

Final test

Practice 1: Money market

1. What is the interest rate of 6-month treasury bills on May 30th, 2019? Is it larger or smaller than the interest rate of 1-year treasury bills on that day? Why? <https://www.federalreserve.gov/>.
2. What are the reserve requirements according to the Federal Reserve System? How does the Fed use it to fight against the financial crisis? If the required reserve ratio is 8%, how much of a new \$15,000 deposit can a bank lend? What is the potential impact on the money supply?
3. The annualized discount rate on a particular money market instrument, is 4.25%. The face value is \$100,000, and it matures in 45 days. What is its price? What would be the price if it had 62 days to maturity?

Practice 2: Stock market

1. Go to the **Industry Center** in Yahoo Finance!
2. Choose an industry and a specific company within this industry.
3. Briefly introduce the company you chose, including name, address, main products, stock price, volume, economic performance, etc. The purpose of doing it is to inform me of what kind of company you chose.
4. Use the **Historical Prices** option to download the stock of the company. Download **Daily data**, from **Jan 1st, 2015 to Jan 1st, 2019**. We only use the **Adj Close** price.
5. Report the descriptive statistics of the adjusted prices of the company, including Mean, SE, Median, Skewness, Kurtosis, Min, Max, Count, etc.
6. Download the index **Dow30** during the same time period and calculate the excess returns on the stock that you chose and the index **Dow30**. Assume that the return on risk-free asset is 0.2%.
7. Estimate the single-index model

$$R(t) = \alpha + \beta \text{Dow30}(t) + e(t)$$

where $R(t)$ is the excess return on the stock that you chose.

- Report and explain R -square
- Report and explain α and β
- Report and explain t -stat and p -value of the coefficient β
- Draw a line Chart of the residual (e).

Practice 3: Bond market

1. What were the bid price, asked price, and yield to maturity of the 5.000% **May 15th, 2037** Treasury bond displayed in Figure below? What was its asked price the previous day? If 30 days have passed since the last coupon payment, what is the sale, or *invoice*, price of the bond?

U.S. Government Bonds and Notes						
MATURITY	COUPON	BID	ASKED	CHG	ASK	YLD
Jun 30 11	5.125	107:11	107:11	-2		0.7792
Jul 31 11	1.000	100:09	100:10	-2		0.8303
Jul 31 11	4.875	107:05	107:06	-3		0.8186
Aug 15 11	5.000	107:18	107:19	-3		0.8118
Aug 31 11	1.000	100:06	100:06	-1		0.9008
Aug 31 11	4.625	106:29	106:30	-3		0.8796
Sep 30 11	1.000	100:03	100:03	-2		0.9555
Sep 30 11	4.500	106:28	106:29	-2		0.9365
Oct 31 11	4.625	107:11	107:12	-2		0.9739
Nov 15 11	1.750	101:16	101:17	-2		1.0122
Nov 30 11	4.500	107:08	107:09	-3		1.0235
May 15 37	5.000	111:00	111:05	-21		4.3049
Feb 15 38	4.375	100:24	100:28	-21		4.3208
May 15 38	4.500	102:29	103:00	-20		4.3161
Feb 15 39	3.500	86:11	86:14	-18		4.3197
May 15 39	4.250	98:26	98:29	-20		4.3156
Aug 15 39	4.500	103:02	103:03	-22		4.3143

2. A 30-year maturity, 10% coupon bond paying coupons semiannually is callable in 15 years at a call price of \$1,100. The bond currently sells at a yield to maturity of 8% (4% per half-year).

- a. What is the yield to call?
- b. What is the yield to call if the call price is only \$1,050?
- c. What is the yield to call if the call price is \$1,100, but the bond can be called in 10 years instead of 15 years?

3. Suppose that the yield to maturity of the 5% coupon, 25-year maturity bond falls to 7% by the end of the first year and that the investor sells the bond after the first year. If the investor's federal plus state tax rate on interest income is 30% and the combined tax rate on capital gains is 20%, what is the investor's after-tax rate of return?

Practice 4: Mortgage market

1. Compute the required monthly payment on a \$200,000, 25-year fixed-rate mortgage with a nominal interest rate of 6%.
2. Consider a 25-year fixed-rate mortgage for \$600,000 at a nominal rate of 8%. What is the difference in required payments between a monthly payment and a bimonthly payment (payments made twice a month)?
3. Consider the following options available to a mortgage borrower:

	Loan Amount	Interest Rate (%)	Type of Mortgage	Discount Points
Option 1	\$150,000	6.35	30-year fixed	1
Option 2	\$120,000	6.42	30-year fixed	2
Option 3	\$145,000	6.05	30-year fixed	3

What is the effective annual rate for each option?

4. Consider a 25-year fixed-rate mortgage for \$250,000 at a nominal rate of 10%. If the borrower pays an additional \$300 with each payment, how fast will the mortgage be paid off?

Practice 5: Foreign exchange market

1. Go to the **Currencies** in Yahoo Finance!
 - Find **your country's currency**. (If Yahoo does not have your country's currency, use RMB instead)
 - Draw a historical graph (one year) of the exchange rate of dollar and your country's currency.
 - Compare the exchange rate of dollar and your country's currency on June 1st, 2019 and June 1st, 2018. Tell me that your country's currency depreciates or appreciates.
 - Based on the answer, how do the export and import of your country change?
2. The interest rate in European bank is 5% now, and the exchange rate is currently 1.05 dollars per euro. If you expect that the exchange rate will be 0.95 dollars per euro one year from now, what is the expected interest rate in the American bank?
3. The interest rates are 4% in Japan and 5% in the United States. The current exchange rate is 113 yen per dollar. What is the expected forward exchange rate?