The deductible in health insurance: do the insured make a choice based on the arguments as intended by the policy makers?

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Health care costs insurance

- Big change in structure: Jan 1st 2006
- No claim of € 250,=
- On top of that deductible (max. € 500,=)
- Reason changes: public awareness

Public awareness or other arguments?

- Health care demand can be manipulated by individuals?
- Unnecessary health care demand?
- Individuals are willing to do so?
- Costs reduction (budget cuts)?
- Economic theory: moral hazard, adverse selection

Insurance premiums

Insurance company	No voluntary deductible	Voluntary deductible € 500	Difference in premium
Aegon	€95.06	€80.06	€15.00
Delta Lloyd	€95.83	€79.16	€16.67
FBTO	€84.35	€63.52	€20.83
Fortis	€94.00	€83.16	€10.84
Interpolis	€94.25	€73.42	€20.83
Menzis	€92.00	€77.00	€15.00
OHRA	€94.16	€77.49	€16.67
Unive	€77.77	€56.78	€20.99
VGZ	€92.95	€77.95	€15.00
Zilveren Kruis	€92.75	€71.92	€20.83
Average	€91.31	€74.05	€17.27

Frequencies deductibles (2007)

Table 3: Descriptive statistics of doctor visits and having a deductible or not

Explanatory variable	Mean	Standard deviation	Number of observations = 0	Number of observations > 0
Deductible - N = 1083	0.300	0.460	754 (69.6%)	329 (30.4%)
Deductible - N = 855	0.303	0.460	596 (69.7%)	259 (30.3%)
Doctor visits - N = 1083	2.240	2.820	258 (23.8%)	825 (76.2%)
Doctor visits - N = 855	2.316	2.962	197 (23.0%)	658 (77.0%)

N = 1083 refers to the 2007 sample (1083 observations) and N = 855 refers to the combined 2006-2007 sample (855 observations).

Determinants of having a deductible

- Health care demand
- Past usage/expected usage
- Health
- Financial reserves
- Risk aversion
- Personal characteristics: gender, age, …

Measurement of determinants

- Health care demand – number of visits to physician (problem!)
- Expected demand? Past demand?
- Health: objective-subjective measures, age, …
- Financial reserves - wealth

Econometric modeling

- Probit with endogenous explanatory variable (expected number of doctor visits)
- Count distribution for expected number of doctor visits
- Switching Poisson (deductible = 0,1)
- Gaussian copula

Data

- DNB Houshold Surveys 2008-2007
- CenterData
- 1083 obs vs 855 obs

Explanatory variables

Table 4: Descriptive statistics of the explanatory variables

Sample	**N = 1083**		**N = 855**	
Variable	**Mean (St.Dev.)**	**min - max**	**Mean (St.Dev.)**	**min - max**
able to save	0.204 (0.403)	0 - 1	0.205 (0.405)	0 - 1
age (scaled)	5.339 (1.456)	2 - 9.2	5.353 (1.437)	2.3 - 9.2
age^2 (scaled)	30.620 (15.554)	4 - 84.64	30.720 (15.434)	5.29 - 84.64
BMI (body mass index)	26.180 (4.812)	15.3 - 70.9	26.290 (4.915)	15.3 - 70.9
breadwinner	0.705 (0.456)	0 - 1	0.705 (0.456)	0 - 1
child younger than 7	0.114 (0.317)	0 - 1	0.108 (0.310)	0 - 1
chronically ill	0.282 (0.450)	0 - 1	0.289 (0.454)	0 - 1
drinker	0.064 (0.244)	0 - 1	0.067 (0.250)	0 - 1
female	0.427 (0.495)	0 - 1	0.436 (0.496)	0 - 1
good health	0.762 (0.426)	0 - 1	0.761 (0.426)	0 - 1
living in urban area	0.430 (0.495)	0 - 1	0.415 (0.493)	0 - 1
number of children	0.618 (1.032)	0 - 5	0.621 (1.046)	0 - 5
partner	0.729 (0.445)	0 - 1	0.727 (0.446)	0 - 1
self-employed	0.041 (0.200)	0 - 1	0.042 (0.201)	0 - 1
smoker	0.205 (0.404)	0 - 1	0.204 (0.402)	0 - 1

Scaling on age: age/10. Scaling on age^2: (age/10)*(age/10). N = 1083 refers to the 2007 sample (1083 observations) and N = 855 refers to the combined 2006-2007 sample (855 observations).

