ECON 351: Assignment 2

1. (Credit Creation) Understanding bank balance sheet is useful since it also helps our understanding of the process called "credit creation." This process shows that the Fed (central bank)'s policy of increasing the money supply is enhanced by banks' operations. Suppose an occurrence of the Fed's open market purchase proceed as follows:

   1. The Fed decided to purchase $100 millions of securities from Bank A.

   2. Bank A holds 10% of its increase in liquidity as required reserves, 40% as excess reserves, and use 50% as loans to Borrower A.

   3. Borrower A holds 50% of her liquidity as currency and 50% as deposits in Bank B.

   4. Bank B holds 10% of its increase in liquidity as required reserves, 40% as excess reserves, and use 50% as loans to Borrower B.

   5. Borrower B holds 50% of her liquidity as currency and 50% as deposits in Bank C.

   4. Finally, Bank C holds all of its increase in liquidity as reserves (required reserves plus excess reserves). Hence the deposit creation process stops here.

   The following balance sheet records the changes in compositions of assets and liabilities for each market participants. Fill the numbers in *a*-*i*.

Fed			
Assets		Liabilities	
Securities	+\$100 million	Currency+Reserves	+\$___ million

Bank A		
Assets		Liabilities
Securities	−\$100 million	
Required reserves	+\$ a million	
Excess reserves	+\$ b million	
Loans	+ \$50 million	

Borrower A			
Assets		Liabilities	
Currency	+\$ c million	Borrowing	+\$50 million
Deposits	+\$ d million		

Bank B			
Assets		Liabilities	
Required reserves	+\$ e million	Deposits	+\$ d million
Excess reserves	+\$ f million		
Loans	+\$ g million		

Borrower B			
Assets		Liabilities	
Currency	+\$ h million	Borrowing	+\$ g million
Deposit	+\$ i million		

Bank C			
Assets		Liabilities	
Reserves	+\$ i million	Deposits	+\$ i million

The answers are

$$a = 10$$

$$b = 40$$

$$c = 25$$

$$d = 25$$

$$e = 2.5$$

$$f = 10$$

$$g = 12.5$$

$$h = 6.25$$

$$i = 6.25$$

2. (Bank Run) Answer the following question about a bank run.

   (a) Explain what is a bank run.

   A bank run is an episode in which many depositors rush to withdraw their deposits. It causes a huge overflow of deposits for a bank and might lead to a bank failure.

   (b) Explain why a special consideration is needed for preventing bank run. In particular, explain why bank run may occur when the bank is healthy enough to be solvent.

   Even if a bank is solvent, an occurrence of a bank run might leads to too much deposit outflow and result in a bank failure. Thus, concerns by depositors about a bank failure becomes self-fulfilling.

   (c) Explain why deposit insurance is effective in preventing bank runs.

   When deposit insurance is installed, consumers do not have to join a bank run to insure their deposits. In other words, this prevents the "bad equilibrium" in Diamond and Dybvig model.

   (d) *Further Reading*: The problem of bank run and its self-fulfilling character is analyzed in Diamond and Dybvig (1983). Also see the survey by Shin (2009).

3. (Credit Cycles) Consider a bank with the balance sheet given below.

Assets		Liabilities	
Reserves	\$ 10 million	Deposits	\$ 80 million
Securities	\$ 50 million	Bank Capital	
Loans	\$ 30 million		

Answer the following questions.

(a) Compute the bank capital.

The bank capital is the total value of assets minus the total value of liabilities. Thus $90 - 80 = 10$.

(b) Assume that there was a default in mortgages loans by 10 million dollars worth. Draw the resulting bank balance sheet.

The resulting balance sheet is

Assets		Liabilities	
Reserves	\$ 10 million	Deposits	\$ 80 million
Securities	\$ 50 million	Bank Capital	\$ 0 million
Loans	\$ 20 million		

(c) Because of the decreased bank capital, the bank has to sell their assets by 10 million dollars. Suppose that it decides to sell securities. Since many other banks are in the same situation and they sold securities, too. Because of the surge of supply, the price of the securities had dropped and it caused the depreciation of bank's securities by 5 million dollars worth. Draw the resulting bank balance sheet.

Because of the sales of the securities by 10 million dollars and of the 5 million-dollar depreciation of the values, the total reduction in the value of the securities is 15 million dollars. Then the resulting balance sheet is

Assets		Liabilities	
Reserves	\$ 20 million	Deposits	\$ 80 million
Securities	\$ 35 million	Bank Capital	-\$ 5 million
Loans	\$ 20 million		

(d) *Further Reading* Similarly to this problem, an occurrence of asset depreciation causes deterioration of bank balance sheet and that further causes contraction in credits. In other words, the existence of credit amplifies the business cycle. This possibility is first analyzed by Kiyotaki and Moore (1997). Also see the survey by Mian and Sufi (2018)

Reference Diamond, Douglas W., Philip H. Dybvig (1983), "Bank Runs, Deposit Insurance, and Liquidity," *Journal of Political Economy*,31, 31,401-419.

Kiyotaki, Nobuhiro, and John Moore (1997), "Credit Cycles," *Journal of Political Economy*, 105, 2, 211-248.

Mian, Atif, and Amir Sufi (2018), "Finance and Business Cycles: The Credit-Driven Household Demand Channel," *Journal of Economic Perspectives*, 32, 3, 31-58.

Shin, Hyun Song (2009), "Reflections on Northern Rock: The Bank Run that Heralded the Global Financial Crisis," *Journal of Economic Perspectives*, 23, 1, 101-119.