

Bond Basics II

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3. Credit Risk

- Investors are paid a premium for assuming credit risk above the risk free rate

Corporate Bond Yield

- Interest Rate Risk: changes in risk free (treasury) interest rate
- Credit Risk: primarily refer to default risk

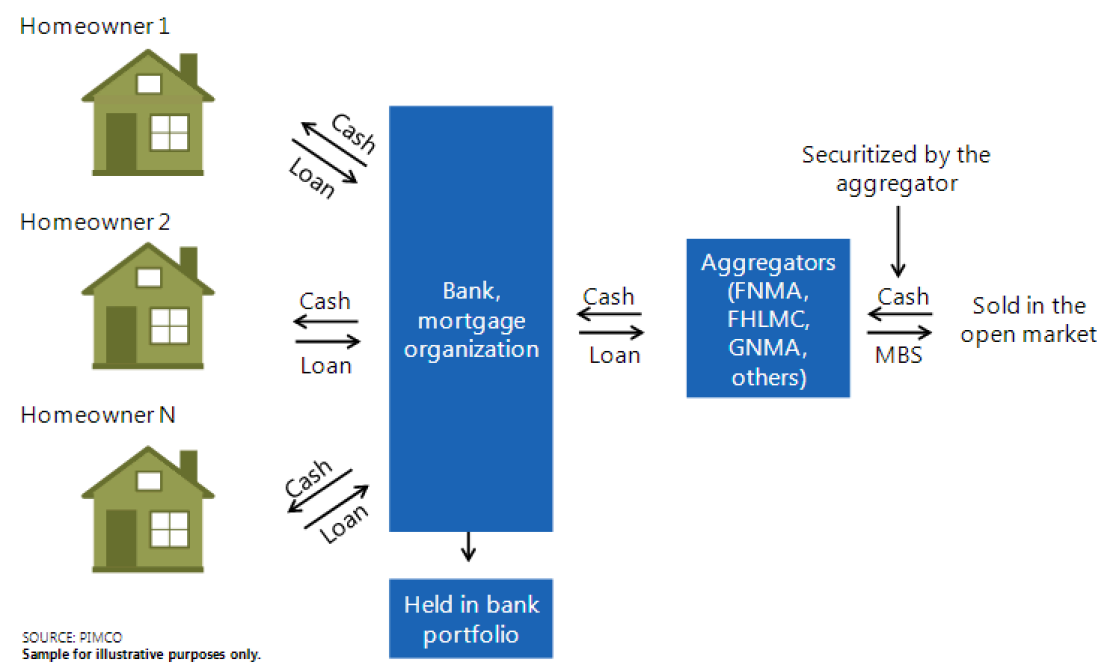
Z-spread

- Constant spread that makes the price of a security equal to the present value of its cashflow when added to the yield at each point on the spot Treasury curve
- Z-spread is what we are earning, so given same risk level, choose security with higher z-spread

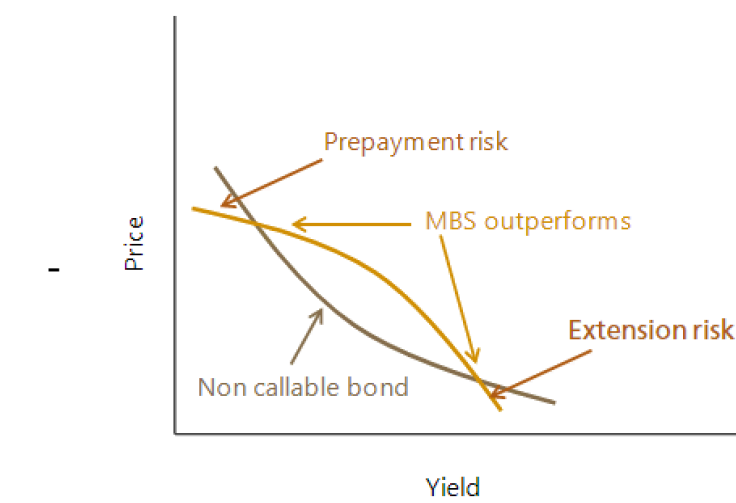
OAS (Option adjusted spread)

- Takes z spread and takes account into account embedded options

Mortgage-backed Security (MBS)



- **Prepayment risk**: in a falling rate environment, because of prepayment embedded option, mortgages are re-financed, shortening duration of MBS securities and capping price appreciation
- **Extension risk**: in rising rate environment, prepayments tend to decline, causing duration of MBS to increase. This can aggravate price loss as bonds become more sensitive to rising rates

