NTNU, Norges teknisk-naturvitenskapelige universitet

EXAMINATION QUESTIONS FOR/ EKSAMENSOPPGÅVE I / EKSAMENSOPPGAVE I SVSOS3003

"ANVENDT STATISTISK DATAANALYSE I SAMFUNNSVITENSKAP"

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Allowed means for assistance/ tillatne hjelpemiddel/ tillatte hjelpemidler:

- Calculator/ kalkulator/ kalkulator
- Norwegian-English/ English-Norwegian dictionary/
  Norsk-engelsk/ Engelsk-norsk ordbok/
  Norsk-engelsk/ Engelsk-norsk ordbok
- Hamilton, Lawrence C. 1992 «Regression with Graphics», Belmont, Duxbury,
- Hardy, Melissa A. 1993 «Regression with Dummy Variables», QASS 93, London, Sage
- Allison, P.D. 2003 «Missing data», QASS 132, London, Sage
- Printed lecture notes from Berge's lectures /
  Trykte forelesingsnotat frå Berge sine forelesingar/
  Trykte forelesningsnotater fra Berge's forelesninger

ENGLISH

Both questions use data from European Social Survey (ESS). The objective of ESS is to explore the relations between institutional conditions and the attitudes, values and opinions of citizens of European countries. The first wave of interviews was conducted during the fall of 2002 and data were made available for public use in the fall of 2003. A total of 22 countries participated. In the two questions only data for Norway has been used.

QUESTION 1 (OLS-regression, weight 0,5)

In a Norwegian study of trust in fellow citizens differences between regions were investigated by OLS regression. Six models were estimated.

a) Explain what Model 1 tells about regional differences in trust.
b) Determine which of the six models best predicts the level of trust a person expresses. Find the F-statistic of a test of the best model against model 2.
c) Evaluate the hypothesis "The relationship between age and trust in fellow citizens is linear". Find a 90% confidence interval for the impact of education in the best model.
d) Formulate the model identified as the best.
e) Based on the best model write up the formula for producing conditional effect plots according to age, sex and location in Oslo/Akershus and Trøndelag.
f) Discuss the degree to which the assumptions of OLS regression are met in the best model.

QUESTION 2 (Logistic regression, weight 0,5)

In the same study of trust, regional differences in viewing politicians as vote maximizers were also investigated. Based on the information available in the tables attached, please answer the following:

a) Discuss what the study says about the hypotheses
   H1: The relationship between "Politicians interested in votes rather than peoples opinions" and "Age" is curvilinear
   H2: The impact of "Age" on "Politicians interested in votes rather than peoples opinions" depends on the sex of the person
b) Based on model 4 write up the equation determining the relationship between dependent and independent variables in the population studied and present the assumptions that have to be met to draw valid inferences from the estimated relationships
c) Find in model 2 the odds ratio between women and men for thinking that politicians are vote maximizers. Discuss regional variation in "Politicians interested in votes rather than peoples opinions"
d) Discuss the degree to which the assumptions of logistic regression have been met in model 5
e) Based on model 4 write up the equation for a conditional effect plot according to age of respondent that will maximise the probability of observing Y=1 on the variable "Politicians interested in votes rather than peoples opinions"
f) Find from model 5 an expression for the odds ratio for observing Y=1 on "Politicians interested in votes rather than peoples opinions" between groups of men with one year difference in age

BOKMÅL

I begge eksamensoppgavene benyttes data fra European Social Survey (ESS). Hensikten med ESS er å kartlegge sammenhengen mellom institusjonelle forhold i de europeiske land og borgernes holdninger, verdier og oppfatninger. Den første intervjurunden ble foretatt høsten 2002 og data ble frigitt for allmenn bruk høsten 2003. I alt har 22 land deltatt. I de to eksamensoppgavene er bare data for Norge benyttet.

OPPGAVE 1 (OLS-regresjon, vekt 0,5)

I en studie av tillit til medborgere i Norge ble forskjeller mellom regionene analysert ved hjelp av OLS regresjon. Seks modeller ble estimert.

a) Forklar hva modell 1 forteller om regionale forskjeller i tillit.
b) Avgjør hvile av de seks modellene som best predikerer tillitsnivået en person gir uttrykk for. Finn F-observatoren for en test av den beste modellen mot modell 2.
c) Evaluer hypotesen "Forbindelsen mellom alder og tillit til medborgere er lineær". Finn et 90% konfidensintervall for virkningen av utdanning i den beste modellen.
d) Formuler den modellen som er identifisert som den beste.
e) Ta utgangspunkt i den beste modellen og skriv opp formelen for å lage betinget effekt plott etter alder, kjønn og lokalisering i Oslo/Akershus og Trøndelag.
f) Drøft i hvilken grad forutsetningene for OLS regresjon er tilfredsstilt i den beste modellen.

OPPGAVE 2 (Logistisk regresjon, vekt 0,5)
I den samme studien av tillit ble regionale ulikheter i synet på politikere som stemmemaksimerere studert. Basert på informasjonen som er tilgjengelig i vedleggstabellene skal følgende spørsmål besvares:

a) Drøft hva studien sier om hypotesene
   - H1: relasjonen mellom "Politicians interested in votes rather than peoples opinions" og "Age" er kurvelineær
   - H2: Virkningen av "Age" på "Politicians interested in votes rather than peoples opinions" er avhengig av personens kjønn

b) Ta utgangspunkt i modell 4 og skriv opp ligningen som bestemmer relasjonen mellom avhengig og uavhengige variable i populasjonen som er studert og presenter forutsetningene som være oppfylt for at en kan dra valide konklusjoner på grunnlag av de estimerte relasjonene.

c) Finn i modell 2 oddsraten mellom kvinner og menn for å tro at politikere maksimerer stemmer. Drøft regional variasjon i "Politicians interested in votes rather than peoples opinions"

d) Drøft i hvilken grad forutsetningene for logistisk regresjon er tilfredsstilt i model 5

e) Ta utgangspunkt i modell 4 og skriv opp ligningen for et betinget effektplott etter respondentens alder som vil maksimere sannsynligheten for å observere Y=1 på variabelen "Politicians interested in votes rather than peoples opinions"

f) Bruk modell 5 til å finne et uttrykk for oddsraten for å observere Y=1 på "Politicians interested in votes rather than peoples opinions" mellom grupper av menn med ett års aldersdifferanse

NYNORSK

Begge eksamensoppgåvene nyttar data frå European Social Survey (ESS). Målet med ESS er å kartlegge samanhengen mellom institusjonelle tilhøve i europeiske land og borgarane sine haldningar, verdiar og oppfatningar. Den første intervjurunden vart gjort hausten 2002 og data vart frigjevne for allmenn bruk hausten 2003. I alt har 22 land vore med. I dei to eksamensoppgåvene er det nytta data berre frå Noreg.

OPPGÅVE 1 (OLS-regresjon, vekt 0,5)

I ein studie av tillit til medborgarane I Noreg vart skilnader mellom regionane analysert ved hjelp av OLS regresjon. Seks modellar vart estimert.

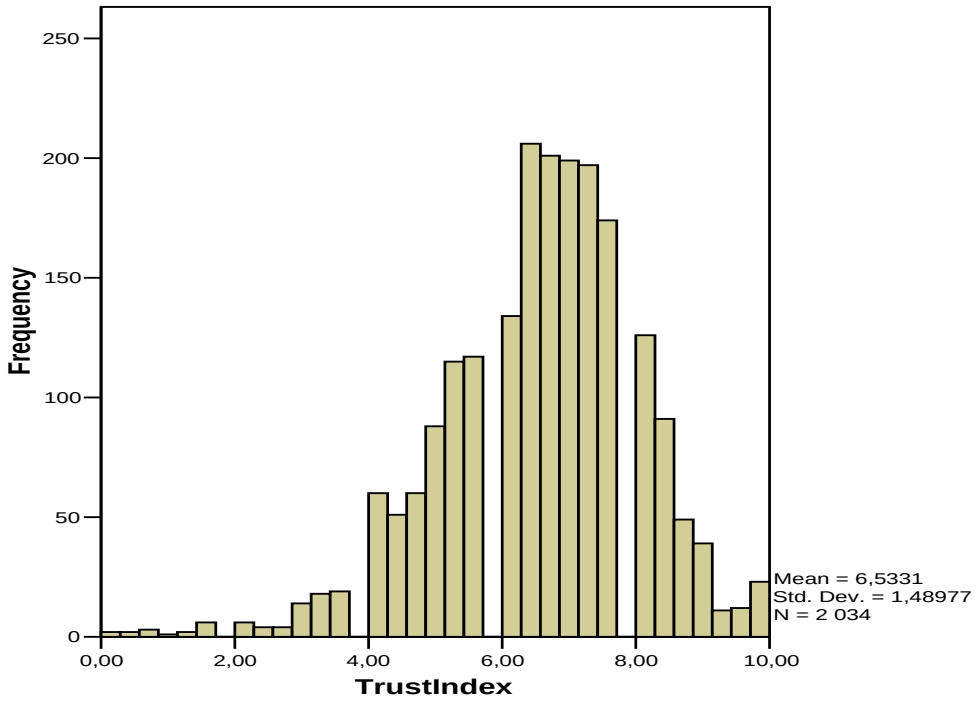
a) Forklar kva modell 1 fortel om regionale skilnader i tillit.
b) Avgjer kva for ein av dei 6 modellane det er som best predikerer nivået av tillit ein person gir uttrykk for. Finn F-observatoren for ein test av den beste modellen mot modell 2.
c) Vurder hypotesen "Sambandet mellom alder og tillit til medborgarar er lineært". Finn eit 90% konfidensintervall for verknaden av utdanning i den beste modellen.
d) Formuler den modellen som vart identifisert som den beste.
e) Ta utgangspunkt i den beste modellen og skriv opp formelen for å lage betinga effektplott etter alder, kjønn og lokalisering i Oslo/ Akershus og Trøndelag.
f) Drøft i kva grad føresetnadene for OLS regresjon er stetta i den beste modellen.

