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Willingness to Pay Student Insurance as a Primary Plan Among Eastern Illinois University Students

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Table of Contents

Chapter	Page
1. Introduction.....	2
2. Concept of Willingness to Pay (WTP).....	3
3. Using WTP in Health Care Decision–Making.....	4
4. EIU Student Health Insurance Policy and Plan.....	5
5. Significance of the Study.....	6
6. Research Questions and Hypotheses.....	6
Hypotheses.....	6
7. Literature Review.....	7
8. Data and Methodology.....	9
Methodology and Model.....	12
Student Health Insurance and level of Education.....	12
WTP among Gender.....	14
Regression results.....	16
9. Conclusion and Policy Recommendations.....	18
10. Annotated Bibliography.....	19
11. References.....	21

Willingness to Pay Student Insurance as a Primary Plan among Eastern Illinois University
students

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Course No: 5402 -001

Advance Microeconomics Theory

Department of Economics

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Abstract

Selecting ideal health insurance coverage entails a trade-off between the gain from risk reduction and the deadweight loss from moral hazard (Manning and Marquis, 1996). This paper investigates students' willingness to pay for student health insurance which will serve as a primary plan. Variables such as demographics, student insurance enrollment and coverage, student insurance utilization and satisfaction were used to assess students' Willingness to pay for student insurance as a primary plan. Both qualitative and quantitative statistics were used to explain the willingness of students to pay for student insurance as a primary plan.

Introduction

Social choices about health insurance involve a trade-off between the gains from risk reduction and the losses from inappropriate incentives for the purchase of more health care (Manning and Marquis, 1996). The rationale behind medical insurance is to spread a risk, the risk of incurring substantial medical expenses. With risk sharing individuals will not pay the full amounts of such expenses (Zeckhauser, 1970). The United States Census Bureau classifies health insurance coverage as either private coverage or government-sponsored coverage. Private health insurance is coverage by a health plan provided through an employer or union or purchased by an individual from a private health insurance company. While all three forms of acquisition are used, employment – based coverage is the dominant source of private health insurance in America. Historically, about 14 to 16 percent of the U.S. population tended to be uninsured each year (DeNavas-Walt, Proctor, & Lee, 2005). While some chose to be uninsured, many of the involuntarily uninsured face the sharp psychological sting from the financial insecurity that can result from an unexpected medical occurrence. Logic suggests that people are without private health insurance for a variety of reasons. First, in a private health insurance system, some people alter their purchases of health insurance in response to changing economic circumstances such as the price of insurance or their income in the same manner they change their demands for other goods and services. Stated differently, some people may choose not to be on private health insurance coverage or may be on the minimal health coverage. In this situation, health insurance is a negative net present value investment; hence, it is rational not to buy insurance.

Considering the high out-of-pocket spending level for healthcare, the desire to improve the effectiveness and availability of healthcare financing, the quality of the care given, and the costs

associated with a campus outbreak of a communicable disease, it seems imperative to know how willing consumers of health insurance want to pay to maximize their utility. On such grounds, this study aims to estimate the willingness of EIU students to pay for student insurance that will serve as a primary plan. The primary plan will provide coverage including treatment on and off campus, routine, care, and prescription benefits.

Concept of Willingness to Pay (WTP)

Although the concept of willingness to pay (WTP) has existed for a long time, it was not until the 1960s that the first empirical application was published in a journal (Davis, 1963). This was in the area of environmental policy evaluation and was specifically concerned with estimating the benefits of outdoor recreation in a backwoods area in the US state of Maine. During the 1970s, the method was further developed in studies of the valuation of human life, as applied to safety and transport policies (Jones-Lee, 1974, 1976; Mooney, 1977) and was first applied in the health area in the famous study of WTP to avoid heart attacks (Acton, 1976). Subsequent to that, there were relatively few studies in the area of health (Diener et al., 1998), probably as a result of the quality adjusted life year (QALY) being perceived as a more acceptable measure of benefit than one which valued life in monetary terms. It was not until the publication of two empirical papers in the Journal of Health Economics in the early 1990s (Johannesson et al., 1991a) and the conceptual paper by Gafni (1991) that the feasibility of using this method in health economics was once again recognized and more studies began to be undertaken (Klose, 1999; Olsen & Smith, 2001).

