TENTAMEN / EXAMINATION

12307683

Fylls i av **student** / *To be completed by the **student***

Skriv anonymiseringskoden på samtliga svarsblad / *Write your anonymity code on each sheet*

Anonymiseringskod / *Anonymity code*: NEGC18 - 0012 - W0M

Provbenämning / *Exam name*: Portföljval

Oanmäld:

Kurskod / *Course code*: NEGC18

Modul / *Module*: 0001

Tentamensdatum / *Examination date*: 2023-02-18

Jag har tagit del av regler som gäller vid tentamen / *I have read the current rules for examinations*: [X] Ja / *Yes*

Antal inlämnade blad med anonymiseringskod / *Number of sheets with anonymity code*: 08 ✓

Fylls i av **skrivvakt** / *To be completed by the **invigilator***

Kontroll av legitimation / *Identification checked*: [X] Ja / Yes

Kontroll av inlämnade blad / *Answer sheets checked*: [X] Ja / Yes

Inlämningstid / *Time of submission*: 11:59

Härmed intygas att kontroller utförts / *This is to certify that the checks have been carried out*

Tydlig sign. / *Signature*: Qm

Fylls i av **lärare** / *To be completed by the **examiner***

Bedömning av uppgifter / Questions attempted

1	2	3	4	5	6	7	8	9	10	~
5,175	2,5	3,5								

11	12	13	14	15	16	17	18	19	20	~

21	22	23	24	25	26	27	28	29	30	~

Totalt antal poäng / *Total points*:

Examin. lärare / Kursansvarig signatur / *Signature of the examiner*:

Betyg / *Grade*:

Namnförtydligande / *Clarification of the signature*:

12307683

Försättsbladet ska alltid lämnas in även om ingen uppgift behandlats / *Examination should always be submitted even if no questions are answered*

Utskriven 2023-02-13 kl. 13:42:06

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NEGC18-0012-wqeu

Löpande sidnr
Consecutive no:
1

Uppgift nr /
Question no:
1(1)

Poäng / *Points awarded:*
5,175.

Lärarens anteckning
Examiner's remarks:

a) SML: $\bar{R}_i = R_F + \beta(\bar{R}_M - R_f)$

$\bar{R}_M - R_F = \text{slope} = \frac{12-7}{2-1} = 5$

$\bar{R}_M = 7 = R_F + 1(5)$

$R_f = 2$

$\bar{R}_M = 7\%$
$\beta_M = 1$
$\bar{R}_i = 12\%$
$\beta_i = 2$

SVAR a):

SML: $\bar{R}_i = 2 + 5\beta$

1

b) CML: $\bar{R}_i = R_F + \left(\frac{R_m - R_f}{\sigma_M}\right)\sigma_i$

$\bar{R}_i = 2 + \frac{5}{4}\sigma_i$

Svar b):

CML: $\bar{R}_i = 2 + 1{,}25\sigma_i$

1

c) The CML is the efficient frontier when risky assets and riskfree assets combine. It shows the most return for a combination of assets for the lowest amount of risk. Risk is measured in std.dev. Only efficient assets and combinations thereof are on the CML.

combination of R_m and R_f

While CML shows assets' return relative to both systematic and unsystematic, the SML only shows assets' return relative to their systematic risk - risk that isn't possible to diversify away. Correctly priced assets lie on the SML, both efficient and inefficient.

0,175

d) An asset with $\beta = 1,5$ should have an $E(R)$ of $= 2+5(1,5) = 9,5$ R

Meaning Asset 2 is underpriced.

Find combination of Asset 1 and Market portfolio so that their $\beta = \beta_2 = 1,5$

$\beta_1 \cdot X_1 + \beta_M \cdot (1-X_1) = 1,5$ & (X_1: weight in asset 1)

$2X_1 + 1(1-X_1) = 1,5$

$2X_1 + 1 - X_1 = 1,5$

$X_1 = 0,5$

$\hookrightarrow 1 - X_1 = X_M = 0,5$

} weights in Asset 1 R and Market portfolio

Net investment $= (-0,5) + (-0,5) + 1 = 0$

We short sell the combination of Asset 1 and Market portfolio R

and buy Asset 2

$E(R) = (-0,5) \cdot 12 + (-0,5) \cdot 7 + 1 \cdot 16,5 = 1\%$ R

$\beta = (-0,5) \cdot 2 + (-0,5) \cdot 1 + 1 \cdot 1,5 = 0$

2

SVAR D)

We've now created a zero-investment portfolio with the following proportions:

Market portfolio: $X_M = -0,5$

Asset 1 $X_1 = -0,5$

Asset 2 $X_2 = 1$

with following return and risk

$E(R) = 1\%$

$\beta = 0$

Without investing anything.

