Do safe assets affect the financial decisions of individuals nearing retirement? Evidence from the Partnership for Long-Term Care Program *

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Abstract

This study examines whether post-retirement asset protection initiatives motivate proactive financial planning among individuals nearing retirement. The Partnership for Long-Term Care (PLTC) program in the United States allows policyholders to protect assets from Medicaid's eligibility requirements. Using data from the Health and Retirement Study and employing a difference-in-differences methodology, we assess the impact of the PLTC's staggered introduction on the financial behaviors of near-retirees. Our results reveal that the PLTC program significantly boosted long-term care insurance coverage by at least 11.8 percent and increased the likelihood of labor market participation by at least 3.5 percent among individuals aged 50-64. These increases were primarily observed among those with moderate or high asset levels. Furthermore, our findings indicate that the primary motivation for these behavioral changes was long-term financial planning, rather than the intention to leave a bequest. These insights are crucial for policymakers and financial planners aiming to enhance retirement readiness and economic activity among older adults.

Keywords Partnership for Long-Term Care Program, Employment, Financial Planning

JEL classification D1, E2, H3, I1, J1, J2

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1 Introduction

The period leading up to retirement is marked by critical financial planning decisions that significantly impact individuals' quality of life in their later years. A major concern during this phase is the potential cost of long-term care (LTC). Over half of the population aged 65 and above is expected to require LTC services, at an average lifetime cost of around $170,000 (Johnson et al. 2021).[1] As this figure nearly matches the median asset levels of U.S. households, it is clear that LTC expenses can be a significant financial challenge, and that these potential cost should be taken into account in personal financial planning (Aladangady et al. 2023). Consequently, many individuals report being worried about the prospect of exhausting their assets if they require extended care services (Hamel and Montero 2023), in line with empirical observations of limited dissaving in retirement (De Nardi et al. 2010; Kopecky and Koreshkova 2014; De Nardi et al. 2016; Lockwood 2018).

Despite these financial challenges, the literature has documented decreased labor force participation and low uptake of LTC insurance among individuals aged 50-64 (Brown and Finkelstein 2008; Abraham and Kearney 2020; Akaichi et al. 2020; Brown 2023). This situation presents a paradox whereby individuals express concern about their financial future yet hesitate to take action to accumulate more assets. This inaction may stem from a complex decision-making environment in which near-retirees find it difficult to weigh the pros and cons of various asset accumulation strategies. For instance, while boosting labor force participation raises individuals' immediate income and savings potential, the current Social Security structures discourage those with longer careers from staying in or re-entering the workforce due to a growing implicit tax (Laitner and Silverman 2012; Goda et al. 2018).[2] Similarly, the non-refundability of unused LTC insurance premiums deters policy purchases, particularly among those who underestimate their future needs. On the other hand, reliance on safety nets like

[1]The lifetime cost of LTC is based on 2017 research from Price Waterhouse Coopers. More information is available at https://www.pwc.com/us/en/insurance/assets/pwc-insurance-cost-of-long-term-care.pdf.

[2]Social Security benefits are calculated based on the highest 35 years of earnings. As career length increases, and earnings potentially rise, benefits grow less quickly than earnings and taxes, leading to implicit net taxes. This can diminish the marginal benefit of continuing to work.

Medicaid, which supports low-asset individuals, may also play a significant role on inaction (Brown and Finkelstein 2008). This reliance could create a sense of security that diminishes the urgency to engage in further asset accumulation, as individuals might expect that their basic needs will be covered regardless of their personal savings. If decision-making complexity is the primary barrier, highlighting the benefits of asset accumulation could simplify choices and encourage more proactive financial engagement. However, if inaction is primarily due to reliance on safety nets, reducing complexity alone may not lead to significant changes.

This paper explores this paradox by addressing two critical questions: Can highlighting the benefits of asset accumulation strategies motivate individuals in this age group to actively employ financial strategies, and what are their underlying motives for saving? Understanding these motives is crucial, as asset accumulation policies that do not align with the actual needs of near-retirees may prove ineffective. Although evidence from Ameriks et al. (2020) suggests that there is a strong preference within this demographic group for accumulating savings to cover potential LTC needs rather than to leave a bequest, the relative importance of health-related precautionary savings versus bequest motives continues to be debated, largely due to a lack of direct empirical evidence.

This paper provides empirical evidence on these two questions by leveraging the introduction of the Partnership for Long-Term Care (PLTC) program across various states. The aim of the PLTC program is to finance the potential LTC costs of individuals who might require such services by integrating public Medicaid benefits with private LTC insurance (Stone-Axelrad 2005; GAO 2007; Lin and Prince 2013; Sun and Webb 2013; Bergquist et al. 2018; Costa-Font and Raut 2021). In contrast to traditional LTC insurance, PLTC policies allow policyholders to shield assets up to the value of their insurance benefits from Medicaid's asset eligibility criteria, without impacting the pricing of the insurance. Traditionally, the high cost of LTC insurance and the potential for never needing to use the benefits dissuaded many people from purchasing policies. However, the PLTC program's asset protection feature reframes LTC insurance from a risky or unnecessary expenditure to a possible financial investment. Therefore, we posit

that the introduction of the PLTC program acts as an exogenous shock, clearly highlighting the asset protection benefits of LTC insurance. This setup allows us to explore how the asset protection feature of the PLTC influences individual behavior, and to examine any underlying motivations behind their choices.

Specifically, we hypothesize that individuals' responses to the PLTC program will vary based on their asset levels. For those with substantial assets, the total value of LTC insurance benefits and the assets protected by the PLTC program are expected to exceed the premium costs, thereby encouraging enrollment. Conversely, individuals with limited assets may find LTC insurance less appealing or unaffordable, leading them to delay or forgo obtaining coverage. Additionally, variations in LTC insurance policies are likely to affect labor supply decisions. The asset protection feature of these policies mitigates the financial uncertainties associated with saving or accumulating assets, which might encourage older adults to remain in the workforce longer and boost labor force participation. However, PLTC policies could also shift perceptions by making Medicaid eligibility through asset depletion seem more accessible. This perceived ease of qualifying for Medicaid could make continued employment less economically attractive, thereby reducing the motivation to stay in the labor force or to accumulate further assets.

