Background Risk and Household Financial Portfolios: Evidence from the Affordable Care Act

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ABSTRACT

This article examines the effects of the health insurance coverage mandate for dependents on household financial portfolio decisions by focusing on the Affordable Care Act of 2010. Using the Survey of Income and Program Participation data, the author finds that the dependent coverage mandate significantly increased (decreased) the share of stocks (bonds and other interest-accruing assets) by 2.5 (1.3 and 1.1) percentage points for households having both parental employer-sponsored health insurance and dependent children aged 19 to 25 years. The mediation analysis suggests that the mandate had a positive effect on shares of stocks through increase in health insurance coverage.

Keywords: Health insurance; health-related risk; investment risk; financial portfolio; Affordable Care Act

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1. Introduction

Many studies have examined how risk associated with health status or medical expenditure affects household financial portfolio.[1] According to the economic theory of background risk (Pratt and Zeckhauser 1987; Kimball 1993; Gollier and Pratt 1996), an individual facing undesirable risk, such as uncertain medical expenditures, is less willing to take on other types of risk, such as investment return risk. Accordingly, the theory predicts that an exogenous decrease in risk of medical expenditures or health status would induce an individual to increase his or her risky assets in a financial portfolio. Yet the empirical evidence is mixed. Some prior studies have found that individuals with lower risk of medical expenditures or with health insurance coverage hold significantly greater shares of risky assets in their portfolios and that those in poor health hold significantly greater shares of safe assets in their portfolios (Rosen and Wu 2004; Goldman and Maestas 2013). Other studies, in contrast, have found that poor health status has only an indirect or small direct effect on household portfolio decisions (Berkowitz and Qiu 2006; Edwards 2008; Coile and Milligan 2009; Fan and Zhao 2009; Love and Smith 2010).

In this field of health-related risks and financial portfolios, no study has examined how the Affordable Care Act (ACA) dependent coverage mandate affects household financial portfolios. In 2010, the ACA mandate required private insurers to allow older dependents to stay on their parents' health insurance plans until they turn 26 years of age (§ 2714 of the U.S. Public Health Service Act) because those young adults generally lost eligibility for public health insurance programs (e.g., Children's Health Insurance Program and Medicaid) and private health insurance

[1] ***Abbreviations*–ACA**: Affordable Care Act, **CI**: Credible Interval, **DD**: Difference-in-Differences, **DDD**: Difference-in-Difference-in-Differences, **ESHI**: Employer-Sponsored Health Insurance, **SIPP**: Survey of Income Program and Participation.

as dependents at the age of 19 (Levine et al. 2011; Anderson et al. 2012).[2] Recent studies have found that the ACA dependent coverage mandate significantly increased young adults' health insurance coverage (Cantor et al. 2012b; Sommers and Kronick 2012; Akosa Antwi et al. 2013; O'Hara and Brault 2013; Sommers et al. 2013), lowered their uninsured rates (Akosa Antwi et al. 2013), improved their health status (Carlson et al. 2014; Barbaresco et al. 2015), and reduced their out-of-pocket health care expenditures (Busch et al. 2014; Chua and Sommers 2014). Through these channels (i.e., increase in health insurance coverage, health status improvement, reduction in medical expenditures), as households with dependent children aged 19 to 25 years face a lower risk of future consumption shock than before the mandate, these households are expected to reduce safe assets and increase risky assets after the ACA mandate provision. Thus, this article empirically investigates whether the ACA mandate affected household portfolio decisions, and identifies mediating channels through which the mandate affected household financial portfolio.

To analyze how the ACA dependent coverage mandate affected household financial portfolio, this paper focuses on three different types of financial assets: (1) risky assets, including stocks and stock mutual funds; (2) safe assets, including U.S. government securities, municipal and U.S. savings bonds, and corporate bonds; and (3) interest-accruing assets, including savings, certificates of deposit, money market funds, and other assets in checking accounts (Poterba and Samwick 2002). Bonds offer households a safer income stream from determinate investment returns, while investment returns on stocks are less predictable. Therefore, with the ACA mandate entitling uninsured dependents aged 19 to 25 years to health insurance through their parental Employer-Sponsored Health Insurance (ESHI), I would expect households with these

[2] The U.S. health care system has struggled with achieving universal health insurance coverage, and especially, older dependent children aged 19 to 25 years have historically higher uninsured rates than other age groups.

dependents to increase (reduce) shares of stocks (bonds) in their portfolios.

To identify the effects of the ACA dependent coverage mandate on household financial portfolio decisions, I compare a treatment group, households living with dependents aged 19 to 25 years, to a control group, households with dependents aged outside the mandate-targeted ages or without dependents, before and after the mandate. In addition, to address issues on "placebo" effects of the time–age difference-in-differences (DD) framework (Slusky 2014), this study further divides households into two sub-groups, based on whether heads of households are covered by ESHI or not, because health insurance coverage for dependents whose parents have ESHI is most likely to increase due to the ACA mandate. That is, the difference-in-difference-in-differences (DDD) framework (i.e., pre- and post-ACA mandate, dependent children age, and parental ESHI availability) enables me to identify the dependent coverage mandate effects on household portfolio decisions.

Analyzing the 2008 Survey of Income Program and Participation (SIPP) data with the DDD framework, I find that households with both dependents aged 19 to 25 years and parental ESHI coverage significantly increased (decreased) the shares of stocks (bonds and other interest-bearing assets) in their financial portfolios by 2.5 (1.3 and 1.1) percentage points after the ACA mandate. Regarding these main findings, the mediation analysis suggests that the ACA mandate had a significant, positive effect on shares of stocks by increasing health insurance coverage for dependent children in a household.

This article contributes to the literature in four major ways. First, to the best of my knowledge, this paper is the first to investigate the impact of the ACA dependent coverage mandate on household financial portfolio decisions. Because household portfolio changes directly affect households' saving and consumption and asset prices in financial markets, it is

critical to understand how they changed their portfolios in response to the ACA mandate. Yet existing research is limited in scope, investigating the ACA mandate effects on labor supply decisions or health-related outcomes of young adults (Cantor et al. 2012b; Sommers and Kronick 2012; O'Hara and Brault 2013; Sommers et al. 2013; Busch et al. 2014; Chua and Sommers 2014; Depew 2015; Bailey and Chorniy 2016). Therefore, this study pioneers the research field that connects the ACA mandate effects to household financial decisions.

Second, this study identifies a significant mediating mechanism, health insurance coverage, through which the ACA mandate had a positive effect on shares of stocks in household financial portfolios. Many possible causal pathways link the ACA mandate to portfolio adjustment, such as increase in health insurance coverage, improvement in health status, or reduction in medical expenditures. Among them, I find that the increase in health insurance coverage by the ACA mandate is a significant mediating channel that explains *how* the mandate has a positive effect on household stock investment. Prior studies founding a significant effect of health-related risk on the financial portfolio have limitations to identifying mediation channels (Rosen and Wu 2004). In contrast, the empirical findings in this paper provide a suggestion to policymakers that the decrease in health-related risk through health insurance coverage would be effective in inducing households to bear other types of risk.

Third, this study reveals the effects of health insurance on financial portfolios for households in non-retirement age groups. Prior studies have mostly focused on households in retirement age and investigated the health-related risk effects on household portfolios. According to the 2014 Medical Expenditure Panel Survey Data, approximately 14% of heads of households facing difficulty in paying medical bills or filing medical bankruptcy are below age 60, and medical care costs deplete a large proportion of household income and vary significantly over time

(Feenberg and Skinner 1994; French and Jones 2004; Chernew and Newhouse 2012). Thus, it is important to understand how households in non-retirement groups manage their portfolios in response to the specific health mandate policy.

Fourth, the DDD approach adopted in this study addresses the methodological concerns of the DD framework. In particular, Slusky (2014) raises the issue that the ACA mandate effects on health insurance outcomes or job flexibility of young adults that prior research found using the DD framework could merely display dynamics in the age structure of labor supply or health insurance status for young adults. Using the same time–age DD framework, Slusky still generated the significant ACA mandate placebo effects on health insurance coverage or working hours of young adults over placebo dates (i.e., different period from the actual ACA implementation date, September 23, 2010). On the contrary, this study differentiates from prior research by identifying the treatment group using the parental ESHI coverage status in addition to time and age differences. The findings suggest that there is no placebo effect under this DDD framework, which precisely demonstrates the ACA dependent coverage mandate effects on household portfolio decisions.

The rest of this article proceeds as follows. Section 2 introduces the new changes in health insurance programs by ACA, reviews previous literature on the ACA dependent coverage mandate effects on health-related outcomes, and suggests how the dependent coverage mandate affects household portfolio decisions. Section 3 describes the SIPP data and presents the descriptive statistics of the data. Section 4 establishes the empirical strategy for identifying the dependent coverage mandate effects on household portfolio decisions. Section 5 provides the empirical results, and concluding remarks with a brief discussion of further research suggestions are provided in Section 6.

