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WHAT'S A MUNI PORTFOLIO MANAGER TO DO? *TAX-AFFECTED PRICE MOVEMENTS OF BONDS NEAR PAR*

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Kalotay Analytics

November 18, 2020



SPEAKERS & AGENDA



Tax Neutral Valuation

Andrew Kalotay, President

Kalotay Analytics



Practical Applications

Guy Davidson, Chief Investment Officer, Municipals

AllianceBernstein

RiskGrid
Technologies



Risk Analytics Technology

Raj Verma, President

RiskGrid Technologies



FLAGSHIP ANALYTICS

BondOAS

Fixed Rate Bonds
callable, putable,
sinker, amortizing,
pay-in-kind, and
step-up

MuniOAS

'Tax-neutral'
valuation (patent
pending) of tax-
exempt municipal
bonds, including
OIDs

MuniSignal

Tax-driven
opportunities for munis;
Optimal tax-loss
harvesting and tax-rate
arbitrage

Other Analytics

FloatVal

Floater and
Structured
Notes

TipsVal

Inflation-
Indexed
Bonds

CLEANMBS

Patented MBS
valuation and
prepayment
modeling

CurviLinear

Yield Curve
& Volatility
Estimation



GENESIS

THE BOND BUYER

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Managing duration extension and negative convexity near par