To empirically assess these hypotheses, we utilize quasi-experimental estimates by leveraging the staggered implementation of the PLTC program across different states from 2000 to 2013. Using detailed data from the Health and Retirement Study (HRS), we employ the Differences-In-Differences (DID) research design, with one dimension of variation stemming from the individual's state of residence and the other determined by whether the survey was completed before or after the implementation of the PLTC program in the respective state. Under the assumption of parallel trends, the state-by-time variation created by the adoption of the PLTC program allows us to derive causal estimates. However, recent econometric studies have pointed out that staggered DID estimates may yield biased results if the treatment effects vary over time and across states. To address this concern, we further refine our estimates with an event-study framework and employ two recently developed robust estimators proposed by Borusyak et al. (ming) and Gardner (2022).

Our findings show that the implementation of the PLTC program had a significant positive impact on LTC insurance uptake rates, with an increase ranging from 1.2 to 1.3 percentage points depending on the estimation method used. Given the baseline LTC insurance rate of 10.2 percent prior to the PLTC program's launch, this represents an approximate 11.8 to 16.7 percent increase. Additionally, the PLTC program positively influenced the labor supply decisions of near-elderly individuals, leading to a 2.3 to 2.5 percentage point increase in current labor force participation and a 1.7 to 2.3 percentage point rise in the likelihood of working past age 65. With a baseline labor force participation rate of 65.8 percent and a baseline intention to work after age 65 of 30.4 percent, these behavioral changes represent a relative rise of about 3.5 to 3.8 percent in labor force participation and a relative increase of 5.6 to 7.6 percent in the likelihood of continuing to work beyond age 65.

The observed positive impact of the PLTC program on LTC insurance adoption and labor market participation supports the hypothesis that individuals value the asset protection it offers. Two additional findings also support this hypothesis. First, increased adoption of LTC insurance and higher labor force participation rates were primarily observed among individuals with moderate to high asset levels, whereas no significant changes in the LTC insurance uptake or employment patterns of individuals with lower asset levels were found. This result suggests that the asset protection feature of the PLTC program enhances the net benefits of LTC insurance for those who find the concept of an asset shield appealing and financially affordable. It further implies that the benefits of asset protection outweigh the perceived cost of continued employment due to decreased access to Medicaid, thus markedly influencing the decision-making processes of older adults. Second, we show that while the PLTC program influenced self-reported expectations of living beyond age 80, it did not significantly alter the self-reported likelihood of leaving a bequest at various thresholds. This finding indicates that the asset protection feature of the PLTC program is primarily leveraged for long-term financial planning, rather than with the intent of bequeathing assets, thereby supporting the notion that the primary motive for saving is covering LTC needs rather than inheritance planning.

This paper contributes to several strands of literature. First, our paper is directly linked to the ongoing discussion about the low uptake rate of LTC insurance and the low dissaving rate in retirement. Previous studies have shown that, from the supply side, market failures, including asymmetric information, result in strict underwriting practices that restrict access to LTC insurance (Hendren 2013). Additionally, the availability of public health insurance programs, such as Medicaid, can crowd out the demand for private LTC insurance, especially among individuals with limited income and assets (Brown and Finkelstein 2008). On the demand side, low adoption rates have been attributed to factors such as limited financial literacy (McGarry et al. 2016), infrequent personal experience with LTC needs (Coe et al. 2015), and a widespread lack of awareness about LTC insurance (Brown 2023). The desire to leave a bequest has also been identified as a substantial motive for purchasing LTC insurance (Lockwood 2018; Canta and Cremer 2019; Courbage and Montoliu-Montes 2020). Diverging from previous studies, this paper shows that individuals' decisions to adjust their LTC insurance coverage and labor force participation are driven by the desire to safeguard their assets to finance their future needs, rather than to bequeath their assets. These findings adds empirical evidence supporting the theoretical frameworks presented in structural studies, such as those by Ameriks et al. (2020). Moreover, these insights have important implications for policy development and financial planning approaches aimed at supporting individuals as they navigate their retirement planning process.

Second, this paper adds to the existing evidence on the relationship between health insurance and labor market outcomes, especially for individuals nearing retirement age. The phenomenon of "job lock," whereby employees stay in suboptimal jobs or postpone retirement to retain employer-provided health benefits, has been extensively documented (Rogowski and Karoly 2000; Nyce et al. 2013; Fitzpatrick 2014; Garthwaite et al. 2014; French and Jones 2017). Studies have shown that having access to health insurance that is not tied to employment, such as through a public program, can encourage early retirement (Boyle and Lahey 2010; Aslim 2019; Wettstein 2020; Aslim 2022). However, much of this research primarily considered health insurance as a mitigator of short-term medical expenses. Our paper extends this discussion to LTC

insurance, a crucial but underexamined type of health insurance that enhances financial security by providing coverage of future LTC expenses. By concentrating on LTC insurance, our study examines how insuring against future care costs affects the labor supply decisions of individuals nearing retirement, viewing the issue through the lens of long-term financial planning. This detailed investigation sheds light on the broader economic and social implications of LTC insurance, offering insights into how policies designed to reduce the uncertainty of future LTC expenses impact the immediate work decisions of the near-elderly population. Consequently, our work helps to close a research gap that has been largely overlooked in the existing literature.

Lastly, this paper contributes to the evaluation of the PLTC program's effectiveness. Lin and Prince (2013) reported a slight increase in LTC insurance purchases after the implementation of the PLTC program, which they mainly attributed to purchases by wealthy individuals. Using numerical optimization techniques, Sun and Webb (2013) concluded that the primary beneficiaries of the PLTC program were individuals who would have secured LTC insurance anyway. Meanwhile, Bergquist et al. (2018) found that the short-term impact of the PLTC program on LTC insurance uptake was negligible. Our study builds upon these studies, employing the latest advances in econometrics on staggered DID to examine the policy implications of the program, which go beyond its impact on the uptake of LTC insurance. As the PLTC program increases the Medicaid asset eligibility threshold and reduces uncertainty about insurance coverage of future medical expenses, it may be expected to affect labor supply decisions based on the precautionary savings model (Gruber and Yelowitz 1999; Maynard and Qiu 2009; Gallagher et al. 2020). Therefore, we expand the literature by exploring how the benefits of the PLTC program affect the career decisions of near-elderly individuals. To the best of our knowledge, this study is the first to analyze the unintended causal effects of the PLTC program on labor force participation.