2. **Dependent coverage mandate and its implications for financial portfolios**

2.1. ACA of 2010 and dependent coverage mandate

Before the federal government enacted the ACA dependent coverage mandate, more than 30 states had already expanded dependent coverage mandate in private health insurance (Cantor et al. 2012a).[3] However, findings in the state mandate policy effects on health insurance coverage for young adults are equivocal because most states imposed several constraints, such as being unmarried, being a full-time student, and not being a dependent on a parent's tax return, in addition to an age restriction below 26 years (Levine et al. 2011; Monheit et al. 2011).[4] Furthermore, although most private sector workers with ESHI are in self-funded programs, state laws of the mandate were only effective in state-regulated plans and did not apply to self-funded programs (Monheit et al. 2011). In contrast, the ACA dependent coverage mandate applies to all young adults under age 26 and to all private insurance plans, regardless of their marital, student, and tax-filing status. Thus, ACA allows researchers to precisely estimate the dependent coverage mandate effects on household financial portfolio.

Specifically, ACA was enacted on March 23, 2010, and it was designed to expand health insurance coverage to nearly universal levels through three key mandate provisions: (1) individuals are needed to hold "qualifying" health insurance,[5] (2) employers with more than 50 full-time employees should offer affordable health coverage options to their workers, and (3) private health insurers must permit older dependent children to remain on their parents' health insurance plans until they turn 26 years old. If individuals, employers, or insurance companies do

[3] Utah was the first state to implement this coverage in 1995.

[4] Regarding the effect of the state-level health insurance mandate on different age cohorts, recent studies (Bitler and Carpenter 2016; Bitler and Carpenter 2017) found that the mandate increased the utilization of preventive health services, such as mammography and cervical cancer screening, for adult women.

[5] The details of minimum essential coverage are available at http://www.irs.gov/Affordable-Care-Act/Individuals-and-Families/ACA-Individual-Shared-Responsibility-Provision-Minimum-Essential-Coverage.

not comply with these mandates, they must pay a penalty. Among the three mandates, the dependent coverage mandate was the first provision to take effect, on September 23, 2010. Because the dependent coverage mandate became effective on the next plan renewal after September 22, 2010, health insurance companies and employer group plans were required to offer that plan no later than September 22, 2011.

2.2. Previous literature

Recent studies have mainly investigated the effects of the ACA dependent coverage mandate on health-related outcomes, such as health insurance coverage, health status, and out-of-pocket health care spending of young adults.[6] First, regarding the dependent coverage mandate effects on health insurance coverage, the majority of studies have found that the ACA mandate substantially reduced young adults' uninsured rates and increased their health insurance coverage (Cantor et al. 2012b; Sommers and Kronick 2012; Akosa Antwi et al. 2013; O'Hara and Brault 2013; Sommers et al. 2013; Jhamb et al. 2015). Second, regarding the mandate effects on health status, studies have suggested that the dependent coverage mandate significantly improved the self-assessed health status of young adults (Carlson et al. 2014; Barbaresco et al. 2015). Third, one research strand on the ACA mandate effects has found that the dependent coverage mandate significantly decreased annual medical expenditures of young adults (Busch et al. 2014; Chua and Sommers 2014). All these empirical findings suggest that households with dependent children aged 19 to 25 years face lower risks of future consumption shock associated with health status and medical expenditures than before the ACA mandate.

[6] In addition to the health-related implications, some studies (Dea and Flinn 2005; Akosa Antwi et al. 2013; Bailey and Chorniy 2016) examine the effects of ESHI or the ACA mandate on labor market flexibility. Other studies investigate the effects of background risk or ESHI with pre-commitment on the performance of insurance markets under adverse selection (Crocker and Moran 2003; Crocker and Snow 2008).

Regarding health-related risk, prior studies have examined its effects on household portfolio decisions.[7] According to the economic theory of background risk (Pratt and Zeckhauser 1987; Kimball 1993; Gollier and Pratt 1996), an individual facing undesirable risk should be less willing to take on other risks. Thus, the theory predicts that an exogenous decrease in health-related risk would induce an individual to increase risky assets in his or her financial portfolio. In support of this theoretical prediction, the extant empirical studies have found the evidence for the medical expenditure risk effects on household financial portfolios. For example, Pang and Warshawsky (2010) suggest that uncertain medical expenses caused households to adjust their portfolios from risky assets (i.e., stocks) to safer assets (i.e., bonds). Goldman and Maestas (2013) estimate the effect of medical expenditure risk on the willingness to hold risky assets and find that individuals facing lower medical expenditure risk (i.e., individuals having protective Medigap or supplemental policies) held greater shares of risky assets than those without supplemental coverage. Ayyagari and He (2016) identify the causal effect of medical spending risk on portfolio choice, and they find that reductions in prescription drug spending risk derived from Medicare Part D led Medicare-eligible persons to increase risky investment.

Related to these medical expenditure risk studies, other studies have also examined the effect of health risk on household portfolio decisions, but the empirical evidence is mixed. Rosen and Wu (2004) find that households in poor health are less likely to own risky financial assets and hold smaller shares of risky assets in their financial portfolios. Atella and his colleagues (2012) study the effect of current health status and future health risk on the decision to hold risky assets, and find that worse current health status, entailing a higher risk of out-of-pocket medical

[7] Several studies have also investigated the effects of unexpected medical expenditure risk on precautionary savings (e.g., Kotlikoff 1986; Hubbard et al. 1994, 1995; Levin 1995; Starr-McCluer 1996; Gruber and Yelowitz 1999; Palumbo 1999; Engen and Gruber 2001; Chou et al. 2003; Guariglia and Rossi 2004; Lee 2016), but, here, I mainly focus on the literature examining the effects of health-related risk on household portfolio decisions.

expenditures, forces households to reduce their financial risk. Yet Berkowitz and Qiu (2006) find that the direct effect of health status change (i.e., diagnosis of new disease) on household portfolios disappears after controlling for household characteristics of financial assets. They suggest that health status change only indirectly affects household portfolios through change in the amount of financial wealth. Consistent with their findings, follow-up studies (Cardak and Wilkins 2009; Coile and Milligan 2009; Fan and Zhao 2009; Love and Smith 2010) have also found that health risk has either no significant direct effect or a small direct effect on household financial portfolios by controlling for household unobservable characteristics.

2.3. Hypotheses

In the literature of background risk, an agent chooses the optimal level of risky investment with financial risk ($\tilde{f}$) to maximize its expected utility. When the agent has wealth (w), and exhibits decreasing absolute risk aversion under the Von Neuman-Morgenstern utility function (u), the optimal level of risky investment (θ^*) under the existence of health-related risk ($\tilde{h}$) satisfies the following condition, $\theta^* E\left[\tilde{f} u'\left(w + \tilde{h} + \theta^* \tilde{f}\right)\right] = 0$. When the health-related risk fades away, the condition becomes $\theta^* E\left[\tilde{f} u'(w + \theta^* \tilde{f})\right] \geq 0$, which implies that the original optimal level of risky investment (θ^*) is less than optimal and thus, the level of risky investment should rise (i.e., $\theta' E\left[\tilde{f} u'(w + \theta' \tilde{f})\right] = 0$, where $\theta' > \theta^*$). Because the ACA dependent coverage mandate increased health insurance coverage, reduced out-of-pocket medical costs, and improved health status of young adults aged 19 to 25 years, households with these dependent children bear lower risk in future consumption shock accompanied with health care spending than before the mandate. Accordingly, I expect that these households increased risky assets and reduced bond investment in their financial portfolios after the ACA mandate because, relying on

safe income streams, they were likely to hold bonds for precautionary purposes. As such, I test the following hypotheses:

Hypothesis 1. The ACA dependent coverage mandate has a positive effect on the probability of owning stocks or shares of stocks in financial portfolios for households with dependent children aged 19 to 25 years and parental ESHI coverage (i.e., $\alpha_1 > 0$).

Hypothesis 2. The ACA dependent coverage mandate has a negative effect on the probability of owning bonds or shares of bonds in financial portfolios for households with dependent children aged 19 to 25 years and parental ESHI coverage (i.e., $\alpha_1 < 0$).

Moreover, I examine the mediating channels through which the mandate had a significant, positive (negative) effect on stock (bond) investment. Building on prior findings of the ACA mandate effects on health insurance coverage, health status, and medical expenditures, I test three causal pathways linking the mandate to financial portfolios and illustrate them in Figure 1. For example, the first channel in Figure 1 illustrates that the ACA mandate increases health insurance coverage, which in turn may cause households to increase risky assets in their portfolios. The other two mediation channels can be interpreted in a similar way. Thus, I test the following three hypotheses:

Hypothesis 3. The ACA dependent coverage mandate has a positive effect on stock investment, mediated by an increase in health insurance coverage (i.e., $\beta_2\gamma_1 > 0$).

Hypothesis 4. The ACA dependent coverage mandate has a positive effect on stock investment, mediated by improvement in health status (i.e., $\beta_3\delta_1 > 0$).

Hypothesis 5. The ACA dependent coverage mandate has a positive effect on stock investment, mediated by reduction in medical expenditures (i.e., $\beta_4\eta_1 > 0$).

Because I assume that households with parental ESHI coverage and dependent children aged 19

to 25 years decreased shares of bonds after ACA, I expect all the signs for three mediating channels to be negative for bond investment.

