Assignment 5 for Econ 452 (2020)

Penn State University

Due: before 1:45pm on April 30, 2020.
Please hand in through Canvas assignment. Do NOT send me or the TA by email.

Question 1. (20 pts) Consider a bank that has made 100 mortgage loans of the following form:

loan amount:	$\$200,000$
fixed mortgage rate:	6%
length/maturity:	30 years
payment frequency:	monthly

An investor is contemplating the purchase of this pool of mortgage loans. For the investor, the annual rate of return on alternative investments is 4.2%. Assume that the mortgage pool does not have any default risk and that there are no fees to be paid in the transaction. Calculate the amount that the investor is willing to pay for the pool of mortgage loans. Using the receipts of this sale, how many new mortgage loans of the above form can the bank make? Support your answer with calculation.

Question 2. (8 pts) Consider a credit default swap (CDS) of a notional amount \$10 million and a term of one year. The CDS spread is 120 basis points and the payment is quarterly. The credit event is a default on the bond. The seller is A and the buyer is B.

(1) **(4 pts)** If the bond has not defaulted, calculate the payment from B to A in the first quarter of the contract.

(2) **(4 pts)** Suppose that there is default on the bond in the fourth quarter immediately after the premium in the quarter is paid but before the contract expires. If the recovery value of the bond is 20% of the par value, calculate the payment from A to B in a cash settlement.

Question 3. (3 pts each) For each statement below, answer whether the statement is true or false for the U.S. Briefly explain your answer.

(1) Fannie Mae performed the useful function of increasing the liquidity of the secondary market of mortgage loans.

(2) Putting different mortgage loans in a pool for selling is always bad for the economy.

(3) The asset in an asset backed security is often a fixed asset such as a building.

(4) Mortgage backed securities helped mortgage originators to replenish their funds.

(5) In a pass-through mortgage backed security, the repayments on mortgage loans are passed through to the mortgage lender.

(6) When a special purpose vehicle (SPV) of an MBS becomes insolvent, the issuer of the MBS is not legally responsible for rescuing the SPV.

(7) By setting up an SPV for an MBS, the issuer of an MBS can potentially increase the liquidity of the MBS.

(8) If a bond is rated BBB+ by the Standard & Poor's, the bond has an investment grade.

(9) Tranching a pool of assets reduces the default risk of the pool.

(10) It is always more profitable to buy senior tranches than junior tranches of an MBS.

(11) Putting a large number of mortgage loans in the same pool does not reduce the exposure of the pool to unpredictable changes in the aggregate economy.

(12) An MBS collateralized debt obligation (CDO) can potentially increase the liquidity of the underlying MBS.

(13) A CDO^2 is a CDO created by putting two or more CDOs together and then tranching the combined pool.

(14) By buying a credit default swap (CDS) on a bond, an investor can potentially hedge against the default risk of the bond.

(15) The notional amount of a reference bond in a CDS cannot exceed the amount of the bond that the buyer holds.

(16) The spread of a CDS on an MBS does not necessarily provide accurate information on the likelihood of default of the MBS.

(17) The repo rate is usually lower than the effective Fed Funds rate because there are more participants in the repo market than in the Fed Funds market.

(18) The haircut in a repo is the fraction of the asset that the lender retains when the repo contract expires.

(19) An open repo allows the borrower to roll over the debt.

(20) In 2006, government Treasury securities but not MBSs were used in repos.

(21) A reverse repo is a repo in which the haircut is negative.

(22) Shadow banking is an illegal activity in the U.S.

(23) The 2008-2009 financial crisis can be understood as a run on commercial banks.

(24) All government Sponsored Enterprises are explicitly backed by the government.