# THE ROLE OF MEDICAL EXPENDITURE RISK IN PORTFOLIO ALLOCATION DECISIONS

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## ABSTRACT

Economic theory suggests that medical spending risk affects the extent to which households are willing to accept financial risk, and consequently their investment portfolios. In this study, we focus on the elderly for whom medical spending represents a substantial risk. We exploit the exogenous reduction in prescription drug spending risk due to the introduction of Medicare Part D in the U.S. in 2006 to identify the causal effect of medical spending risk on portfolio choice. Consistent with theory, we find that Medicare-eligible persons increased risky investment after the introduction of prescription drug coverage, relative to a younger, ineligible cohort.

**Keywords:** Portfolio Choice, Medicare Part D, Background Risk

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## I. INTRODUCTION

Given the high prevalence of chronic illnesses at advanced ages and rising health care costs, older adults face considerable uncertainty regarding their future medical expenditures. Although health insurance coverage can mitigate medical spending risk, this risk is typically not fully insured due to deductibles and other cost-sharing mechanisms. Thus, medical expenditures can be viewed as a type of un-diversifiable background risk.[1] Economic theory suggests that background risk influences the amount of financial risk that a household is willing to bear (Pratt and Zeckhauser 1987, Kimball 1993, Elmendorf and Kimball 2000, Heaton and Lucas 2000). We examine the impact of an exogenous change in prescription drug spending risk due to the introduction of the Medicare Part D program in the U.S. in 2006 on the portfolios of elderly households. Understanding the extent to which medical expenditure risk affects the portfolio allocation decisions of elderly households is important because the elderly constitute a growing share of the US population and have accumulated considerable net worth over their life time. At a micro level, the elderly's savings and portfolio choices affect their future financial security and welfare; and, at a macro level, these decisions affect asset markets and funds available in society for investment, production, and consumption.

The key empirical challenge in identifying the impact of medical expenditure risk on portfolio choice is that unobserved factors such as risk preferences or labor market shocks may affect both medical spending risk and investment decisions. To identify causal effects, we rely on the reduction in the prescription drug spending risk caused by the introduction of the Medicare Part

[1] Background risk refers to any risk that is not directly associated with the riskiness of a financial asset such as stocks or mutual funds.

D program. Part D provides prescription drug coverage for seniors; it was introduced by the 2003 Medicare Modernization Act (MMA) and went into effect on January 1, 2006. Take-up rates of Part D have been relatively high and prescription drug coverage increased significantly among seniors after 2006 (Levy and Weir 2010). Several studies have shown that Part D also reduced out-of-pocket (OOP) spending (Ketcham and Simon 2008, Engelhardt and Gruber 2011). Engelhardt and Gruber (2011) also show that declines in OOP spending were larger at higher quantiles of the spending distribution. They estimate that the mean reduction in the risk premium for those taking up Part D was $455 (the median was $168). Thus, there is strong evidence that Medicare Part D was successful in reducing medical expenditure risk, which is the primary pathway through which health insurance, in general, and Medicare Part D, in particular, might influence portfolio choice.

Using data from the Health and Retirement Study (HRS), we employ a difference-in-differences (DD) strategy that compares differences in portfolios between a Medicare-eligible group and a younger non-eligible group, before and after the introduction of Part D coverage in 2006. Consistent with the theory of background risk, we find that in response to the introduction of Medicare Part D, elderly households are more likely to own risky assets and increase the share of financial wealth invested in risky assets. We perform a number of robustness checks and placebo tests to assess the validity of our research design, and find evidence that supports a causal interpretation. We also examine heterogeneous effects, assessing whether the impact of Part D varies by individual characteristics such as cognition, educational attainment, marital status, financial planning horizons, and bequest motives.

While we hypothesize that the reduction in medical spending risk is the primary pathway through which Part D influences risk-taking, three alternative pathways could potentially play a role in portfolio choice. First, since Part D coverage is largely subsidized by the federal government, it essentially results in an income transfer for eligible households. Given that wealthier households tend to hold riskier portfolios in general (Carroll 2000), the income effect due to Part D might also increase risky investments among Medicare-eligible households. Second, Part D may affect portfolio choice via improvements in health.[2] While most studies have not found evidence of improvements in physical health due to Medicare Part D (Kaestner and Khan 2010, Hanlon et al. 2013), Ayyagari and Shane (2015) find improvements in mental health. The effect of health on portfolio allocation depends on the relationship between health and the marginal utility of consumption (Edwards 2010). If the marginal utility of consumption increases (decreases) with poor health, then the optimal portfolio share of risky assets will be lower (higher). Thus, whether Part D-induced health improvements increase or decrease the share of risky assets depends on the state dependence of utility.[3] Third, Part D may influence portfolio choice via changes in longevity risk. Benartzi and Thaler (1995) show that if individual preferences exhibit loss aversion, then optimal risk taking increases with longer life horizons. Although Kaestner et al. (2014) found no impact of Medicare Part D on mortality rates, it is still plausible that subjective

[2] Several studies have shown that health insurance leads to improvements in health. See Levy and Meltzer (2008) for a review of the literature.

[3] Empirical literature on the state dependence of utility has found conflicting results. While some studies suggest that the marginal utility of consumption declines with poor health (Viscusi and Evans 1990, Finkelstein, Luttmer, and Notowidigdo 2013, Sloan et al. 1998), others have found no relationship between adverse health shocks and marginal utility (Evans and Viscusi 1991), or have found that poor health increases the marginal utility of consumption (Lillard and Weiss 1997).

mortality expectations responded to better drug coverage and portfolio decisions are more likely based on subjective expectations rather than on actual mortality rates.[4] Although we cannot separately identify the impact of each of these alternative pathways, we examine the extent to which the overall effect of Medicare Part D on portfolio choice can be explained by available measures of health and subjective mortality expectations in the HRS. We find no evidence that the estimated increase in risky investment can be attributed to improvements in health or life expectancy.

## II. PRIOR LITERATURE

Several studies have examined the relationship between health and portfolio choice. These studies argue that medical spending risk is one of the pathways through which health affects portfolio choice. The key limitation of this literature is that they do not fully account for time-varying unobserved shocks that may affect both health and portfolio allocations (e.g, Fan and Zhao 2009, Love and Smith 2010, Bogan and Fertig 2013). In general, this literature finds that poor health is associated with safer portfolios (Rosen and Wu 2004, Fan and Zhao 2009, Bogan and Fertig 2013).

Few studies have directly assessed the role of medical expenditure risk, which is directly related to health but is also strongly influenced by institutional factors such as health insurance coverage or access to publicly funded health services. Edwards (2008) finds that self-reported medical

[4] There is evidence that subjective mortality expectations contain private health information not reflected in life tables (Perozek 2008, Hurd 2009) and that individuals update these expectations in response to new information (Smith, Taylor, and Sloan 2001, Hurd and McGarry 1995).

spending risk is associated with safer portfolios. However, the empirical strategy does not account for the endogeneity of self-reported spending risk. Atella, Brunetti, and Maestas (2012) find that health affects portfolio choice only in countries without a National Health Service system that provides comprehensive coverage of medical expenditures, suggesting that medical expenditure risk plays a potentially important role in investment decisions. Goldman and Maestas (2013) estimate the impact of supplemental insurance coverage (Medigap and employer sponsored coverage) and Medicare HMO coverage on the likelihood of owning risky assets among Medicare beneficiaries.[5] They use a discrete factor model with the following instrumental variables: an indicator for a state law on risk pooling (mandatory community rating or prohibition of age rating) and county level non-Medicare HMO market penetration. Consistent with the theory on background risk, they find that supplemental insurance and Medicare HMO coverage significantly increase risky asset holding.

