# UNIVERSITY OF EMBU

## 2017/2018 ACADEMIC YEAR

## SECOND SEMESTER EXAMINATIONS

## THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF COMMERCE

## DFI 304: INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT

**DATE: APRIL 6, 2018** **TIME: 8:30 AM – 10:30 AM**

**INSTRUCTIONS:**

**Answer Question ONE and ANY Other TWO Questions.**

**QUESTION ONE (30 MARKS)**

a) Assume that you recently graduated with a degree in finance and have just reported to work as an investment advisor at the brokerage firm of Suntra Investment Bank. Daisuke Horibe is a tourist who has just come to Kenya from Japan and expects to invest substantial amounts of money through Suntra Investment Bank.

**Required:**

Explain to Daisuke Horibe;

i) Any three differences between investment in financial assets and investment in physical assets. (3 marks)

ii) The stages involved in the investment process. (5 marks)

iii) Any two strategies played when undertaking investment in the futures market. (2 marks)

b) Critically evaluate assumptions of the capital asset pricing model. (5 marks)

c) Njuguna Odongo, a Kenyan investor bought the following combination of shares at the indicated prices in January 2017:

| Share | No. of shares | Unit price |
|---|---|---|
| SCB | 20,000 | Sh.165 |
| Bamburi Cement | 50,000 | Sh.150 |
| Nation Media Group | 30,000 | Sh.72 |

At the end of the year, the prices had risen to Sh.231; Sh.196 and Sh.115 for SCB, Bamburi and Nation Media Group respectively. None of the shares paid dividend during the year.

**Required:**

Compute the portfolio value weighted mean rate of return. (5 marks)

d) Compare and contrast fundamental and technical analysis as used in investment analysis. (4 marks)

e) Briefly describe each of the portfolio performance measures and explain how they are used:

i) Sharpe's ratio (3 marks)

ii) Treynor's ratio (3 marks)

iii) Jensen's Alpha (3 marks)

## QUESTION TWO (20 MARKS)

a) The returns of Safaricom PLC and Nation Media PLC for the past six years are given below:

| Year | Safaricom PLC Return % | Nation Media PLC Return % |
|---|---|---|
| 2013 | 9 | 10 |
| 2014 | 5 | 6 |
| 2015 | 3 | 12 |
| 2016 | 12 | 9 |
| 2017 | 16 | 15 |

**Required:**

Calculate the risk and return of a portfolio consisting of both securities where the proportion of funds invested in Safaricom PLC is 80%. (10 marks)

b) Technical analysis has been around for more than 100 years, and it is not likely to disappear from the investment scene anytime soon. Discuss the implication of efficient market hypothesis on technical analysis. (4 marks)

c) The risk free return of Chibuya PLC is 10% and the expected return of the NSE 20 Index (market portfolio) is 18%, and the risk measurement of the market portfolio by standard deviation is 5%.

**Required:**

Construct an efficient portfolio to produce a 16% expected return and determine its risk. (6 marks)

## QUESTION THREE (20 MARKS)

a) Briefly explain the following terms;

- i) Forward contracts (2 marks)
- ii) Futures contracts (2 marks)
- iii) Option contracts (2 marks)
- iv) Swaps contracts (2 marks)

b) The stock of Home Africa Ltd currently trade at KEs. 30. A call option on Home Africa Ltd. Has a strike price of KES. 25 and expires in three months. The current risk free rate is 5%, and Home Africa Ltd. Has a standard deviation of 45%.

