The Effect of the Partnership Long-Term Care Insurance Program on Private Insurance and Employment*

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Abstract

The Partnership Long-Term Care Insurance (PLTC) program protects policyholders an amount of assets, equivalent with the value of insurance, from Medicaid asset requirement. The public-private PLTC program draws mixed findings about its cost-effectiveness. In this paper, we extend current discussion by exploring the effect of the partnership program on employment, which is little investigated in the literature. Using detailed individual information from the Health and Retirement Study (HRS) from 2000 to 2014 linked with state-level PLTC roll-out information, we first find that the PLTC increases private LTC insurance coverage by 1 to 2 percentage points. In addition, the PLTC program increases the probability of nearly-elderly individuals (45-65) to work full-time by 3 to 7 percentage points. To better understand the unintended labor market effects, we propose a theoretical model based on the "bequest motive" channel. Empirical evidence confirms the theoretical prediction that the effect is mainly driven by individuals with strong bequest motive who have children and are in well-paid jobs.

Keywords Partnership Program, Long-Term Care Insurance, Medicaid, Employment

JEL classification H75, I13, I38

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1 Introduction

The Partnership Long-Term Care Insurance (PLTC) program blends public Medicaid and private insurers to finance the increasing demand for long-term care (LTC) in the United States. Policyholders are granted to sequester an equivalent amount of assets to the value of PLTC benefits from Medicaid asset requirements (Stone-Axelrad 2005; GAO 2007; Lin and Prince 2013; Sun and Webb 2013; Bergquist et al. 2018; Costa-Font and Raut 2021). With the unique feature of Medicaid asset protection, on the one hand, the PLTC program is designed to increase the purchase of private LTC insurance to cover LTC costs that would otherwise be funded by individual financial resources; on the other hand, the PLTC program is expected to save Medicaid spending on LTC by having private insurer to take responsibility for the LTC costs, at least the initial phase of the onset (Stone-Axelrad 2005).

While the PLTC program is designed to expand private LTC insurance coverage and alleviate Medicaid expenditures for LTC services, the program may have unintended effects on the labor market. Some work finds modest effect of PLTC on the private insurance purchase (Lin and Prince 2013; Sun and Webb 2013; Greenhalgh-Stanley 2014) while some work shows estimates with larger magnitude (Stone-Axelrad 2005; Kline 2020; Costa-Font and Raut 2021). The findings on whether PLTC reduces Medicaid spending on LTC is also mixed and ambiguous (America's Health Insurance Plans 2007; GAO 2007; National Conference of State Legislatures 2013; Kline 2020; Costa-Font and Raut 2021). In this paper, we extend on existing studies by examining the labor market effect of PLTC and reconcile, in part, the mixed findings on cost-effective analysis of the partnership program. To the best of our knowledge, this paper is the first to estimate the causal effect of the PLTC program on the labor market outcomes.

First, we take advantage of the roll-out of PLTC across states over time from 2000

to 2014 in a differences-in-differences (DID) framework to examine the private LTC coverage effect (first-stage effect). With the passing of the 2005 Deficit Reduction Act (DRA), all states were re-allowed to establish and develop PLTC programs. For example, three states adopted PLTC in 2006, eleven states established the PLTC in 2008, and another five states implemented the PLTC during 2010 to 2012.[1] Up to 2014, 41 states have adopted the program. The staggered PLTC adoption generates large variation in a quasi-experiment, which we combine the Health and Retirement Study (HRS) with detailed LTC insurance and individual information, to examine the first-stage PLTC effect on private insurance uptake.

Most work on estimating this first stage effect employs the staggered DID design (Lin and Prince 2013; Greenhalgh-Stanley 2014; Bergquist et al. 2018; Costa-Font and Raut 2021). Although this estimation approach has become especially popular in the last two decades,[2] recent advances in econometric theory suggest that the staggered DID design may not provide valid causal estimates of estimands of interest (Callaway and Sant'Anna 2020; Sun and Abraham 2020; Baker et al. 2021; Goodman-Bacon 2021; Athey and Imbens 2022). The pitfall of the staggered DID design is that when treatment effects are different over time and across units, the staggered DID estimates can obtain the opposite sign of true ATT or ATE. In this paper, we improve the estimation strategy of the first-stage effect in the literature by using stacked event study approach. Specifically, we compare the private LTC insurance takeup rates between individuals with high-assets and individuals with low-assets in the 8 years leading up to PLTC implementation and the 7 years after. We test the parallel trend by showing a small and insignificant estimates in the 8 years before PLTC in place between these two groups. Our findings show that the LTC insurance coverage increases immediately after the adoption of PLTC and the increase remains for 6 years. On average, the PLTC

[1] There are three states adpoted PLTC in 2010, 2 in 2011, and 1 in 2012.

[2] Baker et al. (2021) show that from 2000 to 2019, there were 49% of top finance and accounting journals that employ the staggered DID design

encourages individuals to purchase private LTC insurance by by 1-2 percentage points (9-18 percent given the average insurance takeup rate in the previous year).

This stacked event-study approach is a valid causal estimand when there is only heterogeneity over time since being treated. However, when there are heterogeneous treatment effects across adoption groups, the estimand could be biased. Therefore, we further use an imputation estimator suggested by Borusyak et al. (2021) to address this issue. Specifically, we first use observations only for states and time periods that are not-yet treated. Then we infer the never-treated potential outcome for each unit using the predicted value from above regression. The results under this imputation approach show that PLTC increases insurance takeup rates by 1-4 percentage points, relatively stronger than the stacked event study approach.

Second, we use the improved DID estimands to explore the labor market effect of PLTC (second-stage effect), which is little discussed in the literature. How might the PLTC program affect the incentives of near-elderly to work? First, the PLTC program could encourage older people to withdraw from the labor force earlier. For example, PLTC helps to reduce the medical expense uncertainty by private insurance and Medicaid protects individuals from being indigent. Therefore, individuals may view earlier retirement desirable and affordable. Second, the PLTC program could incentivize older people to work longer. If older Americans have a strong willingness to work and preference to save (Gruber and Yelowitz 1999; Maynard and Qiu 2009; Gallagher et al. 2020; Ameriks et al. 2020), these near-elderly individuals who participate in PLTC may increase their labor force participation. In addition, if people have a strong bequest motive (Bernheim 1991; Dynan et al. 2002; De Nardi 2004), they might be inclined to attach to the labor market long enough to retain more assets protected under PLTC for their heirs. These countervailing directions produce unpredictable effects of the PLTC program on older worker's labor force participation. Using the stacked event study approach, we find that the presence of the PLTC programs increases work status of

near-elderly individuals by 3-7 percentage points (5-15 percent given the average work rate in the previous year was 66.2%). The effect is stronger with the imputation approach of 3-10 percentage points.

