Managing Financial Institutions - Markets and Sustainable Finance 1st edition Cooperman Test Bank

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Managing Financial Institutions:

Markets and Sustainable Finance

Test Bank

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Managing Financial Institutions - Markets and Sustainable Finance 1st edition Cooperman Test Bank

Part 1: Test Bank, Chapters 1 to 8

Module 1: The Financial Services Industry: Today and the Future

Chapter 1: Financial Institutions as Social Value Creators and Financial Risk Takers

Short Answer Questions and Problems (with Answers Below):

1) **Should managers of financial institutions be concerned about other stakeholders (i.e. regulators, depositors, uninsured debt-holders, community, employees, customers)? Explain how problems for corporate cultures for financial institutions contributed to serious problems for financial institutions and their customers and other stakeholders giving a recent example.**

Answer: Financial institutions have obligations to consider repercussions of their strategies and actions for all stakeholders that determine their reputation and success including stockholders, regulators, depositors, uninsured debt-holders, community, and customers. This is particularly the case for depository institutions that are chartered to serve their communities and to abide by federal and state regulations. The U.S. Subprime Loan Crisis is an example of the serious repercussions when financial institution managers fail to have good corporate governance, and corporate cultures that value all stakeholders that add to the success and reputation of a financial institution. By having cultures that encouraged short-term profits and provided bonuses for making quantities of loans versus the quality of loans and ability for borrowers to repay loans, for instance contributed to huge numbers of bankruptcies when housing prices collapsed. Wells Fargo's scandal in September 2016 is another example where managers did not consider customers as stakeholders and a corporate culture was created pushing employees for sales goals versus serving customers' best interests. Wells Fargo managers imposed a high-pressure tactics on employees to push products on customers to hit sales goals. This led to fraudulent behavior by employees, where 2 million customer accounts were opened without customers' knowledge. When this scandal was uncovered, Wells Fargo's stock price plunged, and Wells Fargo had serious reputational damage losing major clients and customers. Wells Fargo was given a $185 million fine, and 5,300 employees were fired, and a new CEO put in place. Under the Sarbanes-Oxley Act, Wells Fargo also violated the requirement that executives personally required to certify that a bank has financial and operational controls in place.

(See: Matt Egan, "Wells Fargo stock sinks to 2-1/2 year low." CNN Money, September 26, 2016, accessed on November 14, 2016 at: http://money.cnn.com/2016/09/26/investing/wells-fargo-stock-fake-account-scandal/ and Patrick W. Watson, "Wells Fargo scandal shows next bank crisis coming." *Forbes,* September 15, 2016, accessed on November 14, 2016 at: http://www.forbes.com/sites/patrickwwatson/2016/09/15/wells-fargo-scandal-shows-next-bank-crisis-coming/#79b153f269ec.)

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2) **In setting strategies for risk/return for a financial institution, what would be the likely respective opinions of different stakeholders (stockholders, uninsured debt-holders, regulators, managers, and insured depositors) for taking on more or less risk? Explain why some stakeholders prefer more risk than others.**

Answer: Stockholders with limited liability with a maximum loss their investment may prefer greater risk-taking with in effect a put option where future returns on a small investment are unlimited, but the investment loss is limited to the amount a shareholder invests. Uninsured debt-holders, in contrast, would prefer that managers take less risk to ensure that they will be paid back. Similarly, regulators would prefer that managers take less risk to protect the financial system from financial institution failures, and to ensure against losses for deposit insurance funds. Managers may or may not prefer more or less risk taking depending on bonuses, salary incentives, and the culture of the organization, desiring to protect their own human capital, in terms of their jobs. During the Subprime Loan Crisis, with bonus and fee incentives to make a large volume of loans versus the quality of loans, lenders were encouraged to engage in greater risk taking. Depositors would prefer lower risk taking to protect the bank against failure, but have less incentive to monitor the bank than other debt holders for insured deposits.

3) **Given the quote at the beginning of Chapter 1: *"At its most basic definition, finance is the act of allocating capital to individuals and businesses that want to make productive use of it. In short finance creates social value,"* discuss how financial institutions provide benefits to individual, businesses, and an economy, giving examples for different types of financial institutions.**

Answer: Financial institutions, when they are working well, create social value by providing funds to businesses and individuals that these borrowers in turn can use for productive purposes. Examples include banks providing financing and guidance for small as well as medium sized, and large businesses. This in turn provides a stimulus for economic growth. Banks also provide social value by ensuring a stable and safe payments mechanism and by encouraging savings. Mutual funds provide diversified investments and the means for consumers to save for future goals, such as retirement, dream vacations, college tuition for their children, and other financial needs. Life/Health insurance companies provide protection in the event of adverse events and health coverage payments, and P/L companies provide protection against property damage and liability protection in the event of adverse events. Venture capital firms provide funds for start-ups including new innovations, such as new disruptive technologies to help solve environmental challenges, among other examples.

4) **Give an example of direct finance and an example of indirect finance and the benefits provided by financial intermediaries giving examples for depository institutions, mutual funds, and contractual financial institutions.**

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Answer: With direct financing borrowers and lenders get directly together without the assistance of a financial intermediary. With indirect financing financial intermediaries provide indirect financing contracts and other services including liquidity, maturity, denomination, search, monitoring, and information financial intermediation benefits. Examples include for depository institutions taking in deposits offering check writing services and providing liquidity to depositors and using maturity intermediation making longer-term loans to borrowers and providing monitoring services. Mutual funds provide diversification services and information and professional investment, and liquidity services allowing small investors to invest in diversified portfolios. Contractual financial institutions, such as insurance firms and pension funds, provide maturity intermediation and investing benefits whereby customers pay premiums that are invested for protection against the advent of adverse events in the future, where the insurance companies invest premiums to have funds available in the future, and pension funds take employee and employer contributions and invest these for employees for retirement benefits in the future.

5) **Discuss how technology has affected financial institutions, giving examples of both increased opportunities and risks for FIs with new technologies. Give some examples.**

Answer: Financial institutions have both increased opportunities and risks with new technologies. Increased opportunities include new technology for financial institutions to use and make payments easier for customers, such as new payment apps and mobile banking and new developments for the use of block chain technology for making secure payments, and having FinTech subsidiaries that make investment and other financial services more accessible and easier for customers. Technological advances have also reduced the use of checks, lowering bank costs. Risks are greater use of direct financing such as technology allowing large, creditworthy corporations to issue commercial paper, bonds, and engage in direct finance globally. From the standpoint of risks, financial institutions have competitive risks from FinTech firms and high tech firms including non-bank technology firms are able to enter the payments arena. Examples of technological firms entering the payment arena include Apple, Google, Amazon, Facebook, and Samsung, and the development of digital payment apps, among many others. Technology has also increased the risks of technological failures, hacking, and fraud and embezzlement.

6) **Discuss how bank asset and liabilities differ from those of a firm with physical assets, such as a manufacturing firm. What are typical assets and liabilities for a bank? What special risks does a bank have because of the nature of its assets and liabilities?**

Answer: Banks have primarily financial assets, mainly loans and also securities, versus real assets that depend on the performance of borrowers for loans and security interest and principles payments. Thus, banks have credit risk and interest rate risk.. Bank liabilities are primarily deposits that can be withdrawn at any time, so banks also have liquidity risk. With differences in the maturities of assets and liabilities, banks also have

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considerable interest rate risk, since a primary source of income is net interest income, the difference between interest revenues less interest expenses. Banks also have higher financial leverage than non-bank firms, with high equity multipliers, and hence greater capital risk.

7) The Silver Mountain Bank has interest revenue of 10%, interest expense of 6%, a provision for loan loss to assets of 1%, noninterest expense of 4%, and noninterest revenue of 2%, and equity to total assets of 10%. What is the bank's NIM%, Burden%, OROA, and what is its OROE? If the bank's equity to total assets ratio went up to 11%, what would be the new OROE?

