

Study on Private Health Insurance Coverage for Adults under 65

34 states from 2003 to 2010

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Capstone Project

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Executive summary	3
1 Background.....	3
2 Literature review.....	5
3 Research Design	9
1) Model.....	9
2) Data.....	10
4 Main results	12
1) Independent variables	12
2) Dummy variables.....	14
5 Discussions	15
6 Limitations.....	19
Reference.....	19

Executive summary

Objectives: The analysis in this paper is designed to find out what factors contributed to the change of uninsured rate of people aged between 18 and 65 from 2003 to 2010.

Method: A fixed-effect analysis with panel data is conducted. The analysis unit is state. The main independent variable is the private health insurance cost per enrollee per year. The private insurance cost data covered 34 states sampled in Medical Expenditure Panel Survey from 2003 to 2010.

Key finding: The private insurance cost per enrolled adult below 65, private insurance cost per enrolled adult below 65 as a proportion of median income and Medicare coverage for adults below 65 do not have a statistically significant effects on uninsured rate. Adults receiving lower income and being unemployed tend to be uninsured. The effect of Medicaid coverage on reducing uninsured rate is modest but statistically significant.

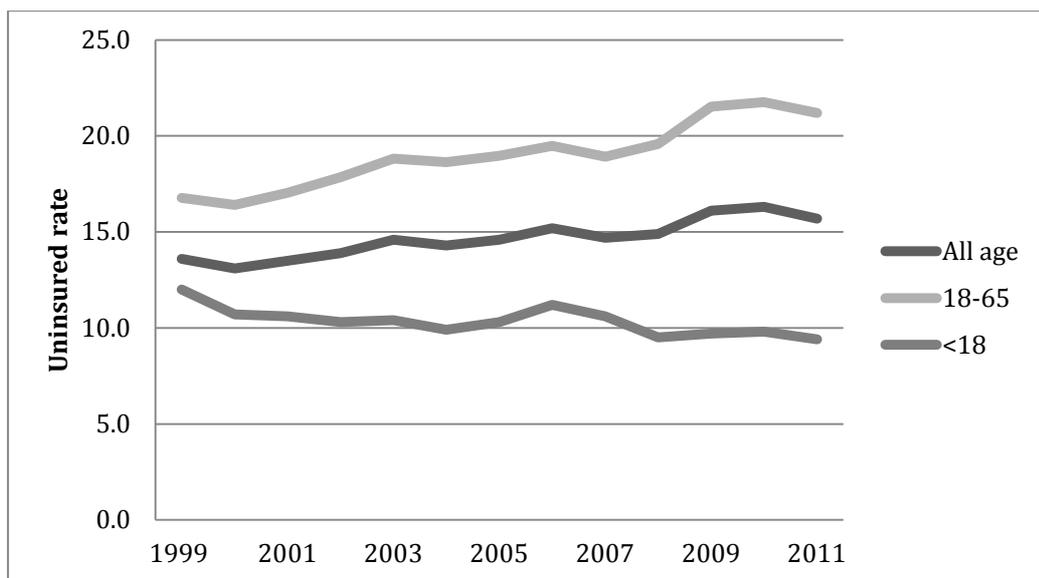
Key words: uninsured rate, private health insurance cost, adults aged between 18 and 65

1 Background

Reform of health insurance is the center topic of Affordable Care Act 2010. The most important move to change private insurance market is to encourage insurance exchange in all levels, especially the state one. By providing more choices, the act is designed to reduce the high cost of private insurance. Information about state level private health insurance expenditures becomes important for policymaking, especially its impact on the coverage rate. As trends in Table 1 show, the uninsured rate for all people increased over the period of 1999-2010. There was a slight drop in 2011, a

year after ACA enactment. The trend for people aged 18-65 closely follows the all-age tide, probably because this group covers the majority of the whole population. However, the uninsured level for it is higher than all people and the population below 18. As the main work force, the 18-65 group bears the high cost of private insurance plans including those directly purchased and employment-based. It will be beneficial to know whether reduction of private insurance cost will bring drops of uninsured rate. The purpose of this paper is to find out what factors have an impact on health insurance coverage for the labor force aged between 18 and 65.