**Required:**

Determine the value of the Home Africa Ltd call option premium using the Black- Scholes option pricing model. (12 marks)

## QUESTION FOUR (20 MARKS)

a) Many portfolios containing equities also contain other asset categories, so the management factors are not limited to equities. Explore any four asset allocation strategies. (8 marks)

b) Describe the efficient market hypothesis theory. (3 marks)

c) The following information relates to two securities X and Y which lie on the Security Market Line (SML)

| Security | Required Rate of Return | Beta Coefficient |
|---|---|---|
| X | 18% | 1.0 |
| Y | 22% | 1.5 |

**Required:**

Determine the risk free rate of return. (4 marks)

d) An investor is considering making an investment in the shares of Home Care Ltd. The following are the attributes of the five economic forces that influence the return of the share. The risk free rate is 9%.

| Factor | Beta | Expected Return | Actual Return |
|---|---|---|---|
| GNP | 1.95 | 6% | 6.50% |
| Inflation | 0.85 | 5% | 5.75% |
| Interest rate | 1.2 | 7% | 8.00% |
| Stock market index | 2.5 | 9.50% | 11.50% |
| Industrial production | 2.5 | 9% | 10.00% |

**Required:**

Determine the total return on the share. (5 marks)

**QUESTION FIVE (20 MARKS)**

a) Performance of the portfolio depends on certain critical decisions taken by a portfolio manager. In view of this statement, discuss the determinants of portfolio performance.

(6 marks)

b) Suppose you are asked to analyze the performance of two portfolios having the following characteristics:

| Fund | Observed Return | Beta | Standard deviation |
|---|---|---|---|
| Portfolio Zimele | 18% | 2.0 | 0.03 |
| Portfolio Sanlam | 12% | 1.5 | 0.00 |

The risk-free rate is 7%. The return on the market portfolio is 15%. The standard deviation of the market is 0.06.

**Required:**

a) Compute the Jensen index for portfolios Zimele and Sanlam (4 marks)

b) Compute the Sharpe index for the market portfolio. (2 marks)

c) Compute the Sharpe index for portfolios Zimele and Sanlam (4 marks)

d) Compute the Treynor index for the portfolios Zimele and Sanlam (4 marks)

**--END--**

Table G: Cumulative Distribution Function for the Standard Normal Random Variable