OPPGÅVE 2 (Logistisk regresjon, vekt 0,5)
I den same studien av tillit vart regionale skilnader i synet på politikarar som røystemaksimerarar studert. Basert på den informasjonen som de finn i vedleggstabellane, gjer vel og svar på følgjane spørsmål:

a) Drøft kva studien har å seie om hypotesene:
   - H1: Relasjonen mellom "Politicians interested in votes rather than peoples opinions" og "Age" er kurvelineær.
   - H2: Verknaden til "Age" på "Politicians interested in votes rather than peoples opinions" er avhengig av kva kjønn personen har.

b) Ta utgangspunkt i modell 4 og skriv opp likninga som fastlegg relasjonen mellom avhengig og uavhengige variable i populasjonen som vert studert og presenter føresetnadene som må stettast om ein skal kunne dra valide konklusjonar på grunnlag av dei estimerte relasjonane.
c) Ta utgangspunkt i modell 2 og finn oddsraten mellom kinner og menn for å tru at politikarar maksimerer røyster. Drøft regional variasjon i "Politicians interested in votes rather than peoples opinions".
d) Drøft i kva grad føresetnadene for logistisk regresjon er stetta i modell 5
e) Ta utgangspunkt i modell 4 og skriv opp likninga for eit betinga effektplott etter respondentens alder slik at det maksimerer sannsynet for å observere Y=1 på variabelen "Politicians interested in votes rather than peoples opinions"
f) Finn frå modell 5 eit uttrykk for oddsraten for å observere Y=1 på "Politicians interested in votes rather than peoples opinions" mellom grupper av menn med eit års skilnad i alder

APPENDIX
TABLES FOR EXAMINATION QUESTION 1 AND 2



Trustindex = (A8+A9+A10)/3 defined by

A8	"most people can be trusted or you can't be too careful"	scores 0-10	high value = trust
A9	"most people try to take advantage of you, or try to be fair"	scores 0-10	high value = fair
A10	"most of the time people helpful or mostly looking out for themselves"	scores 0-10	high value = helpful

Two cases have missing value (= "Don't know" on A9)

Region, Norway

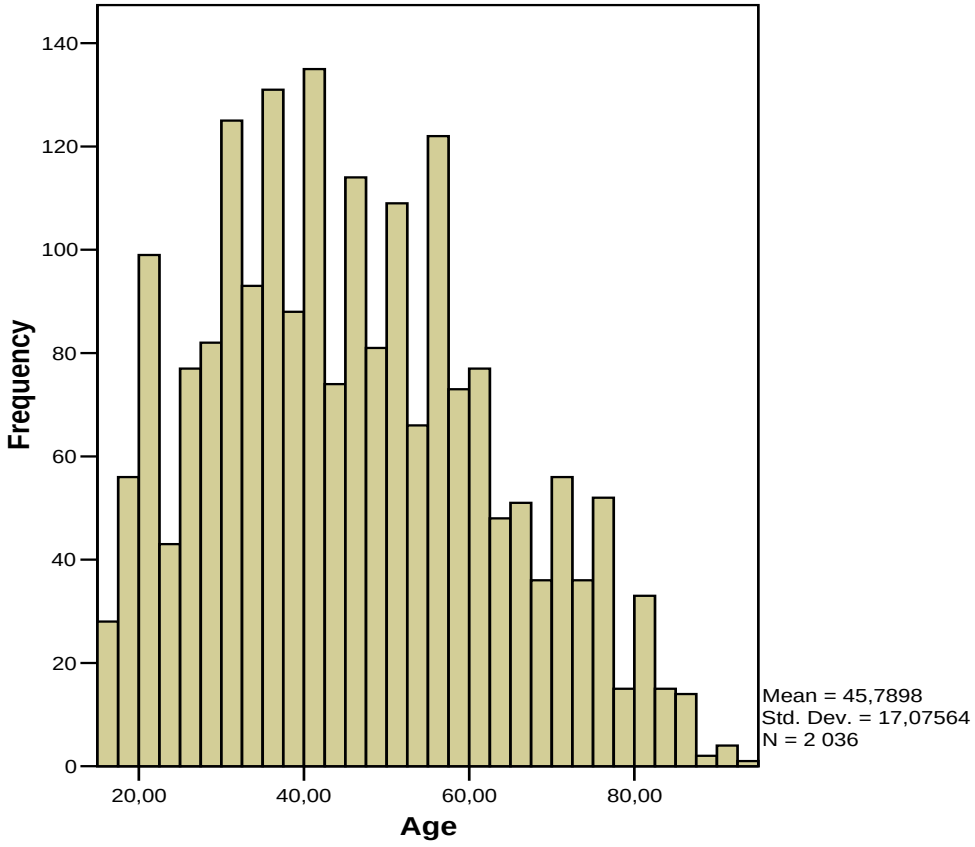
	Frequency	Percent
Oslo and Akershus	403	19,8
Hedmark and Oppland	175	8,6
South Eastern Norway	366	18,0
Agder and Rogaland	304	14,9
Western Norway	386	19,0
Trøndelag	197	9,7
Northern Norway	205	10,1
Total	**2036**	**100.0**

Female

Female=1	Frequency	Percent
0	1103	54,2
1	933	45,8
Total	**2036**	**100,0**

Number of people living regularly as member of household

Number of persons in household	Frequency	Percent
1	395	19,4
2	730	35,9
3	342	16,8
4	350	17,2
5	178	8,7
6	32	1,6
7	6	,3
8	1	,0
9	2	,1
Total	**2036**	**100,0**



Highest level of education, Norway, recoded to education in years

		Frequency	Percent
5 =	No education and pre-school education (under school age)	1	,0
7 =	Primary education (1st. - 7th. class level)	1	,0
9 =	Lower secondary education (8th. - 10th. class level)	296	14,5
12 =	Upper secondary, basic (11th. - 12th. class level)	598	29,4
13 =	Upper secondary, final year (13th. class level+)	493	24,2
14 =	Post-secondary non-tertiary education (14th. class level+)	52	2,6
15 =	First stage tertiary, undergraduate level (14th-17th level)	448	22,0
18 =	First stage tertiary, undergraduate (18th-19th level)	103	5,1
20 =	Second stage tertiary (postgraduate)(20th level+)	12	,6
	SubTotal valid	**2004**	98,4
99=	No answer	32	1,6
Total		**2036**	**100.0**

PoliticiansVoteMaximisers based on "Politicians interested in votes rather than peoples opinions"

Code	**Politicians interested in votes rather than peoples opinions**		Frequency	Percent
1	1=	Nearly all just interested in votes	266	13,1
1	2=	Most just interested in votes	373	18,3
0	3=	Some just interested in votes	752	36,9
0	4=	Most interested in opinions	554	27,2
0	5=	Nearly all interested in opinions	83	4,1
		SubTotal Valid Cases	**2028**	99,6
missing	8=	Don't know	8	,4
		Total	**2036**	**100.0**

Voted based on "Voted last national election"

Code	**Voted last national election**	Frequency	Percent
1	1 = Yes	1648	80,9
0	2 = No	296	14,5
0	3 = Not eligible to vote	92	4,5
	Total	**2036**	**100,0**

LeftRightScale based on "Placement on left right scale"

Code	**Placement on left right scale**	Frequency	Percent
0 = Left	0 = Left	23	1,1
1	1	23	1,1
2	2	84	4,1
3	3	266	13,1
4	4	245	12,0
5	5	503	24,7
6	6	226	11,1
7	7	317	15,6
8	8	208	10,2
9	9	49	2,4
10 = Right	10 = Right	43	2,1
	SubTotal Valid Cases	1987	97,6
99 = Missing	Refusal	9	,4
99 = Missing	Don't know	40	2,0
	SubTotal Missing Cases	49	2,4
	Total	**2036**	**100,0**