Figure 1 United States Uninsured rate by age 1999-2011(%)



Source: Health Insurance Historical Tables HIB Series, Bureau of Census

Public health insurance may play a role. Medicaid has been expanded several times to cover more people. In 1997, the State Children Health Insurance Program offered federal funding to help states expand coverage for children in families with income too high to qualify for Medicaid. As a result, 46 states cover children in families up to or above 200% of the Federal Poverty Level. The Ticket to Work and Work Incentives Improvement Act in 1999 expanded Medicare coverage to

certain disabled beneficiaries who are working. Other people aged 18-65 who could be covered by Medicaid are pregnant women with family income below 133%, limited-income parents with children who meet Temporary Assistance to Needy Families (TANF) standard, some SSI beneficiaries and some Medicare recipients.

2 Literature review

There are two main types of studies trying to explain health insurance coverage change. One type is studies that focus on describing the uninsured situation and comparing variations in economic conditions to changes of uninsured rate. These help identify variables that might be included in regression models to explain coverage.

Among studies of this type, Kuttner (1999) found out that people with low income, facing high insurance cost or being unemployed were usually uninsured. These factors also affected children in that a half of the uninsured children come from families with low income. Concluding from data in Mishel (1998), Kuttner also mentioned that “non-standard” jobs had taken up 29 percent of the whole employment, which could possibly have an impact on coverage¹. Ginsburg (2008), quoting data from Kaiser Family Foundation, asserted that trends of decreasing affordability, changes in employment types, fewer covered retirees and public programs were potentially affecting employment-based health insurance. Based on his qualitative analysis, he argued that insurance exchange was an effective way to deal with the decrease while individual insurance market had its own problem. Holahan (2010)

¹ “Non-standard” jobs include temporary, part-time, contract, and day-labor positions. Mishel L, The state of working America, 1998-99

used trends to explain the effect of the economic recession on health insurance coverage. As more adults lost jobs and income in the recession in 2007-09, they accounted for most of the uninsured population growth, especially those with income below 200% of the federal poverty level². Being seriously affected by the economic downturn, the number of white Americans with 400% FPL or middle-income had dropped significantly while the number of low-income increased by 5.2 million. Most of the uninsured were found to be native-born citizens. Although the number of children uninsured by employee-sponsored plans grew, they were often taken care by Medicaid and CHIP expansion. The actual rate of uninsured children dropped by 0.8%. It was even higher for those lower than 200% FPL, which is up to 2.4%.

Other studies have used multivariate statistical analysis to find out causal influences or the marginal effect of certain factors, Kronick and Glimmer (1999) used three logistic regression models to study the effect of health care spending for a standard benefit package per insured adult on whether an individual aged from 19 to 65 would be insured in the time period of 1979-1995. The first used dummy variables for each year as independent variable to identify the relation between periods and uninsured rate. The second added the independent variable the division of per capita expenditure by the individual's personal income. The third included additional variables representing job characteristics and personal characteristics. The study finds out a 10 percent expenditure-to-income ratio increase will result in a 1.2 percent increase in the uninsured rate while other characteristics have small effects due to limited changes within them. One limitation of this study comes from the measurement of health insurance cost. The health insurance cost per capita is identical

² Americans with 400%FPL decreased by 3.9 million and middle-income 1.9 million. Holahan (2010)

for every individual in a year. Within a year, the model cannot measure the variation among individuals or states. Another limitation is that the analysis did not consider the crowding out effect of public programs. Using the same logistic models and parameter estimates in this study but a different dataset, Kronick and Glimmer (2001) estimated the uninsured rate under different assumptions about health expenditure and income growth. The simulation predicted a 0.6 percent increase of the uncovered in 1999 while the actual rate was 0.2 percent. Holding the most optimistic and pessimistic assumption, the uninsured rate of work adults would range from 22.1% to 30.3% by 2009. However, the actual rate was a little smaller.³ Their model predicted well near the period after 1999, but proved to be less effective as more dramatic changes took place in 21th century such as Medicaid expansion and economic recession.