Estimation results - 1

	N = 1083		**N = 855**	
	deductible yes/no		**deductible yes/no**	
constant	0.432	(0.458)	0.808	(0.597)
age	-0.350	(0.160)*	-0.469	(0.198)*
age^2	0.033	(0.015)*	0.050	(0.018)**
able to save	0.184	(0.080)*	0.173	(0.097)#
female	-0.091	(0.085)	-0.147	(0.103)
number of children	-0.062	(0.038)	-0.043	(0.047)
chronically ill	-0.042	(0.109)	-0.078	(0.135)
good health	-0.026	(0.127)	-0.061	(0.135)
BMI	0.002	(0.011)	0.000	(0.013)
Expected number of doctor visits in 2006			-0.094	(0.067)

Estimation results - 2

	NegBin 2 (doctor visits)				NegBin 2 (doctor visits)			
	deductible = 0		deductible = 1		deductible = 0		deductible = 1	
constant	-0.628	(0.463)	-0.991	(0.867)	-0.918	(0.513)#	-0.218	(1.041)
age	0.082	(0.032)*	0.215	(0.056)**	0.099	(0.035)**	0.221	(0.061)**
female	0.377	(0.106)**	0.164	(0.176)	0.360	(0.114)**	0.154	(0.188)
child younger than 7	0.187	(0.145)	0.351	(0.279)	0.010	(0.163)	0.245	(0.314)
number of children	-0.035	(0.047)	-0.072	(0.089)	-0.029	(0.049)	-0.078	(0.097)
chronically ill	0.451	(0.089)**	0.243	(0.160)	0.516	(0.099)**	0.171	(0.181)
good health	-0.602	(0.092)**	-0.477	(0.174)**	-0.483	(0.101)**	-0.498	(0.184)**
BMI	0.032	(0.008)**	0.001	(0.016)	0.043	(0.008)**	0.003	(0.016)
drinker	0.182	(0.175)	-1.092	(0.370)**	0.064	(0.163)	-1.240	(0.432)**
smoker	-0.038	(0.095)	-0.228	(0.185)	0.012	(0.999)	-0.223	(0.211)
breadwinner	0.032	(0.119)	-0.105	(0.206)	-0.019	(0.124)	-0.283	(0.220)
living in urban area	-0.049	(0.078)	-0.253	(0.142)#	-0.034	(0.081)	-0.326	(0.150)*
partner	-0.046	(0.107)	0.110	(0.190)	-0.098	(0.110)	0.052	(0.202)
self-employed	-0.169	(0.198)	-0.166	(0.370)	-0.108	(0.207)	-0.314	(0.476)

Estimation results - 3

Table 7 continued				
	Other model parameters		**Other model parameters**	
γ	0.106	(0.101)	0.030	(0.070)
θ (deductible = 0)	0.752	(0.160)**	1.728	(0.187)**
θ (deductible = 1)	1.728	(0.547)**	1.112	(0.634)#
ρ (deductible = 0)	-0.799	(0.078)**	-0.755	(0.094)**
ρ (deductible = 1)	0.693	(0.193)**	0.450	(0.322)
loglikelihood value	-2659.346		-2102.582	

Conclusions

Determinants of the deductible:

- No effect of expected/past demand for health care
- No correlation between count – choice processes
- No effect of health measures (objective-subjective) apart from age?
- Only real effect 'financial reserves'