Tables for examination question 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
TrustIndex	2002	,00	10,00	6,5425	1,48616
OsloAkershus	2002	,00	1,00	,1958	,39692
HedmarkOppland	2002	,00	1,00	,0864	,28104
SouthEast	2002	,00	1,00	,1793	,38372
AgderRogaland	2002	,00	1,00	,1494	,35652
WestNorway	2002	,00	1,00	,1913	,39343
Troendelag	2002	,00	1,00	,0964	,29522
NorthNorway	2002	,00	1,00	,1014	,30193
Age	2002	17,00	93,00	45,9361	17,06805
Female	2002	,00	1,00	,4580	,49836
Educ	2002	5,00	20,00	12,8761	2,28080
NoHHmembers	2002	1,00	9,00	2,6723	1,33665
Age2	2002	289,00	8649,00	2401,2947	1698,57299
FemaleAge	2002	25,00	400,00	170,9940	60,19404
FemaleAge2	2002	,00	93,00	21,1109	25,76226
Educ2	2002	,00	8649,00	1109,0320	1684,30051
FemaleEduc	2002	,00	18,00	5,8352	6,53089
FemaleEduc2	2002	,00	324,00	76,6803	92,19002

Model Summary(g)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.086(a)	.007	.004	1.482843	.007	2.494	6	1995	.021
2	.210(b)	.044	.040	1.456509	.037	19.198	4	1991	.000
3	.222(c)	.049	.044	1.452921	.005	10.847	1	1990	.001
4	.229(d)	.053	.046	1.451286	.003	3.243	2	1988	.039
5	.230(e)	.053	.046	1.451557	.000	.257	1	1987	.612
6	.232(f)	.054	.046	1.451518	.001	1.053	2	1985	.349

a Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway
b Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway, Female, Age, Educ, NoHHmembers
c Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway, Female, Age, Educ, NoHHmembers, Age2
d Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway, Female, Age, Educ, NoHHmembers, Age2, FemaleAge2, FemaleAge
e Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway, Female, Age, Educ, NoHHmembers, Age2, FemaleAge2, FemaleAge, Educ2
f Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway, Female, Age, Educ, NoHHmembers, Age2, FemaleAge2, FemaleAge, Educ2, FemaleEduc2, FemaleEduc
g Dependent Variable: TrustIndex

ANOVA(g)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32.906	6	5.484	2.494	.021(a)
	Residual	4386.651	1995	2.199		
	Total	4419.558	2001			
2	Regression	195.812	10	19.581	9.230	.000(b)
	Residual	4223.746	1991	2.121		
	Total	4419.558	2001			
3	Regression	218.709	11	19.883	9.419	.000(c)
	Residual	4200.849	1990	2.111		
	Total	4419.558	2001			
4	Regression	232.371	13	17.875	8.487	.000(d)
	Residual	4187.187	1988	2.106		
	Total	4419.558	2001			
5	Regression	232.913	14	16.637	7.896	.000(e)
	Residual	4186.645	1987	2.107		
	Total	4419.558	2001			
6	Regression	237.352	16	14.835	7.041	.000(f)
	Residual	4182.206	1985	2.107		
	Total	4419.558	2001			

a Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway

b Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway, Female, Age, Educ, NoHHmembers

c Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway, Female, Age, Educ, NoHHmembers, Age2

d Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway, Female, Age, Educ, NoHHmembers, Age2, FemaleAge2, FemaleAge

e Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway, Female, Age, Educ, NoHHmembers, Age2, FemaleAge2, FemaleAge, Educ2

f Predictors: (Constant), NorthNorway, HedmarkOppland, Troendelag, AgderRogaland, SouthEast, WestNorway, Female, Age, Educ, NoHHmembers, Age2, FemaleAge2, FemaleAge, Educ2, FemaleEduc2, FemaleEduc

g Dependent Variable: TrustIndex

Coefficients(a)

Model		Unstandardized Coefficients		t	Sig.	Collinearity Statistics	
		B	Std. Error			Tolerance	VIF
1	(Constant)	6.435	.075	85.914	.000		
	HedmarkOppland	.340	.135	2.512	.012	.759	1.317
	SouthEast	.028	.108	.257	.797	.636	1.572
	AgderRogaland	.030	.114	.267	.790	.667	1.499
	WestNorway	.192	.107	1.803	.072	.625	1.599
	Troendelag	.334	.130	2.562	.010	.742	1.348
	NorthNorway	.00062	.128	.005	.996	.733	1.364
2	(Constant)	4.358	.267	16.329	.000		
	HedmarkOppland	.436	.134	3.247	.001	.745	1.343
	SouthEast	.113	.108	1.051	.293	.618	1.617
	AgderRogaland	.139	.113	1.225	.221	.650	1.538
	WestNorway	.292	.106	2.741	.006	.605	1.654
	Troendelag	.426	.129	3.306	.001	.733	1.365
	NorthNorway	.100	.127	.789	.430	.721	1.387
	Age	.011	.002	5.334	.000	.848	1.179
	Female	.300	.066	4.573	.000	.992	1.008
	Educ	.093	.015	6.241	.000	.913	1.095
	NoHHmembers	.057	.026	2.187	.029	.860	1.163
3	(Constant)	4.842	.304	15.920	.000		
	HedmarkOppland	.452	.134	3.376	.001	.744	1.345
	SouthEast	.116	.108	1.074	.283	.618	1.618
	AgderRogaland	.127	.113	1.126	.260	.650	1.539
	WestNorway	.288	.106	2.710	.007	.604	1.654
	Troendelag	.434	.129	3.377	.001	.733	1.365
	NorthNorway	.099	.127	.783	.434	.721	1.387
	Age	-.022	.010	-2.153	.031	.034	29.237
	Female	.302	.065	4.615	.000	.992	1.008
	Educ	.105	.015	6.863	.000	.861	1.162
	NoHHmembers	.075	.027	2.815	.005	.824	1.213
	Age2	.00035	.000	3.293	.001	.033	30.543
4	(Constant)	5.334	.361	14.756	.000		
	HedmarkOppland	.463	.134	3.459	.001	.743	1.346
	SouthEast	.120	.108	1.113	.266	.618	1.618
	AgderRogaland	.134	.113	1.183	.237	.648	1.542
	WestNorway	.276	.106	2.598	.009	.603	1.658
	Troendelag	.434	.128	3.381	.001	.732	1.367
	NorthNorway	.103	.127	.813	.416	.721	1.387
	Age	-.046	.014	-3.303	.001	.019	52.838
	Female	-.814	.461	-1.763	.078	.020	50.240
	Educ	.107	.015	6.919	.000	.854	1.171
	NoHHmembers	.076	.027	2.820	.005	.822	1.217
	Age2	.00059	.000	4.140	.000	.018	54.924
	FemaleAge	.051	.020	2.538	.011	.004	253.665
	FemaleAge2	-.00051	.000	-2.532	.011	.009	108.988

5	(Constant)	5.695	.799	7.131	.000		
	HedmarkOppland	.466	.134	3.475	.001	.742	1.348
	SouthEast	.125	.108	1.156	.248	.613	1.632
	AgderRogaland	.138	.113	1.218	.223	.645	1.551
	WestNorway	.279	.106	2.625	.009	.601	1.665
	Troendelag	.436	.129	3.391	.001	.731	1.367
	NorthNorway	.105	.127	.827	.408	.720	1.388
	Age	-.046	.014	-3.299	.001	.019	52.841
	Female	-.819	.462	-1.773	.076	.020	50.263
	Educ	.050	.112	.450	.653	.016	61.865
	NoHHmembers	.075	.027	2.809	.005	.821	1.217
	Age2	.00058	.000	4.117	.000	.018	55.007
	FemaleAge	.051	.020	2.550	.011	.004	253.833
	FemaleAge2	-.00051	.000	-2.545	.011	.009	109.074
	Educ2	.0021	.004	.507	.612	.016	60.982
6	(Constant)	6.473	1.025	6.313	.000		
	HedmarkOppland	.459	.134	3.421	.001	.740	1.351
	SouthEast	.120	.108	1.114	.266	.612	1.634
	AgderRogaland	.133	.113	1.174	.240	.644	1.553
	WestNorway	.277	.106	2.600	.009	.600	1.666
	Troendelag	.432	.129	3.356	.001	.729	1.372
	NorthNorway	.099	.127	.784	.433	.719	1.390
	Age	-.043	.014	-3.048	.002	.018	54.151
	Female	-2.373	1.570	-1.511	.131	.002	581.698
	Educ	-.060	.147	-.405	.685	.009	106.464
	NoHHmembers	.075	.027	2.804	.005	.820	1.219
	Age2	.00055	.000	3.793	.000	.018	56.880
	FemaleAge	.046	.020	2.229	.026	.004	264.560
	FemaleAge2	-.00044	.000	-2.102	.036	.009	116.728
	Educ2	.0056	.005	1.040	.299	.010	100.514
	FemaleEduc	.218	.232	.940	.347	.000	2180.187
	FemaleEduc2	-.0069	.009	-.784	.433	.002	624.336

a Dependent Variable: Trustindex

MORE INFORMATION ON THE BEST MODEL:

