I. Introduction

The economic downturn of the late 1990’s changed life for many Americans. Many found their wages cut or jobs eliminated in the face of corporate cost cutting. People now not only found themselves out of work, but without health insurance. Between 1999 and 2002, both the number of people unemployed and the number of people uninsured rose. According to the U.S Department of Labor, the unemployment rate rose from 4.3 percent in 1999 to 6.0 percent in 2002. During the same time period, the National Center for Health Statistics (2003) reported a rise in uninsured Americans from 17.8 percent to 18.7 percent. Purchasing health insurance became an extremely important social issue, as every day an increasing number of Americans found themselves unemployed and uninsured.

During 2002 alone, 2.4 million people became uninsured, according to the National Center for Health Statistics (2003). This represented a 6 percent increase in the overall number of uninsured Americans, bringing the total up to 43.6 million
people. The common belief among many Americans is that this increase is primarily a result of rising unemployment.

There is certainly a correlation between being unemployed and being uninsured, however, more data shows that this may not be the only cause. In studies conducted by the U.S. Census Bureau, several other factors were also observed. These included correlations with race, marital status, and age.

Over the past ten years, many committees have been established by the federal government to examine the health care crisis in the United States. These committees have been convened both to look at specific topics as well as to come up with new reform suggestions. Several alternative health insurance ideas have been proposed during this time. They include a universal healthcare system, a tax credit plan, a medical savings plan, and several others. What seems to have been lacking in all these discussions, however, is an analysis of the precise reason why people do or do not purchase health insurance.

This is the very question I hope to answer in the following study. In order to focus on key issues, I have used three regression analyses to determine which factors are most important in purchasing health insurance as well as simply being insured. By looking at how each factor affects each of these cases, a better solution will hopefully be designed.

II. Literature Review
Several studies have been conducted in recent years on the topic of health insurance. However, few have used an econometric analysis to examine the precise relationships among factors affecting insurance coverage. The model used in this study is based on both a study on private healthcare and the original utility maximization theory of health insurance.

The closest related study on the purchase of private health insurance was performed by Murat K. Munkin and Pravin K. Trivedi (2003). They focused on variables relating to the demand for healthcare, and found the following results. Positive correlations were seen between the purchase of private insurance and living in the Northeast and Midwest, being married, having more years of education and having a higher family income. Negative correlations were found between the purchase of health insurance and having excellent or poor health, having an increasing number of chronic conditions, living in the West, being black, being male, and being older. Their results were somewhat different from the expected results of the study both in sign and strength of variable correlations. This may be due to their use of a broad range of variables in examining the question of demand for private health insurance. In addition, they did not restrict age in their study, and did not account for either children or elderly people in their estimation of the age variable’s effect on the purchase of private insurance. This could skew the results because both age groups have special factors contributing to their purchase of health insurance. Persons under the age of twenty-three may
still qualify for coverage under their parent’s health insurance plans, while persons over the age of sixty-five qualify for the federal government’s Medicare program.

The econometric model used in this study is based on the model employed by Munkin and Trivedi, however, some variable were omitted or changed. By omitting some of the health factor variables, limiting the age range, and changing family income to personal income, I expect to target the factors for purchasing private health insurance more precisely.

Several other, more general studies have also been done over the last several years. In 2000, the Indiana Family and Social Services Administration (2000) conducted a survey of approximately 10,000 households. The highlights of their findings are the following. Uninsurance rates are higher among those with lower incomes, the highest rate of uninsurance was found among African Americans, young adults (18 to 24) were more like to be uninsured, married persons were more likely to be insured, and full time employees were more likely to be insured.

In a 2002 survey conducted by the U.S. Census Bureau (2002), similar results were found, indicating the following. Males were more likely to be uninsured, the probability of being insured increased with age and higher income, persons with less education were more likely to be uninsured, and full-time employees were more likely to be insured.
A fourth study conducted by the National Center for Health Statistics (2003) found matching results as well. According to their findings, the probability of being insured increases with age and education. Females as well as married persons are more likely to be insured. Hispanic, non-Caucasians, and unemployed persons are less likely to be insured.

III. Model

The underlying theory is the generally accepted consumer utility maximization demand function for health insurance. According to John Nyman (2003), the origin of this theory can be traced back to Daniel Bernoulli, who in 1738, developed the first specification of risk versus return. However, it was not until 1944 that Bernoulli’s ideas were applied to insurance, and modeled by von Neumann and Morgenstern.