[Insert Figure 1 here]

3. **Data**

To examine how the ACA dependent coverage mandate affected household portfolio decisions, I use the 2008 SIPP data, which covers the periods before and after the ACA reform. SIPP is a representative sample of the nationwide U.S. population surveyed over a multi-year period, and it adopted a four-month recall interval, with approximately the same number of interviews being conducted in each "wave" of the four-month period. Among the four months of recall periods in each wave, I take the most recent recall reference month of each wave to minimize recall bias. The most recent survey is the 2008 panel, with the duration of five years; the first wave of the panel survey was carried out from September to December 2008, and the last 16th wave of the survey was conducted from September to December 2013. Specifically, the detailed information on respondents' household financial assets and their health insurance coverage are included in waves 4, 7, and 10 of the 2008 SIPP. The corresponding calendar months and years for these three waves are August to November, 2009, 2010, and 2011, respectively.

Table 1 shows the summary statistics of the sample. All the statistics and estimates given herein are weighted by the SIPP sampling weights. The sample for this study includes heads of households aged 19 to 50 years; I divide these heads of households into a treatment and a control group, based on whether they have mandate-eligible dependent children. Additionally, using the information of whether heads of households are covered by ESHI, I further split the treatment

and control group. That is, households whose heads have both ESHI coverage and mandate-eligible dependents are in the treatment group, and the others are in the control groups. The average share of stocks for households in the treatment group was 0.42 before the ACA enactment, and it increased to 0.47 after ACA. For households in the control groups, overall, the average shares of stocks also increased after ACA. For example, households with no parental ESHI coverage and no mandate-eligible dependent children held 24 percentage of their financial portfolio as stocks (i.e., the share of stocks is 0.24 in Table 1) before ACA, which increased to 25 percentage after ACA. That is, the increase in shares of stocks after ACA is relatively greater for households in the treatment group than those in the control groups. For shares of bonds and other assets in interest-bearing accounts, households in both treatment and control groups reduced the shares of those assets in the portfolio. For example, the share of bonds for households in the treatment group was 0.08 before ACA and 0.05 after ACA. Regarding household demographic characteristics, overall, heads of households with ESHI coverage are more educated, more likely to be employed, male, African American, and Asian and are less likely to be married and Hispanic than households with no ESHI coverage.

[Insert Table 1 here]

Figure 2 illustrates the patterns of *unconditional* average shares of stocks, bonds, and other assets in interest-accruing accounts before and after the mandate. As shown in panel A of Figure 2, households in the treatment group increased the share of stocks substantially after the mandate policy was enacted while the increases in the stock shares for households in the control groups are small. Panel B shows that households in the treatment group decreased heavily the shares of bonds after the enactment, and households in the other groups also decreased them to a less extent with bumpy patterns. For shares of assets in interest-accruing accounts, households in the

treatment group slightly decreased the shares while there are not note-worthy changes for the other three groups after the new policy (panel C). To verify equality of the pre-reform trends across different four groups for each type of asset, I conducted a formal statistical test, and found that there is no statistical difference in pre-trends between the treatment and control groups for each asset.[8]

[Insert Figure 2 here]

4. **Econometric framework**

To analyze the dependent coverage mandate effects on household portfolio decisions more precisely, I use a standard DDD framework. For the identification strategy, I compare households with dependent children aged 19 to 25 years with households with dependent children outside the 19 to 25 age range or with no dependent children, before and after the health care reform. In addition, I split the households according to whether heads of households have ESHI coverage or not. This DDD framework (i.e., dependent children age, time, and parental ESHI coverage) addresses the methodological problems raised by Slusky (2014). He suggested that using only a time–age DD framework (i.e., compare dependent children aged 19 to 25 years with other sub-populations before and after the ACA reform period) could simply display dynamics in the age structure of health insurance status or working hours of young adults (i.e., *placebo* effects), instead of identifying the ACA dependent coverage mandate effects. The empirical results in the "robustness check" section suggest that there is no placebo effect under this DDD framework, which is pertinent to precisely identify the ACA dependent coverage mandate effects on household portfolio decisions.

There is a potential concern that using ESHI status might weaken the identification strategy

[8] The details of the test procedures and results are in Section 5.

because some households during the 2008 recession lost their jobs and ESHIs. Accordingly, I examined whether the ESHI status has significantly changed during the reform period, and also reestimated the main model, Equation (1), with the subsample of households keeping their ESHI status constant during the sample period. The empirical results in the "robustness check" section suggested that the ESHI status did not significantly change during the reform period. Moreover, the estimation results with the subsample of households with constant ESHI status are consistent with the main estimates. In sum, the DDD identification framework using ESHI is appropriate for estimating the ACA mandate effects on household portfolio decisions.

Under the ESHI–time–age DDD framework, I estimate the following model:

$$y_{i,s,t} = \alpha_1 I(19 \le dep < 26) \cdot I(Post\ 2010) \cdot I(ESHI) + \alpha_2 I(19 \le dep < 26) \cdot I(Post\ 2010) + \alpha_3 I(Post\ 2010) \cdot I(ESHI) + \alpha_4 I(19 \le dep < 26) \cdot I(ESHI) + \alpha_5 I(19 \le dep < 26) + \alpha_6 I(Post\ 2010) + \alpha_7 I(ESHI) + X'_{i,s,t}\alpha_8 + I(Year)'_t\alpha_9 + \vartheta'_s\alpha_{10} + \varepsilon_{i,s,t}, \quad (1)$$

where $y_{i,s,t}$ is a household i's probability of owning a certain asset (i.e., stocks, bonds, or interest-accruing assets) or share of a certain asset in state s at time t; $I(19 \le dep < 26)$ is an indicator for households with dependents aged 19 to 25 years; $I(Post\ 2010)$ is an indicator for the post-treatment period (i.e., since October 2010); $I(ESHI)$ is an indicator for heads of households with ESHI; $X_{i,s,t}$ is the vector of heads of households' demographic characteristics that possibly affect the financial portfolio, including education, age, square of age, race, sex, marital status, employment status, and household income;[9] $I(Year)_t$ is the vector of year dummies; and ϑ_s controls for state fixed effects, which reflect differences in state-mandate laws before ACA, and thus standard errors are clustered at the state level (Akosa Antwi et al. 2013).[10]

[9] The variable of age square controls for potential nonlinearity in the relationship between financial portfolio and household characteristics (Faig and Shum 2002; Shum and Faig 2006).

[10] Equation (1) is also estimated with the clustering standard errors at the treatment group and year level in the "robustness check" section.

The parameter of interest is α_1, which measures the average impact of the ACA dependent coverage mandate on household financial portfolios. I focus on three different types of financial assets: (1) stock assets, including stocks and stock mutual funds; (2) bond assets, including U.S. government securities, municipal and U.S. savings bonds, and corporate bonds; and (3) interest-accruing assets, including savings, certificates of deposit, money market funds, and other assets in checking accounts (Poterba and Samwick 2002). For the estimates of the probability of owning a certain type of assets, I use the Probit model. For example, the dependent variable for the probability of owning bonds is zero when a household does not hold any bonds in its portfolio and one for any positive amount of bond holdings. For the estimates of the share of a certain type of asset, I use the type I Tobit model because the value of the dependent variable is censored at either zero or one. For example, when a household holds the entire investment as stocks in its portfolio, the share of stocks is censored at one. The share of stocks is constructed by the ratio of the market value of stock holdings to the market value of total financial assets; the other types of shares are also constructed in the same manner.

In addition to estimates for the ACA mandate effects on household portfolio, I investigate the mediating channels through which the ACA dependent coverage mandate increases (decreases) shares of stocks (bonds) in the portfolio. Because the ACA mandate increased health insurance coverage, improved health status, and reduced medical expenditures of dependent children aged 19 to 25 years, I consider three possible mediating channels: (1) health insurance coverage, (2) health status, and (3) medical expenditures of dependent children in a household. The mediating specification is a two-step estimation process based on auxiliary equations (Case et al. 2005; Trannoy et al. 2010; Tubeuf et al. 2012). First, the direct effect of the mandate on the share of assets is as follows:

$$y_{i,s,t} = \beta_1 I(19 \le dep < 26) \cdot I(Post\ 2010) \cdot I(ESHI) + \beta_2 Insurance_{i,s,t} + \beta_3\ Health\ _{i,s,t} +$$
$$\beta_4 Med\_Exp_{i,s,t} + \beta_5 I(19 \le dep < 26) \cdot I(Post\ 2010) + \beta_6 I(Post\ 2010) \cdot I(ESHI) +$$
$$\beta_7 I(19 \le dep < 26) \cdot I(ESHI) + \beta_8 I(19 \le dep < 26) + \beta_9 I(Post\ 2010) + \beta_{10} I(ESHI) +$$
$$X'_{i,s,t}\beta_{11} + I(Year)'_t\beta_{12} + \vartheta'_s\beta_{13} + \varepsilon^{med\_dir}_{i,s,t}, \quad (2)$$

where $Insurance_{i,s,t}$, $Health\ _{i,s,t}$, and $Med\_Exp_{i,s,t}$ denote the health insurance coverage, health status, and medical expenditures of dependent children for household *i*, living in state *s*, at time *t*, respectively, and the rest of the variables are the same as described in Equation (1).

