# CHOOSING HEALTH INSURANCE: PUBLIC, PRIVATE OR NONE?

by

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THESIS ABSTRACT

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I estimate two models of consumer health insurance choices where individual attributes and e.g., income, age, gender, cost, etc. affect qualification for specific programs e.g., Medicaid and Medicare, but also affect the choices individuals make. From these results, I assess how these attributes affect health insurance choices using the 2008 Medical Expenditure Panel Survey. I then use these results to predict how individual health insurance choices change with the implementation of the Patient Protection and Affordable Care Act (ACA) in 2014. My predictions estimate that more 50 percent of those who become eligible for Medicaid under ACA will switch to Medicaid or choose to have both Private and Medicaid insurance.

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For my family.

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# CHAPTER I

# INTRODUCTION

U.S. health care expenditures increased dramatically during the past two decades, growing from $714 billion in 1990 to $2.5 trillion in 2009. Growth of health care expenditures exceeded the U.S. inflation rate in both 2008 and 2009, growing at a rate of 4.7 percent and 4.0 percent respectively (CMS, 2009; BLS, 2001). The cost of providing health insurance also continues to rise. Premiums for employer-sponsored health insurance plans increased 131 percent between 1999 and 2009 (KFF, 2010b). Due in part to the soaring costs of health insurance, approximately 49.5 million Americans, about one in six, were without any health insurance in 2010 (CDC, 2011).

Most Americans that do have health insurance are limited to just a few options. Private insurance is theoretically an option to everyone, but is too expensive for many individuals and families to purchase on their own. Most often consumers secure private health insurance through employers that offer it as a fringe benefit. Low-income consumers and those with certain medical conditions are eligible for Medicaid, a form of public insurance offered by each state. Medicare, a federal public insurance program, is available to almost all American citizens and legal residents age 65 and over as well as those with some particular medical conditions.

Previous research has focused on the impacts of these choices. Some estimate the impact of consumer health insurance choice by evaluating how it affects utility and efficiency (Abaluck, 2009; Dafny, 2010). Others have estimated consumer demand for certain health insurance options (Brau, 2008; Kerssens, 2005). In this study, I fill a gap in the literature by estimating what characteristics make

individuals more likely to make certain health insurance options.

In this study, I estimate two models of consumer health insurance choices where individual attributes e.g., income, age, gender, cost, etc. affect qualification for specific programs e.g., Medicaid and Medicare, but also affect the choices individuals make. From these results, I assess how these attributes affect health insurance choices using the 2008 Medical Expenditure Panel Survey. Using these results, I estimate how consumers will choose health insurance when the Patient Protection and Affordable Care Act is implemented in 2014, expanding Medicaid to all individuals at or below 133 percent of the Federal Poverty Level (FPL). I estimate that more than 60 percent of newly eligible consumers will enroll in Medicaid in 2014.

In order to understand current consumer choices it is important to understand the history, background and trends for each choice available. I present this information in the following section.

# CHAPTER II

# BACKGROUND

About 85.6 percent of Americans had some form of health insurance in 2007 through private insurance companies, Medicaid, Medicare or a mix of these programs. About 66.7 percent had health insurance through private companies, 14.3 percent through Medicare and 14.1 percent through Medicaid 2007 (with some individuals belonging to more than one category) (Gruber, 2009). The options available vary across individuals based on age, health status, income, and the cost of each option varies for each individual as well.[1] Each of the options included in the sample has a unique history, specific qualifying rules and offers various levels of coverage.

## Medicaid

President Linden B. Johnson signed Medicaid and Medicare into law on July 30, 1965. While Medicaid has undergone many modifications, the purpose of the program remains to provide health care to low-income Americans. Currently about 52 million Americans receive services paid for by Medicaid. The rules to qualify for Medicaid coverage vary by state.

Those served by Medicaid fall into three general categories: the categorically needy, the medically needy and special groups. The Federal government requires states to serve the categorically needy. The categorically needy include those who

[1]This study only includes individuals who chose Medicaid, Medicare, private insurance or no insurance. While other public insurance programs such as TriCare exist, those participating were dropped from the sample for identification purposes.

meet states Aid to Families with Dependent Children requirements, pregnant women and children under the age of six whose family income is at or below 133 percent of the Federal poverty level (FPL), children ages 6 to 19 with family income up to 100 percent of the FPL, Supplemental Security Income (SSI) recipients and individuals and couples living in medical institutions with monthly income up to 300 percent of the SSI income standard. In 2005, 34 states and the District of Columbia provided Medicaid programs for the medically needy. The medically needy include pregnant women through a 60-day postpartum period, children under age 18, certain newborns for one year and certain protected blind persons, plus many other optional programs that states may choose to participate in. Special programs provided by Medicaid include providing premiums for people age 65 and over with incomes up to 100 percent of the FPL, Medicare premiums for qualified disabled workers, temporary coverage for women who have breast or cervical cancer and temporary coverage for people with tuberculosis who are uninsured. Coverage of these special programs also varies by state (CMS, 2005).

## Medicare

Prior to the implementation of Medicare in 1965 about one-half of all seniors in the U.S. lacked health insurance. Medicare provides nearly universal coverage to Americans age 65 and over and also provided care to younger people with permanent disabilities. In 2010, this program served about 47 million people and constituted about 12 percent of the federal budget.

Medicare has undergone extensive revisions since its implementation. Today, it consists of 4 parts: A, B, C and D. Medicare Part A is commonly known as hospital insurance (HI). It covers inpatient hospital services, skilled nursing facility, home

health and hospice care. Expenditures on Part A account for about 36 percent of total Medicare expenditures. Medicare Part B helps to cover physician, outpatient, home health and preventive services. Expenditures on Part B account for about 24 percent of total Medicare expenditures. Medicare Part C is also called the Medicare Advantage Program. It allows Medicare beneficiaries to enroll in a private insurance plan. Medicare pays these private plans to provide benefits covered by Medicare including those services covered by Parts A and B. Medicare Part C accounted for about 24 percent of total Medicare expenditures in 2009. In 2003, the Medicare Modernization Act created Medicare Part D, or the outpatient prescription drug benefits plan and was implemented in 2006. Medicare beneficiaries who sign up for Part D sign up with a private insurer and generally pay a monthly premium. Medicare contracts with these private insurers to provide prescription drug benefits. Part D accounted for about 10 percent of total Medicare expenditures in 2009 (KFF, 2010a).

## Private Insurance

The most common source of health insurance in the U.S. is private insurance. Of those with health insurance, 78.8 percent had private health insurance in 2008. Of those with private insurance, the majority receive insurance through employer-based programs. Typically, employees and employers split the cost of the health insurance premium, with individual employees picking up about 16 percent of the bill and employees with families paying about 27 percent of the bill. Only about 13.3 percent of individuals with private insurance purchase it directly from the insurance company (Gruber, 2009).

Private insurance operates through employment for two primary reasons: risk

pooling and an employee tax subsidy. Private insurers who insure a large group of people in a risk pool, such as a business, will have a client base with a predictable distribution of medical risk. Pooling risk via large groups of people allows health insurance companies to collect enough money in premiums to cover the medical costs of the pool. The second benefit of providing insurance through employers is the tax subsidy. When employees opt into employer sponsored health plans, they do not have to pay taxes on the income used by the employer to purchase their health insurance. If the employer paid the employee the same amount of money used to purchase the employee's health insurance, then the employee would be taxed on that income, even if it was used to buy health insurance. Thus, the employee receives a tax break by purchasing health insurance through an employer (Gruber, 2009).

