

Problem Set: Hand in 2. (complete)

Exercise 1.

[1]

A year ago, you invested \$1,000 in a savings account that pays an annual interest rate of 7%. What is your approximate annual real rate of return if the rate of inflation was 3% over the year?

- A) 4%.
- B) 10%.
- C) 7%.
- D) 3%.
- E) none of the above.

Exercise 2.

[3]

A risk-free intermediate or long-term investment

- A) is free of all types of risk.
- B) does not guarantee the future purchasing power of its cash flows.
- C) does guarantee the future purchasing power of its cash flows as it is insured by the U. S. Treasury.
- D) A and B.
- E) B and C.

Exercise 3.

[Moderate]

Discuss how the investor can use the separation theorem and utility theory to produce an efficient portfolio suitable for the investor's level of risk tolerance.

Exercise 4.

OBX stocks - betas

In class you saw the procedure for estimating beta using historical equity data.

In this exercise you are asked to do the same exercise, but for the five lowest ranked stocks in the OBX index.

Specifically, the OBX consists of the following twenty five stocks: EQNR.OL, DNB.OL, AKRBP.OL, NHY.OL, YAR.OL, TEL.OL, MOWI.OL, ORK.OL, TOM.OL, STB.OL, KOG.OL, NOD.OL, SALM.OL, SUBC.OL, NEL.OL, VAR.OL, AUTO.OL, SCHA.OL, FRO.OL, KAHOT.OL, GOGL.OL, MPCC.OL, NAS.OL, RECSI.OL, PGS.OL

For the five last of these, download stock prices for the period 2016–2022, construct the time series of monthly returns, and estimate the beta stock beta for each of the five stocks.

In your solution include an appendix with your R code.

Exercise 5.

[1]

Market risk is also referred to as

- A) systematic risk, diversifiable risk.
- B) systematic risk, nondiversifiable risk.
- C) unique risk, nondiversifiable risk.
- D) unique risk, diversifiable risk.
- E) none of the above.

Exercise 6.

[1]

Beta is the measure of

- A) firm specific risk.
- B) diversifiable risk.
- C) market risk.
- D) unique risk.
- E) none of the above.

Exercise 7.

[5]

Consider an investment opportunity set formed with two securities that are perfectly negatively correlated. The global minimum variance portfolio has a standard deviation that is always

- A) greater than zero.
- B) equal to zero.
- C) equal to the sum of the securities' standard deviations.
- D) equal to -1.
- E) none of the above.

Exercise 8.

[1]

Which of the following is **not** a source of systematic risk?

- A) the business cycle.
- B) interest rates.
- C) personnel changes
- D) the inflation rate.
- E) exchange rates.

Exercise 9.

[3]

When two risky securities that are positively correlated but not perfectly correlated are held in a portfolio,

- A) the portfolio standard deviation will be greater than the weighted average of the individual security standard deviations.
- B) the portfolio standard deviation will be less than the weighted average of the individual security standard deviations.
- C) the portfolio standard deviation will be equal to the weighted average of the individual security standard deviations.
- D) the portfolio standard deviation will always be equal to the securities' covariance.
- E) none of the above are true.

Exercise 10.

[1]

According to the Capital Asset Pricing Model (CAPM) a well diversified portfolio's rate of return is a function of

- A) market risk
- B) unsystematic risk
- C) unique risk.
- D) reinvestment risk.
- E) none of the above.

Exercise 11.

[3]

According to the Capital Asset Pricing Model (CAPM), fairly priced securities

- A) have positive betas.

- B) have zero alphas.
- C) have negative betas.
- D) have positive alphas.
- E) none of the above.

Exercise 12.

[3]

According to the Capital Asset Pricing Model (CAPM), which one of the following statements is **false**?

- A) The expected rate of return on a security decreases in direct proportion to a decrease in the risk-free rate.
- B) The expected rate of return on a security increases as its beta increases.
- C) A fairly priced security has an alpha of zero.
- D) In equilibrium, all securities lie on the security market line.
- E) All of the above statements are true.

Exercise 13.

[1]

An underpriced security will plot

- A) on the Security Market Line.
- B) below the Security Market Line.
- C) above the Security Market Line.
- D) either above or below the Security Market Line depending on its covariance with the market.
- E) either above or below the Security Market Line depending on its standard deviation.

Exercise 14.

