



A DIVISION OF ANDREW KALOTAY ASSOCIATES, INC.

The Interest Rate Risk of Municipal Bonds

February 24, 2014

**Municipal Bond
Buyers Conference**

Challenges of Managing Munis

Today's topic:

Gains and losses are subject to complex tax treatment

Taxes affect value, interest rate risk, and OAS of bonds
currently or *potentially* selling at a discount

Need analytics for hedging and scenario analysis

Standard systems ignore taxes when calculating effective duration (exception: Investortools)

Topic for another day:

Active managers could achieve superior *after-tax return* by strategic tax-loss harvesting

Every muni is a potential candidate

Need to determine resulting benefit and optimum time to sell

Tax Considerations of Discount Munis

Gain at maturity is taxable

Taxed as ordinary income if purchased below de minimis
(for individuals as high as 43.4%)

Above de minimis taxed as capital gains at 23.8%

Rates above include Obamacare surcharge

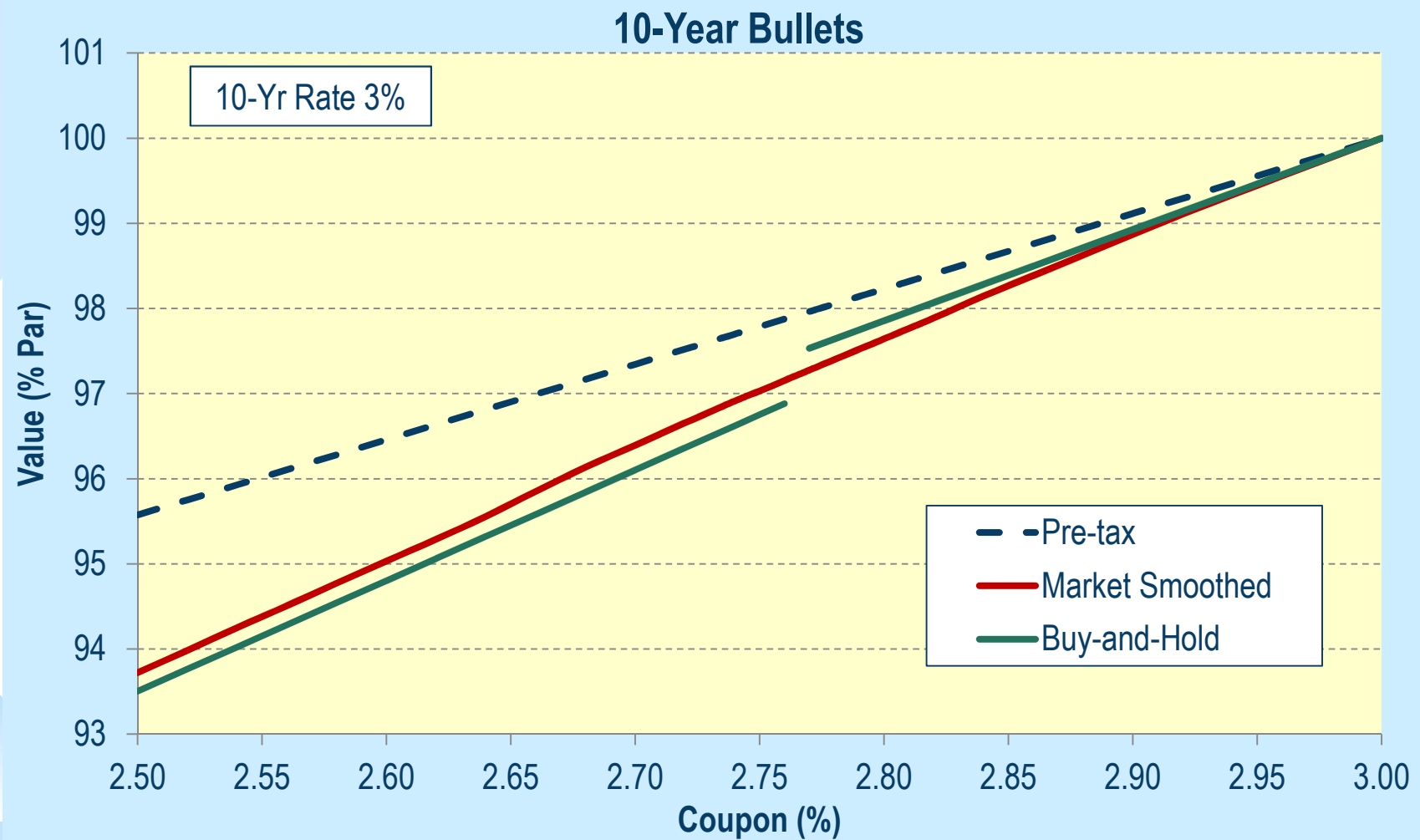
Tax on gain depresses market price (see next slide)

