Precautionary Saving and Health Insurance: A Portfolio Choice Perspective

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JEL Classifications: G11, I1

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Abstract

This paper analyzes the impact of health insurance on household portfolio choice. Using Health Retirement Survey and Survey of Consumer Finance databases, t finds that, other things being equal, insured households are more likely to own stocks and to invest a larger proportion of their financial assets in stocks than uninsured households do. The results remain strong, even after controlling for household observable and unobservable characteristics and reverse causality. The results are consistent with the theory on precautionary motive which suggests that future expenditure risk could affect household asset allocation. The positive relationship between health insurance and stock holdings implies that a precautionary motive is strong in household portfolio choice decisions.

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I. Introduction

Future expenditure uncertainty might lead households to behave in a precautionary fashion, e.g., to have more savings and to allocate more savings to safe assets. Health expenditure risks could be quite serious among certain groups of people. For example, Feenberg and Skinner (1994) documented that health expenditures accounted for more than 20% of the household income of 4.3% of non-elderly households. Health expenditure risk could be even more serious for uninsured households. According to the Employee Benefit Research Institute as of 1996 17.4% of the US population had no health insurance, a number that had grown by 15% between 1988 and 1996. Health expenditure risk, therefore, is a potentially important background risk and might have a significant impact on a household's consumption, savings and asset allocation.

This paper investigates the relationship between household health insurance status and portfolio choice decisions, an issue is of great importance for at least two reasons. First, the empirical results would help us understand the link between the social security system and the financial market. If household portfolio choice is associated with health insurance status, then the direct policy implication would be that the growth of the equity market is related to the evolution of the social security system. Second, such a study could provide new insights into the effect of precautionary motives on household savings behavior. Although moral hazard and adverse selection problems have prevented households from fully insuring against health expenditure uncertainty, health

insurance certainly reduces the risk of out-of-pocket health expenditures. If the precautionary motive is strong, it should be expected that uninsured households would tend to hold more risk-free and liquid assets than insured households, other things being equal. Therefore, the empirical results regarding the relationship between health insurance and portfolio choice could provide further evidence of the impact of precautionary motives on household savings decisions.

This paper addresses two closely related issues that have been studied extensively but separately in the existing literature: the impact of health insurance on precautionary saving and the effect of precautionary motive on household portfolio choice. The impact of health insurance on household precautionary saving has been the focus of great attention recently. Palumbo (1999) found that uncertainty about out-of-pocket medical expenses is a strong motive for precautionary saving among the elderly. Gruber and Yelowitz (1999) investigated the effect of Medicaid on household consumption expenditures and found a strong positive relationship between health insurance and consumption. Chou *et al.* (2002) also documented a negative relationship between health insurance and household saving in Taiwan. Using the Survey of Consumer Finance 1989 data, McCluer (1996) examined the interaction between health insurance and the saving behavior of non-retired people. She found that households with health insurance have less wealth than those without insurance, which is consistent with the notion that the precautionary motive is

weak in those households' savings decisions and the endogeneity between health insurance and wealth as well.

The theory on the precautionary motive suggests that future expenditure risk could affect household saving behavior, not only through the choice between consumption and saving, but also through the allocation of savings, that is, the choice among assets with different degrees of risk. As a partial review of the theoretical literature, Kimball (1993) showed that under the standard risk aversion, the zero-mean background risk will induce a household to allocate a larger share of its wealth to risk-free assets. Gollier and Pratt (1996) defined the risk-vulnerable preference, which guarantees that the individual will behave in a more risk-averse way due to the addition of a zero-mean risk. Koo (1991) and Bertaut and Haliassos (1992) also demonstrated that the demand for risky assets will decrease as the background risk of income increases. Eechoudt (1996) further presented a necessary and sufficient condition for the property of a utility function which guarantees more risk-averse behavior when there is a first- and second-order stochastic dominance change in risk.

Empirical studies of the effect of background risk on household portfolio structure have been focusing on labor-income risk, and found that labor-income uncertainty can reduce incentives to hold risky assets (see, among others, Chakraborty and Kazarosian (1996), Guiso *et al.* (1996), Hochguerted (1997), and Heaton and Lucas (1999, 2000)). Less attention, however, has been paid to the impact of health expenditure uncertainty on household portfolio choice. On the

other hand, empirical research on the relationship between health expenditure uncertainty and household financial wealth has focused on the relationship between health insurance and savings. Yet, a subtler question remains unanswered: what is the impact of health insurance on household portfolio choice?

A closely related stream of study is to investigate the impact of health status on household portfolio choice. Edward (2003) argued that health status could affect household portfolio choice through its effect on risk aversion if health status is entering household utility. Rosen and Wu (2003) pointed out that there are various channels through which health status could affect household portfolio choice, such risk aversion, planning horizon, life expectancy and so on. The authors further tried to identify the channels through which health status can effect household portfolio choice, but found that health status effect remains significant even after controlling for risk attitude, planning horizon, life expectancy, bequest motive, and so on. A recent paper by Berkowitz and Qiu (2003) argued that a health shock leads to a large decline in household financial assets. The effect of health status on the riskiness of a household portfolio could be largely explained away by the difference in financial assets between healthy and sick households.

Unlike health status, health insurance status is closely related to household future health expenditure uncertainty. Given the increasing tremendous government involvement in providing and assuring access to medical

care, it might be more important, from a policy point of view, to know the relationship between health insurance rather than health status and portfolio choice. This paper draws the information from the Health and Retirement Survey to examine the relationship between health insurance status and household asset allocation. By way of preview, it finds that uninsured households are less likely than insured households to invest in stocks. Insured households tend to allocate a greater portion of their wealth to risky assets than do uninsured households. Moreover, the results on married households show that married households' portfolios depend on the coverage degree of the spouses. Specifically, married households with both spouses insured tend to hold more stocks than households with only one spouse insured. And, the latter hold more stocks than households with neither spouse insured. Thus, there seems to be a pecking-order decreasing need for precautionary assets among married couples that have both spouses insured, only one spouse insured or neither spouse insured. The results from single households indicate that the portfolio choice effect of health insurance is important at the individual level as well. We further demonstrate that these results are significant even after controlling for household observable and unobservable characteristics and for reverse causality. Moreover, the underlying attitudes of households, such as risk aversion, planning horizon, bequest motives can not explain away the positive relationship between health insurance and stock holding. We also test the robustness of the results using the Survey of Consumer Finance database and find consistent

results between these two databases. The evidence on the relationship between health insurance and portfolio choice indicates that households' portfolio choices are influenced by their health insurance status and suggests that precautionary motives are strong in household saving decisions. The results also imply a positive link between the social security system and the financial market.

The paper proceeds as follows: Section II uses a simple conceptual model to illustrate how health insurance can affect portfolio choices through precautionary motives. Section III describes the data sources. Section IV presents the effect of health insurance on household portfolio structure. Section V tests the robustness of the results using the Survey of Consumer Finance database. Section VI summarizes and concludes the paper.

