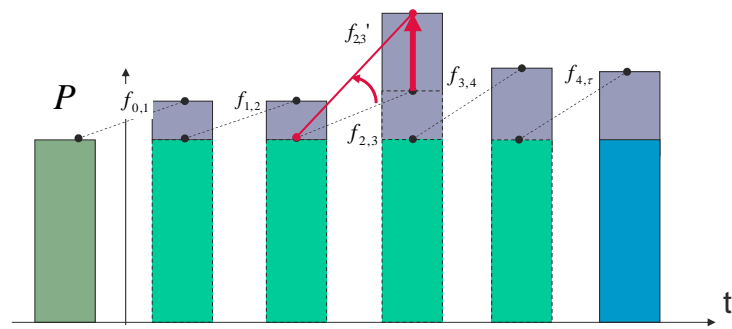
Page 1 / 3

| | | |
|--|-----------------------------|------------------------|
| FORD CREDIT AUST F Float 01/05/07 99.5195/99.7195 | | BGN @ 4/04 |
| ISSUER INFORMATION | | IDENTIFIERS |
| Name FORD CREDIT AUSTRALIA | ISIN XS0181638023 | 1) Additional Sec Info |
| Type Finance-Auto Loans | Sedol 1 7725986 | 2) Floating Rates |
| Market of Issue EURO MTN | BB number ED2400874 | 3) Identifiers |
| SECURITY INFORMATION | | RATINGS |
| Country AU | Currency EUR | Moody's A3 |
| Collateral Type COMPANY GUARNT | S&P BBB- | 4) Ratings |
| Calc Typ(21)FLOAT RATE NOTE | Composite BBB | 5) Fees/Restrictions |
| Maturity 17/5/2007 | Series EMTN | 6) Sec. Specific News |
| NORMAL | ISSUE SIZE | 7) Involved Parties |
| Coupon 3.747 | FLOATING QUARTLY | 8) Custom Notes |
| QUARTL EURIBO+160 | ACT/360 | 9) Issuer Information |
| Announcement Dt 11/25/03 | Amt Issued | 10) ALLO |
| Int. Accrual Dt 12/ 5/03 | EUR 500,000.00 (M) | 11) Pricing Sources |
| 1st Settle Date 12/ 5/03 | Amt Outstanding | 12) Related Securities |
| 1st Coupon Date 4/ 5/04 | EUR 500,000.00 (M) | 13) Par Cds Spreads |
| Iss Pr 99.8530 | Min Piece/Increment | 14) Corporate Actions |
| Reoffer 99.853 | 1,000.00/ 1,000.00 | |
| | Par Amount 1,000.00 | |
| NO PROSPECTUS | BOOK RUNNER/EXCHANGE | 65) Old DES |
| | ML | 66) Send as Attachment |
| | Multiple | |
| CPN RATE=3MO EURIBOR +160BP. MOD FOLLOW BUS DAY CNVTN. LONG 1ST CPN. SR,UNSEC'D. | | |

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2005 Bloomberg L.P.
 6511-1200-0 US-Rep-05 3-15-07

