Economics Bulletin

Volume 29, Issue 2

Health insurance coverage and the role of income uncertainty

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Abstract

This paper uses the National Longitudinal Survey data set to examine the role of income uncertainty in explaining the likelihood of health insurance coverage among individuals. After controlling for a number of socioeconomic, demographic, and behavioral factors, the results suggest that individuals who face greater income uncertainty are less likely to have health insurance coverage. Additionally, the likelihood of health insurance coverage increases with income and educational attainment.

Citation: Swarnankur Chatterjee, (2009) "Health insurance coverage and the role of income uncertainty", *Economics Bulletin*, Vol. 29 no.2 pp. 1246-1254.
Submitted: Mar 18 2009. **Published:** June 03, 2009.

1. Introduction

Health insurance is a financial product that mitigates an individual's financial loss and provides access to health care services, which are associated with improved health status (Ehrlich & Becker, 1972). Prior research has provided ample evidence that access to health care, which is enhanced by adequate health insurance coverage, is a predictor of physical well-being among the insured (Bindman et al., 1996; Starfield, 1995). O'Hara (2004) found that individuals with better health are more likely to have health insurance. Findings from past studies have also indicated that full-time employment is a strong predictor of staying insured (Hoffman & Pohl, 2002; Markowitz, Gold & Rice, 1991; Scannell & Hong, 1997; Thorpe & Florence, 1999). Adler and Newman (2002) found that socioeconomic factors, such as income, educational attainment, and employment account for most of the disparity in insurance status among individuals. Robst, Deitz, and McGoldrick (1998) found that income uncertainty is negatively associated with long-term financial decision making among individuals. Also in the context of investments, Henderson and Ioannides (1983) found that when individuals face less income uncertainty, their investment demand is greater than their consumption demand; therefore, they are more likely to invest in asset ownership. Conversely, when individuals face greater income uncertainty, they are less likely to engage in long-range savings decisions and instead are more likely to use their income for present consumption.

Although the effect of income uncertainty on individual financial decisions has been studied before, the relationship between income uncertainty and health insurance coverage of individuals has not been explored in earlier studies. This study uses the National Longitudinal Survey data set (NLSY79) to examine whether income uncertainty among individuals can affect their likelihood of having health insurance coverage.

2. Literature Review

The health insurance market in the United States is comprised of a wide variety of public (Medicare, Medicaid, SCHIP, and a host of state-sponsored insurance) and private (employer-based and individually purchased private insurance) providers of health insurance, not all of which are available to every individual or household. Whether from a public or private source, health insurance coverage is associated with increased access to medical care for both individuals and families (Nielsen and Garasky, 2008). Previous studies have found that individuals with higher income and greater educational attainment are more likely to remain insured (Scannell & Hong, 1997). Other investigations into health insurance status suggest that research must account for a host of sociodemographic controls. For example, Hanson (2001) found that approximately 10% of all households with children have no insurance coverage, while Fronstin (2000) found that men are more likely to be uninsured than women. This can be attributed to the fact that a greater number of women qualify for public assistance programs because of their lower wage levels, during pregnancy, and as parents of infants or young children, when compared with men (Short, 1998).

The effect of income uncertainty on household investment behavior has been discussed in a number of past studies. Previous examinations by Henderson and Ioannides (1983, 1987); Fu (1991, 1995), and Robst et al. (1998) indicated that income uncertainty among individuals increases their risk aversion. As a result, individuals tend to plan less for future and increase their

current consumption. Robst et al. (1998) found that this shift in preference among investors who face income uncertainty also results in a greater demand for liquidity and reduces the likelihood of investment in financial products that will tie up a portion of their income over a longer period.

3. Data

This study uses a comprehensive data set containing economic, social, demographic, and behavioral characteristics derived from the National Longitudinal Survey (NLSY79). This data, derived from a nationally representative panel, is composed of 12,686 respondents. The 1979 wave began with a national survey of individuals born between 1957 and 1964. The NLSY79 has surveyed the same respondents across consecutive waves of this panel between 1979 and 2006. Zagorsky (1997, 1999) found that the NLSY data correlates well with the data in other major national databases, such as the Survey of Consumer Finances (SCF), Panel Study of Income Dynamics (PSID), and Survey of Income and Program Participation (SIPP). The level of respondent retention has been close to 90% (Haurin et al., 1996). The information in this study related to health insurance is drawn from the most recent 2006 wave of the data set. Only employed individuals who do not receive Medicaid or any other form of welfare assistance are included in this analysis.

4. Model

Past studies have provided empirical confirmation that a greater degree of uncertainty regarding future income reduces household investment participation (Haurin & Gill, 1987; Robst et al., 1998). Since health insurance participation requires a decision to set aside insurance premiums that will help pay for future medical consumption, it is therefore hypothesized that the preference for retaining health insurance coverage will also decrease as income uncertainty increases among investors. Therefore, the empirical model for this paper focuses on the relationship between income uncertainty and insurance status after controlling for potential endogeneity. To determine empirically the effect of income uncertainty on the probability of having insurance coverage, a two-stage estimation model is used. Income uncertainty is instrumented in the first stage. The estimation from the reduced form model in the first stage is then included as an explanatory variable in the second stage to determine the likelihood of health insurance coverage.