Our study contributes to this literature along several dimensions by relying on a plausibly exogenous policy change, namely the introduction of the Medicare Part D program. Our empirical specification also includes individual fixed effects (FE) that account for unobserved person-specific factors. Thus, in contrast to Goldman and Maestas (2013) who rely on cross-sectional variation in insurance coverage, our estimation strategy exploits within-person variation. The DD approach together with the individual FEs implies that our econometric model is able to simultaneously account for the reverse causality of medical spending risk and unobserved differences across individuals. We examine both ownership of risky assets and the share of total financial assets invested in risky assets. Finally, we assess heterogeneity in the

[5] This study uses data from the 1998 and 2000 waves of the HRS, before the introduction of Part D.

impact of prescription drug coverage across a wide range of factors that may influence investment decisions, such as cognition, education, marital status, financial planning horizons, and bequest motives.

## III. DATA AND ESTIMATION STRATEGY

### Data

We use data from the 1996 through 2010 waves of the Health and Retirement Study (HRS).[6] The HRS is a biennial, nationally representative survey of individuals in the U.S. over 50 years of age and their spouses. We use data from the RAND-HRS file (version M) (Chien et al. 2013) and restrict the sample to individuals aged 55 to 75 years in 2004, the survey year immediately before the introduction of Medicare Part D.[7,8] The analysis sample consists of 11,983 persons contributing 83,530 observations.

Definition of Risky Assets. Following Goldman and Maestas (2013), we define risky assets as the sum of equity (stocks, mutual funds and investment trusts) and retirement accounts

[6] We do not include data from the 1992 and 1994 waves of the HRS because some questions on assets changed between these and subsequent waves.

[7] Using a single year to define our sample allows us to have a balanced panel of individuals who are followed over time. Results are robust when the sample consists of 55-75 year olds at *any time* during our study period (1996 to 2010).

[8] As a robustness check, we restricted our sample to financial respondents, thereby ensuring that the regression sample only included one person per household. In addition to a model using the financial respondent's age to define the treatment indicator, we also estimated a specification defining the treatment indicator as one if at least one person in the household was 65 years or older and zero otherwise. Results are robust to these alternative specifications.

(Individual Retirement Accounts (IRA), and Keogh accounts).[9] As a robustness check, we also use the four-way classification of financial assets by Rosen and Wu (2004): (1) “cash” is considered very safe and includes checking and savings accounts, money market funds, CDs, government bonds and T-bills, (2) “bonds” are considered fairly safe and include corporate, municipal and foreign bonds, and bond funds, (3) “retirement accounts” are considered fairly risky and include Individual Retirement Accounts (IRA) and Keogh accounts, and (4) “equity’ is considered very risky and includes stocks, mutual funds and investment trusts.

As mentioned above, we examine both ownership of risky assets and the share of total financial wealth invested in risky assets. Ownership is measured by a binary indicator, which is one if the household reports a non-zero value of wealth invested in risky assets, and zero otherwise. Goldman and Maestas (2013) argue that ownership may have less measurement error than the asset share, since there is considerable variation in the riskiness of stocks, mutual funds, and retirement accounts. Thus, two persons with the same risky asset share may face very different risks depending on their investments.[10] Moreover, changes in the asset share reflect changes in both the quantity and the value (price) of risky assets while changes in ownership only captures changes in quantity. Thus, the ownership of risky assets may be a cleaner measure for evaluating

[9] The HRS questions on risky assets ask about current ownership of stocks and mutual funds. Most HRS interviews are completed during the year of the survey, although some may begin in the prior year or continue into the next year. For example, 71 out of 8,067 interviews of the 1996 wave were begun in 1995 and 210 interviews were completed in 1997. As robustness checks, we also estimated two models, one using the year that the interview began and the other using the year the interview ended (instead of the survey year) to define the post dummy and year fixed effects. Results are robust to these alternative definitions.

[10] The HRS does not include enough details on investments for us to evaluate the actual riskiness of a portfolio.

the behavioral response to a decline in medical spending risk. However, since much of the literature on portfolio choice has focused on asset shares, we also evaluate the share of total financial wealth invested in risky assets (including zero investment). Total financial wealth includes investment in all the four classes described above (cash, bonds, retirement accounts and equity).[11] Following previous literature, we restrict the analysis on asset shares to the sample with a positive value of total financial wealth.

Table 1 presents summary statistics for the full sample, and separately for persons who are 65 years or older (the Medicare-eligible group) and for persons who are 64 years or younger the ineligible group). The Medicare-eligible group is, on average, less likely to hold risky assets. Not surprisingly, this group is also more likely to be widowed and retired, but is comparable to the non-eligible group in terms of gender, race/ethnicity, and educational attainment.[12]

**Econometric Model**

To identify the impact of medical expenditure risk on portfolio choice, we estimate the following difference-in-differences (DD) regression model on the sample of persons aged 55 to 75 years in 2004:

[11] Specifically, total financial wealth is defined as the sum of the following RAND HRS variables: HwACD, HwACHCK, HwABOND, HwASTCK and HwAIRA. Wealth in risky assets is defined as the sum of HwASTCK and HwAIRA. See Chien et al. (2013) for details on the construction of these variables.

[12] There are more males in the older age group likely due to the survey design of the HRS which interviews older adults and their spouses. Since our sample includes both spouses and younger spouses are more likely to be female, there are a higher proportion of women in the younger Medicare ineligible group.

$$Y_{it} = \beta_0 + \beta_1 I(Age_{it} \geq 65) \times Post_t + \beta_2 I(Age_{it} \geq 65) + \beta_3 I(Age_{it} \geq 65) \times Year_t + \beta_4 X_{it} + \gamma_t + \mu_i + \varepsilon_{it}$$

[Equation 1]

The dependent variable in equation (1) is a measure of risky asset ownership or share, as defined above. $I(Age_{it} \geq 65)$ is a binary indicator for being 65 years or older in year $t$, $Post$ is a dummy for observations in 2006 or later, $Year$ represents a linear time trend and $\gamma_t$ is a set of year dummies. Following the approaches used by Finkelstein and McKnight (2008) and Dafny and Dranove (2008), we also include an interaction between $I(Age_{it} \geq 65)$ and a linear year variable, to allow for differential trends in portfolios for the Medicare-eligible group relative to the younger group. Equation (1) also includes individual fixed effects ($\mu_i$) to account for time invariant unobserved factors at the individual level. Thus, parameter estimates capture within-person changes in portfolios over time.[13] The key parameter of interest is $\beta_1$, the coefficient on the interaction between $I(Age_{it} \geq 65)$ and $Post$. It measures the change in portfolio allocation between the pre and post Part D periods for persons who are 65 years or older relative to those are younger than 65. It captures the causal impact of Medicare Part D on portfolio choice under the assumption that there are no unobserved factors post Part D resulting in a differential trend in

[13] Prior studies evaluating the impact of Medicare Part D have used a narrower age sample (60 to 70 years) but do not include individual fixed effects (for e.g., see Engelhardt and Gruber 2011, Ayyagari and Shane 2015). In preliminary analysis, we also estimated a difference-in-differences model without individual fixed effects using the narrower age group. Results are robust to this alternative specification. However, our preferred specification is the model with individual fixed effects since they account for unobserved individual level differences which are likely to play an important role in portfolio choice. Unfortunately, the small sample size of the HRS does not provide enough statistical power to estimate a model with both a narrow age range and individual fixed effects.