II. A Conceptual Model

To understand how uncertain health expenditure can through a precautionary motive influence household consumption, savings and the allocation of savings between risk-less and risky assets, we consider a very simple problem. A representative household is maximizing expected inter-temporal utility and have to choose between consumption, saving, and the allocation of assets between a risky and a risk-less asset. In order to capture the effect of health expenditure uncertainty, the household is assumed to have a certain income, $\overline{Y}$, but is uncertain about health expenses, M_t. The household lives infinitely with a time-additive isoelastic utility. At the beginning of period t, after observing income

and health expenditures, the household chooses consumption, C_t; saving in bonds, B_t; and saving in stocks, S_t, to maximize its lifetime-expected utility. Hence, the household solves the following problem,

$$MAX_{\{B_t,S_t\}} E_0 \sum_{t=0}^{\infty} \beta^t \frac{C_t^{1-\gamma}-1}{1-\gamma}; \qquad \gamma > 0 \tag{1}$$

subject to,

$$C_t + B_t + S_t \le W_t \tag{2}$$

$$W_{t+1} = S_t(1+r_{t+1}^s) + B_t(1+r_f) + \overline{Y} - M_{t+1} \tag{3}$$

$$M_t \sim N(\overline{M}, \sigma_M^2) \tag{4}$$

$$C_t > 0, \ W_t > 0 \tag{5}$$

where E_0 is expectation at time 0. C_t is the consumption at time t. M_t is the health expenditure at time t and is assumed to be a I.I.D. normal distribution with the mean $\overline{M}$ and variance σ_M^2. β is the discount rate. r_{t+1}^s is the return of stocks and r_f is the return of risk-less assets. In addition to the flow of wealth constraints, the household is assumed to face a short sale and borrowing constraints in the equity and bond markets respectively; that is,

$$B_t \ge 0 \tag{6}$$

$$S_t \ge 0 \tag{7}$$

The coefficient of relative risk aversion, γ, measures the strength of both risk aversion and prudence, which guarantees that the households in this model will engage in precautionary saving. However, the drawback of assuming isoelastic (CRRA) utility is that there is no closed-form solution for the level of

optimal portfolio choice, so we numerically solve the problem. Two Euler equations determine the optimal choices of bonds and stocks.

$$B_t: \qquad (W_t - S_t - B_t)^{-\gamma} = MAX[(W_t - S_t)^{-\gamma}, \beta E_t[r_f (W_{t+1} - S_{t+1} - B_{t+1})^{-\gamma}] \tag{8}$$

$$S_t: \qquad (W_t - S_t - B_t)^{-\gamma} = MAX[(W_t - B_t)^{-\gamma}, \beta E_t[r^s_{t+1} (W_{t+1} - S_{t+1} - B_{t+1})^{-\gamma}] \tag{9}$$

The bond return is assumed to be risk free with an annual return of 2%. The stock returns are assumed to take on the values -0.08 and 0.235 with an equal probability to match the U.S. stock market historical return of the mean 7.75% and the standard deviation of 15.7%. The rate of time preference β is set to 0.9. The coefficient of relative risk aversion is set equal to 8.[1] The income is normalized to be 1.

The purpose of this model is to qualitatively explore the impact of expenditure uncertainty on portfolio choice. The quantitative assessment will be left as an empirical matter. Hence, we will not attempt to calibrate the household health expenditure process. Rather, we consider several artificial situations with different degrees of health expenditure risks and examine how they can affect household consumption and portfolio choice. Specifically, we consider the household portfolio choice in three different situations with increasing degrees of health expenditure risks: In situation one, the household is fully insured and faces no medical expenditure risk. Situation two is a first-order stochastic deterioration of the health expenditure risk of situation one, so that households

[1] Since the result might be sensitive to the risk aversion parameters, I also experiment with coefficients that are equal to 2, 4, and 10. All conclusions remain unchanged.

face certain levels of medical uncertainty. The mean medical is assumed to be -0.3 with a standard deviation 0.15.[2] The process of health expenditure is set to take on the values -0.45 or -0.15 with equal probability. Situation three is a mean- preserving shift of the health expenditure uncertainty of situation two. The mean of medical expenditure is still -0.3, but the standard deviation is doubled to 0.3. In this case, the process of health expenditure is set to take on a value of -0.60 or 0 with equal probability.

The optimal policy function of consumption and asset allocation with respect to wealth is presented in Figure 1. Figure 1a shows the household policy function of consumption. The policy functions of consumption show that the household will spend all of its wealth when wealth is below certain levels. For example, in situation 1, when wealth is below 0.9, the household will spend all of its wealth on consumption and does not engage in saving. The intuition behind this behavior is simple: because the household will have greater wealth from income in the future, it would like to borrow and increase consumption today to equalize the inter-temporal marginal utility of consumption. However, due to a borrowing constraint, it will not be able to do so and can only consume all the

[2] Given that income is normalized to 1, a -0.3 mean health expenditure implies that the average health expenditure accounts for 30 percent of income. Since the focus of this model is the comparative static analysis of the impact of different degrees of expenditure risk on portfolio choice, this number is chosen only to reflect a FOSC change of health expenditure. Changing the mean of health expenditure does not affect the conclusion as long as there is an increase in health expenditure. Feenberg and Skinner (1994) found that health expenditure accounted for more than 20% of the household income of 4.3% of non-elderly households. Since health shocks could lead to a large decline in household labor income (Wu (2000)), a 30-percent health expenditure/income ratio could be reasonably viewed as the health expenditure level for sick and uninsured households.

wealth they have. Similar behavior could be found in situations 2 and 3, but we can see that the household will engage in saving at a lower level of wealth and that the consumption function is higher when the household faces a lower expenditure uncertainty, indicating that the household will save more when facing greater expenditure uncertainty. This result suggests that a precautionary motive will lead the household to save more when facing greater health expenditure uncertainty, which is consistent with the previous empirical findings on the impact of health insurance on precautionary saving.

To see the impact of expenditure uncertainty on the asset allocation of savings, Figure 1b plots the policy function of stocks to wealth ratio. When households start saving, they will first put all of their savings in stocks due to the return premium of stocks over bonds.[3] But, from Figure 1b, one can see that households will start to invest in bonds at a lower wealth level when facing greater expenditure risk. Further, they will invest a smaller proportion of wealth in stocks when the expenditure risk increases for a given level of wealth. These results show that the precautionary motives will not only lead households to save more but also to allocate fewer assets to risky assets when facing greater expenditure uncertainty.

[3] The results are similar to the results from a portfolio choice model with income uncertainty and liquidity constraints, such as in Haliassos and Michaelides (2003) and Heaton and Lucas (1997). The reason is simple: Health expenditure essentially changes the household income process. Hence, situation two could be viewed as a first-order stochastic-dominated shift of the income process of situation one, while situation three is a second-order stochastic-dominated shift of the income process in situation two.

In the context of this study, health insurance reduces the health expenditure risk, which discourages households' precautionary saving and leads them to save more in risk-less assets. If the precautionary motive is strong, other things being equal, the insured households will invest a greater proportion of financial assets into stocks than uninsured households do.