To understand these findings, we also conduct heterogeneous analysis by gender. We find that the first-stage effect is mainly concentrated among women, while the second-stage effect holds for both gender. These results suggest that women are more induced by the PLTC programs. One reason could be that women usually live longer than men and they are more likely to be risk-averse. However, the PLTC impact on work status is indifferent between men and women. This suggest that both spouses bear financial responsibility. In addition, we propose a theoretical model based on the standpoint of the bequest motive to discuss the second stage findings. The model suggests that only when individuals whose labor market conditions are favorable, the more assets they tend to bequeath to their children, the more likely they will join the labor market. On the contrary, if an individual is in low-paid jobs, she would prefer to be covered by Medicaid and enjoy leisure. The results from the sub-population analysis suggest that the mechanism through which the PLTC program affects labor force participation is through the bequest motive: the effects are concentrated among individuals with kids who are in well-paid jobs. This finding is consistent with previous literature studying saving behavior among the elderly (De Nardi 2004; Kopczuk and Lupton 2007; De Nardi et al. 2010).

The results have two policy implications. First, the PLTC encourages older people to continue working longer, which is beneficial for governments. With the aging population and the declining labor force participation rate among working population, the Social Security trust will be fully exhausted in 2036. The finding might add one alternative solution to the debate of pension reforms of cutting retirement benefits and increasing the statutory retirement age. Second, the bequest motive behind the working incentive can be employed to better design the PLTC program. Many studies have found a mild increase in LTC insurance

coverage promoted by the PLTC program and little is known why the effect is minimal. The bequest motive proposed here can be a potential starting point to re-target PLTC sub-groups and design differential asset protection models to increase LTC insurance purchase.

This paper contributes to several strands of literature. First, prior work on evaluating the cost-effectiveness of the PLTC program draws mixed findings. Lin and Prince (2013) find limited Medicaid savings from small increase of private LTC insurance purchase using the staggered roll-out of this program across states. Sun and Webb (2013) show that PLTC mainly benefits people who would purchase LTC insurance regardless and the PLTC subsidies cannot be offset by Medicaid savings using numerical optimization method. Kline (2020) uses the LTC Focus data from Brown University and finds that PLTC does not lead to savings in Medicaid spending on nursing homes in her dissertation. In comparison, Costa-Font and Raut (2021) estimate that the introduction of PLTC on average saves $36 for every older American who are 65 and above using longitudinal Health and Retirement Study (HRS). America's Health Insurance Plans (2007) project that PLTC can save Medicaid about $6 billion every year by 2050 and National Conference of State Legislatures (2013) show that PLTC saves Connecticut $3.75 million from officials report. One needs to be cautious about the numbers drawn from these two government reports with arbitrary assumptions.

Second, this paper adds to the cost-effectiveness studies of tax subsidy program that encourages LTC insurance take-up. In 1996, Congress passed the Health Insurance Portability and Accountability Act (HIPAA), which allowed federal tax deductions on expenses for LTC insurance. Courtemanche and He (2009) find that this HIPAA subsidy would cause a net loss to the federal government using the HRS data. Goda (2011) uses the same HRS data and estimates that each dollar of state-level tax subsidy saves only 84 cents in Medicaid. These two branches of literature ignore other potential benefits (costs) when evaluating the welfare of PLTC, which could generate ambiguous and mixed findings. We fill this gap by

exploring the labor market effect, which is important to government revenues, of PLTC.

Third, our paper directly connects with a larger literature that examines the relationship between private or public insurance and labor market outcomes for the near-elderly population. The studies on the employer-provided retiree health insurance find that the availability of such insurance is related to early withdrawal from the labor force and retirement (Rogowski and Karoly 2000; Blau and Gilleskie 2001; 2006; 2008; Robinson and Clark 2010; Strumpf 2010; French and Jones 2011; Marton and Woodbury 2013; Nyce et al. 2013) while some work estimates modest effect on retirement (Gustman and Steinmeier 1994; Kapur and Rogowski 2007). Prior work on analyzing the value of Medicare finds that increasing eligibility age for Medicare leads to extra work years and more attachment to labor market and vice versa (Rust and Phelan 1997; Johnson et al. 2003; French and Jones 2011; Wettstein 2020). De Nardi et al. (2010) and De Nardi et al. (2016) also show that old people, especially those with high lifetime income, value the expansion of Medicaid who insures against the risk of catastrophic medical needs. We build on these studies by exploring the effects of PLTC on labor market outcomes. The PLTC program designs not only to increase LTC insurance purchase but also increase the likelihood to be eligible for public LTC insurance, Medicaid. If individuals are risk-averse, the PLTC offers protection against expensive LTC expenditures in the future and allows to smooth consumption like private health insurance. In addition, the PLTC reduces the uncertainty that comes from volatile LTC costs through Medicaid. We add on these discussions of insurance and explore another mechanism, bequest motive, incentivized by PLTC on labor market outcomes.

The paper proceeds as follows. Section 2 provides the institutional details of Medicaid and the PLTC program. Section 3 describes the data and sample selection. Section 4 presents the empirical strategy and the main results. Section 5 proposes a theoretical model explaining the mechanism behind the empirical results. Section 6 concludes.

2 Institutional Background

2.1 Medicaid

In the United States, Medicare, a federal program that covers every individual who are 65 and above, reimburses limited LTC costs if any. Medicaid is the primary public policy that covers LTC expenses for the older population. Medicaid is a means-tested program that is jointly administered by the federal and state governments. Eligibility for Medicaid requires that an individual's income and assets fall below certain thresholds. Though eligibility requirements vary by marital status and state, the minimum eligibility requirement is determined at the federal level. In general, all states have an asset limit at $2,000. Applicants who have assets greater than $2,000 must "spend down" to qualify for Medicaid. Individuals who receive Supplemental Security Income (SSI) are automatically eligible for Medicaid. In addition, if individuals face high medical expenditures who are medically needy, Medicaid covers LTC even if their income and assets are higher than the thresholds. Medicaid protects individuals who are at risk of high medical needs from being indigent.

Medicaid funds LTC at two settings: institutional settings and home or community-based settings. In 2016, an estimated 62% of LTC nursing home residents were reimbursed and Medicaid paid approximately $50 billion to nursing home enrollees (Harris-Kojetin et al. 2019). With the costly institutional LTC costs, states have implemented Medicaid home or community-based services (HCBS) to contain the increasing LTC expenditures and satisfy individuals' expressed preferences to receive LTC at home. In 2018, about $62.5 billion was spent on HCBS, accounting for 58 percent of total Medicaid expenditures. Medicaid, therefore, acts as one major program through which older people insure themselves against the uncertainty of LTC costs.