When rates rise performance based on mark-to-market suffers
unduly (corroborated by EMMA prices – see Ang, et. al.,
Journal of Finance, 2010)

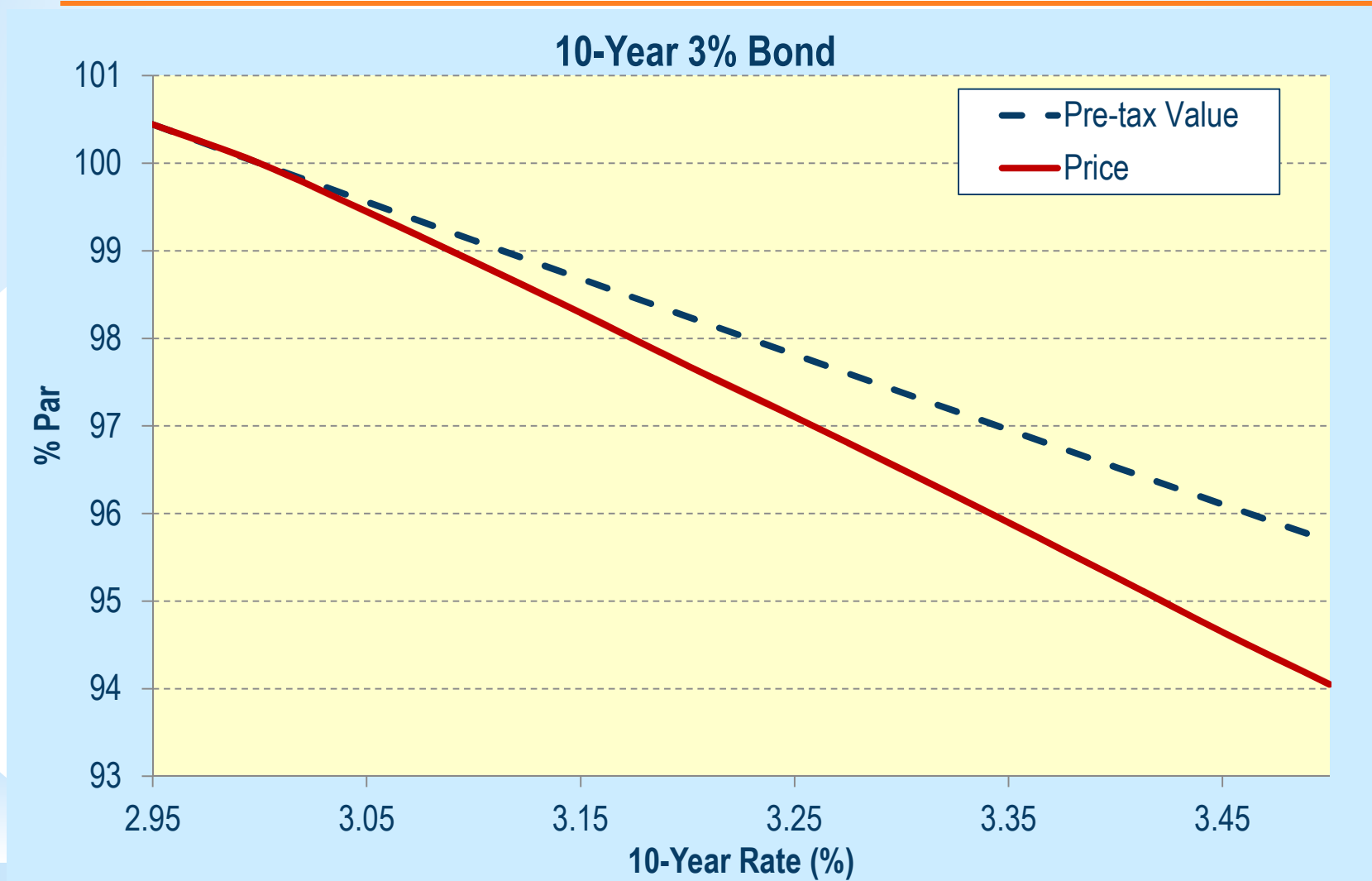
However 'hold value' is investor-specific

