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Income and the demand for complementary health insurance in France

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Main Points:

1) Objectives of the study: to study the demand for supplementary health insurance among low-income households – understand the role of affordability versus preferences.

2) Research question: the French case of complementary insurance – is it efficient to subsidize individuals to buy CHI?

3) Method: since we cannot observe variations in price of CHI we estimate a empirical relationship between demand for CHI and income and use a simple theoretical model of consumer behaviour to infer a relationship between CHI and {price and income}.

4) Empirical estimation: Tobit model with premium paid as the dependent variable and controlling for X, individual characteristics (preference shifters) that might correlate with income.

5) Results: the slope of the income – total CHI relationship is 0.14, which allows us to simulate the proportion of individuals who would buy a target level of CHI over all levels of subsidy (from 0 subsidy to 100% subsidy).

6) Policy conclusion: better raise the income cut-off for the means-tested CHI (CMU) than subsidize the purchase of CHI above the cut-off (ACS). Affordability does not seem to be the only barrier to access to CHI.

Objectives:

Countries with universal coverage (usually single payer) do not cover 100% of what is provided by health care providers. Some countries cover a basic level of quality and allow individuals to buy better quality care (UK, Australia), possibly using voluntary health insurance (VHI) to cover those expenditures. The idea is that anything beyond basic quality is a matter of want rather than need. In Australia and the UK these private schemes are not very popular though and governments try to encourage the purchase of VHI through some kind of subsidy. In this study, we want to document a specific case of subsidy for VHI and what it can tell us about the demand for health insurance among the near poor. The French ACS.

Research question:

France is one of those countries with universal coverage and a single payer. The public scheme covers approximately 78% of total expenditure and individuals can purchase health insurance to cover the rest. Interestingly the rest is comprised of co-payments of the public scheme as well as of extra costs for better quality (over-billing charged by some doctors and costs of prescription glasses and dental prostheses). Using better quality in France differs from what it means in the UK because the cost to the patient of the basic level of quality remains covered in France whereas the British patient willing to access better quality must pay 100% of the cost through private insurance or out-of-pocket. Hence, VHI is Complementary HI in France and Supplementary HI in England. Also, co-payments imply that the poor without CHI use less of the basic health care than the average population. Raises an equity issue as well as an efficiency one if one believes that health care utilization should not e influenced by income but determined by need only.

The rationale for co-payments and over-billings in France is twofold: moral hazard on one hand, to limit redistribution on the other hand (the basic scheme is funded based on contributions proportional to income).

Late 1990s: 85% have some CHI, but the poor are less likely to be covered and being without CHI reduces the probability to see a doctor. Hence a rationale to provide free CHI to the poorest 10% (CMU, in 2000 – CHI limits redistribution but CMU provides a safety net).

Early 2000s: 93% have some CHI (including CMU), the near poor are less likely to be covered. The government creates in 2005 a subsidy to purchase CHI for those with incomes between 100% and 115% of the cut-off threshold for CMU. This works as a voucher paid to the individual for the purchase of any CHI plan complying to some basic requirements.

Despite a generous level of subsidy (approximately 50% of the average premium on the non group market) the ACS has not been a success so far: take-up rate remained at between 10% and 20% of the target population in 2005 and 2006 (Franc and Perronnin, 2007). This lack of success raises the following research question: what is the demand curve for CHI in the low-income population in France and what does it tell us about policies relying on subsidies to cover the population?

Method:

Initial thought was to use the ACS scheme itself to better understand the demand for CHI among the near poor – who is eligible and takes advantage of it, who is and does not, who is eligible, already has some CHI and does not take advantage of the subsidy. However, no access to data on the eligible population (and not easy to identify in a population survey).

We use a survey conducted in 2004 (therefore before ACS) to measure the price-quantity relationship for CHI.

We cannot observe directly any co-variation of price and CHI on a cross-section. Why?