The structure of the paper is organized as follows: Section 2 outlines the institutional details of Medicaid and the PLTC program. Section 3 delivers a conceptual analysis, exploring the potential impacts of the PLTC program. Section 4 describes the dataset employed in this study and elucidates the criteria for sample selection. Section 5 outlines

the empirical methodology utilized and discusses the primary results. Finally, Section 6 provides a summary and conclusion of the research findings.

2 Institutional Background

2.1 Medicaid

In the United States, LTC costs are a significant concern for the aging population. While the federal Medicare program offers limited LTC cost coverage to individuals aged 65 and older, the Medicaid program, a joint federal-state initiative, serves as the primary source of LTC funding for old adults.[3] Medicaid's coverage is contingent upon means-tested eligibility criteria focused on individuals' income and assets. While these requirements may vary by marital status and by state, a federally mandated minimum eligibility guideline is in place. In general, all states enforce an asset limit of $2,000. Applicants whose assets exceed $2,000 must "spend down" to meet the qualification criteria for Medicaid (Mommaerts 2018).

Medicaid plays a pivotal role in financing LTC delivered in institutional settings and through home or community-based services (HCBS), dedicating billions of dollars annually to these costs. According to a recent estimate, Medicaid is responsible for covering the expenses of approximately 62 percent of LTC nursing home residents, which amount to around $50 billion annually (Harris-Kojetin et al. 2019). In response to rising institutional LTC costs and to accommodate the preference of many individuals to receive care in their own homes, states have expanded Medicaid HCBS. As a result, HCBS spending surged to an estimated $92 billion in 2018, accounting for 56 percent of Medicaid's total LTC expenditure (Watts et al. 2020; Murray et al. 2021). This significant reliance on Medicaid underscores the urgent need to reduce government spending, particularly through strategies encouraging some of individuals to shift to the private

[3]Medicare offers limited LTC coverage, focusing primarily on short-term skilled nursing facility care for up to 100 days per illness, part-time home health care, and hospice care for terminal illnesses, all under specific conditions. It does not cover custodial care, which constitutes the majority of LTC needs, such as help with daily activities like bathing and dressing. After the 100-day limit in a skilled nursing facility, costs must be covered out-of-pocket. More details can be found at https://www.medicare.gov/coverage/long-term-care.

LTC insurance market.

2.2 The Partnership for Long-Term Care Program

To address rising LTC costs and to encourage a shift to private LTC insurance coverage, the Partnership for Long-Term Care (PLTC) program was introduced. This initiative, a collaboration between the public Medicaid system and private LTC insurers, seeks to merge Medicaid's supportive framework with the benefits of private insurance (Stone-Axelrad 2005; Lin and Prince 2013; Bergquist et al. 2018). A key feature of the PLTC program is its "dollar-for-dollar" asset protection model.[4] This model enables policyholders to exempt an amount of assets equivalent to the LTC benefits paid out by their private insurance from Medicaid's standard asset eligibility thresholds. For example, if a private policy covers $100,000 in LTC expenses, the policyholder is entitled to shield an equivalent $100,000 of their assets from Medicaid's eligibility requirements. This "dollar-for-dollar" asset protection is the hallmark of the PLTC program, ensuring that participants can retain a much larger share of their wealth if they eventually require Medicaid assistance.

Although PLTC policies come with the distinctive benefit of offering asset protection, their pricing is competitive with that of conventional LTC insurance plans, provided all other conditions are equal.[5] Similar to conventional LTC insurance, the cost of PLTC policies is influenced by multiple factors, including by the purchaser's age, chosen benefits, and health status, as well as by the insurer. Younger purchasers in particular benefit from lower premiums due to their decreased immediate risk of needing LTC services. For instance, an average annual premium for $165,000 in LTC coverage is approximately $900 for a 55-year-old male, but increases to $1,700 for a 65-year-old male.[6]

[4]This model originated in California, Connecticut, and Indiana (Meiners et al. 2002). The "total assets" model is another approach used by Indiana and New York. Further details on the PLTC program's unique eligibility models can be found in the appendix of Bergquist et al. (2018).

[5]Additional information is available at https://www.ltcnews.com/resources/faq/long-term-care-insurance-partnership-program.

[6]These estimates are derived from the American Association for Long-Term Care Insurance's 2022 report. Additional information can be accessed at https://www.aaltci.org/news/long-term-care-insurance-association-news/2022-price-index-for-long-term-care-insurance and

Considering the factors mentioned above, the actuarial value of PLTC insurance stands out due to its incorporation of both the direct benefits of LTC coverage and the indirect financial advantages of asset protection and improved Medicaid eligibility. This dual-benefit structure might make PLTC insurance a more attractive option than traditional LTC insurance for many individuals, particularly those concerned about asset depletion due to prolonged LTC needs. By ensuring Medicaid eligibility without necessitating the complete liquidation of assets, PLTC policies effectively offer a twofold layer of financial security, and are thus potentially appealing LTC planning solutions.

However, the PLTC program's availability varies by state. Funded by the Robert Wood Johnson Foundation, the program was first introduced as a pilot in California, Connecticut, Indiana, and New York during the early 1990s. Although it was first viewed as a way to reduce budgetary expenditures, discussions in Congress led to the passage of the Omnibus Budget Reconciliation Act of 1993. This Act imposed restrictions on the expansion of the program to other states, which slowed its adoption and resulted in its limited availability across the country.