By Andy Kalotay, Ph.D., Guy Davidson October 20, 2020, 2:48 p.m. EDT 5 Min Read



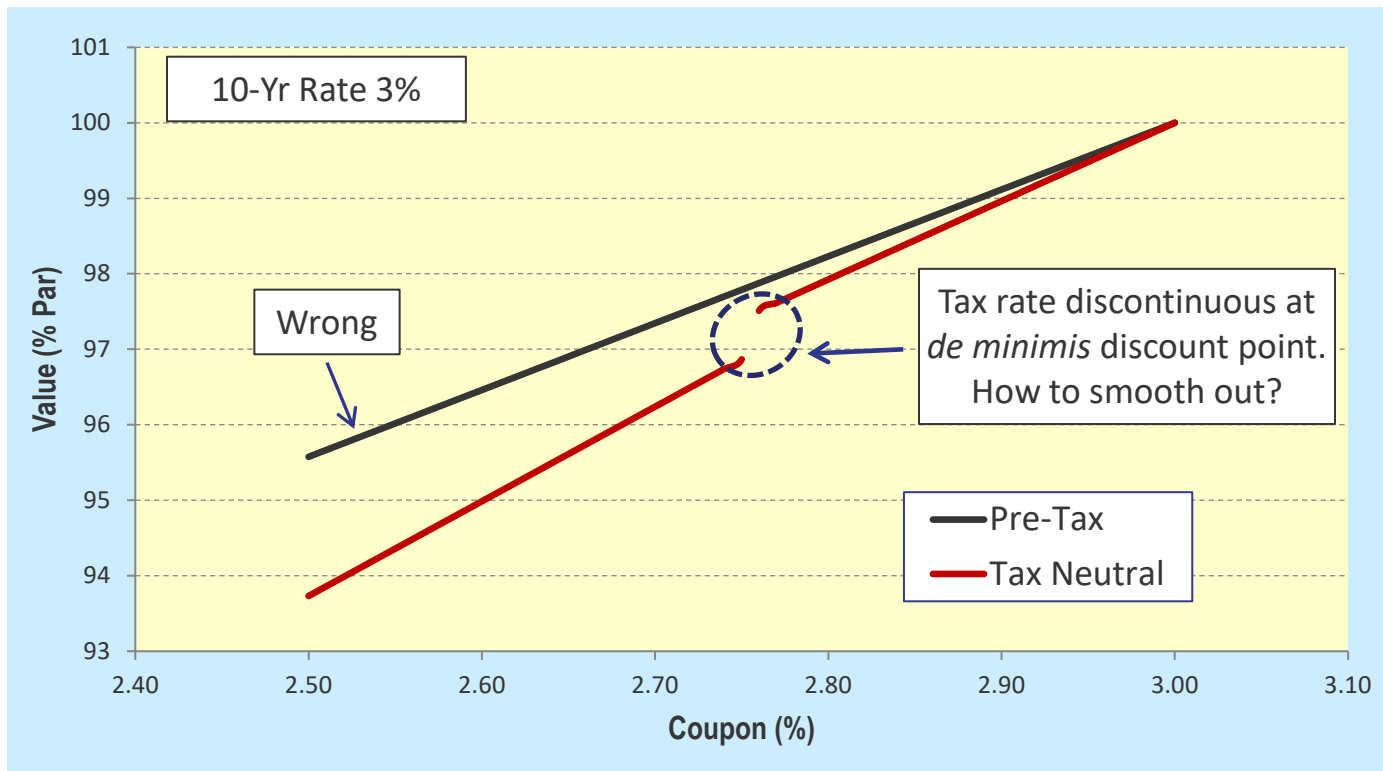
Theory, Andy Kalotay

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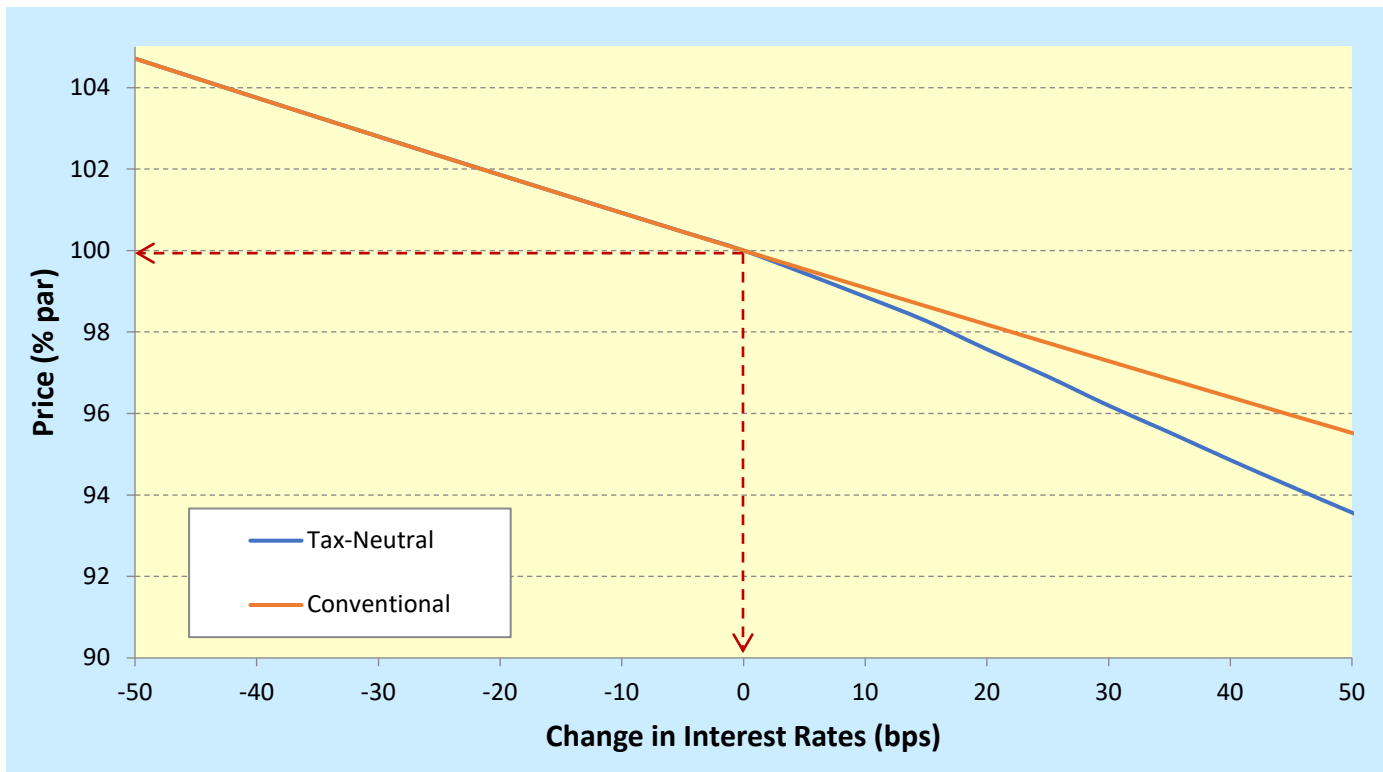
Tax at Maturity Depresses Price of Discount Munis