Since the dependent variable insurance status is binary, a two-stage probit least squares (2SPLS) estimation method is used (Brueckner & Largey, 2006). This method is similar to the regular two-stage least squares (2SLS) model used for estimating continuous variables (Wooldridge, 2006). The only exception in this case is that while in the first stage, OLS estimation is computed for income uncertainty, which is a continuous variable; the second stage uses probit estimation to model insurance status after including the exogenous variables and replacing the endogenous variables with fitted values from the first stage. This technique applies the process described by Maddala (1983).

Income uncertainty= f (X1, e1) stage 1 (1)

Insurance status= f (X2, income uncertainty, e2) stage 2 (2)

X1= Vector of instrument variables in stage 1

e1= Error term 1

X2= Vector of personal characteristics in stage 2

e2= Error term 2

4.1 Income Uncertainty

Income uncertainty is determined by following the method suggested by Robst et al. (1998). Income uncertainty is computed by regressing income for the individual years against various socioeconomic and demographic characteristics. Thus, residuals of annual income regressions from 1994 through 2006 are obtained. Uncertainty is equal to the standard deviation of the residual earnings (σ eit). This method is also comparable to estimations of income uncertainty carried out in past studies (Amuedo-Dorantes & Pozo, 2002; Kazarosian, 1997). Income uncertainty is instrumented with personal mastery and job risk. The scores for personal mastery and job risk are obtained from the scales for these measures included in the NLSY survey.

4.2 Other Control Variables

Other explanatory variables include age, income, and educational attainment. Previous studies have found these characteristics to be predictors of health insurance coverage (Fronstin, 2000; Markowitz et al., 1991). Age squared is also included in the model because of its quadratic relationship with saving and consumption decisions in prior literature (Yin, DeVaney & Stahura, 2005; Wang & Hanna, 1997). Earlier studies have found that race, region of residence, and marital status are also predictors of being insured (Fronstin, 2000; Gabel, 1999). Race is included in the empirical model with white respondents as the reference group, and black, Hispanic and others are compared against the whites. For regions of residence, North East is chosen as the reference, while residences in the West, North Central, and South are compared against the North East. Having children and family size are included because researchers previously have found evidence that these factors are significant predictors of health insurance coverage (Hanson, 2001). Gender is included in the model to control for the effect of gender difference on the health insurance status of individuals (Fronstin, 2000; Short, 1998).

5. Results

Table I shows the change in insurance status from 1994 through 2006. The results indicate a gradual decline in the percentage of uninsured and a steady increase in insured as a percentage of the population. The percentage of uninsured fell from approximately 20.1% in 1994 to 18.8% in 2006. However, the year 2000 recorded the lowest percentage of uninsured 16.7% and the highest percentage of insured 83.3%, before reverting to an uninsured rate above 18% in the subsequent years.

Table I: Insurance Coverage 1994-2006

Year	Insured %	Uninsured %
1994	79.90%	20.10%
1996	80.10%	19.90%

1998	81.90%	18.10%
2000	83.30%	16.70%
2002	81.10%	18.90%
2004	81.20%	18.80%
2006	81.16%	18.84%

Table II shows the demographic and socioeconomic composition as well as health insurance coverage rates for the population. The results show that insurance coverage is higher for married individuals (60.5%). Also, a comparatively higher percentage of women (83.1%) are insured. Additionally, a higher percentage of individuals with lower educational attainment are uninsured. Whites (45.88%) reflect a larger percentage of respondents with insurance coverage when compared with other racial groups. The percentage of uninsured is the highest at the lowest quartiles of income (49.4%) and wealth (47.4%).

Table II: Descriptive Statistics

Variables	Coding	Uninsured	Insured
Age	Continuous	42.69	42.83
Male	Equal to 1 if yes; 0 otherwise	21.58%	78.42%
Female	Equal to 1 if yes; 0 otherwise	16.88%	83.12%
Married	Equal to 1 if yes; 0 otherwise	30.09%	60.47%
Education			
<12	Equal to 1 if yes; 0 otherwise	24.00%	7.56%
12	Equal to 1 if yes; 0 otherwise	49.05%	39.32%
13-15	Equal to 1 if yes; 0 otherwise	19.87%	24.50%
16	Equal to 1 if yes; 0 otherwise	5.26%	12.84%
>16	Equal to 1 if yes; 0 otherwise	1.82%	9.05%
Family size	Continuous	2.73	3.19
Have Children	Equal to 1 if yes; 0 otherwise	72.59%	76.73%
Race		30.54%	45.88%
White	Equal to 1 if yes; 0 otherwise	38.92%	27.69%
Black	Equal to 1 if yes; 0 otherwise	16.11%	12.45%
Hispanic	Equal to 1 if yes; 0 otherwise	14.43%	13.98%
Others	Equal to 1 if yes; 0 otherwise		
Region			
North Central	Equal to 1 if yes; 0 otherwise	20.34%	26.01%
West	Equal to 1 if yes; 0 otherwise	19.10%	18.25%
South	Equal to 1 if yes; 0 otherwise	43.44%	35.03%
North East	Equal to 1 if yes; 0 otherwise	17.12%	20.71%
Income			
Income Quintile 1	Equal to 1 if yes; 0 otherwise	49.42%	14.03%