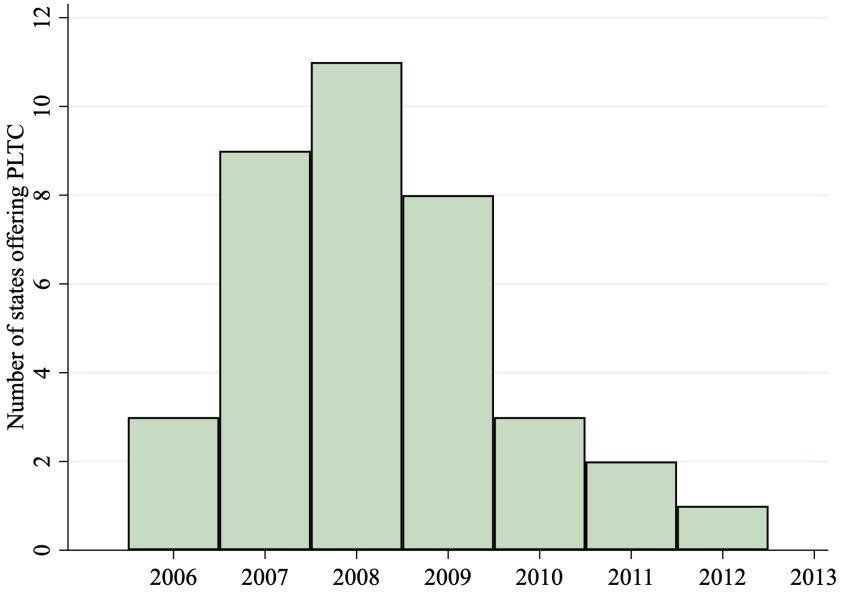
It was not until passage of the 2006 Deficit Reduction Act (DRA) that these restrictions were lifted, enabling broader state adoption in response to increasing LTC service demands and Medicaid expenditures. The DRA aimed to tighten Medicaid eligibility through stricter asset transfer rules and annuity regulations, pushing states to seek alternative LTC management strategies for their aging populations.[7] This legislative shift, coupled with the financial strain of the 2008 economic downturn, prompted a swift expansion of the PLTC program. From 2006 to 2013, 37 additional states adopted the PLTC program, as depicted in Figure 1.[8]

In summary, the PLTC program addresses a crucial need in LTC planning by enhancing the attractiveness of private LTC insurance through Medicaid asset protection mechanisms. It aims to transfer some financial responsibility from Medicaid to individuals and their families, potentially alleviating the financial burden on state and

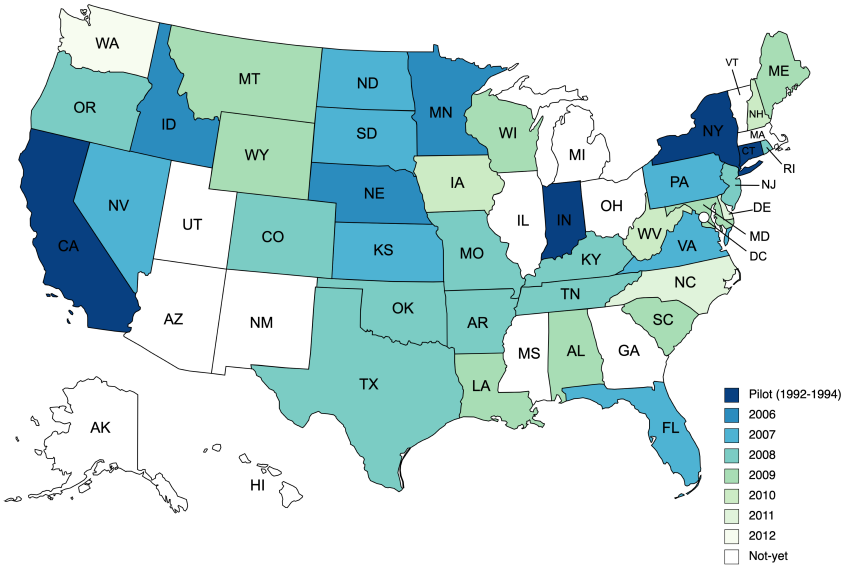
https://www.forbes.com/advisor/life-insurance/long-term-care-insurance-cost/.

[7]Additional information is available at https://www.cms.gov/regulations-and-guidance/legislation/deficitreductionact/downloads/toabackgrounder.pdf.

[8]For details, Appendix Table A.1 presents the effective dates of the PLTC adoption across states. Currently, all states except Alaska, Hawaii, and Mississippi have a PLTC program in place.



(a) PLTC Across Years



(b) PLTC Across States

Figure 1: PLTC Implementation Across Years and States

NOTES: This figure illustrates the expansion of the PLTC program following its 2006 enlargement. Subfigure 1(a) presents the annual increase in the number of states adopting PLTC policies from 2006 to 2013. Subfigure 1(b) depicts the year of PLTC program implementation in each state by 2013, using color intensity to indicate the timing of implementation; darker shades signify earlier adoption. Importantly, pilot states that initiated the program prior to 2006 are excluded from our regression analysis to concentrate on evaluating the impact of the expansion post-2006.

federal budgets. However, whether individuals decide to purchase a PLTC policy may be influenced by a complex interplay of factors, including the cost of the insurance premiums and their asset levels, risk tolerance, and anticipated care needs. Given that younger individuals typically face lower premiums and remain active in the labor market, they may experience the program's effects differently than older people would. This particular dynamic and its potential consequences are elaborated upon in Section 3.

3 Conceptual Framework

As outlined in Section 2.2, the implementation of the PLTC program was expected to significantly affect the targeted demographic under the age of 65. This section provides a conceptual analysis of the program's expected impacts on Long-Term Care Insurance (LTCI) and labor market outcomes, drawing upon the policy framework detailed in Section 2.2.

The PLTC program is designed to safeguard participants' assets from Medicaid's stringent asset requirements. This design allows us to predict nuanced responses to LTCI coverage based on an individual's asset profile. Specifically, we expect that individuals possessing substantial assets will be more inclined to opt for LTCI. This inclination stems from their desire to protect their wealth from potential Medicaid spend-down requirements and their financial capability to afford LTCI premiums without financial strain. For these individuals, the value proposition of LTCI is clear: It serves as a means to preserve their assets while ensuring access to quality LTC services.

Individuals with moderate assets face a more complex situation. While the opportunity for asset protection might encourage LTCI adoption among these individuals as it does among those with higher asset levels, the immediate financial burden of premiums and the distant benefits of policy payouts introduce uncertainty. Furthermore, through the lens of mental accounting — a concept whereby individuals classify their wealth into categories such as spendable income, current assets, and future income — those with moderate assets may opt to postpone the purchase of LTCI to avoid diminishing the growth of their current savings, as theorized by Kahneman and

Tversky (1984) and Thaler (1985).

