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Public Finance II, Spring 08, Slesnick

Market Failures in HealthCare

Joint Determination of Insurance Status and Medical Expenditures

Motivation

Many economists and policy makers have been alarmed by the dramatic growth of Health Care spending in the last few decades. What has been the cause; change in society demographics (baby boomers and increased life expectancy means more elderly in need of health care), increases in real income, better medical services, supplier induced demand (advertising to hypochondriacs), collusive practices in the medical industry (hospitals, pharmaceuticals, insurance, or medical equipment producers), or asymmetric information? Depending on which cause we believe is driving the increased spending, do we need to deal with the cause and, if so, what is the best way? In the following analysis, we will investigate the presence of asymmetric information in the Health Care industry: individuals' private information leads to moral hazard and adverse selection problems in Health Insurance.

Positive Question

In recent decades, the US government has greatly expanded Health Insurance coverage. Does expanding coverage generate significant exploitation of individuals' private information? What is the effect of 'choice of insurance plan' on 'medical expenditures' and, what is the effect

of ‘medical expenditures’ on ‘choice of insurance plan’? What is the joint determination of insurance status and spending?

Methodology

Although there are many methods of testing for the existence of moral hazard and adverse selection in the insurance industry (Chiappori & Salanie), not all of them are structural. Further, some methods use some structure. They postulate reduced form independent “status” and “spending” demand equations, estimate each individually, and test for correlation in errors. Alternatively, one could perform a Likelihood Ratio test with the restriction of requiring coefficients of “status” to be zero on a spending equation. The problem with any of these methods is that, unless properly instrumented, equations with unclear causality in variables cannot stand independently with any clear meaning.

Since this analysis is aimed at making health policy recommendations, I prefer to pursue a structural approach. I will estimate a system of simultaneous equations where one equation has discrete output (“status”) and the other continuous (“spending”). Ideally, I would like the discrete dependent variable to take on different values for different types of insurance, but Stata 10 is currently incapable of handling a simultaneous system with one multinomial logit regression and one continuous regression. Instead, the discrete output must be dichotomous, insured and uninsured. To account then for eligibility differences in choice sets for types of health care insurance, I run the system for each demographic with different choice sets.

Results

Health insurance options	Poverty	Above Poverty
Younger than 65	Medicaid, Private, None	Private, None
65 and older	Medicaid, Medicare, Private, None	Medicare, Private, None

cdsimeq (medexp2 age age2 texpend2 sex res northeast midwest west)
(dinsured age age2 texpend2 sex ai)

medexp2	Coef.	Std.
I_dinsured	-573.737	166.413
age	-16.8077	4.443421
age2	0.351151	0.047739
texpend2	0.037559	0.003492
sex	90.53932	28.01874
res	170.1948	23.98516
northeast	87.77104	49.75598
midwest	106.7705	50.18742
west	-13.975	20.20816
_cons	-370.835	134.5889
dinsured	**Coef.**	**Std.**
I_medexp2	-0.00109	0.000142
age	-0.01615	0.005519
age2	0.000407	7.36E-05
texpend2	4.87E-05	3.79E-06
sex	0.141105	0.017722
ai	0.007439	0.005919
_cons	-0.31682	0.090884

medexp2	Coef.	Std.
I_dinsured	-98.0504	122.5845
age	-11.7999	5.818702
age2	0.245345	0.059958
texpend2	0.029753	0.002641
sex	30.37078	16.95166
res	87.38694	25.21206
northeast	-52.0429	35.76654
midwest	-102.257	41.49257
west	-47.4719	19.02654
_cons	-180.152	110.1893
dinsured	**Coef.**	**Std.**
I_medexp2	-0.00197	0.000138
age	0.006721	0.005305
age2	0.000232	6.95E-05
texpend2	7.67E-05	3.84E-06
sex	0.102354	0.016525
ai	-0.03476	0.005776
_cons	-0.58674	0.096794