Tax-Neutral Value of 10NCL



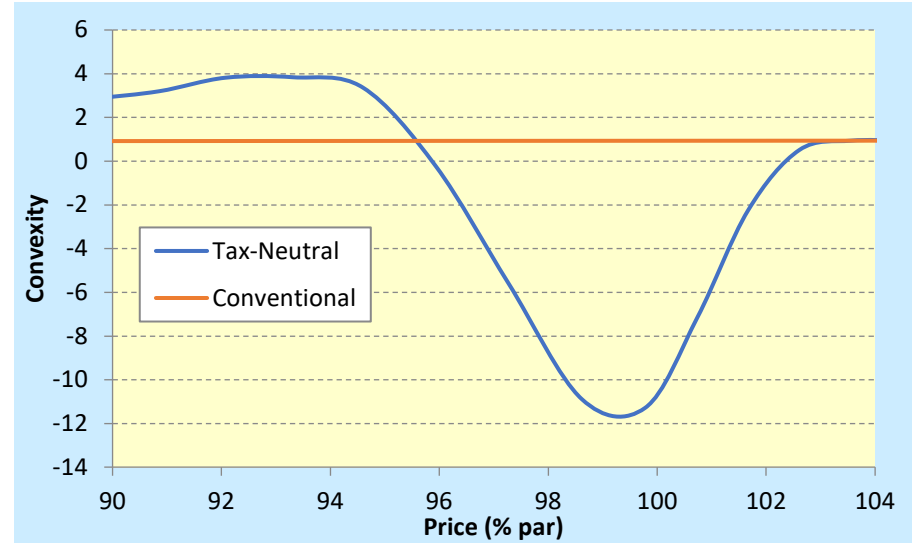
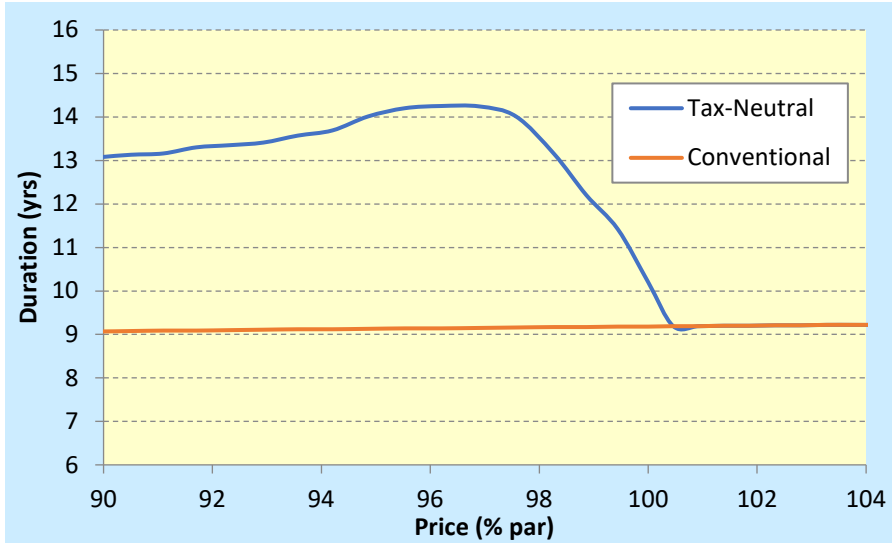
Tax at Maturity Depresses Price of Discount Munis