For individuals with limited assets, the PLTC program is likely to exert minimal influence on their LTCI purchase decisions. Given their proximity to Medicaid eligibility, the financial burden of LTCI premiums may not justify the investment, as the immediate out-of-pocket costs outweigh the uncertain future benefits of LTCI coverage.

The PLTC program's effect on labor force participation is more ambiguous. For individuals with higher asset levels, the program may act as a catalyst, encouraging them to accumulate more assets, which could lead them to increase their labor force participation as they prepare financially for their future care needs. Conversely, the program could also create a perception that it is easier to spend down assets to become eligible for Medicaid, thereby reducing the incentive to remain in the labor market or to continue asset accumulation efforts after the implementation of the PLTC program. For individuals with minimal assets, who are less impacted by the PLTC program, significant changes in labor force participation are not expected.

In summary, the PLTC program introduces complex dynamics into LTCI adoption rates and financial planning, affecting individuals differently based on their asset levels. We anticipate a range of reactions to the program that are all shaped by the individual's financial situation, from increased insurance engagement and labor participation rates among those with significant assets, to the use of more cautious financial strategies among those with moderate assets, to little or no change in behavior among the asset-poor.

4 Data

For the empirical analysis, we employ two primary data sources: state-level PLTC policy data and individual-specific information collected through nationally representative surveys.

The first data source consists of detailed information on the timing of the implementation of state PLTC programs. We gathered data on the implementation date of the PLTC programs across states from the years 1990 to 2021 from multiple sources. As shown in Figure 1, states adopted PLTC programs at different times, predominantly

during the period from 2006 to 2013, with most implementations concentrated in the years 2007, 2008, and 2009.[9]

The second data source is the Health and Retirement Study (HRS), a longitudinal panel survey of Americans aged 50 and older facilitated by the University of Michigan that has been conducted on a biennial basis since 1992. This comprehensive study collects a wide range of information on the respondents, including on their demographic characteristics, health status, healthcare and insurance coverage, employment, retirement plans, and financial outcomes.

For our analysis, we mainly employ the RAND version of the HRS data files, which was developed by the RAND Center. These files present cleaned and harmonized data across different survey waves, ensuring consistency in variables. We integrate these files with the restricted-use version of the HRS, which includes information on the respondents' state of residence. The merged dataset enables precise identification of each individual's exposure status to the PLTC program.

4.1 Sample selection

Our analysis sample is derived based on four key considerations. First, we focus on the age of participants. We define our analysis cohort as individuals aged 50-64 during each survey wave of the HRS. This age restriction allows us to consistently target the same age cohort, thereby reducing the influence of external policy changes that might affect different age groups differently. Our emphasis on individuals nearing retirement age is for several reasons: they are prime candidates for LTCI (Lin and Prince 2013; Cornell et al. 2016; Nordman et al. 2016), making their access to the PLTC program particularly relevant to their insurance decisions; this demographic is still active in the labor market, offering valuable insights into labor participation decisions; they are typically ineligible for Medicare, allowing us to isolate the effects of public health insurance; and they are the primary respondents in the HRS, ensuring the relevance of our study to this demographic.

[9]Most of the policy data for the 1990-2014 period were collected from https://www.aaltci.org/long-term-care-insurance/learning-center/long-term-care-insurance-partnership-plans.php. These data closely align with those employed by Greenhalgh-Stanley (2014). To ensure the accuracy of the PLTC implementation dates, we cross-verified the information from each state's official website.

Second, we limit our data to HRS survey waves from 2000 to 2013. This timeframe is chosen in accordance with the existing literature, as demonstrated in studies such as (Lin and Prince 2013; Brown 2023), and to avoid the confounding influences of the Affordable Care Act's (ACA) Medicaid expansion in 2014, which has been shown to affect labor force participation among adults who were previously ineligible for Medicaid (Abito and Salant 2019; Aslim 2022). This strategic exclusion ensures that our findings on the PLTC program's impact are not distorted by the introduction of the ACA.

Third, our working sample includes states that implemented the PLTC program during its expansion starting after 2006, thus providing a more consistent and comparable set of data. By excluding states that participated in the program's earlier phases in the 1990s, we aim to assess the program's effects within a more stable policy framework.

Lastly, we exclude individuals who changed their state of residence to eliminate any potential variability in PLTC program exposure status, which impacts around 7% of our age-targeted sample. To further enhance the precision of our estimates, we omit individuals with negative financial assets from the main analysis, recognizing that their behavior might differ significantly from those without financial constraints. This exclusion is revisited in placebo tests to confirm the robustness of our findings. Ultimately, our main analysis sample, encompassing the near-elderly population aged 50 to 64 years old, includes a total of 26,323 observations.

4.2 Key variables

Table 1 provides descriptive statistics detailing the outcomes and characteristics of our working sample, segmented into periods before and after the 2006 implementation of the PLTC program. Regarding key outcomes, there was a discernible rise in private LTCI coverage, from 10.2% to 11.6%. Labor force participation also showed an increase, from 65.8% to 72.6%. Conversely, the self-reported likelihood of working past the age of 65 dipped slightly from 30.4% to 29.0%, suggesting a complex interplay between retirement planning and economic factors during these periods.