Mohanty (2005) used Rand Health Insurance Experiment 2-part regression model to estimate health care expenditures for immigrants and US-born people. Firstly the 2-part method includes a logistic regression to decide the probability of having expenditure. Then the probability was multiplied by the predicted log-transformed expenditure of any individual with nonzero expenditures. The results indicated expenditures (both adjusted and unadjusted) were lower for immigrants than for US-born people, except the expenditure per capita for immigrant children, which was 3 times higher than US-born children. The result presumably showed that immigrants had less use and access to health care service.

³ The actual uninsured rate of people aged 19-65 in 2009 was 21.5% according to Health Insurance Historical Tables HIB Series, Bureau of Census

Lo Sasso (2004) built up a regression model studying the impact of the state child insurance program on the uninsured rate. His variable in interest is income eligibility standards set by state policies. He also includes a set of state and time dummy variables. Public eligibility was an indicator imputed using child's age, family income and the state's income eligibility standard. Considering the effect brought by unmeasured local economic conditions and immeasurable children's health status, instrumental variables were introduced into the model to deal with unmeasured economic, social, and individual conditions. The key finding was that the SCHIP had a statistically significant positive influence on insurance coverage although the impact was small. The study also found out a longer waiting period set by SCHIP policies would bring a reduction of insured rate. However, limitation remains as respondents might report that being insured by SCHIP was insured by private insurance.

Chernew uses probit regression with individual level data to examine whether the growing health insurance cost reduces the tendency to have health insurance coverage. The results found out that health insurance premiums growth accounted for a decline in coverage rates. Medical expansion accounted for 1% of the health insurance coverage increase. Variations in economic and demographic characteristics have little effect.

Learning from the above studies, I conclude that previous regression analyses have the common results that health insurance cost has been influential to health insurance coverage rate. Government interventions such as Medicaid expansions and reforms do impact the health insurance coverage rate but the effect tends to be modest.

3 Research Design

1) Model

A multiple regression model will be built to study what factors affect the health insurance coverage rate of the 18-65 population in a state. The dependent variable is the percentage of the population aged between 18 and 65 lacking health insurance. The main explanatory variable is private health insurance cost per enrollee aged between 18 and 65 in a state. It measured the average premium of private insurance for a below-65 adult enrollee. According to Current Population Survey's definition, private insurance includes employment-based insurance, own employment-based health insurance and direct-purchase insurance⁴. This market factor has been proved to have a significant impact on coverage rate in previous studies (Chernew (2005), Kronick (1999), Cutler (2003)).

In addition, I introduce the Medicaid and Medicare coverage rate for the 18-65 population to cover the effect of the two public health insurance programs on coverage. People at these ages are covered due to different reasons. For Medicaid, most of the coverage associates with income. Other conditions could be pregnancy, parents of low-income children, or disability. For Medicare, people aged below 65 are eligible to Medicare Part A benefits if they have received disability benefits from Social Security or Railroad Retirement Board for two years. People with End-Stage Renal Disease could also be covered. Based on the conclusions of Aizer (2003), the eligibility expansions did contribute to an increase of health insurance coverage but quite modestly. My assumption is that the public programs may reduce the uninsured rate of working age people.

⁴ <http://www.census.gov/hhes/www/hlthins/methodology/definitions/cps.html>

A third set of variables is included to describe the characteristics of the working-age population. The composition of race, age and nativity serve as demographic characteristics. The composition of personal income and employment status are introduced to present economic characteristics. States and years are entities to fix the effect over time and across states. The variables are at state level, which means the coefficients in this model represent aggregated effects.