86

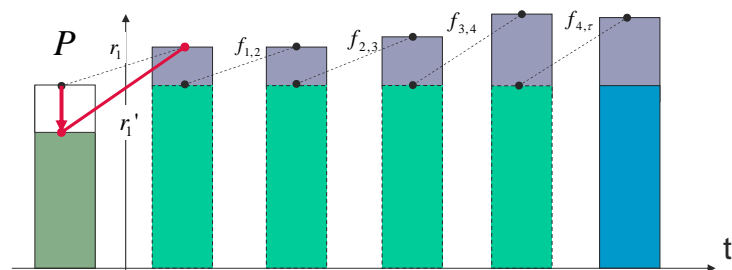
7.4 Effekt langer Zinsen auf FRN



⇒ Wert bleibt immer noch bei 100 dank Auszahlung höherer Coupon

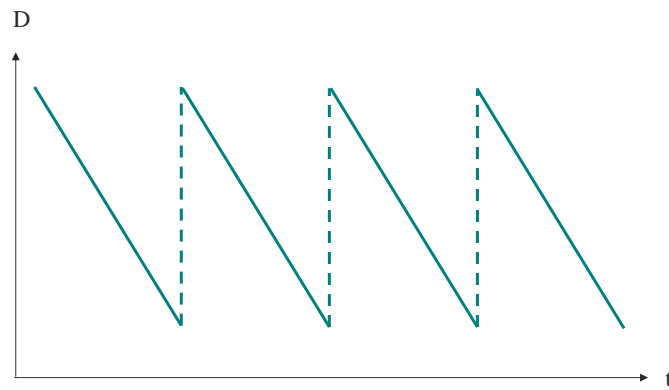
89

7.5 Effekt kurzer Zinsen auf FRN



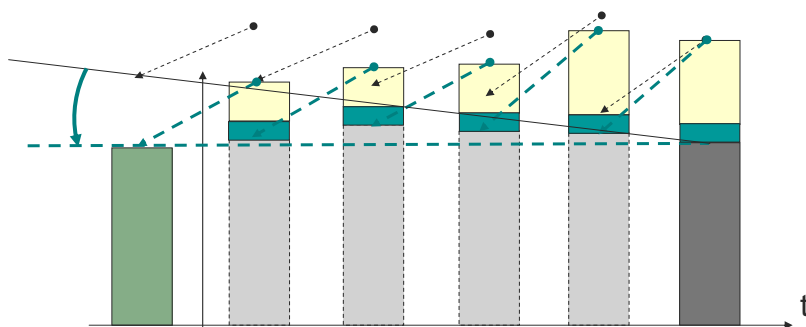
90

7.6 Entwicklung der Zins-Duration über die Zeit



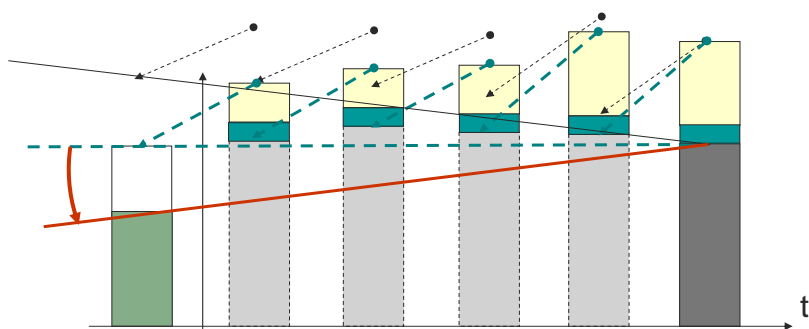
91

7.7 Margin



92

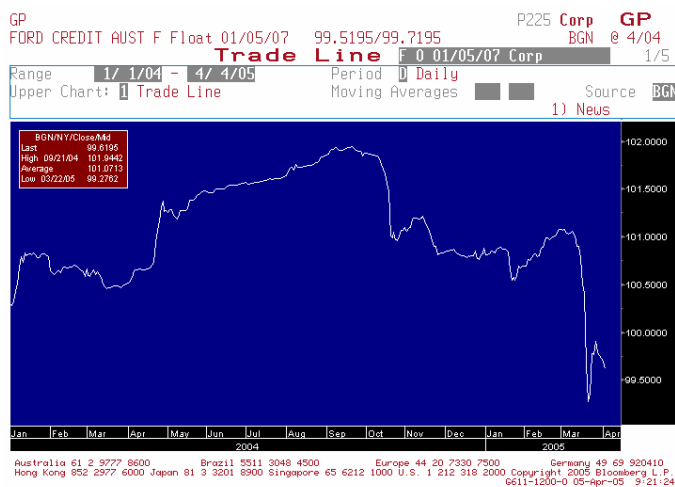
7.8 Credit Duration



⇒ Margin hat Effekt wie Zinsen auf langen Bond

93

7.9 Credit Duration in der Praxis



94

7.12 Andere Spezialfälle

- Amerikanische MBS
- Asset-Backed Securities ABS
- Collateralized Debt Obligations CDO (CLO / CBO)
- Sinking Funds
- Wandelanleihen (Convertibles)

