

# Bank management chapter 7

[Business](#), [Management](#)



Suggested end-of-Chapter Practice Questions: Chapter Seven Chapter 71, 2, 3, 7, 11, 13, 19, 22, 29, 32, 33, problem similar to HW 1. What is the process of asset transformation performed by a financial institution? Why does this process often lead to the creation of interest rate risk? What is interest rate risk? Asset transformation by an FI involves purchasing primary assets and issuing secondary assets as a source of funds. The primary securities purchased by the FI often have maturity and liquidity characteristics that are different from the secondary securities issued by the FI.

For example, a bank buys medium- to long-term bonds and makes medium-term loans with funds raised by issuing short-term deposits. Interest rate risk occurs because the prices and reinvestment income characteristics of long-term assets react differently to changes in market interest rates than the prices and interest expense characteristics of short-term deposits. Interest rate risk is the effect on prices (value) and interim cash flows (interest coupon payment) caused by changes in the level of interest rates during the life of the financial asset. . What is refinancing risk? How is refinancing risk part of interest rate risk? If an FI funds long-term fixed-rate assets with short-term liabilities, what will be the impact on earnings of an increase in the rate of interest? A decrease in the rate of interest? Refinancing risk is the uncertainty of the cost of a new source of funds that are being used to finance a long-term fixed-rate asset. This risk occurs when an FI is holding assets with maturities greater than the maturities of its liabilities.

For example, if a bank has a ten-year fixed-rate loan funded by a 2-year time deposit, the bank faces a risk of borrowing new deposits, or refinancing, at a higher rate in two years. Thus, interest rate increases would reduce net

interest income. The bank would benefit if the rates fall as the cost of renewing the deposits would decrease, while the earning rate on the assets would not change. In this case, net interest income would increase. 3. What is reinvestment risk? How is reinvestment risk part of interest rate risk?

If an FI funds short-term assets with long-term liabilities, what will be the impact on earnings of a decrease in the rate of interest? An increase in the rate of interest? Reinvestment risk is the uncertainty of the earning rate on the redeployment of assets that have matured. This risk occurs when an FI holds assets with maturities that are less than the maturities of its liabilities. For example, if a bank has a two-year loan funded by a ten-year fixed-rate time deposit, the bank faces the risk that it might be forced to lend or reinvest the money at lower rates after two years, perhaps even below the deposit rates.

Also, if the bank receives periodic cash flows, such as coupon payments from a bond or monthly payments on a loan, these periodic cash flows will also be reinvested at the new lower (or higher) interest rates. Besides the effect on the income statement, this reinvestment risk may cause the realized yields on the assets to differ from the a priori expected yields. 7. How does the policy of matching the maturities of assets and liabilities work (a) to minimize interest rate risk and (b) against the asset-transformation function for FIs?

A policy of maturity matching will allow changes in market interest rates to have approximately the same effect on both interest income and interest expense. An increase in rates will tend to increase both income and expense, and a decrease in rates will tend to decrease both income and expense. The

changes in income and expense may not be equal because of different cash flow characteristics of the assets and liabilities. The asset-transformation function of an FI involves investing short-term liabilities into long-term assets.

Maturity matching clearly works against successful implementation of this process. 11. A money market mutual fund bought \$1, 000, 000 of two-year Treasury notes six months ago. During this time, the value of the securities has increased, but for tax reasons the mutual fund wants to postpone any sale for two more months. What type of risk does the mutual fund face for the next two months? The mutual fund faces the risk of interest rates rising and the value of the securities falling. 13. What is market risk? How do the results of this risk surface in the operating performance of financial institutions?

What actions can be taken by FI management to minimize the effects of this risk? Market risk is the risk of price changes that affects any firm that trades assets and liabilities. The risk can surface because of changes in interest rates, exchange rates, or any other prices of financial assets that are traded rather than held on the balance sheet. Market risk can be minimized by using appropriate hedging techniques such as futures, options, and swaps, and by implementing controls that limit the amount of exposure taken by market makers. 14.

What is credit risk? Which types of FIs are more susceptible to this type of risk? Why? Credit risk is the possibility that promised cash flows may not occur or may only partially occur. FIs that lend money for long periods of time, whether as loans or by buying bonds, are more susceptible to this risk

than those FIs that have short investment horizons. For example, life insurance companies and depository institutions generally must wait a longer time for returns to be realized than money market mutual funds and property-casualty insurance companies. 19.

What is the difference between technology risk and operational risk? How does internationalizing the payments system among banks increase operational risk? Technology risk refers to the uncertainty surrounding the implementation of new technology in the operations of an FI. For example, if an FI spends millions on upgrading its computer systems but is not able to recapture its costs because its productivity has not increased commensurately or because the technology has already become obsolete, it has invested in a negative NPV investment in technology.

Operational risk refers to the failure of the back-room support operations necessary to maintain the smooth functioning of the operation of FIs, including settlement, clearing, and other transaction-related activities. For example, computerized payment systems such as Fedwire, CHIPS, and SWIFT allow modern financial intermediaries to transfer funds, securities, and messages across the world in seconds of real time. This creates the opportunity to engage in global financial transactions over a short term in an extremely cost-efficient manner.

However, the interdependence of such transactions also creates settlement risk. Typically, any given transaction leads to other transactions as funds and securities cross the globe. If there is either a transmittal failure or high-tech fraud affecting any one of the intermediate transactions, this could cause an unraveling of all subsequent transactions. 22. If you expect the French franc

to depreciate in the near future, would a U. S. -based FI in Paris prefer to be net long or net short in its asset positions? Discuss. The U. S.