Put simply, WTP instruments measure ‘strength of preference’ for, or value of, a commodity. In areas of public sector activity, such as health care, in which conventional markets do not exist, decisions still have to be made about how best to use limited resources. This requires valuation

of both resource costs of interventions and their benefits that is health gain and other sources of wellbeing, the latter elicited in surveys by use of hypothetical WTP questions. In principle, with this type of information, the combination of interventions can be chosen which maximizes the value of benefits to the community. It is important to distinguish WTP, as a measure of benefit, from the cost of a good. For any good, many people would be willing to pay more than its cost. Given that the good is provided at cost, and many would be willing to pay more, it is the maximum WTP for the good that represents its benefit to these individuals. For any individual, the difference between this benefit and the cost of the good represents a gain in well-being from having the good provided. This is why the concept of WTP is so important, and why the notion of maximum WTP was emphasized by (Dupuit, 1844).

Using WTP in Health Care Decision – Making

Do Hypothetical Questions Give Hypothetical Answers?

In studies of health care, of course, WTP studies are hypothetical with respondents being asked to imagine they must pay. This is inevitable, as not to do so would engender many ‘protest’ responses amongst respondents who may think the exercise was about charging for health care rather than eliciting people’s values. Furthermore, it might be argued what is important in any decision-making context is the relative values derived for the options being compared.

Nevertheless, the extent to which values derived in such surveys reflect ‘real-world’ behavior is an issue, influencing the perceived credibility of the method. In the early 1990s, the literature on this issue was split, with five studies showing WTP values elicited from surveys to be greater than those from real behavior whilst five studies gave consistent results (Hanemann, 1993). One study in the health economics literature revealed a preference and contingent valuation method arrived at similar valuations (Kennedy, 2002), whilst others found the opposite (Clarke, 1997). It

is interesting to note, one study also claimed it may be possible to correct for any overestimation (Blumenschein et al., 2001).

EIU Student Health Insurance Policy and Plan

Eastern Illinois University requires all students who enroll in nine or more on-campus hours, all graduate assistants under contract to the University, and all international students enrolled in three or more on-campus hours, be covered by health insurance. This requirement is enforced via the provision of a supplemental Plan of medical coverage for injury and illness and the mandatory assessment of a related fee in addition to tuition and other fees. The Plan is also available to students enrolled part-time with 5 or more hours who may apply to purchase coverage. The Plan coordinates with the student's primary carrier and provides the student worldwide protection, 24 hours a day. Student Insurance is an economical way to reduce or eliminate out-of-pocket expenses when family health plans do not cover 100% of medical costs because of deductibles, co-payment amounts, limitations on specific benefits, and out-of-network penalties. The Plan has a \$50 deductible per diagnosis and pays up to 80% of eligible expenses for physician and hospital expenses, lab and x-ray, surgery, ambulance transport, physical therapy, maternity expenses, mental health and substance abuse issues. In the event of non-emergency injury or illness, covered students report to Health Service for treatment or referral. The plan is secondary if the student is entitled to benefits from any other policy and the University does not provide coverage for spouse or dependents ("Eastern Illinois University:: Student Health Insurance," n.d.).

Significance of the Study

The objective for this study is to capture how willing are students to pay for a new Primary plan. A Primary plan providing unlimited coverage including treatment on and off campus, routine, care, and prescription benefit, rather than the current “secondary” plan. The results of this investigation will be significant to student insurance staff, the health service advisory board, the vice president for student affairs and other committees or councils at Eastern Illinois University who make decisions regarding policy coverage, improvements in service delivery, and related risks. It will also serve as a guide in addressing recommendations brought forth through the Vitalization Project, as well as the ever changing health field.

Research Questions and Hypotheses

This project focuses on the WTP for a Primary plan providing unlimited coverage among Eastern Illinois University students. The questions we ask in this research project are

- Does WTP for student insurance as a primary plan depend on the deductible (the amount you pay before insurance pays) for the primary plan?
- Does WTP for student insurance as a primary plan differ between genders?
- Does WTP for student insurance as a primary plan differ with age?
- Are students who are currently insured willing to pay for student insurance as a primary plan?