## No Insurance

Theoretically, all Americans have access to private health insurance, many low income families have access to Medicaid, and most people age 65 and over have access to Medicare. Yet, in practice, a significant group of Americans do not have health insurance. Thus, one final category must be added to the list: no insurance. Americans fall into this group for many reasons. Some choose not to purchase health insurance because the costs exceed the benefits. Others simply cannot afford coverage. In particular, those with pre-existing conditions often must pay exorbitant premiums to get any health insurance at all.

In 2008, the uninsured received about $56 billion worth of uncompensated care and paid about $30 billion out-of-pocket. The U.S. government paid for about 75 percent of the uncompensated care through various programs including Medicaid DSH and supplemental payment programs, Medicare DSH and IME payments (Hadley, 2008).

## Patient Protection and Affordable Care Act

The U. S. government enacted Patient Protection and Affordable Care Act (ACA) in order to eliminate this group labeled no insurance. By implementing new regulations on the health insurance industry, the U.S. government is attempting to insurance all Americans by 2014. Efforts to make health care affordable to all Americans involve making many changes to the current system. ACA extends private coverage by requiring most employers to offer health insurance plans. Employers with more than 50 employees that do not offer health insurance coverage and employers with more than 200 employees that do not automatically enroll employees in a health insurance plan will be taxed. Furthermore, all plans, both individual and group, must include dependent coverage for children up to age 26. ACA expands Medicaid coverage to include, at a minimum, all U.S. citizens and lawful immigrants with incomes up to 133 percent of the poverty line. In addition, it imposes a penalty of $695 an individual, $2,085 per family or 2.5 percent of income, whichever is greater, for those who do not have health insurance for more than a 3-month period (KFF, 2011). In essence, the U.S. government is providing every citizen and legal resident with an incentive to purchase health insurance and providing employers with an incentive to help their employees comply.

One of the most significant changes from ACA is the implementation of health

insurance exchanges. A health insurance exchange is an organized marketplace in which consumers can buy health insurance. The exchanges are meant to help foster competition, spread risk, protect consumers and help consumers make informed decisions about their health insurance (Urban Institute).

Given the dynamic nature of the current state of health care reform, it is important to consider the implications that the policy will have on consumers of health insurance. In this study, I estimate how changes in health insurance eligibility rules will effect the size and member characteristics of Medicaid, the option most affected by ACA.

# CHAPTER III

# LITERATURE REVIEW

There are many papers that examine effects of health insurance on outcomes. This section reviews those papers which focus on the effects of giving consumers choices in their health insurance and the effects of public health insurance expansion.

One line of literature examines the utility and effectiveness of giving consumers choice in terms of their specific health insurance plan. Consumers face a menu of options when choosing a health insurance plan which offer varying degrees of utility. Abaluck and Gruber (2009) compare health insurance choices among the elderly choosing their own plans within Medicare Part D. They find that most seniors who utilized the Medicare Part D option failed to choose the most efficient portfolio available, meaning that many seniors could have chosen plans that offered better risk protection at a lower price (Abaluck, 2009). Dafny, Ho, and Varela (2010) also examine the question of insurance plan choice. They find that gains in terms of welfare from giving employees choice instead of the employee getting the employer sponsored plan are equal to about 20 percent of premiums. Ultimately they find that employees would be willing to give up 27 percent of their employer subsidy in order to have the ability to choose their own plan (Dafney, 2010).

Various studies look at the crowd-out effect of public insurance on private insurance. Koch (2010a) finds that the crowd-out effect is greatest in a population of eligible children when a family's income is least. Koch (2010b) investigates the effects of public health insurance on adult members of the households with children enrolled in public health insurance plans. He finds that public health insurance crowds out the private health insurance of adults by up to 17 percent. Currie and

Gruber (2001) also examine the effect of expanding public health care by estimating the effect of Medicaid expansion on medical treatment received by women at childbirth. While treatment intensity increases for women who previously had no insurance, it decreases for women who previously had private insurance. These findings draw attention to the potential trade-offs of an expansion of public health insurance.

Other studies expand on the literature by examining the effect of health insurance choices on health care utilization for certain age groups that tend to face changing health insurance choice sets. Anderson, Dobkin and Gross (2010) examine the effect of young adults losing their health care coverage on health care utilization. The authors find that the uninsured in this population reduce their use of emergency departments and hospital visits. Card, Dobkin and Maestas (2008) compare health-related outcomes of patients just under and over 65 years old. They pay special attention to the effects of Medicare across different socioeconomic subgroups. They find discrete increases in use of medical services once consumers have Medicare insurance coverage.

Koch 2009 uses the MEPS data to explore whether or not non-group insurance market fills the insurance market gap for those who do not have access to employer-provided insurance. He finds that while non-group insurance does help fill the gap, it leaves many holes. These holes vary by age, gender, income and health status, but are present in all cases. Given the economic theory that consumers will demand insurance if the market is competitive, if they have full information and if the price is actuarially fair, this hole is puzzling.

This study expands on the literature by estimating what characteristics make individuals more likely to make certain health insurance choices. Using this information, I predict how choices change given changes mandated by ACA.

# CHAPTER IV

# THE MODEL

This study uses a logit model to examine the choice of options as developed in this section. The logit model includes seven mutually exclusive and exhaustive alternatives. The seven alternatives are Private Insurance, Medicaid, Medicare, Private Insurance and Medicaid, Private Insurance and Medicare, Medicaid and Medicare and no insurance. Each alternative provides the individual consumer with a different amount of utility.

The conceptual framework of the logit model relies on a random utility function with certain characteristics. Let $i$ be an individual consumer characteristics. For each consumer, let the set of the individual's health care alternatives be denoted by $J_i$. Then the consumer's utility function is:

$$U_{ij} = V_{ij} + \varepsilon_{in}$$

where $V_{ij}$ is the observed or known component of the utility function and $\varepsilon_{ij}$ is the unobserved or unknown part of the utility function.

Consumers use their utility functions to establish preferences among health insurance alternatives. Table 1 gives an example of a consumer's utility function in the proposed research. By ranking each utility function from highest to lowest, the consumer can determine which health insurance option is optimal given individual preferences. For example, a consumer may rank their utility functions as follows: $U_A > U_B > U_C > U_D > U_E > U_F > U_G$. In this example, the consumer's random

utility functions look like this:

$$\begin{aligned} Prob(y_i = j) &= Prob(U_j \geq U_k) \text{ for all } k \\ &= Prob(U_{ik} - U_{ij} \leq 0), \text{ for all } k \\ &= Prob(\varepsilon_{ik} - \varepsilon_{ij} \leq V_{ij} - V_{ik}), \text{ for all } k. \end{aligned}$$

A logit model predicts the consumer's choice over $J$ alternatives using the following formula:

$$p_{ij} = \frac{exp(x'_{ij}\beta + z'_i\gamma_j)}{\sum_{j=1}^{m} exp(x'_{il}\beta + z'_i\gamma_l)}, j = 1, ..., m,$$

where $J_i + 1$ is the number of choices available to $i$, $x_i$ are the characteristics of consumer $i$.

One alternative must be omitted from the calculation. This alternative is considered a "baseline case. All other cases are computed relative to this baseline case.

