Homework #1 – Due Friday, October 9 (in class)

1. Define **direct** and **indirect** finance. In your answer, provide two examples of each type.

2. Define **moral hazard** and **adverse selection**. Give an example of each. Be sure to highlight the role that asymmetric information plays in both situations.

3. Suppose the current price level is 120 and the price level is forecast to be 144 at the end of four years. Investors believe that the rate of inflation over this period will be constant; they also believe that the path of one-period real interest rates will be: 4%, 5%, 2%, and 1%. Using the implications of the Fisher relation and expectations hypothesis, plot the implied yield curve for maturities from 1 to 4 years.

4. A 5-year coupon bond with a face value of $1000 is currently selling for $900. If the coupon payments are made quarterly and the yield to maturity is 10% (annual yield), what is the bond’s coupon rate?

5. Calculate the duration of a one-year fixed payments loan with monthly payments of $150 and yield to maturity of 12%. Use this number to determine the % change in the price of this loan if interest rates increase to 14%.

6. Joe Smith purchased a 20-year corporate bond with a 12% coupon rate (payments made semiannually) and par value of $1000 for $1300. Six months later, after receiving a coupon payment, Joe sold the bond. At the time of the sale, the market interest rate for this type of bond was 10%. What was Joe’s rate of return.

7. A bank wishes to obtain a return on equity of 15 percent next year. Its interest earning assets are $100 million, its equity is $12 million, and its tax rate is 30%. The bank has no loan losses, other income, or other expenses. However, next year it will have an annual depreciation of $3 million. What must the bank’s net interest margin be in order to meet its goal?

8. If a bank’s equity multiplier is equal to 15, what is its debt-to-asset ratio?

9. The price of an amortizing bond with constant annual payment of $C$, maturity $N$, and yield to maturity $i$ is given by:

\[ P = \frac{C}{i} \left[ 1 - \left( \frac{1}{1+i} \right)^N \right] \]  

Derive this formula using the value of the principal implied by the constant payment. That is, let $P_0$ denote the initial value of the loan (the same as $P$ above). Then after the first payment the value of the outstanding principal is:

\[ P_1 = P_0 (1 + i) - C \]  

In general, we have

\[ P_t = P_{t-1} (1 + i) - C \]  

Since $P_N = 0$ (the loan is paid off at maturity) derive equation (1) above.