Hypotheses

Given existing evidence in literature, I argue that students’ WTP for student insurance as a primary plan will be positively related to deductible if they have high satisfaction from current supplemental plan. I also hypothesize that there will be differences between gender and their willingness to pay for student insurance as a primary plan. On age, I argue the

greater the age of a student, the greater the WTP for student insurance as a primary plan. We assess these questions with data from the EIU health Service Centre which contains information on perceptions and opinions regarding EIU student insurance, student insurance utilization and satisfaction from 239 students in Eastern Illinois University. The analysis will be interspersed with several comparisons along the lines of demographic variables including gender, age, enrollment status, residency, among others. This study will help EIU and college administrators in general understand and identify factors that affect or explain the willingness of college students to pay for student insurance. The study will employ both econometric and non-econometric approaches in analyzing the data. With the econometric approach, Ordinary Least Squares (OLS) regression will be used to run the regression in estimating the independent factors or variables that help explain the willingness to pay student insurance. On the hand, summary statistics and bar charts will be used for the non-econometric analyzes of the data since most of the independent variables are more on the qualitative side. This will give a pictorial view of the perceptions and satisfaction level EIU students have regarding their student insurance plan and how it influences their willingness to pay for EIU student plan if it were to serve as a primary plan.

Literature Review

Choosing optimal health insurance coverage involves a trade-off between the gain from risk reduction and the deadweight loss from moral hazard (Manning & Marquis, 1996). Several studies analyzed the demand for insurance from a microeconomic perspective, illustrating how demographic characteristics such as age, education, family size, income, or wealth have an effect on the decision to purchase insurance. However, findings are not consistent across studies, and the relationship between demographic or socio-economic variables and insurance willingness to

purchase insurance has been found to be positive, negative, or not significant (Schneider, 2004). A possible explanation for such inconsistent findings may be the fact that these studies ignored interpersonal differences in risk preferences which, in light of the uncertainty surrounding income or unexpected adverse events, are likely to play an important role in household decision to purchase insurance. Some authors examined the role played by attitudes toward risk on insurance purchasing behavior (Hoy & Robson, 1981; Szpiro, 1986) but little research has been done. The scarcity of studies probably depends on the difficulty in finding objective measures of risk attitude. First, it is problematic to shed light on the crucial difference between decisions under ambiguity and under risk. Indeed, in situations of decisions under ambiguity, the consequences of the decision are completely undefined, and we do not have any information about how likely positive or negative consequences will appear (Bechara, 2004). Socio-demographic variables appeared to play a role in health insurance holding. As in a study done by Showers and Shotick (1994), they found a positive correlation between health insurance demand and age. Tobit analysis was used to analyze the impact of household characteristics on demand for total insurance. This approach examined the marginal change in demand for insurance, as well as the change in the probability of purchasing insurance. Showers and Shotick found that, demand effects are dominated by the marginal impacts from existing purchasers of insurance. Although income and number of earners are both positively related to the demand for insurance, the marginal effect from an increase in income is greater for single-earner households than for multi-earner households (Showers and Shotick, 1994).

Conversely, Lin and Grace (2007) did not find a significant relationship between these variables. Inconsistencies may be due to the fact that older people may have a greater desire to leave a bequest, however they may have a binding budget constraint when approaching retirement. In

finance theory, consumers diversify assets as a means of spreading risk. Demand for insurance arises from incomplete diversification. Under utility maximization, portfolio theory suggests that consumers evaluate several factors simultaneously in their insurance purchasing decision.

Doherty (1984) showed that efficient levels of insurance increase with the level of insurable risk and with the weight of the asset in the portfolio. Mayers and Smith (1983) demonstrated that the demand for insurance contracts is determined simultaneously with the demand for other assets in the portfolio. Consumers' expected utility from various assets motivates them to diversify.

Ehrlich and Becker (1972) showed that traditional economic consumer behavior theory can be combined with expected utility within the context of the "state preference" approach to behavior under uncertainty. Although market insurance redistributes income toward the less well-endowed states, the consumer's need for insurance is no different from the consumer's need for any other good or service. They show that the equimarginal principle of consumer behavior is applicable to the purchase of insurance. These consumption behavior studies motivate the development of the total insurance demand model used for this study.