The coefficients of the choice model are not usually directly interpreted. This is because the signs on the coefficient do not indicate that an increase in the regressor leads to an increase in the probability of that choice. Calculating the marginal effects (ME) of each regressor reveals this information. For an individual $i$, the $kth$ regressor and alternative $j$, the ME of a change in the $kth$ regressor on the probability that $j$ is the alternative chosen is:

$$\text{ME}_{ijk} = \frac{\delta Prob(y_i = j)}{\delta x_{ik}}.$$

In this paper, the average marginal effects are presented. That is, the marginal effects are computed for each individual, then averaged. All regressors are held at means except for the $kth$ regressor.

# CHAPTER V

# DATA

The data used to estimate this model is from the Household Component of the 2008 Medical Expenditure Panel Survey (MEPS) collected by the Agency for Healthcare Research and Quality. This is available online at *http://meps.ahrq.gov/mepsweb/data_stats/download_data_files_detail.jsp?cboPufNumber=HC-121* (Last accessed January 2012).

MEPS is comprised of a set of large-scale surveys including surveys of families and individuals, their medical providers (healthcare providers, hospitals, pharmacies, etc.) and their employers. The MEPS sample includes families and individuals from selected communities across the U.S. The particular data used is a subsample of households that participated in a survey in the previous year called the National Health Interview Survey conducted by the National Center for Health Statistics. Through household interviews MEPS collects information about demographic characteristics, health status, health conditions, use of medical services, payment methods for medical care, satisfaction with care, health insurance coverage, income and employment. The survey takes place in rounds over a two-year period which makes it possible to examine the relationships between healthcare, health insurance, income, employment and other variables.

The dependent variable is a consumer's health insurance choice. Each individuals choice falls into one of seven categories: Private, Medicaid, Medicare, Private & Medicaid, Private & Medicare, Medicaid & Medicare or No Health Insurance. Membership in a category means that the participant had the specified type of health insurance for at least one month during 2008. Each category is

mutually exclusive.

Not all individuals have access to all types of health insurance. Medicaid is only available to the poor, as defined by each state. Medicare provides insurance to those age 65 and over and to the disabled who meet certain criteria. Private insurance is available to all people for a price with some exceptions typically due to pre-existing conditions. I limit the choice set based on the information available about the observations in the dataset.

For the purposes of this study, private health insurance refers to non-public health insurance, which, at a minimum, provides benefits for hospital and physician services (including Medigap coverage). All individuals have this option.

Medicaid refers to the public health program described in Section 2.1. Individuals who report receiving Medicaid coverage as well as those who paid nothing for their public hospital/physician insurance when such coverage was through a Medicaid HMO are considered to have Medicaid in the MEPS data. The data do no not include state-level identifiers. Due to this limitation, Medicaid eligibility is estimated by using the mean thresholds from all 50 states. In addition, consumers who chose Medicaid, regardless of their perceived eligibility status, were included in this category. In addition, individuals who received welfare, Temporary Assistance for needy Families, Social Security Incomes are also considered eligible for Medicaid due to Federal guidelines. Table 1 summarizes the values used.

**Table 1. Medicaid Eligibility Threshold Levels**

| Eligibility Group | Eligibility Threshold (% FPL) |
|---|---|
| Pregnant Women | 188 |
| Parents | 89 |
| Childless Adults | 18 |
| Disabled, Aged, Blind | 85 |

Medicare refers to the public health program described in Section 2.2. For the purposes of this study, all those age 65 or over are considered eligible for Medicare.

All individuals are considered eligible for No Health Insurance category.

## Demographics of the Sample

Table 2 shows the total amount of consumers eligible for each type of health insurance and the total amount who chose each option. Of the 20,958 consumers included in the sample, more than half chose Private Insurance. All public and combination public/private programs comprise less than 10 percent of the population. Of those, Medicaid comprises the largest portion with 9.23 percent of the sample. About 22 percent of the sample has No Insurance.

**Table 2. Sample Characteristics**

| | Choice | Eligible for Option | Percent 1 | Percent 2 |
|---|---|---|---|---|
| 1 Private Insurance | 11,114 | 20,958 | 53.03% | 53.03% |
| 2 Medicaid | 1,934 | 3,925 | 49.27% | 9.23% |
| 3 Medicare | 1,282 | 3,101 | 41.34% | 6.12% |
| 4 Private & Medicaid | 250 | 3,925 | 6.37% | 1.19% |
| 5 Private & Medicare | 1,313 | 3,101 | 42.34% | 6.26% |
| 6 Medicaid & Medicare | 459 | 757 | 60.63% | 2.19% |
| 7 No Health Insurance | 4,606 | 20,958 | 21.98% | 21.98% |
| Totals | 20,958 | 56,725 | | |

Percent 1: Percent of eligible for option choosing option.
Percent 2: Percent of total sample choosing option.

Each individual faces one of four choice sets based on the eligibility rules of the program. Everyone is eligible for Private Insurance and No Insurance. Others are eligible for Medicaid too. Those 65 and older are eligible for Medicare in addition to Private Insurance and No Insurance. Finally, some consumers are eligible for all types of insurance modeled here.

1. Private Insurance, No Insurance

2. Private Insurance, Medicaid, Private & Medicaid, No Insurance

3. Private Insurance, Medicare, Private & Medicare, No Insurance

4. Private Insurance, Medicaid, Medicare, Private & Medicaid, Private & Medicare, Medicaid & Medicare, No Insurance

Table 3 presents the summary statistics of each independent variable according to insurance type. These variables make up the individual characteristics used to estimate health insurance choices.

**Table 3. Summary Statistics**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Total |
|---|---|---|---|---|---|---|---|---|
| Income | 77.49 | 25.39 | 37.53 | 39.3 | 57.8 | 24.98 | 39.86 | 59.13 |
| | (51.03) | (25.35) | (34.01) | (32.53) | (47.39) | (31.26) | (37.67) | (49.21) |
| Age | 41.57 | 34.99 | 74.84 | 33.39 | 73.63 | 74.54 | 37.55 | 44.75 |
| | (12.56) | (12.67) | (6.42) | (11.74) | (6.64) | (6.42) | (12.71) | (17.2) |
| Education | 13.61 | 11.18 | 11.57 | 12.28 | 12.93 | 8.85 | 11.15 | 12.56 |
| | (2.6) | (2.7) | (3.35) | (2.35) | (2.96) | (4.29) | (3.29) | (3.15) |
| Gender | 0.52 | 0.72 | 0.6 | 0.73 | 0.53 | 0.67 | 0.48 | 0.54 |
| Married | 0.65 | 0.35 | 0.52 | 0.44 | 0.64 | 0.33 | 0.48 | 0.57 |
| Hispanic | 0.19 | 0.37 | 0.13 | 0.25 | 0.07 | 0.29 | 0.48 | 0.26 |
| Asian | 0.09 | 0.05 | 0.05 | 0.04 | 0.04 | 0.14 | 0.04 | 0.07 |
| Black | 0.17 | 0.33 | 0.19 | 0.31 | 0.12 | 0.32 | 0.19 | 0.19 |
| White | 0.74 | 0.62 | 0.75 | 0.66 | 0.83 | 0.54 | 0.75 | 0.73 |

*Standard deviations in parenthesis.
**Standard deviations are not included for discrete indicators because they are function of the mean.

Income refers to a consumer's total family income scaled by 1,000. Family income is used instead of individual income because insurance is often purchased by family unit. Consumers with a family income greater than $300,000 are dropped. Income is highest for those with Private Insurance followed by those with Private & Medicare. Those on Medicaid have the lowest incomes.

The sample is limited to consumers age 19 and over and top coded so that the highest age is 85 years old. The highest average ages appear in those categories that include Medicare where the mean age is about 74. Only those age 65 and over are eligible for Medicare. Those choosing Medicaid, Private & Medicaid and No Insurance have the lowest average ages.