Answers and Calculations:
NIM = Int. Rev% - Int. Exp.% = 10% - 6% = **4%**
Burden% = Noninterest Exp% - Noninterest Rev% = 4% - 2% = **2%**
PLL% = 1%
OROA = NIM - Burden% - PLL% = 4% - 2% - 1% = **1%**
EM = 1 / (equity/assets) = 1/.10 = **10 x**
OROE = OROA x EM = 1% x 10 = **10%**

8) The Go Broncos Bank has the following questions it would like to ask you about its bank. The bank's balance sheet is as follows:

			Maturity
Assets:			
Securities	2% rate	$150 million	1 year
Long-term Loans	6% rate	$850 million	5 years
Total Assets		$1000 million	
Liabilities & Equity:			
Short-term Deposits	1% rate	$600 million	1 year
Certificates of Deposit	3% rate	$300 million	2 year
Total Liabilities		$900 million	
Equity		$100 million	
Total Liab. & Equity		$1000 million	

Questions Below and Answers:

a. What is the bank's expected net interest income $(NII) and expected net interest margin (NIM)? [Hint: NII = Sum (Each asset x its rate) - Sum (Each liability x its rate) and NIM = NII / Earning Total Assets (excludes cash)]

NII ($'s) **___$39 mil._** NIM % **___3.9%_____**

IR = (150 x .02) + (850 x .06) = $54 mil.
IE = (600 x .01) + (300 x .03) = $15 mil.
Net Interest Income = $ 39 mil.
NIM = $39 mil./$1000 mil. = .039 or 3.9%

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b. If the bank has the NIM% that you calculated above, a PLL% of 0.50%, and a Burden% of 1.50%, what is the bank's operating ROA before taxes (NIM - Burden% - PLL%)? (OROA) _____**1.90%**_____

OROA = NIM - Burden% - PLL%
= 3.9% - 0.50% - 1.50% = 1.90%

c. What is the equity multiplier (EM) for the bank? (Hint: EM = total assets/equity)

EM _____**10 x**_____
EM = 1000/100 = 10 x

d. Using this equity multiplier, what is the bank's Operating ROE? (Hint: ROE = OROA x EM)

Operating ROE _____19%_____
ROE = 1.90% x 10 = 19%

e. What is the bank's 1-year income (funding) gap (Rate Sensitive Assets (RSA) for 1 year - Rate Sensitive Liabilities (RSL) for 1 year?

Funding Gap __ -$450 mil.____
Funding Gap = $150 million - $600 mil. = - $450 mil.

f. Given this funding gap if rates go up by 1%, what is the expected change in the bank's NII $? (Hint: Change NII $ = Funding Gap x Change Rate)

Expected Change in NII ___ -$4.50 mil._____
Change NII = -$450 mil. x .01 = -$4.5 mil.

9) Briefly discuss different balance sheet indicators for credit risk including loan risk indicators and loan loss allowance and earnings coverage ratios. Why is it important also to look at the loan mix that a bank has to examine its credit risk?

Answer: Different balance sheet indicators of credit risk include the types of loans a bank has: for instance, how diversified the loan portfolio is, and industry focused, such as a real estate lender having greater risk with a real estate market downturn and a real estate lender having a larger percentage of construction and development or other real estate loans a more risky types of real estate loans. Other indicators of credit risk are the percentage of other real estate owned (OREO) which often includes reposed collateral, the percentage of net losses (actual loan losses less any recoveries) to total assets, % net charge-offs to total loans and leases, and % noncurrent assets. Other ratios that are important to look at look at the ability of the bank to cover losses from a bank's loan loss allowance, such as loan loss allowance to nonaccrual loans, loan loss allowance to

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net loss, and the ability to cover losses from earnings, such as earnings to net losses. Loan mix is important is analyzing the types and risks of the loan portfolio and the allowance ratios to see if banks are taking provisions for loan losses for future as well as current loan losses and have earnings to cover losses.

10) Why is it important when examining liquidity risk for banks to look at the asset side, liability side, and off-balance sheet side?

Answer: It is important when examining liquidity risk to look at the asset side to see how loaned up a bank is and how much stored liquidity it has, such as its percentage of short-term securities and secondary liquidity in the form of longer term securities. Since banks also have liquidity risk on the liability side, it is also important to look at the type of deposits and other liabilities a bank has that are more likely to leave the bank as non-core purchased funds in the event of bad news for the bank or higher interest rates offered by other financial institutions, with a larger percentage of core, insured deposits less likely to be withdrawn. It is also important to look at off balance sheet items, such as loan commitments that the bank has committed to fund in the future necessitating sources of liquidity to make these.

11) What is a bank's efficiency ratio and how is it calculated as an overall measure of a bank's operating risk?

Answer: A bank's efficiency ratio measures a bank's overall operating efficiency by considering all sources of expenses divided by all sources of revenues, i.e. equal to non-interest expenses divided by net interest income plus non-interest revenue. A higher ratio indicates higher expenses relative to net revenues and thus greater operating inefficiency.

12) In the aftermath of the U.S. Subprime Crisis, there have been many challenges to the theory of stockholder's wealth maximization, arguing an expansion of the fiduciary duty of directors to manage in the interests of a broad range of stakeholders, who benefit from the long-run success of the corporation (e.g., stockholders, employees, creditors, managers, local governments, that contribute to a firm's ability to succeed). Explain the pros and cons of this view provided by Chandler (2015), Samuelson and Padro (2015), and others.

Answer: Recent legal challenges have been made to the concept of stockholders as the owners of a firm, and the fiduciary duty of directors to manage firms solely in shareholder's interests. From this perspective, a company should be managed in the interests of a "broad range of stakeholders," who benefit from the long-run success of the corporation (e.g., employees, creditors, managers, local governments, and others contributing to the firm's ability to succeed).

From this perspective, all stakeholders delegate authority to an independent board of directors to monitor efforts and make determinations how each stakeholder can be rewarded and incentivized. Samuelson and Padro (2015) at the Aspen Institute point out

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that with many investors turning over stock quickly, i.e. "quick-hit investors," that some stockholder interests are at odds with the long-term interests of companies, and that corporations as legal entities have no legal mandate to maximize shareholders value over the long-run interests of the corporation. Chandler (2015) similarly points out that with rapid trading today on numerous exchanges, including high frequency trading, stockholders are often not long-term stakeholders in a firm. Hence, firms need to be run using a more sustainable business model with long-term, close relationships to a broad range of stakeholders central to its mission focusing on long-term value over short-term profit.

13) **In recent years, there has been greater emphasis made for strategic decisions to include other stakeholders including the consideration of environmental, social, governance (ESG) factors in the decision-making framework. Research has also shown additional benefits with empirical findings that if firms include ESG factors in decisions, firms will maximize shareholders' wealth by attracting better and more loyal employees and customers. Explain why incorporating ESG factors in decision-making could help improve the reputation and long-term performance of a financial institution**.

Answer: FIs also face social, legal, and climate change related risks that have to be managed. An example is greater risk for insurance companies with climate change resulting in a greater number of hurricanes and other catastrophic events associated with climate change. This has led to many major insurers hiring climate scientists to estimate the extent of climate change risk and futures potential losses. Hence incorporating environment, social, and governance issues is important in making strategic decisions. Research has also shown additional benefits with empirical findings that if firms include ESG factors in decisions, firms will maximize shareholders' wealth by attracting better and more loyal employees and customers, improving the bottom line and gaining branding and reputation benefits and reducing legal and regulatory costs. Depository institutions in particular are also given charters to operate and receive deposit insurance based on serving their communities, with communities as important stakeholders.

14) **Explain why financial institution managers of depository institutions have a balancing act in managing multiple stakeholders including a discussion of the different stakeholders and managerial objectives associated with each of these.**

Answer: Managerial objectives in financial institutions need to consider customers' needs, and to meet the needs of the community they serve. Customers of FIs are also suppliers of inputs for banks (deposits) that are used to provide out-puts (loans) to other customers, as well as providing interest revenue for banks. In turn financial institutions provide liquidity for depositors. If a financial institution's reputation is damaged, this in turn can lead to depositors, as well as loan customers leaving the bank, and even to deposit runs, that can affect a bank's solvency. FIs also have regulators as stakeholders, being subject to government regulations and often acting as agents for the government, such as depository institutions assisting in carrying out a government's fiscal and monetary policies or other public policies such as the distribution of credit to

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disadvantaged borrowers. Because governments often provide insurance for many financial institutions, they regularly employ examiners to monitor activities and ensure that managerial decisions don't strain or endanger insurance funds or violate regulations for the safety and soundness and integrity of financial institutions.

Thus, FI managers have a balancing act setting objectives and strategies that address multiple stakeholders: stockholders, debt holders, customers, employees, and regulators. The concept of a single objective of maximizing shareholder wealth may be too one-dimensional, as demonstrated by the Sub-Prime Loan Crisis of 2007 to 2008 in the U.S., and subsequent Global Financial Crisis, with goals for short-term share maximization leading to large losses for bank shareholders as well. The impact of strategic decisions on all stakeholders (depositors, borrowers, and other customers) should be considered in terms of maintaining a financial institution's culture that includes values that include providing value for society including environmental and social responsibility.