97

8.1 Benchmarking

Equity DES

CRSDSFI SW Sf NAV **122.97** As of Jun7
CRSDSFI SW DESCRIPTION Page 1/ 4
CS BOND FUND DYNAMIC SFR Objective - Government/Corporate

Credit Suisse Bond Dynamic SFR is open-end fund incorporated in Switzerland. The Fund's objective is to obtain an above-average overall long-term yield. The Fund invests mainly in Swiss franc foreign bonds (including convertible bonds) across the entire range of borrower ratings and maturities.

| Bloomberg Classification Data | | Current / Operational Data | |
|--------------------------------|----------------------|----------------------------|-------------------|
| Asset Class | Debt | 1YGP NAV | Sf 122.97 |
| Style | Total Return | Assets(mil) | 6/ 7/05 Sf 759.51 |
| Sector Focus | Government/Corporate | Inception Date | 7/ 2/84 |
| Rating Class Focus | No Restriction | | |
| Maturity Band Focus | No Restriction | | |
| Geographic Focus | Global | | |
| Performance/Percentile Ranking | | | |
| as of 6/ 8/05 | Return | Rank In Obj. | |
| 3YTRA | 1 Month | .65 | 29 |
| | YTD | 2.31 | 30 |
| | 1 Year | 4.87 | 21 |
| | 2004 | 4.34 | 76 |
| | 5 Year | 3.64 | 19 |

(FPC<GO>) FOR FUND PERFORMANCE CHARTS AND (FSRC<GO>) FOR FUND SEARCH

Australia 61 2 9277 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2005 Bloomberg L.P.
 6691-1200-0 09-Jun-05 16:14:31

98

8.2 Eigenschaften guter Benchmarks

- Objektiv nachvollziehbar / transparent
- Investierbar ⇒ Liquiditätskriterien
- Stabile Charakteristiken
- Tiefer Turnover
- Allgemein anerkannt

99

8.3 Bond-Futures

| Futures Contract Description | | Page 1/1 |
|---|--|--|
| <p>Name SWISS FED BND FUT Jun05 Ticker FBMS <CHDTY> Notional Swiss 10yr 6%</p> | | |
| <p>Contract Size CHF 100,000 Value of 1.0 pt \$F 1,000 Tick Size .01 Tick Value \$F 10 Current Price 131.00 points Contract Value \$F 131,000 @ 11:06:24</p> | | <p>1) CT Contract Table 2) FHG Futures History Graph 3) EXS Expiration Schedule 4) DLV Cheapest to Deliver 5) WECO World Economic Releases</p> |
| <p>Cycle --- Mar --- Jun --- Sep --- Dec</p> | | |
| <p>Trading Hours Zurich Local 08:30-17:00 08:30-17:00</p> | | <p>Long term Swiss Government bonds with a fixed term of 8-13 yrs from the maturity of the contract. Minimum issue volume of CHF 500 million. Trading shall end at 12:30 p.m.CET on the Last Trading Day 3/24/00-OPTIONS DELISTED.</p> |
| <p>First Delivery Fri Jun 10, 2005 Last Delivery Fri Jun 10, 2005 Last Trade Wed Jun 8, 2005 First Notice Wed Jun 8, 2005 First Trade Thu Sep 9, 2004</p> | | <p>UBF Type 98 (GD) to change session defaults. 11:50 Price/Field Symbol WORLD BOND FUTURES 1 North/Latin America Excl US LONG BOND(CBT) Jun05 CBT USHS 111.15 n.a. 4/05 US 10YR NOTE FUT Jun05 CBT TYHS 109.15 n.a. 4/05 US SVR NOTE (CBT) Jun05 CBT FVHS 107.08 n.a. 4/05 US 2YR NOTE (CBT) Jun05 CBT TYHS 103.19 n.a. 4/05 JPMNT BOND FUTURE Jun05 CBT JHHS 103.20 n.a. 4/05 CAN 10YR BOND FUT Jun05 PSE CNHS 111.60 n.a. 4/05</p> |
| <p>Australia 61 2 3077 8000 Brazil 5511 5048 4800 Hong Kong 952 2977 4000 Japan 81 2 2001 9900 Singapore 6</p> | | <p>2 Europe/Africa EURO-BOND FUTURE Jun05 EUX RWHS 118.82 -.02 11:35 119.05 118.74 EURO NOTIONAL 10Y Jun05 NWT NHHS 94.70 n.a. 4/05 10LONG GILT FUTURE Jun05 LIF G HS 110.08 +.15 11:50 110.16 109.89 EURO-BOBL FUTURE Jun05 EUX DEMS 112.76d +.03 11:34 112.84 112.72 EURO-SCHATZ FUT Jun05 EUX DMHS 106.140d +.015 11:34 106.155 106.115 SWISS FED BND FUT Jun05 CBT FBMS 131.074 +.08 11:34 131.36 130.97</p> |

