Final Exam

Fall 2018 | Econ 180-266

Closed Book.
Calculators OK.
Time Allowed: 3 Hours
All Questions Carry Equal Marks

Section A: True or False

3 points for each correct answer; -3 points for each incorrect answer; 0 points for questions left unanswered. Total score on section A cannot be negative.

Please say if each of these statements is true or false.

1. The Federal Reserve system receives an annual appropriation from Congress to cover its operating expenses.

2. The lower is the correlation among defaults, the safer is the senior tranche of a Collateralized Mortgage Obligation.

3. In the financial crisis, the default rates on fixed rate mortgages exceeded those on adjustable-rate mortgages.

4. Crude oil futures contracts are physically settled.

5. Closed end mutual fund shares can always be sold back to the issuer for the net asset value.

6. The *when issued* market is a forward market where two parties agree today to trade a security that has not yet been issued.

7. 88 percent of all foreign exchange trades are between the dollar and some other currency.

8. CDS contracts on sovereign bonds are generally denominated in the currency of whatever country issued the bonds.

9. When interest rates rise, bond prices increase.

10. Crude oil is by convention traded in US dollars.

Section B: Multiple Choice.

4 points for each correct answer; -1 points for each incorrect answer; 0 points for questions left unanswered. Total score on section B cannot be negative.

1. Which of the following is considered to be a *currency swap*?
A. A spot contract to buy foreign currency.
B. An exchange of a fixed payment in foreign currency for a floating payment in foreign currency.
C. A contract to pay for goods in a foreign currency.
D. A spot contract to buy foreign currency coupled with a forward contract to sell foreign currency.
E. A cash-settled futures contract to buy foreign currency.

2. Which of the following best describes the *Volcker rule*?
A. A rule that relates the short term interest rate to the unemployment and inflation rates.
B. A rule that large banks must have a Tier 1 capital ratio that exceeds 6 percent.
C. A rule that restricts banks' trades in bonds and stocks for their own accounts.
D. A rule that limits the leverage of investment banks to no more than 15.
E. A rule that limits off-balance-sheet activity of non-bank financial institutions.

3. Which of the following countries has a floating exchange rate?
A. Denmark.
B. Hong Kong.
C. Ecuador.
D. Canada.
E. Bermuda.

4. In international finance, which of the following best describes "original sin"?
A. The phenomenon that emerging markets cannot borrow in their own currency.
B. The phenomenon that emerging markets cannot borrow for short maturities.
C. The phenomenon that emerging markets cannot borrow from banks in their own countries.
D. The phenomenon that emerging markets cannot borrow from the IMF.
E. The phenomenon that emerging markets cannot borrow at fixed interest rates.

5. Which of the following institutions is NOT eligible to receive interest on reserves from the Federal Reserve, but IS eligible to receive interest on reverse repo transactions with the Federal Reserve.
A. Commercial banks.
B. Money market mutual funds.
C. Exchange traded funds.
D. Nonfinancial corporations.
E. Credit unions.

6. In a fractional reserve banking system, suppose that the cash-to-deposit ratio is 0.2 (consumers hold 20 percent of their wealth in cash and deposit the rest) and the reserve ratio is also 0.2 (banks hold 20 percent of the deposits that they receive as reserves and lend out that the rest). Which of the following is the money multiplier?
A. 0.33
B. 1
C. 3
D. 5
E. 5.5

7. Which of the following is closest to the historical Sharpe ratio on major US stock market indices, like the S&P500?
A. 0.12
B. 0.44
C. 1.60
D. 2.50
E. 18.6

8. Which of the following is the discount rate:
A. The interest rate that the Federal Reserve charges banks for emergency uncollateralized loans.
B. The interest rate that the Federal Reserve charges banks for emergency collateralized loans.
C. The interest rate that the Federal Reserve charges government sponsored enterprises for emergency uncollateralized loans.
D. The interest rate that the Federal Reserve charges government sponsored enterprises for emergency collateralized loans.
E. The interest rate at which banks lend to the largest corporate borrowers.

9. What name is given to the situation in which a futures price for delivery in one year is higher than the current spot price:
A. Backwardation.
B. Upwardation.
C. Risk reversal.
D. Investment basis.
E. Contango.