| d | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| −0.0 | 0.5000 | 0.4960 | 0.4920 | 0.4880 | 0.4840 | 0.4801 | 0.4761 | 0.4721 | 0.4681 | 0.4641 |
| −0.1 | 0.4602 | 0.4562 | 0.4522 | 0.4483 | 0.4443 | 0.4404 | 0.4364 | 0.4325 | 0.4286 | 0.4247 |
| −0.2 | 0.4207 | 0.4168 | 0.4129 | 0.4090 | 0.4052 | 0.4013 | 0.3974 | 0.3936 | 0.3897 | 0.3859 |
| −0.3 | 0.3821 | 0.3783 | 0.3745 | 0.3707 | 0.3669 | 0.3632 | 0.3594 | 0.3557 | 0.3520 | 0.3483 |
| −0.4 | 0.3446 | 0.3409 | 0.3372 | 0.3336 | 0.3300 | 0.3264 | 0.3228 | 0.3192 | 0.3156 | 0.3121 |
| −0.5 | 0.3085 | 0.3050 | 0.3015 | 0.2981 | 0.2946 | 0.2912 | 0.2877 | 0.2843 | 0.2810 | 0.2776 |
| −0.6 | 0.2743 | 0.2709 | 0.2676 | 0.2643 | 0.2611 | 0.2578 | 0.2546 | 0.2514 | 0.2483 | 0.2451 |
| −0.7 | 0.2420 | 0.2389 | 0.2358 | 0.2327 | 0.2296 | 0.2266 | 0.2236 | 0.2206 | 0.2177 | 0.2148 |
| −0.8 | 0.2119 | 0.2090 | 0.2061 | 0.2033 | 0.2005 | 0.1977 | 0.1949 | 0.1922 | 0.1894 | 0.1867 |
| −0.9 | 0.1841 | 0.1814 | 0.1788 | 0.1762 | 0.1736 | 0.1711 | 0.1685 | 0.1660 | 0.1635 | 0.1611 |
| −1.0 | 0.1587 | 0.1562 | 0.1539 | 0.1515 | 0.1492 | 0.1469 | 0.1446 | 0.1423 | 0.1401 | 0.1379 |
| −1.1 | 0.1357 | 0.1335 | 0.1314 | 0.1292 | 0.1271 | 0.1251 | 0.1230 | 0.1210 | 0.1190 | 0.1170 |
| −1.2 | 0.1151 | 0.1131 | 0.1112 | 0.1093 | 0.1075 | 0.1056 | 0.1038 | 0.1020 | 0.1003 | 0.0985 |
| −1.3 | 0.0968 | 0.0951 | 0.0934 | 0.0918 | 0.0901 | 0.0885 | 0.0869 | 0.0853 | 0.0838 | 0.0823 |
| −1.4 | 0.0808 | 0.0793 | 0.0778 | 0.0764 | 0.0749 | 0.0735 | 0.0721 | 0.0708 | 0.0694 | 0.0681 |
| −1.5 | 0.0668 | 0.0655 | 0.0643 | 0.0630 | 0.0618 | 0.0606 | 0.0594 | 0.0582 | 0.0571 | 0.0559 |
| −1.6 | 0.0548 | 0.0537 | 0.0526 | 0.0516 | 0.0505 | 0.0495 | 0.0485 | 0.0475 | 0.0465 | 0.0455 |
| −1.7 | 0.0446 | 0.0436 | 0.0427 | 0.0418 | 0.0409 | 0.0401 | 0.0392 | 0.0384 | 0.0375 | 0.0367 |
| −1.8 | 0.0359 | 0.0351 | 0.0344 | 0.0336 | 0.0329 | 0.0322 | 0.0314 | 0.0307 | 0.0301 | 0.0294 |