According to the general theory, a consumer chooses between being insured and uninsured based on his or her utility function. The assumption that most health insurance applications are based on is that the average consumer is risk averse and prefers a certain level of utility rather than an uncertain, variable level of utility. The basic utility equation for analyzing the issuance decision is as follows:

\[ E(U_i) = U(Y_i - \pi M_i) \]
where $E(U_i)$ is the expected utility of being insured, $Y_i$ is income, $M_i$ is the expenditure on medical care, $\pi$ is the probability of becoming ill, and $(M_i \times \pi)$ is total medical expenditure.

Figure 1: The above model shows the expected utility of being insured $E(U)$ for a risk adverse consumer. As expected income $E(Y)$ increases, so does the potential loss from medical expenditure. Therefore, the expected utility of being insured rises with income. The decision to purchase health insurance is based upon the

The model used for regression analysis is based on this utility function. An additional variable is added to the right-hand side or the function to account for risk tolerance. Thus, being insured is a function of income, insurance cost, and risk tolerance:
Insured = f(Income(Y), Insurance Cost(C), Risk Tolerance(R))

The income variable in the insurance function is disposable income. As a way of ascertaining this value, location variables are used as a proxy for cost of living. This allows for a better focus on real income.

Y = f(Nominal Income, Location)

Insurance costs are a function of several factors. Sex and race are both important factors in insurance cost equations. As seen in the study done by the U.S. Census Bureau, a higher percentage of Hispanics and non-Caucasians were without health insurance. Employment and marriage affect the final cost of insurance to consumers as well. While employed, most individuals have the ability to purchase health insurance at a discounted rate through their employer. Similarly, people who are married have the ability to purchase joint or family plans, which lowers the cost per individual.

C = f(Sex, Race, Employment, Marriage)

Risk tolerance is derived from several factors including age, education, and current health condition. Younger people are often in better health, and more likely to opt not to carry health insurance. Higher levels of education have been shown to have a positive effect on the probability of a person being insured; it is assumed that higher education makes a person more risk adverse. According the 2002 study by the U.S. Census Bureau, Americans with higher levels of education were up to 20 percent more likely to carry health insurance. Unlike education, the
current health status of person can have the opposite effect on an individual’s
decision to purchase health insurance. A healthy person may have a higher risk
tolerance because there is a smaller chance of illness, leading them to forgo the
purchase of health insurance.

\[ R = f(Age, Education, Health) \]

When each factor is replaced in the basic model, the resulting equation is:

\[ Insured = f(Income, Location, Sex, Race, Employment, Marriage, Age, Education, Health) \]

IV. Sample and Variables

Sample

The study was conducted using data from the 1996 Medical Expenditure
Panel Survey Household Component(MEPS). The survey is co-sponsored by the
Agency for Health Care Policy and Research(AHCPR) and the National Center
for Health Services(NCHS). The MEPS is a nationally representative survey of
the U.S. noninstitutionalized population and consists of approximately 25,000
independent observations. From these, all children and elderly people were
removed. In addition, any observations with missing or incomplete data were
omitted, leaving 10,270 observations for the final study.

Insured
Three variables were used in the final formulas. Each was a variation of being insured. The first regression used insured(policy holder) as the dependent variable. This dummy variable was 1 if the individual was the primary holder of a private insurance policy. Approximately 52 percent of the individuals in the study fell under this category. The second regression used insured(private) as the dependent variable. Again, being a dummy variable, the value was 1 if the individual was covered by a private health insurance plan. Approximately 71 percent of the individuals in the study fell under this category. The final regression used insured as the dependent variable. This dummy variable was 1 if the individual was insured. This accounted for individuals insured by government programs, primarily Medicare. Approximately 81 percent of the individuals in the study fell under this category.

Income

Income was computed by using hourly wage and hours worked per week. The product of these two variables was then multiplied by 52 in order to obtain an approximate yearly income. The variable does omit all forms of unearned income as well as taxes applied to earned income. As an individual’s income rises, so does their demand for normal goods. In addition, individuals with higher incomes are more likely to have a lower risk tolerance. Also, as a person’s income rises, their ability to qualify for government aid decreases. Therefore, a positive
correlation is expected between income and the purchase of health insurance and a smaller, but still positive, correlation is expected with being insured.