Tax paid by current holder depends on purchase date and price
Hold value can far exceed market price

Taxes Depress Prices of Discount Munis



When Rates Rise Price of Muni Declines More Than Predicted by Pre-Tax Analytics



When Rates Rise Prices Will Fall More Than Expected

Bond Buyer, March 18, 2013

Single-A Par Bonds	Rates Rise 100bps					
	Standard Approach		Kalotay Approach		Mistake by Standard Approach	
	Price	Yield	Price	Yield	Price	Yield (bps)
2-yr 0.90%	98.05	1.90	96.82	2.54	-1.23	64
5-yr 1.65%	95.35	2.65	92.84	3.21	-2.51	56
10-yr 3.00%	91.82	4.00	88.94	4.38	-2.88	38

Investors Punish Low Coupon Bonds

THE BOND BUYER

Wednesday, July 3, 2013

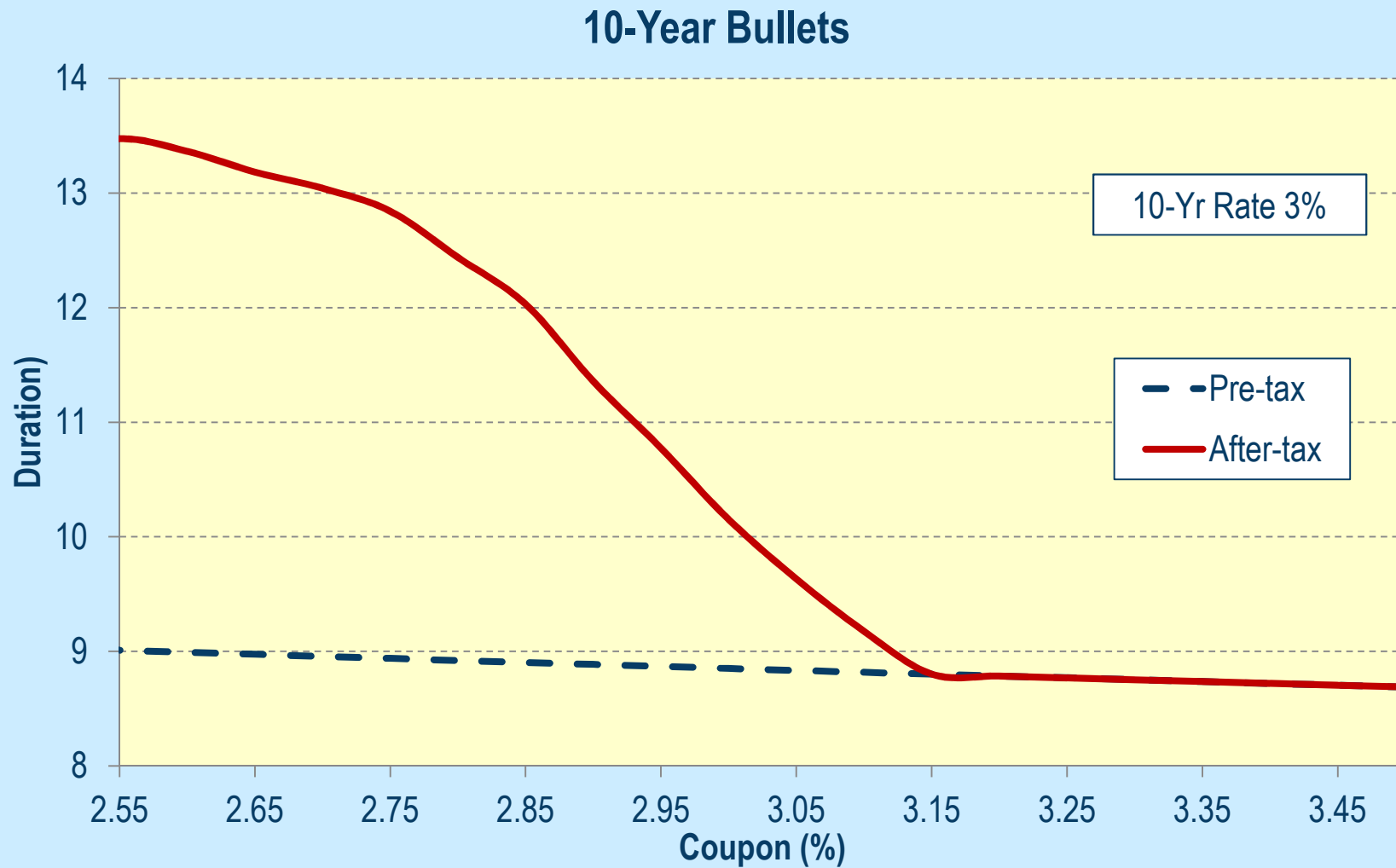
In Selloff, Higher Coupons Outperformed

Markets - Buy Side
by: James Ramage

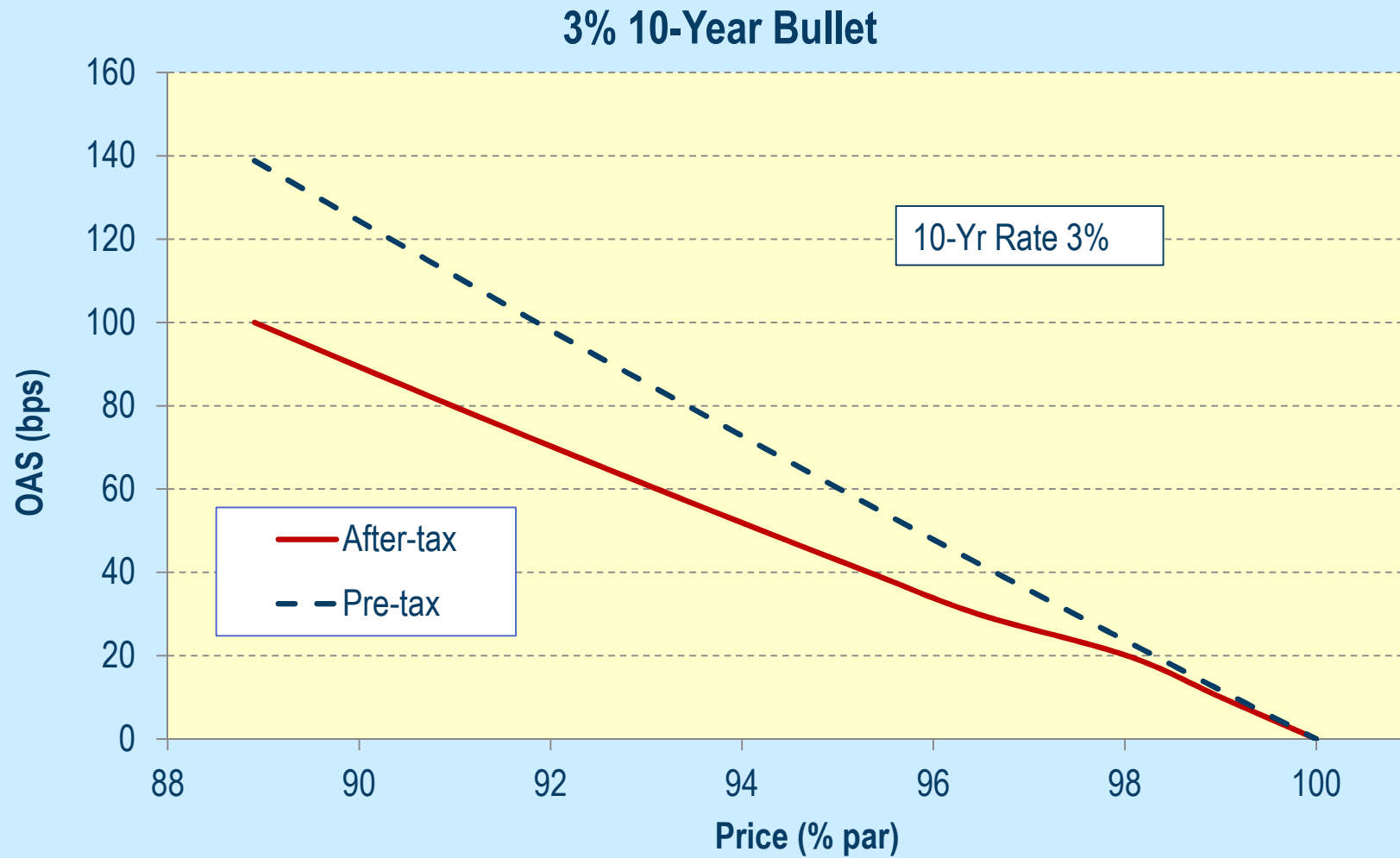
... buyers demanded an additional 40 basis points for 4% coupon bonds, industry analysts estimated, ... [and] ... they demanded an additional 80 basis points for 3% coupons [relative to 5% bonds].