| −1.9 | 0.0287 | 0.0281 | 0.0274 | 0.0268 | 0.0262 | 0.0202 | 0.0250 | 0.0244 | 0.0239 | 0.0233 |
| −2.0 | 0.0228 | 0.0222 | 0.0217 | 0.0212 | 0.0207 | 0.0158 | 0.0197 | 0.0192 | 0.0188 | 0.0183 |
| −2.1 | 0.0179 | 0.0174 | 0.0170 | 0.0166 | 0.0162 | 0.0122 | 0.0154 | 0.0150 | 0.0146 | 0.0143 |
| −2.2 | 0.0139 | 0.0136 | 0.0132 | 0.0129 | 0.0125 | 0.0094 | 0.0119 | 0.0116 | 0.0113 | 0.0110 |
| −2.3 | 0.0107 | 0.0104 | 0.0102 | 0.0099 | 0.0096 | 0.0071 | 0.0091 | 0.0089 | 0.0087 | 0.0084 |
| −2.4 | 0.0082 | 0.0080 | 0.0078 | 0.0075 | 0.0073 | 0.0054 | 0.0069 | 0.0068 | 0.0066 | 0.0064 |
| −2.5 | 0.0062 | 0.0060 | 0.0059 | 0.0057 | 0.0055 | 0.0040 | 0.0092 | 0.0051 | 0.0049 | 0.0048 |
| −2.6 | 0.0047 | 0.0045 | 0.0044 | 0.0043 | 0.0041 | 0.0030 | 0.0039 | 0.0038 | 0.0037 | 0.0036 |
| −2.7 | 0.0035 | 0.0034 | 0.0033 | 0.0032 | 0.0031 | 0.0022 | 0.0029 | 0.0028 | 0.0027 | 0.0026 |
| −2.8 | 0.0026 | 0.0025 | 0.0024 | 0.0023 | 0.0023 | 0.0016 | 0.0021 | 0.0021 | 0.0020 | 0.0019 |
| −2.9 | 0.0019 | 0.0018 | 0.0018 | 0.0017 | 0.0016 | 0.0011 | 0.0015 | 0.0015 | 0.0014 | 0.0014 |
| −3.0 | 0.0014 | 0.0013 | 0.0013 | 0.0012 | 0.0012 | 0.0008 | 0.0011 | 0.0011 | 0.0010 | 0.0010 |
| −3.1 | 0.0010 | 0.0009 | 0.0009 | 0.0009 | 0.0008 | 0.0006 | 0.0008 | 0.0008 | 0.0007 | 0.0007 |
| −3.2 | 0.0007 | 0.0007 | 0.0006 | 0.0006 | 0.0006 | 0.0004 | 0.0006 | 0.0005 | 0.0005 | 0.0005 |
| −3.3 | 0.0005 | 0.0005 | 0.0005 | 0.0004 | 0.0004 | 0.0003 | 0.0004 | 0.0004 | 0.0004 | 0.0004 |
| −3.4 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0002 | 0.0003 | 0.0003 | 0.0003 | 0.0003 |
| −3.5 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0001 | 0.0002 | 0.0002 | 0.0002 | 0.0002 |
| −3.6 | 0.0002 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| −3.7 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| −3.8 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| −3.9 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| −4.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

