The Effect of Supplemental Private Health Insurance on Health Care Purchases, Health, and Welfare in Brazil

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- My apologies for not being able to give this talk in French

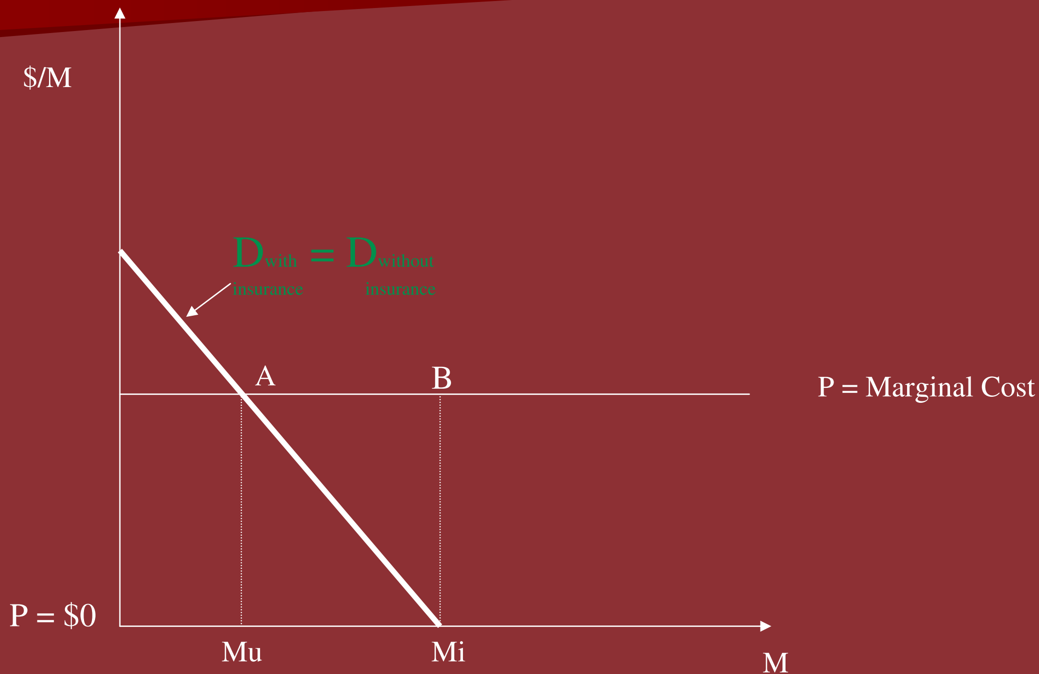
Research Issue

- Does the additional health care that consumers purchase when insured generate a welfare loss or welfare gain?
- Important because many economists have viewed health insurance programs in developing countries as being successful if they increase access to health care—that is, if they generate moral hazard.
- But conventional theory holds that moral hazard only decreases welfare.

Conventional Theory

- Indeed, this moral hazard welfare loss is so large that it makes the purchase of health insurance welfare decreasing
  - Manning and Marquis (1996) estimated that full coverage health insurance generates a large welfare loss and optimal coinsurance is 50%
  - Feldstein (1973) suggests that "the overall analysis suggests that the current excess use of health insurance [in the U.S.] produces a very substantial welfare loss" and recommended raising the coinsurance rate to 67%