risky assets for the Medicare-eligible group compared to the non-eligible group, once we allow for a group-specific linear time trend. $X$ is a vector of time-varying covariates. To account for non-linear changes over the lifecycle, $X$ includes a quadratic function of age. In addition, $X$ includes the number of persons residing in the household and indicators for marital status. We cluster standard errors at both the age and household levels to account for correlations between household members and within age groups (Cameron, Gelbach, and Miller 2011, Cameron and Miller 2015, Bertrand, Duflo, and Mullainathan 2004).[14]

In addition, we estimate several alternative specifications to assess the robustness of our findings. First, we estimate a flexible specification that replaces the $Post$ dummy in the interaction term in equation (1) with a set of year fixed effects. This allows us to evaluate whether there were any differential trends in portfolio choice by age group even prior to Part D. Evidence of such differential "pre-trends" in the same direction as in the post period would suggest that unobserved factors may be driving the results. Second, we estimate models that control for additional factors such as unemployment rate and the housing price index to evaluate the extent to which variation in these factors could be driving our main results. Finally, we estimate a series of DD models on a sample of persons aged 45 to 55 years old in 2004 using arbitrary age cut-offs to define the treatment and control groups.[15] Since none of these individuals are eligible for Medicare Part D at any point during our study period, these

[14] Using the age group level ($I(Age_{it} \geq 65)$) instead of age yields smaller standard errors.

[15] The oldest age is 55 because we do not want any individual in this sample to age into Medicare during our study period.

regressions serve as placebo tests that allow us to assess whether the main results are driven by unobserved differences in portfolio choice by age.

## IV. RESULTS

Table 2 presents difference-in-differences estimates for the impact of Medicare Part D on portfolio choice. We find evidence of a significant increase in both ownership and share of risky assets after the implementation of Part D for the Medicare-eligible group, relative to the non-eligible group. Ownership of risky assets increases by 2.3 percentage points. Compared to the pre-2006 ownership rate of 54.1%, this represents a 4.2% increase in risky asset ownership. The share of total financial wealth invested in risky assets increases by 2 percentage points, a 4.7% increase over the pre-2006 mean. These estimates are consistent with the theory of background risk, and show that the elderly responded to reductions in the risk of prescription drug spending due to Part D by increasing investment in risky financial assets. Our estimates are smaller in magnitude than those obtained by Goldman and Maestas (2013), who found that Medigap or employer provided supplemental coverage increases risky asset holding by 7.1 percentage points and Medicare HMO coverage increases ownership by 13 percentage points relative to no supplemental coverage. The reduction in medical expenditure risk from policies such as Medigap/employer sponsored supplemental plans or Medicare HMOs may be larger than from Medicare Part D, since such plans often provide more comprehensive coverage than prescription drug coverage. This may explain why we find smaller effects.

Next, we assess the key identifying assumption of parallel trends using the flexibly specified models that include interactions between the treatment group indicator and year fixed effects

(2004 being the reference year). Table 3 presents results from these regressions and Figures 1 and 2 graph the coefficient and 95% confidence interval estimates on the interaction terms. Each point on the solid line in Figures 1 and 2 represents the difference in portfolio choice between the Medicare eligible and ineligible groups for that year relative to 2004. The dashed lines represent the confidence intervals. Although estimates become imprecise when estimating the flexible specification, there is a clear pattern in portfolio allocation over the study period. Figure 1 shows that the difference in ownership of risky assets between the Medicare eligible and non-eligible groups declines steadily between 1996 and 2002, and then there is a reversal of this trend beginning in 2004. The difference in the share of risky assets between the two groups shows a similar pattern in the pre-period and a reversal of trend in 2004. Relative to 2004, there is an increase in group differences for both ownership and asset share in 2006, although this effect is imprecisely estimated. In the case of ownership, this increasing trend continues through the end of the study period, so that Medicare-eligible individuals have higher rates of risky asset ownership in 2008 and 2010 relative to 2004. For asset shares, we also observe an increasing trend through 2008 but there is a slight drop in 2010. However, the difference in asset shares between the treatment and control groups in 2010 is still larger than the difference in 2004. Overall these year-by-year coefficient estimates show that there is increasing risk taking in the post-Part D period. This may reflect the fact that enrollment in Part D increased steadily during this time (Engelhardt and Gruber, 2011). In the pre-period, the portfolio difference between the two age groups is declining suggesting that any unobserved factors resulting in differential trends between the two age groups would likely bias our estimates downwards if those trends are not controlled for. Therefore, it is important that our main specification controls for such trends using an interaction between the $I(Age_{it} \geq 65)$ dummy and a linear year variable. Relative to

2004, the difference in ownership of risky assets between the two age groups is significantly lower in 2002. One concern may be that this reflects the aftermath of the 2001 recession. However, given that there does not appear to be a similar change during the Great Recession, a much more severe recession, it seems more plausible that the effect in 2002 is simply a continuation of the declining trend in the pre-period. We further discuss the potential effects of recessions below.

Figures 1 and 2 also provide some suggestion of anticipatory effects. Although Part D coverage was implemented in 2006, the Medicare Modernization Act was enacted in 2003 and there was broad media coverage of the legislation at the time.[16] Therefore, the slight increase in risky investment that we observe in 2004 relative to 2002 may be capturing responses among persons who anticipated enrolling in Part D in 2006. This is consistent with evidence from Alpert (2014) who shows that individuals reduced drug utilization for chronic diseases relative to acute diseases in 2004-2005 in anticipation of Part D's implementation. This anticipatory effect implies that the estimate in our main DD regression understates the true effect of Part D when 2004 is treated as a pre-year. Alternatively, the slight increase observed in 2004 may be capturing responses to other provisions in the Medicare Modernization Act (MMA) which were implemented in 2004. For example, the MMA also introduced Health Savings Accounts (HSA) in 2004 which allow individuals to use pre-tax dollars to pay for medical care and reformed the

[16] In a poll conducted by the Kaiser Family Foundation in March-April 2004, more than 60% of the elderly reported that they followed the news about the Medicare prescription drug program "very closely" or "somewhat closely" during February 2003-April 2004. Source: http://kff.org/medicare/poll-finding/marchapril-2004-kaiser-health-poll-report-survey/

reimbursement method for Medicare Advantage plans.[17] To the extent that these changes led to more generous coverage for beneficiaries, they may lead to greater risk taking. Finally, the Prescription Drug Discount and Transitional Assistance program was implemented in 2004-2005 as a temporary program before the launch of the full Part D program in 2006. This program provided subsidies and drug discounts to low income elderly lacking drug coverage. Although the reduction in medical expenditure risk due to this program is likely to be large, its impact on portfolio choice may be minimal given that the program was targeted towards low income persons who are in general less likely to invest in risky assets. To address anticipatory effects or the impacts of other MMA provisions, we added an interaction between the treatment dummy and a dummy for year 2004 to equation (1), essentially redefining the "pre" period as 1996-2002 and 2004 as a transition period. This alternative specification yielded a DD estimate of 3.5 percentage points for ownership and 3 percentage points for share of risky assets.[18] Overall, the flexible models support our inference that the increase in risky investment post 2006 for the Medicare-eligible group relative to the non-eligible group can be attributed to Medicare Part D.