Chapter 1 Multiple Choice Questions

(a) ___ 1**.** When financial markets and institutions are working well:
- a. They create social value by providing funds to businesses and individuals that can be used for productive purposes.
- b. A financial crisis occurs.
- c. Managers engage in managerial expense preference behavior buying lavish furniture for their offices and taking high travel expenses and getting other perks.
- d. Managers get large fees from pushing products on consumers and making large volumes of subprime loans.

(d) ___ 2. Financial intermediation is beneficial to an economy by:
- a. Lowering transaction costs.
- b. Providing investment diversification.
- c. Providing liquidity and risk reduction services.
- d. All of the above.

(a) ___3. Which is the best answer for the most defining characteristic of a depository institution that distinguishes it from other types of financial institutions?
- a. Depository institutions take deposits (as liabilities on their balance sheet) that are used to make loans (that are assets on their balance sheets).
- b. Depository institutions have large vaults for cash.
- c. Depository institutions offer credit cards.
- d. Depository institutions provide check-writing services.

b)____4. If a customer comes to the bank and starts a savings account, for the customer and for the bank, this is respectively:
- a. A financial asset for the bank and a financial liability for the customer.
- b. A financial asset for the customer and a financial liability for the bank.
- c. A financial liability for both the customer and the bank.

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d. An off-balance sheet account for both the customer and the bank.

(e) ___5. A depository institution differs from a non-financial firm in which of the following ways?

a. A depository institution has primarily financial vs. real assets.
b. A depository institution has much higher financial leverage.
c. A depository institution uses deposits to fund loans.
d. A depository institution generally has lower operating leverage.
e. All of the above.

(b) ___6. A bank has total assets of $100 million including loans of $50 million that pay an interest rate of 10% financed by $40 million of deposits paying an interest rate of 5% and $10 million in equity. What is the bank's Net Interest Margin (NIM)?

a. 2%
b. 3%
c. 5%
d. 4%

Calculations: NIM = (Interest Revenues - Interest Expenses) / Total Assets
= [($50 mil. x .10) - ($40 mil. x .04)] / $100 mil.
= ($5 mil. - $2 mil.)/$100 mil. = .03 or 3%

(c)___7. A savings and loan has a return on assets (ROA) of 1.5%, and an equity to asset ratio of 8%. What is ROE?

a. 12%
b. 15%
c. 18.75%
d. 20%

Calculations: EM = 1 / (equity/assets) = 1/.08 = 12.5
ROE = ROA x EM = 1.5% x 12.5 = 18.75%

(a)___ 8. A credit union has a net interest margin (NIM) of 4%, a Burden of 1%, a Provision for Loan Loss % of 0.50%, and an equity multiplier (assets to equity) of 10. As a non-profit organization, it does not pay taxes, what are the credit union's ROA and ROE?

a. 2.5% and 25%
b. 10% and 150%
c. 15% and 150%
d. 3% and 30%

Calculation: OROA = NIM - Burden% - PLL% = 4% - 1% - 0.50% = 2.5%
OROE = OROA x EM = 2.5% x 10 = 25%

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(d) ___9. A bank has rate sensitive assets of $100 and rate sensitive liabilities of $200, which of the following answers is correct for the bank?

a. It has a negative funding gap and will have a lower NIM if rates fall.
b. It has a positive funding gap and will have a lower NIM if rates rise.
c. It has a positive funding gap and will have a lower NIM if rates fall.
d. It has a negative funding gap and will have a lower NIM if rates rise.

Answer: Should choose d, since RSA $100 - RSL $200 = -$100, a negative funding gap, implying a fall in net interest income and the NIM if interest rates rise.

(b)___10. Depository institutions have the lowest interest-rate risk of all the types of financial institutions.

a. True
b. False

(b)___11. If two banks A and B have the same positive ROA, but Bank B has higher financial leverage (i.e. a lower equity to asset ratio), Bank A will have a higher ROE than Bank B.

a. True
b. False

(e) ____12. To measure credit risk, which of the following are indicators of greater credit risk for a bank's loan portfolio relative to another bank.

a. A higher % of commercial real estate and construction development loans.
b. A large % of net loan losses.
c. A low earnings to net loan losses ratio.
d. A low loan allowance to net losses ratio.
e. All of the above.

(e) _____13. Which of the following are indicators of greater liquidity risk for a bank?

a. A lower core deposit to total liabilities ratio.
b. A larger percentage of off-balance sheet loan commitments.
c. A lower percentage of short-term securities to assets.
d. All of the above.

(b) _____14. Financial institution managers should act in their own interests, excluding the interests of other stakeholders.

a. True
b. False

(b) _____15. Direct financing is preferable to indirect financing, since a financial intermediary doesn't have to be involved, and it's easy for borrowers and lenders to find each other.

a. True
b. False

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(c) ____16. If a bank has an ROA of 1% and an equity to total assets ratio of 10%, what is the bank's equity multiplier, and what is its ROE?

a. EM of 12 and ROE of 12%
b. EM of 1 and ROE of 1%
c. EM of 10 and ROE of 10%
d. EM of 8 and ROE of 18%

Calculation: EM = 1 / (equity/assets) = 1/.10 = 10
ROE = ROA x EM = 1% x 10 = 10%

(d) ____17. A Dupont Analysis of ROA and ROE recognizes the effects of which factors on ROE?

a. Cost efficiency as shown by the net profit margin (NPM)
b. Revenue generation as shown by asset utilization (AU)
c. Financial leverage as shown by the equity multiplier (EM)
d. All of the above.

(b)____ 18. Banks A & B have the following overall efficiency ratios
= [Total Overhead Expense / (Net Interest Income + Noninterest Revenue)]
Bank A has an efficiency ratio of 56.5% and Bank B 66.7%.
True or False: Bank B is more efficient in its operating efficiency than Bank A.

a. True
b. False

False: The Bank with the lower efficiency ratio is more efficient, which is A.

(a) _____19. The Favorite Bank has the following balance sheet (in millions):

Assets: 1 year Consumer Loans (rate 10%)	$100
Liabs.: 10-year Certificates of Deposit (rate 9%)	$80
Equity:	$20

True or False: The bank has a 1-year positive funding gap of $100 mil.
This implies that if rates rise, the bank's NIM will rise.

a. True
b. False

True: Since the firm for a 1-year funding gap has RSA - RSL = $100 - $0 = $100 (in millions), it has more rate sensitive assets than rate sensitive liabilities, and if rates rise, its rates on assets will rise, but in this case no change for its rate sensitive liabilities, resulting in higher interest revenues and a higher net interest income and net interest margin.

(c) _____20. Incorporating environmental, social, and governance (ESG) factors in decision-making by firms has generally shown these firms to have lower financial performance for firms on average.

a. True
b. False

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False: Studies generally on average find a positive relation for firms that include ESG factors in their decision-making and financial performance, with branding and reputational benefits and lower legal liability costs for firms that consider the environmental, social actions of strategies and that have good corporate governance practices.

Module 2: Financial Markets, Interest Rates & Their Regulatory Environment

Chapter 2: Interest Rates, Theories, and Duration as an Overall Risk Measure

Short Answer Questions and Problems (with Answers Below):

1) **You have a 5-year investment holding horizon, would like to earn a 4% annual compound return each year, and you have a choice between two bonds.**

   Find (a) the Price, (b) Duration, and (c) Modified Duration for each bond, and answer the questions below:

   - Bond 1 has a **4%** annual coupon rate, $1000 maturity value, **n = 5 years**, YTM = **4% (pays a $40 annual coupon at the end of each year for each of the 5 years and $1,000 maturity payment at the end of year 5).**

   - Bond 2 is a **zero coupon** bond with a $1000 maturity value, and **n = 5 years**; YTM= **4%. (pays no coupons; only a $1,000 maturity payment at the end of year 5)**

Answers and Calculations:
a. Price Bond 1 ___**$1,000**__ Price Bond 2 __ **$821.93**____
b. Duration Bond 1 ___**4.63**_____ Duration Bond 2 ___**5**_____
c. Modified Duration Bond 1 __**4.45** __ Modified Duration Bond 2 ___**4.81**_____

Price Bond 1 = $40 (PVIFA 4%, 5) + $1000 (PVIF 4%, 5)
= $40(4.4518) + $1000(.82193) = $178.07 + $821.93 = $1,000
(sells at Par Value since CR = YTM rate).
Duration Calculation:

Year	CF	PVIF	PVCF	WtedPVCF
1	$40	.96154	$38.46	$38.46
2	$40	.92456	$36.98	$73.96
3	$40	.88900	$35.56	$106.68
4	$40	.85480	$34.19	$136.77
5	$1,040	.82193	$854.81	$4274.03

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Totals	$1,000	$4629.91

Duration = $4629.91/$1,000 = **4.63**
Modified Duration = 4.63/1.04 = **4.45**
Price Bond 2 = $1000/(1.04)^5 = $1000(.82193) = **$821.93**
Duration for Zero Coupon Bond 2 = Its Maturity = **5 years**
Modified Duration Bond 2 = 5/1.04 = **4.81**

2) Which of the two bonds listed in problem #1 should you choose for your 5-year investment horizon to duration match to ensure your 5% annual compound return? Explain why. (Assume the same default risk for each bond.)