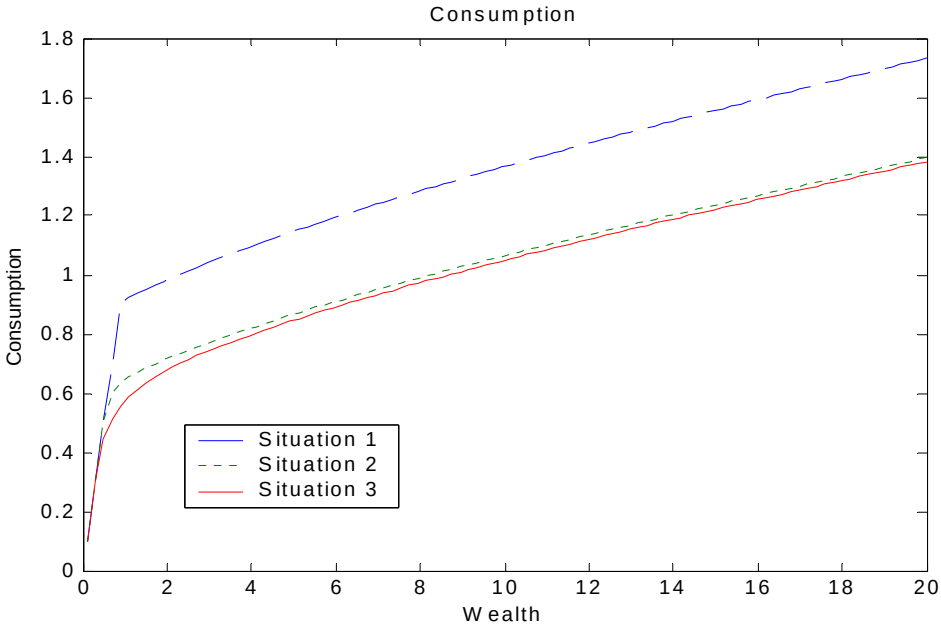

Figure 1a

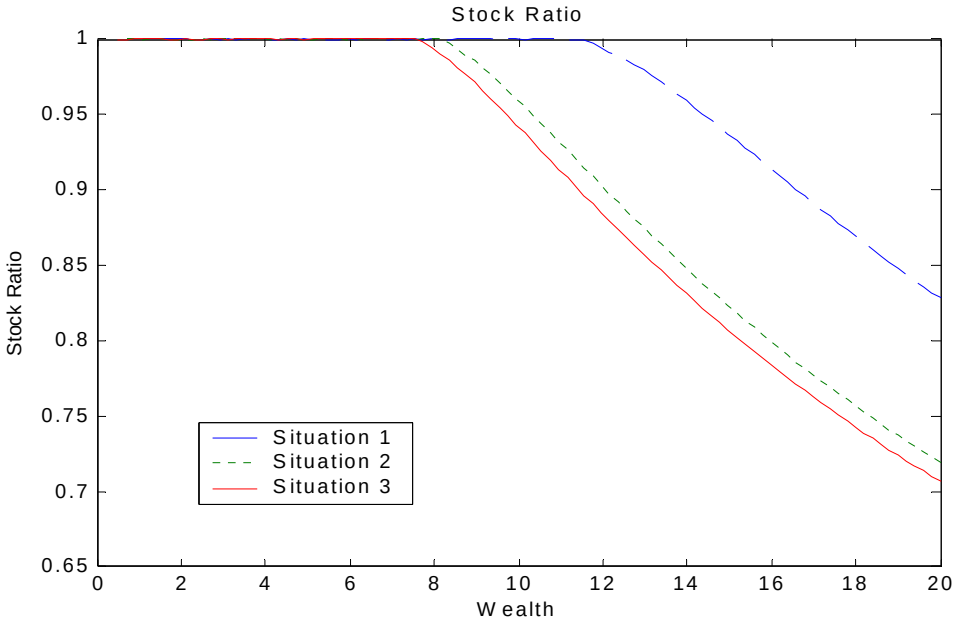

Figure 1b

Figure 1

III. Data

The primary data base used in this study is from the first four waves of the Health and Retirement Survey (HRS) for which final data are available and were collected in the years 1992, 1994, 1996 and 1998. The HRS consists of data collected from a nationally representative group of people who were born between 1931 and 1941 in the first wave of the survey. The HRS includes comprehensive questions about household wealth and health insurance status. Although the data are representative of 51 to 69 year-old households but not the general population, it might be preferable to focus on the elderly since health insurance could be more important for this group of people, given that they generally face greater health expenditure uncertainties than the youth. Further, the older households control a large proportion of net worth and are more likely to hold stocks, as shown by Poterba (1995) and others.[4]

Table 1 about here

Table 1 provides some basic summary statistics of the HRS. The average age for all the households is 58.7.[5] 23.9% of the households have college degrees and 29.7% of the households own stocks. There appear to be certain differences between married couples and singles in terms of wealth and asset holdings. Married couples are generally wealthier than singles. The net worth of married

[4] We also test the robustness of results using the Survey of Consumer Finance 1998 databases and the detail is provided in Section IV.

[5] For the married households, I use the higher of the husband's or wife's age and education to be the proxy for the household's age and education.

[7] The net worth is calculated as the sum of all assets less all debt

couples is $321,707 which is more than twice that of singles, $119,393.[7] Further, married couples are more likely to own stocks than singles. 36.3% of married couples and 18.4% of singles own stock.[8] The share of stocks in financial assets for married couples and singles are 15.1% and 11.3%, respectively. 81.7% of married spouses and 80.9% of singles are fully insured. 7.2% of married couples have husbands only insured, and 4.5% of the married couples have wives only insured.

IV. Empirical Results

A Some Tabulated Facts

To test the portfolio choice effect of health insurance, we start with a simple tabulation of the data to see if there exists some basic pattern between household portfolio choice and health insurance status. For household portfolio choice, we focus on share of stocks and cash in financial assets.[9] The "stocks" are used to assess the risk of household financial assets and include directly held stocks through non-retirement accounts. Using directly held stocks through non-retirement as the measurement of risky assets could be preferable to using total stock holdings. Stock investments through retirement accounts are generally

[8]Please note that the measurement of stocks in the HRS only includes stock investments through non-retirement accounts. Thus, the average stock share calculated here is smaller than that from other databases, such as the Survey of Consumer Finance.

[9] In principle, private business, housing, and other highly non-liquid assets should be treated as risky assets. However, housing and some real estate holdings are not necessary for investment purposes, and may be highly non-liquid and unresponsive to changes in background risk. Since the analysis is restricted to the allocation of financial assets, the above assets are not taken into consideration.

provided by employers and considered a benefit for employees. People working for such firms might be more likely to have health insurance due to the relatively low cost of group health insurance also provided through the firms. In contrast, those who do not work for such firms might be less likely to own stocks through retirement accounts and health insurance since non-group health insurance is often prohibitively costly for them due to the adverse selection problem. The relationship between total stock holdings and health insurance status could be simply generated through the work status of households. Thus, using the directly held stocks could avoid such a concern. The "cash" is used to measure the safety and liquidity of household financial assets. The definition of cash is similar to that of Faig and Shum (2002) and includes checking and savings accounts, CDs, money market funds, T-bills and government saving bonds.

Table 2 about here

The basic relationship between health insurance and portfolio choice are provided in Table 2. Households are divided into different categories according to their wealth level, education level and race, which have been shown in the literature to have a significant impact on household portfolio choice. Column 2 in Table 2 shows the percentage of uninsured households in each category. The first row of column 3 shows that 19.6 percent of households in the HRS are not fully covered by health insurance. An inspection of Column 3 reveals that poor, less educated and non-white households are less likely to be insured, indicating that health insurance coverage is associated with household social status.