**Robustness Checks.**

As mentioned above, prior work by Rosen and Wu (2004) and others has used a four-way classification of assets. In Table 4, we present DD results using this alternative classification of assets. Consistent with the theory of background risk, we find a decline in ownership of cash and bonds, the two safe assets, and an increase in the ownership of retirement accounts and equity,

[17] There is anecdotal evidence that HSAs are used as savings vehicles. For example, see: http://blogs.reuters.com/shaneferro/2013/07/18/hsas-when-your-health-insurance-becomes-a-retirement-account/ and http://www.cnbc.com/id/101018423 (accessed 10/8/2015).

[18] Complete results are available on request.

the risky assets; these estimates, however, are not statistically significant. Interestingly, however, in the case of the share of financial wealth invested in each asset type, we find a stark contrast in the effect of Part D on the safest versus the riskiest asset: there is a significant *reduction* in the share of cash holding but a significant *increase* in the equity share. We do not find a significant effect for either the share of bonds or share of retirement accounts. Overall, these estimates support the conclusion that prescription drug coverage shifts household portfolios towards riskier assets.

Next, we assess potential threats to identification due to the 2007-2009 recession, which may have affected older persons differently than it did younger persons. For example, if the older group was less likely to invest in risky assets even prior to 2006 then it would have experienced smaller shocks due to the recession while the younger group would have seen a larger drop in the value of their retirement accounts and equity holdings. In such a case, we might observe a relative increase in the risky asset share for the treatment group but this may simply reflect the effect of the recession. Another possibility is that the elderly population is less affected by recessions than the younger population because most of the elderly are retired. Since labor income risk affects portfolio choice (Elmendorf and Kimball, 2000), recessions may result in differential trends in risky investment. Three sets of results negate these notions. First, in the flexible specifications presented in Figures 1 and 2, we observe an increase in risky asset holding beginning in 2004, much before the onset of the Great Recession but after the enactment of the Medicare Modernization Act. Moreover, the flexible specification estimates do not show any abrupt breaks in 2008. Second, we find a significant increase in ownership of risky assets. This suggests that the estimated effects are not being driven solely via changes in the value of these assets due to the recession but rather reflect actual changes in behavior. Third, our results are robust to the inclusion of additional controls related to local business cycles, which account for differential impacts of recessions on portfolio allocations. Table 5 presents results from models that include these additional controls. Column 1 presents the baseline regression for ease of reference, while Columns 2-4 add new controls to the baseline specification. Column 2 adds census division of residence dummies, the monthly unemployment rate and the monthly housing price index at the census division level.[19] Column 3 adds interactions between all covariates except age and census dummies and the post dummy, which account for differential trends over time in the impact of these variables. Column 4 adds interactions between all covariates and the $I(Age_{it} \geq 65)$ dummy, which account for differential effects of these variables by age group. These additional controls allow us to test whether the results in Table 2 are being driven by unobserved differences in marital status or local business cycles.[20] In general, the DD estimates are robust to adding these new controls, although they become less precise as we add more covariates.

In Table 6, we examine the extent to which our results are sensitive to differences in risk preferences or other unobserved factors by birth cohort. Malmendier and Nagel (2011) show that individuals' experiences of macroeconomic shocks affect their long term risk attitudes and their

[19] The unemployment rate was obtained from the Bureau of Labor Statistics website and the (purchase-only) housing price index was obtained from the website of the Federal Housing Finance Agency. These variables were then merged with HRS data using the month and year of interview and census division of residence.

[20] In analysis not shown, we also included quintiles of household income and individual level labor force participation indicators (retired, unemployed, disabled or out of the labor force) as well as interactions between these variables and the post and treatment dummies. Results were robust.

investment in risky assets. Since our models include individual fixed effects, average differences in the *level* of investment in risky assets across these birth cohorts would be captured by the individual fixed effects. To the extent that such differences in risk preferences also influence *trends* in investment, our results might not be capturing the effect of Medicare Part D. To assess potential bias due to cohort differences, we re-estimate the DD model controlling for birth cohorts. Specifically, we account for being born during World War II (1939-1945) and for being born in the post war period (1946-1950) and explore the possibility that the portfolios of these cohorts exhibit differential time-trends or age-profiles, in ways that are correlated with the availability of Medicare Part D. Column (1) of Table 6 adds to the baseline specification an interaction between the dummy for being born during World War II and the post dummy. This interaction captures differential time trends in portfolios for the World War II cohort compared to persons born in any other year during 1928-1950, the birth-year range in our sample. Column (2) adds an interaction between the WWII cohort indicator and the treatment group indicator. This accounts for differences across birth cohorts in the age profile of portfolios. Columns (3) and (4) present results from similar models based on the post war birth cohort. In general, the DD estimate is robust to accounting for cohort differences.

**<u>Placebo Tests.</u>**

As an additional check on the identification strategy, we estimate a series of placebo models using a sample of persons aged 45 to 55 years old in 2004. These individuals are between 36 and 63 years of age during the study period, and would not be eligible for Medicare Part D coverage. We use age cut-offs from 47 to 55 to define the “treatment” and “control” groups for each year, and estimate the DD model in equation (1) for each alternative definition of the treatment/control groups. Since none of these individuals are eligible for Medicare Part D during the study period, the coefficient on the interaction between the treatment group indicator and the post dummy should not be significant unless unobserved factors drive our main results. The first row in Table 7 presents the DD estimate from a model that defines the treatment group as persons aged 47 years or older and the control group constitutes persons 46 years old or younger. Similarly, the second row presents results from a model in which 48 to 63 year-olds form the treatment group while persons 47 years or younger form the control group, and so on.  The DD estimates from these placebo tests are mostly statistically insignificant and in many cases have a negative sign. The one estimate that is significant at the 10% level is negative, suggesting that, if anything, older persons are likely to decrease risky investment relative to younger persons in the post-2006 period. Thus, it seems unlikely that differential trends by age due to unobserved factors are driving our main results.

**Evaluating Pathways.**

As mentioned above, health insurance coverage may also affect portfolio choice via improvements in health and life expectancy. To assess the importance of these alternative pathways, we estimate models that include measures of health and life expectancy and report the results in Table 8.  For ease of reference, Column 1 presents the baseline DD estimates from Table 2. In Column 2, we add a quadratic function of the Center for Epidemiologic Studies – Depression (CESD) score, a measure of mental health, and an indicator for missing values of the CESD score to the baseline specification. The CESD score is a count of depressive symptoms and has been shown to decline in response to the introduction of Medicare Part D (Ayyagari and

Shane, 2015).[21] In Column 3, we add the CESD score, indicators for self-rated physical health, and a quadratic function of the number of chronic conditions that a person has been diagnosed with, as well as indicators for missing values for each of these measures.[22] Column 4 adds a quadratic function of the subjective probability that an individual will live for an additional 10 years and an indicator for missing values of this variable.[23] Finally, the model in Column 5 includes all these measures at the same time. Table 8 shows that the DD estimate is very robust to adding these new controls. This suggests that the primary driver of the observed increases in risky financial investments is the reduction in medical expenditure risk and/or the increase in net income due to Part D coverage, not changes in health or life expectancy. One caveat though is that the measures of health and life expectancy available in the HRS may not fully capture Part D-induced changes in health or life expectancy.

**Heterogeneous Effects.**

Next, we explore whether the impact of Part D varies by wealth levels. We split the sample into three groups based on terciles of financial wealth in 2004 and estimate the DD model separately

[21] The CESD score is based on 8 questions that ask the respondent to report how they felt for much of the time over the past week: depressed, everything was an effort, sleep was restless, happy, lonely, sad, could not get going and enjoyed life. CESD is missing for 5331 observations (6.38%).