Education represents the number of years of education an individual reported completing. Those with Private Insurance have the most years of education with an average of 13.6. Those options with no private insurance component include individuals that average less than 12 years of school.

The sample includes more women than men. Only No Insurance contains a higher proportion of men than women. Women make up more than 70 percent of the consumers who choose Medicaid and Private & Medicaid. This is likely due to increased access to pregnant women.

Those who are married are more likely to choose Private Insurance and Private & Medicare. Those who are unmarried are more likely to choose Medicaid, Private & Medicaid and Medicaid & Medicare. For those choosing Medicare or No Insurance, about as many are married as are not.

The other independent variables control for race (Asian, Black, White or Other) and ethnicity (Hispanic). For the purposes of this study, consumers race and ethnicity are considered separately. Thus, in addition to being Hispanic (or not) a person is also included in the Asian, Black or White category. The sample is comprised of people of whom 73 percent are white, 19 percent are black and 7 percent are Asian. About a quarter of the sample is Hispanic.

## Cost

Each type of health insurance comes with a different price. In order to incorporate this choice specific component, I estimate the cost using the following model:

$$C_i = \text{Income}_i\beta + \text{Age}_i\beta + \text{Gender}_i\beta + \text{Married}_i\beta + \text{Hispanic}_i\beta + \text{Asian}_i\beta + \text{Black}_i\beta + \text{White}_i\beta + \varepsilon_i$$

Cost is estimated using two different dependent variables including total charges (the total amount charged to the consumer) and a ratio of out-of-pocket (the cost paid by the consumer) to income. Figures 1 shows total charges for individuals with each of the four choice sets. Figure 2 shows the total out-of-pocket costs for individuals with each of the four choice sets.

**Figure 1. Total Charges**

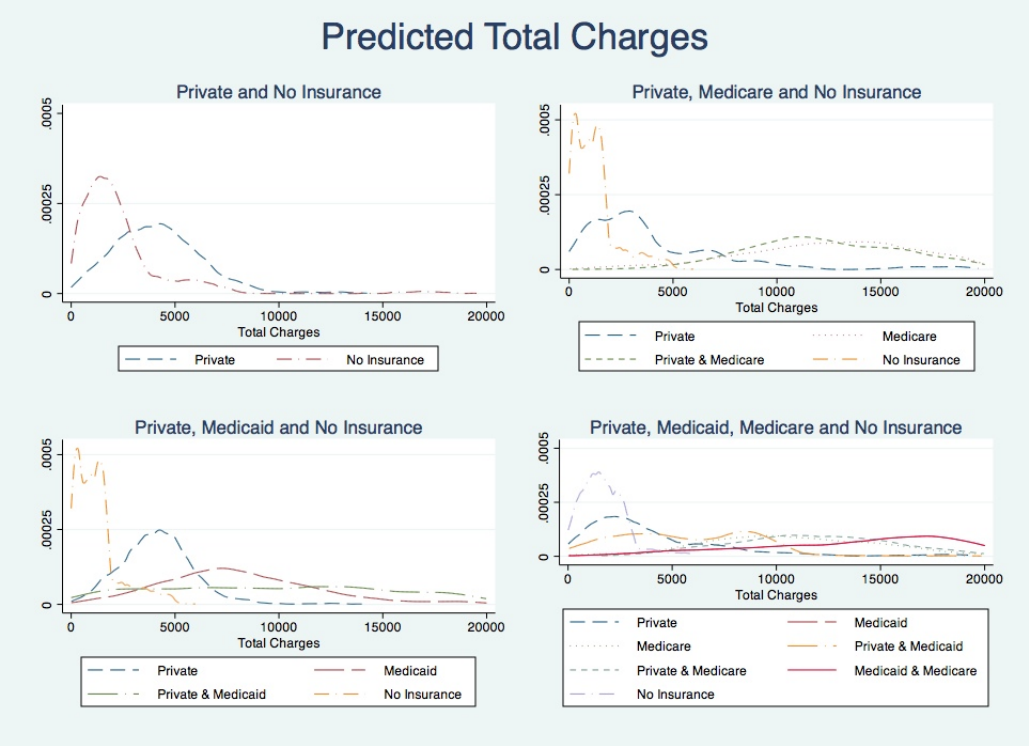



Figure 1 summarizes the predicted costs for individuals by their choice set. Each individual is included in all options shown on a specific graph. The top left graph shows individuals who choose between Private Insurance and No Insurance. Their total charges tend to be less on average when they choose No Insurance. The top right graphs shows individuals who also have the choice of Medicare. For this population, those with No Insurance have the lowest total charges, followed by those with Private Insurance. Those with Medicare and Private & Medicare have similar levels of total charges, although the density of those with Medicare only shows slightly higher total charges. The bottom left graph shows total charges for those who choose from Private Insurance, Medicaid, Medicaid & Private Insurance and No Insurance. Again total charges are relatively low for those who choose No

Insurance and Private Insurance. The density is much flatter if these individuals choose Medicaid or Private & Medicaid meaning that total charges are greater on average when these options are chosen. Finally, for those with all options, those with No Insurance and Private Insurance have relatively low total charges. Those who choose public options, especially Medicaid & Medicare, have greater total costs.

**Figure 2. Predicted Out-of-Pocket Cost**

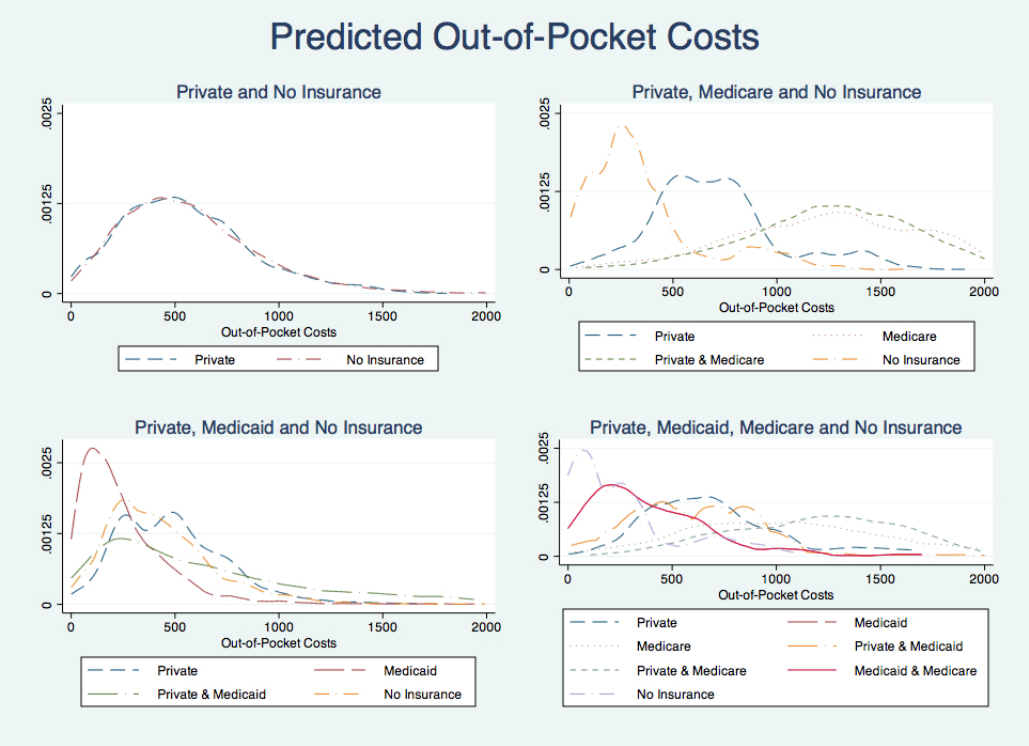



Figure 2 shows out-of-pocket costs for individuals with each of the four choice sets. Those with out-of-pocket costs greater than $2,000 are dropped from the sample for the purposes of graphing. For those with just Private Insurance and No Insurance, the predicted out-of-pocket cost is almost identical. This is shown in the top left graph. The top right graph shows the predicted out-of-pocket for those who can also choose Medicare. Out-of-pocket costs are lowest with private insurance for

