충남대학교
Chungnam National University

투자론

- *R*과 Excel을 통한 금융데이터 분석 -

13주차
실전연습문제

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Problems

1. Practice Problems for the Entire Semester
2. Data Problems
    1. Optimal portfolio selection & Beta estimation
    2. Bond fund management
    3. Fund performance analysis

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Unit 02

Data Problems

7. Consider the data below.

	A	B	C	D	E	F	G	H	I
2	Variance-covariance matrix	La-Z-Boy	Kimball	Flexsteel	Leggett	Miller	Shaw		Means
3	La-Z-Boy	0.1152	0.0398	0.1792	0.0492	0.0568	0.0989		29.24%
4	Kimball	0.0398	0.0649	0.0447	0.0062	0.0349	0.0269		20.68%
5	Flexsteel	0.1792	0.0447	0.3334	0.0775	0.0886	0.1481		25.02%
6	Leggett	0.0492	0.0062	0.0775	0.1033	0.0191	0.0597		31.64%
7	Miller	0.0568	0.0349	0.0886	0.0191	0.0594	0.0243		15.34%
8	Shaw	0.0989	0.0269	0.1487	0.0597	0.0243	0.1653		43.87%

a. Given this matrix, find two efficient portfolios.

b. Plot the efficient frontier.

Use the following information in the table for the question. Due to the limited space, only the part of the data is suggested. Use the excel file that comes with the problem.

	A	B	C	D	E	F	G	H	I	J	K.	L
1	**PRICE DATA: 10 STOCKS AND S&P 500, Jul2007-Jul2012** S&P 500 represented by Vanguard's Index 500 fund (includes dividends)											
2		1	2	3	4	5	6	7	8	9	10	11
3		Apple	Google	Whole Foods	Seagate	Comcast	Merck	Johnson-Johnson	General electic	Hewlett Packard	Goldman Sachs	S&P 500
4												
5	Date	AAPL	GOOG	WFM	STX	CMCSA	MRK	JNJ	GE	HPQ	GS	S&P 500
6	2-Jul-07	131.76	510.00	35.75	21.18	24.17	39.78	51.39	31.84	43.69	178.93	125.27
7	1-Aug-07	138.48	515.25	42.72	23.37	24.00	40.20	52.84	31.93	46.85	497.21	121.40
8	4-Sep-07	153.47	567.27	47.26	23.15	22.25	41.73	56.18	34.21	47.34	205.91	123.22
9	1-Oct-07	189.95	707.00	47.98	25.29	19.37	47.04	55.73	34.04	49.14	23590	127.81
10	1-Nov-07	182.22	693.00	41.66	23.43	18.90	47.93	58.29	31.67	48.64	215.65	129.83
11	3-Dec-07	198.08	691.48	39.52	23.16	16.80	47.23	57.39	30.92	48.07	204.62	124.39
12	2-Jan-08	135.36	564.30	38.41	18.50	16.71	37.47	54.33	27.89	41.63	190.21	123.53
13	1-Feb-08	125.02	471.18	34.23	19.69	17.98	36.00	53.67	45.49	45.49	161.69	116.10
14	3-Mar-08	143.50	440.47	32.11	19.11	17.85	31.11	56.19	43.56	43.56	157.65	112.33

8. Fill in the template below.

	A	B	C	D	E	F	G	H	I	J	K	L
1	RETURN DATA: 10 STOCKS AND SP500											
2		1	2	3	4	5	6	7	8	9	10	11
3		Apple	Google	Whole Foods	Seagate	Comcast	Merck	Johnson-Johnson	General Electric	Hewlett Packard	Goldman Sachs	S&P 500
4	**Monthly statistics**											
5	Mean											
6	Variance											
7	Sigma											
8												
9	**Annual statistics**											
10	Mean											
11	Variance											
12	Sigma											
13												
14	**Regressing individual assets on the S&P 500**											
15	Alpha											
16	Beta											
17	Rsq											
18	T-test, intercept											
19	T-test, slope											
20												
21												
22	RETURN DATA											
23	Date	AAPL	GOOG	WFM	STX	CMCSA	MRK	JNJ	GE	HPQ	GS	SP500
24	1-Aug-07											
25	4-Sep-07											
26	1-Oct-07											
27	1-Nov-07											
28	3-Dec-07											
29	2-Jan-08											
30	1-Feb-08											
31	3-Mar-08											
32	1-Apr-08											
33	1-May-08											
34	2-Jun-08											
35	1-Jul-08											

출처 : 교수자 제공

9. Sandra Kapple presents Maria VanHusen with a description, given in the following table, of the bond portfolio held by the Star Hospital Pension Plan. All securities in the bond portfolio are noncallable U.S. Treasury securities.

				Price if Yiels Change		
Par Value (U.S $)	Treasury Securituy	Market Value (U.S $)	Currnet Price	Up 100 Basis points	Down 100 Basis points	Effective Duration
$48,000,000	2.75% due 2015	$48,667,680	101.391	99.245	103.595	2.15
50,000,000	4.75% due 2040	50,000,000	100.000	86.372	116.887	-
98,000,000	Total bond portfolio	98,667,680	-	-	-	-

a. Calculate the duration of i) the 4.75% Treaury security due 2040, and ii) the total bond portfolio.

b. VanHusen remarks to Kapple, “If you changed the maturity structure of the bond portfolio to result in a portfolio duration of 5.25 years, the price sensitivity of the portfolio would be identical to that of a single, noncallable Treasury security that also has a duration of 5.25 years.” In what circumstance would VanHusen’s remark be correct?

10. Consider the two (excess return) index-model regression results for stocks A and B. The risk-free rate over the period was 6%, and the market's average return was 14%. Performance is measured using an index model regression on excess returns.

	Stock A	Stock B
Index model regression estimate	1%+1.2(r_M-r_f)	2%+0.8(r_M-r_f)
R-square	0.576	0.436
Residual standard deviation, $\sigma(e)$	10.3%	19.1%
Standard deviation of exess returns	21.65	24.9%

a. Calculate the following statistics for each stock:
   I. Alpha
   II. Information Ratio
   III. Sharpe Ratio
   IV. Treynor Measure

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b. Which stock is the best choice under the following circumstances?

I. This is the only risky asset to be held by the investor.

II. This stock will be mixed with the rest of the investor's portfolio, currently composed solely of holdings in the market-index fund.

III. This is one of many stocks that the investor is analyzing to form an actively managed stock portfolio.