100

8.4 Grundprinzip zur Bewertung Bond Future

Trade-Idea für mittellose Investoren:

1. Kaufe zuerst einen Bond spot
2. Organisiere das Geld mit einer Repo-Transaktion (Kosten = Reposatz auf Bondpreis)
3. Verkaufe den Bond forward (Ertrag = Forward-Preis plus aufgelaufener Coupon)

⇒ da risikofrei, muss (wegen Non-Arbitrage-Prinzip) Payout =

$$[F + P_D \cdot \tau \cdot c] - [P_D \cdot (1 + \tau \cdot r)] = 0 \Rightarrow F = P_D + P_D \cdot (r - c) \cdot \tau$$

101

8.5 Conversion Factor und Cheapest-to-Deliver

$$\text{Conversion factor} = \frac{1}{(1,06)^f} \left[\frac{c}{100} \frac{\delta i}{act2} + \frac{c}{5} \left(1,06 - \frac{1}{(1,06)^n} \right) + \frac{1}{(1,06)^n} \right] - \frac{c}{100} \left(\frac{\delta i}{act2} - \frac{\delta e}{act1} \right)$$

Definition:

| | |
|-------|--|
| DD | Delivery date |
| NCD | Next coupon date |
| NCD1y | 1 year before the NCD |
| NCD2y | 2 years before the NCD |
| LCD | Last coupon date before the delivery date |
| de | NCD1y-DD |
| act1 | NCD - NCD1y, where de < 0 NCD1y - NCD2y, where de >= 0 |
| di | NCD1y - LCD |
| act2 | NCD - NCD1y, where di < 0 NCD1y - NCD2y, where di >= 0 |
| f | 1 + de / act1 |
| c | Coupon |
| n | Integer years from the NCD until the maturity date of the bond |

Quelle: Eurex

| Cheapest to Deliver | | | | | | | | | | |
|---|-------|---------|----------|---------|--------|-------|----------|-------|--------|-----------|
| SWISS FED BND FUT Jun05 FBMS 130.97 Trade 4/ 6/05 01/ 6/10/05 | | | | | | | | | | |
| Set 4/11/05 Cheapest 180 -25 | | | | | | | | | | |
| Order | US | re-sort | Y | Price | Source | Yield | C.Factor | Basis | RepoZ | Net Basis |
| 1) | SWISS | 4 | 1/4 | 116.660 | BGN | 2.130 | .895765 | .651 | .23 | .76 |
| 2) | SWISS | 3 | 2/4 | 113.560 | BGN | 2.243 | .834399 | 4.279 | -18.84 | 3.813 |
| 3) | SWISS | 4 | 1/4 | 119.270 | BGN | 2.402 | .853894 | 7.435 | -33.00 | 6.895 |
| 4) | SWISS | 2 | 1/2 | 102.160 | BGN | 2.274 | .720333 | 6.770 | -37.20 | 6.491 |
| 5) | SWISS | 3 | 01/08/18 | 106.610 | BGN | 2.391 | .741131 | 9.544 | -50.58 | 9.189 |

102

8.6 Duration Management mit Bond-Futures

Der Marktwert eines Futures ist wegen des Mark-to-Market immer Null. Darum hat der Future auch keine Duration.