Tax-Neutral Value of 2% 10 NCL



Duration and Convexity of 2% 10-Year Muni

30 bps shift



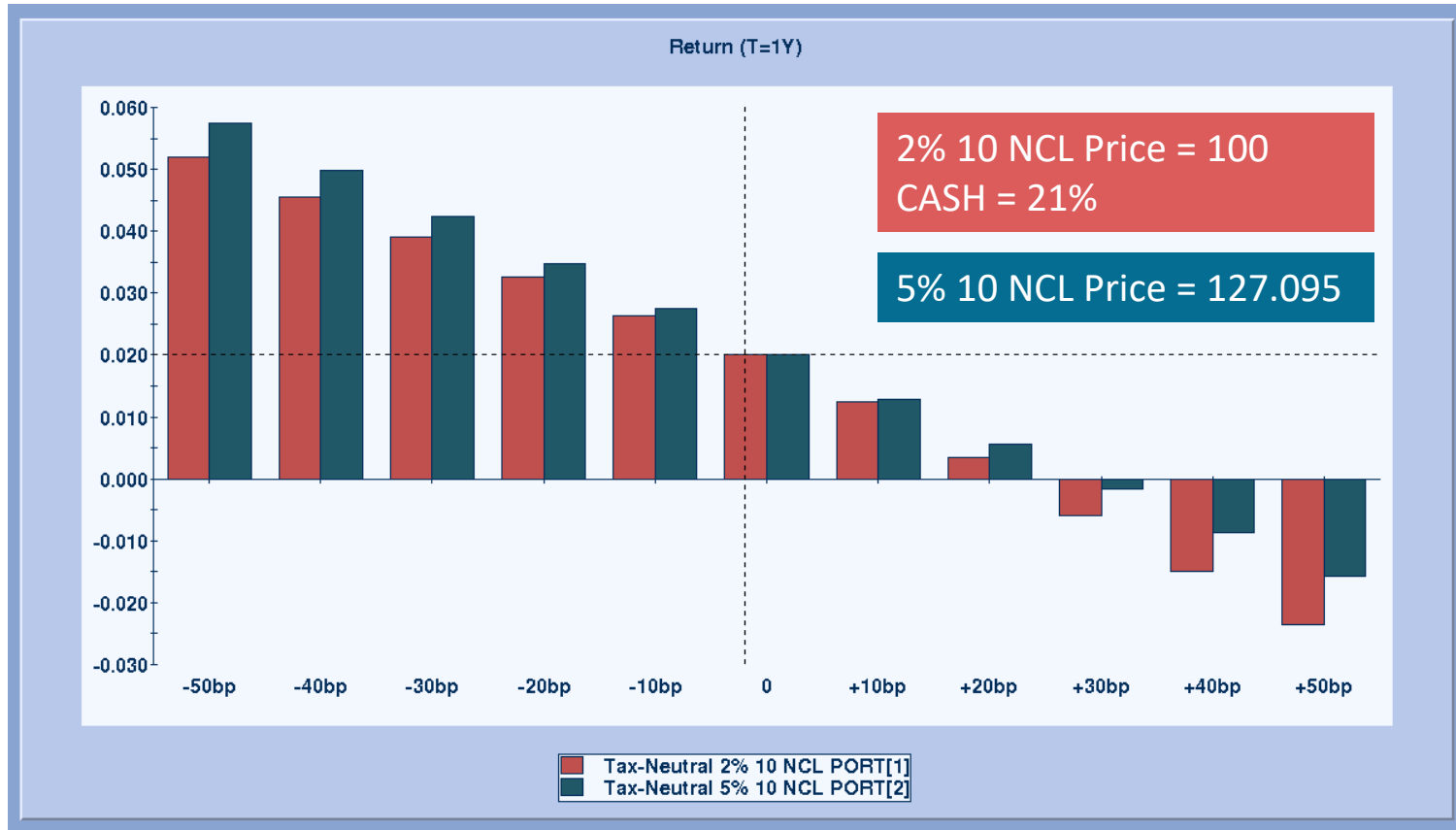
THEORY RECAP

- The prices of discount munis are depressed by the tax payable at maturity by the next buyer.
- Tax-neutral OAS extends conventional OAS to capture this tax effect.
- Conventional OAS underestimates the duration of discount munis, and fails to recognize that the convexity near par is negative.