Accordingly, while 5% coupons could be sold at these levels, buyers demanded an additional 40 basis points for 4% coupon bonds, industry analysts estimated. Following up, they demanded an additional 80 basis points for 3% coupons. 7

Ignoring Taxes → Effective Duration Underestimated



Ignoring Taxes → OAS Overestimated



Callable Bonds Get Hit by a Double Whammy When Rates Rise

Because likelihood of refunding is reduced, expected life of bond is extended and price declines accordingly

Taxables are no exception

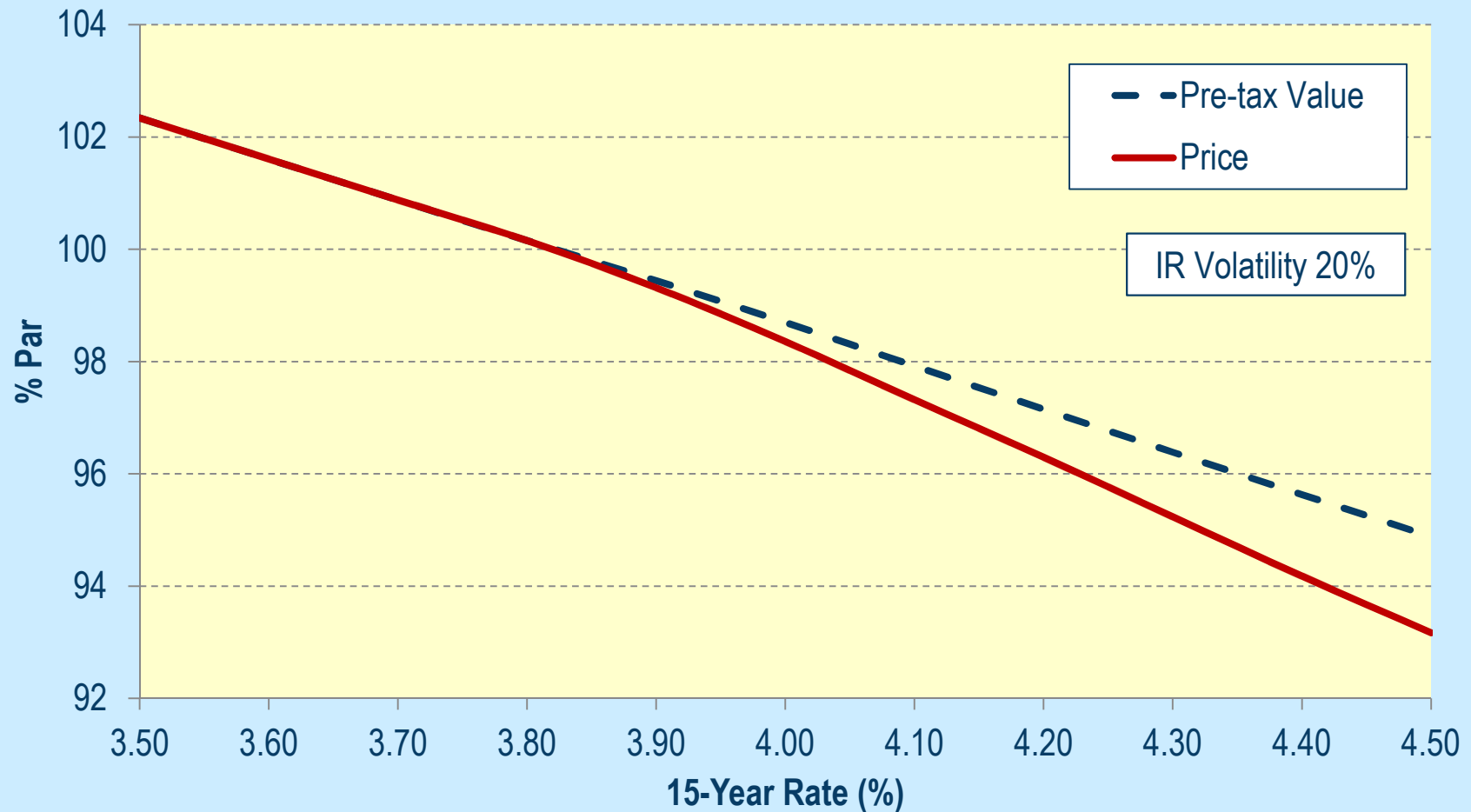
But steeply upward-sloping muni curve exacerbates impact