2.2 The Partnership Long-Term Care Insurance Program

Even with the increasing use of Medicaid HBCS services and decreasing reliance on institutional care, the spending on LTC is escalating in an aging society. Another attempt to look for other sources of LTC funding is the Partnership Long-Term Care Insurance (PLTC) program. The PLTC program is a product coupled by both public Medicaid and private LTC insurance, which makes it a public-private program (Stone-Axelrad 2005; Lin and Prince 2013; Bergquist et al. 2018). Specifically, PLTC encourages consumers to purchase LTC insurance by allowing policyholders with higher assets to be covered by Medicaid who would disqualify otherwise under special eligibility models (Meiners et al. 2002; Lin and Prince 2013; Bergquist et al. 2016; 2018). The commonly-used model is dollar-for-dollar approach which protects the same amount of assets, that private LTC insurance covers, from Medicaid.[3] For example, suppose an individual has a policy that has a specified coverage of $100,000 in LTC costs, an equal quantity ($100,000) of assets will be protected to be eligible for Medicaid. Without PLTC, an individual needs to spend down their assets to $2,000 to qualify for Medicaid. With PLTC, an individual can retain $102,000 in assets ($2,000 normal asset threshold and $100,000 equivalent protection from private LTC insurance). On the one hand, the partnership program provides policyholders a legitimate approach to shelter assets while the cost of LTC can still be reimbursed by Medicaid if eligible (Meiners 2009).[4] On the other hand, the PLTC program could alleviate fiscal burden on Medicaid by shifting some spending paid through private LTC insurance which individuals are incentivized to purchase (Stone-Axelrad 2005; Meiners 2009; Bergquist et al. 2018).

The PLTC program was initiated in 1987 supported by the Robert Wood

[3]This model is originated in California, Connecticut, and Indiana (Meiners et al. 2002). The other model is total assets model used by Indiana and New York. More details about special eligibility models of PLTC are discussed in the Appendix of Bergquist et al. (2018).

[4]One caveat of PLTC: individuals with home equity above $500,000 are not eligible for Medicaid with a PLTC insurance. Some states use higher ceilings to $750,000.

Johnson Foundation (RWJF). Four states, California, Connecticut, Indiana, and New York, implemented PLTC in the original demonstration. At the beginning, the Department of Health and Human Services (HHS) assumed that the RWJF programs offered opportunities for budget savings. However, political debate about the costs and benefits of PLTC resulted in Congress prohibited other states from further establishing PLTC in the Omnibus Budget Reconciliation Act (OBRA) in 1993. The four states with existing RWJF PLTC programs were allowed to continue in place.[5] Opponents of the program challenged that PLTC was cost-effective and PLTC could save Medicaid spending. With the increasing LTC demand and Medicaid LTC spending, the 2005 Deficit Reduction Act (DRA) lifted barriers imposed by Congress and permitted other states to expand the PLTC program. Table 1 reports the effective date when PLTC is adopted across states. To date, all states except Alaska, Hawaii, and Mississippi, have a PLTC program.[6]

3 Data

For the empirical analysis, we use two sources of data: PLTC state-level policy information and survey data with detailed information of individuals.

The first data source is about state PLTC programs. Specifically, we collect information from various sources on the implementation date of PLTC across states and across years 1990 to 2014. Most of the policy data during 1990-2014 were collected from https://www.aaltci.org/long-term-care-insurance/learning-center/long-term-care-insurance-partnership-plans.php. The data for this period in our study is similar to that used by Greenhalgh-Stanley (2014). Each state's website is used to cross-verify the implementation date of PLTC. As illustrated in Table 1, four states had PLTC programs in place by 1994. In 2006, three more states adopted PLTC programs; by 2010, 38 states had PLTC programs. In addition, we

[5]These four states with RWJF PLTC programs are also called permanent states (Costa-Font and Raut 2021).

[6]https://www.medicaidplanningassistance.org/partnerships-for-long-term-care/

collect data about state characteristics, including population, the share of black people, the share of people aged 65 and above, and the share of people in poverty from Census Bureau and Bureau of Labor Statistics.

The second source of data is the Health and Retirement Study (HRS), a longitudinal survey, conducted by the University of Michigan. The HRS is representative of Americans aged 51 and above with different cohorts who are eligible for the study. Respondents are surveyed biennially starting in 1992. The core cohort, the HRS cohort, has been followed and interviewed since 1992. Since 1993, the HRS has included the Study of Assets and Health Dynamics Among the Oldest Old (AHEAD) cohort, including those born before 1924; the Children of the Depression Age (CODA) cohort, including those born between 1924 and 1930; and the War Babies cohort (WB), including those born between 1942 and 1947. An additional Early Baby Boomers (EBB) cohort of those born between 1948 and 1953 was added to the sample in 2004, and the Mid-Baby Boomers cohort of those born between 1954 and 1959 was added in 2010. The HRS provides detailed information of respondents about demographic characteristics, health and functioning, health care and insurance, medical expenses, employment and financial situation. We use the RAND HRS data files, which are derived from original HRS by the RAND Center with clean and consistent variables across waves. Variables of LTC insurance and other insurance related variables, such as life insurance, are from the original HRS surveys. Besides, the HRS restricted data provides the state of residence of respondents, which we can merge with PLTC policy data from the first source. To construct a reliable measure for the implementation of PLTC in each state, we take into account the fact that the HRS survey is conducted biannually. We further acquire information about the exact month when each wave of HRS is conducted for every respondent. Therefore, we can pin down how long each respondent has been exposed to the PLTC program when interviewed.

3.1 Sample selection

First, we restrict our sample to HRS respondents who are between 50 and 65 years old. Individuals of this age range are the potential LTC insurance customers that might be incentivized by the PLTC program and are also active in the labor market. Besides, per the policy design, individuals with assets larger than $2,000 are most likely affected by the PLTC program, we further limit the sample of respondents having more assets than $2,000 each survey year.

Second, we restrict our analysis to the period of 2000-2010 mainly for two reasons. For one aspect, all observable changes in the adoption of the PLTC program by state occurred after 2005. Using data spanning before and after the expansion of PLTC can help to test the parallel trend assumption and allow us to examine longer-term effects. For the other aspect, recent expansions in Medicaid from the Affordable Care Act (ACA) were implemented from 2010. The ACA effect on reducing "employment lock" among childless adults who were previously ineligible for Medicaid may also impact the work motivation of the near-elderly population. Therefore, the results without ACA policy years capture purely the effect from the PLTC program and are not contaminated by other concurrent policy.

Third, one would concern the differences between the four states that adopted the program in the 1990s (RWJF pilot states or permanent states) and the states that did so after 2005. Therefore, we further limit the analysis to non-pilot states. Ultimately, the main sample (the near-elderly population) for empirical results covers 24,892 unique individuals with a total of 32,086 observations.

3.2 Key variables

The most relevant variables for the current study come from questions about labor market outcomes. Specifically, the survey asked respondents about their labor force status. *Labor force participation (LFP)* indicates whether an individual was in the labor force at the time of the survey, or was unemployed but actively looking

for a job. *Working full-time* indicates whether a respondent is working at least 35 hours per week or at least 36 weeks per year.[7] *Working part-time* indicates that an individual is not working full-time. In addition, the respondents were asked about the number of hours per week they were working in their main job, and, if they were employed, about their hourly wage rate. The wage rate is the respondent's hourly wage rate. The question was posed only to individuals who reported that they were working for pay. If the respondent was unemployed, the wage rate is imputed. If the respondent had recently had a job, the wage rate from that job is used. If no previous wage rate is available for an unemployed individual, it is imputed using predicted values from regression results.