Residuals Statistics(a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	5.36869	7.96961	6.54246	.344408	2002
Std. Predicted Value	-3.408	4.144	.000	1.000	2002
Standard Error of Predicted Value	.088	.451	.130	.032	2002
Adjusted Predicted Value	5.51503	8.00887	6.54253	.344833	2002
Residual	-6.796422	3.792056	.000000	1.445703	2002
Std. Residual	-4.682	2.612	.000	.996	2002
Stud. Residual	-4.724	2.620	.000	1.000	2002
Deleted Residual	-6.918898	3.824270	-.000075	1.458604	2002
Stud. Deleted Residual	-4.750	2.624	.000	1.001	2002
Mahal. Distance	6.384	192.281	15.992	10.182	2002
Cook's Distance	.000	.024	.001	.001	2002
Centered Leverage Value	.003	.096	.008	.005	2002

a Dependent Variable: Trustindex

Casewise Diagnostics(a)

Case Number	Respondent's identification number	Std. Residual	TrustIndex	Predicted Value	Residual
85	166	-3,922	,33	6,0259	-5,69254
350	618	-3,055	2,00	6,4344	-4,43445
353	622	-3,020	1,67	6,0496	-4,38294
393	695	-3,470	1,00	6,0369	-5,03693
807	1385	-3,203	1,67	6,3158	-4,64912
1093	1850	-3,524	1,33	6,4489	-5,11553
1240	2063	-3,070	1,67	6,1223	-4,45561
1295	2156	-3,049	2,00	6,4262	-4,42617
1445	2392	-3,318	2,00	6,8158	-4,81578
1579	2563	-4,682	,00	6,7964	-6,79642
1603	2596	-3,748	,67	6,1073	-5,44063
1608	2604	-4,549	,00	6,6035	-6,60352
1667	2703	-4,239	,67	6,8194	-6,15273
1810	2910	-3,056	2,00	6,4356	-4,43562
1865	2998	-3,177	1,33	5,9449	-4,61158
1869	3003	-3,887	,67	6,3093	-5,64264
1880	3020	-3,025	1,67	6,0574	-4,39078
1884	3027	-3,111	1,67	6,1821	-4,51545
1949	3140	-4,023	,33	6,1730	-5,83968

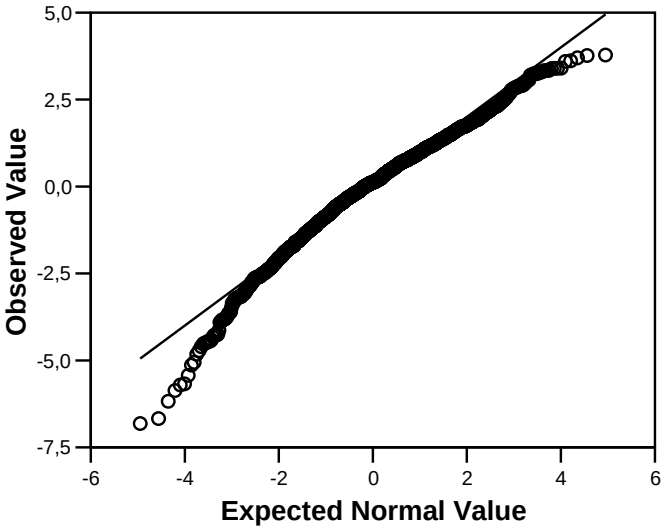
a Dependent Variable: Trustindex

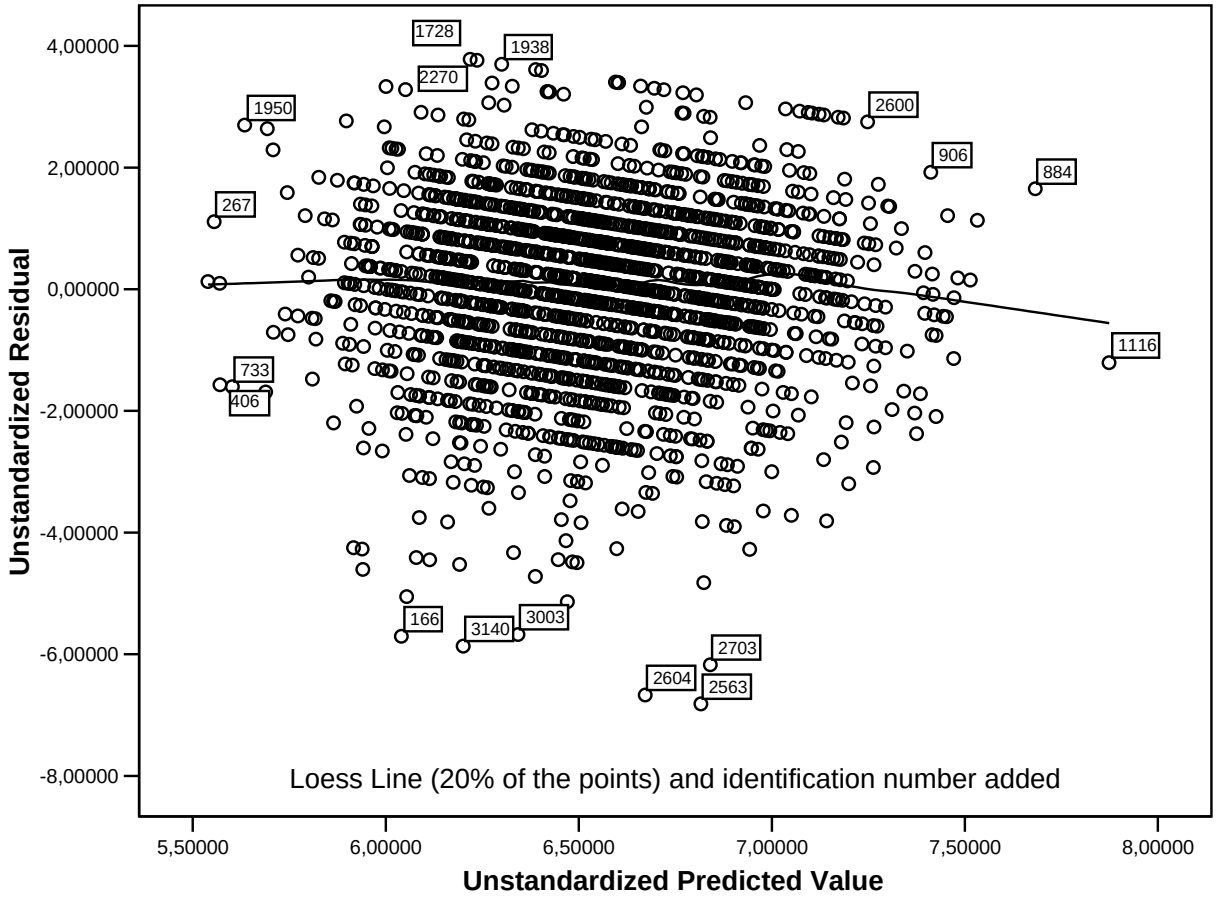
Residuals Statistics(a)

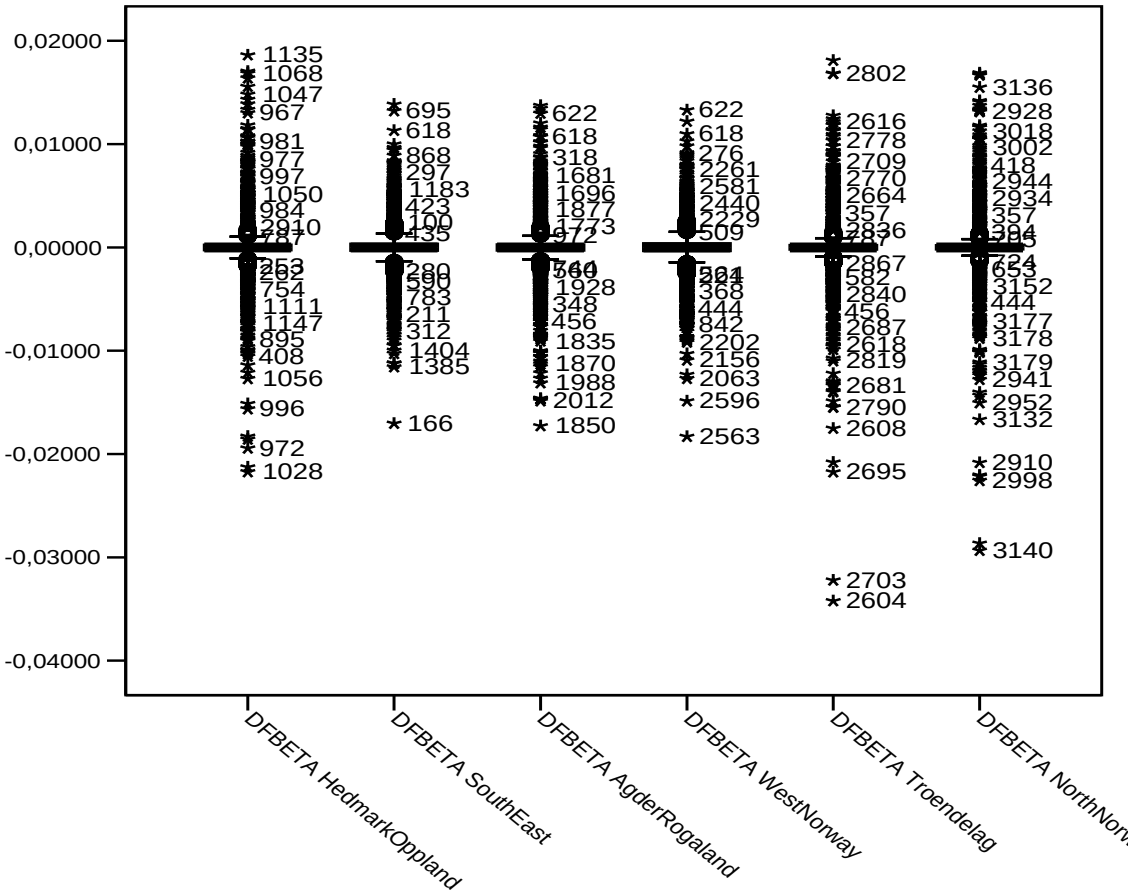
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	5,3687	7,9696	6,5425	,34441	2002
Residual	-6,79642	3,79206	,00000	1,44570	2002
Std. Predicted Value	-3,408	4,144	,000	1,000	2002
Std. Residual	-4,682	2,612	,000	,996	2002