this group. Those with No Insurance and Private & Medicare pay a similar average amount. Those with only Medicare pay the most out-of-pocket. The bottom left graph shows those with Private Insurance, Medicaid, Private & Medicaid and No Insurance as options. Out-of-pocket costs are nearly zero for those with Medicaid. Those with Private Insurance and Private & Medicaid pay more on average than those who are just on Medicaid, but less than those with No Insurance. Finally, of those with all options, those with Medicaid pay the least. The density for the rest of the programs is spread out rather evenly over the range of $0 to $2,000.

# CHAPTER VI

# RESULTS

I present two models in what follows, each of which estimates the probability that an individual chooses a certain type of health insurance. The regressors include the individual specific characteristics described in Section 5, as well as an alternative specific variable measuring some aspect of the cost of health insurance. The cost variables used are total charges and a ratio of out-of-pocket cost to family income. Finally, I present the predicted probabilities that an individual will choose each of their available options in 2008. I compare these results with the predicted choices of consumers in 2014, which assume that Medicaid will be expanded to cover individuals up to 133 FPL due to the implementation of the ACA.

## Total Charges

Table 4 gives the results for the model estimated with individual characteristics and estimated total charges for each type of insurance. The estimates suggest that health insurance choices are more dependent on individual characteristics than their total charges for health care.

Income is significant for all options, yet the average marginal effect is very small. A $1,000 increase in income makes an individual more likely to choose all options except for Medicare and no health insurance. However, at a maximum, it increases the probability that an individual will choose another option by 0.6 percent. A $1,000 decrease in income makes those eligible 0.3 percent more likely to choose Medicare. This is likely due to the retirement and subsequent drop in income of

many Medicare eligible individuals. Similarly, a $1,000 decrease in income increases the probability that the individual will choose to forgo health insurance by 0.3 percent. Income has a small, significant overall effect on the individuals choice.

Age has a significant effect on consumers choosing any option. As age increases, individuals are more likely to switch from having Private & Medicaid, Medicaid & Medicare and No Insurance to another option. The probability of choosing Private Insurance increases by about 0.2 percent with each additional year and the probability of choosing Medicare increases by 0.4 percent. While the average marginal effect of age on choosing Medicaid is nearly zero, the probability of choosing this option relative to choosing Private Insurance decreases with age. An increase in age leaves consumers less likely to choose Medicaid & Medicare and No Insurance.

Gender is only significant in the probability of options pertaining to Medicaid and No Health Insurance. Women are about 7.0 percent more likely to choose Medicaid and 0.8 percent more likely to choose Private & Medicaid. Part of this is likely due to the eligibility of pregnant women under much higher FPL standards. Males are 2.5 percent more likely to choose No Insurance. Gender is not a factor for consumers choosing options with Medicare.

Married individuals are 9.7 percent less likely to choose Medicaid, 21.9 percent less likely to choose Medicaid & Medicare and 3.8 percent less likely to choose No Insurance. It increases the chances that you will choose Private & Medicaid by 1.6 percent and Private Insurance by 5.3 percent.

An increase in the number of years of education increases the probability that an individual chooses Private Insurance. In particular, a one year increase in education increases the chances of choosing Private by 2.3 percent. A one year decrease in the years of education, increases the probability that an individual chooses Medicaid by

1.3 percent, Medicaid & Medicare by 1.8 percent and No Insurance by 2.2 percent.

**Table 4. Logit: Individual Characteristics and Total Charges**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Income | | 0.033*** | −0.016*** | 0.046*** | −0.006* | 0.022*** | −0.018*** |
| | | (0.003) | (0.003) | (0.003) | (0.003) | (0.005) | (0.001) |
| | [0.002] | [0.006] | [−0.003] | [0.001] | [0.001] | [0.006] | [−0.003] |
| Age | | −0.010*** | 0.212*** | −0.025*** | 0.200*** | 0.176*** | −0.016*** |
| | | (0.004) | (0.039) | (0.006) | (0.040) | (0.041) | (0.002) |
| | [0.002] | [0.000] | [0.004] | [−0.001] | [0.000] | [−0.004] | [−0.002] |
| Gender | | 0.426*** | 0.149 | 0.436*** | 0.035 | 0.066 | −0.140*** |
| | | (0.090) | (0.319) | (0.168) | (0.319) | (0.355) | (0.041) |
| | [0.010] | [0.070] | [0.023] | [0.008] | [−0.020] | [−0.009] | [−0.025] |
| Married | | −0.785*** | 0.202 | −0.327** | 0.408 | −0.945** | −0.397*** |
| | | (0.093) | (0.335) | (0.160) | (0.336) | (0.370) | (0.044) |
| | [0.053] | [−0.097] | [−0.003] | [0.016] | [0.061] | [−0.219] | [−0.038] |
| Education | | −0.155*** | −0.018 | −0.006 | 0.062 | −0.095** | −0.192*** |
| | | (0.016) | (0.045) | (0.033) | (0.046) | (0.049) | (0.008) |
| | [0.023] | [−0.013] | [−0.012] | [0.007] | [0.017] | [−0.018] | [−0.022] |
| Hispanic | | 0.279*** | −0.232 | −0.427** | −0.780* | 0.703 | 0.887*** |
| | | (0.106) | (0.446) | (0.190) | (0.450) | (0.489) | (0.049) |
| | [−0.099] | [−0.003] | [0.068] | [−0.041] | [−0.126] | [0.204] | [0.109] |
| Black | | 0.355 | −0.021 | 0.388 | −0.051 | 1.005 | −0.025 |
| | | (0.259) | (1.056) | (0.434) | (1.067) | (1.313) | (0.142) |
| | [−0.002] | [0.050] | [−0.023] | [0.007] | [−0.022] | [0.190] | [−0.009] |
| White | | 0.051 | 0.261 | 0.422 | 0.637 | 0.527 | −0.333** |
| | | (0.252) | (1.031) | (0.427) | (1.040) | (1.291) | (0.138) |
| | [0.035] | [0.018] | [−0.072] | [0.023] | [0.073] | [0.027] | [−0.044] |
| Asian | | 0.163 | 0.492 | −0.466 | 0.549 | 2.013 | −0.244 |
| | | (0.321) | (1.257) | (0.561) | (1.265) | (1.486) | (0.158) |
| | [0.025] | [0.065] | [−0.049] | [−0.031] | [−0.009] | [0.282] | [−0.033] |
| Constant | | 2.819*** | −10.605*** | −1.046 | −11.444*** | −7.025** | 3.407*** |
| | | (0.356) | (2.991) | (0.645) | (2.995) | (3.197) | (0.188) |
| Total Charges | −0.000 | | | | | | |
| | (0.000) | | | | | | |
| Log likelihood | | | | | | | −12196.372 |

Note: Total Observations: 56,725; Unique id numbers: 20,958
Standard errors in parentheses. Average marginal effects in square brackets.
*** p<0.01, ** p<0.05, * p<0.1

Race and ethnicity significantly affect the probability of choosing various types

of health insurance. Hispanics are 9.9 percent less likely to choose Private Insurance than non-Hispanics. Hipsanics are also less likely to choose Medicaid, decreasing the probability by an average of 0.3 percent, and Private & Medicaid, decreasing the probability by 4.1 percent. Hispanics are 20.4 percent more likely to choose Medicaid & Medicare and 10.9 percent more likely to choose No Insurance. Being White decreases the probability of choosing no insurance by 4.4 percent. No other findings about race and ethnicity are statistically significant.