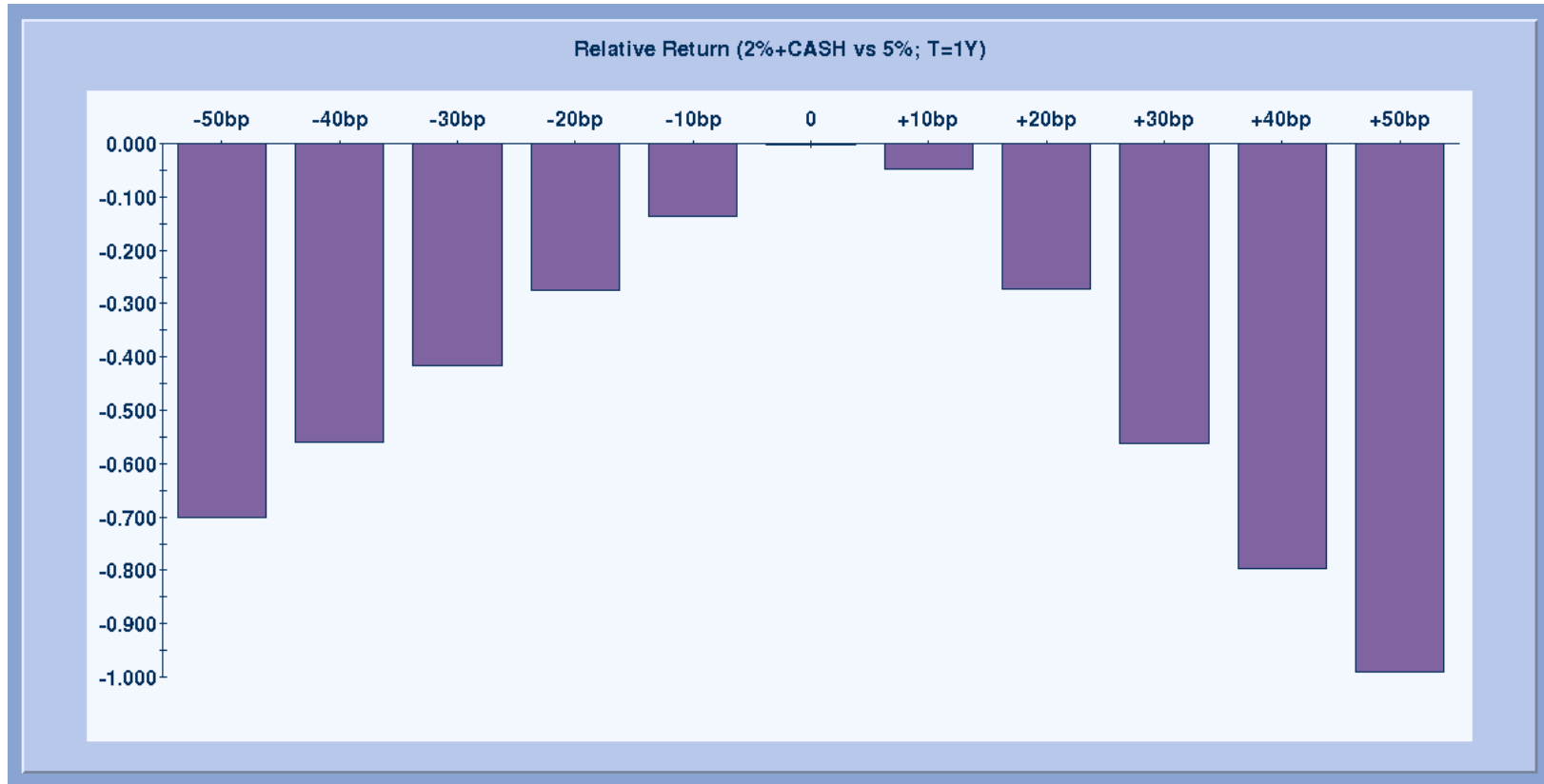
Real World Application, Guy Davidson



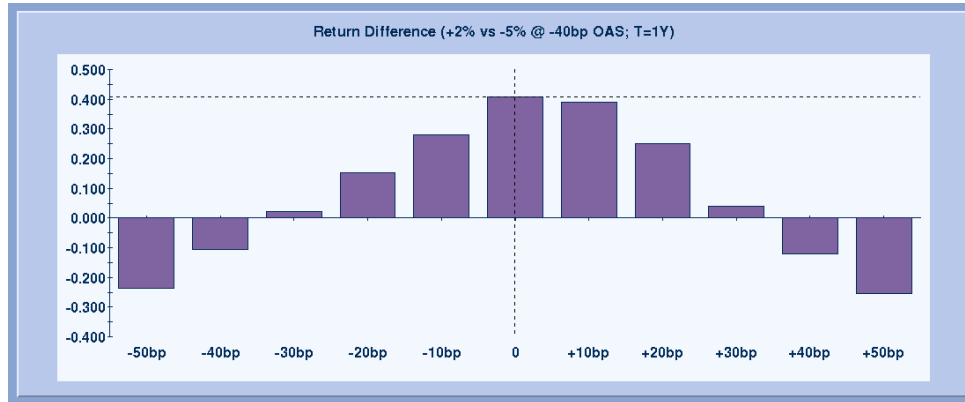
Par & Premium Portfolio Returns: 1 Year Horizon