Data and Methodology

The data for this study comes from the Health Service Centre in EIU. The distribution channel for the survey was through the Panthermail. The survey collected data on demographics of respondents, student's perceptions and opinions regarding EIU student insurance, student insurance enrollment and coverage, and student insurance utilization and satisfaction. The respondents in this survey cuts across diverse demographics. For example, 23.01% of the respondent identified their ethnicity as Caucasian, 1.26% identified themselves as American Indian or Alaska Native, 0.84% of the respondent identified themselves as Asians, 12.97% as Black or African American, 7.11% as Hispanics, 0.42% as Native Hawaiian or other Pacific

Island and 2.09% identified their race as two or more races. About 80.59% of the respondents were domestic students while the remaining 19.41% of the total respondents were international students. 94.76% of the domestic students in EIU reported to be Illinois resident while 5.2356% of domestic students were nonresident. On the grounds of employment on campus, 86.13% of the respondent said they were EIU employee(Excluding student employment) as opposed to 13.87% of the respondent saying they are who are not having any form of student employment. With respect to enrollment status, 78.24% of the respondents described their enrollment status as full-time on-campus student, 2.09% answered they were part-time on-campus student, 3.77% responded as being full-time student enrolled in the school of Continuing Education and or all on-line courses, 5.86% identified themselves as being part-time student enrolled in the school of continuing Education and or all on-line courses and lastly 10.04% described their enrollment status as full-time student enrolled in both on-campus and or on-line courses.

In addition, 14.75% of the respondent who identified themselves as male had student insurance during this recent academic year as opposed to 31.25% of males who did not have any student insurance during that same academic year. Adding to the forgone, 85.25% of female respondents had student insurance during this academic year while 67.86% no having student insurance. Transgendered male with a figure of 0.89% reported not to have used student insurance this academic year.

Statistics on demographics of respondent

Variable	Obs	Mean	Std. Dev.	Min	Max
age(Freshman)	44	19.56818	5.487397	18	55
Age(Sophomore)	49	19.85714	2.236068	18	34
age(Junior)	49	22.61224	7.24516	19	54
Age(senior)	42	25.04762	8.171791	20	59
Age(Graduate)	52	28.92308	7.803584	22	56
Age(male)	54	26	9.289881	18	59
Age(female)	181	22.51381	6.578254	18	56
Age(EIU employee)	33	23.0303	8.064137	18	55
Age(non EIU employee)	202	23.17822	6.958149	18	59
The statistics are computed based on survey response					
Source: Author's computation					

From the table above, it could be seen that the average age of male respondents stood at 26 years as opposed to female respondents with mean age at 23 years. It could also be seen that the mean age for freshman students was 20 years while sophomores, juniors, seniors and graduate students were 20 years, 23 years and 25 years and 29 years respectively.

Methodology and Model

This paper uses both descriptive statistics; graphs and charts as well as quantitative estimations techniques to measure the Willingness of EUI students to pay for health insurance that will serve as a primary plan, which provides students with unlimited coverage including treatment on and off campus, routine, care, and prescription benefits. We estimate the WTP using the model below.

$$WTP_i = \beta + \beta X_i + \varepsilon_i$$

Where WTP measures students' willingness to pay insurance as a primary plan. The explanatory variables to be used for this model include *Age*, *Gender*, *Deductible rate*, if student is currently insured with student insurance (*Currently insured*), residency of respondents (*Residency*), and if students recommends switching plan to primary plan (*Switch to primary plan*). X represents a vector of individual level of covariates that may affect the WTP of a student or ε_i is the error term which is expected to be normally distributed with a zero mean and a constant variance. Since the dependent variable is a continuous, we use ordinary least squares regression. The section that follows give some description of the statistics on WTP across demographics, student satisfaction, and perceptions and opinions regarding EIU student insurance among others.

