



Duration and Risk

Presenters:

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Overview

Investment Analysis: Duration Calculation

- Duration and concepts of convexity
- Different types of duration calculations
- Portfolio duration, risk and strategies
- Application of Bloomberg analysis

Measuring and Evaluating Risk

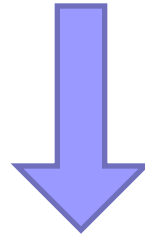
- **Interest Rate Risk**
 - Macaulay Duration
 - Modified Duration
 - Effective/OAS Duration
 - Risk vs. Duration

- **Convexity and Performance**

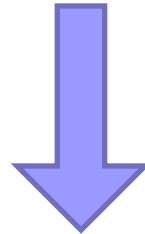
- **Credit Risk**
 - Spread Duration/Risk
 - Probability of Default



Macaulay Duration



Modified Duration



Effective/OAS Duration

Interest Rate Risk and Duration

Inverse relationship between price and yield. The price of some bonds however are more affected by changes in yield.

Interest Rate Risk:

The risk that interest rates will rise causing the yields of bonds to rise and consequently making prices fall.

Duration:

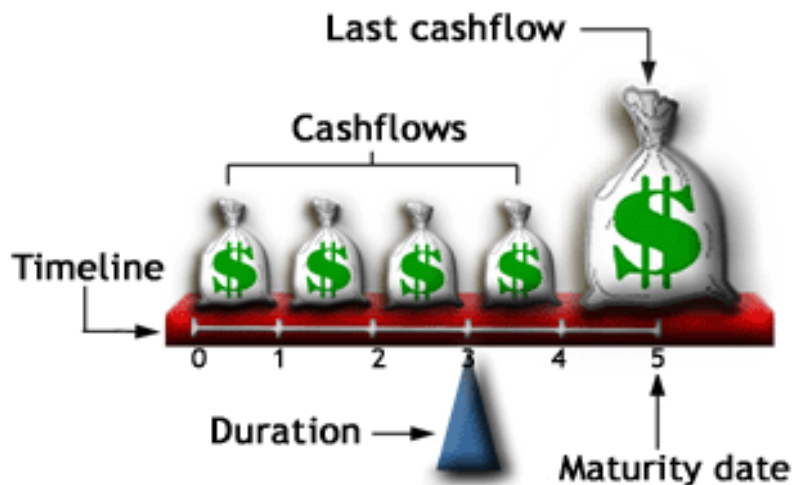
Investors can quantify how much the price of a bond will change as the yield changes through duration, The Duration is a measure of the % change in a bonds value changes in yield.

Risk/DV01:

Measures an absolute dollar movement of the bond.

Macaulay's Duration

Time in years until $\frac{1}{2}$ of the future cash flows are received. Consider a bond that pays coupons annually and matures in five years. Its cash flows consist of five annual coupon payments and the last payment includes the face value of the bond.



The moneybags represent the cash flows you receive over the five-year period. To balance the red lever at the point where total cash flows equal the amount paid for the bond, the fulcrum must be farther to the left, at a point before maturity. (Duration/100 - change in yield 0.01%)

Why should we use a Bonds Duration rather than it's maturity?

T 1 3/8 11/30/15 vs T 9 1/4 2/15/16

YA Govt YA

T 1 3/8 11/30/15 Govt (90) Feedback Yield and Spread Analysis

103-12/103-12 0.480/0.474 CBBT @ 11:45 (95) Buy (96) Sell (97) Settings

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom 6) Yields

T 1.375 11/30/15 (912828PJ3) Risk

| | | | |
|---------------------|------------------|------------------------|---------|
| Price | 103-12 (103.375) | Duration | 3.719 |
| Settle | 02/07/12 | Modified Duration | 3.710 |
| Maturity | 11/30/15 | Risk | 3.845 |
| Street Convention | 0.480 | Convexity | 0.158 |
| Treasury Convention | 0.480 | DV 01 on 1MM | 385 |
| True Yield | 0.480 | Yield Value of a 0 3/2 | 0.00813 |

Street Convention 0.480
Treasury Convention 0.480
True Yield 0.480

Equiv 1 /Yr Compound YA
Japanese Yield (Simple) Bond Matures on a HOLIDAY
Mmkt(Act/ 360)

Current Yield

After Tax (Inc 35.00% CG 15.00%)
Issue Price = 99.827. Bond Purchased with Prem

T 9 1/4 02/15/16 Govt (90) Feedback Yield and Spread Analysis

135-01/135-03 0.451/0.437 CBBT @ 10:44 (95) Buy (96) Sell (97) Settings

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom 6) Yields

T 9.25 2/15/16 (912810DV7) Risk

| | | | |
|---------------------|--------------------|------------------------|---------|
| Price | 135-01 (135.03125) | Duration | 3.428 |
| Settle | 02/07/12 | Modified Duration | 3.420 |
| Maturity | 02/15/16 | Risk | 4.770 |
| Street Convention | 0.451 | Convexity | 0.147 |
| Treasury Convention | 0.451 | DV 01 on 1MM | 477 |
| True Yield | 0.450 | Yield Value of a 0 3/2 | 0.00655 |

Street Convention 0.451
Treasury Convention 0.451
True Yield 0.450

Equiv 1 /Yr Compound Invoice
Japanese Yield (Simple) Face 1,000 M
Mmkt(Act/ 360) Principal 1,350,312.50
Current Yield 6.850 Accrued (176 Days) 44,239.13
Total (USD) 1,394,551.63

After Tax (Inc 35.00% CG 15.00%) 0.293
Issue Price = 99.695. Bond Purchased with Premium.