2) Data

The panel data set built for regression analysis includes data from 34 states over the time period 2003-2010. The number of states and time period are decided by the availability of the data concerning the health insurance cost. The Medical Expenditure Panel Survey used a sample approach that only covers 35 states from 2003 to 2010. It provides the total health expenditure and categorized it into four different payment types: Out of pocket, Private, Medicare and Medicaid. It defined the expenditures as the sum of payments for care provided in 1998⁵. There is no direct source of data indicating health insurance cost per enrollee in states. My calculation of this variable includes three steps. The first is to calculate the population at 19-65 with an expense paid by private health insurance or pocket money. This uses the yearly survey data from Census Bureau. The second is to calculate the total private health insurance expenditure by multiplying the total health expenditure with the percentage of payments through private insurance and out-of-pocket money. The third is to divide the total private health insurance expenditures by the privately insured population to get the personal private insurance cost.

⁵ Mohanty 2005

The population characteristics are divided into categories. One of the categories will be dropped so that the coefficients for the other categories are relative to this omitted category. Age composition consists of 18-24 (omitted), 25-34, 35-44, 45-54, 55-59 and 60-65. Race characteristic includes African American, American Indian and Alaska Native, Asian and Hawaiian, and two or more races (omitted). Nativity is divided into Native and Non-native (omitted). Personal income structure consists of four levels: No-income or below \$5000, \$5000-25000, \$25000-75000, \$75000 or higher (omitted). The employment status is categorized by Employment Status (EMP) Recode, which includes CAN⁶ (omitted), the employed and the unemployed. All categories represented by dummy variables are in the form of proportion of overall 18-65 population and add up to one. The variables included in the analysis can be found in Table 1. It should be noted that the base for percentages of race categories, ethnic categories and income categories is the whole population. The base for percentages of Medicaid coverage, Medicare coverage and age categories is the population of adults under 65.

There are two reasons to choose a panel data set. There are multiple factors affecting the coverage rate, some of them are not observed or measured. Such variables include cultural attitudes and personal opinions about the health risks. A panel data set can eliminate the omitted variable bias when the omitted variables are constant over time within a state (state fixed effect). It accounts for individual heterogeneity. In this way, the regression has considered the variation within a state. This overcomes the drawback of Glimer's calculation. In his 1999 study the private

⁶ This category includes children, armed forces or non-labor.

insurance cost per enrollee is an average at national level rather than a state or individual level one, which means the variable is invariant across states or individuals in each year. My analysis unit is at the state level and my calculation includes the variation between states and over time for the included variables.

Table 1 Names and descriptions of variables in the model

Variable names	Description
Dependent variable	
Uninsured rate	Uninsured rate of adult<65
Independent variable	
Cost per enrollee	Private insurance expenditure per enrollee (thousand dollar)
Percent covered by Medicare	Percentage of adults < 65 covered by Medicare
Percent covered by Medicaid	Percentage of adults < 65 covered by Medicaid
Age 26-35 percentage	Percentage of adults among age 26-35
Age 36-45 percentage	Percentage of adults among age 36-45
Age 46-55 percentage	Percentage of adults among age 46-55
Age 56-60 percentage	Percentage of adults among age 56-60
Age 61-65 percentage	Percentage of adults among age 61-65
White population	Percentage of White population
Black or African American population	Percentage of Black or African American population
Native American population	Percentage of American Indian and Alaska Native population
Asian or NHOPI population	Percentage of Asian alone, NHOPI alone, or both population
Native population	Percentage of population being native
Population with income \$0-4900	Percentage of population with income 0-\$4,999
Population with income \$5000-24999	Percentage of population with income \$5,000-\$24,999
Population with income \$25000-74999	Percentage of population with income \$25,000-\$74,999
Employment rate	Employment rate of adults<65
Unemployment rate	Unemployment rate of adults<65

4 Main results

1) Independent variables

The data set includes 225 observations. Some of the states have only one observation in 2007 and some have 5 from 2003 to 2007. I did the Hausman test to find out whether a random effect or fixed effect model is more suitable. The result $\text{Prob} > \chi^2$

is 0.0001, far less than 0.05, which rejects the assumption that the fixed effect is uncorrelated with the disturbances so random effects would not be a correct specification. The results of the statistical analysis can be seen in Table 2.