In terms of individual attributes, a modest decrease in the average age, from 58.5 to

Table 1: Summary Statistics: Near-elderly (50-64) Sample

Variables	Pre-2006			Post-2006		
	Mean (1)	Std. dev. (2)	N (3)	Mean (4)	Std. dev. (5)	N (6)
Key outcomes						
Private LTCI	0.102	0.302	12,250	0.116	0.320	13,546
In the labor force	0.658	0.474	12,477	0.726	0.446	13,753
Work after 65	0.304	0.340	6,613	0.290	0.339	13,066
Individual characteristics						
Age	58.5	4.0	12,503	57.8	3.9	13,820
Male	0.421	0.494	12,503	0.419	0.493	13,820
Unmarried	0.226	0.418	12,503	0.286	0.452	13,819
Hispanic	0.053	0.225	12,503	0.068	0.252	13,808
Native	0.933	0.250	12,494	0.922	0.268	13,816
Religious affiliation						
Protestant	0.649	0.477	12,462	0.595	0.491	13,767
Catholic	0.255	0.436	12,462	0.249	0.432	13,767
Others	0.095	0.294	12,462	0.156	0.363	13,767
Education						
Less than high school	0.175	0.380	12,499	0.118	0.322	13,818
High school	0.324	0.468	12,499	0.263	0.440	13,818
Some college	0.243	0.429	12,499	0.295	0.456	13,818
College or more	0.257	0.437	12,499	0.324	0.468	13,818
BMI	27.9	5.5	12,250	28.8	6.0	13,602
Self-reported poor health	0.178	0.382	12,495	0.179	0.383	13,816
Non-housing financial asset (thousands)	134.0	565.4	12,503	139.0	498.8	13,820
Total asset (thousands)	515.4	1,357.4	12,503	493.2	1,021.9	13,820

NOTES: This table provides summary statistics for individuals aged 50-64 participating in HRS from 2000 to 2013. The term "Work after 65" refers to the self-reported likelihood of working beyond the age of 65. The "Self-reported poor health" variable is assigned a value of one for individuals who report a health score of four or five, indicating poorer health, on a scale where one signifies excellent health and five denotes poor health. The values for assets are expressed in thousands of dollars.

57.8, suggests a shift towards a younger demographic in the later period. The gender composition remained relatively unchanged, with males making up approximately 42% of the sample. Notably, there was a rise in both the proportion of unmarried individuals and Hispanic participants, signaling demographic shifts. Educational attainment saw an improvement post-2006, with more individuals having at least some college education. Health-wise, the Body Mass Index (BMI) increased marginally, while the prevalence of

self-reported poor health stayed consistently low, indicating minimal changes in health status. However, these subtle shifts are important as they could influence decisions related to LTC insurance coverage. Financially, there was a slight increase in non-housing financial assets, whereas total assets saw a marginal decrease, suggesting changes in the economic landscape facing this demographic. These variations in demographics, health, and financial status are accounted for in our regression analyses to more accurately assess the PLTC program's effects.

5 Empirical Strategy and Results

5.1 Empirical Strategy

Under the assumption of parallel trends, the staggered rollout of the PLTC program allows us to estimate its causal effect on the LTCI and labor supply of near-elderly individuals, using a DID strategy. As a baseline specification, we estimate the following Two-Way Fixed-Effect (TWFE) model:

$$Y_{ist} = \delta \, \text{PLTC}_{st} + \beta \mathbf{X}_{ist} + \alpha_s + \tau_t + \varepsilon_{ist} \tag{1}$$

where Y_{ist} represents an outcome (such as private LTCI status or labor force participation) for an individual i in state s during period t. PLTC_{st} indicates whether state s in year t has implemented a PLTC program or not. $\mathbf{X}_{ist}$ includes individual controls such as the individual's age, gender (male), marital status (unmarried), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI), consistent with previous literature (Lin and Prince 2013; Brown 2023). α_s denotes the state fixed effect, and τ_t represents the year-month fixed effects. It is worth noting that as we account for year-month fixed effects (e.g., 2010m3), which offer more granularity than year-level state controls, we have opted not to include year-level state controls. In addition, we cluster standard errors at the state level to reflect the level of policy variation.

The validity of the parallel trends assumption in our setting may raise concerns. In particular, there may be worries that states implementing the PLTC program could exhibit different LTCI adoption and labor supply trends. To address this concern, a fully dynamic version of equation (1) is estimated and checked for potential pretrends:

$$Y_{ist} = \delta_k \times \sum_{k=-6}^{5} \mathbf{1}\{t - t_s = k\} + \beta \mathbf{X}_{ist} + \alpha_s + \tau_t + \varepsilon_{ist} \tag{2}$$

where $\mathbf{1}\{t - t_s = k\}$ refers to a set of indicator variables that are assigned a value of one if an individual from state s in period t is k years away from the implementation of the PLTC program (t_s).[10] We treat the years just prior to the PLTC implementation as the omitted category and compare them with those exposed to the PLTC implementation in other relative years. All other specifications align with those outlined in equation (1).

However, recent work in econometric theory casts doubt on the validity and robustness of the TWFE estimator with multiple treatment periods. When the treatment effects evolve over time and vary across states, already-treated units 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; Gardner 2022; Borusyak et al. ming). Consequently, as our second strategy, we explore the presence of pretrends by employing a fully dynamic version of the alternative estimators introduced in Borusyak et al. (ming) and Gardner (2022). Our rationale for selecting these particular estimators, following the guidance provided by Roth (2024), is the critical importance of not indiscriminately merging various estimators in a single analysis due to their divergent foundational assumptions. Our choice of these two methods is rooted in their similar procedure for estimating event-study terms. This involves a two-stage estimation process: initially, both methods identify group and period effects using data from observations that have not received treatment. Subsequently, they calculate average treatment effects by contrasting outcomes from treated groups with those estimated for

[10]The HRS provides us with interview dates accurate to the month and year. Likewise, we have precise month and year data for the PLTC program's implementation. This precision enables us to accurately calculate the years before and after the implementation, adjusted for the specific months.

untreated groups. This process ensures the estimation of treatment effects is both consistent and accurate. By foregoing direct 2 × 2 DID comparisons between states that are newly treated and those that have already been treated, these two strategies yield consistent estimates even when the treatment effects differ over time and/or across states.