Columns 4 to 9 in Table 2 present the difference between insured and uninsured households in the average of stock ownership, share of stocks and cash in their financial assets. In Panel A, one can see that households increase their investments in stocks and reduce the percentage of cash in their financial assets as household net worth increases; this is true both for insured and uninsured households. Yet, among households in the same net-worth category, insured households are more likely to invest in stocks and to allocate a greater portion of their financial assets to stocks and less to cash than uninsured households do. Panel B presents the difference in portfolio choice between insured and uninsured households according to different education categories. An inspection of the table shows that better educated households tend to invest more financial assets in stocks. But, the pattern is still clear that insured households are more likely to and invest more in stocks than uninsured households do in the same education category. Similar results could be found in Panel C which separates households into white and non-white. Thus, the basic summary statistics in Table 2 present a pattern that insurance is associated with more risky assets and less cash holdings among various household wealth, education, and race categories.

B. Baseline Regression Analysis

The summary statistics show a clear relationship between household portfolio choice and health insurance status. Of course, there are other household characteristics that might affect household portfolio choice. In this section, we

examine the effect of health insurance on household demand for stocks and cash but control for the effects of other household characteristics. The control variables are conventional and include: (1) age; (2) square of age; (3) a dummy variable for the education level that is equal to one if a household has a college degree and zero otherwise; (4) a dummy variable that is equal to one if the education level of all household members is less than high school and zero otherwise; (5) a dummy variable for household race which is equal to one if one of the household members is white and zero otherwise; (6) a dummy variable indicating the household's health status. In the HRS, households were asked, "Would you say your health is excellent, very good, good, fair, or poor?" The dummy variable is equal to 1, indicating that a household is sick if one of the members reports that his/her health is fair or poor, and zero otherwise; (7) a natural logarithm function of household labor income. The reason for using labor income rather than total income is to avoid endogeneity between portfolio choice and capital income, which is part of a household's total income. (8) Dummy variables indicating the quintile of household net worth distribution are used to control for the wealth effect.

Table 3 about here

Table 3 presents the health insurance effect on household portfolio choices, using random effect probit and tobit models with a lower limit of 0 and an upper limit of 1, which assumes that household unobservable characteristics are constant over time. The results are consistent with previous studies on the

determinants of household portfolio choices (see, for example, Haliassos and Bertaut 1995, Bertaut and McCluer 2000). Wealthier, higher income, better educated and white households are more likely to own stocks and to invest more financial assets in stocks.

The variable of particular interest to us is household health insurance status. Column 2 in Table 3 shows that the estimated coefficient of a household being insured from the stock ownership equation is 0.2575 and significant at the 1% level, which implies that the probability of holding stocks for households with health insurance is about 3.75% higher than the probability of households without health insurance, when other characteristics are at the means of the sample. Column 3 in Table 3 shows that the coefficient of a household being insured from the stock share equation is 0.0565 and significant at the 1% level. The calculation of the marginal effect indicates that insured households hold a 1.57% greater portion of their financial assets in stocks than do uninsured households. In the cash share equation, the coefficient on both spouses being insured is 0.0381 and significant at the 1% level. The marginal effect of health insurance on cash share is -2.45%, suggesting that insured households hold less safe and liquid assets in their financial portfolio. Evidently, the results show that the impact of health insurance on portfolio choice is statistically and economically significant. Further, the relationship between health insurance and household portfolio choice remains strong even after controlling for the household observable and unobservable characteristics.

C. A Separated Analysis of Married Couples and Singles

The baseline results show that health insurance status has a significant impact on portfolio choice at the household level. There are potentially interesting issues to be exploited by treating married and single households separately. First, if health insurance affects household portfolio choice through precautionary motives, we should expect that married households' portfolios will depend on the coverage degree of the spouses. Specifically, there should be a pecking order decreasing need for precautionary assets among married couples that have both spouses insured, or only one spouse insured or neither spouse insured. Thus, a separate analysis of married couples could provide us with an alternative way to test the precautionary motive in household portfolio choices.

Moreover, it is interesting to examine the portfolio choice effect of health insurance at the individual level. If a household has more than one member, the portfolio decisions may be made jointly by the household members, and it is hard to identify who is the decision maker in the household. In addition, the health insurance status of each household member may have a different impact on household portfolio choices. Hence, it would be interesting to identify the direct link between individual health insurance and portfolio choice decisions. In order to examine the impact of health insurance at the individual level, we could adopt the strategy of restricting the sample to households with only one member, that is, a single household.

Therefore, in this section we employ a separate analysis of the effect of health insurance on married- and single-household portfolio choices. For married couples, four dummy variables have been created to indicate if both spouses are insured, only the husband is insured, only the wife is insured or neither spouse is insured (benchmark in the regression). The control variables are expanded to include both husband's and wife's characteristics: (1) husband's/wife's age; (2) square of the husband's/wife's age; (3) a dummy variable for the husband's/wife's education level that is equal to one if he/she has a college degree and zero otherwise; (4) a dummy variable for the husband's/wife's education level that is equal to one if his/her education level is less than high school and zero otherwise; (5) a dummy variable for husband's/wife's race which is equal to one if he/she is white and zero otherwise; (6) a dummy variable indicating the husband's/wife's health status. The dummy variable is equal to 1, indicating that he/she is sick if he/she reports that his/her health is fair or poor, and zero otherwise; (7) a natural logarithm function of household labor income. (8) Dummy variables indicating the quintile of household net worth distribution are used to control for the wealth effect.

Table 4 about here

Table 4 presents the health insurance effect on portfolio choices of married couples. The estimated coefficients of both spouses being insured from the stock ownership equation and stock share equations are 0.3924 and 0.0934 respectively. Both are significant at the 1% level. In the cash share equation, the

coefficient on both spouses being insured is -0.0416 and significant at the 10% level. An inspection of the results in Table 4 shows that both spouses being insured has a larger impact on portfolio choice than only one spouse being insured. For example, in the stock ownership equation, the coefficients on both spouses being insured, only husband being insured, and only wife being insured are 0.3924, 0.2939 and 0.1746, respectively. Further, the coefficients of both spouses being insured are all significant at the 1% level while the coefficients of only husbands being insured are all significant at the 5% level, and those of only wife being insured are not insignificant. The signs of the estimated coefficients on only one spouse being insured are all positive in the stock ownership and share equations, suggesting that even only one spouse being insured allows households to reduce their need for holding precautionary assets and for holding more risky assets. This result is consistent with the precautionary story that suggests that households have a lower need for precautionary assets when there is a decreasing health expenditure risk for married couples such that both spouses are insured, only one spouse is insured or neither is insured.