Modified Duration

Macaulay duration is close but not accurate. By modifying Macaulay's duration we have a more accurate measure of the price change.

$$\text{Modified Duration} = \frac{\text{Macaulay's Duration}}{(1 + \text{Yield/Compounding Frequency})}$$

Modified Duration and Non-Bullet Securities

Small changes in price can cause large swings in duration measures

<HELP> for explanation. Corp YAS

FHLB 1.1 02/17/17 Corp 90) Feedback Yield and Spread Analysis

95) Buy 96) Sell 97) Settings

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom 6) Yield to Call

FHLB 1.1 2/17/17 (3133783W9)

| | | | |
|--------|---------------------------------|----------------|-------------------------|
| Sprd | 33.92 bp vs 5y T 0 7/8 01/31/17 | Maturity | 0AS |
| Price | 99.99 3 dec | Mod Duration | 4.852 1.798 |
| Yield | 1.1020611 Wst | Risk | 4.851 1.797 |
| Wkout | 02/17/2017 @ 100.00 Consensus | Convexity | 0.263 -2.990 |
| Settle | 02/17/12 | DV 01 on 1MM | 485 180 |
| | | Benchmark Risk | 4.893 4.932 |
| | | Risk Hedge | 991 M 364 M |
| | | Proceeds Hedge | <HELP> for explanation. |

| Spread | Yield Calculations | Invoice |
|-----------------|-----------------------------|-------------|
| 11) G-Sprd 32.6 | Street Convention 1.1020611 | Face |
| 12) I-Sprd 5.4 | Equiv 1 /Yr 1.1050974 | Principal |
| Basis N.A. | Mmkt(Act/ 360) | Accrued |
| 14) Z-Sprd 4.5 | Current Yield 1.10011 | Total (USD) |
| 15) ASW 4.4 | | |
| 16) OAS 7.3 | | |
| TED -2.9 | | |

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 SN 140603 PST

Msg:P. Ocheltr

FHLB 1.1 02/17/17 Corp 90) Feedback Yield and Spread Analysis

95) Buy 96) Sell 97) Settings

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom 6) Yield to Call

FHLB 1.1 2/17/17 (3133783W9)

| | | | |
|--------|---------------------------------|----------------|--------------|
| Sprd | 33.71 bp vs 5y T 0 7/8 01/31/17 | Workout | 0AS |
| Price | 100-00 3 dec | Mod Duration | 0.497 1.786 |
| Yield | 1.1000000 Wst | Risk | 0.497 1.786 |
| Wkout | 08/17/2012 @ 100.00 Consensus | Convexity | 0.005 -2.969 |
| Settle | 02/17/12 | DV 01 on 1MM | 50 179 |
| | | Benchmark Risk | 4.893 4.932 |
| | | Risk Hedge | 102 M 362 M |
| | | Proceeds Hedge | 994 M |

| Spread | Yield Calculations | Invoice |
|------------------|-----------------------------|------------------|
| 11) G-Sprd 100.1 | Street Convention 1.1000000 | Face |
| 12) I-Sprd 31.2 | Equiv 1 /Yr 1.1030250 | Principal |
| Basis N.A. | Mmkt(Act/ 360) | Accrued (0 Days) |
| 14) Z-Sprd 71.0 | Current Yield 1.1 | Total (USD) |
| 15) ASW 70.2 | | |
| 16) OAS 6.7 | | |
| TED -69.0 | | |

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Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2012 Bloomberg Finance L.P.

Effective Duration

Effective or OAS duration allows for better evaluation of bonds with embedded optionality such as callable bonds. Effective duration better represents the trading sensitivity of callable bonds and is not subject to the immediate wide swings observed with the modified duration of callable securities.

Effective Duration = **Change in Price of Bond
resulting from a parallel shift in
yield curve.**

Effective Duration provides a better measure of price sensitivity for non-bullet securities

<HELP> for explanation. Corp YAS

FHLB 1.1 02/17/17 Corp 90) Feedback Yield and Spread Analysis

95) Buy 96) Sell 97) Settings

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom 6) Yield to Call

FHLB 1.1 2/17/17 (3133783W9) Risk

| | | | |
|--------|--------------------------------|----------------|--------------|
| Sprd | 33.92 bp vs 5y T 0 7s 01/31/17 | Maturity | OAS |
| Price | 99.99 3 dec 100-17+ 9:29:35 | Mod Duration | 4.852 1.798 |
| Yield | 1.1020611 Wst 0.7628879 Con | Risk | 4.851 1.797 |
| Wkout | 02/17/2017 @ 100.00 Consensus | Convexity | 0.263 -2.990 |
| Settle | 02/17/12 02/07/12 | DV 01 on 1MM | 485 180 |
| | | Benchmark Risk | 4.893 4.932 |
| | | Risk Hedge | 001 M 364 M |

<HELP> for explanation. Msg:P. Ocheltre

FHLB 1.1 02/17/17 Corp 90) Feedback Yield and Spread Analysis

95) Buy 96) Sell 97) Settings

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom 6) Yield to Call

FHLB 1.1 2/17/17 (3133783W9) Risk

| | | | |
|--------|--------------------------------|----------------|-------------|
| Sprd | 33.71 bp vs 5y T 0 7s 01/31/17 | Workout | OAS |
| Price | 100-00 3 dec 100-17+ 9:29:35 | Mod Duration | 0.497 1.786 |
| Yield | 1.1000000 Wst 0.7628879 Con | Risk | 0.497 1.786 |
| Wkout | 08/17/2012 @ 100.00 Consensus | Convexity | 0.005 2.969 |
| Settle | 02/17/12 02/07/12 | DV 01 on 1MM | 50 179 |
| | | Benchmark Risk | 4.893 4.932 |
| | | Risk Hedge | 102 M 362 M |
| | | Proceeds Hedge | 994 M |

| Spread | Yield Calculations | Invoice |
|------------------|-----------------------------|--------------------------|
| 11) G-Sprd 100.1 | Street Convention 1.1000000 | Face 1,000 M |
| 12) I-Sprd 31.2 | Equiv 1 /Yr 1.1030250 | Principal 1,000,000.00 |
| Basis N.A. | Mmkt(Act/ 360) 1.0879121 | Accrued (0 Days) 0.00 |
| 14) Z-Sprd 71.0 | Current Yield 1.1 | Total (USD) 1,000,000.00 |
| 15) ASW 70.2 | | |
| 16) OAS 6.7 | | |
| TED -69.0 | | |

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 G
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 201
SN 140603

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2012 Bloomberg Finance L.P.