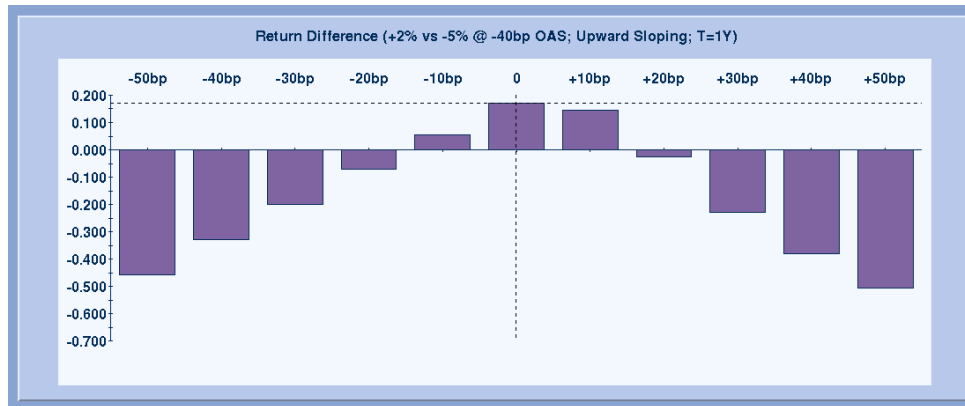
Par v Premium Return Difference: 1 Year Horizon



Return Diff: 1 Year Horizon with 40bp Par Yield Advantage



← Flat 2% Yield Curve



← Upward Sloping Yield Curve

REAL WORLD APPLICATION RECAP

- Par bonds should yield more than premium bonds with the same maturity to compensate investors for negative convexity
- The yield premium for a par bond will vary with 1) expected volatility, and 2) the slope of the yield curve

Implementation, Raj Verma



Kalotay Muni Analytics on RiskWatch

Algorithmics RiskWatch-4.6.1-0217-rhel-i686-5.2-gcc-4.1.2 - AB_OPT5 2020/06/26

File Edit View Options Stress Test Help

Instr Port Curve Model FX Scenario Stress Optim Template Recalc Graph

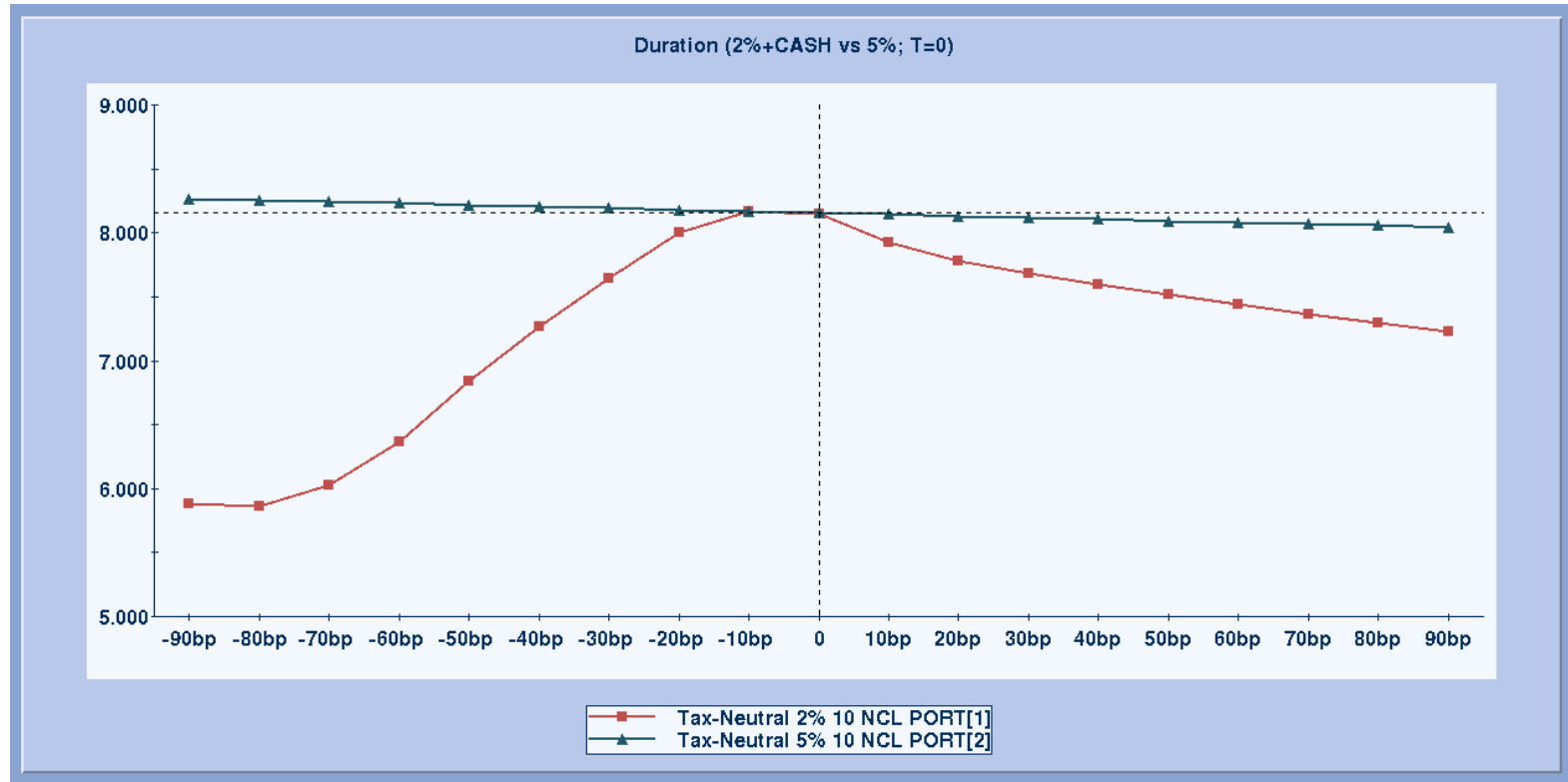
Tax-Neutral Shifts 3 - 0 (0.053)