Location Variables

These variables include Region (Northeast, Midwest, West, South) and Urban Location (Metropolitan Statistical Area(MSA)). In the final equations, the Northeast region was used as a control region and is thus omitted. The cost of living is highest in the Northeast. Assuming that cost of living detracts from disposable income, the remaining regions should have a positive correlation with the purchase of health insurance. Following the same reasoning, a positive correlation is expected with being insured. Similarly, the cost of living in metropolitan areas is higher than in rural areas. However, there is a strong correlation between living in a metropolitan area and higher income. For this reason, a positive correlation is expected with being insured.

Female

Women have a “five-year set back” with most insurance companies. This means that a 40-year-old woman will pay the same rate as a 45-year-old male in similar health. This leads to discounted premiums for women. Normal assumptions would conclude an increase in demand due to a lower cost. Therefore, a positive correlation is expected between being female and being insured. However, other factors come into account estimating this variable’s effect on purchasing private health insurance. Wives are more often the non-
working or part-time employed spouses in one-worker families. If the assumptions dealing with employment, made later in this section, are found true, then the coefficient for this variable should be negative when regressed on purchasing health insurance.

Race

In previous studies, Hispanics and non-Caucasians were typically less likely to have health insurance. These two variables (Hispanic, non-Caucasian) are therefore expected to have a negative correlation with the purchase of health insurance and with being insured.

Employed

The employment variable used in this study is measure with a dummy variable. A 1 represents individuals who are employed full-time for the entire year, while a 0 represents all other cases. Earlier studies have found positive correlations between employment and being insured. This is due to employer provided health benefits. With this, the cost of health insurance to people who are employed is lessened. By reducing the cost of insurance, employment makes a person more likely to purchase it. Therefore, a strong positive correlation is expected between employment and the purchase of health insurance. However, in the third regression, this correlation will be somewhat offset by government aid provided to people who are unemployed. As a result, a smaller, positive correlation is expected with being insured.
Married

This variable can have a twofold effect on purchasing health insurance. First, marriage may change a person’s mindset by making them more risk averse. On the other hand, spouses may opt for family coverage and therefore do not need to carry separate plans. There are several possibilities for the correlation this variable has with the purchase of health insurance. However, the amount of individuals who do not purchase health insurance due to shared plans is expected to outweigh the amount of individuals who purchase insurance due to greater risk aversion. If so, a negative correlation with the purchase of health insurance is expected for this variable. While the number of insurance plans is expected to decrease, the total number of people insured is expected to increase due to marriage. Therefore, a positive correlation is expected with being insured.

Age

Age can have several effects on a person’s decision to carry health insurance. At younger ages, people tend to be insured by their parent’s family plan. At older ages, many Americans are covered by Medicare and may forgo carrying private insurance in addition to this. To avoid confusion from these two groups, the study has limited the age range to between twenty-three and sixty-four. With this in mind, age is used in determining an individual’s risk tolerance. The older a person is, the more likely they are to be risk averse because of other financial obligations and greater concerns about personal health. This should lead
to positive correlations both with the purchase of health insurance and with being insured.

Education

Education is measured by years of formal education. It plays an important role in developing a person’s mindset. There is often a problem of interpretation due to correlation between education and income. However, there is an important distinction between the two variables. Individuals with higher levels of education are typically more risk averse than those with lower levels. This means individuals with higher education are more likely to purchase health insurance. Therefore, positive correlations with purchasing health insurance and being insured are expected for this variable.

Health

A person’s health status can play an important role in his assessment of monetary risk due to poor health. In the MEPS, health status is measured on a scale from 1 to 5; 1 meaning the individual was in excellent health and 5 meaning the individual was in poor health. In the regressions, this scale had been condensed. The dummy variable will be 1 if the original ranking was a 1 or 2. Otherwise, the dummy variable will be 0. If an individual is in good to excellent health, they should be more willing to forgo the purchase of health insurance when compared to an individual who is in poor health. However, a person in good health may also have a lower cost for the purchase of health insurance.
Given these two effects, the effect of this variable is expected to be small in all regressions, but it is unclear whether it will be positive or negative.