Risk

Modified Duration is still not the most accurate way to quantify the price change of a bond.

Risk is a more accurate measure. Multiply the full price of the bond by the modified duration

$$\text{Risk} = \frac{\text{Modified Duration} \times \text{Full Price}}{100}$$

100

Duration is a measure of %. Risk is a measure of \$.

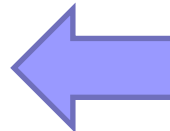
YA Govt YA

T 0 % 01/31/17 Govt 90) Feedback Yield and Spread Analysis

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom 6) Yields

T 0.875 1/31/17 (912828SC5)

| | | | | |
|----------------------|-----------------|------------------|-------------------|---------|
| Price | 100-00 (100.00) | Risk | Duration | 4.903 |
| Settle | 01/31/12 | Maturity | Modified Duration | 4.882 |
| | | 01/31/17 | Risk | 4.882 |
| Street Convention | 0.875 | Convexity | | 0.266 |
| Treasury Convention | 0.875 | DV 01 on 1MM | | 488 |
| True Yield | 0.875 | Yield Value of a | 0.32 | 0.00640 |
| Equiv 1 /Yr Compound | 0.877 | Invoice | | |



At Par: Duration = Risk

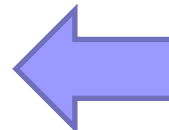
YA Govt YA

T 0 % 01/31/17 Govt 90) Feedback Yield and Spread Analysis

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom 6) Yields

T 0.875 1/31/17 (912828SC5)

| | | | | |
|-------------------------|---------------|------------------|-------------------|---------|
| Price | 97-00 (97.00) | Risk | Duration | 4.901 |
| Settle | 01/31/12 | Maturity | Modified Duration | 4.865 |
| | | 01/31/17 | Risk | 4.719 |
| Street Convention | 1.500 | Convexity | | 0.264 |
| Treasury Convention | 1.500 | DV 01 on 1MM | | 472 |
| True Yield | 1.500 | Yield Value of a | 0.32 | 0.00662 |
| Equiv 1 /Yr Compound | 1.506 | Invoice | | |
| Japanese Yield (Simple) | 1.519 | Face | 1,000M | |
| Mmkt(Act/ 360) | | Principal | 970,000.00 | |
| Current Yield | 0.902 | Accrued (0 Days) | 0.00 | |



At a Discount: Duration > Risk

YA Govt YA

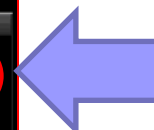
T 0 % 01/31/17 Govt 90) Feedback Yield and Spread Analysis

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom 6) Yields

T 0.875 1/31/17 (912828SC5)

| | | | | |
|----------------------------------|-----------------|------------------|-------------------|---------|
| Price | 103-00 (103.00) | Risk | Duration | 4.905 |
| Settle | 01/31/12 | Maturity | Modified Duration | 4.898 |
| | | 01/31/17 | Risk | 5.045 |
| Street Convention | 0.271 | Convexity | | 0.267 |
| Treasury Convention | 0.271 | DV 01 on 1MM | | 505 |
| True Yield | 0.271 | Yield Value of a | 0.32 | 0.00619 |
| Equiv 1 /Yr Compound | 0.271 | Invoice | | |
| Japanese Yield (Simple) | 0.267 | Face | 1,000M | |
| Mmkt(Act/ 360) | | Principal | 1,030,000.00 | |
| Current Yield | 0.850 | Accrued (0 Days) | 0.00 | |
| After Tax (Inc 35.00% CG 15.00%) | 0.176 | Total (USD) | 1,030,000.00 | |

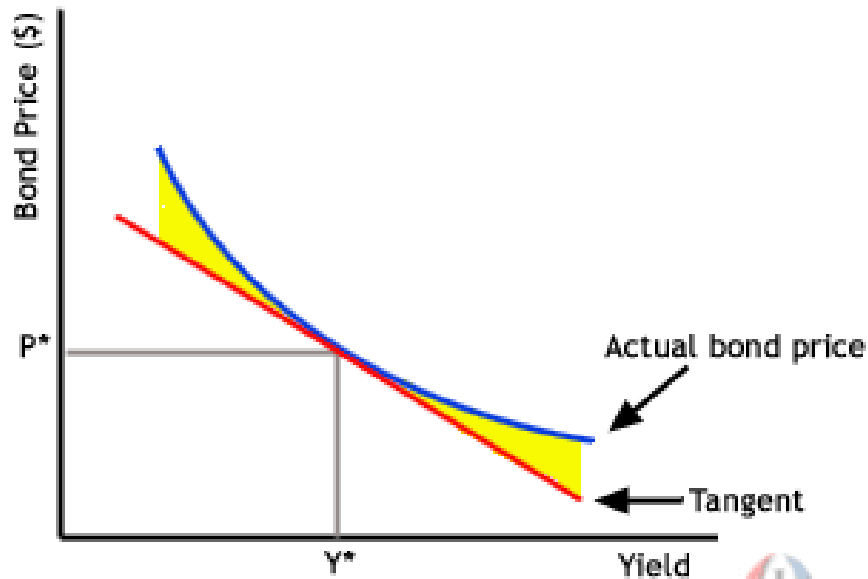
Issue Price = 99.883. Bond Purchased with Premium.



At a Premium: Duration < Risk

Convexity

Modified duration does not account for large changes in yield. If we were to use duration to estimate the price resulting from a significant change in yield, the estimate would be inaccurate. The convexity calculation, therefore, accounts for the inaccuracies of the linear duration line. Essentially, convexity shows how much a bond's price changes in response to a change in yield.