10. What kinds of pension plans does the Pension Benefit Guaranty Corporation insure?
A. Private sector defined benefit and defined contribution plans.
B. Private sector defined benefit plans.
C. Private sector defined contribution plans.
D. All defined benefit plans.
E. All defined contribution plans.

11. Which of the following best describes a monoline insurer?
A. An insurer that sells insurance to just one customer.
B. An insurer that sells term life insurance.
C. An insurer that operates in just one state.
D. An insurer that sells property and casualty insurance.
E. An insurer that sells insurance against bonds defaulting.

12. Which of the following currencies are normally quoted with the foreign currency as the base (as defined in class)?
A. Norwegian Kroner.
B. Euro.
C. Japanese Yen.
D. Swiss Franc.
E. Hong Kong Dollar.

13. Which of the following best describes the three-month dollar LIBOR-OIS spread?
A. The difference between the three-month dollar LIBOR rate and the fixed rate on an interest rate swap contract where the floating rate is the average federal funds rate over three months.
B. The difference between the three-month dollar LIBOR rate and the three-month dollar repo interest rate.
C. The difference between the three-month dollar LIBOR rate and the federal funds rate today.
D. The difference between the three-month dollar LIBOR rate and the three-month Treasury bill rate.
E. The difference between the three-month dollar LIBOR rate and the three-month euro LIBOR rate.

14. Suppose that you have bought CDS protection on $50,000,000 of debt issued by XYZ corporation. The CDS is cash settled. XYZ defaults, and the value of their bonds after default is 80 cents on the dollar. What payment do you receive?
A. $10,000,000.
B. $25,000,000.
C. $40,000,000.
D. $50,000,000.
E. $62,500,000.

15. You buy a Treasury bill (face value: $10,000) at an interest rate quoted on the standard discount basis of 4 percent, with a maturity of 180 days. What is the dollar amount that you pay for this bill?
A. $9,600.
B. $9,800
C. $9,900.
D. $10,100.
E. $10,200.

16. According to the dividend discount model, if the required return on a stock is 5 percent, if it pays dividends of $1 per share and has no growth in dividends, what should it's share price be?
A. $5
B. $10
C. $20
D. $21
E. $50

17. Which of the following is NOT true of real estate investment trusts:
A. They are subject to corporate income tax.
B. They pass most of their income through to shareholders as dividends.
C. Their shares can be bought and sold by any member of the public.
D. They invest in real estate and/or mortgages.
E. Investors pay income tax on real estate investment trust dividends.

18. Which of the following is NOT a feature of a standard residential mortgage?
A. The borrower can pay off the mortgage at any time without penalty.
B. The borrower must make payments to an escrow account to cover property taxes and insurance.
C. Payments are due every month.
D. Mortgages are for 15 or 30 year terms.
E. The principal is owed by the borrower in a single balloon payment at the end of the term of the mortgage.

19. Which of the following defines a rights issue?
A. A firm issuing options to the general public to buy additional shares.
B. A firm issuing options to existing shareholders to buy additional shares.
C. A firm issuing preferred stock which carry the right to a fixed dividend.
D. A firm issuing proxies which are used by shareholders to exercise their voting rights.
E. A firm issuing options to management granting them the right to sell their shares.

20. If you buy stock on margin, what is the initial margin set by Federal Reserve Regulation T?
A. 5%
B. 20%.
C. 25%.
D. 30%
E. 50%.

Section C: Other questions

1. (10 points). The spot euro-dollar exchange rate is 1 euro=$1.1. One-year interest rates are **minus** 0.25 percentage points in the euro zone and **plus** 2.5 percentage points in the US. According to covered interest parity, what is the one-year forward euro-dollar exchange rate?

2. (15 points) Consider a Diamond-Dybvig model. There are 3 periods and 100 consumers. They can consume at time 1 getting c_1 or at time 2, getting c_2. 50 of the consumers have utility $1-\frac{1}{c_1}$. 50 have utility $1-\frac{1}{c_2}$. At the start, they don't know which type they are and so their utility function at time zero is:

$$\frac{1}{2}(1-\frac{1}{c_1})+\frac{1}{2}(1-\frac{1}{c_2})$$

Each consumer has $1 at time zero. There are 100 projects that each cost $1 at time 0, is worth $1 at time 1 or $2.25 at time 2. The bank offers to take a deposit of $1 that is worth $1.20 at time 1 and $1.70 at time 2.
(a) What is the utility at time zero of directly investing in a project?
(b) What is the utility at time zero of investing in the bank deposit?
(c) If only 50 consumers demand their money at time 1 and all get paid in full, and the other 50 demand their money at time 2, how much of a profit will the bank have left over at time 2?