Answer: Choose Bond 2 with the duration of 5 years equal to your 5-year investment horizon. By duration matching, your investment will be immunized against interest rate risk to achieve the desired 4% annual compound yield if the zero coupon bond is held to maturity.

3)

a. If interest rates go up by 1%, what will be the % Change in the market value for each Bond's Price for the two Bonds in Problem #1?

Answer: % Change in Price for Bond 1 __-**4.45%**___
% Change in Price for Bond 2 _-**4.48%**___

Calculation:
% Change in - Modified Duration x Change in Rate
Bond 1 % Change = -4.45(.01) = 0.0445 or- 4.45%
Bond 2 % Change = -4.81(.01) = -.0448 or -4.48%

b. Which of the 2 bonds has more price risk, and has more reinvestment risk? Explain why.

Answers:
Bond 1 has coupon payments, so has more reinvestment risk.

Bond 2 has more price risk, with a higher Modified Duration than Bond 1, so has higher risk of a capital loss if it has to be sold prior to maturity.

4)

a. For the Zero Coupon Bond 2 in Problem #1, what will be your annual compound yield for your 5 year holding period?

Answer:
Annual Compound Yield for Bond 2 at End of Year 5 _____4%_____
ACY = {[$1000/821.93]^1/5} - 1 = (1.21665)^.20 - 1 = .04 or 4%

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b. For the Coupon Bond 1 in Problem #, 1 what will be your annual compound yield if you hold the bond for 5 years (i.e. receive 5 years of coupon payments that are reinvested at a 3% annual rate), and received your maturity payment at the end of year 5? FVIFA = {(1 + r)^n - 1 / r}

Answers:
ACY = {{[FV of Coupons + Maturity Value] / [Price of Bond]}^1/n} - 1,
where n = 5 years, where for Bond 1, Price of Bond = $1,000

FV Coupons = $40 (FVIFA 5, 2%) = $40 (5.204) = $208.16
Total FV = FV Coupons + Maturity Value = $208.16 + $,1000 = $1,208.16
Annual Compound Yield for Bond 1 at the End of Year 5 _3.85%___
ACY = [$1,208.16/1000]^.20 - 1 = .0385 or 3.85%

c. Explain why you received your desired annual compound return for the 5-year holding period for Bond 2, but didn't receive your desired Annual Compound Return for Bond 1 for your 5 year holding period.

Answers:
With duration matching for Bond 2 for your 5-year investment horizon, you locked in the 4% annual compound yield immunizing the bond's interest rate risk. For Bond 1 you had a lower duration than your holding period and had reinvestment risk when rates fell below the desired 4% annual compound rate.

5) Distinguish between a nominal versus a real interest rate.

Answer: A nominal rate is a stated rate that includes both an expected real rate of return and the expected inflation rate over the holding period.
A real rate is the nominal rate less the actual inflation rate over the period.

6) If a bond gives you a 2% nominal annual interest rate and the inflation rate over the year is 2%, what is the real ex post rate of return you receive?

Answer:
Real Rate You Receive ____**0%**_____
Real Rate = [1.02/1.02] = 1 = 0%

7) If an investor wants a real rate of return of 2% and expects inflation to be 2% next year, what nominal rate will the investor demand?

Answer:
Nominal Rate Investor Demands ___**4.04%**_____
Nominal Rate = [(1.02)(1.02)] - 1 = .0404%

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8) **Explain the loanable funds theory in your own words including a discussion of the supply and demand curves for loanable funds, the net suppliers of loanable funds and net lenders of loanable funds, and factors that affect respectively the demand and supply for loanable funds.**

Answers: Under the loanable funds theory, real equilibrium interest rates are determined by the intersection of the demand for loanable funds (i.e., businesses and governments) and supply of loanable funds (i.e., money supply, investors). The demand curve for loanable funds slopes downward, with a higher demand at lower rates) and the supply curve for loanable funds slopes upward (more funds supplied at higher rates). The intersection of the two curves determines the real equilibrium interest rate in an economy. Net suppliers of loanable funds are net savers (investors) and changes in the money supply. Net demanders of loanable funds are businesses and governments.

Factors that affect the demand for loanable funds by businesses and governments include government budget deficits, business cycle expansions and profitable business opportunities, and inflation, with budget deficits increasing the need for funds by governments, profitable business opportunities increasing the need for funds to pursue these by businesses, and inflation reducing the real cost of borrowing, increasing the demand for loanable funds.

Factors affecting the supply for loanable funds by savers (investors) include wealth, expected rates on bonds relative to alternative investments, risk aversion, and liquidity of bonds and inflation. The supply of funds increases with wealth, higher expected rates on bonds relative to other investments, and liquidity, but decreasing with greater risk aversion and risk for bonds relative to alternative investments, and inflation which reduces the real return on bonds.

9) **If the Federal Reserve decided to reduce the money supply by engaging in open market bond purchases from the non-bank public, explain what will happen to the equilibrium interest rate in the U.S. In your discussion use the loanable funds theory to explain the effect on the equilibrium interest rate in an economy.**

Answer: If the Fed engages in a contraction policy by engaging in open market bond purchases, the money supply decreases, shifting the supply curve for LF's inward, resulting in an intersection with the demand curve for LFs at a higher real equilibrium interest rate.

10) **Using the loanable funds theory, explain what will happen to the real interest rate in an economy if a new technology is developed whereby businesses will be demanding more loanable funds?**

Answer: Interest rates will go up, with the LF demand curve for funds shifting outward and intersecting at a higher rate with the supply curve for LF.

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11) Using the loanable funds theory and the demand and supply of loanable funds, explain what will happen to the real interest rate in an economy if a recession occurs?

Answer: Interest rates will fall with the demand curve for loanable funds shifting inward and intersecting with the supply curve for loanable funds at a lower real equilibrium interest rate.

12) Suppose in the *Wall Street Journal* you see the following current (spot) interest rates for Treasury bonds with an upward sloping yield curve:
5-year bond rate = 1.45%; 10-year bond rate = 2.13%

a. Under the expectations theory, what is the expected 5-year bond rate (forward rate) 5 years from now? Based on your answer, what are rates expected to do (rise/fall/stay the same)? Explain why.

Answers: Expected 5-year bond rate 5 years from now = _____2.82%_____ (Be sure to show your work here).

Exp. Rate = [(1.0213)^1/(1.0145)^5]^.20 - 1 = [1.2346 1.0746]^.20 - 1 = .0282 or 2.82%

Rate are expected to rise, since forward rate > current rate for 5-year bond.

b. For the problem in 12a., if there is a liquidity premium of 0.10% for a 5-year bond and 0.20% for a 10-year bond, under the liquidity premium theory (adjusting for liquidity premiums incorporated in bond rates) what is the new expected 5-year bond rate 5 years from now? Based on your answer, what are rates expected to do (rise/fall/stay the same)? Explain why.

Answers: Expected Rate with LP _2.61%_
Rates are expected to rise, since forward rate > current spot rate for a 5-year bond (note the expected rise in rates is smaller under the liquidity premium theory).