Table 2 provides summary statistics of the key variables for the near-elderly group. Approximately 60% of the sample lives in a state that has a PLTC program. Around 53% of the sample is full-time workers, and 9% of the sample reports having a part-time job. The sample is mostly white. About 20% of the sample reports in poor health status, and 11% reports with LTC insurance.

4 Empirical Strategy and Results

4.1 Empirical Strategy

In 2005, the Deficit Reduction Act (DRA) lifted the barriers Congress had imposed on the PLTC program, allowing for the expansion of the Partnership to other states across the country. Since then (post-DRA), many states have adopted the PLTC policies. We exploit the variation of implementation date of PLTC across states to examine the effect on labor market outcomes in a DID framework. Recent work in econometric theory casts doubt on the validity and robustness of DID estimator with multiple treating periods. When treatment effects evolve over time and vary

[7] The hours and weeks are calculated from both main and second job to determine whether an individual is full-time or part-time working.

across states, already-treated units can act as effective comparison units, which can produce negative weights on the average treatment effects in each state and period (Callaway and Sant'Anna 2020; Sun and Abraham 2020; Goodman-Bacon 2021; Athey and Imbens 2022). To address this concern and to better adapt the model specification to fluctuations in the labor market, we run standard DID by comparing post-DRA periods with before-DRA periods when no states adopted the program yet. Specifically, we run the following model specification:

$$Y_{ist} = \beta Treat_s \times Post_t + \gamma X_{it} + \alpha_s + \sigma_t + Z_{s04}t + \eta_r t + \epsilon_{ist} \tag{1}$$

in which i indexes the individual, s the state, and t the year. $Treat_s$ is an indicator if the state has adopted the PLTC program. $Post_t$ is an indicator if the year is after 2004. X_{it} is a set of individual characteristics, including age, marital status, education status, self-reported health status, cancer status, diabetes status, number of children, and assets. Z_{s04} is a set of 2004 state characteristics, including the log of the population, the percent of the population black, the percent of population aged greater than 65, and the percent of the population in poverty. Besides, we control for state fixed effects and year fixed effects. In addition, given that the coefficient is likely to overestimate the effect in the presence of pre-trends, we control for region-level time trends ($\eta_r t$) as an alternative specification. All estimates are adjusted by personal-level weights, and standard errors are clustered at the state level.

4.2 Results

Before presenting the main regression results, we test for the parallel trends assumption in the DID framework by comparing 2000 and 2002 to 2004. Table 3 shows the results for full-time work status, and Table 4 for part-time work status. In both tables, we run the regressions without controlling for region trends in odd-numbered columns, and in even-numbered columns, we additionally control

for region trends. All coefficients on the DID term are insignificant, so we can not reject the null hypothesis of parallel trends.

The DID estimates based on equation (1) for the full-time work status are presented in Table 5. Except for 2008, DID terms in all post years are significantly positive under both specifications, suggesting that the PLTC program induces a 2.5-6.9 percentage points increase in the number of older workers holding a full-time job. Table 6 reports effects on the part-time status. Contrary to the full-time job, the results show that the PLTC program negatively affects part-time job rates, especially in 2006. The coefficients imply the adoption of the PLTC program induces a 1.2-2.1 percentage point decrease in the number of individuals working part-time.

These findings indicate that the PLTC program induces more people to work as full-time workers, with fewer people doing part-time jobs. To check whether these changes mean that older workers shift from part-time jobs to full-time jobs, we also run specifications in which the outcome variable equals one if the individual either holds a full-time job or a part-time job as in Table 7. With controlling region trends, the coefficients imply that the adoption of the PLTC program raises the total labor force participation by 3.0-5.2 percentage points among older workers. The rise of labor force participation among older workers suggests that this program encourages individuals to work more, which is consistent with the hypothesis that an increase in Medicaid asset eligibility threshold and the reduction of future medical expense uncertainty would affect labor supply decisions.

4.3 Placebo Tests

One may be concerned that the positive effects of the PLTC program on labor force participation are mainly due to the macro environment. For example, states that adopted the PLTC program happened to have increased demand in the labor market, resulting in the increment in labor force participation among older

workers. To address this concern, we examine two alternative age groups. First, we present results among a group of individuals aged below 50 who would experience the same demand change in the labor market. As seen from Table 8, altering the regression sample to the younger cohorts, the results are all insignificant, suggesting that the changes in labor force participation among older workers are due to the PLTC program. As a placebo test, we also conduct similar regressions among individuals aged over 70 during the study period. Since most elderly individuals should have been retired after 65, we would expect that the coefficients among this age group should be insignificant. As shown in Table 9, the results are consistent with this prediction, suggesting that the empirical specification are valid to examine the impact of the PLTC program.

Another concern is that though labor demand was similar between treated states and "not-yet" treated states during the study period, the states that adopted the program could differ on other policies that push older workers to work, regardless of the PLTC program' impacts. To address this concern, we use near-elderly individuals whose assets below $2,000 as a placebo test. These low-asset individuals are at the same age as the main group, so they should experience a similar job market or macroeconomic background. However, since their asset level is below $2,000, they are not affected before or after the adoption of the PLTC program because they are always qualified to enroll in Medicaid. Table 10 reports estimates of the effect of living in a state with the PLTC program on labor force participation among the near-elderly population with assets lower than $2,000. None of the estimates are significant, indicating that the changes in labor force participation among the higher-asset group are not due to the macroeconomic background common to all older workers.

In sum, the results in this section show that the PLTC program affects the job arrangements of near-elderly individuals, particularly those who have assets larger than $2,000 (who are less likely to be qualified to Medicaid without the PLTC policy). The following section hypothesizes that these effects might be associated with the

bequest motives.

5 Discussion: The Bequest Motive

Though we find that near-elderly individuals increase labor force participation due to the PLTC program, it is still unclear why they do that. After all, the near-elderly individuals who purchased LTC insurance would face less medical expense uncertainty and easily rely on private/public health insurance to finance their health care. To better understand the benefits of the PLTC program and how it may differ across individuals, this section first outlines one hypothesis - the bequest motive - describing why older workers may respond to the PLTC program. Then with theoretical analysis, we confirm that the bequest motive is the reason driving near-elderly individuals to work more.

As mentioned in previous studies, one fundamental reason for explaining the saving behavior among the elderly is the bequest motive (De Nardi 2004; Kopczuk and Lupton 2007; De Nardi et al. 2010). If this is the case, one would expect that near-elderly individuals without any children should not respond to the PLTC program. Table 11 reports estimates of the PLTC program's impact on labor force participation among childless near-elderly individuals. As we predicted, we find no effects of the PLTC program on childless individual's labor market outcomes, either for full-time work status or part-time work status. On the contrary, when we limit the analysis to near-elderly individuals with children, the results show a different story. Though these individuals who have children did not change their part-time job status, they increase full-time jobs significantly by 1.8-7.2 percentage points (as shown in Table 12).

