Week 9 Recitation

This week we are going to investigate the role of banks in the financial system, what are the basic mechanisms that allow a bank to operate with financial health, and how can banks as a whole create money in an economy.

1) What are the four functions of money? Can you name some item that is a store of value, but does not serve the other functions of money?
   1. **Medium of Exchange – you don't "consume" money, you use money to consume other things**
   2. **Store of Value – preserves economic value for future use**
   3. **Unit of account – how we measure prices, GDP, income, wealth, etc.**
   4. **Standard of deferred payment – can be used as credit. Can make purchases today and pay it back later.**

   Lots of items that people buy and sell can serve as a store of value but not meet the other functions of money. Examples include a house, land, baseball cards, art, stocks, cars, etc.

2) How do we measure how much money is in our economy? Is a debit card money?

   We can look at the "narrow" measurement, which only include money in circulation or can be easily placed into circulation. If money is easily placed in circulation it is highly "liquid". This category is called M1 money supply, it includes currency in circulation, checking accounts, and saving accounts. Saving accounts became part of M1 starting in 2020 (prior to which they were part only of M2).

   Or we can look at the broad definition, which includes all of M1 plus some less liquid forms of money like Money Market funds and time deposits. This category is called the M2 money supply. It includes money that is easily placed in circulation and some that aren't quite as easy. Prior to savings becoming part of the M1 money supply, the difference between M1 and M2 was quite substantial. But since 2020, this distinction has become much less important.

   A debit card is not money. It is a platform to exchange money or to move money around. However, a debit card can automatically take from your M1 money in your checking account.

3) Imagine that you are in the position of buying loans in the secondary market (that is, buying the right to collect the payments on loans) for a bank or other financial services company. Explain why you would be willing to pay more or less for a given loan if:

   a. The borrower has been late on a number of loan payments

A borrower who has been late on a number of loan payments looks perhaps less likely to repay the loan, or to repay it on time, and so you would want to pay less for that loan.

b. Interest rates in the economy as a whole have risen since the bank made the loan
If interest rates generally have risen, then this loan made at a time of relatively lower interest rates looks less attractive, and you would pay less for it.

c. The borrower is a firm that has just declared a high level of profits
If the borrower is a firm with a record of high profits, then it is likely to be able to repay the loan, and you would be willing to pay more for the loan.

d. Interest rates in the economy as a whole have fallen since the bank made the loan
If interest rates in the economy have fallen, then the loan is worth more.

4) The table below represents the T-account for the KRS Bank. First, describe each component of the assets and the components of the liabilities. Then, calculate the net worth and briefly describe the financial health of the KRS Bank. If there's a run on banks and all clients decide to cash their deposits, would the KRS Bank be able to honor their responsibilities with their clients?

Assets		**Liabilities + Net Worth**	
Loans	\$8 million	Deposits	\$12 million
Government Securities	\$3 million		
Reserves – mandatory (Federal Reserve)	\$0.6 million		
Reserves – voluntary (own premises)	\$0.4 million	Net Worth	?

The loans represent the market value of the loans that the KRS Bank lended to their clients. This means that, if they were to sell their loans in the secondary financial market (the market between financial institutions), that's how much money they would get, and the buyers (i.e. another financial institution) would have the right to collect those loans from the clients. The primary financial market is the one involving households and financial institutions.

Government securities are bonds that the KRS Bank has bought from the government of this imaginary country. In general, when those bonds come from the government, the return is smaller than bonds offered by private institutions, but they are more secure. That value represents the market value of those bonds.

The mandatory reserves are the percentage of deposits that the monetary authority (in general the Federal or Central Bank) requests the banks to hold, as a guarantee. As we shall discuss later, that percentage can change depending on the Federal Bank's strategy—if they want to increase the amount of money in an economy, the mandatory reserves should decrease, and vice-versa.

The voluntary reserves represent an extra reserve (on top of the federally determined one) that the bank decides to hold. If they are overall pessimistic about lending money—due to bad expectations about the economy, like a perceived increased risk of default by their clients—they tend to increase their reserves voluntarily.

The deposits are the total deposits that the clients make in their checking accounts, savings or deposit certificates. They are a liability because, whenever the client decides to take that money back, it's mandatory for the bank to provide it for them.

The last component of the right hand side of the T-account is net worth, which is the total assets minus the deposits. It is a component of the right hand side because the T-account should always sum to zero.

Assets = Liabilities + Net Worth: \$8 + \$3 +\$0.6 + \$0.4 = \$12 + Net Worth

Net worth = 8 + 3 + 0.6 + 0.4 – 12 = \$0

This means that the KRS Bank would (in theory) be able to honor their responsibilities with their clients, but it would end up with no money at all. Therefore, the bank is not immediately going out of business, but it should start thinking about strategies to increase their financial health. Moreover, with many of the bank's assets in form of illiquid loans, if all depositors asked for their money back, the bank would likely not be able to meet those obligations (as they can't just call in all loans). They may be able to sell some of those loans on the secondary loan market, but if this is an ecnomy wide crisis, the value of those could also be substantially lowered.