Price of CHI is the loading fee (not the premium which reflects the product of the price and the quantity purchased). We do not observe directly the loading fee: we observe the total premium paid, but we do not know what is covered by the contract and therefore cannot impute an expected level of reimbursement. As a result, it would be awkward (and prone to measurement error) to try to impute individual loading fees in order to estimate co-variations between price and quantity at various income levels. Moreover we have good reasons to believe that loading fees do not vary much across individuals in France for CHI (reasonable degree of competition – the poor do not seem to pay more per coverage than the rich).

We take a different option: our cross-section allows us to estimate the income-quantity relationship and all we need is a simple model linking income, price, and quantity to infer a demand curve from the estimated relationship.

We model the demand for complementary health insurance as a simplified trade-off between two goods (close to what Bundorff and Pauly recently did): CHI and a composite good reflecting all other consumptions.

The model contains two important and original features: first, there is a minimum level of the composite good below which life is not sustainable, so that even an infinite level of CHI cannot compensate for a consumption level of the composite good below that minimum (concept of affordability and the general perception of a hierarchy of need – page 10 in the paper); second, the "minimum" level of CHI (the level for which they want to receive an infinite level of the composite good to be compensated and keep the same level of utility) is negative for some individuals (recall they already benefit from basic coverage and lack of CHI only means co-payments).

For the sake of simplicity we used a Cobb-Douglas utility function; the Cobb-Douglas implies a linear relationship between income and the quantity of CHI purchased (the slope being the power exponent of CHI in the utility function). We check that assumption empirically, and, as will be described in the results section below, our findings support the Cobb-Douglas assumption in the range of income we are interested in. Moreover it can easily be shown that any constant-elasticity-of-substitution function would yield similar results.

The formal model works as follows: individuals maximize the utility described above, under a binding budget constraint based on current income y (there is no saving or borrowing in such a model):

$$\textbf{Max } U(c;HI) = [\max(0;(c-\bar{G})]^{\alpha}.(HI+HI^{0})^{1-\alpha}$$
$$\textbf{s.t. } \pi.HI + c = y \qquad (1)$$

The derivation of the price effect and, therefore, of the effect of a subsidy on the quantity of CHI purchased is straightforward: substituting the value for c from the budget constraint ($c = y - \pi.HI$) into the maximization program yields a simple equation in HI. Solving yields:

$$\pi.HI^{*} = (1-\alpha).y - ((1-\alpha).\bar{G} + \alpha.\pi.HI^{0})) \qquad (2)$$

We use equation (2) to simulate the impact of a price subsidy: The price subsidy is simulated as a reduction in π. All we need to do is to use equation (2) to calculate the percentage of individuals at a given level y with an HI* at least equal to an arbitrary level (what the government wants individuals to buy) for all levels of price below the market price.

Data and estimation:

We use ESPS 2004 - We drop all individuals with CHI obtained through their employer (even partially) and restrict our sample to those with a non-group contract (including retirees) and those with no CHI. We use 3,600 observations.

Dependent variable: total premium paid (on all CHI for the same individual) per covered individual. Average €527 per year.

Independent variables: equivitized income (main variable of interest) and Confounding factors:
Risk-adjustment factors: age, sex, and family size (individuals covered by the contract – in some cases, individuals living in the household are not covered and, in some rare cases, an individual not living in the household anymore is covered by the contract).

Preference shifters: The shape of the iso-utility curve depends on the utility of being covered. We describe it as follows:

Risk reduction: Individuals purchase insurance to reduce the financial risk associated with the probability of injury or illness. Two main theoretical frameworks of risk reduction lead to different ways of measuring the gain of CHI in reducing risk, expected utility and prospect theory.

Attitude toward risk and uncertainty: none of these variables reached significance in our estimations and we ultimately dropped these from our preferred model.

Preference for health (Commitment to spend on health care) or private information: individual observed out-of-pocket spending during the year.