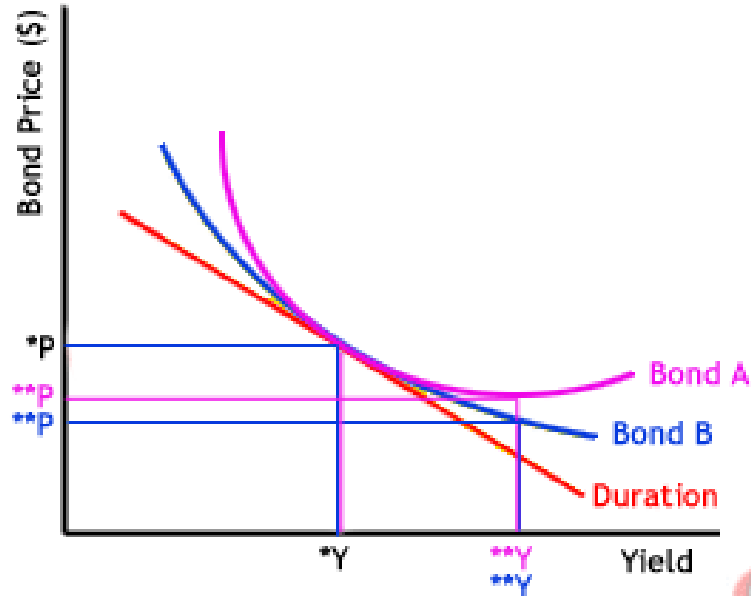


Convexity

Convexity is Good

A bond with greater convexity is less affected by a change in interest rates.

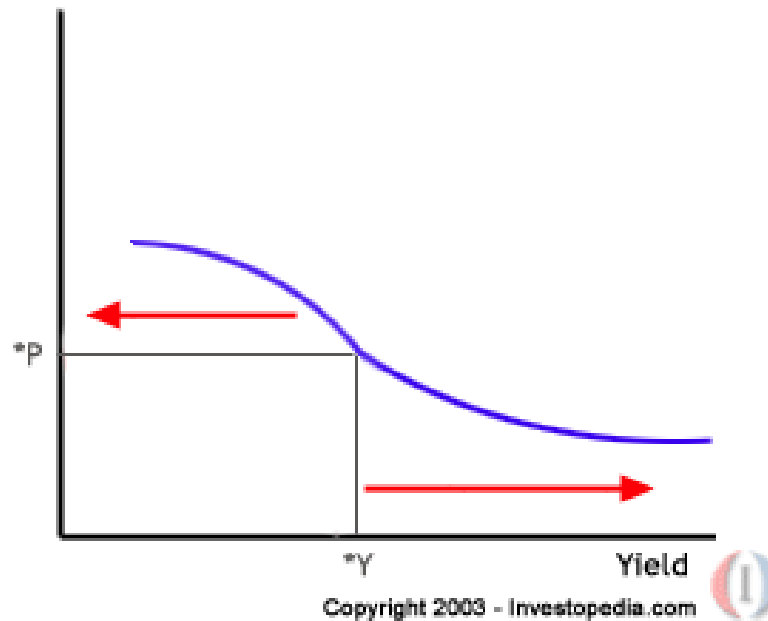
Bonds with greater convexity will have a higher price than bonds with a lower convexity, regardless of whether interest rates rise or fall.



Convexity

Callable bonds will exhibit negative convexity at certain price-yield combinations.

Negative convexity means that as yield decrease, duration will also decrease.



How does convexity effect the return of a bond?

FNMA 1.125 6/27/14 vs FFCB 1.27 1/18/17

| DES | | Corp | | DES | |
|--------------------------------|--|----------------------------------|--|---------------------------------|--|
| FED FARM CREDIT | | FFCB 1.27 01/17 | | 99.994/100.064 (1.27/1.20) BVAL | |
| FFCB 1.27 01/18/17 Corp | | 99) Feedback | | Page 1/11 Description: Bond | |
| Data not provided by Bloomberg | | 94) Notes (NEW) | | 95) Buy 96) Sell 97) Settings | |
| 21) Bond Description | | 22) Issuer Description | | | |
| Pages | | Issuer Information | | Identifiers | |
| 1) Bond Info | | Name FEDERAL FARM CREDIT BANK | | CUSIP 31331K6Y1 | |
| 2) Addtl Info | | Type Sovereign Agency | | ISIN US31331K6Y14 | |
| 3) Covenants | | Security Information | | BB Number EI9572450 | |
| 4) Guarantors | | Mkt of Issue US Domestic | | Bond Ratings | |
| 5) Bond Ratings | | Country US Currency USD | | S&P AA+ | |
| 6) Identifiers | | Rank Unsecured Series | | Moody's Aaa | |
| 7) Exchanges | | Coupon 1.27 Type Fixed | | Composite AA+ | |
| 8) Inv Parties | | Cpn Freq S/A | | Fitch NA | |
| 9) Fees, Restrict | | Day Cnt 30/360 | | Issuance & Trading | |
| 10) Schedules | | Maturity 01/18/2017 | | Amt Issued/Outstanding | |
| 11) Coupons | | CALLABLE CALL 01/18/13@100.00 | | USD 125.000.00 (M) / | |
| Quick Links | | Issue Spread | | USD | |
| 32) ALLQ Pricing | | Calc Type (1) STREET CONVENTION | | Min Piece/I | |
| 33) QRD Quote Recap | | Announcement Date 01/11/2012 | | 1,000 | |
| 34) TDH Trade Hist | | Interest Accrual Date 01/18/2012 | | Par Amount | |
| 35) CACS Corp Action | | 1st Settle Date 01/18/2012 | | Book Runner | |
| 36) CF Prospectus | | 1st Coupon Date 07/18/2012 | | Reporting | |
| 37) CN Sec News | | | | | |
| 38) HDS Holders | | | | | |
| 66) Send Bond | | | | | |