These findings show significantly different patterns between individuals with or without children, suggesting that individuals with children are the major group to respond to the PLTC program. However, one may be concerned about other policies rather than the PLTC program driving this difference. To address this

concern, we illustrate a theoretical framework to explore why the changes in labor force participation are made due to the PLTC program.

Consider in a static model where an individual aged 50-64 seeking to maximize his utility. The individual derives utility from consumption, C, and hours of leisure, L. His utility function is in the form

$$U(C, L) = \frac{1}{1-\nu}(C^{\gamma}L^{1-\gamma})^{1-\nu}. \tag{2}$$

Individuals with higher values of γ place less weight on leisure.

The quality of leisure is

$$L = T - H \times P \tag{3}$$

where T is the individual's total time endowment. P denotes participation in the labor market. we allow P to be a continuous variable, which equals one if the individual takes a full-time job. When P is a fraction number, it means that the individual takes a part-time job. H is the total working hours if he chooses a full-time job.

The individual decides his optimal consumption with the following form:

$$C = (T - L) \times w \times P + (1 - P)Y_b - M - A \tag{4}$$

where w denotes the total wages for a full-time job, Y_b denotes the benefits or transfers from the government. M denotes his total medical spending, while A denotes the asset he is willing to save for children. If A equals zero, it means that the individual consumes every penny.

The research question now is whether individuals who prefer to leave more assets to their children would be more likely to join the labor market. Based on the implicit function theory, this question is equivalent to test whether $\frac{dP}{dA} = -\frac{\frac{\partial U}{\partial A}}{\frac{\partial U}{\partial P}} > 0$. To test it, we examine the inequality, $\frac{\frac{\partial U}{\partial A}}{\frac{\partial U}{\partial P}} < 0$. The nominator can be described as the

following:

$$\frac{\partial U}{\partial A} = -\gamma \cdot [HwP^2 + (1-P)Y_b - M - A]^{\gamma(1-\nu)-1} \cdot (T - HP)^{(1-\gamma)(1-\nu)}, \tag{5}$$

and the denominator is as follows:

$$\begin{aligned}\frac{\partial U}{\partial P} =& \gamma \cdot [HwP^2 + (1-P)Y_b - M - A]^{\gamma(1-\nu)-1} \cdot (T - HP)^{(1-\gamma)(1-\nu)} \cdot (2HwP - Y_b) \\ & - (1-\gamma) \cdot [HwP^2 + (1-P)Y_b - M - A]^{\gamma(1-\nu)} \cdot (T - HP)^{(1-\gamma)(1-\nu)-1} \cdot H\end{aligned} \tag{6}$$

From (5), we know $\frac{\partial U}{\partial A} < 0$. $\frac{\frac{\partial U}{\partial A}}{\frac{\partial U}{\partial P}} < 0$ if and only if $\frac{\partial U}{\partial P} > 0$. This inequality holds if w is big enough. The intuition is that only when the individual whose labor market conditions are favorable, the more assets they want to leave to their children, they are more likely to join the labor market. On the contrary, if the individual is in low-paid jobs, she would prefer to receive government transfers and enjoy leisure.

Table 13 reports the DID estimates among near-elderly individuals with children to test this theory. Columns (1) and (2) show that if individuals' assets are below 50% of the population, they will not change their work status after the PLTC program. Columns (3) and (4) instead report the estimates when individuals' assets are above 50% of the population. The results indicate that the PLTC program has a positive and significant effect on labor-force participation among them. Especially in 2010, the effect increases to 8.9-10.3 percentage points.

To avoid the concern that individuals with higher wage rates increase their labor force participation regardless of the PLTC program, we conduct a test among childless near-elderly individuals in well-paid jobs. Since childless individuals are less likely to have the bequest motive, one would expect that we cannot observe the program's effect on them. As we have seen from Table 14, among childless near-elderly individuals, the results of the PLTC program on labor force participation are small and insignificant under all specifications. This evidence is

consistent with our expectation, suggesting that the significant increase in labor force participation among well-paid individuals is due to the bequest motive and the PLTC program.

6 Conclusion

Cost-effectiveness is a key rationale behind the PLTC program. Proponents of the program believe it can reduce Medicaid spending in the future by creating an incentive for individuals to assume responsibility through LTC insurance for at least the initial phase of their need for LTC services. With attracting individuals who might not otherwise purchase private LTC insurance, the government expects to save spending on Medicaid by shifting the responsibilities to private companies and individuals. However, previous literature casts doubt about the efficiency of this program because many participants would still be too wealthy to qualify for Medicaid (GAO 2007).

In this paper, we shed light on this problem from a new perspective. we use data from the HRS spanning the recent state adoptions of the PLTC program to examine the responsiveness of work status to changes in the existence of the programs across states and over time. The findings show that near-elderly individuals increase their labor force participation, and more of the effects come from individuals with assets above $2,000. To explore the reason behind this responsiveness, based on the bequest motive hypothesis, we propose a theoretical model that suggests that only when individuals are in well-paid jobs would they be more motivated by the PLTC program by taking full-time jobs. Empirical evidence confirms the theoretical model, showing that most of the program's impact is driven by individuals who have children and are in well-paid jobs. Overall, these findings suggest that changes in the PLTC program could have unintended (second-order) effects.

Besides, this paper also provides a new direction for thinking about the aging

issues. As aging populations and decreasing labor force participation rates among older workers create a financial strain on public pension and health care programs,[8] encouraging employment among older workers becomes an important factor in helping society to deal with the ongoing demographic transition toward an older population. In response, many countries are starting to enact or at least consider policies that cut retirement benefits and increase the statutory retirement age. However, these policy reforms are not considered as effective policy instruments because it mainly restricts the opportunity set of the less healthy workers in low-paid jobs (with the highest incentive to retire), who are the main recipients of social security and health care programs. Finding an efficient way to promote the labor force participation of older workers is a topic that should have attracted significant attention from policymakers and researchers. This paper, therefore, provides empirical evidence on the unintended positive effects of an LTC insurance program on employment among older workers. we interpret the results as suggestive that PLTC program can be the potential way to promote labor force participation of older workers.

[8]Between 1980 and 2020, the old-age to working-age ratio has increased from 20 to 31 (OECD 2020).

