CALLABLE BONDS: FRIEND AND FOE
GIOA INVESTMENT CONFERENCE 2017

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William M. Quinn, CFA, FTN Financial
GSE Callables

- Market Update
- Quick Refresh
- Why? and Why Not?
- Friend AND Foe
- Additional Features and Uses
- Recommendations
Primary Market Activity

- 2012-2016: 23,000+ Issues totaling $1.6T
- 78% ($1.25T) 1-5yr maturities
- More than 40 Active Underwriters

Source: Bloomberg
**US Agency Issuance by Type**

- **2015**
  - Callables: 50%
  - Floaters: 25%
  - Bullets: 25%

- **2016**
  - Callables: 46%
  - Floaters: 32%
  - Bullets: 22%

**US Agency Issuance by Maturity**

- **2015**
  - 1.5-4.9 Years: 67%
  - 5-9.5 Years: 9%
  - >= 10 Years: 4%
  - 1-1.4 Years: 20%

- **2016**
  - 1.5-4.9 Years: 64%
  - 5-9.5 Years: 15%
  - >= 10 Years: 3%
  - 1-1.4 Years: 18%

Source: FTN Financial-Agency Annual
US Agency Issuance by Call Type

2015
- One Time: 31%
- Discrete: 33%
- Step-ups: 20%
- Continuous: 16%

2016
- One Time: 12%
- Discrete: 44%
- Step-ups: 17%
- Continuous: 27%

US Agency Issuance by First Call Date

2015
- Three Month: 52%
- Six Month: 29%
- One Year: 17%
- Two Year: 2%

2016
- Three Month: 40%
- Six Month: 36%
- One Year: 20%
- Two Year: 4%

Source: FTN Financial-Agency Annual
Agency Issuance by Month (2016)

Last price reported as daily closing yield. Source: Bloomberg
Agency Calls by Month (2016)

Last price reported as daily closing yield.  
Source: Bloomberg
Quick Refresh on Important Terms

- Duration/Effective Duration
- Convexity
- Expected Life
- Book Yield
- Total Return
Duration and Expected Life

- **Duration** is one measure of a fixed income security’s interest rate risk. It gives us a close approximation of how much a bond’s price will increase given small, uniform decreases in its yield, or how much it will decrease when its yield goes up.

- Bonds with prepayment options, like callables, are typically evaluated using their effective duration. Effective duration is an adjusted duration that reflects the probability that principal will be returned before its maturity date.

  - 5yr Non-Callable: approx 4.7
  - 5yr nc 1yr: approx 3.1

- **Expected Life** is the date in the future that market participants expect redemption of callable bonds using assumptions for the overall level of interest rates and market spreads.
Convexity

- As a bond’s price moves further and further away from par its duration will change. For non-callable bonds 5yrs to maturity and under, these changes are small giving them convexity values near zero.
  
  3yr approx 0.10  
  5yr approx 0.3

- A callable bond’s duration will drop (shorten) as its price moves above par, this is called negative convexity.
  
  3yr nc 3mo -3.7  
  5yr nc 1yr -1.7
Agency structures IMPACT on pricing
Optionality (negative convexity) impacts interest rate risk

<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>Ticker</th>
<th>Cpn</th>
<th>Maturity</th>
<th>Call Date</th>
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<th>Convex</th>
<th>Yield</th>
<th>WAL</th>
<th>Price Vol</th>
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<td>5-Yr Bullet</td>
<td>FHLB</td>
<td>2.250</td>
<td>3/11/2022</td>
<td>NA</td>
<td>4.7</td>
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<td>2.15</td>
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<td>5.0</td>
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<tr>
<td>2</td>
<td>5NC1 Callable</td>
<td>FHLMC</td>
<td>2.300</td>
<td>3/29/2022</td>
<td>3/29/2018</td>
<td>3.1</td>
<td>-1.7</td>
<td>2.30</td>
<td>5.0</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Source: FTN Financial, Yield Book
Book Yield vs. Total Return

- **Book Yield** is simply the yield rate that corresponds to the price that was paid for a specific bond or portfolio of bonds. Fixed rate bonds purchased at par have book yields equal to their coupon rate.

- **Total Return** considers a security’s cash flows as well as its change in price over some period of time. These values are usually expressed as an annualized rate.
Why Issue Callables?