⇒ Verwendung von Δ (Delta, „monetäre Duration“, „Dollar-Duration“, PV01)

| | Nominal | Preis | Marchzins | Marktwert (V) | Duration | PV01 | |
|-----------|-----------|--------|-----------|---------------|----------|---------|--|
| Bond 1 | 1,000,000 | 104.25 | 1.22 | 1,054,700.00 | 4.25 | 448.25 | $PV01_{bond} = \frac{D_{mod} \cdot V_{bond}}{10000}$ |
| Bond 2 | 1,000,000 | 99.86 | 0.36 | 1,002,200.00 | 3.69 | 369.81 | |
| Bond 3 | 1,000,000 | 100.30 | 2.10 | 1,024,000.00 | 5.88 | 602.11 | |
| Subtotal | | | | 3,080,900.00 | 4.61 | 1420.17 | $PV01_{bonds} = \sum_{bonds} PV01_{bond}$ |
| Future | # | Preis | Size (K) | Marktwert (V) | Dur CTD | | |
| | -15 | 119.45 | 100,000 | 0 | 7.89 | 1413.69 | $PV01_{future} = \frac{D_{CTD} \cdot P \cdot K \cdot \#}{10000}$ |
| Portfolio | | | | 3,080,900.00 | | 0.02 | $PV01_{portfolio} = \sum_i PV01_i$ |

$$\# = \frac{V_{portfolio} \cdot D_{portfolio} - V_{bonds} \cdot D_{bonds}}{D_{CTD} \cdot P \cdot K}$$

$D_{portfolio} = 10000 \cdot \frac{PV01_{portfolio}}{V_{portfolio}}$

103

8.7 Mark-to-Market

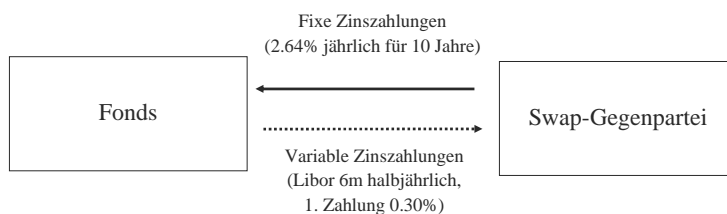
- Futures-Kontrakte werden täglich abgerechnet (daily settlement) ...
- ... dadurch entstehen tägliche Mittelflüsse ...
- ... über das Margin-Account ...
- ... mit Auswirkungen auf die Bewirtschaftung der Liquidität.

⇒ Vorsicht bei Absicherung illiquider Anlagen !

104

8.8 Zinsswaps

Beispiel Receiver Swap, Laufzeit 10 Jahre

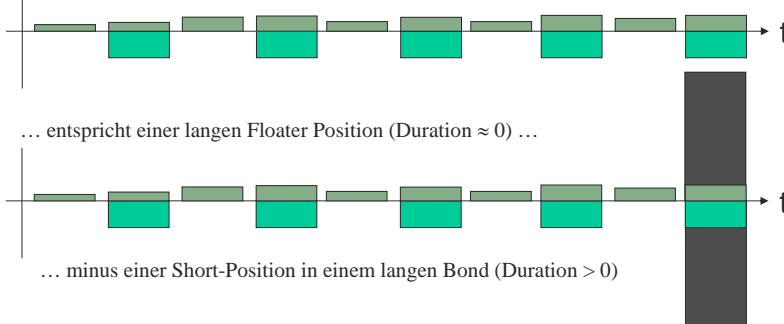


- ⇒ Floater + Receiver Swap = Fixed Bond
- ⇒ Fixed Bond + Payer Swap = Floater

105

8.9 Durationssteuerung mit Swaps

Der Netto-Mittelfluss eines Payer Swap ...