Finally, the alternative specific variable total charges does not affect consumers health insurance choices. Table 5 presents the average marginal affect of total charges on consumers' health insurance choices. The coefficients are scaled by $100,000. While most results are zero or near zero even at this scaled level, some changes in choices can be detected. In particular, all own effects are negative.

**Table 5. Average Marginal Effect: Total Charges**

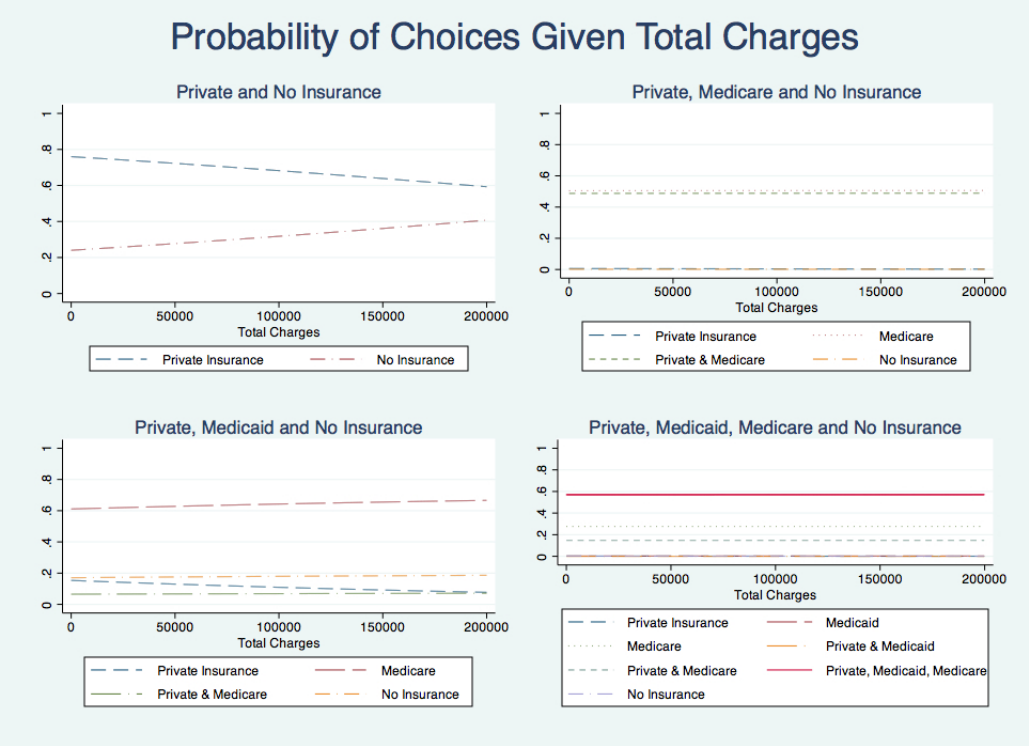
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | −0.048 | 0.004 | 0.000 | 0.001 | 0.000 | 0.000 | 0.043 |
| 2 | 0.024 | −0.070 | 0.000 | 0.015 | 0.000 | 0.000 | 0.030 |
| 3 | 0.001 | 0.000 | −0.082 | 0.000 | 0.069 | 0.011 | 0.001 |
| 4 | 0.003 | 0.015 | 0.000 | −0.021 | 0.000 | 0.000 | 0.003 |
| 5 | 0.002 | 0.000 | 0.069 | 0.000 | −0.077 | 0.006 | 0.000 |
| 6 | 0.001 | 0.002 | 0.044 | 0.000 | 0.025 | −0.072 | 0.001 |
| 7 | 0.043 | 0.006 | 0.000 | 0.001 | 0.000 | 0.000 | −0.049 |

As total charges go up, the likelihood that consumers will choose another option increases. The probability that consumers who chose Private Insurance will keep Private Insurance decreases by 4.8 percent, while the probability that consumers will choose any other option increases. The probability that consumers who chose Medicaid will choose a different option is 7.0 percent, while the probability that they will choose non-Medicare options increases. An increase of $100,000 increases the probability that a consumer leaves Medicare by 8.2 percent. The probability

that these consumers choose Private & Medicare or Medicaid & Medicare increases at the same level. Of those who chose Private & Medicaid, the probability that they will keep this option decreases by 2.1 percent. The probability that they will choose Private, Medicaid or No Insurance increases. The probability of those who chose Private & Medicare will keep this option decreases by 7.7 percent. The probability that they will choose Medicare or Medicaid & Medicare increases by 6.9 percent and 2.5 percent respectively. Finally, the probability that those with No Insurance will continue to choose this option decreases by 4.9 percent. The probability that they will choose most other options increases, with the largest increase being a 4.3 percent increase in Private Insurance.

Figure 3 shows the probability of given choice given changes in total charges. These graphs assume a median or mean value for all other variables by choice set. The relatively flat lines on the graphs show the small effect that total charges has on the consumers' insurance decisions.

**Figure 3. Predicted Total Cost**




## Out-of-Pocket Costs to Income

In Table 6, a second model is presented. This conditional logit model is estimated using individual characteristics and an alternative specific ratio of out-of-pocket cost to family income. The ratio of out-of-pocket costs to income is highly significant. Thus, in this model, both the individual characteristics and the alternative specific characteristics affect consumers' insurance choices.

Income is significant across all options. An increase of $1,000 in income decreases the likelihood of choosing Medicare and No Insurance by 0.3 percent. It increases the likelihood of choosing other options. An increase in income makes it more likely that an individual will choose one of the other options, but by small amount.

Age is also highly significant for all options. The younger the consumer's age, the more likely it is that he or she will choose Private & Medicaid, Medicaid & Medicare or No Health Insurance. An increase in age makes an individual 0.4 percent more likely to choose Medicare and 0.2 percent more likely to choose Private Insurance. The average marginal effect of age on choosing Private & Medicare is zero, but relative to Private Insurance are positive. This means that as age increases, consumers are more likely to choose Private& Medicare, relative to Private Insurance.

Gender effects the probability that individual will choose Medicaid, Medicaid & Private and No Insurance. Females are 6.9 percent more likely to choose Medicaid and 0.7 percent more likely to choose Private & Medicaid. Males are 2.3 percent more likely to choose No Insurance. For all other choices, gender does not significantly affect the probability that an individual will choose that particular option.

Marriage significantly affects the probability of most consumer health insurance choices. Those that are married are 9.4 percent less likely to choose Medicaid, 22.8 percent less likely to choose Medicaid & Medicare and 3.9 percent less likely to choose No Insurance. Marriage increases the probability that the consumer will choose Private Insurance by 5.3 percent and Private & Medicaid by 1.6 percent.