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UEGC18-C012-WAM

Löpande sidnr
Consecutive no:
3

Uppgift nr /
Question no:
1 (3)

Poäng / *Points awarded:*

Lärarens anteckning
Examiner's remarks:

* e)

$X_1 = 20\%$ $\beta_1 = 0,5$

$X_2 = 60\%$ $\beta_2 = 1,5$

$X_3 = 20\%$ $\beta_3 = 2$

$\beta_{fund} = 1,4 = 0,2 \cdot 0,5 + 0,6 \cdot 1,5 + 0,2 \cdot 2$ R

$R = 8\%$

One way to evaluate a fund's performance is to use the treyner's measure. RTP

$$T_M = \frac{\bar{r}_M - r_f}{\beta_M} = \frac{7-2}{1} = 5$$

$$T_P = \frac{\bar{r}_P - r_f}{\beta_P} = \frac{8-2}{1,4} = 4,2857$$

$$T^2_P = T_P - T_M = 4,2857 - 5 = -0,7143$$

SVAR e):

This $T^2_2 = -0,7143$ shows that the managed portfolio has not performed particularly well, for the amount of risk it has performed worse than the market portfolio. A combination of risk-free and market portfolio would have performed better at this level of risk.

which can be shown with the SML:

$R_i = 2 + 5(1,4) = \boxed{9\%} > R = 8\%$

1

f) 9 ?

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VEGC18-0012-w0u

Löpande sidnr
Consecutive no:
4

Uppgift nr /
Question no:
2(1)

Poäng / *Points awarded:*
2,5

Lärarens anteckning
Examiner's remarks:

explain

* a) Find r_{01} r_{02} r_{03}

$\frac{100}{98,02} = 1,0202 = (1+r_{01})$

$\frac{100}{94,18} = 1,0618 = (1+r_{02})^2 \Rightarrow (1+r_{02}) = 1,0304$

$\frac{100}{92,77} = 1,0779 = (1+r_{03})^3 \Rightarrow (1+r_{03}) = 1,0253$

Find r_{12} r_{23}

$(1+r_{0,T})^T = (1+r_{01})(1+r_{12})\ldots(1+r_{T-1,T})$

$1,0618 = (1,0202)(1+r_{12})$

$/1,0202$

$(1+r_{12}) = 1,0408$

$1,0779 = (1,0202)(1,0408)(1+r_{23})$

$/(1,0202)(1,0408)$

$(1+r_{23}) = 1,0152$

0,5

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VEGC18-0012-WOM

Löpande sidnr
Consecutive no:
5

Uppgift nr /
Question no:
2(a)

Poäng / *Points awarded:*

Lärarens anteckning
Examiner's remarks:

b) The expected return on a 3-year contract ZCB the expected return is 7,79%.

The expected return on three 1-year contracts would be:

$(1,0202)(1,03308)(1,0152) = 1,0676 = 6,76\%$
$(1+r_{1,2}+e_{101})$

Therefore, investing in a 3-year bond would result in a risk-free profit. 0,5

c) The other way around now.

$E(R)$ on 3-year is still 7,79%

But now three 1-year bonds will generate:

$(1,0202)(1,0408)(1,0202) = 1,08327 = 8,33\%$ 0,5

Investing in three 1-year bonds is more profitable.

d) Spot-interest increases with maturity bc of different reasons according to different hypothesis / theories.

According to expectation theory, a higher interest would in cam there's an expectation market interest will rise in the future.

The market segmentation theory would say it is either because long maturity bonds are in high supply or low in demand bringing price down (interest up) 1

The liquidity preference plays on supply- and-demand too. Investors prefer shor-term bonds since long-term = more risk. Short-term is more liquid and investors are willing to pay more! Long term investors require higher premiums.