When price falls below par, taxes make matters worse

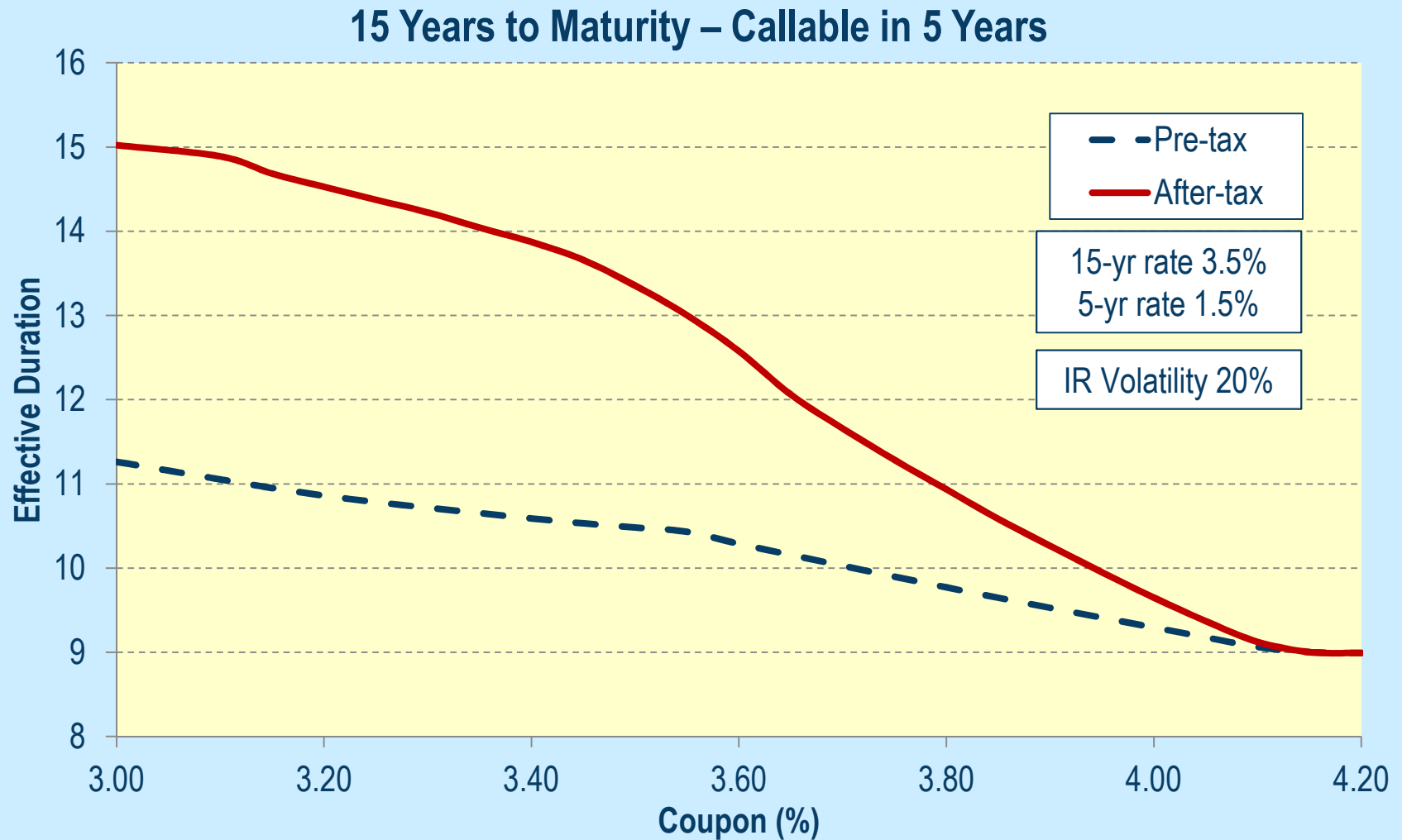
Unique to munis

Rising Rates Punish Discount Callable More Than Predicted by Pre-Tax Analytics

4% Bond 15 Years to Maturity – Callable in 5 Years



Rising Rates Exacerbate Duration Extension of Callable Munis: Longer Life → Lower Price → Higher Taxes



Analytical Approach: Overlay Taxes on Standard OAS Framework

Capital gains and losses are taxable

Treatment of callables and OID's is particularly challenging
Investors assumed to be in the top tax bracket

Key concepts: *tax-neutral 'fair' price* and OAS

Fair price equals the PV after-tax cashflows, *including tax payable at maturity*; determined iteratively

Tax-neutral OAS adjusts for both call option and taxes

Essential for managing interest rate risk and to enhance after-tax performance

Recap: Taxes Affect Effective Duration and OAS

Discount bonds are much more sensitive to interest rates than reported by standard analytics systems

Unpleasant surprise when rates rise

Wider than normal spread for a discount bond does not mean that bond is cheap

For rigorous rich-cheap analysis use tax-neutral OAS

References

“The Interest Rate Sensitivity of Tax-Exempt Bonds Under Tax-Neutral Valuation”
The Journal of Investment Management (First Quarter 2014)

“The Tax Option in Municipal Bonds”
The Journal of Portfolio Management (Winter 2014)

“How to Take a Tax Loss and Then Profit from Obamacare”
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The Bond Buyer, March 18, 2013.

“The Allure of 5% Bonds: Coupon Levitation Creates Magical Savings”
The Bond Buyer, January 27, 2012

“Taxes on Tax-Exempt Bonds,” Ang, A., V. Bhansali, and Y. Xing,
Journal of Finance 65 (No. 2), 565-60, 2010

See kalotay.com/research

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