

Name: \_\_\_\_\_

Midterm exam I  
Answers  
266: Fi. Markets and Institutions  
Spring 2017  
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Directions:

You have 70 min. to do the exam (unless other arrangements have been made).

Some questions offer a bit of choice on which parts you do, so read carefully. If you answer too many parts, we will grade the first ones and ignore extras.

Where computations are required, full points will be given for the correct answer. For incorrect answers, partial points will be given if warranted. For example, the proper formula with the relevant values plugged in will get near full points.

You may write on the backs of the exam pages and request additional paper.

If your answer extends outside the space provided, you must label clearly where the additional portion is located.

All parts of all questions are worth equal value.

The last page of the exam is marked, 'The End.'

**1 Definitons. Do 5 of 6.**

1.1 Asymmetric information in financial markets

**Answer/comment**

Asymmetric information simply means that the two parties to a transaction have different information material to the merits deal.

1.2 S&P 500 stock index.

**Answer/comment**

The Standard and Poor's 500 is an stock market index reflecting the prices of 500 large U.S. traded firms. In particular, it is a capitalization-weighted index.

1.3 Limit order to buy a stock.

**Answer/comment**

A limit order to buy is an order purchase the stock at or below a stated price. If the price is higher than the limit price, the stock is not purchased.

1.4 Par value of a bond.

**Answer/comment**

The face or principal value of the bond. The amount that is repaid at maturity.

1.5 Stock broker.

**Answer/comment**

A stockbroker or simply a broker, is a professional who executes buy and sell orders for stocks on behalf of the general public.

1.6 Primary market (for a financial instrument)

**Answer/comment**

The primary market is the market where the instrument, say a new stock or bond, is initially sold to the public.

2 **Facts.** Give answers to the following questions. Be sure to state units when appropriate.

- 2.1 The U.S. Treasury yield curve in the U.S. generally slopes [pick one: up/down ], implying that yields on longer-maturity bonds are generally [pick one: higher/lower] than yields on shorter maturity bonds.

**Answer/comment**

Up - Higher

- 2.2 Typical yields on municipal debt in the U.S. have historically tended to be [pick one: higher/lower] than yields on U.S. Treasury Debt. In the aftermath of the crisis, typical yields on municipal debt have often been [pick one: higher/lower] than yields on 10-year Treasury debt.

**Answer/comment**

Lower - Higher

- 2.3 U.S. stock indices have fallen in value by more than 30 percent [pick one: once/twice/many] times this century.

**Answer/comment**

Twice (the financial crisis and the tech bubble) Side note: flash crash was around 9%.

- 2.4 What is the approximate value for U.S. nominal GDP?

**Answer/comment**

Approximately 20 Trillion Dollars

- 2.5 Nonfinancial corporate business debt as a share of GDP has [pick one: generally risen/generally remained steady/fluctuated widely with no clear trend] since 1950.

**Answer/comment**

generally risen

- 2.6 Late on election night in Nov. 2017, Paul Krugman wrote for the New York Times, 'It really does now look like President Donald J. Trump, and markets are plunging. When might we expect them to recover? ...I guess people want an answer: If the question is when markets will recover, a first-pass answer is never.' In reality, the recovery took [pick one: less than a day/a decade/a millennium]

**Answer/comment**

less than a day

3 Pricing a bond. We have a coupon bond with 2 years remaining to maturity. Principal value is \$100; annual coupon is \$2.23; yield to maturity is 3 percent.

3.1 The price of the bond today is what?

Answer/comment

$$\begin{aligned} P &= \frac{C}{1+i} + \frac{C+F}{(1+i)^2} \\ 98 &= \frac{2.23}{1+0.03} + \frac{2.23+100}{(1+0.03)^2} \end{aligned}$$

3.2 What is the coupon rate on this bond, in percent?

Answer/comment

2.23/100, or 2.23%

3.3 What is the current yield on this bond, in percent?

Answer/comment

Current Yield = Annual Coupon/Current Bond Price = 2.23/98 or 2.28%

4 Expectations theory of interest rates.

Suppose the current 1-year spot rate is 1 percent, the 2-year spot rate is 3 percent, and the 3-year spot rate is 3 percent, or  $i_{1,t} = 0.01$ ,  $i_{2,t} = 0.03$ , and  $i_{3,t} = 0.03$ .

Note: In this question, you may use the standard approximate formulation (based on  $\ln(1+z) \approx z$ ).

4.1 Under the expectations theory of the term structure, what do market participants expect the 1-year rate to be 1 year from now? And 2 years from now?

Answer/comment

You could do this using the approximation or not. First let us show not using the approximation:

$$\begin{aligned} P &= \frac{C}{1+i} + \frac{C+F}{(1+i)^2} \\ 98 &= \frac{2.23}{1+0.03} + \frac{2.23+100}{(1+0.03)^2} \end{aligned}$$

one year from now:

$$(1.03)^2 = (1.01)(1+x)$$

so  $x = 0.05$  and the expectation is 5 percent.

two years from now:

$$(1.03)^3 = (1.03)^2(1 + x)$$

so  $x = 0.03$ , and the expectation is 3 percent.

Using the approximation, we have that, say, the 2-year rate equals the average of the two one-year rates that will prevail during the two years. For the one-year rate in one year:

$$0.03 = (0.01 + x)/2$$

or  $x = 0.05$  as before.

