WHAT IS THE IMPACT OF DUPLICATE COVERAGE ON THE DEMAND FOR HEALTH CARE IN GERMANY?

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Outline

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Government Health System

- Everyone living in Germany to be insured for at least hospital and out-patient medical treatment (The health insurance reform 2007).
- There is the Government Health System (Gesetzliche Krankenversicherung or GKV) and if your gross salary is below 3,975 Euros per month, membership in the GKV is mandatory.
- GKV benefits include in-patient (hospital), out-patient care with registered doctors (Kassenärzte) and basic dental care. Non-working dependents are included at no additional cost.

Duplicate Coverage

- Duplicate coverage involves those individuals who hold public health insurance, and purchase additional private coverage.
- For to upgrade their medical coverage, for instance the right to consult a private doctor, to homeopathic remedies, a private room in hospital and higher dental reimbursements.
- The cost of full medical insurance is based on the benefits chosen, as well as on the age, gender and any pre-existing conditions of the insured..

Outline

A Literature Review

- Health Care Demand and Health Insurance
  - Cameron et al (1986) Mechanism of decisions
  - Vera Hernandez (1997) Duplicate Coverage
- Econometrics Methods
  - Terza (1998) FIML
  - Windmeijer (1992) GMM

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Basic Assumptions

- 1 period of time two moments
- He knows his initial health.
- He decides about the insurance policy ($dc = 0, 1$) at the very beginning ($\tau = 0$) and decides about the health care demand at a moment $\tau = 1$
- Health care is measured as number of visit to the doctor (v).
- Individual maximizes the final health's level and the consumption during the period.

Sequence of decisions

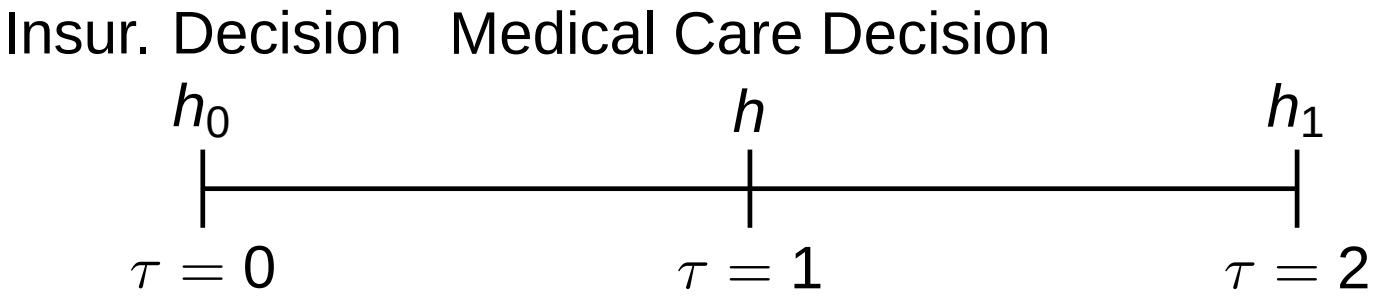

Figure: Decisions schedule and information

- h is the pretreatment health's level
- h_1 final health's level
- h_0 initial health's level.

The final health's level

$$h_1 = H(h_0 + \epsilon + \mu v | \mathbf{A}) = H(h + \mu v | \mathbf{A}) \tag{1}$$

- $H(\cdot|\mathbf{A})$ is increasing
- **A** (age, gender, and so on).
- ϵ random variable (diseases, accidents, and so on)
- $F_\epsilon(\epsilon|\mathbf{Z})$ is the distribution of ϵ
- **Z** (risk factors).
- m medical care and μ is a parameter of effectiveness (given).

Assumptions: Utility Function and Budget Constraint

- an utility function $U(c, H)$
- 2 goods c (without risk) and H (risky)
- U is C^2 strictly increasing and strictly concave in c and H
- Budget constrain $Y - Pdc = c + (1 - dc)p_v v + kv$

Outline

How Solve the Problem

at moment $\tau = 1$ h and dc are given, then

$$V(Y, h, dc, \mathbf{A}) = \arg\max_{V} U\left(Y - Pdc - (1 - dc)p_v v - kv, H(h + \mu v | \mathbf{A})\right) \quad (2)$$

applying this at moment $\tau = 0$

$$DC(Y, h_0, \mathbf{Z}, \mathbf{A}) = \arg\max_{dc} \int U\left(Y - Pdc - (1 - dc)p_v V - kV, H(h_0 + \epsilon + \mu V | \mathbf{A})\right) F_\epsilon(\epsilon | \mathbf{Z})\, d\epsilon \quad (3)$$

Outline

FIML ES Terza (1998)

$$\ell(\Gamma) = \sum_{i=1}^{N} \ln f(V_i, DC_i | \Gamma, \mathbf{x}_{1i}, \mathbf{x}_{2i})$$

$$f(V_i, DC_i | \Gamma, \mathbf{x}_{1i}, \mathbf{x}_{2i}) = \frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(V_i | \Gamma_v, \mathbf{x}_{1i}, DC_i, \xi_i \sigma \sqrt{2}) \times$$
$$\times \left[DC_i \Phi_i^*(\xi_i \sigma \sqrt{2}) + (1 - DC_i)(1 - \Phi_i^*(\xi_i \sigma \sqrt{2}) \right] \exp(-\xi_i^2)\, d\xi_i$$

$$\Phi_i^* = \Phi \left(\frac{\mathbf{x}'_{2i}\gamma + (\rho/\sigma)\zeta_{1i}}{\sqrt{1 - \rho^2}} \right)$$

$f(V_i | \Gamma_v, \mathbf{x}_{1i}, DC_i, \xi_i \sigma \sqrt{2})$ can be Poisson, Binomial or Zero inflated.