[3]

The CAPM applies to

- A) portfolios of securities only.
- B) individual securities only.
- C) efficient portfolios of securities only.
- D) efficient portfolios and efficient individual securities only.
- E) all portfolios and individual securities.

Exercise 15.

[3]

A well-diversified portfolio is defined as

- A) one that is diversified over a large enough number of securities that the nonsystematic variance is essentially zero.
- B) one that contains securities from at least three different industry sectors.
- C) a portfolio whose factor beta equals 1.0.
- D) a portfolio that is equally weighted.
- E) all of the above.

Exercise 16.

[1]

Of the following four investments, _____ is considered to be the safest.

- A) commercial paper
- B) corporate bonds
- C) Treasury bills
- D) Treasury bonds
- E) U. S. Agency issues

Exercise 17.

[1]

At issue, coupon bonds typically sell _____.

- A) above par value
- B) at or near par value
- C) below par
- D) at a value unrelated to par
- E) none of the above

Exercise 18.

[1]

Ceteris paribus, the price and yield on a bond are

- A) positively related.
- B) negatively related.
- C) sometimes positively and sometimes negatively related.
- D) not related.
- E) indefinitely related.

Exercise 19.

[1]

The bond market

- A) can be quite "thin".
- B) primarily consists of a network of bond dealers in the over the counter market.
- C) consists of many investors on any given day.
- D) A and B.
- E) B and C.

Exercise 20.

[1]

The _____ is a measure of the average rate of return an investor will earn if the investor buys the bond now and holds until maturity.

- A) current yield
- B) dividend yield
- C) P/E ratio
- D) yield to maturity
- E) discount yield

Exercise 21.

[3]

A Treasury bond due in one year has a yield of 6.2%; a Treasury bond due in 5 years has a yield of 6.7%. A bond issued by General Motors due in 5 years has a yield of 7.9%; a bond issued by Exxon due in one year has a yield of 7.2%. The default risk premiums on the bonds issued by Exxon and General Motors, respectively, are

- A) 1.0% and 1.2%
- B) 0.5% and .7%
- C) 1.2% and 1.0%
- D) 0.7% and 0.5%
- E) none of the above

Exercise 22.

[3]

A coupon bond that pays interest semi-annually has a par value of \$1,000, matures in 5 years, and has a yield to

maturity of 10%. The intrinsic value of the bond today will be _____ if the coupon rate is 8%.

- A) \$922.78
- B) \$924.16
- C) \$1,075.80
- D) \$1,077.20
- E) none of the above

Exercise 23.

[3]

A Treasury bill with a par value of \$100,000 due one month from now is selling today for \$99,010. The effective annual yield is _____.

- A) 12.40%
- B) 12.55%
- C) 12.62%
- D) 12.68%
- E) none of the above

Exercise 24.

[3]

Consider a 5-year bond with a 10% coupon that has a present yield to maturity of 8%. If interest rates remain constant, one year from now the price of this bond will be _____.

- A) higher
- B) lower
- C) the same
- D) cannot be determined
- E) \$1,000

Exercise 25.

David vs Goliath

In class we discussed the case of the Adani Group vs Hindenburg Research.

- Why does Hindenburg's release of a (very) negative report on the Adani Group fit the business model of Hindenburg Research?
- The release of the report from Hindenburg Research happened just before a seasoned equity offering was being finalized. What were the consequences for Adani Group of the Hindenburg report?

Exercise 26.

Inflation [1]

How does the central bank of Jamaica want its inflation?

Exercise 27.

[3]

A 10%, two year bond is traded at a price of 90. The current one year spot rate is $r(0, 1) = 12\%$ (with discrete, annual compounding). The bond has a face value of 100.

1. Determine the duration and convexity of the bond, using both the full term structure and the Macaulay style calculations.

Exercise 28.

Discount bond [1]

A discount (zero coupon) bond with a principal of 100 has a maturity of 6 years. The term structure of interest rates is flat with a (continuously compounded) interest rate of 5%.

1. Determine the duration of the bond.

Exercise 29.

Short Answer Question

What happens to a bond's price as the bond approaches maturity?

Exercise 30.

When estimating the risk free term structure for the norwegian fixed income market we do not include the Central Bank's policy rate (Styringrenten). Why?

Exercise 31.

Immunization [4]

You will be paying \$10,000 a year in tuition expenses at the end of the next two years. Bonds currently yield 8%.

- What are the present value and duration of your obligation?
- What maturity zero-coupon bond would immunize your obligation?