

Morton handley ad company: interest rate determination assignment

[Business](#)



The interest rate paid to savers depends (1) on the rate of return producers expect to earn on invested capital, (2) on savers' time preferences for current versus future consumption, (3) on the riskiest of the non, and (4) on the expected future rate of inflation. Producers' expected returns on their business investments set an upper limit to how much they can pay for Chapter 6: Interest Rates savings, while consumers' time preferences for consumption establish how much consumption they are willing to defer, hence how much they will save at different interest rates. Higher risk and higher inflation also lead to higher interest rates.

B. What is the real risk-free rate of interest (r^*) and the nominal risk-free rate (r_{ref})? How are these two rates measured? Answer: [Show SO-3 and SO-4 here.] Keep these equations in mind as we discuss interest rates. We will define the terms as we go along: $r = r^* + IP$. The real risk-free rate, r^* , is the rate that would exist on default-free securities in the absence of inflation. The nominal risk-free rate, r_{ref} , is equal to the real risk-free rate plus an inflation premium, which is equal to the average rate of inflation expected over the life of the security.

There is no truly riskless security, but the closest thing is a short-term U. S. Treasury bill (T-bill), which is free of most risks. The real risk-free rate, r^* , is estimated by subtracting the expected rate of inflation from the rate on short-term Treasury securities. It is generally assumed that r^* is in the range of 1 to 4 percentage points. The T-bill rate is used as proxy for the longer risk-free rate. However, we know that all long-term bonds contain interest rate risk, so the T-bill rate is not really riskless.

It is, however, free of default risk. Define the terms inflation premium (IP), default risk premium (DRP), liquidity premium (LIP), and maturity risk premium (MR.). Which of these premiums is included when determining the interest rate on (1) short-term U.S. Treasury securities, (2) longer U.S. Treasury securities, (3) short-term corporate securities, and (4) long-term corporate securities? Explain how the premiums would vary over time and among the different securities listed. Answer: [Show SO-5 here. The inflation premium (IP) is a premium added to the real risk-free rate of interest to compensate for expected inflation. The default risk premium (DRP) is a premium based on the probability that the issuer will default on the loan, and it is measured by the difference between the interest rate on a U.S. Treasury bond and a corporate bond of equal maturity and marketability. A liquid asset is one that can be sold at a predictable price on short notice: a liquidity premium is added to the rate of interest on securities that are not liquid.

The maturity risk premium (MR.) is a premium that reflects interest rate risk; longer-term securities have more interest rate risk (the risk of capital loss due to rising interest rates) than do shorter-term securities, and the MR. is added to reflect this risk, 1, Short-term treasury securities include only an inflation premium. 2. Long-term treasury securities contain an inflation premium plus a maturity risk premium. Note that the inflation premium added to long-term securities will differ from that for short-term securities unless the rate of inflation is expected to remain constant. . The rate on short-term corporate securities is equal to the real risk-free rate plus premiums for inflation, default risk, and liquidity. The size of the default and liquidity premiums will vary depending on the financial strength of the

issuing corporation and its degree of liquidity, with larger corporations generally having greater liquidity because of more active trading. 4. The rate for long-term corporate securities also includes a premium for maturity risk. Thus, long-term corporate securities generally carry the highest yields of these four types of securities. D.

What is the term structure of interest rates? What is a yield curve? Answer:

[Show SO; 6 here. SO; 6 shows a recent (October 2008) Treasury yield

curve,] The term structure of interest rates is the relationship between

interest rates, or yields, and maturities of securities. When this relationship is

graphed, the resulting curve is called a yield curve. (Sketch out a yield curve

on the board,) Interest 14% 12% 0 10 20 30 October 2008 Years to Maturity

1. 00 5. 00 1000 30. 00 E. Yield 1. 74% 2. 55 3. 61 409 Suppose most

investors expect the inflation rate to be 5% next year, 6% the following year, and 8% thereafter.

The real risk-free rate is 3%. The maturity risk premium is zero for bonds that

mature in 1 year or less and 0.1% for 2-year bonds; then the MR. increases

by 0.1% per year thereafter for 20 years, after which it is stable. What is the

interest rate on 1-, 10-, and 20-year Treasury bonds? Draw a yield curve

with these data. What factors can explain why this constructed yield curve is

upward sloping? [Show SO-7 through SO-12 here.] Step 1: Find the average

expected inflation rate over Years 1 to 20: Yr 1: IP 5.0%, Yr IP $(5 + 8)/10 = 6.5\%$

$(5 + 8)/20 = 7.75\%$.

Step 2: Find the maturity risk 7.5%. Yr 20: $= (5 + 6 + 8 + 8 + \dots)$ Premium in

each year: Yr 1: MR. = Yr 10: MR. = 0.1% $g =$ Yr 20: MR. = 0.1% $0.19 = 1.$

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9%. Step 3: Sum the Pips and Mrs., and add = Yr 1: ref = 5.0% + 0.0% = 5.0%. Yr 10: = 0.9% = 5.9%. Yr 20: 7.75% * 1.3% = 12.65%. The shape of the yield curve depends primarily on two factors: (1) expectations about future inflation and (2) the relative riskiness of securities with different maturities. The constructed yield curve is upward sloping. This is due to increasing expected inflation and an increasing maturity risk premium. F.

At any given time, how would the yield curve facing a AAA-rated company compare with the yield curve for U.S. Treasury securities? At any given time, how would the yield curve facing a BBB-rated company compare with the yield curve for U.S. Treasury securities? Draw a graph to illustrate your answer. Answer: [Show SO-13 and SO-14 here.] Curves for AAA-rated and BBB-rated securities have been added to demonstrate that riskier securities require higher returns.) The yield curve normally slopes upward, indicating that short-term interest rates are lower than long-term interest rates.

Yield curves can be drawn for government securities or for the securities of any corporation, but corporate yield curves will always lie above government yield curves, and the riskier the corporation, the higher its yield curve. The spread between a corporate yield curve and the Treasury curve widens as the corporate bond rating decreases. Interest Rate (+6) BBB-Rated AAA-Rated 5.9% Treasury 6.0% Yield Curve 0015101520 Years to Maturity What is the pure expectations theory? What does the pure expectations theory imply about the term structure of interest rates? Show SO-15 and SO-16 here.] The pure expectations theory assumes that investors establish bond prices and interest rates strictly on the basis of expectations for interest

rates, This means that they are indifferent with respect to maturity in the sense that they do not view long-term bonds as being riskier than short-term bonds. If this were true, then the maturity risk premium would be zero, and long-term interest rates would simply be a weighted average of current and expected future short-term interest rates.