Second, the following auxiliary equations capture the mediation mechanisms of the mandate effects on shares of assets through health insurance coverage, health status, and medical expenditures for dependent children in a household:

$$Insuarnce_{i,s,t} = \gamma_1 I(19 \le dep < 26) \cdot I(Post\ 2010) \cdot I(ESHI) + \gamma_2 I(19 \le dep < 26) \cdot$$
$$I(Post\ 2010) + \gamma_3 I(Post\ 2010) \cdot I(ESHI) + \gamma_4 I(19 \le dep < 26) \cdot$$
$$I(ESHI) + \gamma_5 I(19 \le dep < 26) + \gamma_6 I(Post\ 2010) + \gamma_7 I(ESHI) +$$
$$X'_{i,s,t}\gamma_8 + I(Year)'_t\gamma_9 + \vartheta'_s\gamma_{10} + \varepsilon^{med\_ins}_{i,s,t}, \quad (3a)$$

$$Health_{i,s,t} = \delta_1 I(19 \le dep < 26) \cdot I(Post\ 2010) \cdot I(ESHI) + \delta_2 I(19 \le dep < 26) \cdot$$
$$I(Post\ 2010) + \delta_3 I(Post\ 2010) \cdot I(ESHI) + \delta_4 I(19 \le dep < 26) \cdot I(ESHI) +$$
$$\delta_5 I(19 \le dep < 26) + \delta_6 I(Post\ 2010) + \delta_7 I(ESHI) + X'_{i,s,t}\delta_8 + I(Year)'_t\delta_9 +$$
$$\vartheta'_s\delta_{10} + \varepsilon^{med\_hlt}_{i,s,t}, \quad (3b)$$

and

$$Med\_Exp_{i,s,t} = \eta_1 I(19 \le dep < 26) \cdot I(Post\ 2010) \cdot I(ESHI) + \eta_2 I(19 \le dep < 26) \cdot$$
$$I(Post\ 2010) + \eta_3 I(Post\ 2010) \cdot I(ESHI) + \eta_4 I(19 \le dep < 26) \cdot$$
$$I(ESHI) + \eta_5 I(19 \le dep < 26) + \eta_6 I(Post\ 2010) + \eta_7 I(ESHI) + X'_{i,s,t}\eta_8 +$$
$$I(Year)'_t\eta_9 + \vartheta'_s\eta_{10} + \varepsilon^{med\_exp}_{i,s,t}. \quad (3c)$$

When plugging in these three auxiliary equations into Equation (2), I obtain

$$y_{i,s,t,} = \theta_1 I(19 \le dep < 26) \cdot I(Post\ 2010) \cdot I(ESHI) + \zeta_2 I(19 \le dep < 26) \cdot I(Post\ 2010) + \zeta_3 I(Post\ 2010) \cdot I(ESHI) + \zeta_4 I(19 \le dep < 26) \cdot I(ESHI) + \zeta_5 I(19 \le dep < 26) + \zeta_6 I(Post\ 2010) + \zeta_7 I(ESHI) + X'_{i,s,t}\zeta_8 + I(Year)'_t\zeta_9 + \vartheta'_s\zeta_{10} + \varepsilon^{med}_{i,s,t}, \quad (4)$$

where $\theta_1 = \beta_1 + \beta_2\gamma_1 + \beta_3\delta_1 + \beta_4\eta_1$ and $\zeta_k = \beta_{k+3} + \beta_2\gamma_k + \beta_3\delta_k + \beta_4\eta_k$, for $k = 2, 3, 4, \cdots, 10$.

I estimate Equations (2), (3a), (3b), and (3c) simultaneously using a Bayesian mediation analysis (Tingley et al. 2014). The parameter of interest is $\theta_1 (= \beta_1 + \beta_2\gamma_1 + \beta_3\delta_1 + \beta_4\eta_1)$, the total effects of the dependent coverage mandate on shares of certain assets. The total effects consist of the direct mandate effects on shares of assets (β_1) and the mediating effects through health insurance $(\beta_2\gamma_1)$, health status $(\beta_3\delta_1)$, and medical expenditures $(\beta_4\eta_1)$ of dependent children in households. Figure 1 and 3 illustrates the total, direct, and mediating effects, and the mediators are the effective channels of the mandate effects on financial portfolio as long as $\beta_2\gamma_1$, $\beta_3\delta_1$, or $\beta_4\eta_1$ are statistically significant (Hayes 2013).

[Insert Figure 3 here]

5. **Empirical results**

5.1. Main results

Table 2 provides the estimates for the ACA dependent coverage mandate effects on the probability of owning a certain asset. Because financial investment decisions (i.e., which assets to purchase and how much to invest) are based on a model with corner solutions, all the Probit and Tobit estimates presented in the tables herein represent the marginal effects. As shown in columns (1), (2), and (3) of Table 2, I find that the Probit estimates for the interaction term

among the indicators of having dependent children aged 19 to 25 years, parental ESHI coverage, and post-ACA period are not statistically significant for all three types of assets. I also estimate the mandate effects on asset ownership in linear regression because the magnitude of the interaction effect in nonlinear models is not equivalent to the marginal effect of the interaction term (Ai and Norton 2003). The estimates in linear regressions are shown in columns (4), (5), and (6), and the magnitudes and signs of the interaction terms for all three types of assets are consistent with the Probit estimates. That is, the ACA mandate does not significantly affect household financial portfolios at the extensive margin.

[Insert Table 2 here]

Table 3 presents the estimates for the ACA dependent coverage mandate effects on shares of financial assets. In column (1), the coefficient for the interaction term among the indicators of having dependent children aged 19 to 25 years, parental ESHI coverage, and post-ACA period is positive at the 1% significance level ($\hat{\alpha}_1 = 0.025, p < 0.01$) for shares of stocks.[11] Since the control group accounts for passive changes in asset holdings due to asset return changes, the DDD estimate shows household active portfolio changes in response to the dependent coverage mandate. That is, the ACA dependent coverage mandate caused households with dependent children aged 19 to 25 years and parental ESHI coverage to significantly increase their investments in stocks by 2.5 percentage points, in support of Hypothesis 1. This empirical finding lends support to the theoretical prediction that households facing lower undesirable health-related risks after ACA increased other types of risk (i.e., investment return risk). As the summary statistics in Table 1 show, on average, the mandate-induced increase in stock holdings

[11] The estimates for Equation (1) with additional control variables such as the federal poverty level, monthly state unemployment rates, interaction between the treatment dummy and state unemployment rates, and monthly linear national and state-specific trends, are still consistent with the main results (i.e., the mandate effects significantly increased the stock investment; $\hat{\alpha}_1 = 0.026, p < 0.01$).

is approximately $580 for households in the treatment group.

[Insert Table 3 here]

In accordance with the increase in shares of risky assets, these households significantly decreased the shares of bonds after the ACA mandate. The estimates in Table 3 suggest that the coefficient is negative and statistically significant for the shares of bonds ($\hat{\alpha}_1 = -0.013, p < 0.01$; column (2)), which supports for Hypothesis 2. The estimate is also significantly negative for the shares of interest-accruing assets ($\hat{\alpha}_1 = -0.011, p < 0.10$; column (3)).

The estimates for household demographic characteristics also appear in Table 3. They suggest that more educated, higher-income, married, and male heads of households hold significantly greater shares of stocks in their portfolio. The estimates also suggest that more educated, higher-income heads of households hold significantly higher shares of bonds but lower shares of interest-bearing assets. These findings are consistent with the findings of previous studies (Rosen and Wu 2004; Berkowitz and Qiu 2006; Cardak and Wilkins 2009).

To explain how the ACA mandate had a significantly positive effect on shares of stocks, I also conducted a mediation analysis to determine whether health insurance coverage, health status, and medical expenditures are effective mediating channels. The estimation results in Table 4 suggest that health insurance coverage is the significant mediating channel through which the ACA mandate had a positive effect on the share of stocks in financial portfolios ($\hat{\beta}_2\hat{\gamma}_1 = 0.002$, the 95% credible interval [CI] does not include 0), in support of Hypothesis 3. That is, households experienced significantly higher health insurance coverage of their young dependents after ACA, which subsequently increased their share of risky assets. The ACA mandate also significantly decreased the share of other assets in interest-bearing accounts through the health insurance coverage channel ($\hat{\beta}_2\hat{\gamma}_1 = -0.003$, the 95% CI does not include 0).

Yet Hypothesis 4 and 5 are not supported because health status and medical expenditures do not significantly mediate the positive effect of the ACA mandate on the shares of stocks ($\hat{\beta}_3\hat{\delta}_1 = -0.0001$; $\hat{\beta}_4\hat{\eta}_1 = -0.00001$, not significant). For the shares of bonds, the estimates in Table 4 suggest that three mediating channels are not significant for the negative mandate effect on the bond investment.

[Insert Table 4 here]

For the completeness, Table 5 presents the estimates of how the dependent coverage mandate affected three mediating channels, health insurance coverage, health status, and medical expenditures. The estimates in Table 5 suggest that the dependent coverage mandate significantly increased the health insurance coverage and health conditions of dependent children in the households ($\hat{\beta}_2 = 0.007, p < 0.01$; $\hat{\beta}_3 = 0.062, p < 0.01$).