Advance time

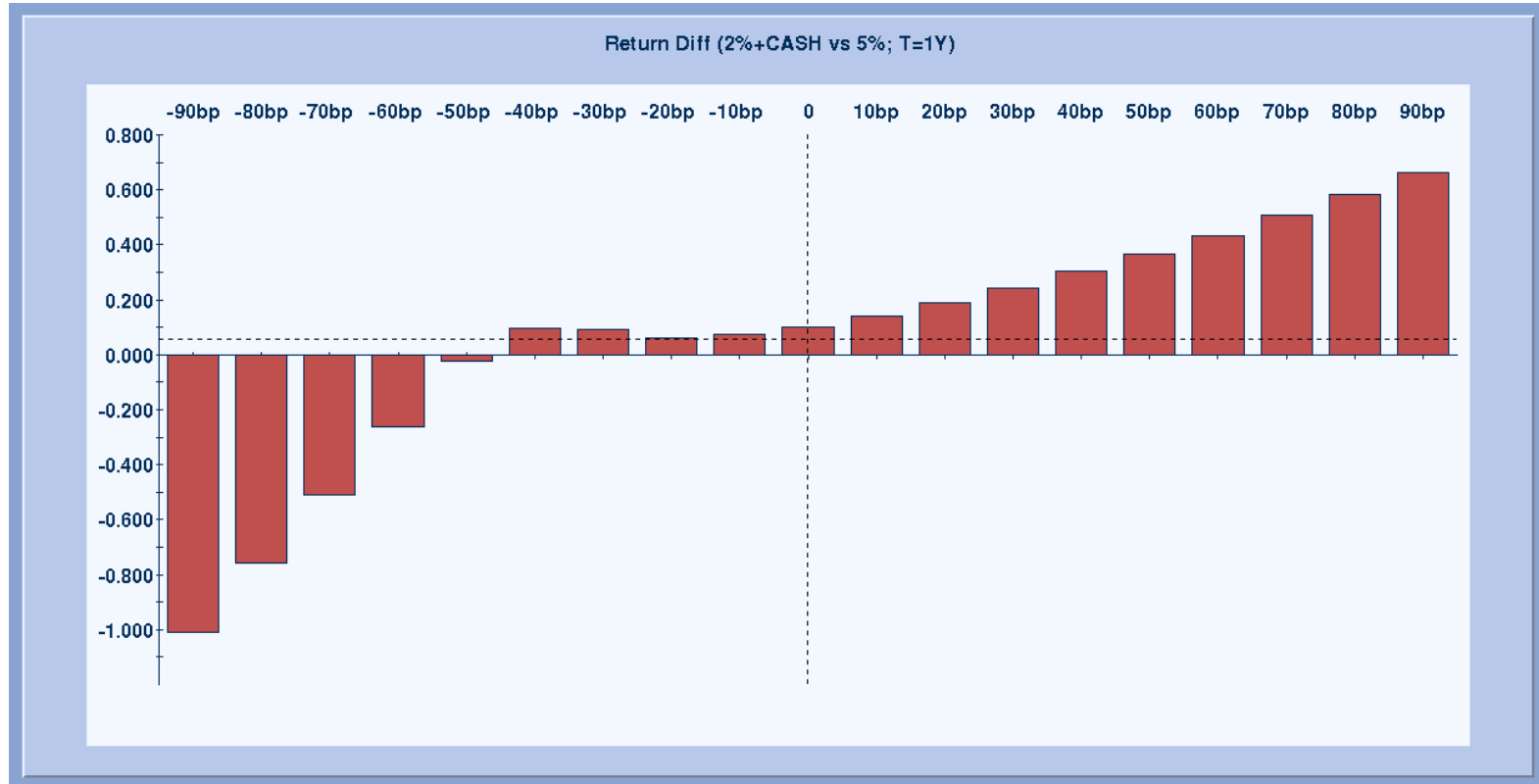
Previous time	Advance time	Reset time	2021/06/30 (369)	Mark time	2020/06/26 (0)	Start date	2020/06/26 (0)
Prev scenario	Next scenario	Reset scenario	0	Mark scenario	0	End date	2021/06/30 (369)