| DES | | Corp | | DES | |
|--------------------------------|--|--------------------------------------|--|----------------------------------|--|
| FANNIE MAE | | FNMA 1 1/8 06/14 | | 101.691/101.747 (0.41/0.38) BVAL | |
| FNMA 1 1/8 06/27/14 Corp | | 99) Feedback | | Page 1/11 Description: Bond | |
| Data not provided by Bloomberg | | 94) Notes (NEW) | | 95) Buy 96) Sell 97) Settings | |
| 21) Bond Description | | 22) Issuer Description | | | |
| Pages | | Issuer Information | | Identifiers | |
| 1) Bond Info | | Name FANNIE MAE | | CUSIP 3135G0BJ1 | |
| 2) Addtl Info | | Type Sovereign Agency | | ISIN US3135G0BJ19 | |
| 3) Covenants | | Security Information | | BB Number EI6750331 | |
| 4) Guarantors | | Mkt of Issue Global | | Bond Ratings | |
| 5) Bond Ratings | | Country US Currency USD | | S&P AA+ | |
| 6) Identifiers | | Rank Unsecured Series | | Moody's Aaa | |
| 7) Exchanges | | Coupon 1.125 Type Fixed | | Fitch AAA | |
| 8) Inv Parties | | Cpn Freq S/A | | Composite AA+ | |
| 9) Fees, Restrict | | Day Cnt 30/360 | | Issuance & Trading | |
| 10) Schedules | | Maturity 06/27/2014 | | Amt Issued/Outstanding | |
| 11) Coupons | | BULLET | | USD 4,000,000.00 (M) / | |
| Quick Links | | Issue Spread 20.50bp vs T 1 05/15/14 | | USD 4,000,000.00 (M) | |
| 32) ALLQ Pricing | | Calc Type (1) STREET CONVENTION | | Min Piece/Increment | |
| 33) QRD Quote Recap | | Announcement Date 05/12/2011 | | 2,000.00 / 1,000.00 | |
| 34) TDH Trade Hist | | Interest Accrual Date 05/16/2011 | | Par Amount 1,000.00 | |
| 35) CACS Corp Action | | 1st Settle Date 05/16/2011 | | Book Runner BCLY,GS,JPM | |
| 36) CF Prospectus | | 1st Coupon Date 06/27/2011 | | Reporting TRACE | |
| 37) CN Sec News | | | | | |
| 38) HDS Holders | | | | | |
| 66) Send Bond | | | | | |

The Durations of the Securities are Virtually Identical

Convexities are much different

<HELP> for explanation. Corp YAS

FFCB 1.27 01/18/17 Corp 90) Feedback Yield and Spread Analysis

99.994/100.064 1.271/1.200 BVAL @ 04:00 95) Buy 96) Sell 97) Settings

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom 6) Yield to Call

FFCB 1.27 1/18/17 (31331K6Y1) Risk

| | | | |
|--------|---------------------------------|----------------|--------------|
| Sprd | 45.09 bp vs 5y T 0 7/8 01/31/17 | Workout | 0AS |
| Price | 99.994 3 dec 100-08+ 6:18:37 | Mod Duration | 0.922 2.320 |
| Yield | 1.2712088 Wst 0.8202741 S/A | Risk | 0.922 2.322 |
| Wkout | 01/18/2017 @ 100.00 Consensus | Convexity | 0.013 -2.035 |
| Settle | 02/13/12 02/13/12 | DV 01 on 1MM | 92 232 |
| | | Benchmark Risk | 4.862 4.902 |
| | | Risk Hedge | 190 M 474 M |
| | | Proceeds Hedge | |

| Spread | Yield Calculations | |
|------------|--------------------|-----------------------------|
| 11) G-Spr | 45.9 | Street Convention 1.2712088 |
| 12) I-Sprd | 18.7 | Equiv 1 /Yr 1.2752487 |
| Basis | N.A. | Mmkt(Act/ 360) |
| 14) Z-Sprd | 18.6 | Current Yield 1.270076 |
| 15) ASW | 18.1 | |
| 16) OAS | 23.0 | |
| TED | -17.1 | |

<HELP> for explanation. Corp YAS

FNMA 1 1/8 06/27/14 Corp 90) Feedback Yield and Spread Analysis

101.691/101.747 0.408/0.384 BVAL @ 04:00 95) Buy 96) Sell 97) Settings

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom

FNMA 1.125 6/27/14 (3135G0BJ1) Risk

| | | | |
|--------|---------------------------------|----------------|-----------------|
| Sprd | 13.40 bp vs 2y T 0 1/4 01/31/14 | Maturity | OAS |
| Price | 101.691 3 dec 99-30+ 6:18:7 | Mod Duration | 2.340 2.342 |
| Yield | 0.4079386 Wst 0.2739413 S/A | Risk | 2.383 2.385 |
| Wkout | 06/27/2014 @ 100.00 Consensus | Convexity | 0.067 0.067 |
| Settle | 02/13/12 02/13/12 | DV 01 on 1MM | 238 239 |
| | | Benchmark Risk | 1.957 1.959 |
| | | Risk Hedge | 1,218 M 1,218 M |
| | | Proceeds Hedge | 1,019 M |

| Spread | Yield Calculations | | Invoice |
|------------|--------------------|-----------------------------|----------------------------|
| 11) G-Spr | 9.5 | Street Convention 0.4079386 | Face 1,000 M |
| 12) I-Sprd | -17.2 | Equiv 1 /Yr 0.4083546 | Principal 1,016,910.00 |
| Basis | N.A. | Mmkt(Act/ 360) | Accrued (46 Days) 1,437.50 |
| 14) Z-Sprd | -13.9 | Current Yield 1.106293 | Total (USD) 1,018,347.50 |
| 15) ASW | -13.8 | | |
| 16) OAS | 9.8 | | |
| TED | 14.8 | | |

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Cop
 SN 140603 PST GMT-8:0

3 month returns with modest interest rate increases

<HELP> for explanation.