- ⇒ Mit Payer Swap lässt sich die Duration des Portfolios verkürzen (ähnlich wie Short Future)

106

8.10 Vorteile und Nachteile des Einsatzes von Swaps

Vorteile

- Kein Daily Settlement / keine Margin-Accounts
- Mehr Punkte auf der Kurve
- Grössere Liquidität in vielen Märkten
- Vermeidung von Stempelsteuer
- Trennung Kreditentscheid von Zinsentscheid

Nachteile

- Spread zwischen Swap und Future
- Documentation (ISDA Agreements)
- Mindestgrösse ca 5 Mio

⇒ Swaps für Privatanleger in erster Linie über Fonds

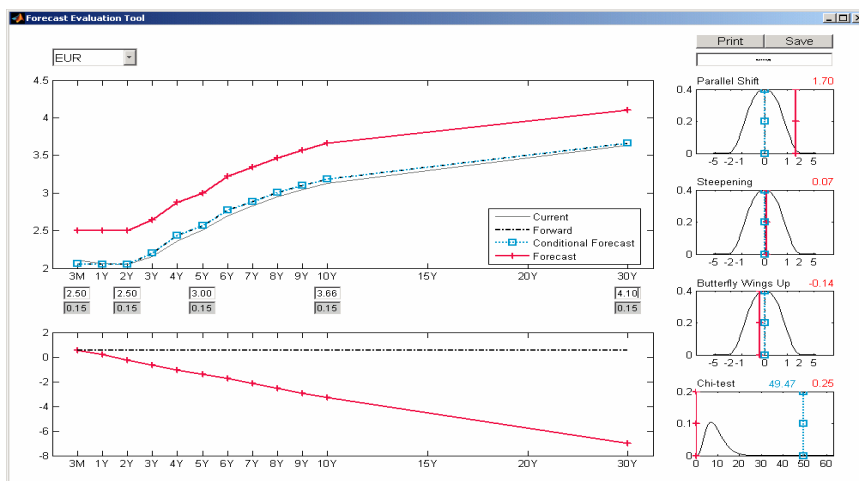
107

8.11 Nicht-parallele Kurvenbewegungen



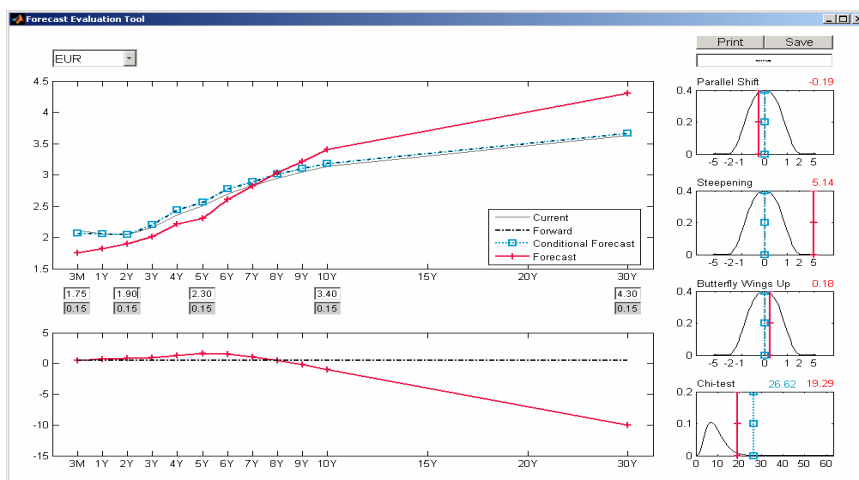
108

8.12 Einfluss eines positiven Shift um 50 Basispunkte



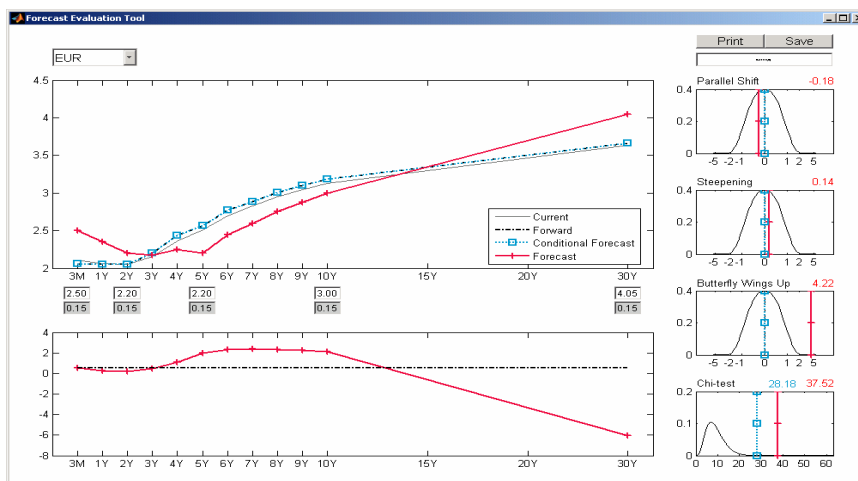