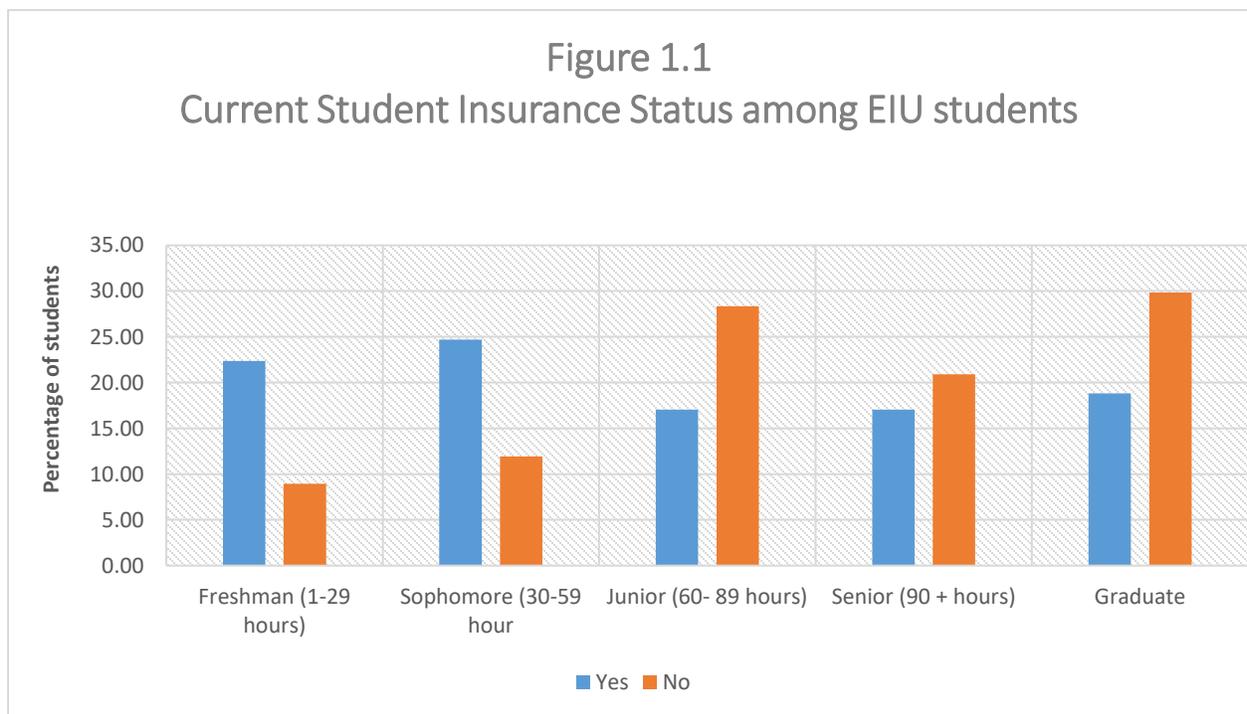
Student Health Insurance and level of Education

To understand the rudimentary analysis of how students are willing to pay for health insurance, we first gather descriptive information on the percentage of students who are currently having insured with student insurance. From the data, we seek to examine the current student insurance status among different levels of education. 22.35% of respondents who were freshman reported to have student insurance as supplementary plan as opposed to 8.96% not currently having EIU student insurance. 24.71% of sophomores reported to currently have student insurance whiles

11.94% said they were not currently having student insurance. There was a close tie between juniors and seniors on the grounds of currently having student insurance of which 17.06% was reported respectively for each group as opposed to 50.75% of both juniors and seniors not currently enrolled on the student insurance plan. 18.82% of graduate students reported to currently have enrolled in student health insurance while 29.85% of them said they are not currently enrolled with EIU student insurance plan. From figure 1.1, it could be visual seen that, Sophomore students have the highest currently enrolled student insurance with a value of 24.71% as opposed to both junior and senior years student who have the lowest enrollment student insurance plan. With students currently not having student insurance, graduate students recorded the highest percentage point of 29.85% as opposed to freshman having the lowest at 8.96%. From the questionnaires, a follow up question was asked about why students were not currently insured with student insurance. 53.03% of the respondents which formed the highest number explained that the student insurance was waived because of the coverage their personal coverage provides. Also, another reason respondents gave were that, they were not aware they could purchase student insurance if they were enrolled in on-line/off-line campus hours only. Lastly 6% of the respondent answered by saying they were enrolled in less than 9 on-campus hours so they were not automatically billed.

Level of Education	Currently insured with Student Insurance?		
	Yes	No	Total
Freshman (1-29 hours)	22.35	8.96	18.57
Sophomore (30-59 hour)	24.71	11.94	21.1
Junior (60- 89 hours)	17.06	28.36	20.25