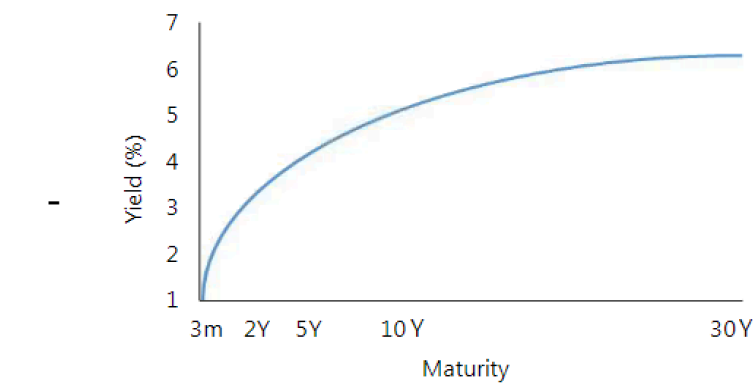


Summary

Sector / instrument	Primary risks	Performs best	Performs worst
Treasury / government	Interest rate risk	Contracting economy; falling interest rates	Expanding economy; rising interest rates
U.S. mortgage-backed securities	Reinvestment risk	Low volatility environment	High volatility environment
Corporate securities	Credit risk	Economic expansion	Economic contraction

4. Yield Curve

- Market yields against time of maturity



- Positive/Upward sloping yield curve:
 - o Expectations for economic expansion and inflation
- Inverted yield curve:
 - o Expectations for economic contraction and lower inflation

Yield curve shifts

- Curve steepens: longer rates rise more or fall less than shorter rates
- Curve flattens: shorter rates rise more or fall less than longer rates

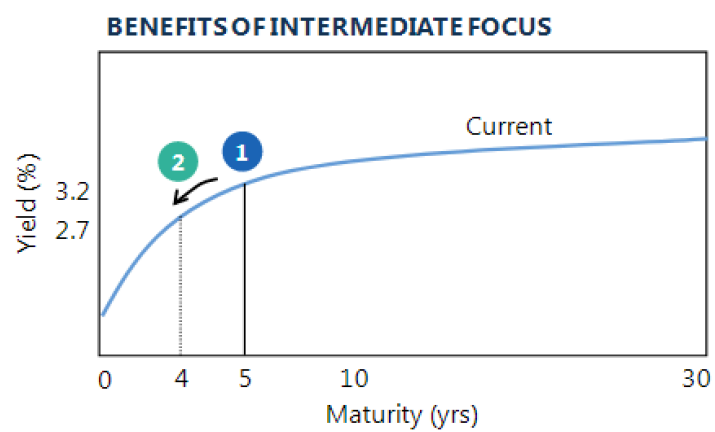
Roll-down adds value to steep yield curve environment

Yield curve roll-down explains the increase in a bond's price as time passes and discount rates fall as a bond approaches maturity

- 1 Buy 5-year government
 - Priced at \$100
 - 3.2% yield
- 2 One year later, own 4-year government
 - 2.7% yield
 - Price appreciates to 102*
 - Investment return is 5.2%
 - o 2.0% capital gain
 - o 3.2% coupon

Sell bond with 4 years remaining and reinvest proceeds in a new 5-year bond and repeat the process

Return from rolling down the intermediate sector of the curve can exceed 10-year yields in a stable interest rate environment



Six pillars of carry

Total Carry	Intends to capture the expected return of securities and accounts at a three month horizon, expressed annually, under the assumption that yields, spreads, implied volatilities and exchange rates are unchanged (and that forwards are not realized).
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	Pillar	Short Description	Looks familiar
1	FX / Investment	Baseline rate of return available by currency at three month horizon generally quoted as 3m LIBOR	Bond Yield
2	Duration / Yield extension	Return from excess yield above FX/Investment attributable to duration extension on the (swap) yield curve	
3	OAS Spread	Return from credit spread relative to the swap curve	
4	Rolldown	Return from rolling down yield curve and credit spread curve	Capital Gain
5	Theta	Return from explicit and embedded optionality (Textbook Black-Scholes Option Theta)	Derivative Exposure
6	Financing	Additional return that can be captured by gaining duration exposure via futures instead of cash bonds (post small margin; invest freed up cash)	

Total Carry = 1 + 2 + 3 + 4 + 5 + 6