medexp2	Coef.	Std.
I_dinsured	1691.638	297.0027
age	-75.1168	53.94362
age2	0.51584	0.324667
texpend2	0.041783	0.003798
sex	-88.7889	56.11609
res	82.58846	58.79736
northeast	-352.201	74.3848
midwest	-418.877	82.11828
west	-427.446	81.22624
_cons	124.5124	1940.865
dinsured	**Coef.**	**Std.**
I_medexp2	-0.00161	0.000486
age	0.37274	0.082725
age2	-0.00212	0.000469
texpend2	0.000115	0.000031
sex	0.185045	0.05833
ai	-0.29651	0.069474
_cons	-14.9433	3.674682

medexp2	Coef.	Std.
I_dinsured	954.0944	199.7671
age	69.16163	37.5341
age2	-0.26824	0.232332
texpend2	0.047724	0.00209
sex	13.2535	43.81477
res	48.32723	76.05698
northeast	-472.359	83.17628
midwest	-308.734	67.42176
west	-285.461	67.30692
_cons	-5560.01	1428.007
dinsured	**Coef.**	**Std.**
I_medexp2	-0.00055	0.000272
age	0.119603	0.055319
age2	-0.0007	0.000319
texpend2	3.98E-05	1.55E-05
sex	-0.08393	0.058734
ai	-0.19405	0.041659
_cons	-2.93886	2.36611

For the entire sample together:

medexp2	Coef.	Std.
I_dinsured	845.6529	134.3819
age	-9.176312	1.555013
age2	0.0256245	0.0317723
texpend2	0.0109657	0.0032355
sex	-47.6967	14.28468
res	137.2303	17.78794
northeast	-299.2299	35.85766
midwest	-340.0191	39.54439
west	-51.42119	14.20269
_cons	-170.3066	51.27048

A positive significant coefficient on being insured ('I_dinsured') in the 'medexp2' equation indicates presence of moral-hazard, a private-information insurance market failure.

dinsured	Coef.	Std.
I_medexp2	-0.0016871	0.0000931
age	-0.0155359	0.0020075
age2	0.0005218	0.0000257
texpend2	0.0000783	3.00E-06
sex	0.0736868	0.0111776
ai	-0.0684854	0.0043054
_cons	-0.3792518	0.0477883

A positive significant coefficient on medical spending levels ('I_medexp2') in the 'dinsured' equation indicates presence of adverse-selection, another private-information insurance market failure.

Conclusions

For prime age and younger individuals of any income level, the effect of insurance status on medical spending is barely significant and negative, or not significant at all. Moral Hazard does not prove to be a critical insurance market failure for these individuals. Similarly, based on the coefficients of medical expenditures on insurance status, adverse selection does not prove to be a critical insurance market failure for these individuals either. By comparing coefficients across these two groups, it does not appear either that there is any significant increase in moral hazard or adverse selection from expanding health care coverage to the young and poor through Medicaid.

For older individuals, the effect of insurance status on medical spending is positive, large and significant. Moral Hazard does appear to be prevalent across these individuals. On the other hand, spending coefficients in the status equation were negative and barely significant. Adverse Selection is not a prevalent insurance market failure among the elderly, perhaps due to the already existing very high rates of enrollment due to expanded eligibility; no causality of expenditure on insured status because everyone insured at least by Medicare. Comparing across the two elderly groups, the magnitude of the moral hazard increases from expanding coverage to the elderly poor.

Even more dramatically, the comparison across age groups indicates extreme presence of the moral hazard insurance market failure from expanding coverage to the elderly. For individuals turning 65 and becoming eligible for Medicare, the increase in moral hazard behavior is astounding.

For policy makers concerned with the health care spending growth phenomenon experienced in the last few decades, a real explanation to the fact seems to be the increase in private information market failures due to expanded coverage. While it is good that more citizens are availed to health care, to curb the large spending increases policy makers should consider either privatization or incorporating contract theory tools into the implementation of these government health insurance markets; in particular, changing the incentive structure to a more high-powered incentive scheme such as HMOs have done with higher individual cost-sharing percentages.