Tables

Table 1: Effective Date of the PLTC Program by State

State	Effective Date	State	Effective Date
Alabama	March 2009	Montana	July 2009
Alaska	Not Filed	Nebraska	July 2006
Arizona	July 2008	Nevada	January 2007
Arkansas	July 2008	New Hampshire	February 2010
California	Pilot State	New Jersey	July 2008
Colorado	January 2008	New Mexico	August 2019
Connecticut	Pilot State	New York	Pilot
Delaware	November 2011	North Carolina	March 2011
Florida	January 2007	North Dakota	January 2007
Georgia	January 2007	Ohio	September 2007
Hawaii	Not Filed	Oklahoma	July 2008
Idaho	November 2006	Oregon	January 2008
Illinois	2019	Pennsylvania	September 2007
Indiana	Pilot State	Rhode Island	July 2008
Iowa	January 2010	South Carolina	January 2009
Kansas	April 2007	South Dakota	July 2007
Kentucky	June 2008	Tennessee	October 2008
Louisiana	October 2009	Texas	March 2008
Maine	July 2009	Utah	October 2014
Maryland	January 2009	Vermont	2020
Massachusetts	2020	Virginia	September 2007
Michigan	February 2016	Washington	January 2012
Minnesota	July 2006	West Virginia	July 2010
Mississippi	Not Filed	Wisconsin	January 2009
Missouri	August 2008	Wyoming	July 2009

NOTES: Illinois, Massachusetts, and Vermont are three states that only adoption year is available.

Table 2: Summary Statistics: Near-elderly (50-65) samples

Variable	Near-Elderly (50-65) Mean	Std.dev.
PLTC state	0.597	0.302
Full-time work	0.529	0.499
Part-time work	0.087	0.282
Age	57.716	3.71
Unmarried	0.270	0.444
Male	0.482	0.500
White	0.863	0.344
Less than high school	0.107	0.309
Poor health status	0.199	0.399
Private LTC insurance	0.105	0.306
Cancer	0.077	0.266
Diabetes	0.136	0.343
Any ADLs/IADLs	0.126	0.332
Number of children	2.769	1.812
Assets ($K)	460.236	1044.951

Table 3: Test of Parallel Trends Assumption - Full-Time Job Status

	Dependent Variable: Full-Time Work			
Post Years	2000		2002	
	(1)	(2)	(3)	(4)
Treat × Post	0.010	0.007	0.026	0.042
	(0.017)	(0.018)	(0.025)	(0.033)
Additional controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes
Region trend	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes
Observations	11668	11668	10439	10439
R-squared	0.170	0.171	0.163	0.164

NOTES: This table reports comparison spanning the recent adoption of the PLTC program. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

Table 4: Test of Parallel Trends Assumption - Part-Time Job Status

	Dependent Variable: Part-Time Work			
Post Years	2000		2002	
	(1)	(2)	(3)	(4)
Treat × Post	0.013	0.013	0.002	0.008
	(0.019)	(0.019)	(0.011)	(0.014)
Additional controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes
Region trend	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes
Observations	11668	11668	10439	10439
R-squared	0.043	0.043	0.037	0.038

NOTES: This table reports comparison spanning the recent adoption of the PLTC program. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

Table 5: DID Estimates of the PLTC Program's Impact on Full-Time Work Status

	Dependent Variable: Full-time work					
Post Years	2006		2008		2010	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat × Post	0.029**	0.050***	0.025	0.039	0.050**	0.069***
	(0.014)	(0.014)	(0.019)	(0.025)	(0.023)	(0.022)
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes	Yes	Yes
Region trend	No	Yes	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10260	10260	9361	9361	11787	11787
R-squared	0.164	0.164	0.148	0.148	0.160	0.160

NOTES: This table reports comparison spanning the recent adoption of the PLTC program. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

Table 6: DID Estimates of the PLTC Program's Impact on Part-Time Work Status

	Dependent Variable: Part-Time Work					
Post Years	2006		2008		2010	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat × Post	-0.021**	-0.020**	-0.012	-0.016	-0.015	-0.017
	(0.009)	(0.009)	(0.013)	(0.015)	(0.016)	(0.021)
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes	Yes	Yes
Region trend	No	Yes	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10260	10260	9361	9361	11787	11787
R-squared	0.039	0.039	0.042	0.042	0.032	0.032

NOTES: This table reports comparison spanning the recent adoption of the PLTC program. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

Table 7: DID Estimates of the PLTC Program's Impact on Work Status

	Dependent Variable: Full/Part-Time Work					
Post Years	2006		2008		2010	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat × Post	0.008	0.030**	0.012	0.022	0.035	0.052**
	(0.012)	(0.01)	(0.017)	(0.020)	(0.022)	(0.020)
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes	Yes	Yes
Region Trend	No	Yes	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10260	10260	9361	9361	11787	11787
R-squared	0.039	0.039	0.042	0.042	0.032	0.032

NOTES: This table reports comparison spanning the recent adoption of the PLTC program, and pooled full-time/part-time work status together. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

Table 8: Placebo Test: DID Estimates of the PLTC Program's Impact on Work Status (Age < 50)

	Dependent Variable			
	Full-Time Work		Part-Time Work	
Comparison Years	(1)	(2)	(3)	(4)
2000	-0.014	-0.023	0.014	0.012
	(0.071)	(0.063)	(0.072)	(0.065)
2002	0.055	0.053	-0.079	-0.075
	(0.056)	(0.052)	(0.066)	(0.064)
2006	0.034	0.029	-0.020	-0.020
	(0.079)	(0.080)	(0.054)	(0.056)
2008	0.118	0.116	-0.046	-0.052
	(0.093)	(0.079)	(0.051)	(0.049)
2010	0.079	0.070	0.020	0.016
	(0.057)	(0.053)	(0.051)	(0.044)
Additional individual controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes
Region trend	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes
Observations	2401	2401	2401	2401
R-squared	0.124	0.050	0.127	0.056

NOTES: This table reports results comparing 2004 (as the benchmark year) with all other years, and pooled all years in one regression. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

Table 9: Placebo Test: DID Estimates of the PLTC Program's Impact on Work Status (Age > 70)

	Dependent Variable			
	Full-Time Work		Part-Time Work	
Comparison Years	(1)	(2)	(3)	(4)
2000	-0.012	-0.012	0.016	0.016
	(0.010)	(0.010)	(0.017)	(0.017)
2002	-0.008	-0.007	-0.001	-0.001
	(0.008)	(0.007)	(0.006)	(0.006)
2006	-0.012	-0.012	-0.002	-0.001
	(0.008)	(0.008)	(0.003)	(0.004)
2008	-0.013	-0.012	0.005	-0.005
	(0.009)	(0.009)	(0.006)	(0.006)
2010	-0.005	-0.006	0.004	0.005
	(0.008)	(0.009)	(0.007)	(0.007)
Additional individual controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes
Region trend	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes
Observations	47698	47698	47698	47698
R-squared	0.064	0.064	0.015	0.015

NOTES: This table reports results comparing 2004 (as the benchmark year) with all other years, and pooled all years in one regression. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

Table 10: Placebo Test: DID Estimates of the PLTC Program's Impact on Work Status (Asset $\leqslant$ 2,000)