3 (25 points). Please explain each of the following five terms briefly but precisely:
(a) A credit-linked note.
(b) A swaption.
(c) The weak version of the efficient markets hypothesis.
(d) The Trilemma.
(e) A letter of credit.

4.(10 points). Consider the original Taylor rule as proposed by John Taylor. Suppose that the unemployment rate is 7%, the inflation rate is 2% and the NAIRU is 4%. What should the federal funds rate be, according to this rule?

5. (10 points). You buy a European put option at a strike price of $20 on GE shares. The option costs you $2.
(a) Suppose that at the maturity of the option, the price of GE shares is $19. What is your profit or loss on this position?
(b) Suppose that at the maturity of the option, the price of GE shares is $15. What is your profit or loss on this position?

6. (10 points). You have entered into a plain vanilla interest rate swap contract in which you receive fixed and pay floating. The floating rate is three month LIBOR and payments are exchanged four times a year. The fixed rate is 3 percent. The notional underlying is $100,000,000. At a payment date, LIBOR is 2.5 percent. Do you make a receive a payment? How much?

7. (10 points). Suppose that you short a December Eurodollar futures contract at a price of $98.10. On settlement day, the three-month LIBOR interest rate is 2.7 percent and the three-month Treasury bill rate is 2.5 percent. Do you make or receive a payment? How much?

Solutions

Section A.
1. False.
2. True.
3. False.
4. True.
5. False.
6. True.
7. True.
8. False.
9. False.
10. True.

Section B.
1. D.
2. C.
3. D.
4. A.
5. B.
6. C.
7. B.
8. B.
9. E.
10. B.
11. E.
12. B.
13. A.
14. A.
15. B.
16. C.
17. A.
18. E.
19. B.
20. E.

Section C.
1. The forward rate satisfies $1.1*(1+0.025)=F*(1-0.0025)$ which gives a forward rate of 1.1303. No credit for getting it backwards. 2 points off for an algebraic error. If you get the correct answer with a dollar base (forward rate of $1=0.885 euro), that is acceptable.

2. (a) $=\frac{1}{2}(1-\frac{1}{2.25})=\frac{5}{18}=0.2777$
(b) 0.2892
(c) The bank needs to sell 60 projects at time 1 to pay $1.20 to each of 50 investors. The remaining 40 projects can be held to time 2 and are worth $2.25 each for a total of $90. The 50 remaining investors get $1.70 each, for $85 total. The bank is left with a profit of $5.
5 points for each part with no partial credit.

3. 5 points for each part.
(a) A **credit-linked note** is a bond issued by a bank which pays a high coupon. But it refers to some other borrower, and if that borrower defaults, then the credit-linked note does not have to be repaid in full. Instead, the bank just has to pay an amount equal to the recovery rate on the defaulted bonds. 4 points for the idea but not specifying recovery.
(b) A **swaption** is a contract giving the holder the right but not the obligation to enter into a swap contract (either to pay fixed or pay floating).
(c) The **weak version of the efficient markets hypothesis** states that future asset price movements cannot be predicted using past price and volume data. 2 points if you say that can't be predicted with "historical information" as that is too vague and could be any version of the efficient markets hypothesis.
(d) The **trilemma** states that countries can select any two of the following three policies: a floating exchange rate, an independent monetary policy and an absence of capital controls.
(e) A **letter of credit** is a commitment from a bank to pay for goods that are delivered to a buyer, in the event that the buyer fails to pay. They are typically issued in the context of international trade, so that an exporter will be assured that they will receive payment.

4. It should be $2+2+0.5(2-2)-(7-4)$ which is 1 percent. No partial credit for using the wrong formula, such as having a positive coefficient on unemployment.

5. (a) Loss of $1.
(b) Profit of $3.

6. I **receive** a payment of $0.25*(0.03-0.025)*100,000,000$ which is $125,000. No credit for getting it backwards or failing to state if the payment is made or received. 7 points if fail to multiply by 0.25.

7. The settlement price is 97.3. So I **receive** $2,500*(98.1-97.3)=$2,000. No credit for getting it backwards or failing to state if the payment is made or received.