Calculations:
Step 1: Reduce the 5-year and 10-year spot rates by subtracting the liquidity premiums:
Adjusted 5-year rate = 1.45% - .10% = 1.35%
Adjusted 10-year rate = 2.13% - .20% = 1.93%
Step 2: Then use these adjusted rates to find the expected forward rate, and then add back the liquidity premium for a 5-year bond:
Exp. Rate = [(1.0193)^10/(1.0135)^5] - 1 = [1.2107/1.06935]^.20 - 1
= .0251 or 2.51% + LP of .10% = 2.61%

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13) Explain how interest rates are determined under the market segmentation theory. Give examples of financial institutions that have preferences for particular types of securities.

Answer: The market segmentation theory suggests that there are separate markets for short-term bonds, immediate term bonds, and long-term bonds, because different investors have preferences for specific markets, so rates are determined by separate supply and demand markets for the interest rate in each respective market, with little substitution across markets. This theory suggests that short-term and long-term rates are determined separately with short-term rates not predictors of long-term rates. Examples of preferences are life insurance companies and pension funds having preferences for long-term securities and banks having preferences for short-term securities.

14) What is the preferred habitat theory, and how does it differ from the market segmentation theory?

Answer: The preferred habitat theory is similar to the market segmentation theory with investors having different preferences for different bond maturities, but investors will shift to another maturity if they can get a higher yield from doing so, such as a premium for additional risk of moving out of a preferred investment habitat.

15) The Go Broncos Bank has the following questions it would like to ask you about its bank. The bank's balance sheet is as follows:

Assets:			**Ave. Duration**
Securities	**3% rate**	**$150 million**	**1 year**
Long-term Loans	**6% rate**	**$850 million**	**6 years**
Total Assets		**$1000 million**	
Liabilities & Equity			
Short-term Deposits	**1% rate**	**$600 million**	**1 year**
Certificates of Deposit	**3% rate**	**$300 million**	**3 year**
Total Liabilities		**$900 million**	
Equity		**$100 million**	
Total Liab.& Equity		**$1000 million**	

a. What is the Bank's Duration of Assets and Duration of Liabilities and its Duration gap (D-Gap)? What does the duration gap tell you about the bank's interest rate risk?

b. What is the expected % change in the value of equity with a rise in rates of 1%? Use an average loan rate of 5.5%.

Answers and Calculations:

a. Duration of Assets __5.25_____
Duration of Liabilities _____1.667_____
Duration Gap ___3.75_____

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D-GAP = Duration of Assets - {[Total Liabs. / Assets] x Duration Liabs.}
Duration of Assets = Sum {[Each type of asset / Total Assets] x its Duration}
Duration of Liabilities = Sum {[Each type of Liability / Total Liabs.] x its Duration}
Duration of Assets = [(150/1000) x 1] + [(850/1000) x 6]
= .15 + 5.1 = 5.25
Duration of Liabs. = [(600/900 x 1] + [(300/900) x 3]
= .667 + 1 = 1.667
D-Gap = 5.25 - [(900/1000) x 1.667} = 5.25 - 1.50 = 3.75
The bank has a positive duration gap (indicating a negative funding gap) with interest rate risk if interest rates rise.

b. Expected Change in Value of Equity
= - D-GAP x {[(Chg rate / (1+ Ave. Loan Rate)]
Expected Change in Value = -3.75 x [.01/1.055] = -.0356 or -3.56%
Expected Change in Value of Equity = -.0356 x $100 mil. = -$3.56 mil.

Chapter 2: Multiple Choice Questions

(a) ___1. If you purchase a 5 year bond with a face value of $1,000, an annual coupon rate of 8%, and a YTM of 10% (the market rate for similar bonds), which of the following statements is true?

a. The bond will be selling at a discount at a price less than $1,000 (its face value), since the coupon rate < YTM.
b. The bond will be selling at its par (face) value of $1,000.
c. The bond will be selling at a premium at a price greater than $1,000 (its face value), since the coupon rate < YTM.
d. None of the above.

(c) ___2. If you invest $1000, and your investment is worth $1,100 next year, what was your annual compound yield on your one-year investment?

a. 8%
b. 5%
c. 10%
d. 110%

Answer Calculation: ACY = [FV/PV]^1/n - 1 = [1100/1000]^1 - 1 = .10 or 10%

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Managing Financial Institutions: Markets and Sustainable Finance

Part 2: Test Bank, Chapters 9 to 14

Part 4: Asset and Liability Management

Module 6: Asset and Liability Management and Innovations

Chapter 9: Loan Analysis, Credit Risk Management, and Loan Securitization

Short Answer Questions (with Answers Below):

1. **In an introductory quote, Professor Uday Rajan (University of Michigan) observes:**

"Statistical models that predict loan defaults failed to warn lenders about risky borrowers, because these models relied too much on hard information, such as credit scores and loan-to value ratios, and not enough on soft information from personal contact with borrowers, such as a person's job security, upcoming expenses or other observable behaviors that may help prevent the likelihood of default...A fundamental cause for this failure was that the models ignored changes in the incentives of lenders to collect soft information about borrowers and residential properties."… "When incentives change, the link between the data and predicted outcomes changes in a fundamental manner."

Explain the Five C's of Credit, and discuss why soft information on borrowers can be important for depository institutions to carefully underwrite a loan. Also, discuss incentives for loan underwriter during the period prior to the Subprime Loan Crisis that contributed to poor underwriting practices that contributed to the crisis.

Answer: The 5 C's of Credit include character, capacity, capital, collateral, and conditions.

- **Character** (the willingness of a customer to pay). Character includes soft information on a customer in determining the willingness of a customers to pay, often assessed by loan officers using their experience to evaluate the character of individuals during a loan interview. Other evidence of character includes past credit history, credit ratings of firms and individuals, and for firm's reputation from customers and suppliers.
- **Capacity** (the ability of a customer to pay in terms of cash flow). Capacity is often evaluated by looking at current and projected cash flow statements of

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corporate customers to determine if cash flow will be adequate to cover loan payments.

- **Capital** (the soundness of a borrower's financial position in terms of equity). The net worth or equity position of a corporate borrower relative to assets provides information on the cushion that the borrower has to absorb potential losses. For consumer customers, net worth is estimated as personal assets less personal liabilities.
- **Conditions** (the industry and economic conditions that may affect a firm's ability to repay a loan). For instance, during recessions, mortgage delinquencies also tend to rise, and real estate booms and busts in particular areas can affect the likelihood of foreclosures, such as occurred during the U.S. Subprime Loan Crisis.
- **Collateral** (secondary sources of repayment) (asset-based lending). Collateral and at times for private firms' personal guarantees based on personal assets are used as a secondary source of repayment for the bank, particularly for more risky company loans. However, taking possession of the collateral is expensive, so lenders should reply on cash flow for primary payment of a loan, with collateral only as a secondary source of repayment, and independent appraisals need to be made.

Incentives for loan underwriter during the period prior to the Subprime Loan Crisis that contributed to poor underwriting practices that contributed to the crisis included bonuses for underwriting more loans versus the quality of loans, and since loans were sold for securitization, no responsibility for loan officers to monitor or be responsible for loan defaults. Hence, a moral hazard problem was created encouraging poor quality loans to be made and incentives for predatory lending and taking on subprime loans. Heavy reliance on quantitative models for loans and the use of low doc loan documentation for qualifying for loans that was popular including applying for online loans with quick decisions, failed to incorporate soft information including character, the willingness to pay, capital, and conditions, with loan officers assuming that market values of properties would continue to rise and failing to consider adverse conditions with very low down payments for loans required and high loan to value ratios. Thus, when the market values of properties fell, many borrowers with loans now greater than the value of the properties, walked away from their loans.

2. **Discuss the function of the credit process as protection against default risk and loan structure factors that help to reduce default risk on a loan**.

Answer: The function of the credit process is to structure a loan to reduce its default risk, with the risk of loans including default risk as the result of both firm-specific processes and industry problems. With proper structuring of loans whereby the cash flow generated by a firm or income generated by a consumer borrower is adequate to cover loan payments.

Loan structure factors that help to reduce the credit risk of a loan include:

(a) **The proper pricing of the loan**, ensuring that borrower's cash flow or income before taxes is adequate to cover loan payments. For instance, with variable rate loans, when interest rates rise borrowers may not be able to meet the higher

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payments, increasing the credit risk of the loan. This occurred during the Subprime Loan Crisis, where with low teaser rates, followed by higher rates when rates rose, subprime borrowers were not able to make their loan payments, contributing to bankruptcies.