V. Results

The actual study was carried out using three ordinary least square regressions. They are as follows:

**Regression 1:** Insured (policy holder) = \( \beta_1 + \beta_2 \text{Midwest} + \beta_3 \text{West} + \beta_4 \text{South} + \beta_5 \text{MSA} + \beta_6 \text{Female} + \beta_7 \text{Married} + \beta_8 \text{Non-Caucasian} + \beta_9 \text{Hispanic} + \beta_{10} \text{Age} + \beta_{11} \text{Education} + \beta_{12} \text{Employed} + \beta_{13} \text{Income} + \beta_{15} \text{Health_Status} \)

**Regression 2:** Insured (private) = \( \beta_1 + \beta_2 \text{Midwest} + \beta_3 \text{West} + \beta_4 \text{South} + \beta_5 \text{MSA} + \beta_6 \text{Female} + \beta_7 \text{Married} + \beta_8 \text{Non-Caucasian} + \beta_9 \text{Hispanic} + \beta_{10} \text{Age} + \beta_{11} \text{Education} + \beta_{12} \text{Employed} + \beta_{13} \text{Income} + \beta_{15} \text{Health_Status} \)

**Regression 3:** Insured = \( \beta_1 + \beta_2 \text{Midwest} + \beta_3 \text{West} + \beta_4 \text{South} + \beta_5 \text{MSA} + \beta_6 \text{Female} + \beta_7 \text{Married} + \beta_8 \text{Non-Caucasian} + \beta_9 \text{Hispanic} + \beta_{10} \text{Age} + \beta_{11} \text{Education} + \beta_{12} \text{Employed} + \beta_{13} \text{Income} + \beta_{15} \text{Health_Status} \)

The first regressed the explanatory variable on holders of private insurance plans. Next, the same factors were regressed on being privately insured. The last regression once again used the same factors, but this time used being insured as the left-hand variable. The results of the regressions (shown in Appendix B: Regression Equations) were close to the expected results.

The regional variables’ results were almost exactly those expected. However, the variables were also found to be largely insignificant. For the first regression, Midwest, West, and South all had positive coefficients. The only significant variable in this regression was West. For the second equation, Midwest had a positive coefficient while West and South both had negative
coefficients. South was the only significant variable in this regression. In the last equation, all three variables had negative coefficients. In this regression, both West and South were significant. Positive coefficients represent positive correlations between the independent variable and the dependent variable. Likewise, negative coefficients represent negative correlations between the variables. It is hard to speculate at the cause for these results. It is possible that these variables may have a greater effect on risk tolerance of individuals. Under this assumption, regional differences would play a greater role in determining mindset rather than disposable income. A second possible explanation is that are greater government health benefits in the northeast than in any other region.

The results for Metropolitan Statistical Area (MSA), similar to the other location variables, were somewhat opposite than expected. MSA had a small positive correlation to the dependent variable in each regression. Unlike the regional variable, MSA was statistically significant in all regressions. These results may be due to higher incomes received by many MSA residents. Therefore, they are more likely to purchase private health insurance.

The effects of being female were as expected. The Female variable has a strong negative correlation with purchasing health insurance. This again is accounted for by the fact that many women choose not to work or work part-time. Therefore, they join their working spouse’s healthcare plan because it is cheaper than purchasing their own. Also, as expected, Female has a small positive
correlation with being insured. This is attributed to the fact that women traditionally have lower healthcare and health insurance costs than men. In all regressions, the Female variable was statistically significant.

Like the prior variable, the results for the Married variable were as expected. Married has a negative correlation with purchasing private health insurance. This is accounted for by the need for only one spouse to purchase a health insurance plan. It then becomes cheaper to add the second spouse onto the existing plan, rather than purchasing a second individual plan. For this same reason, Married has a positive correlation with being insured. It becomes relatively cheaper to become insured when married. Therefore, individuals who are married have a higher probability of being insured than those individuals who are not married. Married was significant in all regressions.

The racial variables also followed their expected patterns. Both non-Caucasian and Hispanic had negative correlations in all three regressions. This is due to the fact that health insurance costs are higher for both of these racial groups. Most likely, the higher cost is due to a lower overall level of employment for both groups. However, non-Caucasian was only significant in the second regression, while Hispanic was significant in all three. The negative correlation between the racial variable and the income variable may play a role in both the coefficient and significance of the racial variable.
Age was the first non-dummy variable used in the equations. Its result was almost the same in each of the three regressions. Age had a small positive correlation with each of the dependent variables used. This suggests that age does have an effect on an individual’s mindset. As a person becomes older, he tends to become more conservative, preferring a fixed level of utility. This result also suggests that this effect outweighs that of the increase in insurance cost due to age. Age was significant in all regressions.