In addition, there appears to be some evidence that the impact of husband's and wife's health insurance status is asymmetric. The estimated coefficients of only husband being insured are generally larger than the coefficients of only wife being insured. Further, the effect on stock holdings of only husband being insured is significant at the 5% level while that of only wife being insured is insignificant. Although the fact that husband's and wife's health

insurance status have asymmetric impact on household portfolio choice is not the focus of this study, the results are consistent with those of previous studies. For example, Wu (2003) showed that a new diagnosis of a serious decease of the wife leads to a larger decline on household wealth than the diagnosis of the husband. Barber and Odean (2001) found that men are more risk loving and tend to trade stocks more frequently than women. One possible explanation for the result here is that the husband, on the average, is the primary decision maker in household portfolio choices and, as a result, the "background" of the husband plays a more important role in household portfolio choices. This seems to be supported by the results that the husband's race and college education generally have a relatively more significant impact on household portfolio choice than those of the wife.

Table 5 about here

We now turn to examine the effect of health insurance on the single household's portfolio choice, which is reported in Table 5. The results show that health insurance has a significant impact on single households as well. The coefficients on singles' being insured are 0.4443 and 0.1485 in the stock ownership and stock share equation. Both are significant at the 1% level. In the cash share equation, the coefficient on singles' being insured is -0.0651 and significant at the 5% level. Thus, the results here present a consistent picture that households' portfolio choices are influenced by their health insurance status, both for married and single households. For married couples, there could be a different need for precautionary assets, depending on whether both spouses are

insured, only one spouse is insured or neither is insured. The results support the view that households adjust the composition of their portfolios in response to consumption risk in a precautionary manner and in line with previous studies on the impact of health insurance on household saving, which generally find that precautionary motives are strong in household-saving decisions.

D. Private Health Insurance

One potential concern with the previous results is that public insurance plans, such as Medicaid, CAMPUS and Medicare, are only eligible for people with unique characteristics. These could potentially affect the relationship between health insurance and portfolio choice. For example, the eligibility of Medicaid is subject to the income/assets tests, which might prevent stock market participation by households that want to keep their eligibility. The reason is simple: capital gains from stock investments are "countable" income in the test for eligibility, and there is a possibility that large capital gains of stock investments could force them to drop out of Medicaid. Thus, the income and asset test might significantly reduce household incentives to hold stocks, even though health insurance allows them to take greater financial risks.[10]

[10] Medicare is for people who are of age 65 or older, whether they are rich or poor, and should reduce the eligible households' need for precautionary assets. However, some Medicare beneficiaries also qualify for Medicaid or Medicare Saving Programs, which provides partial protection for low-income Medicare beneficiaries not entitled to the full Medicaid benefits package. Medicare Saving Programs also have income/asset tests.[10] Further, some people with disabilities under the age of 65 and people with end-stage renal disease are also eligible for Medicare; this group of people might have certain preferences for asset holdings, which is hard to control for in the empirical analysis. Therefore, Medicare beneficiaries are composed of groups with quite different features.

Table 6 about here

To avoid the concern that the special feature of public insurance could bias the relationship between health insurance and portfolio choice, we reassess the impact of health insurance on household portfolio choice by focusing on private insurance and excluding households publicly insured. As for private health insurance, we further separated the insurance types into employer-sponsored insurance and privately-purchased insurance. The rationale for making such a separation is that, compared to employer-sponsored insurance which generally is a group insurance, non-group privately-purchased health insurance is more variable and expensive and usually comes with severe limitations on benefits. Thus, households covered by employer-sponsored insurance may experience lower future health expenditure risks, which might lead them to have fewer needs for precautionary assets than those covered by privately-purchased insurance. However, the significance of the difference between employer-sponsored insurance and privately-purchased insurance in the effect of household portfolios is an empirical matter.

Table 5 reports the results on the impact of private insurance on household portfolio choice using the information from single households.[11] Other control variables are the same as in Table 4 but not reported. One can see that both employer-sponsored and privately purchased health insurance is

[11] The reason for the analysis to be focused on singles is that it is clear what kind of insurance the single household has, such as Medicaid, Medicare, employer-sponsored or privately purchased insurance. For married households, husband and wife might be insured by different types of insurance.

significantly positively associated with household stock holdings. This result shows that health insurance has a positive impact on household stock holding in the absence of income/asset testing. Moreover, the coefficients on employer-sponsored health insurance are generally larger than those on privately purchased health insurance. This is consistent with the previous argument that employer-sponsored insurance is less variable than privately purchased insurance and allows households to take greater financial risks. However, except for the cash holding equation, the chi square tests on the difference of the effects on employer-sponsored insurance and privately purchased insurance are insignificant at the 10% level. Therefore, while this difference may be economically significant, there is little statistical power. We hesitate to put much of an interpretation on the difference between employer-sponsored insurance and privately purchased insurance. Nevertheless, the results indicate that excluding households insured by public insurance does affect the positive relationship between health insurance and household portfolio.

E. Reverse Causality

There is a potential reverse causality between health insurance and household portfolio choice. It is possible that households who decide to invest more in stocks will tend to buy health insurance to hedge future expenditure uncertainty. Therefore, health insurance might be correlated with the residual in the regression and biases the results. To avoid reverse causality effects, we use the lag household insurance status to be the instrumental variable for the current

household insurance status. Since the surveys are conducted every two years, it is unlikely that households' current health insurance status could be affected by their portfolio choice decisions made two years later. Hence, the reverse effect of household portfolio choice should be mitigated if the lag household health insurance status is used in the regression as the instrumental variable for current insurance status.

Table 7 about here

Table 7 reports the results from the instrumental variable approach. The estimated coefficients on health insurance are 0.3032 in the stock ownership equation and 0.1355 in the stock share equation; and it is -0.0566 in the cash share equation. All are significant at the 1% level. The results are close to the estimated coefficients using contemporary health insurance status in Table 3, implying that the reverse causality is not a serious problem in the relationship between health insurance and portfolio choice. It also suggests that there may be a two-step decision-making process regarding household ownership of health insurance and portfolio choice. That is, households first decide on health insurance ownership and then make the choice of different assets.

F. Robustness Test

While the above results are consistent with the precautionary motives story, it is possible that health insurance may affect household portfolio choices through other underlying attitudes in the household. For example, people with a longer planning horizon may be more likely to buy health insurance and stocks than

those with a shorter planning horizon. Moreover, attitudes toward risk could affect health insurance and portfolio choices simultaneously. Thus, to test the robustness of the results, we explore the possibility that the link between household insurance status and portfolio choice may be through the underlying attitudes of a household by adding several important self-assessed attitudes in the regression. These variables include household risk attitudes, planning horizons and bequest motives.[12] The respondents are defined as risk takers and non-risk takers based on the question whether they would risk taking a new job, given that the family income is guaranteed now. The new job offers a chance to increase the income but also carries the risk of a loss of income.[13] If the respondent is a household that has a plan for the next few months, next year, next few years, next 5-10 years and longer than 10 years, it is classified as a long-horizon planner. A household has a bequest motive if the answers to a question whether they intend to leave a sizable bequests is "yes," "probably" and "possibly," while the household has no bequest motive if the answer is "probably not" and definitely not." As the information on household self-assessed attitudes

[12] The information on shopping habits is not available in the HRS.

[13] These variables are constructed based on the question: Suppose that you are the only income earner in the family, and that you have a good job guaranteed to give you your current (family) income every year for life. You are given the opportunity to take a new and equally good job, with a 50-50 chance it will double your (family) income and a 50-50 chance that it will cut your (family) income by a third. Would you take the new job? Households are defined as risk takers if the answer is "yes" and non-risk takers if the answer is "no."

is available only in the first wave of the survey, the robustness test is performed based on the information in the first wave.