Table 2 State observations in panel data set

Year range	State
2007	Arkansas, Iowa, Kansas, Mississippi, Nevada
2003-2007	Connecticut, Kentucky, Oklahoma, Oregon
2003-2010	Alabama, Arizona, California, Colorado, Florida, Georgia, Illinois, Indiana, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New York, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, Washington, Wisconsin

Table 3 Stata fixed effect results (private insurance cost per enrollee)

Variables	Coef.	t statistics
Cost per enrollee	0.0001	0.08
Percent covered by Medicare	0.0471	0.38
Percent covered by Medicaid	-0.0529	-1.90
Age 26-35 percentage	0.0302	0.31
Age 36-45 percentage	0.2547*	2.52
Age 46-55 percentage	0.1932	1.55
Age 56-60 percentage	0.2308	1.42
Age 61-65 percentage	-0.0360	-0.24
White population	0.3215	1.16
Black or African American population	0.1150	0.29
Native American population	0.1132	0.36
Asian or NHOPI population	-0.0282	-0.08
Native population	-0.1563	-1.45
Population with income \$0-4900	0.8973***	4.56
Population with income \$5000-24999	0.6756***	3.76
Population with income \$25000-74999	0.4683**	2.74
Employment rate	0.0835	0.64
Unemployment rate	0.4402*	2.41
Year2004	0.0019	0.62
Year2005	0.0134***	3.58
Year2006	0.0269***	5.26
Year2007	0.0270***	4.19
Year2008	0.0261***	3.87
Year2009	0.0243*	3.12
Year2010	0.0330***	4.03
_cons	-0.8818	-2.33

*p<0.05, **p<0.01, ***p<0.001

Observations: 225

R square (overall): 0.1149

The private health insurance cost per enrolled adult below 65 has no statistically significant effect on the uninsured rate of adult below 65 ($p=0.33$). The result provides no evidence that the cost per income is related to being uninsured. Medicare coverage rate has no statistically significant effect, either ($p=0.68$). Medicaid is not statistically significant at the customary 5% level ($p=0.06$), but it just misses that. At the .06 significance level, it has a negative effect on the uninsured rate. This effect is consistent with the results of other studies.

2) Dummy variables

Income has large, statistically significant, positive effects. The lower three categories (no income to \$5,000, \$5,000 to \$25,000, \$25,000 to \$75,000) have higher rates of being uninsured relative to the highest income level ($> \$75,000$). The poorest population has the largest coefficient of 0.89 that is accompanied by the strongest statistical significance ($t=4.55$). It means a one percent change in the proportion of poorest below-65 adult population would lead to an increase of uninsured rate by 0.0089. With a 5% growth, the marginal effect will be up to 0.04, which is quite large relative to the average uninsured rate (0.14) for the cross-sectional data. Unemployed people are more likely to be uninsured ($t=2.41$). The coefficient is 0.44, which means a 1 percent increase in the population of unemployed adult below 65 would produce an increase of uninsured rate by 0.0044. Compared to the average uninsured rate 0.14 again, a one percent change in unemployed population produce an uninsured rate increase of about 3%. Age dummies do not provide statistically significant effect except the category of 35-44 with a coefficient of 0.24 ($t=2.34$). Race and ethnicity dummies have no impact on the uninsured rate.