Corp FISA

FFCB 1.27 01/18/17 Corp 98) Actions - 99) Feedback Scenario Analysis
 99.994/100.064 1.271/1.200 BVAL @ 04:00 95) Buy 96) Sell 97) Settings

1) Load CIX 2) Save as CIX

| Security | Swap Type | Risk | Settlement | | | OAS | | | Financing | | | |
|--------------------|-----------|-------|------------|-----------|----------|-----|------|------|-----------|--|--|--|
| B/S | Amt (M) | Date | Price | Yield | Workout | OAS | Vol | Risk | Rate | | | |
| FFCB 1.27 01/18/17 | B | 1,000 | 02/13/12 | 99.994000 | 1.271209 | W | 23.5 | 53.3 | 2.30 | | | |
| <Add Security #2> | | | | | | | | | | | | |
| <Add Security #3> | | | | | | | | | | | | |

Scenario Results

Reinvestment Rate % 0.230

Horizon Date Multiple Horizon 05/13/12

| Scenario Name | Total Return % | HPR % | Horizon Yield | Net P & L (USD) | B/E Yield |
|--------------------------|----------------|--------|---------------|-----------------|-----------|
| Curve Shifts(I25) | | | | | 1.341 |
| My Custom Scenarios(I25) | | | | | |
| +50 | -5.090 | -1.281 | 1.627 | -12,817 | |
| +75 | -8.920 | -2.255 | 1.848 | -22,573 | |

<HELP> for explanation.

Msg: Bsave

FNMA 1 3/8 06/27/14 Corp 98) Actions - 99) Feedback Scenario Analysis
 101.691/101.747 0.408/0.384 BVAL @ 04:00 95) Buy 96) Sell 97) Settings

1) Load CIX 2) Save as CIX

| Security | Swap Type | Risk | Settlement | | | OAS | | | Financing | | | |
|---------------------|-----------|-------|------------|------------|----------|-----|-----|------|-----------|--|--|--|
| B/S | Amt (M) | Date | Price | Yield | Workout | OAS | Vol | Risk | Rate | | | |
| FNMA 1 3/8 06/27/14 | B | 1,000 | 02/13/12 | 101.691000 | 0.407939 | W | 9.7 | 0.0 | 2.39 | | | |
| <Add Security #2> | | | | | | | | | | | | |
| <Add Security #3> | | | | | | | | | | | | |

Scenario Results

Reinvestment Rate % 0.230

Horizon Date Multiple Horizon 05/13/12

| Scenario Name | Total Return % | HPR % | Horizon Yield | Net P & L (USD) | B/E Yield |
|--------------------------|----------------|--------|---------------|-----------------|-----------|
| Curve Shifts(I25) | | | | | 0.457 |
| My Custom Scenarios(I25) | | | | | |
| +50 | -3.528 | -0.886 | 0.883 | -9,021 | |
| +75 | -5.566 | -1.401 | 1.133 | -14,270 | |

Convexity Effects Duration and Risk as Rates Change

<HELP> for explanation.

Corp YAS

| FFCB 1.27 01/18/17 Corp | | 90) Feedback | Yield and Spread Analysis | |
|---------------------------------|-----------------------------------|--------------------|---------------------------|------------------|
| | | 95) Buy | 96) Sell | 97) Settings |
| 1) Yield & Spread | | 2) Price Discovery | | 3) Descriptive |
| 4) Graphs | | 5) Custom | | 6) Yield to Call |
| FFCB 1.27 1/18/17 (31331K6Y1) | | | | |
| Sprd | 101.24 bp vs 5y T 0 7s 01/31/17 | Maturity | OAS | |
| Price | 97.454 3 dec ↻ 100-07 7:2:45 | Mod Duration | 4.497 | 4.367 |
| Yield | 1.8400000 Wst 0.8275705 S/A | Risk | 4.401 | 4.274 |
| Wkout | 01/18/2017 @ 100.00 Consensus | Convexity | 0.229 | -1.380 |
| Settle | 05/13/12 05/13/12 | DV 01 on 1MM | 440 | 427 |
| | | Benchmark Risk | 4.623 | 4.656 |
| | | Risk Hedge | 952 M | 918 M |
| | | Proceeds Hedge | 974 M | |
| Spread | | Invoice | | |
| 11) G-Spr | 101.8 Street Convention 1.8399999 | Face | 1,000 M | |
| 12) I-Sprd | 74.5 Equiv 1 /Yr 1.8484639 | Principal | | |
| Basis | N.A. Mmkt(Act/ 360) | Accrued (115 Days) | | |
| 14) Z-Sprd | 71.4 Current Yield 1.303175 | Total (USD) | | |
| 15) ASW | 67.9 | | | |
| 16) OAS | 108.1 | | | |
| TED | -69.4 | | | |

<HELP> for explanation.

Corp YAS

| FNMA 1 1/8 06/27/14 Corp | | 90) Feedback | Yield and Spread Analysis | |
|----------------------------------|-----------------------------------|--------------------|---------------------------|----------------|
| | | 95) Buy | 96) Sell | 97) Settings |
| 1) Yield & Spread | | 2) Price Discovery | | 3) Descriptive |
| 4) Graphs | | 5) Custom | | |
| FNMA 1.125 6/27/14 (3135G0BJ1) | | | | |
| Sprd | 105.26 bp vs 2y T 0 1/4 01/31/14 | Maturity | OAS | |
| Price | 99.572 3 dec ↻ 99-30+ 7:1:49 | Mod Duration | 2.080 | 2.082 |
| Yield | 1.3300000 Wst 0.2773716 S/A | Risk | 2.080 | 2.082 |
| Wkout | 06/27/2014 @ 100.00 Consensus | Convexity | 0.054 | 0.054 |
| Settle | 05/13/12 05/13/12 | DV 01 on 1MM | 208 | 208 |
| | | Benchmark Risk | 1.711 | 1.712 |
| | | Risk Hedge | 1,216 M | 1,216 M |
| | | Proceeds Hedge | 1,000 M | |
| Spread | | Invoice | | |
| 11) G-Spr | 101.6 Street Convention 1.3300000 | Face | 1,000 M | |
| 12) I-Sprd | 74.5 Equiv 1 /Yr 1.3344223 | Principal | 995,720.00 | |
| Basis | N.A. Mmkt(Act/ 360) | Accrued (136 Days) | 4,250.00 | |
| 14) Z-Sprd | 77.3 Current Yield 1.129835 | Total (USD) | 999,970.00 | |
| 15) ASW | 74.3 | | | |
| 16) OAS | 104.4 | | | |
| TED | -75.8 | | | |