Table 8 about here

Table 8 reports the results from the regressions that include household self-assessed attitudes. One can see that the coefficients on health insurance remain economically and statistically significant even after controlling for household underlying risk attitudes. The household self-assessed attitudes appear to have very little impact on the relationship between health insurance and portfolio.

V. Evidence From the Survey of Consumer Finance

In this section, I use the information from the Survey of Consumer Finance 1998 database to examine the impact of health insurance on household demand for stocks and liquid assets. Survey of Consumer Finance (SCF), has been regarded as a distinguished comprehensive and reliable resource that deals with household wealth information. The SCF provides richer information on household portfolio information than the HRS. For example, a clear classification of mutual funds into equity funds and bond funds, which allows for a more precise measurement of stock invested through equity fund; information on the household investments through retirement accounts which is missing in the HRS. Further, the SCF also includes detailed information on household health status and health insurance coverage. The major disadvantage of the SCF is that the surveys do not follow the same set of households over time and only have

cross-sectional features. This issue may be serious in the regression analysis since it is not able to control for unobservable household characteristics.

Three models are employed to gauge the impact of health insurance status on household portfolio choice: a probit model is used to estimate the effect of health insurance on the ownership of stock holdings; a tobit model is used to analyze the share of stocks and cash in financial assets. Since household portfolio choice and health insurance are both choice variables for households, I employ a Heckman treatment effect model to address the potential endogeneity problem generated from the unobservable household characteristics.

Table 9 about here

The control variables in the regression are similar as those in regression using the HRS database. Table 3 reports the regression results from the probit, tobit and treatment effect models. The coefficients and t-statistics are adjusted for the imputation using the program provided in the SCF code book.[14] The estimated coefficient of health insurance from stock ownership equation (probit model) is 0.2343 and significant at the 1% level, which implies that the probability of holding stock for households with health insurance is about 9.51% higher than the probability of households without health insurance, when other characteristics are at the means of the sample. The coefficient of the health insurance from the stock share equation is 0.0693 in the tobit model and significant at 1% level The calculation of the marginal effect indicates that

[14] See the Survey of Consumer Finance Code Book 1998 for details.

insured households hold a 4.02% greater portion of their financial assets in stocks than do uninsured households. Column three reports the impact of health insurance status on the household holding of liquid assets. The coefficient of household health insurance is –0.0470 and significant at the 1% level. The point estimator indicates that health insurance is associated with a decrease of 4.22% in the proportion of financial assets to be held in liquid assets.

The above results indicate a strong relationship between households' portfolio choices and their health insurance status. However, their health insurance status might also be a choice variable for households and determined by the process that generates their portfolio choice decisions. Therefore, the health insurance variable may be correlated with the residues in the above regressions and bias the results. To address the potential bias generated from the endogenous problem, I use the two-step mis-measurement treatment effects model. The treatment effects consider the effect of an endogenously chosen binary treatment on another endogenous variable, conditional on two sets of independent variables. It first estimates a health insurance participation equation via a probit model. Then it estimates the portfolio choice equation and includes the inverse Mills term which is estimated from the health insurance participation equation as the control function in the second-step regression. The dependent variable is the ratio of liquid assets to financial assets, and the independent variables are the same set of regressors in the first-step regression.

Column 4 reports the relationship between household characteristics and the ownership of health insurance. Consistent with conventional wisdom, the older, white, married, better educated, higher income households are more likely to have health insurance. Interestingly, the coefficient on the household health status is insignificant, suggesting that household's decision on the ownership of health insurance coverage is not based on their health status. The coefficient of health insurance in the second step regression is -0.5519 and still significant at the 1% level. The results show that health insurance is associated with a smaller holding of relatively risk-free and liquid assets, which is consistent with the notion that the uninsured household faces greater health expenditure uncertainty, and that the precautionary motives lead uninsured households to allocate more financial assets to risk-free and liquid assets than do insured households, when other things are held constant.

In sum, the results from the SCF indicate that household portfolio choice decisions are associated with health insurance status and in line with those from the HRS. The results are consistent with previous studies on the impact of health insurance on household saving, which suggests that precautionary motives are strong in household saving behavior.

VI. Conclusion

This paper provides an initial investigation of the relationship between health insurance status and household portfolio choices. It finds a strong relationship between insurance coverage and household portfolio choice. Households with

health insurance tend to participate in the stock market and hold more stocks in their portfolios than do households without insurance, other things being equal. These results remain strong even after controlling for household observable as well as unobservable characteristics. In addition, there is no evidence that the impact of health insurance is through household underlying attitudes, such as risk aversion, planning horizon and bequest motive. The positive association between health insurance and the holding of more risky assets is consistent with the notion that households behave precautionary in their household portfolio decisions when facing greater background risk. The results indicate that health insurance not only affects household savings, which has been documented in the previous literature, but also affects their savings allocation, that is, the choice between risky and less risky assets. The results have certain important policy implications: the growth of a financial market is associated with the development of the social security system. This result might be even more relevant for the countries that are on their way to establishing a financial market as well as a social security systems.

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Table 1

Summary Statistics of the Data

This table provides the basic summary statistics of the first four (1992, 1994, 1996, 1998) waves of the Health and Retirement Survey. The sample includes the households that were surveyed in all four waves. Columns 2, 3 and 4 are the summary statistics for all the households, single households and married households, respectively.

	All Households	Singles	Married Couples
Age	58.7	58.6	.
Husband Age	.	.	58.4
Wife Age	.	.	54.6
College Degree	23.9%	16.2%	.
Husband College Degree	.	.	22.8%
Wife College Degree	.	.	15.9%
All Household Members Insured	81.4%	80.9%	81.7%
Only Husband Insured	.	.	7.2%
Only Wife insured	.	.	4.5%
Household Net Worth	$246,745	$119,393	$321,707
Stock Owners	29.7%	18.4%	36.3%
Share of Stocks in Financial Assets	13.8%	11.3%	15.1%
N	18312	6785	11527

Table 2

Health Insurance and Household Portfolio Choice for Different Categories of Households

This table provides the basic relationship between household portfolio choice and health insurance status for different categories of households. The sample is the first four (1992, 1994, 1996, 1998) waves of the Health and Retirement Survey. The sample includes the households that were surveyed in all four waves. Households are divided into different categories according to household net worth (Panel A), education (Panel B) and race (Panel C). Column 2 shows the percentage of households owning stocks in each category. Column 3 shows the percentage of uninsured households in each category. Columns 4 and 5 compare the stock ownership between insured and uninsured households. Columns 6 and 7 compare the share of stocks of financial assets owned by insured and uninsured households. Columns 8 and 9 compare the share of cash held by insured and uninsured households.