	Dependent Variable			
	Full-Time Work		Part-Time Work	
Comparison Years	(1)	(2)	(3)	(4)
2000	0.034	0.035	0.044	0.047
	(0.057)	(0.055)	(0.046)	(0.045)
2002	0.001	0.002	0.028	0.036
	(0.066)	(0.064)	(0.028)	(0.028)
2006	-0.017	-0.003	-0.028	-0.018
	(0.038)	(0.035)	(0.034)	(0.032)
2008	0.031	0.038	-0.032	-0.034
	(0.070)	(0.067)	(0.066)	(0.065)
2010	0.010	0.010	0.015	0.023
	(0.053)	(0.053)	(0.028)	(0.027)
Additional individual controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes
Region trend	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes
Observations	4222	4222	4222	4222
R-squared	0.221	0.223	0.052	0.054

NOTES: This table reports results among individuals aged 50-65 by comparing 2004 (as the benchmark year) with all other years, and pooled all years in one regression. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age $>$ 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** p<0.01, ** p<0.05, * p<0.1)

Table 11: Test Hypothesis: DID Estimates of the PLTC Program's Impact on Work Status (Without Kids)

	Dependent Variable			
	Full-Time Work		Part-Time Work	
Comparison Years	(1)	(2)	(3)	(4)
2000	-0.113	-0.075	0.038	0.071
	(0.079)	(0.069)	(0.081)	(0.087)
2002	-0.053	-0.055	0.050	0.074
	(0.114)	(0.108)	(0.074)	(0.069)
2006	-0.015	-0.027	-0.041	-0.006
	(0.062)	(0.079)	(0.073)	(0.060)
2008	-0.001	-0.067	0.056	0.078*
	(0.075)	(0.095)	(0.067)	(0.042)
2010	0.078	0.082	0.011	0.020
	(0.065)	(0.072)	(0.049)	(0.038)
Additional individual controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes
Region trend	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes
Observations	2101	2101	2101	2101
R-squared	0.157	0.164	0.058	0.065

NOTES: This table reports results among childless individuals aged 50-65 by comparing 2004 (as the benchmark year) with all other years, and pooled all years in one regression. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

Table 12: Test Hypothesis: DID Estimates of the PLTC Program's Impact on Work Status (With Kids)

	Dependent Variable			
	Full-Time Work		Part-Time Work	
Comparison Years	(1)	(2)	(3)	(4)
2000	-0.006	-0.010	-0.012	-0.006
	(0.017)	(0.016)	(0.019)	(0.015)
2002	-0.002	-0.031	-0.003	-0.003
	(0.018)	(0.022)	(0.015)	(0.015)
2006	0.029*	0.043***	-0.017	-0.012
	(0.017)	(0.015)	(0.012)	(0.011)
2008	0.018	0.031	-0.014	-0.009
	(0.021)	(0.024)	(0.015)	(0.016)
2010	0.048*	0.072***	-0.015	-0.013
	(0.025)	(0.025)	(0.018)	(0.018)
Additional individual controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes
Region trend	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes
Observations	28206	28206	28206	28206
R-squared	0.167	0.168	0.036	0.036

NOTES: This table reports results among individuals aged 50-65 with kids by comparing 2004 (as the benchmark year) with all other years, and pooled all years in one regression. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

Table 13: Test Hypothesis: DID Estimates of the PLTC Program's Impact on Work Status (With Kids)

	Dependent Variable: Full-Time Work			
	Wage Rate Below 50%		Wage Rate Above 50%	
Comparison Years	(1)	(2)	(3)	(4)
2000	-0.046	-0.029	0.001	-0.017
	(0.054)	(0.047)	(0.025)	(0.025)
2002	-0.040	-0.030	-0.013	-0.022
	(0.045)	(0.054)	(0.020)	(0.021)
2006	-0.007	-0.015	0.037**	0.046***
	(0.047)	(0.048)	(0.017)	(0.013)
2008	-0.023	-0.028	0.034*	0.049**
	(0.045)	(0.050)	(0.018)	(0.022)
2010	-0.056	-0.032	0.089***	0.103***
	(0.045)	(0.057)	(0.023)	(0.026)
Additional individual controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
2000 state vars trend	Yes	Yes	Yes	Yes
Region trend	No	Yes	No	Yes
Weights	Yes	Yes	Yes	Yes
Observations	6908	6908	21298	21298
R-squared	0.082	0.086	0.231	0.232

NOTES: This table reports results among individuals aged 50-65 with kids by comparing 2004 (as the benchmark year) with all other years, and pooled all years in one regression. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

Table 14: Test Hypothesis: DID Estimates of the PLTC Program's Impact on Work Status (Without Kids)

	Dependent Variable: Full-Time Work	
	Wage Rate Above 50%	
Comparison Years	(1)	(2)
2000	-0.049	-0.067
	(0.067)	(0.068)
2002	-0.023	-0.008
	(0.128)	(0.106)
2006	-0.072	-0.126
	(0.072)	(0.093)
2008	-0.064	-0.073
	(0.077)	(0.091)
2010	0.042	0.022
	(0.084)	(0.067)
Additional individual controls	Yes	Yes
Year FE	Yes	Yes
State FE	Yes	Yes
2000 state vars trend	No	Yes
Region trend	No	Yes
Weights	Yes	Yes
Observations	1605	1605
R-squared	0.194	0.206

NOTES: This table reports results among childless individuals aged 50-65 by comparing 2004 (as the benchmark year) with all other years, and pooled all years in one regression. All regression include controls for: age, gender, marital status, years of education, White, self-reported health, cancer, diabetes, any ADLs/IADLs, and number of children. State variables for 2000 include log of population, percent of population black, age > 65, and in poverty, each interacted with a linear time trend. Individual weighting is used to represent the whole population. Results with no weighting are very similar. Robust standard errors, clustered at the state level, are in parentheses. (*** $p<0.01$, ** $p<0.05$, * $p<0.1$)

References

America's Health Insurance Plans. Long-term care insurance partnerships: New choices for consumers – potential savings for federal and state government. 2007.

John Ameriks, Joseph Briggs, Andrew Caplin, Minjoon Lee, Matthew D Shapiro, and Christopher Tonetti. Older Americans would work longer if jobs were flexible. *American Economic Journal: Macroeconomics*, 12(1):174–209, 2020.

Susan Athey and Guido W Imbens. Design-based analysis in difference-in-differences settings with staggered adoption. *Journal of Econometrics*, 226(1):62–79, 2022.

Andrew Baker, David F Larcker, and Charles CY Wang. How much should we trust staggered difference-in-differences estimates? *Available at SSRN 3794018*, 2021.

Savannah Bergquist, Joan Costa-Font, and Katherine Swartz. Partnership program for long-term care insurance: the right model for addressing uncertainties with the future? *Ageing & Society*, 36(9):1779–1793, 2016.