Income Quintile 2	Equal to 1 if yes; 0 otherwise	27.28%	17.94%
Income Quintile 3	Equal to 1 if yes; 0 otherwise	12.82%	21.97%
Income Quintile 4	Equal to 1 if yes; 0 otherwise	10.48%	46.06%
Net worth			
Net worth Quintile 1	Equal to 1 if yes; 0 otherwise	47.37%	20.53%
Net worth Quintile 2	Equal to 1 if yes; 0 otherwise	17.44%	15.45%
Net worth Quintile 3	Equal to 1 if yes; 0 otherwise	22.56%	26.92%
Net worth Quintile 4	Equal to 1 if yes; 0 otherwise	12.63%	37.11%

Table III shows the two-stage regression results for the model. The results show that income uncertainty is a negative predictor of insurance coverage among individuals. Similar studies in the past have found that income uncertainty is also associated negatively with investment participation and long-term financial decision making (Haurin & Gill, 1987; Robst et al., 1998). When compared with those in the fourth quartile of income, individuals in the first, second, and third quartiles of income are less likely to have insurance coverage. The results also show that job tenure is associated positively with having health insurance coverage. The negative association between low income and insurance status is consistent with findings from previous studies (Fronstin, 2000). When compared with women and households with children, men are less likely to have health insurance coverage. Past studies observed similarly that men have a lower probability of being insured than women, whereas having children also reduces the likelihood of having health insurance coverage (Hanson, 2001; Short, 1998). Results also show that compared with the reference group of less than 12 years of schooling, individuals who have greater than 12 years of schooling are more likely to have coverage. This finding also validates the results from previous assessments in this area, which have found that educational attainment increased the probability of staying insured (Adler & Newman, 2002; Gabel, 1999).

Table III: Estimation of Insurance Status (2^{nd} stage)

Dependent Variable	Insured		
Variables	Coef.	S.E.	Sig
Log Income Uncertainty	-0.652	0.113	***
Age	-0.139	0.407	
Age Square	0.002	0.005	
Income (Ref: Q4)			
Income Q1	-0.857	0.154	***
Income Q2	-0.641	0.095	***
Income Q3	-0.333	0.071	***
Married	0.07	0.062	
Male	-0.201	0.047	***
Race (Ref: White)			
Black	-0.101	0.087	
Hispanic	-0.221	0.29	

Others	-0.031	0.07	
Family size	0.024	0.019	
Children	-0.171	0.064	***
Education (Ref: <12 years)			
12	0.089	0.072	
13-15	0.33	0.087	***
16	0.553	0.121	***
> 16 years	0.456	0.14	***
Job Tenure	0.251	0.101	**
Region (Ref: North East)			
North Central	0.049	0.072	
South	-0.061	0.067	
West	-0.019	0.077	
Constant	3.267	0.273	***
Wald Chi-square test	940.69	P>|c2|	***
N	4817		

6. Conclusion

This paper uses data from the NLSY to examine the role of income uncertainty in the health insurance coverage decisions made by individuals. The results suggest that while income uncertainty is associated negatively with health insurance coverage, higher levels of income, longer job tenure, and educational attainment increase the likelihood of insurance coverage among individuals. The lower rate of insurance coverage among individuals who face income uncertainty prevents them from accessing quality health care. Further, this lack of coverage puts them at risk of being burdened with even larger medical expenses in the future. The negative association of income uncertainty and lower income levels with health insurance coverage is a possible indicator that the high cost of health insurance premiums makes it unaffordable for lower income individuals who do not receive welfare benefits to have health insurance coverage. As the government and policy makers grapple with ideas to tackle the escalating costs of medical care, the findings of this study indicate that it will be important in the future for scholars and health care policy makers to develop strategies that can help lower income households gain access to health insurance plans. Since lower educational attainment is associated with being uninsured, one possible reason for the low rates of health insurance coverage might possibly result from a lack of awareness in society regarding the availability and qualification criteria for various health insurance programs (Curtis, 2002). In the future, community directed financial education programs focused on increasing awareness about the various health insurance and public assistance options should be developed in order to increase health insurance coverage among lower income and less educated households.

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