Education significantly affects the probability of choosing Medicaid, Medicaid & Medicare and No Insurance. A one year decrease in education increases the probability that the individual will choose Medicaid by 1.6 percent, Medicaid & Medicare by 1.8 percent and No Insurance by 2.2 percent. Education was not significant for other choices.

Race and ethnicity affects the probability that consumers will make certain health insurance choices. Hispanics are 4.1 percent less likely to choose Private &

Medicaid and 11.9 percent less likely to Private & Medicare. Hispanics are 10.8 percent more likely to choose No Insurance. Whites are 4.6 percent less likely to choose No Insurance. No other race variables are significant.

**Table 6. Logit : Individual Characteristics and Out-of-Pocket/Income**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Income | | 0.034*** | −0.017*** | 0.047*** | −0.006** | 0.023*** | −0.018*** |
| | | (0.003) | (0.003) | (0.003) | (0.003) | (0.005) | (0.001) |
| | [0.001] | [0.006] | [−0.003] | [0.001] | [0.001] | [0.006] | [−0.003] |
| Age | | −0.011*** | 0.207*** | −0.026*** | 0.196*** | 0.166*** | −0.016*** |
| | | (0.003) | (0.039) | (0.006) | (0.039) | (0.040) | (0.002) |
| | [0.002] | [0.000] | [0.004] | [−0.001] | [0.000] | [−0.005] | [−0.002] |
| Gender | | 0.421*** | 0.200 | 0.423** | 0.073 | 0.087 | −0.127*** |
| | | (0.090) | (0.320) | (0.167) | (0.319) | (0.353) | (0.041) |
| | [0.008] | [0.069] | [0.027] | [0.007] | [−0.022] | [−0.013] | [−0.023] |
| Married | | −0.768*** | 0.237 | −0.312* | 0.398 | −0.987*** | −0.398*** |
| | | (0.093) | (0.338) | (0.160) | (0.337) | (0.368) | (0.044) |
| | [0.053] | [−0.094] | [0.007] | [0.016] | [0.054] | [−0.228] | [−0.039] |
| Education | | −0.155*** | −0.029 | −0.007 | 0.052 | −0.106** | −0.192*** |
| | | (0.016) | (0.046) | (0.033) | (0.046) | (0.048) | (0.008) |
| | [0.023] | [−0.012] | [−0.012] | [0.007] | [0.017] | [−0.018] | [−0.022] |
| Hispanic | | 0.291*** | −0.276 | −0.425** | −0.789* | 0.563 | 0.879*** |
| | | (0.106) | (0.446) | (0.190) | (0.450) | (0.488) | (0.049) |
| | [−0.099] | [0.000] | [0.065] | [−0.041] | [−0.119] | [0.182] | [0.108] |
| Black | | 0.364 | 0.030 | 0.396 | 0.108 | 1.047 | −0.050 |
| | | (0.259) | (1.063) | (0.436) | (1.069) | (1.307) | (0.143) |
| | [0.001] | [0.053] | [−0.041] | [0.007] | [0.000] | [0.180] | [−0.012] |
| White | | 0.053 | 0.311 | 0.395 | 0.752 | 0.644 | −0.355** |
| | | (0.252) | (1.037) | (0.429) | (1.042) | (1.286) | (0.139) |
| | [0.037] | [0.021] | [−0.085] | [0.022] | [0.085] | [0.036] | [−0.046] |
| Asian | | 0.194 | 0.618 | −0.490 | 0.774 | 2.161 | −0.258 |
| | | (0.320) | (1.266) | (0.564) | (1.269) | (1.481) | (0.158) |
| | [0.026] | [0.072] | [−0.065] | [−0.033] | [0.011] | [0.279] | [−0.035] |
| Constant | | 2.790*** | −10.116*** | −1.049 | −11.132*** | −6.212** | 3.409*** |
| | | (0.356) | (2.976) | (0.648) | (2.980) | (3.167) | (0.188) |
| Out-of-Pocket /Income | −0.420** (0.184) | | | | | | |
| Log likelihood | | | | | | | −12194.8 |

Note: Total Observations: 56,725; Unique id numbers: 20,958
Standard errors in parentheses. Average marginal effects in square brackets.
*** p<0.01, ** p<0.05, * p<0.1

When health insurance choices are estimated using individual characteristics and an estimated alternative-specific ratio of out-of-pocket cost to income, the results suggest that the ratio and income have very significant, but very small effects on the individual's choice. As in the previous model, all own effects are negative. This means that if income increases while out-of-pocket expenses decreases, the consumer is likely to choose a different option. Conversely, if income decreases while out-of-pocket costs increase, the consumer is also likely to change. The average marginal effect varies widely between options. These effects are reported in Table 7. These results should be interpreted as the effect on the probability of a choice if out-of-pocket costs increase by one.

**Table 7. Average Marginal Costs: Out-of-Pocket Costs to Income**

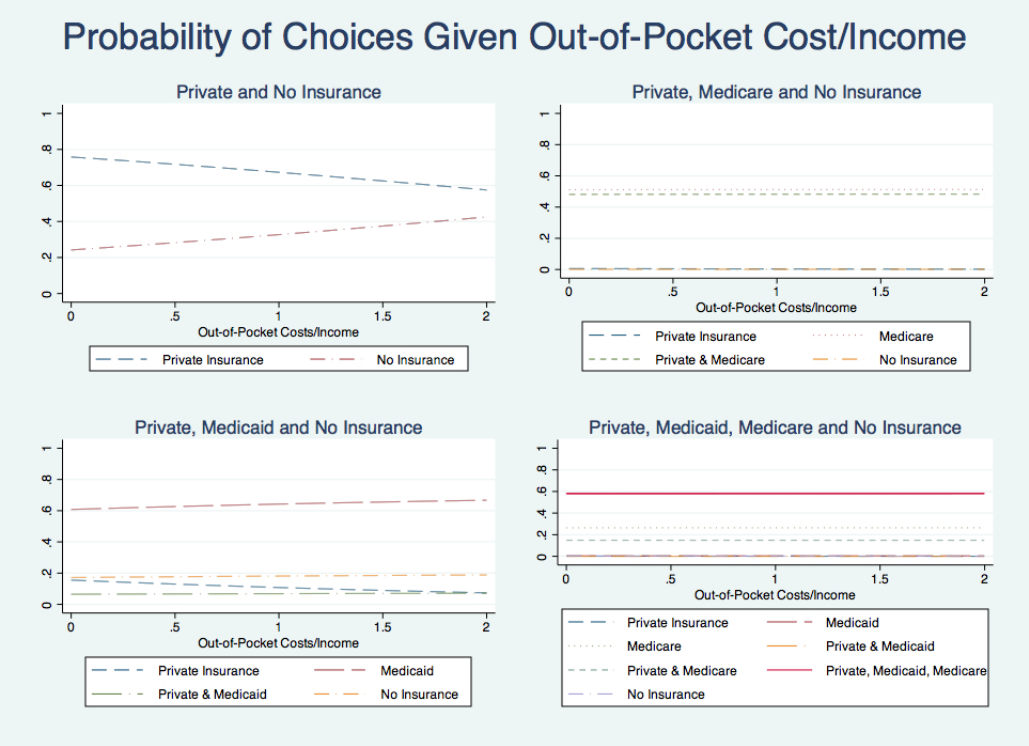
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | −0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 |
| 2 | 0.003 | −0.008 | 0.000 | 0.002 | 0.000 | 0.000 | 0.003 |
| 3 | 0.000 | 0.000 | −0.009 | 0.000 | 0.007 | 0.001 | 0.000 |
| 4 | 0.000 | 0.002 | 0.000 | −0.002 | 0.000 | 0.000 | 0.000 |
| 5 | 0.000 | 0.000 | 0.007 | 0.000 | −0.008 | 0.001 | 0.000 |
| 6 | 0.00 | 0.000 | 0.005 | 0.000 | 0.003 | −0.008 | 0.000 |
| 7 | 0.005 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | −0.005 |

