Win Analytics LLC

From NIC to TIC to RAY: Calculating True Lifetime Cost of Capital for Municipal Borrowers

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Callable Premium Bonds

- What is a 5% 20-year maturity w/ 10-year call?
  - 20-year bond with in-the-money call?
  - 10-year bond with out-of-the-money put?
    - Bond Anticipation Bond?

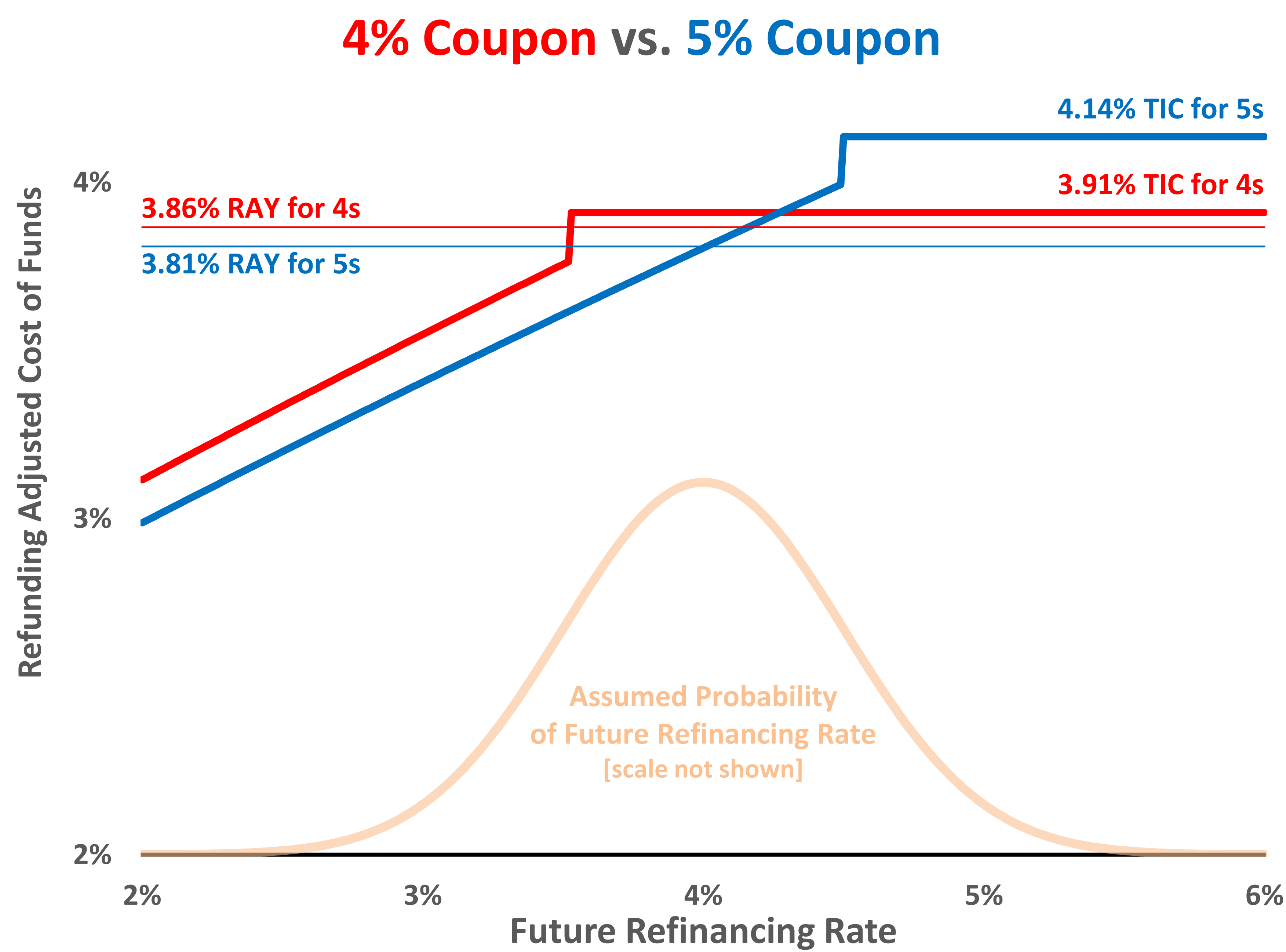
- Concerns
  - Issuer not paid for full debt schedule
  - Reasonable debt level requires refinancing
  - Market Opacity

Key Assumptions for the RAY Calculation

- Interest Rate Process
  - Reversion to Historical Average Yield Curve
  - Many Factors
- Structuring
  - Par Bonds
  - Matched Maturities for Bonds and Escrows

Using RAY for Competitive Bids

- Can public officials have confidence in calculations?
- Can bidders understand calculations?
- Will bidders be discouraged?
- Can calculations be processed & verified quickly?
- Is it better to be *optimal* or *robust*?


4% Coupon vs. 5% Coupon
4.14% TIC for 5s
3.91% TIC for 4s
3.86% RAY for 4s
3.81% RAY for 5s
4%
3%
2%
Refunding Adjusted Cost of Funds
Assumed Probability
of Future Refinancing Rate
[scale not shown]
2%
3%
4%
5%
6%
Future Refinancing Rate

Suggestion for Further Research

- How sensitive is RAY to key assumptions?
  - Target yield curve
  - Matched maturity structure

- Investigate other competitive bid procedures, such as:
  - Publish option values for various coupons & maturities before bid
  - Calculate adjusted TIC with preset option values