(b) **Borrower's debt to income ratios**, ensuring that a loan amount is not greater than, for instance, 30% of a borrower's gross monthly income before taxes. Typically lenders also require a higher credit score for a borrower when there is a lower down payment than 20%, and a higher required down payment of 30%, and required credit score that is higher for self-employed individuals.

(c) **Loan to Value (LTV) ratios**, ensuring that the ratio of the loan amount to the loan amount is less than the appraised value of a property to protect the lender in the case of default and reduce the incentive of the borrower to walk away from the loan. Generally banks like to have a maximum of 75% loan to value ratio.

(d) **Proper Appraisal of Property Values**. Lenders need to have policies in place for having certified, well-trained real estate appraisers. Prior to the U.S. Subprime Loan Crisis, many financial institutions allowed unqualified appraisers to make appraisals, which resulted in inflated valuations that made lenders more willing to lend to subprime borrowers with low down-payments. Since appraised values are historically based, it's also important for lenders to consider future cash flows expected, especially for commercial real estate loans to determine if cash flows projected will be sufficient for loan repayments.

Hence, the structuring of loans to ensure repayment by the borrower is one of the keys to having an effective bank lending process. The credit evaluation process is also critical. To protect the bank and maximize the profitability of loans that are made, banks must have a credit process in place including a carefully written loan policy, loan request procedures and a process for credit analysis, a process for credit execution and administration, and a credit review process to identify problems early for loans that have been made. The loan process must also conform to a large number of lending regulations, with a number of other specifications and regulations to follow if loans are to be securitized including maximum loan-to-value ratios.

3. What is the purpose of a loan committee, who is on a loan committee, and what considerations are made in determining whether a loan should be made?

Answer: Loan committees review larger loans to provide an assessment of whether a loan is credit worthy and should be granted and if it abides by bank regulations. A loan committee consists of loan officers, the bank's regulatory compliance officer, and for smaller banks, often the chief officers for the bank. A loan officer presents the loan request information and the weaknesses and strengths of the loan. Usually, loan officers have close relationships with loan customers, so they act as the advocate for their customers at the loan committee meetings. In turn, bank officers and other lending officers grill the loan officer presenting the loan in terms of potential weaknesses or

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problems that the loan might have. Underwriting guidelines must be met, using a uniform format for ease of presentation.

Considerations are made for whether cash flow is adequate to repay the loan, collateral as a secondary source of repayment is adequate, the likelihood the loan will be paid based on the character of the applicant and capital, and also need to be made for local market conditions for general types of loans that will be approved, such as if loans are given for commercial development of apartment complexes, whether there is a saturation of new apartment buildings would be carefully considered, along with projected occupancy rates, which are important factors determining whether a loan will be repaid. For more risky construction development loans, often the bank will only lend for a short period of time, under the condition that the loan will be purchased by an insurance company or other long-term lender. Alternative uses for buildings that are collateral for such types of loans would also be important, in the event the bank had to foreclose on a property and how marketable the building would be including considerations of location, and the future value of the property.

4. **Why is it important for banks to have written loan policies? What are Credit Execution Policies and why are they important?**

Answer: A bank's overall loan policy reflects long-term strategic planning for the overall asset portfolio, including setting general guidelines for the size of the loan portfolio, its composition, and the maximum acceptable level of default risk. For example, in a commercial bank, decisions must be made about the proportion of loan funds to be invested in different types of loans. These decisions influence the way a depository advertises its services, the customers whose loan applications will be given preference, and many other aspects of lending. Specific industries or markets that the bank wishes to target where lending officers have expertise are also included. Goals for loan volume and loan quality balances and loan portfolio diversification goals with a bank's liquidity, capital, and rate of return objectives are also incorporated, along with systems and controls to reduce credit risk. In addition, standards and procedures are included in terms of loan quality and procedures for documenting and reviewing loans and loan pricing. Loan policies and procedures for complying with lending regulations also need to be put in place to ensure that all bank-lending regulations are met.

Credit Execution Policies include an overview of credit execution and administration process in terms of loan committee reviews, collateral, and documents required for loans and loan reviews, and the follow-up procedures for loans once they have been made. From these policies specific procedures for the credit analysis, credit execution and administration, and credit review process are put in place. Policies also include a code of ethics and conflict of interest policy for boards of directors and senior management including treatment of confidential information from customers. Credit execution policies are important to ensure fairness for all loan applicants and proper monitoring and administration for loans.

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5. Give an overview of items usually included in loan request summaries prepared for a loan committee review.

Answer: Loan procedures generally include the following;

(1) The **source** of the business (is this a new or existing customer; information about the customer's past relationships and type of business and industry as background).

(2) The **principal contacts** for the loan (the contacts that the bank regularly communicates with)

(3) The **participation structure** (optional: if other banks are participating in the loan). If the credit accommodation is either a bought or sold participation then all the pertinent details of the participation need to be spelled out including the lead bank and its role in the management of the credit and other participants, and each participant's share and effective yield that the bank will receive on the credit accommodation.

(4) The **amount and reason** for the loan request (the purpose for the funds to be borrowed and a narrative about the rationale for the transaction and structure).

(5) Brief **history and operations** of the firm (include how and when the company was formed, general background and the firm's products, services, and markets, and how it has evolved over time and details about the firm's operations including the geographical and customer market it serves, products it sells, and the competitive environment in which it operates. The competitive advantages or disadvantages the firm enjoys and how these relate to the overall economic environment in which the firm operates should also be discussed.

(6) Optional **industry analysis** if needed for large or unusual borrowing requests, or a credit request in which the Bank/Division has a large concentration.

(7) **Management Performance Profiles:** Assessment of Management including practical resume information on the top management of the company and comments for the account officer's assessment of managers and their professional accomplishments and capabilities.

(8) **Financial Performance**, including a historical financial performance analysis with headings for subsections for Income Statement, Balance Sheet, and Uniform Cash Flow. This should include a narrative for the trends occurring including insights for why trends are positive or negative and the mix of sales if applicable and complexion for the cost of sales. Any unusual expenses or revenues should be explained clearly. The balance sheet should include explanations for all major accounts with insights for trends regarding asset turnover and special emphasis on working capital management including accounts receivable, inventory, accounts payable, and accruals. The rationale for the firm's capital structure should also be explained with a discussion about its appropriateness for the firm's operating strategy. For the cash flow statement, there should be insights on the sources and used of cash and the firm's ability to generate sufficient cash flow to be able to repay debts and sustain its growth. Industry factors, such as markets, products, competition, and management capabilities should also be considered.

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(9) **Collateral/Risk analysis**, summarizing collateral available and risks involved in the loan, such as barriers for entry to a particular industry, and the effect on the firm's future operating results. Preferably a narrative on the collateral, liquidation analysis, and a general risk analysis should be included. This section should have a conclusion that clearly demonstrates to the loan committee that the loan is collateralized or if a gap exists and the rationale for the bank taking on the loan including such a gap risk.

(10) **Loan review and rating recommendation** by the loan officer, which includes whether the loan would be categorized as A, B, or C, (or other types of categories) from excellent to average or below rating, based on the bank's classification of ratings for loans.

(11) **Conclusion and opinion**: favorable or unfavorable factors for the loan. The conclusion should summarize all the important items that lead the underwriter to conclude that there is a reasonable risk for the bank to take on the loan, including favorable and unfavorable considerations.

6. Discuss CreditMetrics and other portfolio approaches.

Answer: Other measures of a financial institution's credit risk have been used taking an overall portfolio approach, looking at the diversification of a bank's loan or total asset portfolio. In 1997, JP Morgan with several other large banks released to the public a model for quantifying portfolio risk based on a value at risk (VAR) approach. The CreditMetrics approach estimates changes in the market value of a bank's loan portfolio as well as other financial instruments in the event of a credit upgrade or downgrade as well as potential loan defaults. Probabilities based on historical data are calculated for the occurrence of such events. Using these probabilities, the expected change in the value of loans, value at risk, for a given confidence level can be calculated. Correlation between the value at risk for different loans and other financial instruments can be used to derive an aggregate measure of the volatility or value at risk for a bank's entire loan portfolio and other instruments, such as swaps, futures, and forward contracts.

