

Case in: **EXC 23041 Statistics**

Handout date: 25.05.07, 09.00

Examination is held: 11.06.07, 09.00 - 12.00

Total number of pages: 3

General information

The case analysis will be the basis for 15 out of the 30 multiple choice questions. You have to bring the case text and the results of your analysis to the exam. Your analysis will hopefully supply the answers to the exam questions. You will not be required to hand in your analysis.

The case is relatively open. The questions invite to different approaches and use of different statistical methods. You should focus on the approach you find the most interesting and the methods you find to be the most relevant.

As you do not know in advance the questions that will be asked, your analysis should be a broad one. The questions in the multiple choice exam are posed in such a way that, even if you haven't worked out the exact answer required, a thorough analysis of the case will enable you to choose the right answer.

You can analyse the case on your own or together with a group of other students. What is important is that you acquire an insight into the data material, that you understand the analytical methods used and that you are able to draw the right conclusions. The multiple choice exam is an individual exam.

You will find the data here: <http://www.bi.no/users/fag87027/met8006.htm>

Case: Kebab (weight 7)

The authorities will periodically control the books in shops and restaurants. This happened recently at a kebab shop in the Oslo area. The authorities wanted to control whether the shop had entered costs based on a higher weight per kebab than was the actual case. This way the accounts would show a smaller profit, resulting in lower taxes. The authorities therefore collected two samples of kebab by turning up unannounced and weighing a random sample of kebabs. The first sample consisted of 18 kebabs bought during a single day. The second consisted of two kebabs bought during another day. The results are in gram per kebab:

Smp. 1 467 465 519 439 462 482 482 484 465 443 500 430 480 450 460 480 450 470
 Smp. 2 524 553

The authorities combined the two samples, performed calculations, and assumed that the population mean (average) was 460 gram. They performed an assessment taxation of the kebab shop based on this assumption. (This is a simplified version of the story.)

- a) Combine the samples and analyse the data. Is it reasonable to assume a population mean (average) of 460 gram?
- b) Is it reasonable to assume that the two samples are from the same population?¹ How does this illuminate the authorities' assessment taxation?

Case: Blonde test (weight 3)

Are blondes more stupid than brunettes? UFO² wants to answer this question once and for all. The test consists of five questions, and 46 girls were given the test. UFO gives the results in percent, and we are not told how many of the 46 that were blondes and brunettes.

- a) Who has the highest mean (average) score?
- b) Suppose there were 23 girls in each category. Is there a significant difference between blondes and brunettes?³
- c) Will another distribution of the 46 girls according to blondes and brunettes change the conclusion from b)?⁴

Take the blonde test

1. Which number is next:
5 8 6 9 7 10? Alternatives: 8, 7, 13, 9
2. In which country do we find Jerusalem:
Iraq, The Middle East, Israel, Iran?
3. In which city can you take the Ulriksbanen:
Bergen, Stavanger, Arendal, Ålesund?
4. Hand is to glove as head is to:
hair, hat, horse, body?
5. Which word does not fit in?
stjerne, tre, spisser, briller

Correct	5 of 5	4 of 5	3 of 5	2 of 5	1 of 5	Sum
Brunettes	15 %	27 %	27 %	31 %	0 %	100 %
Blondes	20 %	25 %	30 %	15 %	10 %	100 %

¹ Use Statark or SPSS or an appropriate approximation formula to find the critical value.
² Correct answers: 8, Israel, Bergen, Hat, Tre according to Aftenposten Aften 10-04-07
³ Use the chi-square test. Ignore the fact that there are too few observations in certain cells, or that you get decimal numbers rather than integers. In that case you may use the decimal numbers.
⁴ To investigate this, it may be practical to use a spreadsheet.

Case: Do stock brokers deserve their commission? (weight 5)

The table below shows the relationship between the number of times a share at Oslo Stock Exchange (OSE) has been recommended during 2006, and the rise in the share's price during the year.

a) Analyse the relationship using a fitting model from your curriculum. Let x be the increase in price and y the number of recommendations.

b) The increase in the OSE index was 30,9 % for the period (up to 22/11). Compare this with the increase in price of the shares that were recommended at least 12 times.

(We are simplifying by only counting the number of recommendations as *Dagens Næringsliv* have done, because the reasons for recommendation differ: sometimes it is a short term recommendation, other times for a long term investment, and a few are recommended to the end of the year. Nevertheless ...)

RELATIONSHIP BETWEEN BROKER'S RECOMMENDATIONS AND SHARE PRICE GROWTH - OSE 2006

Based on numbers from Dagens Næringsliv 30. December 2006, updated by Jørgen Randers

Company	Recommendations	Growth in share price	Company	Recommendations	Growth in share price
Fast	93	37,1	Frontline	11	-20,2
Orkla	69	26,3	Schibsted	11	11,0
Tomra	66	-11,0	Tgs Nopec	11	62,8
Scorpion Offsh	54	46,3	Clavis Pharma	10	-3,4
Subsea 7	51	44,2	Medicult	10	22,4
Pan Fish	50	173,6	Revus Energy	9	8,0
Sinvest	48	56,3	PGS	8	136,7
SeaDrill	47	94,0	Bergesen W gas	6	-7,0
Fred O Energy	42	20,2	Ementor	6	57,1
Telenor	42	77,0	PA Resources	6	99,1
Cermaq	35	66,2	Eastern drilling	6	28,4
Aker	33	102,5	Prosafe	5	54,5
Statoil	32	6,6	Acta Holding	5	84,4
Tandeberg Telev	29	-12,4	Seven marine	5	15,2
DnB NOR	29	22,9	Aceryg	5	52,9
Songa Offshore	28	14,4	Aker Yards	5	49,1
Yara Intl	27	44,3	Itera	5	38,2
Deep sea Sup	26	0,0	REC	4	-2,6
Awilco Offshore	26	53,3	Biotec	4	100,0
Eltak	23	-44,7	Komplett	4	52,4
RCCL	23	-14,7	Aker Drilling	4	-1,5
DNO	21	-22,7	SeaBird	3	52,1
Tandberg	19	-23,8	Storebrand	3	36,1
Birdstep	19	-22,8	DOF	2	88,9
Farstad Shipping	17	39,7	Norsk Hydro	2	39,6
Petrolia Drilling	17	9,2	Stolt Nielsen	2	-14,5
Apl	14	51,9	Spb Midt-Norge	2	4,8
Expert	14	39,9	Golden Ocean G	1	193,4
Norwegian	13	17,7	Kongsberg Auto	1	18,3
Lerøy	12	50,7	Aker Kværner	1	87,7