Savannah Bergquist, Joan Costa-Font, and Katherine Swartz. Long-term care partnerships: Are they fit for purpose? *The Journal of the Economics of Ageing*, 12:151–158, 2018.

B Douglas Bernheim. How strong are bequest motives? evidence based on estimates of the demand for life insurance and annuities. *Journal of Political Economy*, 99(5): 899–927, 1991.

David M Blau and Donna B Gilleskie. Retiree health insurance and the labor force behavior of older men in the 1990s. *Review of Economics and Statistics*, 83(1):64–80, 2001.

David M Blau and Donna B Gilleskie. Health insurance and retirement of married couples. *Journal of Applied Econometrics*, 21(7):935–953, 2006.

David M Blau and Donna B Gilleskie. The role of retiree health insurance in the employment behavior of older men. *International Economic Review*, 49(2):475–514, 2008.

Kirill Borusyak, Xavier Jaravel, and Jann Spiess. Revisiting event study designs: Robust and efficient estimation. *arXiv preprint arXiv:2108.12419*, 2021.

Brantly Callaway and Pedro HC Sant'Anna. Difference-in-differences with multiple time periods. *Journal of Econometrics*, 2020.

Joan Costa-Font and Nilesh Raut. Long-term care partnership effects on Medicaid and private insurance. 2021.

Charles Courtemanche and Daifeng He. Tax incentives and the decision to purchase long-term care insurance. *Journal of Public Economics*, 93(1-2):296–310, 2009.

Mariacristina De Nardi. Wealth inequality and intergenerational links. *The Review of Economic Studies*, 71(3):743–768, 2004.

Mariacristina De Nardi, Eric French, and John B Jones. Why do the elderly save? the role of medical expenses. *Journal of Political Economy*, 118(1):39–75, 2010.

Mariacristina De Nardi, Eric French, and John Bailey Jones. Medicaid insurance in old age. *American Economic Review*, 106(11):3480–3520, 2016.

Karen E Dynan, Jonathan Skinner, and Stephen P Zeldes. The importance of bequests and life-cycle saving in capital accumulation: A new answer. *American Economic Review*, 92(2):274–278, 2002.

Eric French and John Bailey Jones. The effects of health insurance and self-insurance on retirement behavior. *Econometrica*, 79(3):693–732, 2011.

Emily A Gallagher, Radhakrishnan Gopalan, Michal Grinstein-Weiss, and Jorge Sabat. Medicaid and household savings behavior: New evidence from tax refunds. *Journal of Financial Economics*, 136(2):523–546, 2020.

GAO. Long-term care insurance partnership programs include benefits that protect policyholders and are unlikely to result in Medicaid savings. *United States Government Accountability Office*, 2007.

Gopi Shah Goda. The impact of state tax subsidies for private long-term care insurance on coverage and Medicaid expenditures. *Journal of Public Economics*, 95(7-8):744–757, 2011.

Andrew Goodman-Bacon. Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2):254–277, 2021.

Nadia Greenhalgh-Stanley. Can the government incentivize the purchase of private long-term care insurance? evidence from the partnership for long-term care. *Applied Economics Letters*, 21(8):541–544, 2014.

Jonathan Gruber and Aaron Yelowitz. Public health insurance and private savings. *Journal of Political Economy*, 107(6):1249–1274, 1999.

Alan L Gustman and Thomas L Steinmeier. Employer-provided health insurance and retirement behavior. *Industrial and Labor Relations Review*, 48(1):124–140, 1994.

Lauren D Harris-Kojetin, Manisha Sengupta, Jessica Penn Lendon, Vincent Rome, Roberto Valverde, and Christine Caffrey. Long-term care providers and services users in the United States, 2015-2016. 2019.

Richard W Johnson, Amy J Davidoff, and Kevin Perese. Health insurance costs and early retirement decisions. *Industrial and Labor Relations Review*, 56(4):716–729, 2003.

Kanika Kapur and Jeannette Rogowski. The role of health insurance in joint retirement among married couples. *Industrial and Labor Relations Review*, 60(3): 397–407, 2007.

Cheris A Kline. *An Analysis of the Impact of the Long-Term Care Partnership Program on the Number of Lives Covered by Long-Term Care Insurance and Medicaid Expenditures in Nursing Homes*. PhD thesis, The University of Alabama at Birmingham, 2020.

Wojciech Kopczuk and Joseph P Lupton. To leave or not to leave: The distribution of bequest motives. *The Review of Economic Studies*, 74(1):207–235, 2007.

Haizhen Lin and Jeffrey Prince. The impact of the partnership long-term care insurance program on private coverage. *Journal of Health Economics*, 32(6):1205–1213, 2013.

James Marton and Stephen A Woodbury. Retiree health benefits as deferred compensation: Evidence from the Health and Retirement Study. *Public Finance Review*, 41(1):64–91, 2013.

Alex Maynard and Jiaping Qiu. Public insurance and private savings: who is affected and by how much? *Journal of Applied Econometrics*, 24(2):282–308, 2009.

Mark R Meiners. Long-term care insurance partnership: considerations for cost-effectiveness. *Center for Health Care Strategies, Inc. Policy Brief, March*, 2009.

Mark R Meiners, Hunter L McKay, and Kevin J Mahoney. Partnership insurance: An innovation to meet long-term care financing needs in an era of federal minimalism. *Journal of Aging & Social Policy*, 14(3-4):75–93, 2002.

National Conference of State Legislatures. A guide to long-term care for state policy makers: The long-term care partnership program. 2013.

Steven Nyce, Sylvester J Schieber, John B Shoven, Sita Nataraj Slavov, and David A Wise. Does retiree health insurance encourage early retirement? *Journal of Public Economics*, 104:40–51, 2013.

OECD. *Pensions at a glance 2019: OECD and G20 indicators*. Organisation for Economic Co-operation and Development OECD, 2020.

Christina Robinson and Robert Clark. Retiree health insurance and disengagement from a career job. *Journal of Labor Research*, 31(3):247–262, 2010.

Jeannette Rogowski and Lynn Karoly. Health insurance and retirement behavior: evidence from the Health and Retirement Survey. *Journal of Health Economics*, 19 (4):529–539, 2000.

John Rust and Christopher Phelan. How social security and medicare affect retirement behavior in a world of incomplete markets. *Econometrica*, pages 781–831, 1997.

Julie Stone-Axelrad. Medicaid's long-term care insurance partnership program. *Congressional Research Service*, 2005.

Erin Strumpf. Employer-sponsored health insurance for early retirees: impacts on retirement, health, and health care. *International Journal of Health Care Finance and Economics*, 10(2):105–147, 2010.

Liyang Sun and Sarah Abraham. Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, 2020.

Wei Sun and Anthony Webb. Can long-term care insurance partnership programs increase coverage and reduce Medicaid costs? 2013.

Gal Wettstein. Retirement lock and prescription drug insurance: Evidence from Medicare Part D. *American Economic Journal: Economic Policy*, 12(1):389–417, 2020.