a Dependent Variable: TrustIndex

Normal Q-Q Plot of Unstandardized Residual



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-0,02000
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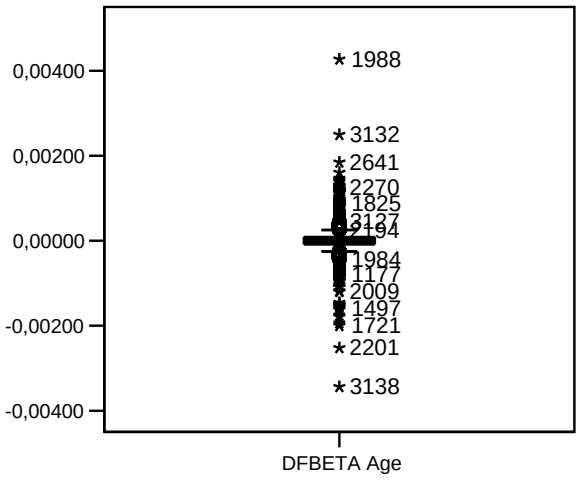
DFBETA SouthEast
DFBETA AgderRogaland
DFBETA WestNorway
DFBETA Troendelag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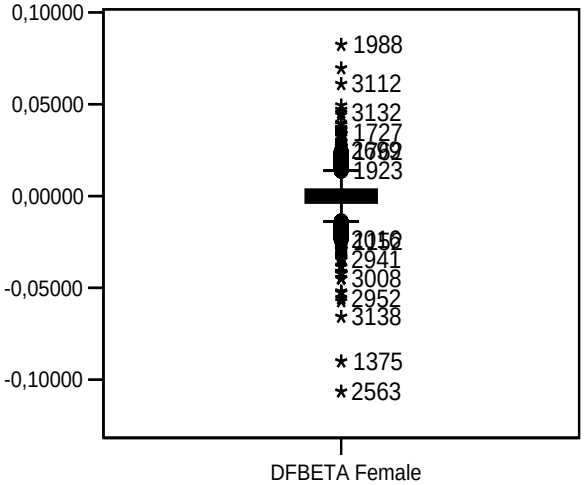
DFBETA Age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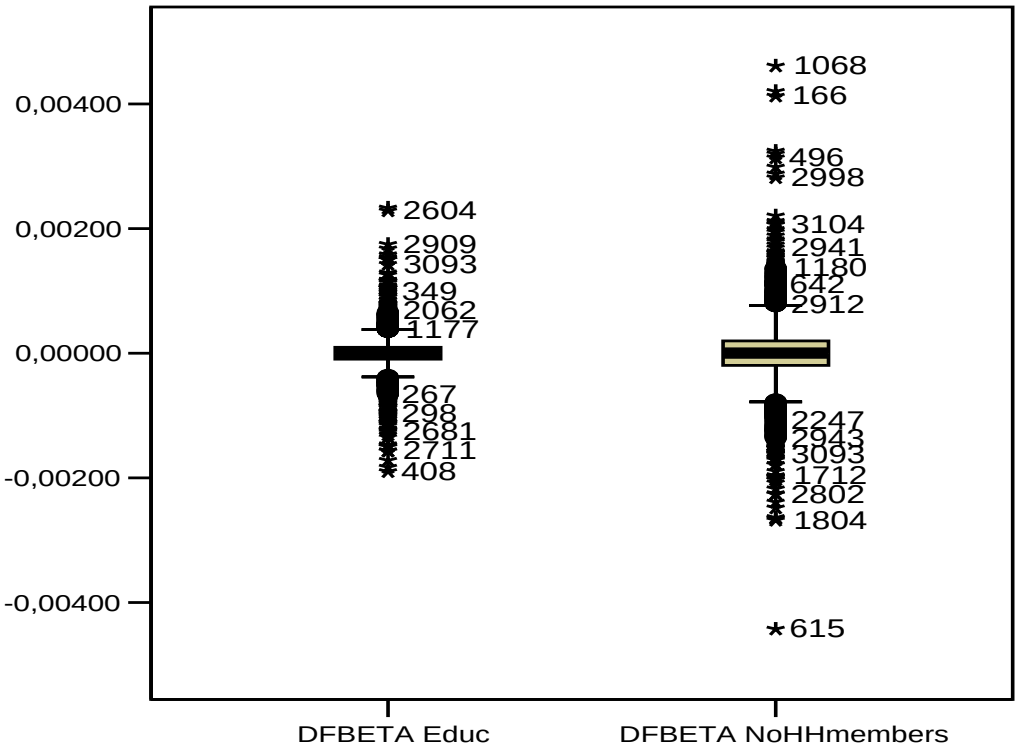
DFBETA Female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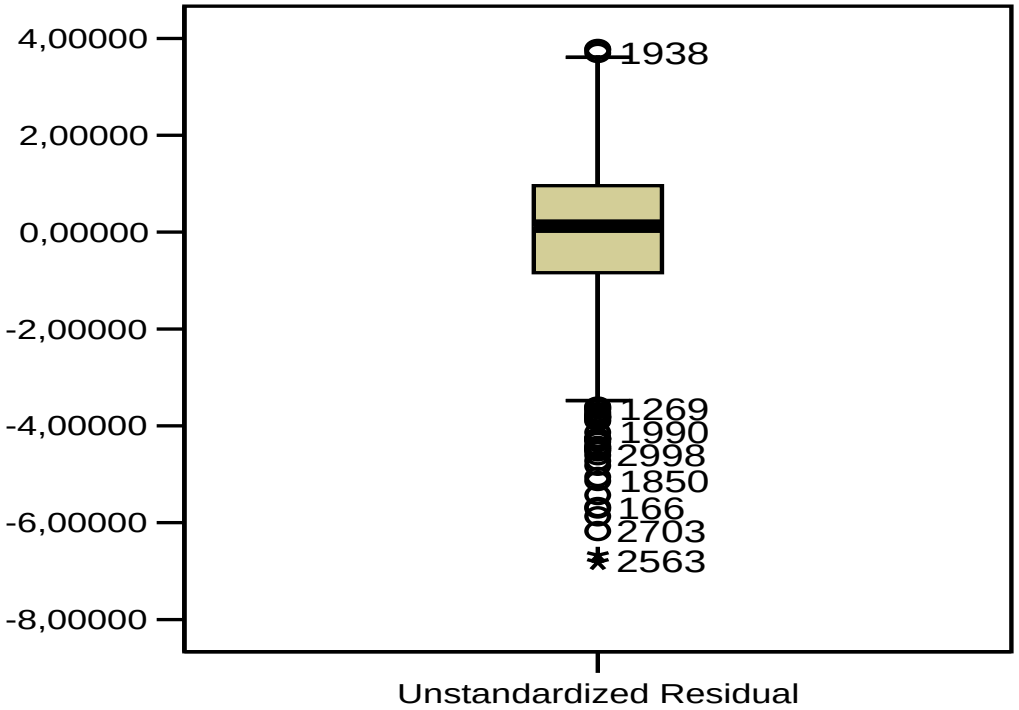
1180
349
642
2062
2912
1177
267
2247
298
2943
2681
3093
2711
1712
408
2802
1804
615
DFBETA Educ
DFBETA NoHHmembers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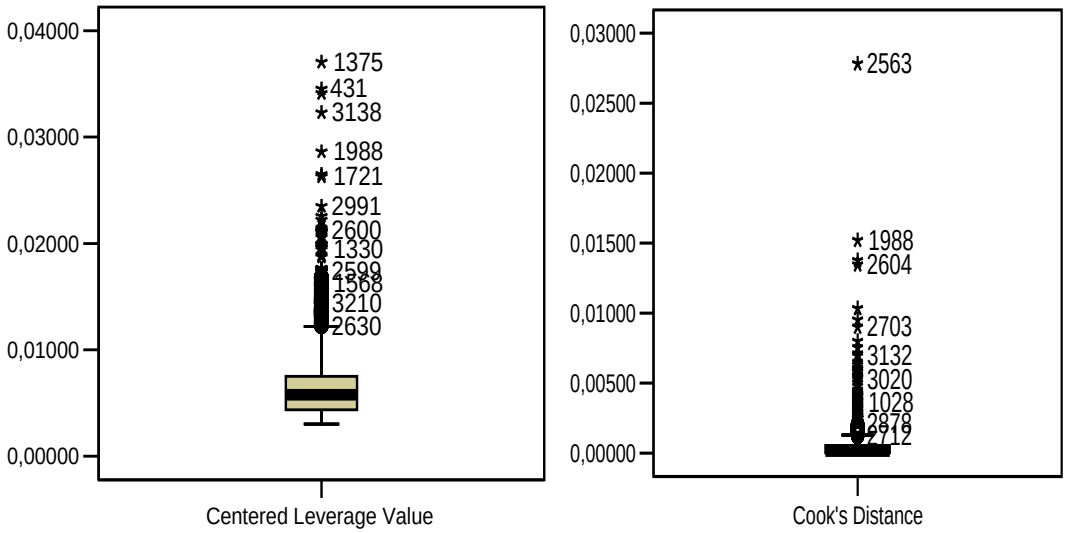
2563
Unstandardized Residual