[Insert Table 5 here]

5.2. Robustness checks

First, I examine whether the financial portfolio patterns between households in the treatment and control groups are similar in the pre-reform period. If investment patterns for households in the two groups differed in the pre-reform period, the main estimation results would merely exhibit differences in investment patterns between the two groups, not the dependent coverage mandate effects. Exploiting the data from August to November 2009, I analyze a model with the same specification of Equation (1) by replacing the indicator for the post-ACA period with linear month trends. The estimation results in Table 6 show that there are no significant disparities in investment patterns for all three types of assets between the treatment and control groups before the ACA reform period.

[Insert Table 6 here]

Second, there is a possibility that parents with mandate-eligible children would be more likely to take up ESHI coverage after ACA to obtain health insurance benefits for their dependents, which also might influence household portfolio decisions. To assess whether households with dependents aged 19 to 25 years are more likely to take up ESHI after ACA, I run the following Probit model:

$$I(ESHI) = \mu_1 I(19 \leq dep < 26) \cdot I(Post\ 2010) + \mu_2 I(Post\ 2010) + \mu_3 I(19 \leq dep < 26) + X'_{i,s,t}\mu_4 + I(Year)'_t\mu_5 + \vartheta'_s\mu_6 + \varepsilon_{i,s,t}, \quad (5)$$

where all the variables are the same as in Equation (1). The estimation results presented in Table 7 show that the ACA mandate did not significantly raise the ESHI take-up for parents with dependents aged 19 to 25 years ($\hat{\mu}_1 = 0.007$). That is, this confounding factor does not damage the main estimates of the ACA mandate effects on household portfolio.

[Insert Table 7 here]

Third, because the ACA mandate effects on portfolio decisions might be attributed to dynamics in portfolio structures across various households over time, I also run a series of placebo tests by setting artificial reform periods. I replace the indicator for the post-ACA period, $I(Post\ 2010)$, in Equation (1) with an indicator for a placebo date by falsely assuming that the ACA reform occurred on different dates before March 2010. Specifically, I reestimate Equation (1) for each of all three placebo months between September and November 2009. The estimates for placebo dates appear in Table 8. All the placebo test results indicate no statistical significance in the coefficients for the interaction term of indicators among having dependent children aged 19 to 25 years, parental ESHI coverage, and placebo date, which confirms that the main estimates did not arise from dynamics in financial asset investment across different households,

but from the ACA dependent coverage mandate. In addition, I conduct a permutation test by generating 1,000 "placebo" samples. I randomly reassign treatment group to households within the same EHSI status, and reestimate Equation (1) with each placebo sample. Based on the distribution of the estimates from placebo simulations, I confirm that the estimate from the true treatment sample is an outlier with the implied *p*-value of 0.085.

[Insert Table 8 here]

Fourth, I examine whether the main estimates for the mandate effects are robust to macroeconomic shocks during the 2008 recession in several ways. Because the 2008 recession made some households lost their jobs and ESHIs, the composition changes in the treatment and control groups might affect the main results. I thus reestimate Equation (1) with the subsample of households with constant ESHI status during the sample period. The estimation results are presented in Table 9, and they are still consistent with the main estimates.

[Insert Table 9 here]

Last, I reestimate Equation (1) to investigate whether the main estimates from the DDD framework are robust to the treatment–year level clustering standard errors. Since a *t*-distribution is derived based on a small number of treatment–year clusters (i.e., 12 clusters and thus the degrees of freedom are equal to 11), the critical values used for the hypothesis tests are more conservative than those using state-clustered robust standard errors in the main analysis.[12] In Table 10, the estimation results with the treatment–year-clustered robust standard errors are qualitatively consistent with the main estimates.

[Insert Table 10 here]

[12] The block bootstrap (Bertrand et al. 2004) or wild cluster bootstrap (Cameron et al. 2008) methods are not feasible because of the extremely small number of groups.

6. **Conclusions**

This study examines how the ACA dependent coverage mandate affected household portfolio decisions. For the identification strategy, I divided households into treatment and control groups, based on whether heads of households had dependent children aged 19 to 25 years and ESHI coverage. I compared the shares of stocks, bonds, and interest-accruing assets in the portfolio for the treatment and control groups before and after the ACA enactment. I find that for households with both dependent children aged 19 to 25 years and parental ESHI coverage, the ACA dependent coverage mandate significantly increased the shares of stocks in their portfolios by 2.5 percentage points. On the contrary, these households significantly reduced the shares of bonds by 1.3 percentage points and other interest-accruing assets by 1.1 percentage points. The mediation analysis suggests that the positive effect of the mandate on shares of stocks is mediated through the increase in health insurance coverage. In addition, the placebo tests suggest that the baseline DDD framework is pertinent to precisely identify the ACA dependent coverage mandate effects on household portfolio decisions. Because other mandate provisions, such as individual and employer mandates, were implemented in 2014 and thus are not examined in this study, analyzing these newly implemented mandate effects on household portfolio decisions would be a worthwhile future research direction.

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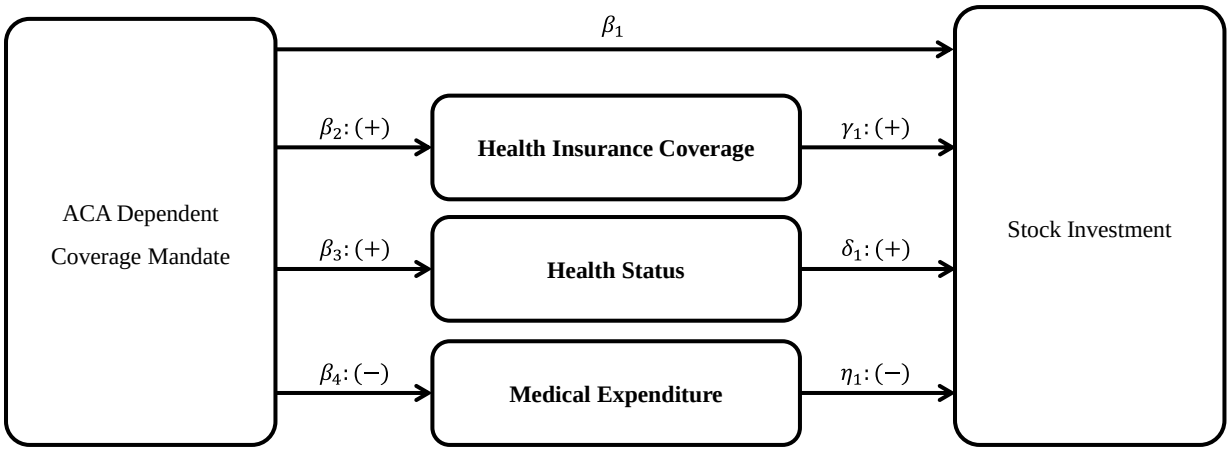


Total Effects of the ACA Dependent Coverage Mandate on Stock investment	$\beta_1 + \beta_2\gamma_1 + \beta_3\delta_1 + \beta_4\eta_1$
Direct Effects	β_1
Mediating Effects via Health Insurance Coverage	$\beta_2\gamma_1$
Mediating Effects via Health Status	$\beta_3\delta_1$
Mediating Effects via Medical Expenditures	$\beta_4\eta_1$

FIGURE 1. Mediating roles of health insurance coverage, health status, and medical expenditures on the relationship between the ACA mandate and investment on stocks.