[22] The list of chronic conditions includes high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems and arthritis. Self-rated health is missing for 46 observations (0.6%) and the count of chronic conditions is missing for 7 observations (0.01%).

[23] The life expectancy question asks respondent to report the probability of living to an age between 80 and 100, depending on their age at the time of the interview. Persons less than 70 years are asked about living to age 80; those between 70 and 74 are asked about living to age 85, and so on. For more details, see Chien et al. (2013). The life expectancy measure is missing for 26,738 observations (31.99%).

for each of these subsamples.  Table 9 reports the results. Consistent with the findings of Goldman and Maestas (2013), we find the strongest effects, both in terms of economic and statistical significance, for households in the middle tercile. These households increase ownership of risky assets by 5.1 percentage points, an effect twice as large as the effect for households in the wealthiest tercile. The lower responsiveness of the wealthiest households may be because these households are already much more likely to own risky assets relative to the middle wealth group (90.5% vs 57.3%), and to invest a larger proportion of their wealth in risky assets (66.7% vs 39.4%). Further, wealthy households were more likely to have access to prescription drug coverage from other sources such as employer sponsored insurance prior to the introduction of Part D (Levy and Weir 2010). For households in the lowest wealth tercile, we find an insignificant effect of Part D on the portfolio choice, and in fact, the coefficient estimates are negative. This may reflect the availability of Medicaid (which also covers prescription drugs) or low financial literacy among this group.

Next, we estimate the DD model separately for various subsamples based on the 2004 characteristics of the financial respondent of each household (Table 10).[24] Portfolio allocation decisions may be influenced by factors such as cognition, financial planning horizon, bequest motives, and demographics, which may also influence a household's responsiveness to changes in medical spending risk. The first two panels in Table 10 examine heterogeneity by cognition, which is positively associated with stock market participation (Christelis, Jappelli, and Padula 2010, Grinblatt, Keloharju, and Linnainmaa 2011). Individuals with better cognitive function

[24] For households with multiple respondents, the HRS asks that one person be designated as the financial respondent and all household-level financial questions are asked to that person.

may be more aware of the Part D program and its benefits, and may also be better at assessing the consequent reduction in spending risk. We use two measures of cognitive ability available in the HRS – the serial 7 and word recall scores which measure working memory and episodic memory, respectively. [25] For both measures, we find that persons with better cognition respond more to the introduction of Part D by increasing investment in risky assets compared to those with lower cognition scores.

In Panel 3, we explore differences by financial planning horizon.[26] A longer planning horizon generally increases optimal risk taking, and to the extent that longer horizons reflect forward looking behavior they may influence the responsiveness to changes in medical expenditure risk. For example, persons who plan their investments well in advance may be more likely to change portfolios in response to a drop in medical expenditure risk while persons with shorter horizons may not consider future, uncertain changes in medical spending when choosing their investments. While the effect on risky asset shares does not differ substantially by planning horizon, we do find a larger effect on ownership of risky assets for households that have a

[25] The serial 7 score is based on a task in which respondents are asked to subtract 7 from 100 and to continue subtracting 7 from each subsequent number for a total of five times. The serial 7 score is the sum of correct answers, with each subtraction assessed independently, and ranges from 0 to 5. The word recall measure is based on a task in which interviewers read a list of 10 nouns and ask the respondent to recall as many words as possible in any order, immediately after the list is read and again after about 5 minutes. The word recall score is the number of words recalled correctly at both times and ranges from 0 to 20. The average serial 7 score is 3.7 and the average word recall score is 10.4 for this sample.

[26] The HRS asks: "In planning your (family's) saving and spending, which of the following time periods is most important to you (and your husband/wife/partner), the next few months, the next year, the next few years, the next 5-10 years, or longer than 10 years?"

horizon of five years or longer, compared to households with planning horizons shorter than five years.

Next, we examine differences by bequest motives (Panel 4).[27] Although bequest motives have often been hypothesized to play an important role in savings and investment decisions, literature on the impact of bequest motives on portfolio choice has provided mixed findings both in terms of the magnitude and direction of the effect (Hurd 2002, Cocco, Gomes, and Maenhout 2005, Rosen and Wu 2004).[28] We find that households with a greater than 50% probability of leaving a bequest of $10,000 or more respond more to the introduction of Medicare Part D than households with a 50% or lower bequest probability. This is consistent with Rosen and Wu's argument that one can think of bequest motives as increasing a household's financial planning horizon (since the effective horizon combines own horizon and children's horizon) and/or reflecting the children's risk preferences.

Next, we examine heterogeneity by educational attainment (Panel 5). In general, highly educated persons are more likely to invest in stocks and other risky assets, likely because education is correlated with factors such as financial literacy, better information and higher wealth, all of which increase investment in risky assets. We find that persons with a high school degree or

[27] Bequest motives are assessed based on the survey question: "What are the chances that you (and your husband/wife/partner) will leave an inheritance totaling $10,000 or more?"

[28] Hurd (2002) finds no evidence that portfolio compositions are influenced by bequest motives using a descriptive analysis. Cocco, Gomes, and Maenhout (2005) use a calibrated model to show that the optimal equity share is lower in the presence of a bequest motive. Rosen and Wu (2004) find that bequest motives are positively associated with risky portfolios.

higher educational attainment are more likely to increase ownership of risky assets in response to the introduction of Medicare Part D, although this difference is not substantial. Somewhat surprisingly, when we examine the share of risky assets, we find that persons with less than a high school degree are much more responsive to Part D. It is not clear what is driving this difference.

Finally, we examine differences by marital status which could affect optimal portfolio composition through its effect on wealth, savings, and income volatility (which is lower when both spouses are earning). Marriage is typically associated with riskier portfolios compared to widowhood, divorce, or never married (Love 2010). Panel 6 shows that married/partnered households are also more responsive in terms of increasing ownership of risky assets but less responsive in terms of share of financial wealth invested in risky assets, relative to individuals who are divorced/separated, widowed or never married. However, these differences are not substantial.

## V. CONCLUSION

We find robust evidence that a reduction in prescription drug spending risk due to the introduction of Medicare Part D led seniors to increase risky investment. Though modest in magnitude, our results are consistent with economic theory which suggests that as background risk decreases, investment in risky financial assets will increase even when the two risks are independent of each other. We also find evidence of heterogeneity – households in the middle of the wealth distribution are more responsive to the drop in spending risk, as are persons with better cognitive ability, longer planning horizons, and stronger bequest motives.

Understanding the exact pathways through which health insurance affects portfolio allocation remains a challenge. Given the strong evidence in extant literature on reductions in medical expenditure risk due to Medicare Part D and the relatively weak evidence on its impact on physical health and life expectancy, we speculate that the main pathway is through a reduction in expenditure risk. This is corroborated by the robustness of the DD estimates to controlling for health and mortality expectations. However, it is plausible that the measures available in the HRS do not fully capture changes in health risk or longevity risk. A potential avenue for future research could be disentangling the effects of changes in medical expenditure risk, health risk, and longevity risk on portfolio choice.