5.2 Results

5.2.1 LTCI coverage

Table 2 presents the estimated impacts of the state-level implementation of the PLTC

Table 2: DID Estimates of the PLTC Program's Effect on LTCI Coverage

	TWFE		BJS		Gardner	
	(1)	(2)	(3)	(4)	(5)	(6)
PLTC	0.027***	0.016**	0.022***	0.012**	0.027***	0.017**
	(0.007)	(0.008)	(0.006)	(0.006)	(0.007)	(0.007)
Mean	0.102	0.102	0.102	0.102	0.102	0.102
Controls	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
State FE		✓		✓		✓
Observations	25,239	25,238	25,239	25,233	25,239	25,239

NOTES: This table presents the impact of the PLTC program on LTCI coverage among individuals aged 50-64. Columns (1) and (2) provide DID estimates using the TWFE method. Columns (3) and (4) display results employing the methodology proposed by Borusyak et al. (ming), and columns (5) and (6) report outcomes based on the approach developed by Gardner (2022). The analysis is restricted to survey data collected from 2000 to 2013, eliminating potential confounding effects associated with the Affordable Care Act (ACA) on the labor force. Moreover, our focus narrows to states that embarked on the PLTC program's expansion starting in 2006, thus excluding earlier adopters from the 1990s to maintain consistency and comparability across states. Controls include age, gender (male), marital status (unmarried), highest education level attained, religious affiliation, Hispanic ethnicity, U.S. nativity, self-reported health status, and Body Mass Index (BMI), aligning with variables utilized in Lin and Prince (2013) and Brown (2023). Additionally, as we account for year-month fixed effects (e.g., 2010m3), which offer more granularity than year-level state controls, we have opted not to include year-level state controls. The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

program on the adoption of LTCI, employing δ from equation (1) as the parameter of

interest. The analysis employs several estimation techniques: the TWFE Ordinary Least Squares (OLS) method shown in columns (1) and (2), the approach proposed by Borusyak et al. (ming) in columns (3) and (4), and the methodology developed by Gardner (2022) in columns (5) and (6). To account for time-specific variations, odd-numbered columns include year-month fixed effects, while even-numbered columns further control state fixed effects, offering a more nuanced analysis.

Our results reveal a positive influence of the PLTC program on private LTCI adoption rates, noting increases between 1.2 and 1.7 percentage points using different estimation approaches. This range aligns closely with findings by Lin and Prince (2013), who reported a 2.5 percentage point increase in LTCI adoption among individuals with higher assets due to PLTC exposure—a topic we will delve deeper into in Section 5.2.3. Given the average LTC insurance rate of 10.2 percent prior to the implementation, these increases represent a substantial relative growth of approximately 11.8 to 16.7 percent. This evidence underscores the effectiveness of the PLTC program in enhancing private LTCI coverage among the near-elderly population, demonstrating its potential to influence insurance adoption rates significantly.

Figure 2 presents the coefficients from the fully dynamic model, as defined in equation (2). These estimates support the parallel trend assumption, showing that, across different estimation methods, coefficients for periods prior to the adoption of the PLTC program approximate zero. Additionally, there is a notable uptick in LTCI purchases beginning in the second year following the program's implementation. This trend underscores the dynamics of treatment effects and illustrates the policy's incremental impact over time.

Two observations merit emphasis. First, the time-varying impact of the policy suggests limitations of the TWFE method, which may not accurately account for the staggered adoption of treatment across different groups. This is reflected in the relatively larger standard errors associated with TWFE estimates compared to those generated by the two more recently proposed robust estimation techniques. Consequently, we give preference to alternative methods that more effectively manage these temporal variances, enhancing the reliability of our results. Second, the sample size decreases significantly in the 5th year, halving from an average of 1,726 to 820 observations, which

could introduce greater variability and potentially affect the precision of the estimates. This effect might be exacerbated if the composition of the remaining sample in the 5th year differs in significant, unmeasured ways from that of the previous years. Additionally, a potential policy saturation effect might be occurring; by the 5th year, those most likely to adopt LTCI due to the PLTC program could have already done so, resulting in a natural leveling off of adoption rates.

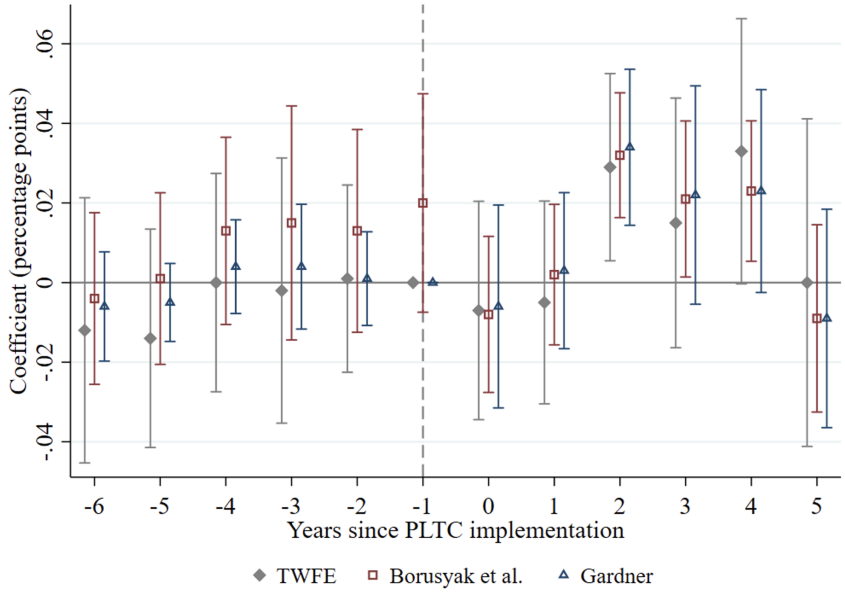


Figure 2: Event-Study Estimates of the PLTC Program's Effect on LTCI Coverage

NOTES: This figure displays the event-study plots developed using three different estimators: a dynamic version of the TWFE model, estimated using OLS (depicted in gray with diamond markers), Borusyak et al. (ming) (in maroon with square markers), and Gardner (2022) (in navy with triangle markers). The dependent variable is the LTCI ownership status of individuals aged 50-64. In the analyses utilizing the TWFE model and Gardner (2022)'s approach, the year preceding the implementation of the PLTC is purposely excluded, and as a result, estimates are normalized to zero for that year. Conversely, the methodology from Borusyak et al. (ming) involves a three-step process, using non-treated observations to estimate potential outcomes for treated individuals as if they had remained untreated. Thus, this approach allows for the inclusion of data from the year preceding the policy's implementation without exclusion. The bars represent 95 percent confidence intervals. Standard errors are clustered at the state level. The detailed estimated coefficients are presented in Appendix A.2.