			Stock Ownership		Share of Stocks		Share of Cash	
	Stock Ownership	Uninsured	Uninsured	Insured	Uninsured	Insured	Uninsured	Insured
All Households		19.6%	16.6%	32.7%	9.6%	14.6%	63.3%	51.4%
				Panel A: Household Net Worth				
1st Quintile of Net Worth Distribution	3.3%	30.5%	1.5%	4.1%	1.4%	3.8%	86.2%	83.3%
2nd Quintile of Net Worth Distribution	13.1%	22.7%	6.8%	14.7%	4.8%	7.9%	77.8%	68.8%
3rd Quintile of Net Worth Distribution	28.1%	14.3%	17.9%	29.6%	7.8%	12.8%	58.2%	51.9%
4th Quintile of Net Worth Distribution	47.7%	11.6%	36.7%	49.2%	14.2%	15.5%	48.9%	38.8%
5th Quintile of Net Worth Distribution	69.3%	11.9%	59.4%	70.8%	23.0%	26.9%	35.4%	26.7%
				Panel B: Education				
College Degree	51.8%	12.8%	48.6%	54.7%	21.2%	21.3%	40.4%	35.2%
High School	5.2%	29.2%	20.2%	33.8%	9.0%	14.4%	61.3%	51.2%
Less Than High School	30.2%	5.3%	5.1%	12.9%	4.1%	7.8%	78.1%	70.1%
				Panel C: Race				
White and Non Hispanic	35.1%	17.2%	21.1%	38.3%	11.1%	15.9%	59.5%	48.0%
Non White or Hispanic	9.1%	23.2%	4.9%	11.2%	3.7%	7.4%	78.8%	70.3%

Table 3

Health Insurance and Household Portfolio Choice

This table analyzes the effect of health insurance status on households' portfolio choice, using the information from the first four waves of the HRS. Column 2 reports the impact of health insurance status on household stock ownership using the random effect probit model. Column 3 reports the impact of health insurance status on the share of stocks of financial assets, using the random effect tobit model. Column 4 reports the impact of health insurance on the share of cash of financial assets, using the random effect tobit model. Standard errors are in parentheses. Numbers with * are significant at the 10-percent level. Numbers with ** are significant at the 5-percent level. Numbers with *** are significant at the 1-percent level. N is the number of observations

	Stock Ownership	Stock Share	Cash Share
Household Insured	0.2575***	0.0565***	-0.0381***
	(0.055)	(0.015)	(0.012)
Age	-0.0704	-0.0351	-0.0655***
	(0.105)	(0.028)	(0.023)
Age²/10^3	0.0050	0.0002	0.0006***
	(0.001)	(0.002)	(0.000)
White	0.8456***	0.1889***	-0.2042***
	(0.087)	(0.026)	(0.020)
College Degree	0.5233***	0.1122***	-0.1379***
	(0.067)	(0.018)	(0.015)
Less Than High School	-1.095***	-0.2884***	0.2712***
	(0.095)	(0.028)	(0.021)
Sick	-0.1232**	-0.0210	0.0367***
	(0.047)	(0.013)	(0.011)
Log(Labor Income)	0.0278***	0.0048***	-0.0085***
	(0.005)	(0.001)	(0.001)
2nd Quintile of Wealth Distribution	0.7181***	0.1907***	-0.2288***
	(0.081)	(0.025)	(0.016)
3rd Quintile of Wealth Distribution	1.3353***	0.3604***	-0.4504***
	(0.082)	(0.024)	(0.017)
4th Quintile of Wealth Distribution	2.022***	0.5090***	-0.5700***
	(0.085)	(0.025)	(0.018)
5th Quintile of Wealth Distribution	2.7030***	0.6439***	-0.6726***
	(0.091)	(0.026)	(0.019)
Control for Year Effect	Yes	Yes	Yes
N	18312	15229	15229

Table 4

Health Insurance on Household Portfolio Choice: Married Couples

This table analyzes the effect of health insurance on married couples' portfolio choices, using the information from the first four waves of the Health and Retirement Survey. Column 2 reports the effect of health insurance status on household stock ownership using the random effect probit model. Column 3 reports the impact of health insurance status on share of stocks of financial assets, using the random effect tobit model. Column 4 reports the impact of health insurance status on share of safe assets of financial assets using the random effect tobit model. Standard errors are in parentheses. Numbers with * are significant at the 10-percent level. Numbers with ** are significant at the 5- percent level. Numbers with *** are significant at the 1-percent level. N is the number of observations.

	Stock Ownership	Stock Share	Cash Share
Both Spouses Insured	0.3924***	0.0934***	-0.0416*
	(0.122)	(0.033)	(0.025)
Only Husband Insured	0.2939**	0.0880**	-0.0361
	(0.141)	(0.037)	(0.029)
Only Wife Insured	0.1746	0.0529	0.0045
	(0.156)	(0.041)	(0.033)
Husband Age	-0.0550	-0.0546	-0.0726
	(0.149)	(0.038)	(0.031)
Husband Age^2/10^3	0.3206	0.4046	0.6384
	(1.277)	(0.324)	(0.265)
Wife Age	0.0144	0.0033	-0.0088
	(0.048)	(0.013)	(0.010)
Wife Age^2/10^3	0.0258	-0.0056	-0.0088
	(0.456)	(0.119)	(0.010)
Husband White	0.4476***	0.9361*	-0.1069***
	(0.178)	(0.049)	(0.039)
Wife White	0.2992*	0.0519	-0.0617*
	(0.174)	(0.047)	(0.022)
Husband College Degree	0.4548***	0.0882***	-0.0875***
	(0.092)	(0.0229)	(0.020)
Wife College Degree	0.1024	0.0275	-0.0619***
	(0.099)	(0.0249)	(0.022)
Husband Less Than High School	-0.5546***	-0.1278***	0.1252***
	(0.092)	(0.024)	(0.020)
Wife Less Than High School	-0.6848***	-0.1486***	0.1482
	(0.097)	(0.026)	(0.021)

Table 4 (Continued)

Husband Sick	-0.0952 (0.149)	-0.0222 (0.018)	0.0407*** (0.014)
Wife Sick	0.3206* (0.174)	-0.0331* (0.018)	-0.0270* (0.014)
Log (Household Labor Income)	0.0233*** (0.006)	0.0043** (0.002)	-0.0076*** (0.001)
2nd Quintile of Wealth Distribution	0.4520*** (0.111)	0.1310*** (0.0321)	-0.1575*** (0.022)
3rd Quintile of Wealth Distribution	1.0502*** (0.119)	0.2840*** (0.032)	-0.3931*** (0.022)
4th Quintile of Wealth Distribution	1.6821*** (0.119)	0.4184*** (0.032)	-0.4987*** (0..023)
5th Quintile of Wealth Distribution	2.3363*** (0.119)	0.5373*** (0.033)	-0.5922*** (0.024)
Control for Year Effect	Yes	Yes	Yes
N	11527	10408	10408

Table 5

Health Insurance and Household Portfolio Choice: the Singles

This table analyzes the effect of health insurance status on the single households' portfolio choice, using the information from the first four waves of the HRS. Column 2 reports the impact of health insurance status on household stock ownership using the random effect probit model. Column 3 reports the impact of health insurance status on the share of stocks of financial assets, using the random effect tobit model. Column 4 reports the impact of health insurance on the share of cash of financial assets, using the random effect tobit model. Standard errors are in parentheses. Numbers with * are significant at the 10-percent level. Numbers with ** are significant at the 5-percent level. Numbers with *** are significant at the 1-percent level. N is the number of observations