FI would prefer to be net short (liabilities greater than assets) in its asset position. The depreciation of the franc relative to the dollar means that the U. S. FI would pay back the net liability position with fewer dollars. In other words, the decrease in the foreign assets in dollar value after conversion will be less than the decrease in the value of the foreign liabilities in dollar value after conversion. 29. What is country or sovereign risk? What remedy does an FI realistically have in the event of a collapsing country or currency?

Country risk involves the interference of a foreign government in the transmission of funds transfer to repay a debt by a foreign borrower. A lender FI has very little recourse in this situation unless the FI is able to restructure the debt or demonstrate influence over the future supply of funds to the country in question. This influence likely would involve significant working relationships with the IMF and the World Bank. 32. What is liquidity risk? What routine operating factors allow FIs to deal with this risk in times of normal economic activity?

What market reality can create severe financial difficulty for an FI in times of extreme liquidity crises? Liquidity risk is the uncertainty that an FI may need to obtain large amounts of cash to meet the withdrawals of depositors or other liability claimants. In times of normal economic activity, depository FIs meet cash withdrawals by accepting new deposits and borrowing funds in the short-term money markets. However, in times of harsh liquidity crises, the FI may need to sell assets at significant losses in order to generate cash quickly. 33.

Why can insolvency risk be classified as a consequence or outcome of any or all of the other types of risks? Insolvency risk is the risk that an FI may not have enough capital to offset a sudden decline in the value of its assets. This risk involves the shortfall of capital in times when the operating performance of the institution generates accounting losses. These losses may be the result of one or more of interest rate, market, credit, liquidity, sovereign, foreign exchange, technological, and off-balance-sheet risks. 34. Discuss the interrelationships among the different sources of FI risk exposure.

Why would the construction of an FI's risk management model to measure and manage only one type of risk be incomplete? Measuring each source of FI risk exposure individually creates the false impression that they are independent of each other. For example, the interest rate risk exposure of an FI could be reduced by requiring customers to take on more interest rate risk exposure through the use of floating rate products. However, this reduction in FI risk may be obtained only at the possible expense of increased credit risk. That is, customers experiencing losses resulting from unanticipated interest rate changes may be forced into insolvency, thereby increasing the FI's default risk. Similarly, off-balance sheet risk encompasses several risks since off-balance sheet contingent contracts typically have credit risk and interest rate risk as well as currency risk. Moreover, the failure of collection and payment systems may lead corporate customers into bankruptcy. Thus, technology risk may influence the credit risk of FIs. As a result of these interdependencies, FIs have focused on developing sophisticated models that attempt to measure all of the risks faced by the FI at any point in time.

Practice 1. A bank has the following balance sheet structure: Assets Liabilities and Equity  
 Cash \$10,000 Certificate of Deposit \$90,000 Bond \$90,000 Equity \$10,000  
 Total Assets \$100,000 Total Liabilities and Equity \$100,000  
 The bond is a Eurobond; it has a ten-year maturity and a fixed-rate coupon of 6 percent. The certificate of deposit has a one-year maturity and a 4 percent fixed rate of interest. The FI expects no additional asset growth. a. What will be the net interest income (NII) at the end of the first year? Note: Net interest income equals interest income minus interest expense. b.

If at the end of year 1, market interest rates have increased 100 basis points (1 percent), what will be the net interest income for the second year? Is the change in NII caused by reinvestment risk or refinancing risk? c. Assuming that market interest rates increase 1 percent. (i) What will be the market value of the bond? (ii) What will be the market value of equity? (Assume that all of the NII in part (a) is used to cover operating expenses or is distributed as dividends, so that there is no addition to retained earnings. ) a. What will be the net interest income (NII) at the end of the first year?

Note: Net interest income equals interest income minus interest expense.  
 Interest income \$5,400  $\$90,000 \times 0.06$   
 Interest expense 3,600  $\$90,000 \times 0.04$   
 Net interest income (NII) \$1,800  
 b. If at the end of year 1, market interest rates have increased 100 basis points (1 percent), what will be the net interest income for the second year?  
 Interest income \$5,400  $\$90,000 \times 0.06$   
 Interest expense 4,500  $\$90,000 \times 0.05$   
 Net interest income (NII) \$900  
 The decrease in net interest income is caused by the increase in financing cost without a corresponding increase in the earnings rate.



The increase in market interest rates does not affect the interest income because the bond has a fixed-rate coupon for ten years. Note: this answer makes no assumption about reinvesting the first year's interest income at the new higher rate. c. Assuming that market interest rates increase 1 percent. (i) What will be the market value of the bond? (ii) What will be the market value of equity? (Assume that all of the NII in part (a) is used to cover operating expenses or is distributed as dividends, so that there is no addition to retained earnings. Note: market value of equity falls due to lower market value of the bond If the coupon rate is 6%, yield to maturity = 7%, then using our financial calculator,  $N = 9$  (only 9 years left),  $PMT = 540$ ,  $I = 7\%$ ,  $FV = 90,000$ . Compute PV; find  $PV = -84,136.29$ . Hence the market value of the bond fell from \$90,000 to \$84,136.29 (a decrease of \$5,863.71). Since the interest rate on the CD has risen (it had only a one year maturity; so it gets a new interest rate when it is re-issued), the market value of the CD is \$90,000 (interest rate = coupon rate on the CD).

Consequently, it is the market value of equity that will decline. If the bank must sell the bond, it will sell it at the lower market value and realize the loss. The book value of equity has remained at \$10,000, but the market value of equity has fallen by the amount of the decrease in the value of the bonds. This was a problem faced by banks in 2008, when the market value of the mortgage debt and mortgage backed securities and CDOs (collateralized debt obligations) fell; some of them had negative equity in market value terms.