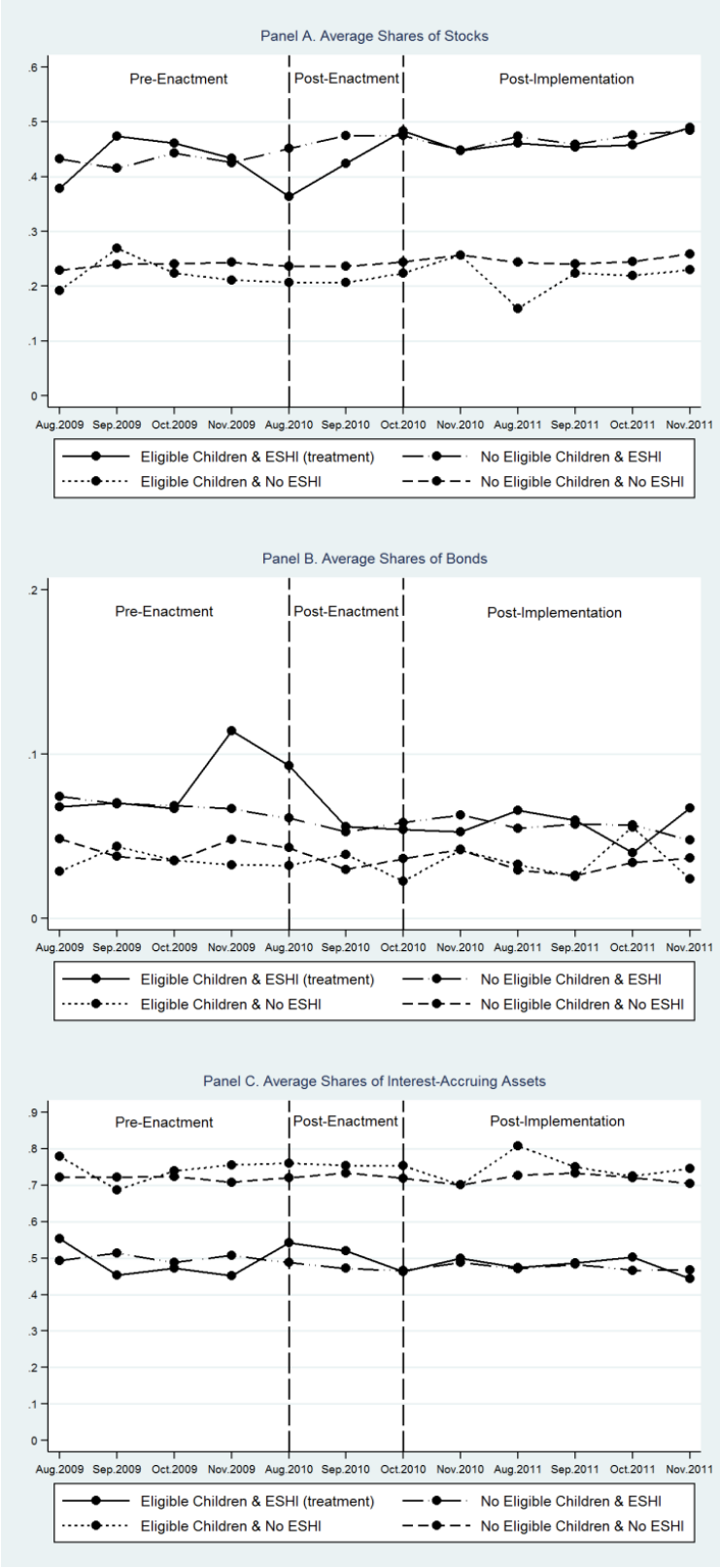
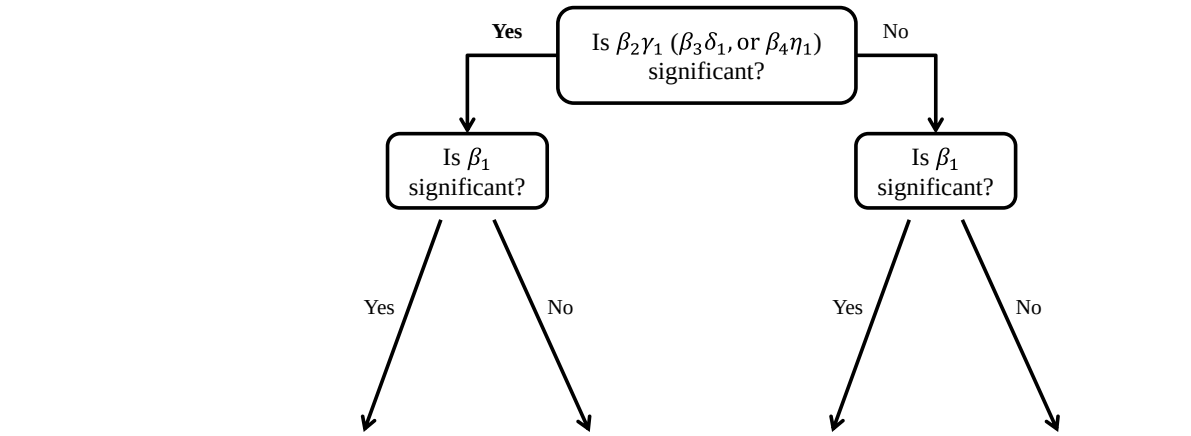


FIGURE 2. Shares of financial assets by treatment and control groups.



Hypothesized Mediators	**Effective**	**Effective**	Ineffective	Ineffective
Omitted Mediator	Likely	Unlikely	Likely	Unlikely

FIGURE 3. Decision tree for understanding mediation effects.

TABLE 1. Summary statistics: 2008 SIPP data.

	All	Pre-ACA Enactment				Post-ACA Enactment			
		ESHI		No ESHI		ESHI		No ESHI	
		Mandate-Eligible Dependent Children	No Dependent Children, or Non-Mandate-Eligible Dependent Children	Mandate-Eligible Dependent Children	No Dependent Children, or Non-Mandate-Eligible Dependent Children	Mandate-Eligible Dependent Children	No Dependent Children, or Non-Mandate-Eligible Dependent Children	Mandate-Eligible Dependent Children	No Dependent Children, or Non-Mandate-Eligible Dependent Children
% of stocks in portfolio	0.36	0.42	0.44	0.22	0.24	0.47	0.47	0.22	0.25
% of bonds in portfolio	0.05	0.08	0.07	0.03	0.04	0.05	0.06	0.03	0.03
% of other assets in portfolio	0.59	0.50	0.49	0.75	0.72	0.48	0.47	0.75	0.72
Health insurance coverage (covered=1, not covered=0)	0.58	0.67	0.80	0.41	0.45	0.74	0.82	0.40	0.46
Health status (poor=1, fair=2, …, excellent=5)	4.34	4.35	4.34	4.29	4.37	4.36	4.40	4.26	4.33
Medical expenditures	0.46	0.52	0.53	0.46	0.49	0.36	0.44	0.39	0.56
Age	37.14	42.97	36.69	41.73	35.75	40.81	36.98	39.65	36.27
Education	14.28	13.80	14.77	12.86	13.93	13.85	14.91	12.86	13.92
Sex (male=1, female=2)	1.50	1.55	1.41	1.66	1.56	1.51	1.41	1.65	1.57
Employment status (having a job=1, looking for a job=2, not in labor force=3)	1.23	1.02	1.03	1.47	1.49	1.03	1.02	1.46	1.47
Hispanic	0.12	0.14	0.10	0.17	0.13	0.13	0.10	0.19	0.13
White	0.71	0.66	0.72	0.68	0.71	0.67	0.71	0.64	0.71
Black	0.10	0.15	0.10	0.09	0.09	0.14	0.11	0.11	0.09
Asian	0.04	0.03	0.05	0.02	0.04	0.03	0.05	0.02	0.04
Other	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.04	0.03
Marital status (unmarried=0, married=1)	0.55	0.59	0.50	0.69	0.61	0.52	0.50	0.62	0.60
Total household income	6.30	7.43	6.91	6.24	5.43	6.70	6.97	5.80	5.36
Number of households	32,774	1,280	8,357	1,316	6,796	1,134	7,081	1,195	5,615

Notes: The estimates are from the 2008 SIPP data and the author's calculation. All averages are weighted by the SIPP sampling weights. All the monetary values are adjusted to thousands of 2011 US dollars.

TABLE 2. Effects of the ACA mandate on probability of owning financial assets.

	Probit			OLS		
	Pr (Stocks=1)	Pr (Bonds=1)	Pr (Other Assets=1)	Pr (Stocks=1)	Pr (Bonds=1)	Pr (Other Assets=1)
	(1)	(2)	(3)	(4)	(5)	(6)
$I(ESHI) \times I(19 \leq Dep < 26) \times I(post\text{-}2010)$	0.021	-0.032	-0.002	0.019	-0.029	-0.012
	(0.031)	(0.022)	(0.015)	(0.030)	(0.022)	(0.016)
$I(19 \leq Dep < 26) \times I(post\text{-}2010)$	0.005	0.020	-0.016	0.007	0.016	-0.013
	(0.024)	(0.014)	(0.012)	(0.022)	(0.011)	(0.010)
$I(ESHI) \times I(post\text{-}2010)$	0.011	0.004	0.000	0.012	-0.002	-0.003
	(0.013)	(0.006)	(0.007)	(0.013)	(0.007)	(0.007)
$I(19 \leq Dep < 26) \times I(ESHI)$	0.000	0.018	-0.010	-0.006	0.011	-0.011
	(0.021)	(0.016)	(0.012)	(0.020)	(0.017)	(0.011)
$I(post\text{-}2010)$	0.006	-0.008	-0.004	0.006	-0.004	-0.002
	(0.013)	(0.009)	(0.007)	(0.012)	(0.008)	(0.006)
$I(19 \leq Dep < 26)$	-0.045***	-0.024*	0.005	-0.042***	-0.021*	0.005
	(0.015)	(0.012)	(0.007)	(0.014)	(0.011)	(0.005)
I(ESHI)	0.186***	0.053***	-0.028***	0.203***	0.050***	-0.026***
	(0.010)	(0.009)	(0.005)	(0.011)	(0.009)	(0.005)
Age	0.026***	-0.002	-0.009***	0.026***	-0.004	-0.008***
	(0.004)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)
Age square	-0.000***	0.000	0.000***	-0.000***	0.000*	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education	0.032***	0.019***	0.002**	0.032***	0.018***	0.003**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Sex (male=1, female=2)	-0.018**	0.003	0.001	-0.018**	0.002	-0.000
	(0.008)	(0.005)	(0.004)	(0.008)	(0.005)	(0.004)
Employment status (having a job=1, looking for a job=2,	-0.059***	-0.007	0.013***	-0.058***	-0.005	0.009***
not in labor force=3)	(0.006)	(0.005)	(0.003)	(0.006)	(0.004)	(0.002)
Marital status (unmarried=0, married=1)	0.018***	0.024***	0.011***	0.024***	0.022**	0.011***
	(0.006)	(0.008)	(0.004)	(0.006)	(0.009)	(0.004)
Hispanic	-0.079***	-0.010	0.029***	-0.072***	0.006	0.032***
	(0.021)	(0.014)	(0.008)	(0.022)	(0.010)	(0.010)
White	0.074***	0.060***	0.011*	0.078***	0.054***	0.014*
	(0.019)	(0.008)	(0.006)	(0.021)	(0.007)	(0.008)
Asian	-0.024	-0.028	0.026***	-0.021	-0.032	0.026***
	(0.020)	(0.021)	(0.008)	(0.021)	(0.021)	(0.009)
Other	-0.017	0.041*	0.027**	-0.017	0.038*	0.028***
	(0.023)	(0.023)	(0.011)	(0.024)	(0.021)	(0.010)
Total household income	0.014***	0.004***	0.001***	0.012***	0.005***	0.001***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
N	32,774	32,774	32,774	32,774	32,774	32,774
Pseudo-R^2	0.170	0.076	0.046	0.211	0.065	0.022

Notes: All the estimates are weighted by the SIPP sampling weights. State and time fixed effects are included in the estimation, but not reported. State-clustered robust standard errors are in parentheses. Asterisks denote statistical significance at the 1% (***), 5% (**), and 10% (*) levels.

TABLE 3. Effects of the ACA mandate on shares of financial assets.

	Shares of Stocks	Shares of Bonds	Shares of Other Assets
	(1)	(2)	(3)
$I(ESHI) \times I(19 \leq Dep < 26) \times I(post\text{-}2010)$	0.025***	-0.013***	-0.011*
	(0.005)	(0.003)	(0.007)
$I(19 \leq Dep < 26) \times I(post\text{-}2010)$	0.014***	0.005	-0.033***
	(0.004)	(0.004)	(0.005)
$I(ESHI) \times I(post\text{-}2010)$	0.001	-0.000	-0.003
	(0.003)	(0.002)	(0.004)
$I(19 \leq Dep < 26) \times I(ESHI)$	0.045***	0.012**	-0.086***
	(0.005)	(0.005)	(0.005)
$I(post\text{-}2010)$	0.013***	0.002	-0.016***
	(0.003)	(0.003)	(0.004)
$I(19 \leq Dep < 26)$	-0.067***	-0.011***	0.097***
	(0.003)	(0.002)	(0.005)
I(ESHI)	-0.243***	0.006	0.188***
	(0.010)	(0.004)	(0.007)
Age	-0.002***	-0.001***	0.003***
	(0.000)	(0.000)	(0.000)
Age square	0.000***	0.000**	-0.000***
	(0.000)	(0.000)	(0.000)
Education	0.024***	0.007***	-0.039***
	(0.002)	(0.003)	(0.000)
Sex (male=1, female=2)	-0.014***	-0.004***	0.023***
	(0.001)	(0.000)	(0.003)
Employment status (having a job=1, looking for a job=2,	-0.075***	-0.003***	0.106***
not in labor force=3)	(0.002)	(0.000)	(0.005)
Marital status (unmarried=0, married=1)	0.020***	0.005	-0.034***
	(0.004)	(0.003)	(0.003)
Hispanic	-0.086***	-0.000	0.119***
	(0.003)	(0.002)	(0.006)
White	0.052***	0.011**	-0.090***
	(0.005)	(0.005)	(0.002)
Asian	-0.056***	-0.025***	0.092***
	(0.001)	(0.007)	(0.005)
Other	-0.055***	-0.006***	0.073***
	(0.002)	(0.001)	(0.004)
Total household income	0.008***	0.001**	-0.012***
	(0.001)	(0.001)	(0.000)
N	32,774	32,774	32,774
Pseudo-R^2	0.099	0.062	0.101

Notes: All the estimates are weighted by the SIPP sampling weights. State and time fixed effects are included in the estimation, but not reported. State-clustered robust standard errors are in parentheses. Asterisks denote statistical significance at the 1% (***), 5% (**), and 10% (*) levels.

TABLE 4. Effects of the ACA mandate on household financial portfolio through three mediating mechanisms.

	Health Insurance Coverage			Health Status			Medical Expenditures		
	(1)			(2)			(3)		
	Estimates of $\beta_2\gamma_1$	Lower CI	Upper CI	**Estimates of $\beta_3\delta_1$**	Lower CI	Upper CI	**Estimates of $\beta_4\eta_1$**	Lower CI	Upper CI
Shares of Stocks									
Average causal mediation effect	0.002**	0.0007	0.004	-0.0001	-0.0006	0.0003	-0.00001	-0.0005	0.0004
Shares of Bonds									
Average causal mediation effect	0.001	0.0003	0.002	-0.00001	-0.0001	0.0001	-0.00001	-0.0002	0.0001
Shares of Other Assets									
Average causal mediation effect	-0.003**	-0.005	-0.001	0.0001	-0.0003	0.001	-0.00002	-0.001	0.0004

Notes: Posterior means of the parameters are tabulated, and all the estimates are weighted by the SIPP sampling weights. * The 90% CI does not contain 0 (two-sided). ** The 95% CI does not contain 0 (two-sided).

TABLE 5. Effects of the ACA mandate on health insurance coverage, health status, and medical expenditures.

	Health Insurance Coverage	Health Status	Medical Expenditures
	(1)	(2)	(3)
$I(ESHI) \times I(19 \leq Dep < 26) \times I(post\text{-}2010)$	0.007***	0.062***	-3.885
	(0.001)	(0.003)	(11.220)
$I(19 \leq Dep < 26) \times I(post\text{-}2010)$	-0.005***	0.005***	-9.646
	(0.001)	(0.001)	(7.595)
$I(ESHI) \times I(post\text{-}2010)$	-0.004***	-0.058***	0.156
	(0.0004)	(0.002)	(0.143)
$I(19 \leq Dep < 26) \times I(ESHI)$	0.018***	0.084***	8.013
	(0.003)	(0.003)	(10.595)
$I(post\text{-}2010)$	0.004***	-0.012***	-0.866
	(0.001)	(0.001)	(1.137)
$I(19 \leq Dep < 26)$	0.193***	1.385***	40.243***
	(0.026)	(0.040)	(5.936)
$I(ESHI)$	-0.001***	-1.021***	-22.273*
	(0.0001)	(0.028)	(11.296)
Age	0.005***	0.005***	0.165
	(0.001)	(0.0001)	(0.151)
Education	0.001***	-0.001***	-0.332*
	(0.0001)	(0.000)	(0.176)
Sex (male=1, female=2)	0.001***	0.009***	2.048***
	(0.0003)	(0.001)	(0.686)
Employment status (having a job=1, looking for a job=2,	-0.001***	-0.005***	-0.942
not in labor force=3)	(0.000)	(0.0002)	(0.563)
Marital status (unmarried=0, married=1)	0.003***	-0.028***	-0.735
	(0.001)	(0.0005)	(0.959)
Hispanic	-0.002***	-0.006***	2.139*
	(0.0002)	(0.001)	(1.182)
White	0.0003	-0.013***	4.083***
	(0.0002)	(0.0003)	(1.278)
Asian	-0.002***	-0.016***	2.503**
	(0.0002)	(0.001)	(1.163)
Other	-0.001***	-0.021***	2.201
	(0.0001)	(0.0004)	(1.608)
Total household income	0.001***	0.001***	0.095
	(0.0001)	(0.0001)	(0.087)
N	32,774	32,774	32,774
Pseudo-R^2	0.644	0.563	0.054

Notes: All the estimates are weighted by the SIPP sampling weights. State and time fixed effects are included in the estimation, but not reported. State-clustered robust standard errors are in parentheses. Asterisks denote statistical significance at the 1% (***), 5% (**), and 10% (*) levels.

TABLE 6. Household financial portfolio trends in the pre-reform periods.

	Shares of Stocks	Shares of Bonds	Shares of Other Assets
	(1)	(2)	(3)
$I(ESHI) \times I(19 \leq Dep < 26) \times Trend$	-0.000	0.007	-0.018
	(0.002)	(0.009)	(0.035)
$I(19 \leq Dep < 26) \times Trend$	0.008***	0.001	-0.014
	(0.002)	(0.006)	(0.021)
$I(ESHI) \times Trend$	-0.005***	-0.001	0.008
	(0.001)	(0.003)	(0.013)
$I(19 \leq Dep < 26) \times I(ESHI)$	0.051***	-0.006	-0.054
	(0.007)	(0.017)	(0.089)
Trend	0.005***	-0.001	-0.006
	(0.001)	(0.003)	(0.009)
$I(19 \leq Dep < 26)$	-0.076***	-0.016	0.125**
	(0.006)	(0.015)	(0.062)
I(ESHI)	-4.295***	0.042	0.330
	(0.253)	(0.067)	(0.355)
Age	-0.019***	0.022	0.010
	(0.001)	(0.048)	(0.171)
Age square	0.000***	-0.000	-0.000
	(0.000)	(0.001)	(0.002)
Education	0.024***	0.008***	-0.039***
	(0.002)	(0.001)	(0.002)
Sex (male=1, female=2)	-0.017***	-0.006	0.028*
	(0.001)	(0.004)	(0.015)
Employment status (having a job=1, looking for a job=2,	-0.073***	-0.005*	0.100***
not in labor force=3)	(0.002)	(0.003)	(0.013)
Marital status (unmarried=0, married=1)	0.018***	0.011***	-0.037**
	(0.004)	(0.004)	(0.014)
Hispanic	-0.089***	0.007	0.122***
	(0.003)	(0.010)	(0.027)
White	0.061***	0.008	-0.095***
	(0.006)	(0.007)	(0.025)
Asian	-0.054***	-0.039**	0.104**
	(0.001)	(0.016)	(0.048)
Other	-0.062***	0.009	0.052
	(0.002)	(0.013)	(0.047)
Total household income	0.008***	0.002***	-0.013***
	(0.001)	(0.000)	(0.001)
Pseudo-R^2	0.098	0.070	0.102
Number of observations	12,238	12,238	12,238

Notes: All the estimates are weighted by the SIPP sampling weights. State and time fixed effects are included in the estimation, but not reported. State-clustered robust standard errors are in parentheses. Asterisks denote statistical significance at the 1% (***), 5% (**), and 10% (*) levels.

TABLE 7. Effects of the ACA mandate on parental ESHI coverage.

	ESHI Coverage
$\mathrm{I}(19 \leq \mathrm{Dep} < 26) \times \mathrm{I}(\text{post-}2010)$	0.007
	(0.013)
$\mathrm{I}(\text{post-}2010)$	-0.004
	(0.010)
$\mathrm{I}(19 \leq \mathrm{Dep} < 26)$	-0.003
	(0.015)
Age	0.048***
	(0.005)
Age square	-0.001***
	(0.000)
Education	0.027***
	(0.001)
Sex (male=1, female=2)	-0.104***
	(0.007)
Employment status (having a job=1, looking for a job=2,	-0.333***
not in labor force=3)	(0.008)
Marital status (unmarried=0, married=1)	-0.133***
	(0.010)
Hispanic	-0.033
	(0.020)
White	-0.037***
	(0.012)
Asian	-0.037**
	(0.019)
Other	-0.041*
	(0.024)
Total household income	0.006***
	(0.001)
Pseudo-R^2	0.172
Number of observations	32,774

Notes: All the estimates are weighted by the SIPP sampling weights. State and time fixed effects are included in the estimation, but not reported. State-clustered robust standard errors are in parentheses. Asterisks denote statistical significance at the 1% (***), 5% (**), and 10% (*) levels.

TABLE 8. Effects of the ACA mandate on household financial portfolio: Placebo tests.

	Shares of Stocks	Shares of Bonds	Shares of Other Assets
	(1)	(2)	(3)
$I(ESHI) \times I(19 \leq Dep < 26) \times I(\text{Placebo date: Sep. 2009})$	0.000	-0.008	-0.009
	(0.007)	(0.019)	(0.078)
$I(ESHI) \times I(19 \leq Dep < 26) \times I(\text{Placebo date: Oct. 2009})$	-0.001	0.013	-0.031
	(0.007)	(0.021)	(0.072)
$I(ESHI) \times I(19 \leq Dep < 26) \times I(\text{Placebo date: Nov. 2009})$	0.004	0.038	-0.077
	(0.009)	(0.023)	(0.096)

Notes: All the estimates are weighted by the SIPP sampling weights. State and time fixed effects are included in the estimation, but not reported. State-clustered robust standard errors are in parentheses. Asterisks denote statistical significance at the 1% (***), 5% (**), and 10% (*) levels.

TABLE 9. Effects of the ACA mandate on shares of financial assets: Constant ESHI.

	Shares of Stocks	Shares of Bonds	Shares of Other Assets
	(1)	(2)	(3)
$\text{I(ESHI)} \times \text{I}(19 \leq \text{Dep} < 26) \times \text{I(post-2010)}$	0.035***	-0.014***	-0.022***
	(0.005)	(0.003)	(0.007)
$\text{I}(19 \leq \text{Dep} < 26) \times \text{I(post-2010)}$	0.014***	0.005	-0.034***
	(0.004)	(0.004)	(0.005)
$\text{I(ESHI)} \times \text{I(post-2010)}$	0.009***	-0.001	-0.015***
	(0.003)	(0.002)	(0.004)
$\text{I}(19 \leq \text{Dep} < 26) \times \text{I(ESHI)}$	0.041***	0.011**	-0.081***
	(0.005)	(0.005)	(0.005)
I(post-2010)	0.005*	0.002	-0.005
	(0.003)	(0.003)	(0.004)
$\text{I}(19 \leq \text{Dep} < 26)$	-0.067***	-0.011***	0.097***
	(0.003)	(0.002)	(0.004)
I(ESHI)	-0.207***	0.023**	0.093***
	(0.008)	(0.009)	(0.006)
Age	-0.001***	-0.001***	0.003***
	(0.000)	(0.000)	(0.000)
Age square	0.000***	0.000**	-0.000***
	(0.000)	(0.000)	(0.000)
Education	0.024***	0.007***	-0.039***
	(0.002)	(0.003)	(0.000)
Sex (male=1, female=2)	-0.011***	-0.002***	0.017***
	(0.001)	(0.000)	(0.003)
Employment status (having a job=1, looking for a job=2,	-0.075***	-0.004***	0.106***
not in labor force=3)	(0.002)	(0.000)	(0.004)
Marital status (unmarried=0, married=1)	0.023***	0.004	-0.037***
	(0.004)	(0.003)	(0.003)
Hispanic	-0.086***	0.001	0.116***
	(0.003)	(0.002)	(0.006)
White	0.053***	0.012**	-0.093***
	(0.005)	(0.006)	(0.002)
Asian	-0.058***	-0.024***	0.094***
	(0.001)	(0.006)	(0.005)
Other	-0.043***	-0.005***	0.058***
	(0.001)	(0.001)	(0.004)
Total household income	0.008***	0.001**	-0.012***
	(0.001)	(0.001)	(0.000)
N	30,033	30,033	30,033
Pseudo-R^2	0.107	0.064	0.110

Notes: All the estimates are weighted by the SIPP sampling weights. State and time fixed effects are included in the estimation, but not reported. State-clustered robust standard errors are in parentheses. Asterisks denote statistical significance at the 1% (***), 5% (**), and 10% (*) levels.

TABLE 10. Effects of the ACA mandate on shares of financial assets: Clustering at treatment-year level.

	Shares of Stocks	Shares of Bonds	Shares of Other Assets
	(1)	(2)	(3)
$I(ESHI) \times I(19 \leq Dep < 26) \times I(post\text{-}2010)$	0.025***	-0.013***	-0.011**
	(0.004)	(0.003)	(0.005)
$I(19 \leq Dep < 26) \times I(post\text{-}2010)$	0.014***	0.005**	-0.033***
	(0.003)	(0.002)	(0.004)
$I(ESHI) \times I(post\text{-}2010)$	0.001	-0.000	-0.003
	(0.002)	(0.002)	(0.003)
$I(19 \leq Dep < 26) \times I(ESHI)$	0.045***	0.012***	-0.086***
	(0.004)	(0.004)	(0.003)
$I(post\text{-}2010)$	0.013***	0.002	-0.016***
	(0.003)	(0.002)	(0.003)
$I(19 \leq Dep < 26)$	-0.067***	-0.011***	0.097***
	(0.002)	(0.002)	(0.005)
I(ESHI)	-0.243***	0.006*	0.188***
	(0.010)	(0.003)	(0.006)
Age	-0.002***	-0.001***	0.003***
	(0.000)	(0.000)	(0.000)
Age square	0.000***	0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
Education	0.024***	0.007***	-0.039***
	(0.001)	(0.002)	(0.000)
Sex (male=1, female=2)	-0.014***	-0.004***	0.023***
	(0.001)	(0.000)	(0.003)
Employment status	-0.075***	-0.003***	0.106***
(having a job=1, looking for a job=2, not in labor force=3)	(0.002)	(0.000)	(0.004)
Marital status (unmarried=0, married=1)	0.020***	0.005**	-0.034***
	(0.003)	(0.003)	(0.003)
Hispanic	-0.086***	-0.000	0.119***
	(0.003)	(0.001)	(0.005)
White	0.052***	0.011**	-0.090***
	(0.005)	(0.004)	(0.002)
Asian	-0.056***	-0.025***	0.092***
	(0.001)	(0.006)	(0.005)
Other	-0.055***	-0.006***	0.073***
	(0.001)	(0.001)	(0.004)
Total household income	0.008***	0.001***	-0.012***
	(0.001)	(0.000)	(0.000)
N	32,774	32,774	32,774
Pseudo-R^2	0.099	0.062	0.101

Notes: All the estimates are weighted by the SIPP sampling weights. State and time fixed effects are included in the estimation, but not reported. Treatment–year-clustered robust standard errors are in parentheses. Asterisks denote statistical significance at the 1% (***), 5% (**), and 10% (*) levels.