109

8.13 Einfluss eines positiven Twist



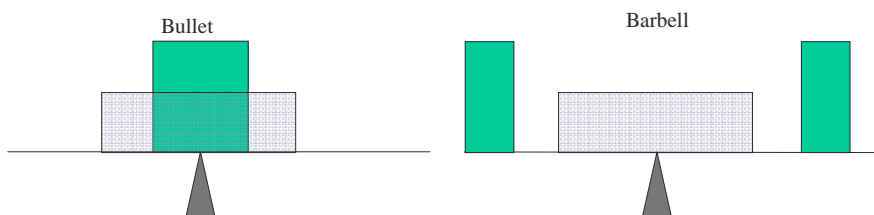
110

8.14 Einfluss eines positiven Butterfly



111

8.15 Bullet versus Barbell



Bei (neutralem) Steepening:
Benchmark verliert mehr auf
lange Laufzeiten als er auf
kurze Laufzeiten gewinnt.

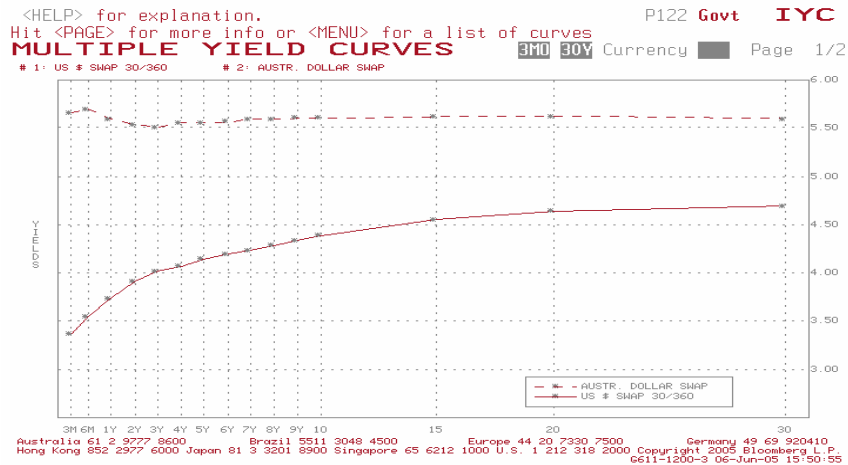
Bullet = Steepening Trade

Bei (neutralem) Flattening:
Portfolio gewinnt mehr auf
lange Laufzeiten als es auf
kurze Laufzeiten verliert.

Barbell = Flattening Trade

112

8.16 Internationale Bond Portfolios



113

8.17 Steuerliche Aspekte

- Stempelsteuer
- Quellensteuer Ausland
- Spezialfall Quellensteuer USA
- Quellensteuer Schweiz
- Europäische Zahlstellensteuer
- Spezialfall inflationsgeschützte Anleihen

114