Our results have important implications for health insurance policy, particularly Medicare reform. Several changes under the 2010 Affordable Care Act (ACA) are expected to further reduce medical spending risk for the elderly and non-elderly. As out-of-pocket spending risk declines for Medicare beneficiaries, we may see a greater acceptance of financial risk, although the associated increase in financial risk is likely to be modest. Among the non-elderly population many individuals are expected to gain coverage for the first time, resulting in a substantial drop in medical spending risk. However, given that younger individuals tend to have longer planning horizons, the effect of the ACA on the non-elderly may be larger than the effect of the Medicare Part D program on the elderly. On the other hand, individuals gaining coverage under the ACA may be healthier than the elderly population in our study, and may simply not face a very high medical spending risk. Further research is warranted to fully understand the magnitude and direction of these effects on other populations.

TABLE 1

Summary Statistics

| | Full Sample | Age < 65 | Age ≥ 65 |
|---|---|---|---|
| Owns Risky Assets | 0.5260 | 0.5426 | 0.5090 |
| | (0.4993) | (0.4982) | (0.4999) |
| Risky Asset Share | 0.4262 | 0.4066 | 0.4451 |
| | (0.4072) | (0.4042) | (0.4092) |
| Age | 64.5529 | 59.0724 | 70.1856 |
| | (6.7506) | (3.6764) | (3.9898) |
| Male | 0.4268 | 0.4103 | 0.4438 |
| | (0.4946) | (0.4919) | (0.4968) |
| Non-Hispanic White | 0.7446 | 0.7371 | 0.7523 |
| | (0.4361) | (0.4402) | (0.4317) |
| Non-Hispanic Black | 0.1455 | 0.1489 | 0.1421 |
| | (0.3527) | (0.3560) | (0.3492) |
| Non-Hispanic Other | 0.0145 | 0.0153 | 0.0137 |
| | (0.1195) | (0.1226) | (0.1163) |
| Hispanic | 0.0953 | 0.0987 | 0.0918 |
| | (0.2937) | (0.2983) | (0.2888) |
| Years of Education | 12.4091 | 12.6150 | 12.1977 |
| | (3.2013) | (3.1208) | (3.2686) |
| Number of Household | 2.2698 | 2.4279 | 2.1073 |
| Members | (1.1544) | (1.2408) | (1.0335) |

| | | | |
|---|---|---|---|
| Married | 0.6854 | 0.7264 | 0.6432 |
| | (0.4644) | (0.4458) | (0.4791) |
| Divorced/Separated | 0.1189 | 0.1300 | 0.1074 |
| | (0.3236) | (0.3363) | (0.3096) |
| Widowed | 0.1313 | 0.0762 | 0.1880 |
| | (0.3378) | (0.2653) | (0.3908) |
| Working | 0.4292 | 0.6006 | 0.2531 |
| | (0.4950) | (0.4898) | (0.4348) |
| Unemployed | 0.0144 | 0.0199 | 0.0087 |
| | (0.1190) | (0.1395) | (0.0928) |
| Retired | 0.4425 | 0.2453 | 0.6451 |
| | (0.4967) | (0.4303) | (0.4785) |
| Disabled | 0.0312 | 0.0459 | 0.0161 |
| | (0.1738) | (0.2093) | (0.1257) |
| Not in Labor Force | 0.0828 | 0.0883 | 0.0771 |
| | (0.2756) | (0.2838) | (0.2668) |
| Observations | 83,530 | 42,337 | 41,193 |
| Persons | 11,983 | 10,381 | 9,785 |

Notes: Table presents means, and standard deviations are in parentheses. Statistics on the risky asset share are presented for persons with positive financial wealth, which includes a total of 72,743 observations, with 35,747 observations in the Medicare ineligible group and 36,996 observations in the Medicare eligible group.

TABLE 2

Effect of Medicare Part D on Portfolio Choice

| | (1) Owns Risky Assets | (2) Risky Asset Share |
|---|---|---|
| $I(Age \geq 65) \times$ Post | 0.0225** | 0.0204** |
| | (0.0088) | (0.0092) |
| $I(Age \geq 65)$ | 2.3786 | 1.5799 |
| | (2.6615) | (2.7511) |
| $I(Age \geq 65) \times$ Year | -0.0012 | -0.0008 |
| | (0.0013) | (0.0014) |
| Age | 0.0184*** | 0.0259*** |
| | (0.0064) | (0.0068) |
| Age squared | -0.0002*** | -0.0003*** |
| | (0.0000) | (0.0000) |
| Married | 0.0273** | 0.0299** |
| | (0.0126) | (0.0130) |
| Divorced | -0.0537*** | -0.0532*** |
| | (0.0137) | (0.0148) |
| Widowed | -0.0092 | 0.0012 |
| | (0.0125) | (0.0138) |
| # of household residents | -0.0039* | -0.0008 |
| | (0.0021) | (0.0024) |

| | | |
|---|---|---|
| Observations | 83,530 | 72,743 |
| Persons | 11,983 | 11,357 |

Notes: * p<0.10, ** p<0.05, *** p<0.01 Robust standard errors in parenthesis are clustered at the household and age levels. Regressions also include individual fixed effects and year fixed effects.

TABLE 3

Flexible Specifications

| | (1) Owns Risky Assets | (2) Risky Asset Share |
|---|---|---|
| $I(Age \geq 65) \times$ Year 1996 | 0.0206 | 0.0014 |
| | (0.0160) | (0.0148) |
| $I(Age \geq 65) \times$ Year 1998 | 0.0070 | 0.0045 |
| | (0.0099) | (0.0098) |
| $I(Age \geq 65) \times$ Year 2000 | 0.0027 | 0.0018 |
| | (0.0077) | (0.0095) |
| $I(Age \geq 65) \times$ Year 2002 | -0.0159** | -0.0094 |
| | (0.0074) | (0.0076) |
| $I(Age \geq 65) \times$ Year 2004 | REF | REF |
| $I(Age \geq 65) \times$ Year 2006 | 0.0066 | 0.0124 |
| | (0.0071) | (0.0076) |
| $I(Age \geq 65) \times$ Year 2008 | 0.0196** | 0.0202** |
| | (0.0096) | (0.0095) |
| $I(Age \geq 65) \times$ Year 2010 | 0.0225* | 0.0083 |
| | (0.0126) | (0.0133) |
| Observations | 83,530 | 72,743 |
| Persons | 11,983 | 11,357 |

Notes: * p<0.10, ** p<0.05, *** p<0.01; Robust standard errors in parenthesis are clustered at the household and age levels. Regressions also include age, age squared, indicators for marital status (married, divorced, and widowed), number of household residents, individual fixed effects, and year fixed effects. “REF” stands for “reference period.”

TABLE 4

Alternative Definition of Safe and Risky Assets

| | (1) Cash | (2) Bonds | (3) Retirement Accounts | (4) Equity |
|---|---|---|---|---|
| | Asset Ownership | | | |
| $I(Age \geq 65) \times$ Post | -0.0018 | -0.0120** | 0.0136 | 0.0147 |
| | (0.0090) | (0.0060) | (0.0085) | (0.0094) |
| Mean dep. var. | 0.8546 | 0.0723 | 0.4364 | 0.3108 |
| Observations | 83,530 | 83,530 | 83,530 | 83,530 |
| Persons | 11,983 | 11,983 | 11,983 | 11,983 |
| | Asset Shares | | | |
| $I(Age \geq 65) \times$ Post | -0.0177** | -0.0027 | -0.0033 | 0.0237*** |
| | (0.0090) | (0.0024) | (0.0087) | (0.0072) |
| Mean dep. var. | 0.5598 | 0.0156 | 0.2701 | 0.1546 |
| Observations | 73,080 | 73,080 | 73,080 | 73,080 |
| Persons | 11,694 | 11,694 | 11,694 | 11,694 |

Notes: * p<0.10, ** p<0.05, *** p<0.01; Robust standard errors in parenthesis are clustered at the household and age levels. All regressions include age, age squared, indicators for marital status (married, divorced, and widowed), number of household residents, individual fixed effects, year fixed effects, and age group specific linear time trends.