The probability of switching from Private Insurance to another option is 0.5 percent for those who chose Private Insurance initially. If this ratio increases, the probability that these consumers would choose Medicaid and No Insurance increases. For those who initially chose Medicaid, the probability of choosing a different option is 0.8 percent. Those consumers would likely choose Private & Medicaid or No Insurance. For those choosing Medicare initially, the likelihood of switching to another option is 0.9 percent. Medicare consumers would likely switch to Private & Medicare or Medicaid & Medicare. Of those initially choosing Private & Medicaid, the probability that they choose a different option with an increase in the ratio is

.02 percent. These consumers would likely choose Medicaid if they switched. The probability that consumers who chose Private & Medicare would choose the same option decreases by 0.8 percent. These consumers would likely switch to Medicare or Medicaid & Medicare. The probability that consumers who chose Medicaid & Medicare will switch to another option with an increase in the ratio is 0.8 percent. The probability that these consumers will choose Medicare or Private & Medicare increases. Finally, the probability that consumers choose No insurance decreases by 0.5 percent. The probability that these consumers choose Private Insurance increases by 0.5 percent. Overall, the effects of out-of-pocket costs to income are highly significant, but small unless out of pocket costs increase significantly.

Figure 4 shows the probability of choosing each option for a range of the ratio out-of-pocket costs to income by choice set. Independent variables other than the ratio are fixed at their mean or median. The relatively flat lines convey that unless there is a large increase in the out-of-pocket costs, this variable has a small effect on consumer insurance choices.

**Figure 4. Predicted Out-of-Pocket Cost**




## ACA Comparison

In 2014, the implementation of ACA will expand the Medicaid program so that all individuals under 65 years old and with an income less than 133 percent of the FPL will be eligible. In addition, individuals with an income greater than $9,350 and a married couple with an income greater than $18,700 will be taxed. The minimum tax will be $695 and the maximum will be $2,085.

In the chart below I present five models representing only those who were not eligible for Medicaid in 2008, but that will be eligible in 2014 due to the implementation of ACA. The model "2008" gives the average probability of individuals' choice in 2008. The model "No Tax" gives the average probability if

Medicaid were expanded, but no tax were implemented. The model "1% Flat Tax" gives the average probability if the minimum income requirements are implemented along with a 1 percent tax on anyone who does not have insurance. The model "2.5 % - ACA Rules" gives the average probability if the ACA rules are implemented as described above. Finally, the model "5 % Flat Tax" gives the average probability if the minimum income requirements are implemented along with a 5 percent tax on anyone who does not have insurance. The models are presented using the estimates created from the logit model estimated with total charges and with the ratio of out-of-pocket costs to income. The results are shown in Table 8 and Table 9.

**Table 8. ACA Total Charges Model**

| | 2008 | No Tax | 1% Flat Tax | 2.5%-ACA Rules | 5% Flat Tax |
|---|---|---|---|---|---|
| Private | 0.4577 | 0.1660 | 0.1662 | 0.1668 | 0.1672 |
| Medicaid | . | 0.5692 | 0.5685 | 0.5668 | 0.5657 |
| Private & Medicaid | . | 0.0637 | 0.0635 | 0.0632 | 0.0630 |
| No Insurance | 0.5423 | 0.2012 | 0.2018 | 0.2033 | 0.2042 |

**Table 9. ACA: Out-of-Pocket Cost to Income Model**

| | 2008 | No Tax | 1% Flat Tax | 2.5%-ACA Rules | 5% Flat Tax |
|---|---|---|---|---|---|
| Private | 0.4573 | 0.1667 | 0.1662 | 0.1673 | 0.1678 |
| Medicaid | . | 0.5678 | 0.5685 | 0.5654 | 0.5642 |
| Private & Medicaid | . | 0.0631 | 0.0635 | 0.0626 | 0.0624 |
| No Insurance | 0.5427 | 0.2024 | 0.2018 | 0.2046 | 0.2056 |

The results from each logit model are almost identical. In addition, the results for each model after ACA is implemented are also almost identical. In 2008, the probability of choosing Private Insurance is about 0.46, while the probability of choosing No Health Insurance is about 0.54. After the expansion, the probability that individuals in this group will choose Medicaid is 0.57 and the probability that they will choose Private & Medicaid is 0.063 regardless of the model used. This leads to a decrease in the probability that these individuals will choose Private

Insurance of 0.29 and No Health Insurance of 0.34.

The implications of implementing ACA are threefold. First, the increase in the availability of Medicaid will likely crowd out Private Insurance to some extent. However, even when individuals have the option of choosing Medicaid, a free health insurance option, about 36 percent of those who had private insurance will likely keep their private insurance. The estimates suggest that a little more than half of the newly eligible switch to Medicaid and about 6.3 percent switch to Private & Medicaid.

The second implications is that while ACA will cause major changes to occur in the health insurance industry, it will not completely change in the system in terms of enrollees. This expansion affects a relatively small portion of the population. For this study, 1,947 of 20,958 individuals (9.3 percent) become eligible for Medicaid under the expansion who were not eligible before. The crowd-out rate of Private Insurance will likely not change for other segments of the population.

In this model, the taxing scheme did not significantly effect the consumers choices. However, this model does not incorporate the effect of the price of Private Insurance premiums on the choice of consumers choosing no insurance and being taxed. Once the tax exceeds the cost of buying insurance, it seems likely that individuals will choose to buy it. this is an area that need further study.

## Limitations

This study faced significant limitations. First, I was unable to identify the exact population that was eligible for Medicaid in 2008 due to data access restrictions. Identifying this information would make this study more precise. Second, this study does not incorporate the cost of health insurance premiums. This may significantly

affect insurance choices, especially after ACA is implemented. Finally, this study does not incorporate all of the changes in benefits that have occurred since 2008 or that will occur by 2014. In particular, a decrease in benefits is planned for the Medicare population. This may increase the choice of Private & Medicare. Other changes have occurred as well and will likely influence choices in the future.

# CHAPTER VII

# CONCLUSION

In an effort to extend health insurance coverage to all Americans, President Barack Obama signed into law the ACA in March 2010. ACA requires most U.S. citizens and legal residents to have health insurance by 2014 or face tax penalties (KFF 2011). With the deadline for Americans to acquire health insurance approaching, it is important to identify who is currently uninsured, so that steps can be taken to make the insurance system more accessible to them. By identifying additional characteristics of these populations will aid policymakers in their quest to design health insurance options that realistically meet the needs of the currently uninsured.

This study found that out-of-pocket costs relative to family income of each insurance option have a significant effect on the consumer's insurance choice. In addition, individual characteristics play a key role. Hispanics, men and unmarried individuals are less likely to have health insurance than other populations. Whites and women are more likely to be insured. Policymakers can use these types of trends to target enrollment and help get everyone insured by 2014.

Of those affected by the expansion of Medicaid, this study predicts more than 60 percent will change from Private Insurance and No Insurance to Medicaid or Private & Medicaid. A significance amount of crowd-out of the private sector occurs, but overall this population represents less than 10 percent of total population. Overall, the implementation will go a long way towards insuring many more Americans.

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