Education is another factor that can affect the mindset of an individual. As people become more educated, they tend to become more conservative, similar to people who are older. They prefer a fixed income or utility to a variable, uncertain level. Considering this line of reasoning, it is logical that education would have a small, positive coefficient in each of the three regressions. Like Age, Education was significant in each regression.

Employment is a major factor in both purchasing insurance and being insured. The correlation of this variable with the purchase of health insurance was extremely strong and positive. In each of the subsequent regressions, the correlation with the dependent variable diminished, but always remained strong and positive. These results suggest that the hypothesis stated earlier was correct. People who are employed can purchase private health insurance much more cheaply than people who are not employed. A lower cost leads most employed individuals to purchase the insurance plans offered to them. The reason that the
correlation decreases in the second equation is the same reason used to explain the shift in the Married variable. Unemployed spouses will most likely also benefit from these discounted plans, and therefore, employment will play a lesser role in the second regression. Similarly, the third regression takes into account people receiving other forms of insurance, aside from private. Many of these people may be receiving some type of governmental aid. Here the Employed variable will play a lesser role in the final outcome. In each of the three regressions, the Employed variable was found to be significant.

Income followed its expected pattern in all three regressions. The Income variable has a small positive correlation in both the second and third regressions. This makes sense because people with higher incomes are more likely to purchase some form of health insurance. In the first regression, the correlation was almost double that of the second and third. Again, individuals with higher incomes are much more likely to purchase private health insurance for themselves. Income was statistically significant in all regressions.

Health status can have a twofold effect on the purchase of health insurance. Excellent health can make a person less likely to purchase health insurance because they may feel that they do not need it. On the other hand, excellent health also lessens the cost of health insurance in some cases. The result of each of the three regressions points towards the second effect. The Health Status variable was positively correlated with each of the dependent variables.
Also, the variable was significant in each regression. This means that individuals are more likely to carry health insurance if they are in better health.

**IV. Conclusions**

The results of this study have supported the trends and patterns witnessed in earlier studies performed by various groups. While they agree with these studies, I also believe that the results of this study help to more precisely show the effects of the included variables. Employment was shown to be the single greatest factor which influences a person to purchase private health insurance. However, this same variable has a far less significant effect on actually being insured, while race and education play more significant roles in this area.

Each of the regressions used in this study has implications for the future of healthcare policy. When looked at together, they present a broad view of how factors influence a person’s decision to purchase health insurance. Depending on how you wish to approach the problem of an increasing number of uninsured Americans, each can play an important role. The first regression has shown that a rise in employment, education, and income will lead to a larger amount of people purchasing health insurance. These three variables are also the slowest to change. This suggests the possibility for future health care improvement through social improvement. The second and third regressions are useful for trying to identify ways to improve health insurance in the short term. Hispanics and non-Caucasians as groups are both far below the social average in terms of carrying
health insurance. This suggests that specific government programs targeting these groups could have a significant effect on health insurance coverage in the short term. At the same time, married persons, as a group, are well above the social average. This means that new types of group rate plans, beside family plans, may also help to increase the number of insured Americans in the short term.

As stated earlier, many ideas have been proposed for healthcare system reforms. However, I believe that many of these plans will not change some of the basic problems we are currently facing. Three of the prominent reforms are: a national healthcare system, a tax credit plan, and a medical savings plan.

The first of these ideas, a national healthcare system, does present some interesting ideas. According to the results of this study, large scale, group coverage could have a significant and positive effect on short-term health insurance coverage. However, the results also suggest that there are people who simply opt not to purchase health insurance for one reason or another. Under this new system, all Americans would have some form of health insurance. The problem here is that by forcing those individuals who opt not to carry private health insurance to purchase it, the system would be somewhat inefficient and unfair. In addition, the time needed to accomplish such a plan would be far longer than simply instituting new types of group plans. As stated earlier, group plans is more of an immediate was to aid Americans in purchasing health
insurance. If this proposal takes several years, it is missing its window of opportunity to be truly effective.