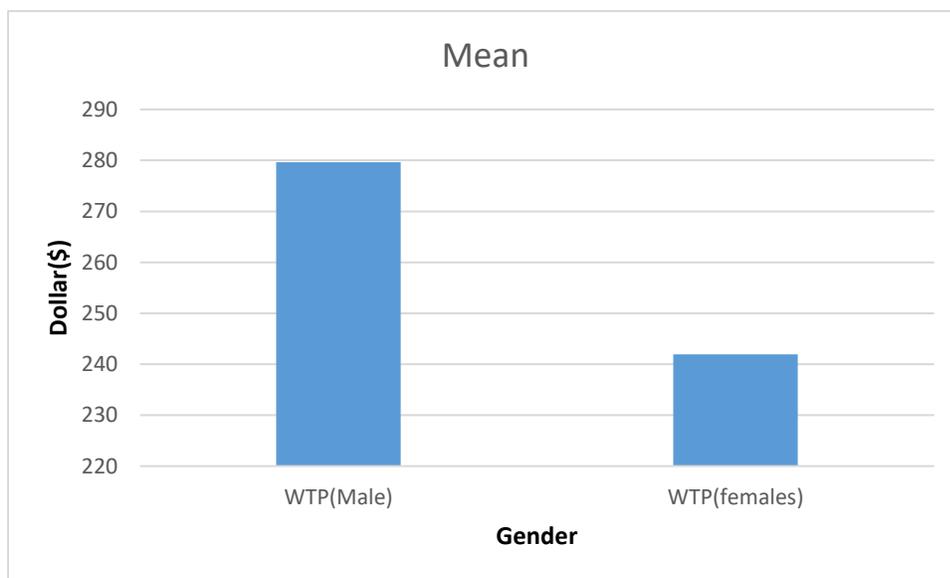
Senior (90 + hours)	17.06	20.9	18.14
Graduate	18.82	29.85	21.94
Total	100	100	100
Author's computation			



WTP among Gender

The table below indicates that on the average students who identified themselves as males were willing to pay \$279 on the average for student health insurance that will serve as a primary plan as opposed to females who were willing to pay to \$242 on the average for the primary plan.

Variable	Obs	Mean	Std. Dev.	Min	Max
WTP(Male)	54	279.6296	126.0872	150	650
WTP(females)	180	241.9444	102.2326	150	650



Student Insurance Satisfaction and WTP

Using descriptive statistics to understand how student insurance utilization and satisfaction affect WTP, we examine this table below.

WTP	DISSATISFIED	SATISTIED	VERY SATISFIED
\$150	37.5	43.53	23.33
\$250	25	34.12	50
\$350	25	14.12	20

\$450	0	5.88	3.33
\$500	0	2.35	0
MORE THAN	12.5	0	3.33
\$500			

The table above gives a clear indication that as students are willing to pay more if their current student insurance utilization and satisfaction is high. Looking at the table, 34.12% students who were satisfied were willing to pay \$250 for a plan that would serve as a primary plan, providing unlimited coverage including treatment on and off campus, routine, care, and prescription benefits. 50% of students who were very satisfied with the current health insurance were willing to equally pay a higher premium of \$250 relative to the minimum amount of \$150. Adding to the forgone, just around 3.33% of students who were highly satisfied were also really to pay for as high as \$500 if the supplemental EIU plan served as primary plan for them. This indicates that, willingness to pay for per semester for a primary plan over a semester is pretty determined by their current satisfaction they gain from their student insurance plan.

Regression results

WTP	Coefficient	Standard Error	PValue
Gender(Female)	-0.1078085	0.062943	*0.089
Age	-0.0003199	0.003756	0.932
Switch to Primary Plan	0.1005403	0.056219	*0.075

Deductible rate	0.1742025	0.036137	***0.00
Currently insured	0.0316197	0.064221	0.623
Residency	-0.0614909	0.128296	0.632
Constant	5.152537	0.193073	0.00
Sample size 182			
F-Statistic 6.37			
***p<0.01, **p<0.05,		R-square 0.1664	
*p<0.1			

From the table, we can infer that the variables Age, currently insured status of a student, residency of student were not significant in explaining WTP. Age had a negative sign which means that as the age of a student increases, WTP for student insurance as a primary plan reduces but this variable was not significant. Gender (female) came out to be negatively related to WTP. This means that if gender is female, a student is willing to pay less premium for the primary plan relative to a student being male. Stated differently, male respondent on the average are willing to pay more for the primary plan than females. A look at switch to primary plan variable shows that students who recommended current supplementary plan be switched to primary plan are willing to pay more for the primary plan as opposed to students who recommended keeping plan as it is, a supplemental plan. This explanatory variable was significant at 10% alpha level. Lastly, deductible rate as an explanatory variable was highly significant and positively related to WTP. It could be also be seen that there was a positive significant relationship between students who desire to pay higher premiums also desire to pay

deductibles. This shows that at higher deductibles, students are willing to pay higher premiums. This is an indication that the better the services covered under the insurance program.