7. Why are terms for loans important, and what do they typically include?

Answers: Establishing the loan structure and terms and conditions are also critical to ensuring the repayment of a loan. Since loans dominate depository institution's asset portfolios, keeping loan rates at appropriate levels is a prerequisite to earning a target NIM and target ROE. **Loan terms include the lending rate, noninterest terms and fees for the loan, the maturity and timing of payments, the loan amount or other secondary sources of payment, and any restrictive covenants associated with the loan.**

Loan Rates: For loan rates a base rate including the firm's cost of funds and administrative costs and other costs need to be considered and RARO, the risk-adjusted return on capital needed to cover losses, required loan loss premium, and risk premiums

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that may be based on the rankings of loans such as A, B, C, etc. For a hypothetical loan rate using RAROC with the base rate the weighted average cost of funds for the loans, such as: Loan Rate = Bank's Transfer cost of Funds (Weighted Average Cost of Funds for the Loan) + Required Loan Loss Provision, such as 1.25% + Administrative Costs, + Capital Charge (RAROC) for the loan's cost of equity capital needed for the loan's risk. Loan pricing is important since often loans and risk premiums can be underpriced. Yet loan rates need to be competitive with rates offered by competitors as well.

Non-Interest Costs of Loans are often used with banks adjusting the effective loan rate by using compensating balances (about 10% of the remaining balance of the loan) to be held as deposits with the institution, which guarantees the lender access to inexpensive funds and liquidity, increasing the actual cost of the loan to the borrower. Lines of credit and commitment fees are also used which are agreements to extend funds to the borrower over some prearranged time period. While a *line of credit* is informal and can be revoked, a loan commitment is a formal, legal guarantee that funds will be available at a given rate, amount, and maturity. Terms of commitment usually require a commitment fee on any amount of unused credit over the life of the arrangement, plus a fee on the amount actually borrowed.

Other Noninterest Loan Structuring Decisions with banks often protecting their interests by establishing restrictive covenants, such as minimum liquidity or debt ratios or a borrower taking on additional debt or limitations on dividend payments or minimum current and quick ratios, life insurance on key personnel, and that the bank receive quarterly financial statements from the firm, among others. The loan may state that if the covenants are not met, the loan will be called.

Type of Loan and Proper Structuring and Maturity are important to structure the loans to ensure that borrowers will be able to make loan payments. Often borrowers also request too much or too little funds, so the amount and structure of the loan are important. Loans should be structured so projected cash flows of a borrower will be adequate to make loan payments. By forecasting financial statements including an indirect cash flow statement or source and use statements, the proper amount needed for a loan can be determined, as the missing source that makes sources equal to total uses. Different types of loans payment structures include amortized loans, bond type payments, and revolving loans.

Collateral: With asset-based lending, collateral is often matched with the use for the loan; for example, banks often collateralize the assets that are being financed for a loan, such as using temporary accounts reasonable and inventory as collateral for a one-year seasonable working capital loan. In turn once the company sells and collects on these, the loan is paid back during the year. Hence, collateral is matched with the use and term of the loan, such as the equipment and machinery that a long-term loan is being purchased for would be used as collateral for the loan.

Asset-based lending often incorporates costly monitoring, so loan rates are often higher than unsecured loans for the same degree of safety, often 2% to 6% above a

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bank's basic lending rate, depending on the risk of the borrower. Maintaining accurate records (loan documentation) is important when examiners are assessing the quality of outstanding loans. Determining the value of the assets to be pledged as collateral, including how liquid and marketable assets are is important, and for accounts receivables, the quality of the accounts receivables, and if they are concentrated towards a few large customers that could default, and reviewing an aging schedule for accounts receivables. The Security Agreement, the legal agreement assigning the assets as collateral, is important as well.

8. Why are special considerations for different types of loans important? Give some examples.

Answers: The structuring of different types of loans is important to reduce the risk of default for particular types of loans for a bank. For instance a longer-term term loan for equipment should be structured with cash flows that match the cash flow savings generated by the equipment that will be purchased and amortized loan payments are used for gradual repayment from the cash flows that the firm generates, and collateral often the equipment that is being purchased. Revolving loans are also often used where a loan is made with a shorter maturity, but conditionally can be renewed if the firm is still in good financial condition and has been a good customer in repaying the loan, with financial statements and projected financial statements reviewed.

Similarly, seasonal working capital loans are often renewable and repaid within a year after sales are made allowing a firm to finance its temporary working capital, with quarterly cash flow statements forecast for peak and low seasons to determine the appropriate loan amount and looking closely at a firm's cash to cash cycle. Seasonal working capital loans are typically collateralized by inventory and accounts receivables.

9. Give an overview of the structure and mechanics of securitizations by discussing the steps in securitizations. What are different types of structured finance securitizations?

Answers: Structure and Mechanics of Securitizations
Loans are removed from the balance sheet and packaged into securities with characteristics that make them attractive to large and small investors. Banks gain liquidity by receiving cash to make new loans. The mechanics of securitizations are subject to a wide variety of tax, securities, regulatory, and accounting laws.

Steps in securitizations include:

(1) Banks sell pools of loans on a nonrecourse basis to a limited purpose corporation or special enterprise vehicle.
(2) A Limited Purpose Corporation (often an investment bank or special subsidiary) buys the loan pool, and a Trust Company is set up to purchase loans from the limited purpose company. The Trust Company packages the loans into certificates that can be sold to investors.

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(3) An agency rates the issue. Often a reserve for losses as well as credit guarantees from large credit worthy banks are included to gain a favorable rating.
(4) The bank gets two forms of non-interest revenues:
    a. The profit made on selling the loans; and
    b. Fees for continuing to service the loans over their life.

Structured Finance Transactions Examples:
Asset-Backed Commercial Paper (ABCP)
In addition to traditional securitizations, banks use structure securitizations to provide financing to businesses in creative ways that avoid limitations placed on banks in terms of the maximum that can be lent to a borrower or as a percentage of total capital and other regulatory restrictions. An example is asset-backed commercial paper (ABCP) that is used for off-balance sheet lending. With ABCP, accounts receivables of multiple corporate clients of banks are put in a special purpose vehicle (SPV). A trust in turn issues high quality commercial paper backed by the underlying accounts receivables. Often credit enhancers are used such as credit and liquidity lines from a bank or group of banks. The ABCP proceeds in turn are passed on to the corporate clients to use for liquidity needs and to pay for the accounts receivables that were sold. The advantage of ABCP is a lower cost of financing and access to markets for commercial paper that generally would require high credit ratings. Banks benefit by receiving fee income and better customer lending relationships.

Structured Project Finance Securitization
Similarly, project financing (for large public or capital-intensive projects) can be facilitated using structured finance. A special purpose vehicle (SPV) is created to issue debt serviced by cash flows from underlying assets held by the SPV. Long-term bank project loans are put in an SPV, which in turn issues senior and subordinated debt that will be serviced by cash flows that come from underlying projects. For instance, a bank may initiate the construction of a plant for a two-year phase, with an SPV taking on the loan, thereafter removing the loans from the bank's balance sheet. Since banks don't like to take on permanent long-term financing of projects, the project financing securitization lessens the problem and provides cheaper fixed-rate financing than if the bank initiated the loan and later sold it to a long-term lender.

Catastrophe-Linked Securities
Insurance companies at times cannot get reinsurance to handle potential large losses, but can use structured finance arrangements, CAT bonds, as a solution to this problem. With a CAT bond, similar to other structured bonds a remote SPV is set that is backed by collateral provided by an insurance firm.
With a CAT bond the securities that are issued by the SPV for the risk of a catastrophic loss in a particular regions, such as a hurricane in Florida. The coupon rate on the bond is set to be greater than the return on the collateral for the bond, with the excess premiums from the insurer paying for the excess return. The SPV in effect serves as a reinsurance contract for the insurance firm against the risk of a larger loss than expected. The cash proceeds from the security issuance is usually invested in high-quality fixed income investments that generate funds to use for payments against claims, with the

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yield that bondholders receive conditional on whether the insurance firm files claims for excess losses above the expected (attachment) point.

10. What are different types of loan sales?

Answers: Financial institutions are also active in selling loans to other financial institutions including pension funds, insurance companies, and other depository institutions.

Different types of loan sales include:

(1) **Participation**, where originating bank continues to hold the formal contract between the bank and the borrower.

(2) **Assignment**, where the loan is assigned to the buyer, but the originating bank may retain the lien on any collateral backing the loan or some other obligations.

(3) **Novation** (least common arrangement), where all rights and obligations are transferred to the buyer and the originator is free of any legal obligations to the buyer or the borrower.