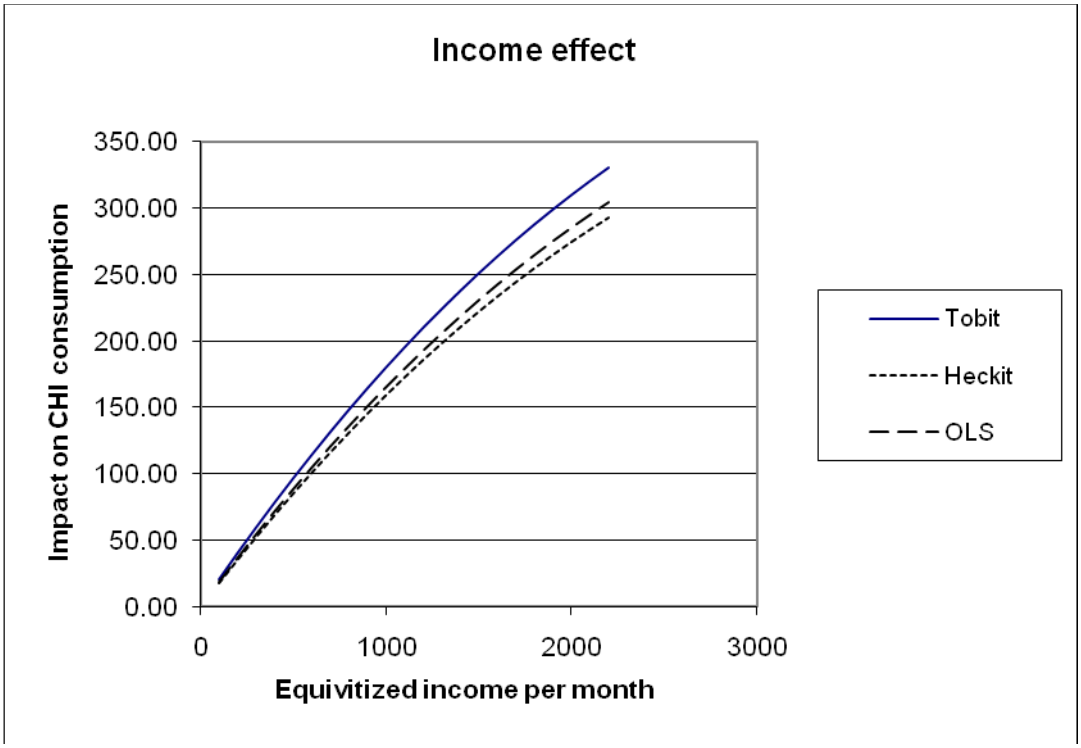
Specification: we use a Tobit, which seems natural since we assume zeroes are generated by the same process that generates positive demand for CHI – we vary the threshold to account for supply-side characteristics (insurers do not want to supply contracts below a given level). We run sensitivity checks based on alternate specifications (OLS and Heckman).

Results:

Table 3: Estimates, three main models (OLS, Tobit and Heckit): dependent is the value of the premium paid.

Variable	Model 1: OLS	Model 2: Tobit	Model 3: Sample Selection
Constant	232.54 ***	-666.71 **	372.55 ***
User charge	28.38 **	63.42 ***	26.65 *
User charge squared	-1.42	-4.39 **	-1.27
Age	-0.87	2.45 **	-1.34
Age squared	0.07 ***	0.06 ***	0.08 ***
Number covered persons	-70.61 ***	467.59 ***	-68.42 ***
Covered persons, squared	4.61	-70.19 ***	4.36
Income/1000	189.63 ***	**223.13** ***	183.12 ***
Income/1000, squared	-25.02 ***	**-30.36** ***	-24.41 ***
Income/1000, cubic	0.80 ***	**1.03** ***	0.78 ***
Risk premium	6.87 ***	1.69	6.65 ***
IMR			-421.92 **
# Observations	2645	3618	2641
Adjusted R2 (Log Likelihood)	0.2790	-19590	0.28
Scale		346.25	

*, **, ***: significant at 10%, 5% and 1% level.



Slope = 0.14 yields $\alpha = 0.82$

Figure 3: relationship between the subsidy level (horizontal axis) and the proportion of individuals willing to buy the level of CHI deemed appropriate by the government, here assumed at €50 per month (vertical axis), for various income levels.