Credit Risk

- **Credit Spread Risk vs. Duration**
 - Credit/OAS duration measures
 - Bullet Securities: Credit Duration = Interest Rate Duration
 - Callable Securities: Credit Duration ~ Interest Rate Effective Duration
 - Floating Rate Securities: Credit Duration is substantial different than Interest Rate Duration

Floating Rate Example: GE Float 9/15/14

DES GEN ELEC CAP CRP GEFloat 09/15/14 97.622/97.622 Corp TRAC DES

GE Float 09/15/14 Corp 99) Feedback Page 1/11 Description: Bond

94) Notes (NEW) 95) Buy 96) Sell 97) Settings

21) Bond Description 22) Issuer Description

| | | |
|-------------------|------------------------------------|---------------------|
| Pages | Issuer Information | Identifiers |
| 1) Bond Info | Name GENERAL ELEC CAP CORP | CUSIP 36962GK94 |
| 2) Addtl Info | Type Diversified Finan Serv | ISIN US36962GK948 |
| 3) Covenants | | BB Number ED6155607 |
| 4) Guarantors | Security Information | Bond Ratings |
| 5) Bond Ratings | Mkt of Issue Global | S&P AA+ |
| 6) Identifiers | Country US Currency USD | Moody's Aa2 |
| 7) Exchanges | Rank Sr Unsecured Series MTNA | Composite AA |
| 8) Inv Parties | Coupon 0.80625 Type Floating | Fitch NA |
| 9) Fees, Restrict | Formula QUARTLY US LIBOR +26.00000 | |
| 10) Schedules | Day Cnt ACT/360 Iss Price 100.7080 | |
| 11) Coupons | Maturity 09/15/2014 | |

Quick Links

32) ALLQ Pricing

33) QRD Quote Recap

34) TDH Trade Hist

35) CACS Corp Action

36) CF Prospectus

37) CN Sec News

38) HDS Holders

66) Send Bond

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 SN 140603 PST

DES GEN ELEC CAP CRP GEFloat 09/15/14 97.622/97.622 Corp TRAC DES

GE Float 09/15/14 Corp 99) Feedback Page 11/11 Description: Bond

94) Notes (NEW) 95) Buy 96) Sell 97) Settings

21) Bond Description 22) Issuer Description

Pages

1) Bond Info

2) Addtl Info

3) Covenants

4) Guarantors

5) Bond Ratings

6) Identifiers

7) Exchanges

8) Inv Parties

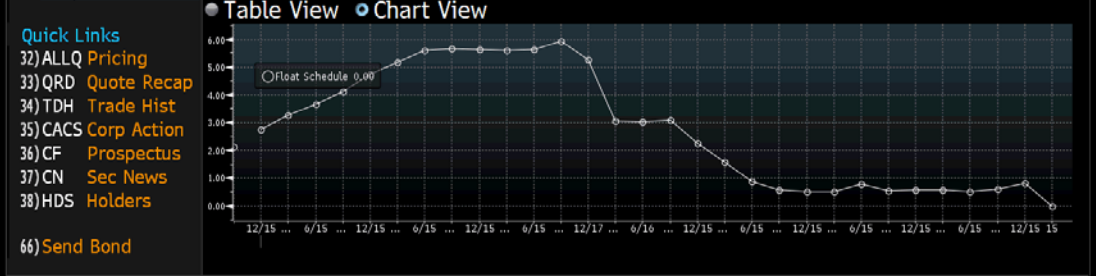
9) Fees, Restrict

10) Schedules

11) Coupons

51) Coupons

| | | | |
|-----------------|-------------|------------------|--------------------|
| Benchmark | US0003M | Benchmark Freq | QUARTLY |
| Fix Frequency | Quarterly | Next Coupon Date | 03/15/2012 |
| Paying Agent | | Prev Coupon Date | 12/15/2011 |
| Pay Calendars | US EN | Cap | Floor |
| Refix Calendars | EN | Return | +26 |
| First Irreg Cpn | Short First | Current Coupon | .80625 |
| Last Irreg Cpn | Normal | Cpn Conv Mod-Adj | Lockout |
| | | | Cpn Freq Quarterly |



Measuring Credit Risks of a Floating Rate Bond

<HELP> for explanation. Corp **YAS**

GE Float 09/15/14 Corp 90) Feedback Yield and Spread Analysis

97.622/97.622 1.706/1.706 TRAC @ 07:47 95) Buy 96) Sell 97) Settings

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom

GE 0 9/15/14 (36962GK94)

| <p>Price 97.622000 Settle 02/15/12</p> <p>DM (bp) 120.0151000 to Wst</p> <p>Yield 1.7061510</p> <p>Workout 09/15/14 @ 100.00</p> | <p>Floater Coupon History</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Date</th> <th>Rate</th> </tr> </thead> <tbody> <tr> <td>12/15/11</td> <td>0.80625</td> </tr> <tr> <td>03/15/12</td> <td></td> </tr> </tbody> </table> | Date | Rate | 12/15/11 | 0.80625 | 03/15/12 | |
|--|---|------|------|----------|---------|----------|--|
| Date | Rate | | | | | | |
| 12/15/11 | 0.80625 | | | | | | |
| 03/15/12 | | | | | | | |