Two years from now:

$$0.03 = (2 \times 0.03 + x)/3$$

or  $x = 0.03$ .

- 4.2 Suppose the Fed causes the 1-year spot rate to increase to 2 percent ( $i_{1,t} = .02$ ), but expectations of future 1-year rates in years 2 and 3 remain as in the previous question. What is the new value for the 3-year spot rate  $i_{3,t}$ ?

(Note: If you did not get the previous part, you may just posit values for  $i_{1,t+1}^e$  and  $i_{1,t+2}^e$ .)

**Answer/comment**

$(1 + x)^3 = (1.02)(1.05)(1.03)$ , or  $x = 0.033$ , 3.3%.

- 4.3 Market expectations derived using the expectations theory of the term structure usually prove to be accurate predictors of the future. True/False and explain.

**Answer/comment**

False. The predictions of the expectations theory often prove to be exactly backwards: when the expectations theory says that the short-term rate is likely to increase, it often decreases.

## 5 Stock valuation.

- 5.1 Suppose that a company is expected to pay an annual dividend of  $d_{t+1}^e, d_{t+2}^e, d_{t+3}^e, \dots$ , in years  $t+1, t+2, t+3, \dots$ . Give a formula for the value of the share price today, at time  $t$ , using our standard discounted present value relation and assuming a constant interest rate for discounting.

**Answer/comment**

$$P = \sum_{j=1}^{\infty} \frac{d_{t+j}^e}{(1+i)^j}$$

or

$$P = \frac{d_{t+1}^e}{(1+i)^1} + \frac{d_{t+2}^e}{(1+i)^2} + \dots$$

- 5.2 The Gordon growth model of stock prices is consistent with the present value formula you've just given, but makes certain simplifying assumptions. What additional assumption does the Gordon model make about dividends?

**Answer/comment**

The Gordon Growth model assumes the dividends grow at a constant rate in perpetuity.

- 5.3 The stock of LAX corp. is currently selling for \$20 per share. LAX is expected to pay an annual dividend of 65 cents per share. Analysts expect the price of LAX shares to be \$23 in one year. Using these expectations, what is the expected rate of return for holding LAX over the next year?

**Answer/comment**

One plus the expected rate of return equals future value over present value:

$$(1 + x) = \frac{23 + 0.65}{20}$$

or  $x = 0.1825$ , 18.25%

- 6 The secondary market for equities.

- 6.1 Adam Smith was a great advocate of markets as a way to facilitate efficient exchange in economies, but he believed that companies that were owned broadly by shareholders who traded shares on a stock market were doomed to failure. Why?

**Answer/comment**

He believed that the managers of the firms would tend to screw off (be lazy, not work hard) because the owners, not the managers, would get the benefits of the hard work. He believed that the shareholders would not bother to monitor the managers to keep them working hard because they were not liable for the full debts of the firm and thus would not pay much attention. Key here is two parts: 1) Why do the managers screw off and 2) Why don't the owners pay attention and keep the managers working hard.

- 6.2 Smith may have been wrong about publicly traded companies, at least for a few major economies, but in most economies around the world financing through publicly traded shares plays a much smaller role than in the U.S. [pick one: true/false]

**Answer/comment**

True

- 6.3 According to Patricia Little, there are very strict regulations regarding communication of financial information to investors coming from publicly owned firms. Ms. Little said that on the whole these restrictions are good or bad, and why?

**Answer/comment**

Good. The shareholders deserve full, accurate, and fair disclosures. (Side note:

these full disclosures help lower the cost of monitoring by shareholders and thereby help overcome the Smith problem.)

7 Most debt financing in economies around the world is provided by banks.

7.1 Explain some features of well-designed loan contracts that help overcome asymmetric information problems in bank lending.

**Answer/comment**

We are looking for at least 2 here. Covenants and Collateral are two main ways, though you might state others.

Covenants; which restrain the borrower from taking specified actions contrary to the interest of the lender. So long as these are enforced, they limit the ability of the borrower to waste the lenders money. The asymmetric information is that the lender doesn't know the borrower's intentions *ex ante* or actions *ex post*. Covenants lessen the need to know these things by limiting the actions of the borrower, or, more fully, providing avenues of redress should the borrower take certain actions.

Collateral is something of value that can be seized by the lender if the terms of the loan are not met. Specifying collateral changes the incentives of the borrower, who now knows he/she will lose something of value if he/she doesn't repay. It also is a sort of insurance for the lender: if the person does not repay, the lender gets compensation in the form of the collateral.

7.2 Since the financial crisis economic problems in Europe have left many European banks in a weakened financial condition. What would it mean to create a 'bad bank' to help return European banks to health? And what are the benefits that some folks argue might come from this step?

**Answer/comment**

This is from the reality readings. The idea is that healthy banks are crucial to the health of the whole economy. Some European banks are holding lots of potentially bad debt. This makes them weak and unable to play their role in the economy. The idea is to take all the bad (or more accurately, questionable) debt from the banks, leaving the banks healthy. Put all the questionable debt in one institution, the only role of which is to manage these debts—for they are still of value. (Of course, the sticking point is over who it is that takes whatever losses may be entailed in taking on these questionable debts.)

The keys to getting full points: 1) When banks are weak because of bad debts the economy may perform poorly. 2) If the government takes the bad debts and sticks them in a special 'bad bank,' the healthier banks will promote a healthier economy.

(This all sounds great until we come to the question of who pays the bill.)

**Congratulations. The End.**