	Stock Ownership	Stock Share	Cash Share
Single Insured	0.4443***	0.1485***	-0.0651**
	(0.116)	(0.039)	(0.029)
Age	-0.2115	-0.0631	-0.0408
	(0.244)	(0.073)	(0.059)
$Age^2/10^3$	1.5694	0.4623	0.3908
	(2.000)	(0.618)	(0.504)
White	0.9274***	0.2437***	-0.2282***
	(0.137)	(0.047)	(0.036)
College Degree	0.6084***	0.1197***	-0.1305***
	(0.139)	(0.043)	(0.037)
Less Than High School	-0.9936***	-0.2836***	0.3450***
	(0.151)	(0.052)	(0.040)
Sick	-0.1203	0.0050	0.0240
	(0.107)	(0.034)	(0.027)
Log(Labor Income)	0.0388***	0.0078***	-0.0110***
	(0.009)	(0.003)	(0.002)
2nd Quintile of Wealth Distribution	0.9474**	0.2722***	-0.3207***
	(0.125)	(0.043)	(0.032)
3rd Quintile of Wealth Distribution	1.5889***	0.4822***	-0.5121***
	(0.135)	(0.046)	(0.033)
4th Quintile of Wealth Distribution	2.4006***	0.6638***	-0.6539***
	(0.148)	(0.048)	(0.036)
5th Quintile of Wealth Distribution	3.0278***	0.8434***	-0.7571***
	(0.169)	(0.053)	(0.040)
Control for Year Effect	Yes	Yes	Yes
N	6785	4821	4821

Table 6

Private Insurance and Household Portfolio Choice

This table provides the results on the impact of private health insurance, employer-sponsored and privately purchased insurance on household portfolio choice. The sample includes the single households in the first four waves of the HRS. Columns 2, 3 and 4 report the impact of different types of health insurance status on stock ownership, the share of stocks of financial assets and the share of safe assets of financial assets, respectively. Other control variables include, but are not reported here, age, age^2, white, sick, college degree, less than high school, log (labor income), indicators for the 2nd to the 5th quintile of wealth distribution and year dummy variables. Numbers with * are significant at the 10-percent level. Numbers with ** are significant at the 5-percent level. Numbers with *** are significant at the 1-percent level. N is number of observations.

	Stock Ownership	Stock Share	Cash Share
Insured by Employer-Sponsored Insurance	0.4198***	0.1063***	-0.0970***
	(0.056)	(0.034)	(0.027)
Insured by Privately Purchased Insurance	0.2401***	0.0943***	-0.0426
	(0.061)	(0.033)	(0.027)
N	4788	3789	3789

Table 7

Impact of Health Insurance on Household Portfolio Choice: Instrumental Variable

This table provides a test of the impact of health insurance on household portfolio choice, using lag health insurance status as the instrumental variable. Other control variables also include, but are not reported, age, age^2, log(labor income), white, sick, college degree, less than high school, indicators for the 2nd to 5th quintile of wealth distribution and year dummy variables. Standard errors are in parentheses. Numbers with * are significant at the 10-percent level. Numbers with ** are significant at the 5-percent level. Numbers with *** are significant at the 1-percent level. N is the number of observations

	Stock Ownership	Stock Share	Cash Share
Household Insured by Private Insurance (lag value)	0.3032*** (0.065)	0.1355*** (0.022)	-0.0566*** (0.017)
N	13734	7632	7632

Table 8

Robustness Test

This table provides the result of the robustness test of the impact of health insurance status on household portfolio choice by including household self-assessed attitudes, such as planning horizon, risk attitude and bequest motives. Other control variables in Panel A and B also include, but are not reported, age, age^2, log (labor income), white, sick, college degree, less than high school, indicators for the 2nd to 5th quintile of wealth distribution and year dummies. Standard errors are in parentheses. Numbers with * are significant at the 10-percent level. Numbers with ** are significant at the 5-percent level. Numbers with *** are significant at the 1-percent level.

	Stock Ownership	Stock Share	Cash Share
Household Insured	0.3406***	0.1390***	-0.0737***
	(0.069)	(0.033)	(0.027)
Risk Taker	0.1596***	0.0689**	-0.0623***
	(0.049)	(0.022)	(0.019)
Long Planner	0.1039**	0.0139	-0.0297
	(0.049)	(0.022)	(0.019)
Bequest Motives	0.1078**	0.0378*	0.0055
	(0.051)	(0.023)	(0.020)
N	4578	3765	3765

Table 9

Regression Analysis Using the Survey of Consumer Finance Database

This table analyzes the effect of health insurance status on the households' portfolio choice, using the information from the SCF 1998 database. Column 2 reports the impact of health insurance status on household stock ownership using the probit model. Column 3 reports the impact of health insurance status on the share of stocks of financial assets using the tobit model. Column 4 reports the impact of health insurance on the share of cash in financial assets using the tobit model. Column 5 reporst the impact of health insurance on the share of cash in financial assets using the Heckman selection model. Standard errors are in parentheses. Numbers with * are significant at the 10-percent level. Numbers with ** are significant at the 5-percent level. Numbers with *** are significant at the 1-percent level. N is the number of observations

	Stocks		Cash	Cash Treatment Effect Model	
	Stock Ownership	Stock Share	Cash Share	Probability of Insured	Cash Share
Household Insured	0.2343***	0.0693***	-0.0470***		-0.5519***
	(0.076)	(0.025)	(0.018)		(0.072)
Head Sick	-0.1082	-0.0484**	0.0048	0.0253	0.0079
	(0.069)	(0.022)	(0.016)	(0.074)	(0.015)
Log(Financial Assets)	0.3899***	0.1069***	-0.0980***	0.1231***	-0.0688***
	(0.015)	(0.004)	(0.003)	(0.012)	(0.003)
Log(Income)	0.0385***	0.0068***	0.0003	-0.0037	0.0003
	(0.007)	(0.002)	(0.001)	(0.008)	(0.001)
Age	-0.0169***	-0.0060***	0.0029***	0.0098***	0.0030***
	(0.002)	(0.001)	(0.0001)	(0.002)	(0.000)
College Degree	0.1050*	0.0453***	0.0398***	0.1928***	0.0462***
	(0.057)	(0.017)	(0.013)	(0.064)	(0.013)
Less than High School	-0.2252**	-0.0847***	-0.0039	-0.3320***	-0.0511**
	(0.090)	(0.031)	(0.020)	(0.080)	(0.020)
Married	-0.0088	0.0195	-0.0019	0.3089***	0.0345**
	(0.078)	(0.023)	(0.017)	(0.082)	(0.017)
White	0.2725***	0.0817***	-0.0175	0.2511***	0.0247
	(0.072)	(0.023)	(0.017)	(0.066)	(0.016)
Female	-0.0947	-0.0265	-0.0483***	0.2657***	-0.0060
	(0.080)	(0.026)	(0.018)	(0.083)	(0.018)
Family Number	0.0245	-0.0039	-0.0016	-0.0646***	-0.0099*
	(0.025)	(0.007)	(0.006)	(0.023)	(0.005)
Constant	-3.8085***	-0.8962***	1.3221***	-0.8841***	1.3547***
	(0.191)	(0.054)	(0.036)	(0.160)	(0.045)
N	21515	20300	20300	20300	20300
R-square	0.44	0.30	0.37	Wald Chi^2	2700

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