“Callable debt plays an important role in helping Fannie Mae manage the interest-rate risk inherent in the mortgage assets it owns. Generally, mortgage loans tend to prepay more quickly in periods of lower interest rate levels and prepay more slowly in periods of higher interest rate levels. Callable debt provides Fannie Mae with flexibility to ensure that the durations of our liabilities and of our mortgage assets are closely matched. By issuing callable debt, Fannie Mae is effectively buying a call option from investors and compensating these investors with additional yield above comparable maturity bullet securities.”

Source: www.fanniemae.com
Why Buy Callables?

- Yield Enhancement without Additional Credit Risk
- Yield Enhancement without Additional Interest Rate Risk
- Large, Liquid, and Active Markets
- Opportunities for Customization to Meet Specific Investor Objectives
Credit Quality

- Callables are Issued Under the GSE’s Senior Debt Programs
  - Moody’s: Aaa
  - S&P: AA+
  - Fitch: AAA
## Interest Rate Risk

<table>
<thead>
<tr>
<th>Duration</th>
<th>Type</th>
<th>Effective Duration</th>
<th>Book Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>5yr “Bullet”</td>
<td></td>
<td>4.7</td>
<td>2.15%</td>
</tr>
<tr>
<td>5yr nc 1yr Callable</td>
<td></td>
<td>3.1</td>
<td>2.30%</td>
</tr>
<tr>
<td>3yr “Bullet”</td>
<td></td>
<td>2.8</td>
<td>1.71%</td>
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<tr>
<td>3yr nc 6mo Callable</td>
<td></td>
<td>2.0</td>
<td>1.85%</td>
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</table>
Callable Marketplace

- Participants
  - State and Local Governments
  - Broker/Dealers
  - Domestic Depository Institutions
  - Investment Managers
  - Insurance Companies, Pension Funds
  - Corporate Treasury Accounts
  - Foreign Banks/Governments

- Daily Trading Volumes = $500mm - $1b+

Sources: Bloomberg, TRACE
Custom-Made

- “Reverse Inquiry” Allows Investors to Tailor their Investments to Meet their Unique Portfolio Needs
  - Maturity/Call/Coupon Dates
  - Call Types (European/Bermudan/American etc.)
  - Discount or Premium at Issuance
  - Variable Coupons (Fixed, Floating, Stepping etc.)
Customizable Features

- **Lockout Period and Call Frequency**
  - Longer Lockout → More Call Protection
  - Shorter Lockout → Higher Coupon
  - Fewer Call Options → More Call Protection
  - More Call Options → Higher Coupon

<table>
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<tr>
<th></th>
<th>5yr Bullet</th>
<th>5yr nc 2yr</th>
<th>5yr nc 1yr</th>
<th>5yr nc 1yr quarterly</th>
<th>5yr nc 6mo quarterly</th>
<th>5yr nc 3mo continuous</th>
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<tr>
<td>no call</td>
<td>2.10%</td>
<td>2.15%</td>
<td>2.20%</td>
<td>2.30%</td>
<td>2.35%</td>
<td>2.40%</td>
</tr>
</tbody>
</table>

*Source: FTN Financial*
Why not Callables?

- **Prepayment Risk**
  - All Principal Returned when Favorable for Issuer, Forcing Re-investment at Lower Rates

- **Limited Market Price Appreciation**
  - Callable Bonds Exhibit Negative Convexity
    - Their market values rise less than bullets of similar maturities when rates are falling.

- **Spread Risk**
  - Widening callable spreads will decrease their market values vs. their comparable bullets
Rising Interest Rates

- Options are less likely to be exercised, extending the “expected life” of callable bond

- Increased probability that callable will remain outstanding to the maturity date

- “Friendly” callable has provided more cash flow that can be re-invested at better rates or otherwise deployed as investors’ needs dictate
Falling Interest Rates

- Call options are likely to be exercised, shortening the “expected life” of callable bond

- Decreased Probability that callable will remain outstanding to maturity date

- Callable bond returns principal early, forcing investor to re-invest at lower rates

- “Friendly” bullet continues to pay stated coupon until maturity date, while increasing in market value
Valuation