Case information

idno	2563	2604	2703	3140	166	3003	2596	1850	695
regionno	5	6	6	7	3	7	5	4	1
TrustIndex	0,000	0,000	0,667	0,333	0,333	0,667	0,667	1,333	1,000
Age	84	66	44	53	34	38	33	38	25
Female	1	1	1	0	0	0	0	1	1
Educ	9	9	12	13	13	14	12	12	12
NoHHmembers	1	1	3	2	1	4	1	3	1
OsloAkershus	0	0	0	0	0	0	0	0	1
HedmarkOppland	0	0	0	0	0	0	0	0	0
SouthEast	0	0	0	0	1	0	0	0	0
AgderRogaland	0	0	0	0	0	0	0	1	0
WestNorway	1	0	0	0	0	0	1	0	0
Troendelag	0	1	1	0	0	0	0	0	0
NorthNorway	0	0	0	1	0	1	0	0	0
PRE_1	6,816	6,672	6,841	6,200	6,040	6,343	6,096	6,470	6,054
RES_1	-6,816	-6,672	-6,174	-5,867	-5,707	-5,676	-5,429	-5,137	-5,054
ZPR_1	0,804	0,380	0,875	-1,004	-1,474	-0,587	-1,310	-0,212	-1,433
ZRE_1	-4,697	-4,597	-4,254	-4,043	-3,932	-3,911	-3,741	-3,540	-3,482
COO_1	0,028	0,013	0,009	0,008	0,006	0,007	0,005	0,004	0,006
LEV_1	0,017	0,008	0,006	0,006	0,005	0,006	0,005	0,004	0,007
DFB0_1	0,003	-0,026	-0,006	0,030	-0,013	0,019	-0,018	-0,002	-0,030
DFB1_1	0,002	0,003	0,001	0,001	0,000	0,000	0,000	0,000	0,014
DFB2_1	0,002	0,002	0,001	0,000	-0,017	0,000	0,000	0,000	0,013
DFB3_1	0,004	0,002	0,000	-0,001	0,000	0,000	0,000	-0,017	0,014
DFB4_1	-0,018	0,001	0,001	-0,001	-0,001	0,001	-0,015	0,000	0,012
DFB5_1	0,000	-0,034	-0,032	0,000	0,000	0,001	0,001	0,000	0,012
DFB6_1	0,002	0,002	0,001	-0,029	0,000	-0,029	0,000	0,000	0,014
DFB7_1	0,000	0,000	0,000	-0,002	0,000	-0,001	-0,001	0,000	0,000
DFB8_1	-0,106	0,014	0,025	-0,028	0,007	-0,004	0,002	0,008	-0,057
DFB9_1	0,001	0,002	0,001	0,000	0,000	0,000	0,001	0,001	0,001
DFB10_1	0,000	0,002	0,000	0,001	0,004	-0,002	0,004	0,000	0,003
DFB11_1	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
DFB12_1	0,006	-0,001	-0,002	0,001	0,000	0,001	0,000	-0,001	0,002
DFB13_1	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000

End of tables for examination question 1

Tables for examination question 2

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PoliticiansVoteMaximisers	1954	,00	1,00	,3132	,46392
OsloAkershus	1954	,00	1,00	,1986	,39902
HedmarkOppland	1954	,00	1,00	,0880	,28340
SouthEast	1954	,00	1,00	,1755	,38052
AgderRogaland	1954	,00	1,00	,1489	,35611
WestNorway	1954	,00	1,00	,1929	,39471
Troendelag	1954	,00	1,00	,0967	,29566
NorthNorway	1954	,00	1,00	,0993	,29912
Voted	1954	,00	1,00	,8214	,38312
LeftRightScale	1954	,00	10,00	5,3270	2,00818
Age	1954	17,00	93,00	45,9647	16,97075
Female	1954	,00	1,00	,4565	,49823
Educ	1954	5,00	20,00	12,9002	2,28169
Age2	1954	289,00	8649,00	2400,6116	1686,62040
Educ2	1954	25,00	400,00	171,6187	60,32406
FemaleAge	1954	,00	93,00	21,0266	25,69177
FemaleAge2	1954	,00	8649,00	1101,8475	1670,21638
FemaleEduc	1954	,00	18,00	5,8280	6,54318
FemaleEduc2	1954	,00	324,00	76,7574	92,55414

Logistic Regression

Case Processing Summary

Unweighted Cases(a)		N	Percent
Selected Cases	Included in Analysis	1954	96,4
	Missing Cases	74	3,6
	Total	2028	100,0
Unselected Cases		0	,0
Total		2028	100,0

a If weight is in effect, see classification table for the total number of cases.

Block 0: Beginning Block

Iteration History(a,b,c)

Iteration		-2 Log likelihood	Coefficients Constant
	1	2429,979	-,747
	2	2429,369	-,785
	3	2429,369	-,785

a Constant is included in the model. b Initial -2 Log Likelihood: 2429,369

c Estimation terminated at iteration number 3 because parameter estimates changed by less than ,001.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-,785	,049	259,133	1	,000	,456

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	20,823	6	,002
	Block	20,823	6	,002
	Model	20,823	6	,002

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2408,546(a)	,011	,015

a Estimation terminated at iteration number 4 because parameter estimates changed by less than ,001.

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
HedmarkOppland	-,435	,213	4,196	1	,041	,647
SouthEast	,335	,156	4,612	1	,032	1,398
AgderRogaland	,098	,166	,352	1	,553	1,103
WestNorway	-,147	,159	,862	1	,353	,863
Troendelag	-,258	,199	1,687	1	,194	,772
NorthNorway	,152	,187	,663	1	,415	1,164
Constant	-,791	,110	52,158	1	,000	,453

a Variable(s) entered on step 1: HedmarkOppland, SouthEast, AgderRogaland, WestNorway, Troendelag, NorthNorway.

Block 2: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	18,886	3	,000
	Block	18,886	3	,000
	Model	39,709	9	,000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2389,660(a)	,020	,028

a Estimation terminated at iteration number 4 because parameter estimates changed by less than ,001.

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
HedmarkOppland	-,444	,214	4,314	1	,038	,641
SouthEast	,329	,157	4,398	1	,036	1,389
AgderRogaland	,079	,167	,226	1	,635	1,082
WestNorway	-,166	,159	1,084	1	,298	,847
Troendelag	-,286	,200	2,039	1	,153	,751
NorthNorway	,141	,188	,561	1	,454	1,152
Voted	-,388	,124	9,706	1	,002	,679
LeftRightScale	,028	,025	1,271	1	,260	1,029
Female	-,279	,100	7,767	1	,005	,757
Constant	-,491	,208	5,568	1	,018	,612

a Variable(s) entered on step 1: Voted, LeftRightScale, Female.

Block 3: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	61,196	2	,000
	Block	61,196	2	,000
	Model	100,905	11	,000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2328,464(a)	,050	,071

a Estimation terminated at iteration number 4 because parameter estimates changed by less than ,001.

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
HedmarkOppland	-,646	,219	8,715	1	,003	,524
SouthEast	,168	,161	1,084	1	,298	1,183
AgderRogaland	-,084	,171	,242	1	,623	,919
WestNorway	-,320	,164	3,821	1	,051	,726
Troendelag	-,408	,204	3,994	1	,046	,665
NorthNorway	-,003	,193	,000	1	,986	,997
Voted	-,296	,127	5,397	1	,020	,744
LeftRightScale	,026	,025	1,077	1	,299	1,027
Female	1,148	,591	3,780	1	,052	3,153
Educ	-,118	,031	14,916	1	,000	,889
FemaleEduc	-,118	,046	6,419	1	,011	,889
Constant	1,092	,446	5,986	1	,014	2,980

a Variable(s) entered on step 1: Educ, FemaleEduc.