(4) **Distressed Loan Sales**, such as international loans that are sold at large discounts. With the Brady Plan of 1989 countries were allowed, for instance, the exchange of loans for long-term bonds with longer maturities and more favorable terms with U.S. government guarantees for interest payments (debt for debt swaps). By the mid-1980s, a strong secondary market for trading less developed country debt emerged with large commercial banks and investment banks serving as brokers and dealers. Debt for equity swaps are also used to clean up distressed loans.

(5) **Syndicated loans** sold by large banks with prices quoted in the financial news. This market has become very large with prices quoted and data available through groups such as Reuters Loan Pricing Corporation. In this way, banks can abide by capital regulations concerning the amount that can be lent to one lender and reduce risk by having other banks take on portions of large loans.

(Also, see Appendix A & B: Overview Liquidity Analysis & Mini-Loan Analysis Cases for Loan Analysis Questions and Analysis.)

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Chapter 9: Multiple Choice Questions

(d) ____ 1. The 5 C's of Credit include which of the following:

a. Congeniality, Cash, Collateral, Capacity, & Credit
b. Credit Scoring, Credit Ratings, Collateral, Capital, & Conditions
c. Compensation, Capacity, Credibility, Collateral, & Capital
d. Character, Capacity, Capital, Collateral, & Conditions

(a)_____2. If a bank makes a loan and prices it with a variable rate, the bank passes on interest-rate risk to the borrower, possibly increasing the borrower's default risk for the loan if interest rates rise.

a. True
b. False

(a)_____3. The Zorro Corporation applies for a loan at Bank Zeta and provides the following information to the bank to calculate its Zeta Score (using the model):
Zeta = 1.2 WC + 1.4RE + 3.3ROA + .6 Equity + 1 AT, where WC = net working capital to total assets; RE = retained earnings to total assets; ROA is operating profit to total assets; Equity is the market Value of Equity to Total Debt; and AT is Sales/Total Assets.

What is the firm's Zeta Score? Given the following information:

Sales = $4,200,900	Retained Earnings = $393,000
Current Assets = $2,938,700	Current Liabs. = $1,369,000
Operating Profit = $970,000	Total Debt = $1,687,000
Total Assets = $4,500,430	Stock Price = $10 (with 100,000 Shares Outstanding)

a. 2.54
b. 3.54
c. 4.54
d. 1.54

Answer Calculation:
Z = 1.2[(2,938,700 – 1,369,000)/4,500,430)] + 1.4(393,000/4,500,430)
+ 3.3(970,000/4,500,430) + .6[$10 x 100,000 shares) /1,687,000]
+ 1(4,200,900/4,500,430] = **2.54**

(d)_____4. If a line of credit is given to a borrower for $2,000,000, with a stated rate of 10% on any used portion, a commitment fee of 0.50% on the unused portion of the line of credit. The average loan balance is 50% of the line of credit, and a compensating balance is required of 10% on the used portion of the loan commitment, and the bank has a reserve requirement of 10%, **what is the actual implicit return to the bank**?

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a. a. 10%
b. 11.18%
c. 10.54%
d. 11.54%

Answer Calculations:
Interest Expense = $1,000,000 x .10 = $100,000
Non-interest Expense = Commitment fee .0050 x $1,000,000 = $5,000
Compensating Balance Less Reserve Requirements
= $1,000,000 x .10 (1 - .10) = $90,000
Investable Funds = Loan Balance - Compensating Balance
= $1,000,000 - $90,000 = $910,000
Implicit Return = Total Expenses / Investable Funds
= $105,000/$910,000 = .1154 or **11.54%**

(a)_____5. Which of the following U.S. Acts requires that a bank must meet the credit needs of its area, especially in low and moderate income areas?

a. Community Reinvestment Act (CRA)
b. Equal Credit Opportunity Act
c. Fair Housing Act
d. Home Mortgage Disclosure Act

(e) _____6. Which of the following factors(s) are important factors to help reduce the default risk of a loan?

a. The pricing of the loan
b. A borrower's gross monthly income before taxes relative to the monthly loan payment
c. The Loan to Value (LTV) Ratio
d. Proper appraisal of property values
e. All of the above

(a)_____7. Which of the following statements is **false?**

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a. The Equal Credit Opportunity Act (Reg B) in the U.S. forbids discrimination in lending on the basis of race, color, national origin, sex, age, and marital status.
b. U.S. banks to not have any limits on how much they can lend to one borrower and has no restrictions on loans given to insiders.
c. The U.S. Fair Housing Act forbids discrimination based on any handicap or family status.
d. The U.S. Fair Credit Reporting Act of 1970 requires consumer credit agencies to stress accuracy, correct errors promptly, and to release individual consumer histories only for legitimate purposes.
e. The U.S. Truth in Lending (TIL) requirement requires that a bank must quote its rates as annual percentage rates.

(b) _____ 8. A discounted loan offers a lower loan rate than a regular (non-discounted) loan.

a. True
b. False

Answer: False, a discounted loan has a higher effective annual rate, since the borrower is given lower usable funds, i.e. the loan amount less the discount.

(c) _____ 9. A borrower who borrows $200,000 with a 6% stated annual rate with a 10% discount stipulation has an effective annual rate of:

a. 10%
b. 6%
c. 6.67%
d. 8.2%

Answer: EAR = [Interest Expense / (Loan Amount) (1 - discount%)]
= [$12,000/($200,000)(1 - .10)] = $12,000/$180,000 = .0667 or 6.67%

(c) _____10. Which of the following is not a typical restrictive covenant for a bank commercial loan?

a. Life insurance for key personnel
b. Minimum current and quick ratios
c. Bank is allowed to run the firm if repayment difficulties
d. Limits on borrower taking on additional debt and dividend payments

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(a)_____11. Loan terms that increase the effective rate on a loan **do not include** which of the following:

a. A discount loan
b. Points on a mortgage loan
c. Having a loan syndicate
d. Required compensating balance
e. Loan fees

(a)_____12. Lenders can reduce the risk of loan default by:

a. Increasing the frequency of payments
b. Requiring assets to be pledged as collateral
c. Requiring a larger down payment and lower loan to value ratio
d. All of the above
e. a. and b. only

(a)_____13. Which of the following is **false** concerning seasonal working capital loans?

a. Seasonal working capital loans are usually paid back over 5 years.
b. Seasonal working capital loans are typically collateralized by inventory and accounts receivables.
c. Seasonal working capital loans are usually paid back within a year.
d. A rough estimate of annual working capital needs is the daily cost of goods sold times a firm's cash conversion cycle days.

(b) _____14. Which of the following is **false** concerning a term loan?

a. A term loan is typically an amortized loan with equal payments over the life of the loan that Include interest and principal payments.
b. Longer-term loans to purchase depreciable assets are often for 20 to 30 years.
c. Longer-term loans to purchase depreciable assets typically have a maturity of 1 to 7 years.
d. Term loans are typically structured to match cash flows generated by the firm over the life of the equipment.
e. Collateral for a term loan is often the equipment being purchased.

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(a)_____15. Special considerations for commercial real estate and construction and development loans include which of the following:

a. Take-out commitments from a long-term lender after the completion of a project or after a certain number of years.
b. Surety bonds guaranteeing the completion of a project.
c. Higher loan rates and fees to compensate for the great risk of these loans.
d. Careful consideration of projected vacancy rates to reduce the risk of taking on a construction and development loan.
e. All of the above.

(a)_____ 16. Which of the following is not a step in a loan securitization?

a. Banks keep pools of loans on their books to be able to service and monitor these loans and pay investors that purchase mortgage backed securities (MBS).
b. Banks sell pools of loans on a recourse basis to a limited purpose corporation or special enterprise vehicle.
c. A Limited Purpose Corporation (LPC) buys the loan pool and a trust company is set up to purchase loans from the LPC, and the trust company packages the loans into certificates that can be sold to investors.
d. An agency rates the issue with often a reserve for losses as well as credit guarantees from large credit worth banks included to gain a favorable rating.

(a)_____17. Which of the following is **false** about mezzanine lending?

a. Mezzanine loans are longer-term, unsecured loans in which a firm's cash flow is the major source of repayment.
b. Start-up firms typically get mezzanine loans before they are able to generate large cash flows.
c. Mezzanine loans often contain an option through which the lender can share in the increased value of the business to compensate for the relatively high risk of the loan, allowing a lower interest rate, with financing often containing layers of different investors with senior and junior debt including warrants attached that allow future equity stake in a firm and bond financing privately placed.
d. Mezzanine loans are for more established firms that have stable cash flows to be able to make loan payments.

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