Year dummies have a statistically significant impact on the uninsured rate, controlling for the other factors. The uninsured rate increased by 3.3 percent points from 2003 to 2011. Ninety-three percent of the variance of uninsured rates is associated with stable state factors ($\rho=0.927$), which means there are unknown uniquely distinct characteristics that affect uninsured rate among states. For instance, Texas has uninsured rates consistently over 20% while Massachusetts remained below 10%.

5 Further Analysis

The private insurance cost per enrolled adult does not affect the uninsured rate significantly. One possible reason is the private insurance cost per enrollee, being an absolute value, cannot describe how large the amount is unless it is compared to different levels of income. To check this possibility, I substitute the independent variable “Private health insurance cost per enrollee” with “Private health insurance cost per enrollee divided by median income”. I divided the observations of private insurance spending per enrollee by the median income of the adults under 65 for each state to get this new variable describing how much the private insurance cost is relative to income for a person. Dependent variable and other independent variables remain the same. I ran the same fixed effect command and the results came out that the ratio of private insurance cost per enrollee to median income does not have a statistically significant effect on uninsured rate either while being employed, income level, and being 35-44 still have impact with same significant levels, as can be seen in Table 4. The Medicaid coverage does not have a statistically significant impact with the customized 5% level ($p=0.06$) but again is significant and negative at the .06 level.

Thus, there is some indication that Medicaid helps reduce the uninsured rate, as other analysts have found.

6. Discussion

One possible explanation for the failure of insurance cost to affect the uninsured rate in this analysis is that the majority of adults below 65 are in the labor force that usually receives health insurance through employment. An employee will be insured because he or she is employed, regardless of how much the health insurance premium takes up the income. Cawley and Simon (2003) found out every one percent increase in the state unemployment rate is associated with different levels of decrease in the probability of health insurance coverage for men, women and

Table 4 Stata fixed effect results (cost-to-income rate)

Variables	Coefficient	t statistics
Cost per enrollee	0.0142	0.32
Percent covered by Medicare	0.0438	0.35
Percent covered by Medicaid	-0.0530	-1.90
Age 26-35 percentage	0.0331	0.34
Age 36-45 percentage	0.2547*	2.52
Age 46-55 percentage	0.1921	1.54
Age 56-60 percentage	0.2361	1.45
Age 61-65 percentage	-0.0366	-0.24
White population	0.3371	1.22
Black or African American population	0.1334	0.33
Native American population	0.1544	0.41
Asian or NHOPI population	-0.0102	-0.03
Native population	-0.1585	-1.48
Population with income \$0-4900	0.8943***	4.54
Population with income \$5000-24999	0.6723***	3.74
Population with income \$25000-74999	0.4661**	2.72
Employment rate	0.0812	0.63
Unemployment rate	0.4384*	2.40
Year2004	0.0019	0.60
Year2005	0.0133***	3.54
Year2006	0.0268***	5.22
Year2007	0.0269***	4.16
Year2008	0.0261***	3.89
Year2009	0.0242*	3.11
Year2010	0.0330***	4.04
_cons	-0.8925	-2.36

* p<0.05, **p<0.01, ***p<0.001

Observations: 225

R square (overall): 0.1194

children. Glied and Jack (2003) found out variations in unemployment are important for insurance coverage for educated people. My analysis also shows an increase of unemployment rate will bring more uninsured adults. However, a possibility remains that an employee could be uncovered due to various reasons: their employers do not offer coverage, they choose their spouse's employer's coverage instead or they are not eligible according to firms' policy. According to Kaiser Family Foundation 2013 Employer Health Benefits Survey, the rate of employees covered by their own employers dropped through 2003-2010 by 3%⁷.

There is one more possibility that adults cannot afford the health: the income growth fails to catch up with the health insurance growth. The health expenditure inflates naturally over time due to the price inflation of drugs and medical equipment. According to Health Care Cost Institute (2010), health expenditure for adults under 65 grew three times faster than the rate of general inflation in 2010, which is due to the increased prices instead of the growth health service use. My results reveal that more population at the lower income level result in more people between 18-65 will be uninsured. However, more analyses are required to reach the conclusion that people are uninsured because they don't have enough income growth to cover the health insurance growth because my analysis finds that controlling for median income has no effect on the uninsured rate.