TABLE 5

Robustness Checks – Testing for Recessionary Effects

| | (1) Baseline | (2) Add Covariates | (3) Add Interactions with Post | (4) Add Interactions with $I(Age_{it} \geq 65)$ |
|---|---|---|---|---|
| Owns Risky Assets | 0.0225** | 0.0220** | 0.0208** | 0.0199** |
| | (0.0088) | (0.0087) | (0.0089) | (0.0096) |
| Risky Asset Share | 0.0204** | 0.0203** | 0.0171* | 0.0144 |
| | (0.0092) | (0.0093) | (0.0093) | (0.0100) |

Notes: * p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis are clustered at the household and age levels. All regressions include age, age squared, indicators for marital status (married, divorced, and widowed), number of household residents, individual fixed effects, and year fixed effects. In addition, Column 2 includes census division of residence dummies, the monthly housing price index, and monthly unemployment rate at the census division level. Column 3 includes all the covariates in Column 2 plus interactions between the post dummy and marital status indicators, number of household residents, housing price index, and unemployment rate. Column 4 includes all the covariates in Column 2 plus interactions between the treatment group dummy and marital status indicators, number of household residents, housing price index, and unemployment rate.

TABLE 6

Robustness Checks - Testing for Cohort Effects

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Owns Risky Assets | 0.0210** | 0.0229*** | 0.0224** | 0.0225** |
| | (0.0100) | (0.0088) | (0.0092) | (0.0088) |
| Risky Asset Share | 0.0221** | 0.0206** | 0.0168* | 0.0204** |
| | (0.0103) | (0.0092) | (0.0098) | (0.0092) |
| WWII × Post | X | | | |
| WWII × $I(Age_{it} \geq 65)$ | | X | | |
| Post War × Post | | | X | |
| Post War × $I(Age_{it} \geq 65)$ | | | | X |

Notes: * p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis are clustered at the household and age levels. Regressions also include age, age squared, indicators for marital status (married, divorced, and widowed), number of household residents, individual fixed effects, and year fixed effects. The WWII cohort includes persons born during 1939-1945, and the post war cohort includes persons born during 1946-1950. The full sample includes persons born during 1928-1950.

TABLE 7

Placebo Tests (Sample: 45 to 55 Year Olds in 2004)

| | (1)<br>Owns Risky Assets | (2)<br>Risky Asset Share |
|---|---|---|
| $I(Age \geq 47) \times$ Post | 0.0157 | -0.0806 |
| | (0.1862) | (0.2152) |
| $I(Age \geq 48) \times$ Post | 0.0101 | 0.0030 |
| | (0.0502) | (0.0490) |
| $I(Age \geq 49) \times$ Post | -0.0633* | -0.0354 |
| | (0.0327) | (0.0360) |
| $I(Age \geq 50) \times$ Post | -0.0183 | -0.0104 |
| | (0.0298) | (0.0316) |
| $I(Age \geq 51) \times$ Post | -0.0132 | 0.0161 |
| | (0.0280) | (0.0336) |
| $I(Age \geq 52) \times$ Post | -0.0042 | 0.0002 |
| | (0.0264) | (0.0247) |
| $I(Age \geq 53) \times$ Post | -0.0201 | -0.0053 |
| | (0.0243) | (0.0282) |
| $I(Age \geq 54) \times$ Post | -0.0362 | -0.0031 |
| | (0.0243) | (0.0255) |
| $I(Age \geq 55) \times$ Post | -0.0225 | 0.0122 |
| | (0.0260) | (0.0251) |

| | | |
|---|---|---|
| Observations | 15,607 | 12,968 |
| Persons | 3,549 | 3,145 |

Notes: * p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis are clustered at the household and age levels. Regressions also include age, age squared, indicators for marital status (married, divorced, and widowed), number of household residents, individual fixed effects, year fixed effects, and age group specific linear time trends.

TABLE 8

Evaluating Pathways

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Owns Risky Assets | 0.0225** | 0.0223** | 0.0222** | 0.0220** | 0.0219** |
| | (0.0088) | (0.0089) | (0.0089) | (0.0091) | (0.0089) |
| Risky Asset Share | 0.0204** | 0.0202** | 0.0201** | 0.0201** | 0.0200** |
| | (0.0092) | (0.0092) | (0.0092) | (0.0091) | (0.0093) |
| Mental Health | | X | X | | X |
| Physical Health | | | X | | X |
| Mortality Expectations | | | | X | X |

Notes: * p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis are clustered at the household and age levels. Mental health variables include a quadratic function of the CESD score and an indicator for missing values. Physical health variables include indicators for self-rated health, a quadratic function of the number of diagnosed chronic conditions, and indicators for missing values of self-rated health and the number of chronic conditions. Mortality expectations variables include a quadratic function of the subjective probability of living another 10 years and an indicator for missing values. All regressions include age, age squared, indicators for marital status (married, divorced, and widowed), number of household residents, individual fixed effects, year fixed effects, and age group specific linear time trends.

TABLE 9

Heterogeneous Effects by Terciles of Financial Wealth

| | (1)<br>Owns Risky Assets | (2)<br>Risky Asset Share |
|---|---|---|
| Tercile 1 | -0.0051 | -0.0050 |
| | (0.0160) | (0.0158) |
| Tercile 2 | 0.0508** | 0.0355** |
| | (0.0205) | (0.0169) |
| Tercile 3 | 0.0246* | 0.0249* |
| | (0.0130) | (0.0135) |

Notes: * p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis are clustered at the household and age levels. Regressions also include age, age squared, indicators for marital status (married, divorced, and widowed), number of household residents, individual fixed effects, year fixed effects, and age group specific time trends.

TABLE 10

Heterogeneous Effects by Characteristics of the Financial Respondent in 2004

| | | (1) Owns Risky Assets | (2) Risky Asset Share |
|---|---|---|---|
| Panel 1 | Serial 7 score ≥ 3 | 0.0305*** | 0.0244** |
| | | (0.0106) | (0.0115) |
| | | N=59,837 | N=55,157 |
| | Serial 7 score <3 | 0.0075 | 0.0099 |
| | | (0.0208) | (0.0243) |
| | | N=16,429 | N=11,565 |
| Panel 2 | Word recall score ≥ 10 | 0.0347*** | 0.0233** |
| | | (0.0115) | (0.0114) |
| | | N=46,829 | N=43,319 |
| | Word recall score < 10 | 0.0094 | 0.0188 |
| | | (0.0145) | (0.0171) |
| | | N=29,437 | N=23,403 |
| Panel 3 | Financial planning horizon ≥ 5 years | 0.0436*** | 0.0244* |
| | | (0.0138) | (0.0135) |
| | | N=28,291 | N=25,934 |