Conclusion and Policy Recommendation

Our study seeks to find the willingness to pay student insurance as a primary plan among EIU students. We examine this question with data from EIU health service. We find that gender (female) generally has a negative relationship with WTP for student insurance as a primary plan over relatively large samples. We also find that, students who recommended that current supplementary plan be changed to primary plan are willing to pay for student insurance as a primary plan as opposed to students who recommended keeping the plan as it is, a supplemental plan. The reason might be that, students who opposed to keeping plan as supplemental have really had great utility from the student insurance hence they know when it is changed to primary plan, they will maximize their utility. We also learn that students who desire to pay higher premiums also desire to pay higher deductibles— an indication that the better the services covered under the insurance program (such as the unlimited coverage as defined in the survey's primary plan), the more willing students are to pay a higher amount. Simply put, cost is not in itself, is not a major hindrance for students who desire quality insurance services. The university health service can thus leverage on this to provide the quality of services that commensurate the premium charged.

Annotated Bibliography

Acton, J. P. (1976). Demand for health care among the urban poor, with special emphasis on the role of time. In *The role of health insurance in the health services sector* (pp. 163-214). NBER.

Jan Paul Acton in his paper examines the demand for medical services by types of provider with a strong accentuation on the importance of time as a determining factor. In his paper, he draws attention to the fact that, health and medical services has attracted significant interest in recent years because of the high cost of health services in the sector. His paper suggested that, the time patients travel to the health service and waiting time may replace money prices as the paramount determinant of demand for insurance.

Blumenschein, K., Johannesson, M., Yokoyama, K., & Freeman, P. (2001). Hypothetical versus real willingness to pay in the health care sector: results from a field experiment. *Value in Health, 4*(2), 79-79.

In spite of an increased utilization of the contingent valuation (CV) in the health care sector (HCS), this method remains controversial. The central bone of contention is the magnitude to which hypothetical choices in the contingent valuation method mimic real economic choices. In their study, Blumenschein, Johannesson, Yokoyama, and Freeman conducted an experiment directly comparing responses to a dichotomous choice (DC) contingent value (CV) question with real purchase decisions using a pharmacist provided asthma management service as the item being valued. 172 respondents with asthma were recruited from 10 Kentucky community pharmacies. The study showed that, respondents who answered “definitely sure” hypothetical yes responses corresponded to real yes responses. In addition, the dichotomous choice and contingent value methods overestimates willingness to pay(WTP) in the health care sector, but it

may be possible to correct for this by sorting out “definitely sure” yes responses according to Blumenschein, Johannesson, Yokoyama and Freeman.

Diener, A., O'brien, B., & Gafni, A. (1998). Health care contingent valuation studies: a review and classification of the literature. *Health economics*, 7(4), 313-326.

In this paper, the authors adopted O'Brien and Gafni (1996) to classify and appraise health care with contingent valuation method (CVM) studies. In their methodology, they used 40 CVM studies of which 42 undertook money valuation in the context of cost benefit analysis (CBA) with the remainder being pricing/demand studies. Consumer utility which was measured (compensating (CV) versus equivalent variation (EV) was explicitly stated in only three (7%) studies among the 42 CBA studies. Using cross-tabulation, 49(91%) studies were designed as WTP/CV, two (4%) were WTP/EV, two (4%) were willing to accept, WTA/CV and no studies used Willingness to accept or equivalent variation (WTA/EV). They concluded by saying that there is a wide variation among health care CVM studies in terms of the types of questions being posed and also the classification and appraisal of the literature is arduous because reporting of methods and their relationship with the conceptual framework of CBA is poor.

Gafni, A. (1991). Willingness-to-pay as a measure of benefits: relevant questions in the context of public decision-making about health care programs. *Medical care*, 29(12), 1246-1252.

This paper explored the usefulness of willing to pay in a cost-benefit analysis which plays a vital role in most decision- making process in both public and private sector. For individuals, payments for improvement on the quality of life and lower risk of death depends on the willingness to pay a certain amount.

Schneider, P. (2004). Why should the poor insure? Theories of decision-making in the context of health insurance. *Health policy and planning*, 19(6), 349-355.

In recent years, concerns have risen regarding the issue of health insurance decision making. In order to pay for health insurance this author reviewed social and economic theories indicating how it affect decision-making.

Mayers, D., & Smith Jr, C. W. (1983). The interdependence of individual portfolio decisions and the demand for insurance. *Journal of Political Economy*, 91(2), 304-311.

The authors emphasized the connection between the demand for health insurance and other portfolio assets as a way of diversifying assets so as to reduce the risk involved.

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