Although Medicaid coverage does not prove to have a statistically significant impact on uninsured rate with the customized 5% level, it has a p value very close to

⁷ 62 percent of employees were covered by employment-based insurance dropped from to 59 percent in 2003-2010.

0.05 ($p=0.06$). It has a negative coefficient (-0.0529), which means more Medicaid coverage could help reducing the number of adults under 65 lacking health insurance. The reason comes from the shrinking employment-based coverage during recession. In economic recession, as more people lose their jobs or find their income reduced, more of them will be eligible for Medicaid and State Children's Health Insurance Program by meeting the low-income requirements. The average annual growth rate of Medicaid expenditure for United States in fiscal year 2007-2010 is 6.8%, which is almost two times of the rate in fiscal year 2004-2007 (3.6%)⁸.

However, the uninsured still faces challenges. Diane (2009) found out that 1 percentage point increase in the national unemployment rate produces 1 million more Medicaid enrollees but 1.1 million more uninsured at the same time. Although Medicaid coverage expanded in severe economic downturn, the expansion did not cover the entire newly uninsured adult population. Some states provide income eligibility cutoff for children greater than 200% of Federal Poverty Level, which might cover children while leaving the parents uninsured. Medicaid would not cover adults without children and without disability. But this situation should change after the fully enactment of the Affordable Care Act that will cover more adults. Since my data covers the pre Affordable Care Act period, the effect of the Medicaid coverage of adult is expected to be stronger in the future. Last but not least, the Medicaid coverage is sensitive to budget change. If there is a cutback of Medicaid expenditure from state funds in states, the effect will be doubled or more since Medicaid is a jointly funded program.

⁸ The average annual growth in Medicaid Spending, State Health Fact, Kaiser Family Foundation,

6 Limitations

My data for calculating the private insurance cost per enrolled adult is constrained by the sample drawn by MEPS. My results only explain the parameters for selected 34 states and the time period of 2003-2010. Some characteristics variables that might have an impact on the uninsured rate are left out. Since employment has a statistically significant effect, job characteristics such as job types might play a role. Glimmer found out that the employment shift of workers to part-time, self-employed, non-unionized, or service industries leads to a loss of the benefit associated with former employment by 0.8 percent. Due to the lack of data about the job types proportions in each state for 2003 to 2010, this variable is not included in the analysis. .

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Data Sources

1 Private health insurance expenditure 2003-2010:

Medical Expenditure Panel Survey, Summary tables (total Health Services, percent of persons with an expense, mean expense per person with an expense, and distribution of expenses, by source of payment), 2003-2010

http://meps.ahrq.gov/mepsweb/data_stats/quick_tables_results.jsp?component=1&subcomponent=0&year=-

[1&tableSeries=8&searchText=&SearchMethod=1&Action=Search](http://meps.ahrq.gov/mepsweb/data_stats/quick_tables_results.jsp?component=1&subcomponent=0&year=-1&tableSeries=8&searchText=&SearchMethod=1&Action=Search)

2 Population 18-65 covered by private health insurance:

Census Bureau Health, Health Insurance historical Table-HIB series, Health Insurance Coverage Status and Type of Coverage--Children Under 18 by Age: 1999 to 2011, Health Insurance historical Table-HIB series, Health Insurance Coverage Status and Type of Coverage—Persons Under 65: 1999 to 2011

http://www.census.gov/hhes/www/hlthins/data/historical/HIB_tables.html

3 Medicaid and Medicare coverage, personal income proportion, age proportion, race proportion, nativity proportion, uninsured rate of adults under 65

Current Population Survey table creator, Census Bureau

<http://www.census.gov/cps/data/cpstablecreator.html>

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