The proposed tax credit plan would provide assistance to low-income families to help pay the expenses associated with healthcare insurance. In theory, a reduction in cost would aid these families in purchasing health insurance. However, there are several problems with this plan as well. First, the expected tax credit will in many cases not be enough to cover the cost of decent health insurance. This will leave many low-income families in the same situation they are currently in. Secondly, the plan only deals with low-income families. Recent trends show health insurance cost to now be a growing problem not only among low-income families, but also middle-income families. Tax credits would be of very little help to such households. Another problem is that these tax credits may not be timed correctly to aid most families in purchasing health insurance.

Insurance premiums are due at variable times during the year, while tax credits would be reimbursed only once per year. Lastly, this is a form of government provided insurance. The idea of this study was to encourage ways in which people would be able to purchase private health insurance.

The best plan proposed to date is that of medical savings accounts or MSAs. This plan uses high deductible health insurance in conjunction with a medical savings account. The savings account is used to pay for routine visits while the individual is covered from catastrophic illness by the high deductible
insurance plan. This plan has been implemented on a small scale and shown to improve health care coverage, but like the others, this plan has its shortcomings as well. The major fault of the MSAs is in the actual savings account. Those families who could not afford health insurance will most likely not be able to afford to maintain a savings account to pay for routine medical treatment. This leaves them in the same situation as before. Despite this apparent problem, I believe that the expansion of this program could help to decrease the number of uninsured Americans.

In the future, many more studies will be done regarding health insurance. I hope that this paper may serve as a base for those studies. Further work could be done to this paper in a few areas. The use of more up to date data would aid in updating the results to the most recent times. Additionally, one variable which was omitted due to date problems was self employment. This variable may have a significant effect on the employed variable. Individuals who are self employed lack the benefits of employer provided healthcare options, and therefore it more costly for them to purchase private health insurance. This paper also leaves much room for the discussion of results in relation to proposed solutions to the decline in health insurance coverage. These are all areas for future study.
## Appendix 1: Variable Definitions and Summary Statistics

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<tr>
<th>Variable Description</th>
<th>Mean</th>
<th>Standard Deviation</th>
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<tr>
<td><strong>Insured (policy holder)</strong> (1 for insurance policy holder)</td>
<td>0.5230</td>
<td>0.4995</td>
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<tr>
<td><strong>Insured (private)</strong> (1 for privately insured)</td>
<td>0.7074</td>
<td>0.4550</td>
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<td><strong>Insured</strong> (1 for insured)</td>
<td>0.8081</td>
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<td><strong>Northeast</strong> (1 for PA, NJ, NY, RI, CT, MA, VY, NH, ME)</td>
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<td><strong>Midwest</strong> (1 for ND, SD, NE, KS, MN, IA, MO, WI, IL, MI, IN, OH)</td>
<td>0.2218</td>
<td>0.4155</td>
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<tr>
<td><strong>West</strong> (1 for WA, OR, CA, MT, ID, WY, NV, UT, CO, AZ, NM)</td>
<td>0.3533</td>
<td>0.4780</td>
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<tr>
<td><strong>South</strong> (1 for OK, TX, AR, LA, DE, MD, WV, VA, DC, NC, SC, GA, FL, KY, TN, MS, AL)</td>
<td>0.2269</td>
<td>0.4188</td>
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<td><strong>MSA</strong> (1 for Metropolitan Statistical Region)</td>
<td>0.8022</td>
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<td><strong>Female</strong> (1 for Female)</td>
<td>0.5493</td>
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<td><strong>Married</strong> (1 for Married)</td>
<td>0.6335</td>
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<td><strong>Non-Caucasian</strong> (1 for non-caucasian)</td>
<td>0.1260</td>
<td>0.3319</td>
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<tr>
<td><strong>Hispanic</strong> (1 for Hispanic)</td>
<td>0.1912</td>
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<td><strong>Education</strong> (Number of years of education; values between zero and seventeen)</td>
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<td><strong>Employed</strong> (1 for employed)</td>
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<td><strong>Income</strong> (Yearly income : hourly wage * hours worked per week * 52)</td>
<td>20529</td>
<td>50863</td>
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<tr>
<td><strong>Health_Status</strong> (1 for excellent or very good health)</td>
<td>0.5984</td>
<td>0.4902</td>
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Appendix B: Regression Equations

