ANALYSIS OF HEALTH CARE EXPENDITURES WITH FAMILY INCOME AND LIFE CYCLE STAGE

COMMENTS

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I would like to begin my comments by complimenting the committee on a fine choice for the Master's thesis award. I would like to compliment Sara Stiefvater on a fine thesis.

Sara has worked on an important consumer problem, one that is a major area of national policy debate. As Marilyn Moon noted this morning, health care costs are a problem that is likely to occupy researchers and policy makers for at least the next couple of decades. Health care in America consumes nearly 12% of our GNP, our total productive capacity. This share has been rising and will continue to rise in the foreseeable future.

Health care provision is possibly the most distorted market, distorted from the normal rules of supply and demand. Among the reasons for these distortions are the 'special' nature of need for health care and the very important role of third party payment, by both government and the insurance industry. In many ways the normal feedback mechanisms of price and quantity demanded are uncoupled in this market.

Sara has crafted a research project that begins to untangle some of the major issues in health care utilization. In a nutshell, Sara has examined out-of-pocket expenditures (the ones that matter when estimating demand, since these are the 'prices' to which consumers respond) for health care at different life-cycle stages for different health care categories. This means that Sara provides explicit recognition of the different needs for types of health care at varying life-cycle stages.

Sara's thesis begins with an up-to-date review of the relevant literature, and a careful presentation of her research question and related hypotheses. It should be noted that later in presenting her empirical results she duly notes where her empirical findings are in accordance with her hypotheses and where they are not.

The heart of Sara's thesis is found in three sets of tables. The first (Table 5 and Appendix A) presents the probabilities of households in each of six family types reporting any out-of-pocket expenditure on each of seven health care categories. Out-of-pocket expenditure does vary across life-cycle stage and health-care category. Sara utilities chi-square statistics to demonstrate that within each health care

expenditure category each life-cycle stage has a different likelihood of out-of-pocket expenditure. Conclusion -- life-cycle stage is associated with out-of-pocket expenditure.

An overview of the entire 6x7 table of life-cycle stage by expenditure category reveals that single-parent households are almost always the least likely to have out-of-pocket expenditures for any category (6 out of 7 categories) and that empty-nest families (older couples with children gone) are the most likely (4 out of 7 categories) to have out-of-pocket expenditures.

The second important table (Table 6) presents multivariate regression results predicting out-of-pocket expenditures (for those who have out-of-pocket expenditures) from income, life-cycle stage, and regional variables. In general she finds that nearly all independent variables are significant, meaning that life-cycle stage is related to the amount of expenditure. Sara provides explanations and interpretations of these results.

Unfortunately, I place less credibility in her results than she does. Table 6 presents extremely high F statistics (a high F statistic indicates a very good model) and low to very low R^2 (amount of variation in out-of-pocket expenditure explained by the model). The R^2 for these models indicates that the various models account for 8% or less of the variation in out-of-pocket expenditure in the health care categories (5 of the 7 health care expenditure categories have R^2 of 2% and less). The very high F statistics and very low R^2 are basically contradictory and require explanation. These regressions are estimated using the Bureau of Labor Statistics weights, which may have the effect of inflating the sample size to the population size (millions), which inflates the F statistics. I suspect that the t-statistics on the significance level of the independent variables are also over inflated. This is essentially an accounting problem in the statistical estimates, and one I assume can be dealt with rather easily. The potential for inflated t-statistics and the F statistic accounts for most of my skepticism about the results and the interpretation of the estimated coefficients.

There are two other potential problems with the model I would like to address, although they are beyond the expectations for a Master's project. These are brought up more to remind all of us of the econometric difficulties in working in these areas. The first is to note that the low R^2 suggests that most of the variation in out-of-

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pocket expenditure is not explained by the model. If there are variables related to both out-of-pocket expenditures and variables currently in the model, then there is a problem of omitted variable bias, and the model coefficients may well be biased.

A more difficult problem to address is that many households reported no out-of-pocket expenditures for some health care categories and thus were not included in the regression models for those categories. Estimating out-of-pocket expenditures for only those households reporting such expenditures leaves unaddressed the question of why some households have these expenditures and others do not. Health care expenditure is really a two part decision. The first issue is what determines which households purchase care from a particular health care category, and the second issue is how much do they spend. There are techniques to deal with this problem (most commonly Tobit analysis), but they are not generally introduced to master's students.

The third set of important tables (Tables 7 to 13) in this thesis provide estimations of the dollar amount and share of out-of-pocket expenditure for each health care category and for each life-cycle stage based on the regression results. Focusing on TOTAL expenditure, it is interesting to note that single parent households have low expenses (dollar amount) but spend a larger share of income on health care than other families with children. Sara notes the potential policy implications that single parent households may be at risk of not acquiring enough health care. She also notes that empty-nest families exhibit high expenses and a high budget share. This may indicate risk by this group, or it may merely indicate a normal shift in expense patterns by the elderly.

Criticisms aside, what has Sara accomplished? Her thesis is extremely well written and easily read. She has done an excellent job of conceptualizing a problem and providing an innovative approach to examining out-of-pocket expenditure by life-cycle stage and health care category. Her results are in general intuitively plausible and informative. I would have liked to see better statistical documentation of their significance. Her concluding chapter on limitation and implications is well written and provides a springboard for further research in this area. This thesis is a remarkable piece of work at the Master's level. I encourage Sara to continue to bring this type of intellectual capacity and energy to consumer issues.