Outline

SOEP

- The SOEP is a wide-ranging representative longitudinal study of private households.
- The Panel was started in 1984.
- It provides information on all household members, consisting of Germans living in the Old and New German States, Foreigners, and recent Immigrants to Germany.
- Some of the many topics include household composition, occupational biographies, employment, earnings, health and satisfaction indicators.

Our Sample

- 10327 of Observations
- Over 17 years
- One or more visits.
- In the public system.
- In the SOEP's wide 2004 and 2005

Outline

Dependent Variables.

- Duplicate Coverage (DC, 0 without and 1 if duplicated coverage)
- Number of Visits (VISITS, number of visits in the last 3 months)

VARIABLE	Obs	Mean	Std. Dev.	Min	Max
DC	10327	0.1277	0.3338	0	1
VISITS	10327	3.6468	4.1895	1	90

Variables.

- Income Variables (**Y**)
  - Income (INC,INC1 0-1000, INC2 1000-1500, ..., INC6 4000- ...)
  - West Germany (WG 1 in WG and 0 EG)
  - Number of members in the Household (NHH)
- health variables (*h*)
  - Health Status (2005), (HEA HEA1 Very good, HEA2 Good, HEA3 Satisfactory, HEA4 Poor or bad).
  - Disability (WG 0 without and 1 if there is present disability)
- Individual chracteristics (**A**)
  - Gender (GENDER 1 for females and 0 for males).
  - Age (AGE years divided by 100).
  - Education (EDUHS Education With Respect to High School,EDUHS1 Less than H S, EDUHS2 High School, EDUHS3 More than H S)

Variables Cont.

- Risk likelihood ($\boldsymbol{Z}$)
  - Head of HH (PRI 1 for Head HH and 0 i.a.c.)
  - Education level of the head (EDUHSPRI like EDUHS)
  - Occupation (Blue collars , White collars , Others).
  - Frequency of sport or exercise (SPORT Almost never or never 1, Several times a year 2, At least once a month 3,At least once a week 4)
- Previous Health Status (h_0)
  - Health Status (2004), (HEA0 like HEA).
  - Pressed for time in the last 4 Weeks (2004) (PRESSED Always 1, Often 2, Sometimes 3, Almost Never 4, Never 5)
  - Strong Physical Pain in the last 4 Weeks (2004)(PHYS Always 1, Often 2, Sometimes 3, Almost Never 4, Never 5)

Outline

Results

Table: Health care estimations (n= 10,327)

MODEL	NB2 VISITS	POIS VISITS	ES VISITS	ES DC	PROBIT DC
DC	0.112*	0.116*	0.739*		
GENDER	0.078*	0.072*	0.077*	0.086*	0.094*
AGE	-1.008*	-0.801*	-0.946*	0.088	0.204
AGE_SQR	0.954*	0.749*	1.008*	-0.408	-0.497
EDUHS2	-0.015	-0.015	-0.037	0.342*	0.347*
EDUHS3	0.002	-0.002	-0.025	0.377*	0.370*
CONS	1.053*	1.010*	0.801*	-2.127*	-2.297*
ALPHA	0.290*				
SIGMA			0.587*		
RHO			-0.615*		
Pseudo R2		0.071			0.096

* *significant at 5%*

Results Income

Table: Health care estimations (n= 10,327)

MODEL	NB2 VISITS	POIS VISITS	ES VISITS	ES DC	PROBIT DC
INC2	0.087*	0.103*	0.068*	0.238*	0.242*
INC3	0.093*	0.101*	0.077*	0.357*	0.403*
INC4	0.071	0.076	0.038	0.609*	0.632*
INC5	0.037	0.048	-0.015	0.760*	0.782*
INC6	-0.012	-0.009	-0.136*	1.058*	1.081*
WG	0.083*	0.093*	0.026	0.357	0.410*
NHH	0.001	0.000	0.024*	-0.128*	-0.130*

* *significant at 5%*

Results Health

Table: Health care estimations (n= 10,327)

MODEL	NB2 VISITS	POIS VISITS	ES VISITS	ES DC	PROBIT DC
HEA2	0.122*	0.117*	0.127*		
HEA3	0.383*	0.381*	0.375*		
HEA4	0.913*	0.911*	0.881*		
DISAB	0.247*	0.243*	0.268*		
PRESSED	-0.015	-0.018	-0.007	-0.063*	-0.060*
PHYS	-0.050*	-0.049*	-0.050*	0.013	0.013
HEA02				-0.075	-0.047
HEA03				-0.053	-0.020
HEA04				0.030	0.027

* *significant at 5%*

Results Risk Likelihood

Table: Health care estimations (n= 10,327)

MODEL	NB2 VISITS	POIS VISITS	ES VISITS	ES DC	PROBIT DC
PRI				0.121*	0.110*
EDUHSPRI2				0.060	0.106
EDUHSPRI3				0.148	0.211*
BLUE_CO				-0.168*	-0.121*
WHITE_CO				-0.069	-0.040
SPORT				0.121*	0.110*

* *significant at 5%*

Summary

- The results show that the duplicate coverage have a positive impact in the demand for healths services
- We found enough evidence for reject the hypothesis of exogeneity in the choice of duplicate coverage respect to the use of health services.

Extensions

Outlook

- Improve the quality of the variables representing the previous health (h_0)
- Implement a ES model using a negative binomial distributions instead of the Poisson distribution that is used in this work and/or Zero inflated.

References

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