Block 4: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	22,414	2	,000
	Block	22,414	2	,000
	Model	123,319	13	,000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2306,050(a)	,061	,086

a Estimation terminated at iteration number 4 because parameter estimates changed by less than ,001.

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
HedmarkOppland	-,655	,220	8,878	1	,003	,519
SouthEast	,176	,162	1,183	1	,277	1,193
AgderRogaland	-,052	,173	,090	1	,765	,950
WestNorway	-,282	,165	2,921	1	,087	,755
Troendelag	-,391	,206	3,604	1	,058	,677
NorthNorway	,014	,194	,005	1	,942	1,014
Voted	-,494	,136	13,256	1	,000	,610
LeftRightScale	,032	,026	1,621	1	,203	1,033
Female	,254	,727	,122	1	,727	1,289
Educ	-,102	,031	11,127	1	,001	,903
FemaleEduc	-,080	,048	2,843	1	,092	,923
Age	,011	,004	6,753	1	,009	1,011
FemaleAge	,009	,006	2,150	1	,143	1,009
Constant	,514	,505	1,040	1	,308	1,673

a Variable(s) entered on step 1: Age, FemaleAge.

Block 5: Method = Enter **Iteration History(a,b,c,d)**

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	3,737	2	,154
	Block	3,737	2	,154
	Model	127,056	15	,000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2302,313(a)	,063	,088

a Estimation terminated at iteration number 4 because parameter estimates changed by less than ,001.

Classification Table(a)

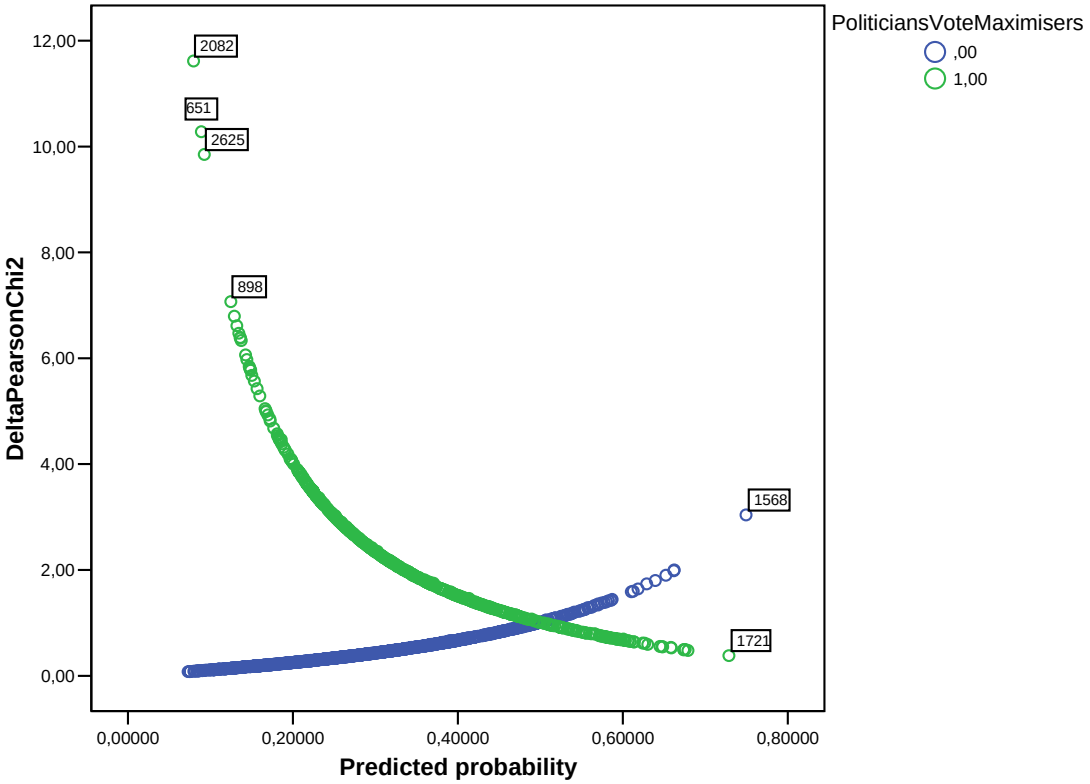
		Predicted		
		PoliticiansVoteMaximisers		Percentage Correct
Observed		0	1	
PoliticiansVoteMaximisers	0	1283	59	95,6
	1	527	85	13,9
Overall Percentage				70,0

a The cut value is ,500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	Tolerance	VIF
HedmarkOppland	-,638	,220	8,383	1	,004	,528	,740	1,351
SouthEast	,184	,162	1,288	1	,256	1,202	,627	1,594
AgderRogaland	-,044	,173	,065	1	,799	,957	,653	1,532
WestNorway	-,294	,165	3,175	1	,075	,745	,611	1,636
Troendelag	-,385	,206	3,498	1	,061	,681	,733	1,364
NorthNorway	,021	,195	,012	1	,913	1,022	,724	1,382
Voted	-,477	,138	11,870	1	,001	,621	,863	1,159
LeftRightScale	,032	,026	1,577	1	,209	1,033	,966	1,035
Female	-,703	,904	,606	1	,436	,495	,013	76,487
Educ	-,090	,031	8,265	1	,004	,914	,486	2,059
FemaleEduc	-,100	,049	4,191	1	,041	,905	,027	37,693
Age	-,023	,021	1,253	1	,263	,977	,018	54,805
FemaleAge	,065	,032	4,270	1	,039	1,068	,004	265,826
Age2	,00035	,00021	2,752	1	,097	1,000	,018	55,577
FemaleAge2	-,00058	,00032	3,343	1	,067	,999	,009	115,640
Constant	1,063	,601	3,123	1	,077	2,895		

a Variable(s) entered on step 1: Age2, FemaleAge2.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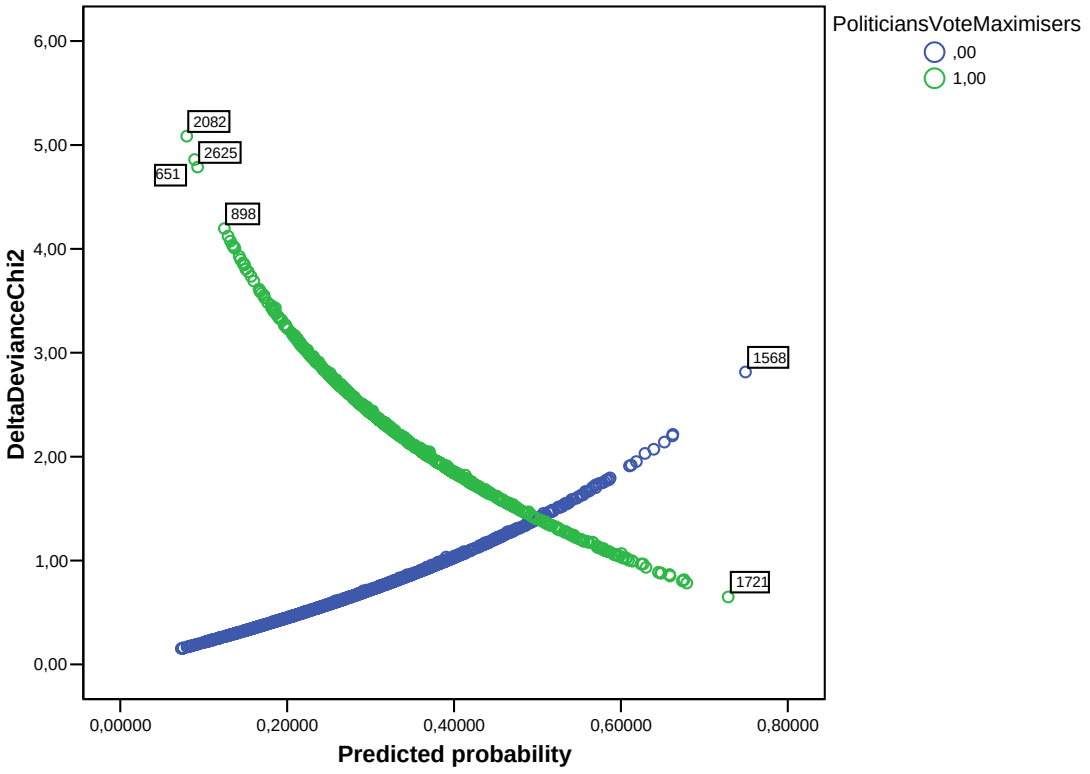
Predicted probability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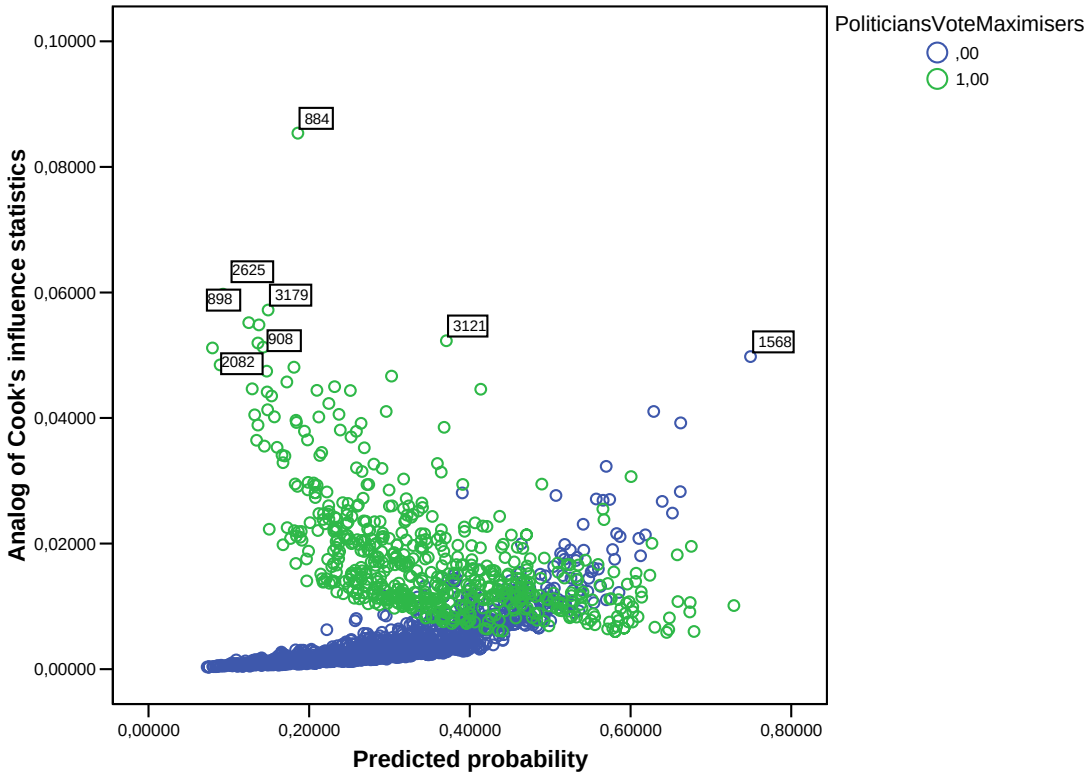
Predicted probability