5) How could the KRS Bank increase their financial health? List at least two suggestions.

(1) Diversify their clients. Sometimes, when a bank is too specialized, a crisis in that sector can make them too vulnerable. If the KRS Bank does the majority of their loans to cabbage farmers, for example, a bad cabbage crop would increase the risk of default, so the market value of their loans would decrease.
(2) Invest their voluntary reserves in either government bonds or other secure but profitable financial assets.
(3) Sell part of their loans in the secondary market and invest that money in bonds.
(4) Offer to clients the possibility of applying their money in less liquid bonds (or money market accounts), so that they can decrease the magnitude of deposits.

6) Suppose that a client who took \$1 million in loans from the KRS Bank deposited that money at her checking account at Mila Bank. Mila Bank kept the mandatory reserves and lent the rest to other clients. Supposing that the face value and the market value of those loans are exactly the same, and that this is the only operation of Mila Bank, what does the T-account of Mila Bank look like? Calculate the money multiplier and the potential total change in the M1 money supply after this deposit, supposing that there are multiple banks operating in this economy (and they all hold only the mandatory minimum reserves), and interpret your result.

From the KRS Bank T-account, we can see that the mandatory reserves are 5% of deposits. The rest of that money, that enters in the form of deposits, will be loaned to other people.

Assets		Liabilities	
Loans	**\$0.95 million**	**Deposits**	**\$1 million**
Reserves – mandatory (Federal Reserve)	**\$0.05 million**		

Money multiplier: 1 / 0.05 = 20

Since the Mila Bank has $0.95 million in loans, people who take those loans deposit them in their savings or checking accounts at other banks, which will keep the 5% reserves and lend it for other people, and so on. So the (potential) change in the M1 money supply in this economy is: 20 * 0.95 = $19 million. This is how banks create money in the economy: because of the money multiplier, a $1 million deposit can create a $19 million increase in M1.

7) Why is the change in M1 calculated on the previous questions a possible, rather than guaranteed, increase in money supply?

For the money supply to actually increase, the people/businesses that take loans must deposit it at another bank, and that bank must choose to lend it to someone too. If people decide to take the money and get it out of the banking system (say, by using it in illegal activity or just leaving it under the mattress at home), or if the bank is unable or unwilling to lend it for any reason (e.g. banks hold voluntary or excess reserves), that potential money increase will not occur. That can happen if the risk of default by lenders increases, for example, so the market value of those loans will decrease, and likely the banks will not be willing to lend that money. Similarly, if people start to decrease their trust in banks, they are less likely to put their money back in the banking system—after the 2008 crisis, for example, there was a big movement incentivizing people to use credit cooperatives and other alternatives because they were afraid of a new wave of bankruptcies, and there was an overall feeling of unfairness when banks were bailout with trillions of dollars. It could also be that the cetnral bank offers interest on reserves (as the Federal Rerserve in the US now does). Then if interst on reserves is relativey high, the bank may not want to laon out the money, rather opting to earn the high risk-free return on reseves held at the central bank.

8) [Discussion questions] During the 2008 crisis, the investment bank Lehman Brothers bankruptcy became the largest bankruptcy filing in history, which intensified the financial crisis and contributed to the erosion of almost $10 trillion in market capitalization from global capital markets. At the time, their latest published T-account showed $639 billion as assets and $619 billion as liabilities, indicating a relatively good standing regarding their financial health. However, they were tricking the public by using a procedure called Repo 105, that allowed Lehman to receive cash in exchange for $50 billion of their assets which was used to pay down their liabilities and temporarily show less leverage (assets/net worth). Immediately after the publication of their quarterly financial statements and armed with this favorable financial picture of their balance sheet, Lehman went into the open market and secured loans. The proceeds would then be used to repurchase the assets at 105 percent of the cash amount received. For that, three chief executives of Lehman Brothers were sued. Based on your knowledge of banking, do you think they were rightfully accused of wrongdoing? In your opinion, should banks be able to perform such risky operations? How can this bankruptcy affect the whole banking system and the economy as a whole?

This question was designed for the students to debate, so you can ask them to form groups of 3-4 people and then briefly summarize what they talked about for the rest of the

class. They should be able to understand that T-accounts are a great way of understanding banks, but there are ways to trick the audience that reads them—so it's important to understand how they operate. Since a massive bank went out of business, this caused a severe decrease in M1 (remember about the money multiplier), which leads to a recession in the economy (we will talk more about that next week). Further, it decreases the people's trust in banks, that can decrease their willingness to deposit their money in a checking or savings account, further decreasing M1.

Observed leverage ratio = 639 / (639-619) = 31.95

Actual leverage ratio = 689 / (689-669) = 34.45