	Position	POS/Position Units	THEO/Value	THEO/Value@REL(s)	THEO/Adjusted Duration	THEO/Convexity	Cash Flow
	Tax-Neutral 2% 10 NCL[1]	0.640	60.311 USD	0.165 USD	11.810 T	345.430 T	0.640 USD
	USD-Cash[1]	0.000	0.000 USD	0.000 USD	0.000 T	0.000 T	0.000 USD
	Instrument[1]	0.640	60.311 USD	0.165 USD	11.810 T	345.430 T	0.640 USD
	USD[1]	37.569	37.569 USD	1.829 USD	0.000 T	0.000 T	0.000 USD
	Cash[1]	37.569	37.569 USD	1.829 USD	0.000 T	0.000 T	0.000 USD
	Tax-Neutral 2% 10 NCL PORT[1]	38.209	97.880 USD	1.994 USD	7.277 T	212.844 T	0.640 USD
	Tax-Neutral 5% 10 NCL[2]	0.761	94.113 USD	-1.929 USD	7.461 T	65.753 T	1.904 USD
	USD-Cash[2]	0.000	0.000 USD	0.000 USD	0.000 T	0.000 T	0.000 USD
	Instrument[2]	0.761	94.113 USD	-1.929 USD	7.461 T	65.753 T	1.904 USD
	USD[2]	3.822	3.822 USD	3.822 USD	0.000 T	0.000 T	0.000 USD
	Cash[2]	3.822	3.822 USD	3.822 USD	0.000 T	0.000 T	0.000 USD
	Tax-Neutral 5% 10 NCL PORT[2]	4.583	97.935 USD	1.893 USD	7.170 T	63.187 T	1.904 USD
	Tax-Neutral 2% 10 NCL PORT[3]	1.000	97.880 USD	1.994 USD	7.277 T	212.844 T	0.640 USD
	Tax-Neutral 5% 10 NCL PORT[3]	-1.000	-97.935 USD	-1.893 USD	7.170 T	63.187 T	-1.904 USD
	Instrument[3]	0.000	-0.054 USD	0.102 USD	-184.939 T	-268,725.296 T	-1.264 USD
	Cash[3]	0.000	0.000 USD	0.000 USD	0.000 T	0.000 T	0.000 USD
	Tax-Neutral 2v5 10 NCL[3]	0.000	-0.054 USD	0.102 USD	-184.939 T	-268,725.296 T	-1.264 USD

Duration of Discount vs Premium



Relative Returns Discount vs Premium at 1 Year



IMPLEMENTATION RECAP

- Although discount bonds are very sensitive to interest rate movements, convexity near par is negative.
- Risk simulations and scenario analysis that deploy tax neutral analytics are required to understand complex behavior of munis at par and discount levels.



Q & A





QUESTIONS & ANSWERS

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