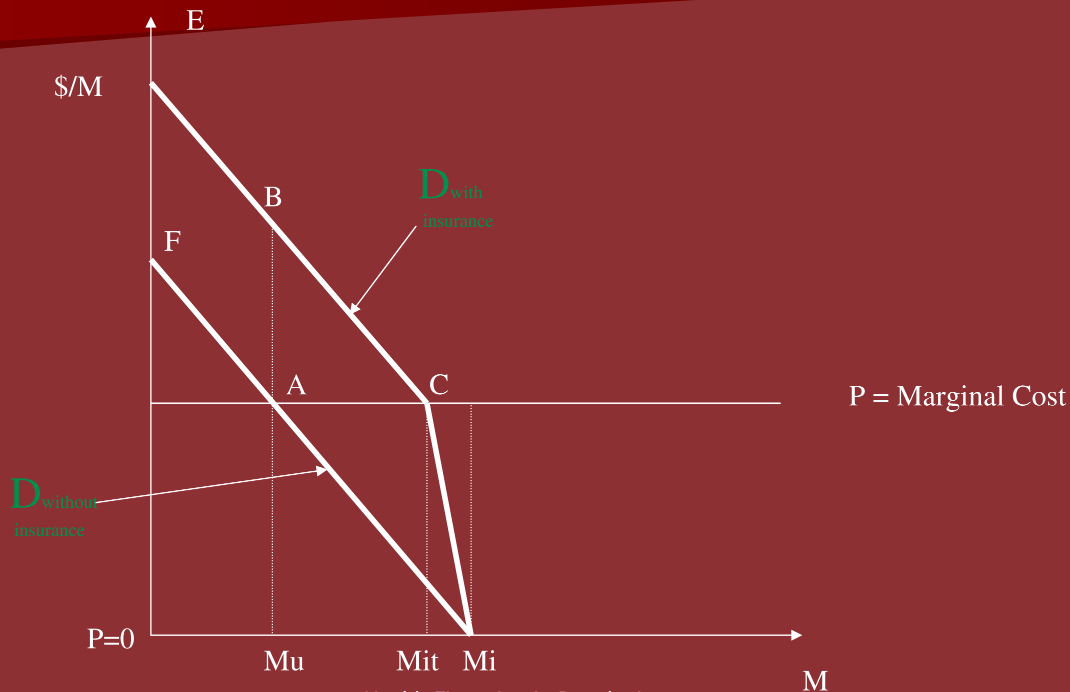
Conventional Theory: All Moral Hazard is Welfare Decreasing



New Theory

- The price decrease in health insurance is the vehicle by which income is transferred from those who buy insurance and remain healthy, to those who buy insurance and become ill.
- For most medical care expenditures, only the ill respond to the price decrease:
  - *What healthy person would consume a coronary bypass procedure just because the price had fallen to zero?*
- This income transfer must be accounted for in the welfare calculations of moral hazard.

New Theory: A Portion of MH is Welfare Increasing



New Theory

- Thus, some moral hazard is welfare increasing and some is welfare decreasing
- So, whether moral hazard on net increases or decreases welfare is *now an empirical question*
- Need to estimate the gain from moral hazard and compare to costs
- This is the purpose of this paper

Empirical Study

- World Bank's Research on Standard of Living Survey of Brazil, 1996-97
- Over 19,000 respondents
- Brazil had national health insurance, but it was unevenly available and incomplete coverage
- Survey asked if respondent had supplemental private insurance (SPI)
- 24% of respondents had SPI

Establishing Moral Hazard

- About 24% of respondents also had an acute illness in previous 30 days
- Estimated the effect of supplemental private insurance (SPI) on whether or not respondents with acute illness were treated for it (1,0)
- Logit regression found odds ratio of 1.8
- About 16% of respondents had a chronic disease
- Estimated effect of SPI on whether or not they were treated for chronic disease
- Logit regression found odds ratio of 2.5

Effect of SPI on Health Status

- Health status variable was self-reported "excellent," "very good," "good," "average" or "poor"
- Probit regression on the effect of SPI on health status
- Used Kane and Spizman (2001) procedure to convert probit results into marginal changes in the probability of reporting being in each of these health statuses due to SPI
- Controlled for type of acute or chronic illness, income, education, gender, age, and race

Acute Illness: Changes in Probabilities Due to SPI

Health status category	Probability that health status category i is reported, given no SPI	Probability that health status category i is reported, given SPI	Marginal effect of supplemental private insurance
Poor	0.0218430	0.0144297	-0.0074133
Average	0.3285957	0.2758917	-0.0527040
Good	0.4600893	0.4713019	0.0112126
Very Good	0.1405226	0.1698451	0.0293225
Excellent	0.0489495	0.0685316	0.0195822