Indicator of each first matching case as Primary

	Frequency	Percent
Duplicate Case	111	5,5
Primary Case	1917	94,5
Total	2028	100,0

Frequency of cases in pattern

No of cases in pattern	Pattern Frequency	No of cases
1	1816	1816
2	92	184
3	8	24
4	1	4
Total	1917	2028

Probability of Y=1 and ln(p/(1-p)) according to groups on LeftRightScale, Age and Education

	Y=0	Y=1	Sum	p = Pr(Y=1)	ln(p/(1-p))
LeftRightScale (Banded)					
Left	88	42	130	0.32307692307692	-0.7396671961948
	206	59	265	0.22264150943396	-1.2503387248839
	173	72	245	0.29387755102041	-0.8766254754817
	471	254	725	0.35034482758621	-0.6175238269979
	219	98	317	0.30914826498423	-0.8041042511459
	144	62	206	0.30097087378641	-0.8426789145309
Right	58	34	92	0.3695652173913	-0.5340824859303
Age (Banded)					
Low age	155	69	224	0.30803571428571	-0.809318612322
	116	42	158	0.26582278481013	-1.015920572823
	160	58	218	0.26605504587156	-1.0147308046874
	164	55	219	0.25114155251142	-1.0925332425917
	151	56	207	0.27053140096618	-0.9919281460798
	141	53	194	0.27319587628866	-0.978467976826
	115	60	175	0.34285714285714	-0.6505875661411
	126	69	195	0.35384615384615	-0.6021754023542
	84	40	124	0.32258064516129	-0.7419373447294
	54	33	87	0.37931034482759	-0.4924764850978
	50	42	92	0.45652173913043	-0.1743533871448
	41	26	67	0.38805970149254	-0.4554755286828
	26	21	47	0.4468085106383	-0.2135741002981
High age	6	15	21	0.71428571428571	0.91629073187416
Educ (Banded)					
Low educ	154	139	293	0.47440273037543	-0.1024786692829
	740	350	1090	0.32110091743119	-0.7487170317148
	387	112	499	0.22444889779559	-1.2399258217347
High educ	87	28	115	0.24347826086957	-1.1337036084794

The 10 cases with largest residual (RES_1)

idno	908	2355	1061	1011	1055	1450	898	2625	651	2082
regionno	2	5	2	2	2	3	2	6	1	5
Age	22	19	29	33	50	40	46	23	31	35
Female	1	1	1	1	1	1		1	1	1
Educ	13	12	12	13	15	18	18	15	18	18
OsloAkershus									1	
HedmarkOppland	1		1	1	1		1			
SouthEast						1				
AgderRogaland										
WestNorway		1								1
Troendelag								1		
NorthNorway										
Politicians-VoteMaximisers	1	1	1	1	1	1	1	1	1	1
Voted		1	1	1	1	1	1	1	1	1
LeftRightScale	3	4	5	7	6	4	2	7	4	6
PRE_1	,14	,14	,14	,13	,13	,13	,12	,09	,09	,08
COO_1	,05	,05	,04	,04	,04	,04	,06	,06	,05	,05
LEV_1	,01	,01	,01	,01	,01	,01	,01	,01		
RES_1	,86	,86	,86	,87	,87	,87	,88	,91	,91	,92
LRE_1	7,28	7,34	7,34	7,44	7,57	7,75	8,01	10,79	11,23	12,57
SRE_1	2	2	2	2,01	2,02	2,03	2,05	2,19	2,20	2,25
ZRE_1	2,51	2,52	2,52	2,54	2,56	2,60	2,65	3,13	3,20	3,40
DEV_1	1,99	2	2	2	2,01	2,02	2,04	2,18	2,20	2,25
DFB0_1				-,01	-,01		-,05	-,01	,02	-,01
DFB1_1	,03		,03	,03	,03		,03		-,01	
DFB2_1						,01			-,01	
DFB3_1									-,01	
DFB4_1		,01							-,01	,02
DFB5_1								,03	-,01	
DFB6_1									-,01	
DFB7_1	-,01	,01	,01	,01				,01		
DFB8_1										
DFB9_1	,07	,12	,05	,01	-,06	-,08	,05	,04	-,05	-,06
DFB10_1										
DFB11_1						,01			,01	,01
DFB12_1										
DFB13_1										
DFB14_1										
DFB15_1										

9 cases with large DeltaPearsonChi2, DeltaDevianceChi2 and Analog of Cook's D statistic.

idno	651	884	898	908	1568	2082	2625	3121	3179
Age	31	82	46	22	84	35	23	72	51
Female	1	1		1		1	1		1
Educ	18	15	18	13	9	18	15	20	18
OsloAkershus	1								
HedmarkOppland		1	1	1					
SouthEast					1				
AgderRogaland									
WestNorway						1			
Troendelag							1		
NorthNorway								1	1
Politicians-VoteMaximisers	1	1	1	1		1	1	1	1
Voted	1	1	1			1	1		1
LeftRightScale	4	7	2	3	5	6	7	2	7
PRE_1	,09	,19	,12	,14	,75	,08	,09	,37	,15
PGR_1					1				
COO_1	,05	,09	,06	,05	,05	,05	,06	,05	,06
LEV_1		,02	,01	,01	,02		,01	,03	,01
RES_1	,91	,81	,88	,86	-,75	,92	,91	,63	,85
LRE_1	11,23	5,38	8,01	7,28	-3,99	12,57	10,79	2,70	6,72
SRE_1	2,20	1,85	2,05	2	-1,68	2,25	2,19	1,43	1,96
ZRE_1	3,20	2,09	2,65	2,51	-1,73	3,40	3,13	1,30	2,39
DEV_1	2,20	1,83	2,04	1,99	-1,66	2,25	2,18	1,41	1,95
DFB0_1	,02	-,01	-,05		-,05	-,01	-,01	-,05	-,01
DFB1_1	-,01	,03	,03	,03					
DFB2_1	-,01				-,01				
DFB3_1	-,01								
DFB4_1	-,01					,02			
DFB5_1	-,01						,03		
DFB6_1	-,01							,02	,02
DFB7_1				-,01	,01		,01	-,01	
DFB8_1									
DFB9_1	-,05	-,02	,05	,07	,06	-,06	,04	,04	-,10
DFB10_1								,01	
DFB11_1	,01	,01				,01		-,01	,01
DFB12_1									
DFB13_1									
DFB14_1									
DFB15_1									
Delta-PearsonChi2	10,28	4,47	7,07	6,33	3,04	11,62	9,85	1,75	5,77
Delta-DevianceChi2	4,86	3,43	4,20	4	2,81	5,08	4,79	2,05	3,85

End of tables for examination question 2