Max E. Schnidman

Prof. Videras

Economics 400: Econometrics

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Lab IV

**Part I: Data and Models**

One of the largest debates in Congress is over the fate of entitlement programs. Some people, however, may not need them as much as others: wealthier individuals, for example, will not need these programs as much as poorer individuals, but may lose their wealth in investments. It is therefore necessary to understand how people invest, and whether wealthier people are more likely to invest riskily.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Observations | Mean | Std.Dev | Min | Max |
| *Age* | 4442 | 50.21139 | 16.17051 | 18 | 95 |
| *Health* | 4442 | 1.895993 | .8306161 | 1 | 4 |
| *married* | 4442 | .6051328 | .4888772 | 0 | 1 |
| *wealth* | 4442 | .00731858 | .3174611 | 0 | 6.498344 |
| *college* | 4442 | .4603782 | .4984838 | 0 | 1 |
| *percentrisk* | 4147 | .2293965 | .3221697 | 0 | 1 |
| *Riskb* | 4442 | .4306619 | .4952246 | 0 | 1 |

*Table I: Descriptive Statistics*

*Age* is the person’s age. I would expect risky investments to decrease with age, as people become more concerned with their welfare. *Health* is a person’s health quality, ranging from one to four. I expect risky investments to decrease with health, as healthier people are less likely to take risks, relative to unhealthy people, who have less to lose in the face of failed investments. *Married* is a binary variable determining marriage status. I expect married couples to make riskier investments because they have mutual support. *Wealth* is a person’s wealth, in $100,000s. I expect risky investments to increase with it, as more wealth means a loss is less devastating, but I will also include *Wealth2*to see if a quadratic trend exists for wealth. *College* is a binary variable for whether or not someone has college-level education. I expect risky investments to be higher among college-educated people, as they are more likely to know how to riskily invest properly. *Percentrisk* states how much of a person’s investments are in risky assets; on average, 22% of individuals’ investments are risky. *Riskb* is a binary variable stating whether or not someone has any risky assets. 43% of the sample has risky assets.

I am running three different kinds of regressions: an OLS regression on *riskprecent,* and a linear probability model and a probit model on *Riskb*. A linear probability is a standard OLS regression, but risks heteroskedasticity (unless corrected by robust standard errors), and risks predicted values less than 0 and greater than 1. A probit model controls for these problems, but requires an average marginal effect (or a marginal effect of the average) to properly interpret.

**Part II: Results**

The results for the three models are below. Robust standard errors are in parentheses.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | OLS on *riskprecent* | LPM on *riskb* | Probit on *riskb* | Average Marginal Effects |
| *Age* | .0016114 (.000293)\* | .003335 (.0004123)\* | .0096571 (.001389)\* | .0029214 |
| *Health* | -.0353182 (.0056368)\* | -.0772134 (.0079972)\* | -.2494061 (.0278167)\* | -.0754482 |
| *Married* | .0592476 (.0094429)\* | .1518965 (.0138595)\* | .4576285 (.0439324)\* | .138438 |
| *Wealth* | .4256476 (.0380674)\* | .4693024 (.0404956)\* | 2.491244 (.4265373)\* | .7463239 |
| *Wealth2* | -.0696002 (.0099462)\* | -.0830965 (.0118661)\* | -.3846734 (.0660331)\* |  |
| *College* | .1356105 (.0099226)\* | .298312 (.015038)\* | .8117747 (.0441071)\* | .2455713 |
| Constant | .0840878 (.0188271)\* | .154818 (.0257239)\* | -.9818656 (.0883279)\* |  |
| R2 | .1867 | .2649 | .2218 |  |
| N | 4147 | 4442 | 4442 | 4442 |

\*: P<.05

*Table II: Regressions*

The majority of these results are in line with the expectations laid out in Part I. There are, however, an interesting exception. Wealth actually increases the percent of risky investments, on average, until about $300,000 in wealth, at which point the percent of risky investments decreases. Similarly, in the linear probability model, wealth, on average, increases the probability of having a risky investment, until about $280,000 in wealth, at which point the probability of having risky investments decreases.

The OLS model has a rather good R2 for cross-sectional data, explaining 18.67% of the variation of *riskprecent*. *Marriage* and *College* have particularly notable impacts. *Marriage* demonstrates that, on average, being married increases percent of risky investments, on average, by .06 percent, *ceteris paribus*. *College* demonstrates that, on average, having a college degree increases percent of risky investments, on average, by .14 percent, *ceteris paribus*.

The linear probability model also has a strong, R2, which explains 26.49% of the variation in whether or not a person has a risky asset. *Health, Marriage,* and *College* have particularly notable impacts. *Health* demonstrates that, on average, a greater level of self-reported health decreases likelihood of having a risky investment, on average, by 8 percent, *ceteris paribus*. *Marriage* demonstrates that, on average, being married increases the likelihood of having a risky investment, on average, by 15 percent, *ceteris paribus*. *College* demonstrates that, on average, having a college degree increases the likelihood of having a risky investment, on average, by 30 percent, *ceteris paribus*. Some of the predicted values of this model, however, are less than zero or above one, signifying issues with the accuracy of this model. As a result, we must turn to the probit model.

The probit model, by its design, corrects for the problem we just saw in the linear probability model. Additionally, the signs on all of the coefficients on the model are identical to the linear probability model, demonstrating its accuracy. The Psuedo-R2 of 22.18% is close to the R2 of the linear probability model. These are both signs that the model is close to the linear probability model. The coefficients, however, cannot be interpreted in this model, because they all change with respect to each other. To analyze the coefficients, we must take the average marginal effect. In doing so, we find that the effect of age decreases slightly, but the effect of health barely changes. The effect of marriage and college decrease very slightly, but the effect of wealth increases greatly. This is the most significant change between the linear probability model and the probit model, showing that wealth has a very strong impact on whether or not someone has a risky investment.

It is clear that wealth has a significant effect on both the likelihood of having a risky investment and the percent of risky investments held. With the quadratic cutoff at very high levels of income, the push of the wealthy toward risky investments poses a significant policy problem for controlling entitlement spending.



use "H:\Data Lab 4.dta", clear

capture log close

log using "H:\SchnidmanLab4.log", replace

set more off

gen percentrisk = (risky/(risky+safe+bond+retirement))

gen wealth2 = wealth^2

gen riskb=1 if risk>0

replace riskb=0 if riskb==.

d

sum age health married wealth college percentrisk riskb

reg percentrisk age health married c.wealth##c.wealth college, robust

reg riskb age health married c.wealth##c.wealth college, robust

predict lpmhat

sum lpmhat, d

probit riskb age health married c.wealth##c.wealth college, robust

margins, dydx (age health married wealth college)