Chronic Illness: Changes in Probabilities Due to SPI

Health status category	Probability that health status category i is reported, given no SPI	Probability that health status category i is reported, given SPI	Marginal effect of supplemental private insurance
Poor	0.13716063	0.09478863	-0.042372
Average	0.61253544	0.58060934	-0.0319261
Good	0.2079125	0.2584296	0.0505171
Very Good	0.03556677	0.05387467	0.0183079
Excellent	0.00682466	0.01229776	0.0054731

Welfare Effects of Moral Hazard from SPI: Steps

1. Translate change in health status probabilities into change in health-related quality of life (HRQOL)
2. Estimate resulting gain in quality adjusted life years (QALYs) attributable to SPI
3. Compare gain in QALYs to cost of additional health care (moral hazard) to construct incremental cost-utility ratio (ICUR)
4. Compare ICUR to value of a QALY

1. Translate change in health status probabilities into change in HRQOL

- No Brazilian data available so used U.S. HRQOL from ongoing AHRQ-funded study (Nyman et al., 2005)
- Find that SPI increases the average HRQOL of those with acute illness by 0.013 using as weights:
  - "poor" is HRQOL of 0.498
  - "average" is 0.711
  - "good" is 0.844
  - "very good" is 0.903
  - "excellent" is 0.941
- Find SPI increases chronic HRQOL by 0.021

2. Estimate change in QALYs from change in HRQOL

- Acute illness
  – If acute illness lasts 1 month, then change in HRQOL of 0.013 would have QALY value of (90.013/12) = 0.001 QALYs
  – But, on day of Survey, 1 in 4 had acute illness, so expect 3 such 1 month episodes per year in average respondent
  – Accordingly, QALY gain from SPI for treatment of acute illness is (0.001*3) = 0.003 QALYs

2. Estimate change in QALYs from change in HRQOL

- Chronic illness
  - Chronic illness assumed to last 1 year
  - So, gain in QALYs for those with chronic illness is 0.021 QALYs
  - About 16% of respondents had chronic illness
  - So, expected gain in QALYs for a person purchasing SPI at random is (0.021*0.16) = 0.003 QALYs
- Expected gain from SPI for treatment of acute and chronic illness is (0.003 + 0.003) = 0.006 QALYs

3. Estimate cost of moral hazard and construct ICUR

- 1994 per capita spending for health care provided by private health insurers was US$43
- Since only 24% of Brazilians had SPI, 1994 spending per insured person was (US$43/0.24) = US$179
- US MEPS found that spending by insured was twice the spending by uninsured, so ½ of insured spending is cost of moral hazard
- Cost of MH is (US$179/2) = $90
- ICUR = $90/0.006 QALYs = US$15,000/QALY

4. Compare ICUR to value of QALY in Brazil to determine welfare

- Again, no information on value of QALY in Brazil
- In the U.S. in the mid-1990s, economists were transitioning from using US$50,000 to US$100,000 as a value of a QALY
- Hirth et al. (2000) justifies US$265,000
- Based on U.S. standards, cost of US$15,000/QALY < US$100,000/QALY value…moral hazard is welfare increasing

Limitations

- No estimate of value of QALY in Brazil
  - U.S. estimate based on labor market studies that would likely generate lower value in Brazil
  - But there is a normative question…
- Only included effect of SPI on morbidity, but moral hazard likely to cause large mortality effect as well
  - In U.S., Franks, Clancy and Gold (1993) found that health insurance reduced mortality rates by 25%
  - Including the effect of SPI on mortality would increase the QALYs saved and reduce the ICUR

Limitations

- Total value of insurance would also include
  - Value of "risk sharing" for "risk averse" consumers
  - External value of access to care to others
- Large amount of uncertainty in parameters, so a sensitivity analysis is included in paper
- Possible omitted variables that are correlated with both SPI status and health, but could not use instrumental variable approach because no instrumental variable could be identified in data

New Theory

- ***The Theory of Demand for Health Insurance***
- by John A. Nyman
- Stanford University Press, 2003