**Regression 1**: Insured (policy holder) = $\beta_1 + \beta_2$ Midwest + $\beta_4$ South + $\beta_5$ MSA + $\beta_6$ Female + $\beta_7$ Married + $\beta_8$ Non-Caucasian + $\beta_9$ Hispanic + $\beta_{10}$ Age + $\beta_{11}$ Education + $\beta_{12}$ Employed + $\beta_{13}$ Income + $\beta_{15}$ Health Status

**Regression 2**: Insured (private) = $\beta_1 + \beta_2$ Midwest + $\beta_4$ South + $\beta_5$ MSA + $\beta_6$ Female + $\beta_7$ Married + $\beta_8$ Non-Caucasian + $\beta_9$ Hispanic + $\beta_{10}$ Age + $\beta_{11}$ Education + $\beta_{12}$ Employed + $\beta_{13}$ Income + $\beta_{15}$ Health Status

**Regression 3**: Insured = $\beta_1 + \beta_2$ Midwest + $\beta_4$ South + $\beta_5$ MSA + $\beta_6$ Female + $\beta_7$ Married + $\beta_8$ Non-Caucasian + $\beta_9$ Hispanic + $\beta_{10}$ Age + $\beta_{11}$ Education + $\beta_{12}$ Employed + $\beta_{13}$ Income + $\beta_{15}$ Health Status

<table>
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<th>Variables</th>
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<th>Coefficients (T-Statistics)</th>
<th>Coefficients (T-Statistics)</th>
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<td><strong>Regression 2</strong></td>
<td><strong>Regression 3</strong></td>
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<td>Constant</td>
<td>-0.326 (-10.588)</td>
<td>-0.34 (-12.413)</td>
<td>0.231 (8.666)</td>
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<tr>
<td>Midwest</td>
<td>0.017 (1.292)</td>
<td>0.016 (1.383)</td>
<td>-0.0001 (-0.009)</td>
</tr>
<tr>
<td>West</td>
<td>0.033* (2.779)</td>
<td>-0.008 (-0.799)</td>
<td>-0.038* (-3.715)</td>
</tr>
<tr>
<td>South</td>
<td>0.016 (1.206)</td>
<td>-0.024* (-2.046)</td>
<td>-0.029* (-2.575)</td>
</tr>
<tr>
<td>MSA</td>
<td>0.026* (2.416)</td>
<td>0.052* (5.342)</td>
<td>0.037* (3.964)</td>
</tr>
<tr>
<td>Female</td>
<td>-0.124* (-14.473)</td>
<td>0.04* (5.25)</td>
<td>0.041* (5.751)</td>
</tr>
<tr>
<td>Married</td>
<td>-0.068* (-7.58)</td>
<td>0.188* (23.689)</td>
<td>0.095* (12.213)</td>
</tr>
<tr>
<td>Non-Caucasian</td>
<td>-0.019 (-1.411)</td>
<td>-0.076* (-6.44)</td>
<td>-0.017 (-1.498)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.065* (-5.34)</td>
<td>-0.145* (-13.334)</td>
<td>-0.149* (-14.043)</td>
</tr>
<tr>
<td>Age</td>
<td>0.006* (15.598)</td>
<td>0.006* (15.741)</td>
<td>0.005* (13.312)</td>
</tr>
<tr>
<td>Education</td>
<td>0.026* (16.786)</td>
<td>0.032* (23.154)</td>
<td>0.02* (14.672)</td>
</tr>
<tr>
<td>Employed</td>
<td>0.431* (42.106)</td>
<td>0.302* (33.093)</td>
<td>0.083* (9.382)</td>
</tr>
<tr>
<td>Income (in thousands)</td>
<td>0.007* (8.071)</td>
<td>0.003* (4.513)</td>
<td>0.003* (4.597)</td>
</tr>
<tr>
<td>Health Status</td>
<td>0.045* (4.991)</td>
<td>0.088* (10.901)</td>
<td>0.019* (2.431)</td>
</tr>
<tr>
<td>R Squared</td>
<td>0.284 10270</td>
<td>0.316 10270</td>
<td>0.131 10271</td>
</tr>
</tbody>
</table>

*significant at $\alpha = .005$ for two-sided test
References