*(Contd..)*



Table G Contd.

| d | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.5000 | 0.5040 | 0.5080 | 0.5120 | 0.5160 | 0.5199 | 0.5239 | 0.9279 | 0.5319 | 0.5359 |
| 0.1 | 0.5398 | 0.5438 | 0.5478 | 0.5517 | 0.5557 | 0.5596 | 0.5636 | 0.5675 | 0.5714 | 0.5753 |
| 0.2 | 0.5793 | 0.5832 | 0.5871 | 0.5910 | 0.5948 | 0.5987 | 0.6026 | 0.6064 | 0.6103 | 0.6141 |
| 0.3 | 0.6179 | 0.6217 | 0.6255 | 0.6293 | 0.6331 | 0.6368 | 0.6406 | 0.6443 | 0.6480 | 0.6517 |
| 0.4 | 0.6554 | 0.6591 | 0.6628 | 0.6664 | 0.6700 | 0.6736 | 0.6772 | 0.6808 | 0.6844 | 0.6879 |
| 0.5 | 0.6915 | 0.6950 | 0.6985 | 0.7019 | 0.7054 | 0.7088 | 0.7123 | 0.7157 | 0.7190 | 0.7224 |
| 0.6 | 0.7257 | 0.7291 | 0.7324 | 0.7357 | 0.7389 | 0.7422 | 0.7454 | 0.7486 | 0.7517 | 0.7549 |
| 0.7 | 0.7580 | 0.7611 | 0.7642 | 0.7673 | 0.7704 | 0.7734 | 0.7764 | 0.7794 | 0.7823 | 0.7852 |
| 0.8 | 0.7881 | 0.7910 | 0.7939 | 0.7967 | 0.7995 | 0.8023 | 0.8051 | 0.8078 | 0.8106 | 0.8133 |
| 0.9 | 0.8159 | 0.8186 | 0.8212 | 0.8238 | 0.8264 | 0.8289 | 0.8315 | 0.8340 | 0.8365 | 0.8389 |
| 1.0 | 0.8413 | 0.8438 | 0.8461 | 0.8485 | 0.8508 | 0.8531 | 0.8554 | 0.8577 | 0.8599 | 0.8621 |
| 1.1 | 0.8643 | 0.8665 | 0.8686 | 0.8708 | 0.8729 | 0.8749 | 0.8770 | 0.8790 | 0.8810 | 0.8830 |
| 1.2 | 0.8849 | 0.8869 | 0.8888 | 0.8907 | 0.8925 | 0.8944 | 0.8962 | 0.8980 | 0.8997 | 0.9015 |
| 1.3 | 0.9032 | 0.9049 | 0.9066 | 0.9082 | 0.9099 | 0.9115 | 0.9131 | 0.9147 | 0.9162 | 0.9177 |
| 1.4 | 0.9192 | 0.9207 | 0.9222 | 0.9236 | 0.9251 | 0.9265 | 0.9279 | 0.9292 | 0.9306 | 0.9319 |
| 1.5 | 0.9332 | 0.9345 | 0.9357 | 0.9370 | 0.9382 | 0.9394 | 0.9406 | 0.9418 | 0.9429 | 0.9441 |
| 1.6 | 0.9452 | 0.9463 | 0.9474 | 0.9484 | 0.9495 | 0.9505 | 0.9515 | 0.9525 | 0.9535 | 0.9595 |
| 1.7 | 0.9554 | 0.9564 | 0.9573 | 0.9582 | 0.9591 | 0.9599 | 0.9608 | 0.9616 | 0.9625 | 0.9633 |
| 1.8 | 0.9641 | 0.9649 | 0.9656 | 0.9664 | 0.9671 | 0.9678 | 0.9686 | 0.9693 | 0.9699 | 0.9706 |
| 1.9 | 0.9713 | 0.9719 | 0.9726 | 0.9732 | 0.9738 | 0.9744 | 0.9750 | 0.9756 | 0.9761 | 0.9767 |
| 2.0 | 0.9772 | 0.9778 | 0.9783 | 0.9788 | 0.9793 | 0.9798 | 0.9803 | 0.9808 | 0.9812 | 0.9817 |
| 2.1 | 0.9821 | 0.9826 | 0.9830 | 0.9834 | 0.9838 | 0.9842 | 0.9846 | 0.9850 | 0.9854 | 0.9857 |
| 2.2 | 0.9861 | 0.9864 | 0.9868 | 0.9871 | 0.9875 | 0.9878 | 0.9881 | 0.9884 | 0.9887 | 0.9890 |
| 2.3 | 0.9893 | 0.9896 | 0.9898 | 0.9901 | 0.9904 | 0.9906 | 0.9909 | 0.9911 | 0.9913 | 0.9916 |
| 2.4 | 0.9918 | 0.9920 | 0.9922 | 0.9925 | 0.9927 | 0.9929 | 0.9931 | 0.9932 | 0.9934 | 0.9936 |
| 2.5 | 0.9938 | 0.9940 | 0.9941 | 0.9943 | 0.9945 | 0.9946 | 0.9948 | 0.9949 | 0.9991 | 0.9952 |
| 2.6 | 0.9953 | 0.9955 | 0.9956 | 0.9957 | 0.9959 | 0.9960 | 0.9961 | 0.9962 | 0.9963 | 0.9964 |
| 2.7 | 0.9965 | 0.9966 | 0.9967 | 0.9968 | 0.9969 | 0.9970 | 0.9971 | 0.9972 | 0.9973 | 0.9974 |
| 2.8 | 0.9974 | 0.9975 | 0.9976 | 0.9977 | 0.9977 | 0.9978 | 0.9979 | 0.9979 | 0.9980 | 0.9981 |
| 2.9 | 0.9981 | 0.9982 | 0.9982 | 0.9983 | 0.9984 | 0.9984 | 0.9985 | 0.9985 | 0.9986 | 0.9986 |
| 3.0 | 0.9986 | 0.9987 | 0.9987 | 0.9988 | 0.9988 | 0.9989 | 0.9989 | 0.9989 | 0.9990 | 0.9990 |
| 3.1 | 0.9990 | 0.9991 | 0.9991 | 0.9991 | 0.9992 | 0.9992 | 0.9992 | 0.9992 | 0.9993 | 0.9993 |
| 3.2 | 0.9993 | 0.9993 | 0.9994 | 0.9994 | 0.9994 | 0.9994 | 0.9994 | 0.9995 | 0.9995 | 0.9995 |
| 3.3 | 0.9995 | 0.9995 | 0.9995 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9997 |
| 3.4 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9998 |
| 3.5 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 |
| 3.6 | 0.9998 | 0.9998 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 |
| 3.7 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 |
| 3.8 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 |
| 3.9 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 4.0 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |