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Effects of dependent coverage mandate on household precautionary savings: Evidence from the 2010 Affordable Care Act

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HIGHLIGHTS

- The Affordable Care Act (ACA) of 2010 implemented the dependent coverage mandate.
- The ACA affected households with employer-sponsored health insurance and dependents.
- The dependent coverage mandate lowered those households' precautionary savings.
- Specifically, those households reduced liquid assets after the implementation of ACA.
- They however did not reduce savings in tax-deferred accounts or real estate assets.

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ABSTRACT

This article examines the effects of the health insurance coverage mandate for young adults on household precautionary savings by focusing on the Affordable Care Act (ACA) of 2010. The ACA dependent coverage mandate allows young adults to remain on their parents' health insurance plans until their 26th birthday. Using the Survey of Income and Program Participation data, I find that the ACA mandate reduced precautionary savings for households with both parental employer-sponsored health insurance and dependent children aged 19–25 years. These households significantly reduced liquid assets by $897 after ACA, but they did not reduce savings in tax-deferred accounts or real estate assets.

1. Introduction

To alleviate high uninsured rates for older dependent children aged 19–25 years, the Affordable Care Act (ACA) of 2010 allowed these young adults to remain on their parents' health insurance plans until they turn 26 years of age.[1] Recent studies have found that the ACA dependent mandate significantly reduced young adults' uninsured rates (Akosa Antwi et al., 2013), increased their health insurance coverage (Cantor et al., 2012; Jhamb et al., 2015; Sommers et al., 2013; Sommers and Kronick, 2012), and led them to switch from public health insurance or their own private health insurance to their parents' employer-sponsored health insurance (ESHI) plans as dependents (Akosa Antwi et al., 2013). Moreover, studies have shown that the dependent coverage mandate significantly reduced the out-of-pocket costs of medical treatment for young adults (Busch et al., 2014; Chua and Sommers, 2014).

However, no research has examined whether the ACA dependent coverage mandate reduces households' precautionary savings. Because the ACA dependent coverage mandate significantly increased health insurance coverage and reduced medical care expenditures of dependent children aged 19–25 years, households with these dependent children were able to lower their risk of future consumption shock than before. As a result, this paper demonstrates that households with mandate-eligible dependents should reduce their precautionary savings after the ACA mandate provision. According to the standard theory of "precautionary sav-

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[1] Abbreviations—ACA: Affordable Care Act, DD: Difference-in-Differences, DDD: Difference-in-Difference-in-Differences, ESHI: Employer-Sponsored Health Insurance, SIPP: Survey of Income Program and Participation, TDAs: Tax-Deferred Accounts.

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ings", health-related risks encourage households to accumulate assets against uncertain future consumption (Kimball, 1990; Leland, 1968; Sandmo, 1970). Ceteris paribus, households with uninsured family members face greater uncertainty about health care costs than their insured counterparts and thus hold higher savings levels to buffer consumption shock in case of sickness (Starr-McCluer, 1996).

To provide a comprehensive understanding of how the dependent coverage mandate had a negative effect on household precautionary savings, this article investigates the policy effects on four different types of savings: (1) liquid assets, defined as savings in banking and interest-bearing accounts; (2) savings in tax-deferred accounts (TDAs), such as individual retirement accounts, Keogh accounts, and Thrift and 403(b) plans; (3) total wealth, including liquid assets, savings in TDAs, and real estate; and (4) total net worth for total wealth including debts and liabilities. The savings in liquid assets are most easily converted to cash to deal with adverse consumption shocks, whereas savings in TDAs or real estate have relatively low liquidity to be converted into cash.[2] Therefore, when uninsured dependent children aged 19–25 years become entitled to health insurance through their parental ESHI due to the ACA mandate, households with these dependent children are more likely to reduce savings in liquid assets rather than the three other types of savings.

Using the 2008 Survey of Income Program and Participation (SIPP) data with the difference-in-difference-in-differences (DDD) framework (i.e., dependent children age, period before and after the ACA mandate, and parental ESHI availability), I find that households with both parental ESHI coverage and dependent children aged 19–25 years significantly reduced their savings in liquid assets by $897 after the ACA mandate. However, there was no significant reduction in savings in TDAs, total wealth, or total net worth.

This article makes three major contributions to the literature. First, this study reveals the effect of *private* health insurance on US household precautionary savings. Although some prior studies have shown a negative effect of *public* health insurance on household precautionary savings (Chou et al., 2003; Engen and Gruber, 2001; Gruber and Yelowitz, 1999; Kantor and Fishback, 1996; Kuan and Chen, 2013; Levin, 1995), no studies have found any evidence of a negative effect of *private* health insurance on household precautionary savings because they suffered from self-selection bias (Guariglia and Rossi, 2004; Starr-McCluer, 1996). This paper overcomes the self-selection issue by exploiting the structural changes of the health insurance policy by the ACA.

Second, to the best of my knowledge, this article is the first to investigate the impact of the ACA dependent coverage mandate on household financial decisions, especially precautionary savings. Households' savings directly affect their consumption and, thus, future welfare. According to the 2011 Medical Expenditure Panel Survey data, approximately 40% of heads of households below age 60 faced difficulties in paying medical bills or filed medical bankruptcy. Thus, it is important to understand how households manage their savings in response to the specific health insurance mandate policy.

Third, the DDD framework used in this study addresses the methodological concerns that Slusky (2014) raises. Specifically, Slusky notes that the ACA mandate effects on health insurance coverage or labor supply of young adults that previous research found using the difference-in-differences (DD) framework could simply reflect dynamics in the age–time structure of health insurance or labor markets for young adults. Using the same DD framework, Slusky still produced significant ACA mandate "placebo" effects on health insurance coverage or labor supply of young adults over placebo dates (i.e., long period before the ACA implementation). In contrast, the empirical results in this article suggest that there is no placebo effect under the DDD framework.

2. Dependent coverage mandate and its implications for precautionary savings

2.1. ACA and dependent coverage mandate

The ACA was enacted on March 23, 2010, and it included three key mandate provisions to expand health insurance coverage to universal levels: (1) employers with more than 50 full-time employees must offer affordable health coverage options to their employees, (2) individuals are required to hold "qualifying" health insurance, and (3) private health insurers must allow older dependent children to stay on their parents' health insurance plans until their 26th birthday. If employers, individuals, or insurance companies elect not to comply with these mandates, they must pay a penalty. The dependent coverage mandate was the first to take effect, on September 23, 2010. Because the dependent coverage mandate became effective on the next plan renewal after September 22, 2010, health insurers and group plans were required to offer that plan no later than September 22, 2011.

2.2. Conceptual framework and hypothesis

According to the stochastic life-cycle model (Blanchard and Fischer, 1989; Deaton, 1992), households facing uncertainty in future medical expenditures maximize their lifetime expected utility by choosing the optimal consumption (and, thus, savings). Specifically, households first spend out-of-pocket medical expenditure E_t in period t and then choose the consumption level, C_t, and future consumption, $(C_{t+1}, \ldots, C_T)$. To express the solution for optimal consumption in a closed form, the utility function is assumed to exhibit absolute risk aversion (Caballero, 1990; Kimball and Mankiw, 1989; Weil, 1993). At $t = 0$, the household maximizes

$$
\begin{aligned}
&E\left[\sum_{t=0}^{T}\beta^t\left(-\frac{1}{\eta}\right)\exp\left(-\eta C_t\right)\right]\\
&s.t.\quad \tilde{C}_{t+1} = \tilde{Y}_{t+1} + R\cdot\left(Y_t - E_t - C_t\right) - \tilde{E}_{t+1}, \qquad (1)\\
&Y_t = Y_{t-1} + \zeta_t, \quad \ln\zeta \sim N\left(0, \sigma_Y^2\right),\\
&E_t = E_{t-1} + \varepsilon_t, \quad \ln\varepsilon \sim N\left(0, \sigma_E^2\right),\\
&Y_t \quad \text{and} \quad E_t \geq 0, \quad \textit{for } \forall t,
\end{aligned}
$$

where β is the time preference rate, η is the degree of absolute prudence as well as the degree of absolute risk aversion, R is the gross interest rate, and Y_t is income in period t. Then, the optimal solution for consumption is $C_t = \frac{\eta R}{\eta(1+R)}\left(Y_t - E_t\right) + \frac{1}{1+R}\left\{\left(\mu_Y + \mu_E\right) - \frac{1}{2}\eta\left(\sigma_Y^2 + \sigma_E^2\right)\right\} - \frac{1}{\eta(1+R)}\log\beta R$. This equation suggests that the lower risk of future medical expenditure $\left(\sigma_E^2\right)$ would increase consumption and thus reduce precautionary savings $(=Y_t - E_t - C_t)$.

With the ACA dependent coverage mandate both increasing health insurance coverage and reducing out-of-pocket medical costs of young adults aged 19–25 years, households with these dependent children faced the lower risk of future consumption shock associated with medical expenditures than before. As a result, I expect that they reduced precautionary savings after the ACA mandate. Because liquid assets are easily converted into cash and thus are held for precautionary reasons, households likely would have reduced their liquid assets after ACA, rather than

[2] For savings in TDAs or real estate assets, several restrictions exist on liquidation, such as 10% penalty for early withdrawal from TDAs.

Table 1
Summary statistics: 2008 SIPP data.

	All	Pre-ACA mandate				Post-ACA mandate			
		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
Liquid assets	7.01	8.79	9.48	4.92	5.49	7.20	9.25	4.84	4.80
Savings in TDAs	28.89	49.95	43.14	14.21	12.55	50.81	47.79	14.29	13.89
Total wealth	178.37	252.01	204.99	200.28	155.61	221.04	189.83	175.32	140.35
Net worth	166.49	234.62	190.95	185.26	143.56	207.58	179.13	164.55	131.36
Number of observations	65,026	2,810	13,401	3,492	15,064	2,625	11,343	3,502	12,789

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. Other covariates' summary statistics are available on request.

savings in TDAs or real estate assets. As such, I test the following hypothesis:

H_1: The ACA dependent coverage mandate has a negative effect on savings in *liquid assets* for households with parental ESHI coverage and dependent children aged 19–25 years (i.e., $\alpha_1 < 0$).

3. Data

To understand the impact of the ACA dependent coverage mandate on household precautionary savings, I use the 2008 SIPP data, which reflect the periods before and after the ACA reform. Especially, waves 4, 7, and 10 of the 2008 SIPP include detailed information on respondents' health insurance coverage and their household savings in financial and real estate assets, and thus they are used in the analysis. The corresponding calendar months and years for these three waves are August–November, 2009, 2010, and 2011, respectively.[3] The sample for this study includes heads of households aged 19–59 years, and these heads of households are divided into a treatment and a control group, based on whether they have mandate-eligible dependent children. In addition, using the information on whether heads of households are covered by ESHI, I further split the treatment and control group. That is, households whose heads are covered by ESHI and have mandate-eligible dependents are in the treatment group and the others are in the control groups.

Table 1 presents the summary statistics of the sample.[4] All the statistics and estimates given herein are weighted by the SIPP sampling weights. The average amount of savings in liquid assets for households in the treatment group is \$8,790 before the ACA mandate, and it decreased to \$7,200 after the ACA. All the monetary values in the estimates are adjusted to thousands of 2011 US dollars. For households in the control groups, the average amount of liquid assets also decreased after ACA. For savings in TDAs, households in both treatment and control groups increased them after ACA. The average amount of total wealth decreased after ACA for all four sub-groups. I also illustrate the unconditional patterns of savings in liquid assets, TDA, total wealth, and total net worth before and after the mandate in Fig. 1. To assess equality of pre-reform trends across the four different sub-groups of savings, 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 saving type.

4. Econometric framework

To analyze the dependent coverage mandate effects on household precautionary savings, the identification strategy I use is a standard DDD framework. Households with dependent children aged 19–25 years are compared with households with dependent children outside this age range or with no dependent children, before and after the ACA reform period. In addition, I split households further, depending on whether heads of households have ESHI or not. As such, I estimate the following model:

$$\begin{aligned} y_{i,s,t} = {} & \alpha_1 I\,(19 \le Dep < 26) \cdot I\,(Post\ 2010) \cdot I\,(ESHI) \\ & + \alpha_2 I\,(19 \le Dep < 26) \cdot I\,(Post\ 2010) \\ & + \alpha_3 I\,(Post\ 2010) \cdot I\,(ESHI) \\ & + \alpha_4 I\,(19 \le Dep < 26) \cdot I\,(ESHI) \\ & + \alpha_5 I\,(19 \le Dep < 26) + \alpha_6 I\,(Post\ 2010) \\ & + \alpha_7 I\,(ESHI) + X'_{i,s,t}\alpha_8 + I(Year)'_t\alpha_9 + \vartheta'_s\alpha_{10} + \varepsilon_{i,s,t}, \end{aligned} \quad (2)$$

where $y_{i,s,\,t}$ is a household i's savings (i.e., savings in liquid assets, savings in TDAs, total wealth, or total net worth) in state s at time t; $I\,(19 \le Dep < 26)$ is an indicator for households having dependent children aged 19–25 years; $I\,(Post\ 2010)$ is an indicator for the post-treatment period (i.e., after October 2010); $I\,(ESHI)$ is an indicator for heads of households with ESHI; $X_{i,s,t}$ is a vector of heads of households' demographic characteristics that possibly affect household savings, including age, education, sex, race, marital status, employment status, and household income; $I(Year)_t$ 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).[5]

The parameter of interest is α_1, which captures the average impact of the ACA dependent coverage mandate on precautionary savings. Among the four different types of savings (i.e., liquid assets, savings in TDAs, total wealth, and total net worth), I would

[3] Among the four months of recall periods in each wave, to reduce recall bias, I use the most recent recall reference month of each wave for the analysis.

[4] To check whether the sample used in the analysis is representative of the US population, I further compare the median values of the financial assets in the sample with the national ones from the Census website (http://www.census.gov/people/wealth/). The median values between the two sources are close when ages of heads of households are controlled. For example, for heads of households aged between 45 and 54 years, the median value of net worth in 2011 is \$84,500 in Census and \$85,000 in my sample.

[5] I also estimate Eq. (2) using the treatment-month-level clustering standard errors, and the main results still hold.

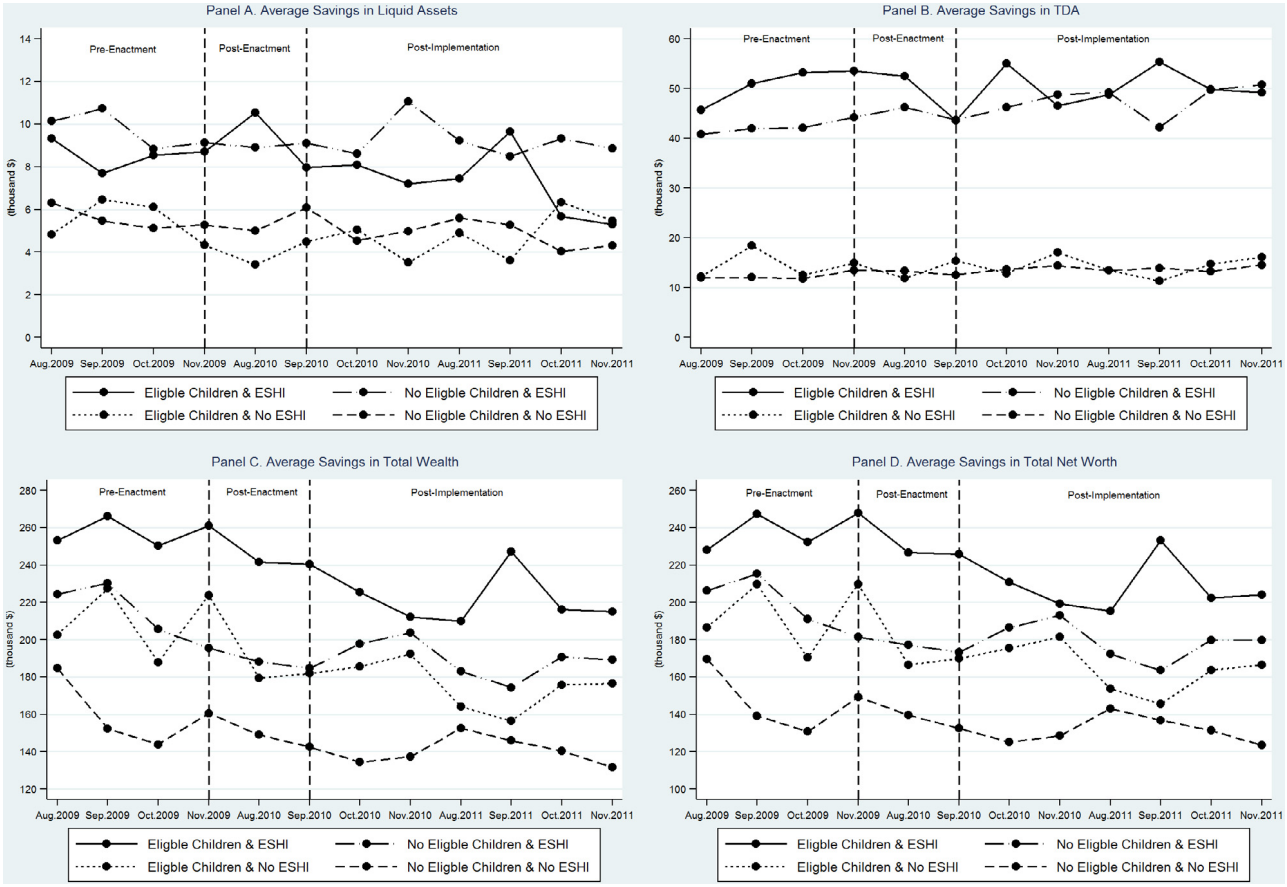

Fig. 1. Saving patterns over time by treatment and control groups.

expect the estimate of α_1 to be significantly negative only for liquid assets. I use the type-I Tobit model for the estimation of the mandate effects on liquid assets and savings in TDAs because the values of these dependent variables are censored at zero (i.e., some households do not hold any liquid assets or savings in TDAs). For the estimation of the mandate effects on total wealth or net worth, I use the standard ordinary least squares model.

To address a possible concern that the use of ESHI status might weaken the identification strategy – some households during the 2008 recession lost both their jobs and ESHIs or parents with mandate-eligible children might be more likely to take up ESHI coverage after ACA – I conducted robustness analyses. The estimation results show that the ACA did not significantly increase the likelihood of parents obtaining ESHI. In addition, the estimates with the subsample of households with constant ESHI status during the reform period are still consistent with the main results. Thus, the DDD identification framework using ESHI is suitable for estimating the ACA mandate effects on precautionary savings.

5. Empirical results

5.1. Main results

Table 2 presents the estimates for the ACA dependent coverage mandate effects on household precautionary savings.[6] In Column (1), the coefficient for the interaction term among the indicators of parental ESHI coverage, having dependent children aged 19–25 years, and post-ACA period is negative at the 5% significance level ($\alpha_1 = -0.897, p < 0.05$) for liquid assets. That is, the ACA dependent coverage mandate caused households with parental ESHI coverage and dependents aged 19–25 years to significantly reduce their savings in liquid assets by $897, which is close to the average annual medical expenditure (approximately $772) for dependents aged 19–25 without health insurance before the reform. However, this mandate did not have any significantly negative effects on savings in TDAs, total wealth, or total net worth, as Columns (2), (3), and (4) show, respectively. These empirical results provide support for the hypothesis and suggest that the ACA dependent coverage mandate significantly reduced household precautionary savings. Furthermore, I confirmed that the main results qualitatively hold for a different measure of liquid assets.[7]

5.2. Robustness checks

First, I test whether the saving patterns for households between the treatment and control groups are similar in the pre-reform period.[8] If saving patterns for the households were different in the pre-reform period, the main estimation results would simply reflect differences in saving patterns between the two groups, not the dependent coverage mandate effects. Using the data from August to November 2009, I estimate a model with the same specification of Eq. (2) by replacing the indicator for post-treatment period with linear month trends. The estimation results

[6] The Tobit estimates presented in Table 2 are the marginal effects.

[7] I also estimated Eq. (2), including the cash value of life insurance, stocks and mutual funds, or both life insurance and stocks and mutual funds in liquid assets. The estimates with the different measure of liquid assets still suggest that the ACA dependent coverage mandate significantly reduced the precautionary savings.

[8] All the estimates in the robustness check section are available on request.

Table 2
Effects of the ACA mandate on household precautionary savings.

	Liquid assets (1)	Savings in TDAs (2)	Total wealth (3)	Total net worth (4)
$I(\text{ESHI}) \times I(19 \leq \text{Dep} < 26) \times I(\text{Post 2010})$	−0.897**	0.850	9.931	8.815
	(0.441)	(2.333)	(10.266)	(10.549)
Pseudo-R^2	0.022	0.066	–	–
R^2	–	–	0.084	0.080
Number of observations	65,026	65,026	65,026	65,026

Notes: All the dependent variables are adjusted to thousands of 2011 US dollars. All the estimates are weighted by the SIPP sampling weights. Other covariates are included in the estimation, but not reported (these estimates are available on request). State-clustered robust standard errors are in parentheses.
** Statistical significance at the 5% level.

show that there are no significant differences in saving patterns for all types of savings between the treatment and control groups before the reform period.

Second, because the ACA mandate effects on precautionary savings might result from dynamics in saving structures across different households over time, I also conduct a series of placebo tests by setting artificial reform periods (Akosa Antwi et al., 2013). All the placebo test results indicate no statistical significance in the coefficients for the interaction term among the indicators of ESHI coverage, having dependent children aged 19–25 years, and placebo date, which confirms that the main estimates are not due to dynamics in savings across different households.

Third, I test whether the main estimates are robust to macroeconomic shocks during 2008. For example, for households that planned to use home equity to finance college expenses of their 19-year-old dependents, the housing market crash might have forced them to draw down on their precautionary savings. To rule out this possibility, I re-estimate Eq. (2) with the subsample of households with no mortgage and home equity loan, and the results are qualitatively consistent with the main estimates.

Fourth, I re-estimate Eq. (2) to investigate whether the main estimates from the DDD framework are robust to the treatment-month-level clustering standard errors.[9] The estimation results with the treatment-month-level clustering robust standard errors are qualitatively consistent with the main estimates.

Fifth, heads of households aged 19–25 years in the sample are affected by the 2008 recession to a greater extent than other age groups (Bell and Blanchflower, 2011), which might affect the main results. I also estimate Eq. (2) excluding that age group and using the different age cutoffs (i.e., lower cutoff varying from 27 to 30 and upper cutoff ranging from 60 to 65). The estimates with different age cutoff levels provide the same qualitative results.

Sixth, when households face additional costs to insure their dependent children, they may need to draw down their precautionary savings or wealth. To consider this possibility, I re-estimate Eq. (2) by controlling for household health insurance premium, total medical expenses, and total out-of-pocket medical costs for their dependents. The empirical results are qualitatively consistent with the main results.

6. Conclusions

This study investigates how the ACA dependent coverage mandate affected households' precautionary savings. For the empirical analysis, households were divided into a treatment and a control group, based on whether they had dependent children aged 19–25 years and ESHI coverage. Savings for the treatment and control group were compared before and after the ACA mandate. The findings reveal that the ACA dependent coverage mandate significantly reduced precautionary savings for households with parental ESHI coverage and dependent children aged 19–25 years. Specifically, those households significantly reduced savings in liquid assets (i.e., most easily converted into cash for emergency) by $897 after ACA but did not reduce savings in TDAs, total wealth, and total net worth. In addition, the placebo tests suggest that the baseline DDD framework is appropriate for identifying precisely the ACA dependent coverage mandate effects on household precautionary savings. As other mandate provisions, such as employer and individual mandates, were just implemented in 2014 and thus not considered in this study, investigating the effects of these newly implemented mandates on precautionary savings would be a fruitful research direction.

[9] 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.

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