- Spread vs. Matched Maturity Bullet
- Spread vs. Matched Duration Bullet

5yr nc 1yr vs 5yr bullet +15bps
5yr nc 1yr vs 3yr bullet +60bps

5yr nc 1yr Effective Duration ~3.1
3yr bullet Effective Duration ~2.7
5yr nc 1yr vs 3yr bullet

Mean: 72
Max: 103
Min: 40

Source: FTN Financial
## Sample Structures

<table>
<thead>
<tr>
<th>#</th>
<th>Cusip</th>
<th>Type</th>
<th>Call Type</th>
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<td>5.0</td>
<td>5.0</td>
<td>-12.0</td>
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</table>

Sources: Yield Book, FTN Financial
Agency Market: Yield / Effective Duration Landscape

Higher yields in callables BUT more optionality

Sources: Yield Book, FTN Financial
Agency Market: "Base Case" Total Return Landscape

*Callables outperform relative to duration in unchanged environment due to additional carry*

Sources: Yield Book, FTN Financial
Agency Market: "+100" Total Return Landscape

Callables outperform (defensive) in rising rate environment due to shorter durations and bigger coupons

Sources: Yield Book, FTN Financial
Agency Market: "-100" Total Return Landscape

Bullets outperform in falling rate environment due to positive convexity & "roll-down"
For the Bearish Investor

- Premiums “Cushion Bonds”
- Step-Ups
Premiums “Cushion Bonds”

- Investor pays above Par for Callable with high likelihood of redemption. Yields to expected call dates exceed those of other short term investments.
- Above-market coupons provide Investor with protection if rates rise above their expectations.

Example:

5yr nc 1yr 1x 3.00%  Price: 101.733
  1.25% Yield to Call  (+25bps to 1yr Bullet)
  2.63% Yield to Maturity  (+40bps to 5nc1yr 1x at Par)
Step-Ups

- Investor accepts below-market starting coupon in return for higher coupons in later periods.

Example: 5yr nc 6mo Annual Step-Up

1.50% - 2.00% - 3.00% - 4.00% - 5.00%

6m Yield to Call: 1.50%  (+60bps to 6m bullet)
1yr Yield to Call: 1.50%  (+50bps to 1yr bullet)
2yr Yield to Call: 1.75%  (+35bps to 2yr callable)
3yr Yield to Call: 2.16%  (+36bps to 3yr callable)
Yield to Maturity: 3.05%  (+70bps to 5nc6m at Par)
Agency structures IMPACT on pricing

Optionality (negative convexity) impacts interest rate risk

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<th>#</th>
<th>Type</th>
<th>Ticker</th>
<th>Cpn</th>
<th>Maturity</th>
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<th>WAL +0</th>
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<td>1</td>
<td>5-Yr Bullet</td>
<td>FHLB 2.250</td>
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<td>NA</td>
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Source: FTN Financial, Yield Book
### Customization of Step-Ups

**Example:** 5yr nc 1yr Annual Step/Annual Call
1.80% - 2.40% - 2.80% - 3.10% - 3.30%

<table>
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<th>Coupons</th>
<th>LIBOR Rates</th>
<th>Spread</th>
<th>YTC/YTM</th>
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<td>1.43</td>
<td>37bps</td>
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<td>2.80%</td>
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<tr>
<td>3.10%</td>
<td>2.71</td>
<td>39bps</td>
<td>2.52%</td>
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<tr>
<td>3.30%</td>
<td>2.89</td>
<td>41bps</td>
<td>2.66%</td>
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+35bps over the 1yr LIBOR rate at each year
An Attractive Alternative in Rising Rates

Agency Market: "+100" Total Return Landscape

Callables outperform (defensive) in rising rate environment due to shorter durations and bigger coupons.
For the Bullish Investor

- Discounts:
  - Investor purchases lower coupon/longer duration callables at prices below Par and at yields that exceed matched maturity bullets.
  - Falling rates increase the likelihood of redemption at Par, where Investor would enjoy above-market returns.

Example:
5yr nc 1yr 1.75% Price: 97.88
  - 3.93% Yield to 1yr Call (+290bps to 1yr bullet)
  - 2.20% Yield to Maturity (+5bps to 5yr bullet)
CALLABLE BONDS: FRIEND AND FOE Q&A
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