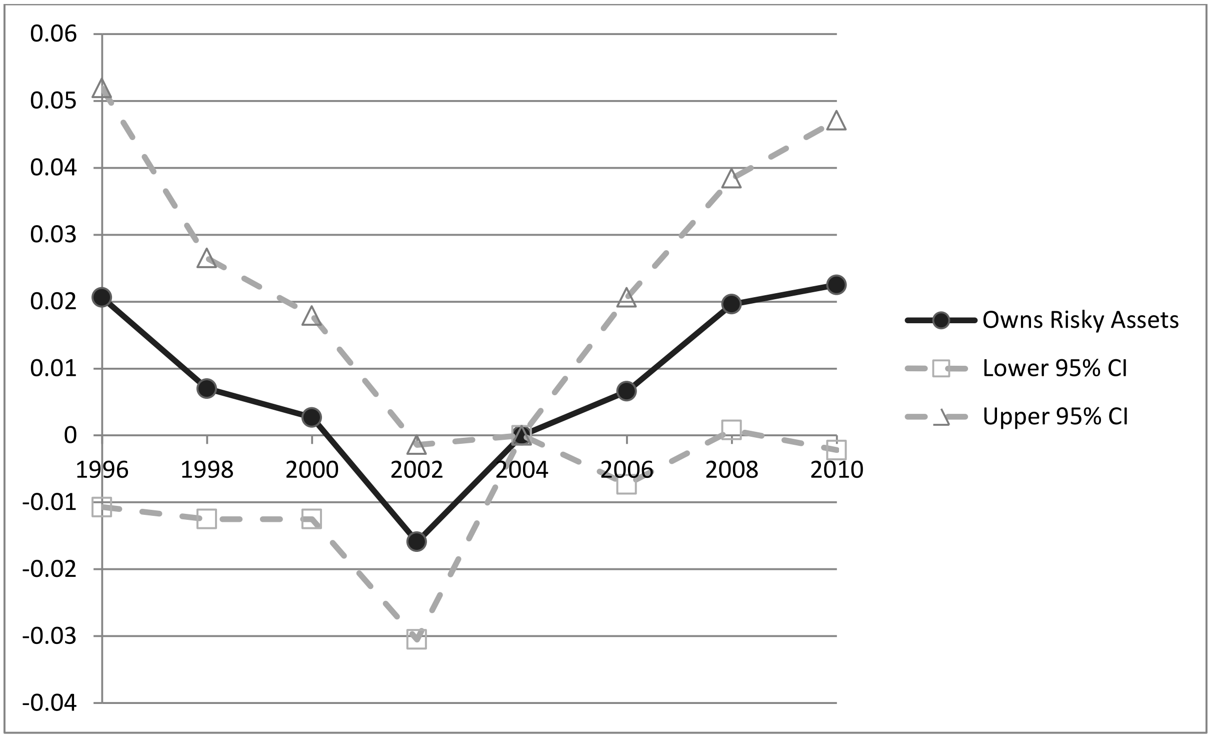
| | | | |
|---|---|---|---|
| | Financial planning horizon < 5 years | 0.0158 | 0.0222* |
| | | (0.0130) | (0.0125) |
| | | N=44,194 | N=38,214 |
| Panel 4 | Bequest probability >50% | 0.0286** | 0.0218* |
| | | (0.0117) | (0.0112) |
| | | N=51,733 | N=48,841 |
| | Bequest probability ≤ 50% | 0.0144 | 0.0152 |
| | | (0.0164) | (0.0185) |
| | | N=22,730 | N=16,602 |
| Panel 5 | ≥ High school graduate | 0.0241** | 0.0135 |
| | | (0.0102) | (0.0100) |
| | | N=60,053 | N=56,073 |
| | < High school graduate | 0.0177 | 0.0545** |
| | | (0.0173) | (0.0251) |
| | | N=19,728 | N=13,337 |
| Panel 6 | Married or partnered | 0.0234** | 0.0179 |
| | | (0.0111) | (0.0114) |
| | | N=56,736 | N=51,554 |
| | Not married or partnered | 0.0168 | 0.0260 |
| | | (0.0156) | (0.0188) |

| | | |
|---|---|---|
| | N=23,053 | N=17,860 |

Notes: * p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis are clustered at the household and age levels. All regressions include age, age squared, indicators for marital status (married, divorced, and widowed), number of household residents, individual fixed effects, and year fixed effects and age group specific linear time trends. Regressions in Panel 6 do not include marital status indicators.

FIGURE 1

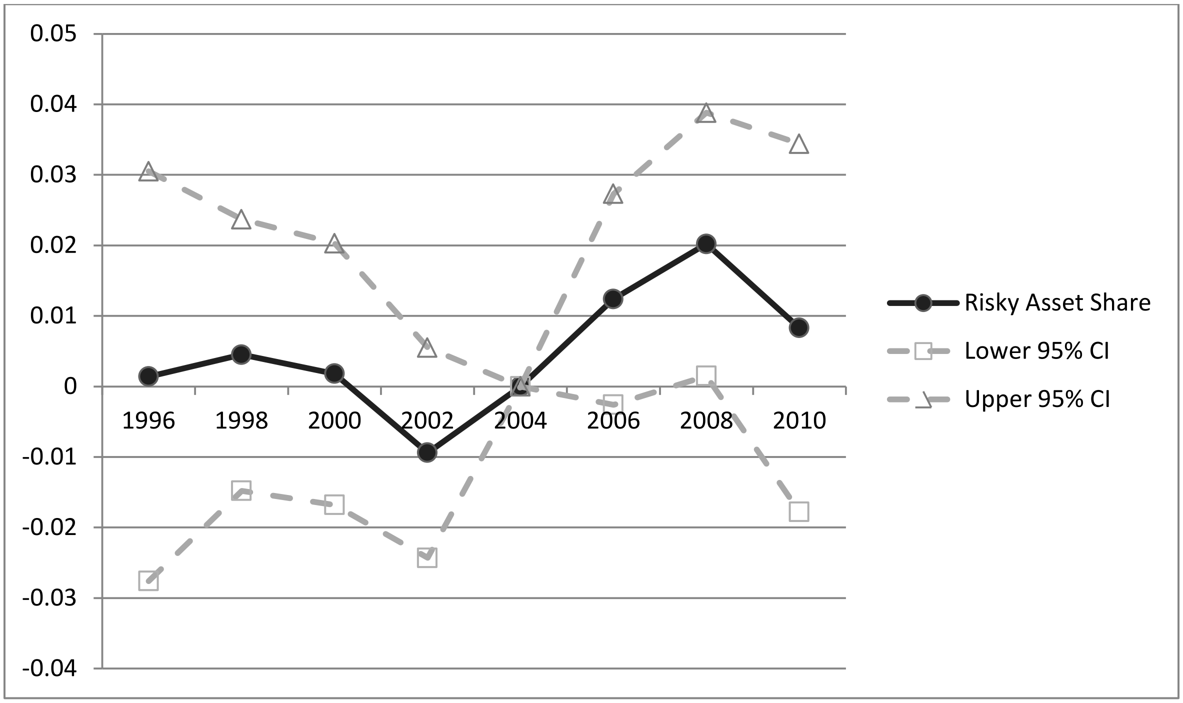
Ownership of Risky Assets – Flexible Specification




Notes: Each point on the solid line graphs the coefficient estimate on the interaction between the treatment dummy and the year dummy for that year. 2004 is the reference year. Thus, each point on the solid line represents the difference in risky asset ownership between the Medicare eligible and ineligible groups in that year relative to 2004.

FIGURE 2

Share of Financial Wealth in Risky Assets – Flexible Specification




Notes: Each point on the solid line graphs the coefficient estimate on the interaction between the treatment dummy and the year dummy for that year. 2004 is the reference year. Thus, each point on the solid line represents the difference in risky asset share between the Medicare eligible and ineligible groups in that year relative to 2004.

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