

YTM

The 3 components which create the Yield to Maturity or YTM, are:

- 1) Coupon rate
- 2) Capital appreciation
- 3) Reinvestment yield, on the cash from coupon

Market Rate (Target Rate)	2.75%	} Spread -1.19%				
Coupon Rate	5.00%					
Reinvestment Rate	1.56%					
IRR	1.56%					
Lower Purchase Price						
Par	1,000.0	←				
Purchase Price	1,100.0					
Capital Gain	- 100.0					
Coupon	150.0					
Reinvestment	2.4					
Total Additional Cash Flow	52.4					
Disbursed Cash Flow Table						
	0	1	2	3	Total	% of Total
Coupon	0.0	50.0	50.0	50.0	150.0	286.50%
Capital Appreciation	0.0	-33.3	-33.3	-33.3	-100.0	191.00%
Reinvestment	0.0	0.0	0.8	1.6	2.4	4.50%
Total	0.0	16.7	17.4	18.2	52.4	
Cash Flow Table						
	0	1	2	3		
Cash Flow	-1,100.0	50.0	50.0	1,050.0		
IRR	1.56%					
IRR Growth						
	0	1	2	3		
Cashflow growth at IRR	1,100.0	1,117.2	1,134.6	1,152.4		
Annual Growth		1.56%	1.56%	1.56%		

Sensitivity Table	
Purchase Price	IRR
500	34.15%
600	25.71%
700	19.02%
800	13.55%
900	8.95%
1000	5.00%
1100	1.56%
1200	-1.47%
1300	-4.18%
1400	-6.61%
1500	-8.82%

- 1) Coupon rate is self explanatory. It is the cash flow for the investor, which can be reinvested in a bank, or other holdings, or held in a safe yielding zero. The higher the risk, the higher the coupon rate.
- 2) Capital appreciation is the difference between the disposition price and the purchase price. Let's assume we purchase at 1,100 and we hold until maturity, and receive 1,000. This means, in the capital portion, we will realize a loss of -100, or over 3 years, -33.3 each year. Why would anybody purchase a bond, to realize a loss in the capital portion, which is a large portion of the total return? Bill Gross, fund manager at PIMCO, discussed the same dilemma for US Treasury investors. They are purchasing the bonds at a premium, which will result in tiny returns, probably less than 2%. So he sold off on his Treasury holdings, but his call was off because Treasuries actually rose in price, which made even less rational sense. Europe turned sour, pushing investors to safe havens like USD, JPY and US Treasuries was a safe bet. Although it was practically a zero return, and on a real return basis when taking into consideration inflation, a negative return, but it was safer than parking the capital into the equities market. Some funds are obligated to keep a high capital invested ratio, so they put it into bonds, instead of cash.
- 3) Reinvestment yield is a tiny part of the total yield, but is an important concept to consider. YTM, or IRR, assumes the cash received from coupon payments are reinvested in another security yielding the same rate as the bonds' IRR, which is a lofty and uncertain assumption. So if we receive coupon payments of \$50 annually, IRR assumes we reinvest in another investment that yields 1.56%, which may not be the case, if we keep the cash in a bank account. So, it is safer to zero out the reinvestment rate, and be surprised with a higher return at disposition, rather than assume a high reinvestment rate and be humbled by the weaker results.