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UEGC18-2012-WQM

Löpande sidnr
Consecutive no:
6

Uppgift nr / *Question no:*
3(1)

Poäng / *Points awarded:*
3,5

Lärarens anteckning
Examiner's remarks:

*a)

	Skandia	Alfred Berg	HB	Market
Sharpe's	14/28,2 = 0,49645 ✓	1,1/11,5 = 0,09565 ✓	6,2/19,2 0,32292 ✓	7,8/3,8 2,05263
Treynor's	14/1,2 = 0,11667 ✓	1,1/0,3 = 0,03667 ✓	6,2/0,68 = 0,09118 ✓	= 0,078
Jensen's	0,0464 ✓	-0,0124 ✓	0,009 ✓	
IR $\alpha_i/\sigma(\varepsilon_p)$	0,16454	-0,10783	0,04687	
	0,516	-0,1 ✓	0,075	

$R_i = \alpha_i + \beta_i R_M + e_i$

$14 = \alpha_1 + 1,2(7,8) \Rightarrow \alpha_1 = 4,64/100 = 0,0464$

$1,1 = \alpha_2 + 0,3(7,8) \Rightarrow \alpha_2 = -1,24/100 = -0,0124$

$0,2 = \alpha_3 + 0,68(7,8) \Rightarrow \alpha_3 = 0,9/100 = 0,009$

Ranking:
1 Skandia according to all measures
2 Handelsbanken
3 Alfred Berg

Sharpes shows the portfolio's performance when considering both systematic and non-systematic risk (σ)

Treynor's shows the performance when only considering systematic risk (β)

Jensen's

Information Ratio

1

b) find $w_{j,k,l}$ in portfolio j = Skandia
k = AB
l = HB

$$w_j = \frac{0,0464/(0,282^2)}{0,0464/(0,282^2) + 0,0124/(0,1115^2) + 0,009/(0,192^2)}$$

$$= 0,3305$$

1,12

$$w_k = \frac{0,0124/0,1115^2}{\sum_{i=1}^{n} \frac{\alpha_i}{\sigma^2(\varepsilon_i)}}$$

$$= 0,5312$$

-0,24

$$w_l = \frac{0,009/0,192^2}{\sum_{i=1}^{n} \frac{\alpha_i}{\sigma^2(\varepsilon_i)}}$$

$$= 0,1383$$

0,12

The weights will be
Skandia 33,05 % w_j
Alfred Berg 53,12 % w_k
Handelsbanken 13,83 % w_l

0,5

c)

$$\alpha_A = 0,3305 \cdot 0,0464 + 0,5312 \cdot -0,0124 + 0,1383 \cdot 0,009 = 0,009993$$

$$\beta_A = 33,05\% \cdot 1,2 + 53,12\% \cdot 0,3 + 13,83\% \cdot 0,68 = 0,65$$

0,5

$$\sigma^2(\varepsilon_A) = w_j^2 \cdot 0,282^2 + w_k^2 \cdot 0,1115^2 + w_l^2 \cdot 0,192^2 = 0,01312$$

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NEGC18-0012-W24

Löpande sidnr / *Consecutive no:* 8

Uppgift nr / *Question no:* 3(3)

Poäng / *Points awarded:*

Lärarens anteckning / *Examiner's remarks:*

d) Find w_0 first

$$w_0 = \frac{0,000999 / 0,078}{0,01312 / 0,038^2} = 0,014096$$ ✓

then find w^*

$$w^* = \frac{0,014096}{(1+(1-0,65))\,0,014096} = 0,014007.$$ ✓

Skandia $33,05\% \cdot 1,4\% = 0,0046$
AB $53,12\% \cdot 1,4\% = 0,0074$
HB $13,83\% \cdot 1,4\% = 0,0019$
} optimal weight

(I believe I have miscalculated somewhere, but not sure where. I do think the calculations are otherwise correct.) 1

If weight were greater than one it would mean short-selling one of the assets.

e)

$$S_M^2 = \left(\frac{7,8}{3,8}\right)^2 = 4,2132 \cdot 10^{-2} = 0,042132$$

$$S_P^2 = 0,042132 + \frac{0,000999^2}{0,01312} = 0,049738$$

$$S_P = \sqrt{0,049738} = 0,223002$$ 0,5

Sharpe's ratio

Better because you can choose how much risk your investment is going to have.