| <p>Floater Information</p> <p>Benchmark US0003M Assumed Rate 0.506</p> <p>Quoted Margin 26.00 Coupon 0.80625</p> <p>Next Pay 03/15/12 Coupon Freq 4</p> <p>Index to 03/15/12 Refix Freq 4</p> <p>OAS 0.24850</p> | <p>Risk</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>To 03/15/12</th> <th>OAS</th> </tr> </thead> <tbody> <tr> <td>Mod Duration</td> <td>0.079</td> <td>2.531</td> </tr> <tr> <td>Risk</td> <td>0.077</td> <td>2.474</td> </tr> <tr> <td>Convexity</td> <td>0.000124</td> <td>0.077054</td> </tr> <tr> <td>DV 01 on 1MM</td> <td>8</td> <td>247</td> </tr> </tbody> </table> | | To 03/15/12 | OAS | Mod Duration | 0.079 | 2.531 | Risk | 0.077 | 2.474 | Convexity | 0.000124 | 0.077054 | DV 01 on 1MM | 8 | 247 |
|--|---|----------|-------------|-----|--------------|-------|-------|------|-------|-------|-----------|----------|----------|--|---|-----|
| | To 03/15/12 | OAS | | | | | | | | | | | | | | |
| Mod Duration | 0.079 | 2.531 | | | | | | | | | | | | | | |
| Risk | 0.077 | 2.474 | | | | | | | | | | | | | | |
| Convexity | 0.000124 | 0.077054 | | | | | | | | | | | | | | |
| DV 01 on 1MM | 8 | 247 | | | | | | | | | | | | | | |

| | |
|--|--|
| <p>OAS 122 1) YASN</p> <p>Option Premium N.A.</p> <p>Discount Curve S23 USD Swaps(30/360,S/A)</p> <p>Forward Curve S23 USD Swaps(30/360,S/A)</p> <p>Curve Shift (bp) 0</p> <p>Vol Cube VCU</p> <p>Yield With Curve 09/15/14 1.7821</p> | <p>Invoice</p> <p>Face 1,000 M</p> <p>Principal 976,220.00</p> <p>Accrued (62 Days) 1,388.54</p> <p>Total (USD) 977,608.54</p> |
|--|--|

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2012 Bloomberg Finance L.P.
 SN 140603 PST GMT-8:00 G357-2652-0 10-Feb-2012 08:13:27

Example Quantifying Risk of Widening Credit Spreads

YA Corp YA

GE Float 09/15/14 Corp 90) Feedback Yield and Spread Analysis

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom

GE 0 9/15/14 (36962GK94) Floater Coupon History

| Price | Settle | Date | Rate |
|---------------------------|----------|----------|---------|
| 100.000000 | 02/15/12 | 12/15/11 | 0.80625 |
| DM (bp) 26.9239145 | to Wst | 03/15/12 | |
| Yield 0.7752391 | | | |
| Workout 09/15/14 @ 100.00 | | | |

Floater Information

| | | | | | |
|----------------|----------|--------------|---------|----------------|----------|
| Benchmark | US0003M | Assumed Rate | 0.506 | To 03/15/12 | OAS |
| Quoted Margin | 26.00 | Coupon | 0.80625 | Mod Duration | 2.543 |
| Next Pay | 03/15/12 | Coupon Freq | 4 | Risk | 2.547 |
| Index to | 03/15/12 | Refix Freq | 4 | Convexity | 0.000130 |
| OAS | 27.3 | Refix Freq | 0.24850 | DV [01] on 1MM | 8 |
| Option Premium | N.A. | | | | |

Invoice

| | |
|-------------------|------------|
| Face | 1,000M |
| Principal | 974,710.00 |
| Accrued (62 Days) | 1,388.54 |
| Total (USD) | 976,098.54 |

Yield With Curve 09/15/14 0.8413

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1211
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2012
SN 140603 PST GMT-8:00 6357-26

YA Corp YA

GE Float 09/15/14 Corp 90) Feedback Yield and Spread Analysis

1) Yield & Spread 2) Price Discovery 3) Descriptive 4) Graphs 5) Custom

GE 0 9/15/14 (36962GK94) Floater Coupon History

| Price | Settle | Date | Rate |
|---------------------------|----------|----------|---------|
| 97.471000 | 02/15/12 | 12/15/11 | 0.80625 |
| DM (bp) 126.0000000 | to Wst | 03/15/12 | |
| Yield 1.7659999 | | | |
| Workout 09/15/14 @ 100.00 | | | |

Floater Information

| | | | | | |
|----------------|----------|--------------|---------|----------------|----------|
| Benchmark | US0003M | Assumed Rate | 0.506 | To 03/15/12 | OAS |
| Quoted Margin | 26.00 | Coupon | 0.80625 | Mod Duration | 2.530 |
| Next Pay | 03/15/12 | Coupon Freq | 4 | Risk | 2.470 |
| Index to | 03/15/12 | Refix Freq | 4 | Convexity | 0.000123 |
| OAS | 128.1 | Refix Freq | 0.24850 | DV [01] on 1MM | 8 |
| Option Premium | N.A. | | | | |

Invoice

| | |
|-------------------|------------|
| Face | 1,000M |
| Principal | 974,710.00 |
| Accrued (62 Days) | 1,388.54 |
| Total (USD) | 976,098.54 |

Yield With Curve 09/15/14 1.8408

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1211 Hong Kong 852 2977 6000
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2012 Bloomberg Finance L.P.
SN 140603 PST GMT-8:00 6357-2652-0 10-Feb-2012 08:29:53



Summary: It's a Risky World!

- Investing is Inherently Risky**
- Effective Investment Management can be defined as Effective Risk Management**
- Identifying and Quantifying risk is critical for long term effective portfolio management**
- Duration and the Risk of Portfolio will change with Interest Rate Shifts**
- Credit Risk involves more than simple default risk**



Tony Garcia, CFA

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- tgarcia@wellsfargo.com

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