5.2.2 Labor market outcomes

Table 3 reports the effects of the PLTC program on labor market outcomes among individuals aged 50-64. Columns (1)-(3) focus on current labor force participation, while columns (4)-(6) examine the likelihood of working beyond age 65. These outcomes are all

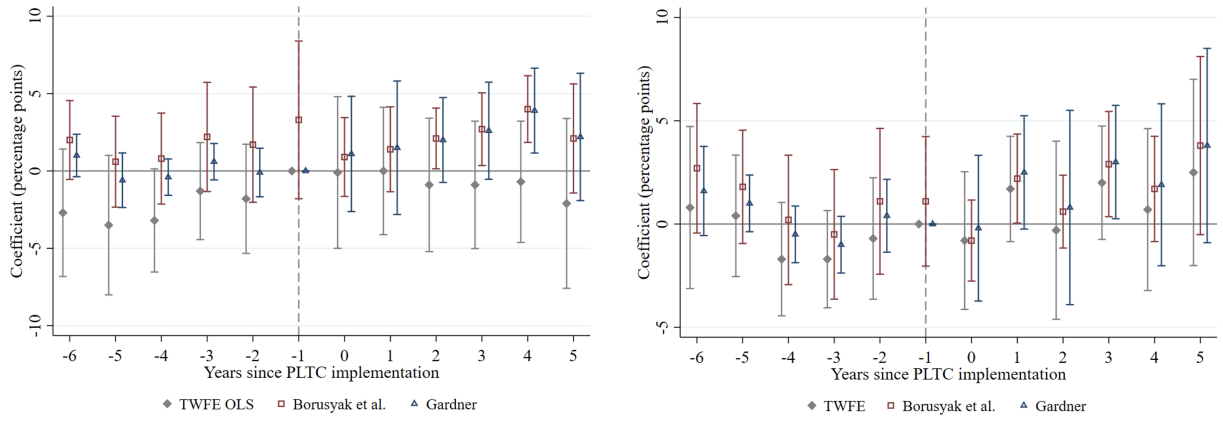
Table 3: DID Estimates of the PLTC Program's Effect on Labor Force Participation

	In the Labor Force			Work After 65		
	(1)	(2)	(3)	(4)	(5)	(6)
PLTC	0.007	0.023***	0.025**	0.019*	0.017*	0.023*
	(0.015)	(0.009)	(0.011)	(0.010)	(0.009)	(0.014)
Mean	0.658	0.658	0.658	0.304	0.304	0.304
Method	TWFE	BJS	Gardner	TWFE	BJS	Gardner
Controls	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
Observations	25,653	25,648	25,654	19,267	19,262	19,268

NOTES: This table presents the impact of the PLTC program on labor market outcomes among individuals aged 50-64. Columns (1) and (4) provide DID estimates using the TWFE method. Columns (2) and (5) display results employing the methodology proposed by Borusyak et al. (ming), and columns (3) and (6) report outcomes based on the approach developed by Gardner (2022). The analysis is restricted to survey data collected from 2000 to 2013, eliminating potential confounding effects associated with the Affordable Care Act (ACA) on the labor force. Moreover, our focus narrows to states that embarked on the PLTC program's expansion starting in 2006, thus excluding earlier adopters from the 1990s to maintain consistency and comparability across states. Controls include age, gender (male), marital status (unmarried), highest education level attained, religious affiliation, Hispanic ethnicity, U.S. nativity, self-reported health status, and Body Mass Index (BMI), aligning with variables utilized in Lin and Prince (2013) and Brown (2023). Additionally, as we account for year-month fixed effects (e.g., 2010m3), which offer more granularity than year-level state controls, we have opted not to include year-level state controls. The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

evaluated using three different estimation strategies. Excluding estimates derived from the TWFE model, which are likely affected by reduced precision, the point estimates from the other two robust estimation methods suggest an increase of 2.3-2.5 percentage points in current labor force participation and 1.7-2.3 percentage points in the probability of working past age 65. Given the baseline labor force participation rate of 65.8 percent

and the baseline intention to work post-65 of 30.4 percent, these increments constitute a relative increase of roughly 3.5 to 3.8 percent for labor force participation, and 5.6 to 7.6 percent for working beyond age 65. Compared to existing literature that identifies an 8 percent reduction in labor force participation due to the ACA's Medicaid expansion (Wood 2019), our findings suggest the PLTC program may mitigate some of the adverse effects on labor supply associated with the extension of public health insurance.



(a) In the Labor Force

(b) Work After 65

Figure 3: Event-Study Estimates of the PLTC Program's Effect on Labor Force Participation

NOTES: This figure displays the event-study plots developed using three different estimators: a dynamic version of the TWFE model, estimated using OLS (depicted in gray with diamond markers), Borusyak et al. (ming) (in maroon with square markers), and Gardner (2022) (in navy with triangle markers). The dependent variable in Figure 3(a) is the current labor force participation status of individuals aged 50-64. In Figure 3(b), it is the likelihood of these individuals working after age 65. In the analyses utilizing the TWFE model and Gardner (2022)'s approach, the year preceding the implementation of the PLTC is purposely excluded, and as a result, estimates are normalized to zero for that year. Conversely, the methodology from Borusyak et al. (ming) involves a three-step process, using non-treated observations to estimate potential outcomes for treated individuals as if they had remained untreated. Thus, this approach allows for the inclusion of data from the year preceding the policy's implementation without exclusion. The bars represent 95 percent confidence intervals. Standard errors are clustered at the state level. The detailed estimated coefficients are presented in Appendix A.2.

Figure 3 continues this examination by presenting the dynamic model's coefficients, which conform to the parallel trends assumption prior to the PLTC implementation and demonstrate an increase in labor participation from the second year onward. This trend aligns with the pattern observed in LTCI purchase behavior, underscoring the policy's

impact over time. Yet, the TWFE estimates, which are noted for their lack of precision as per Braghieri et al. (2022), exhibit a flattened post-implementation trend. This flattening could be attributed to the model's inability to capture increasing treatment effects dynamically. In light of this, our subsequent analysis will primarily employ the two most recent robust estimators, due to their superior accuracy and reliability.

5.2.3 Heterogeneous response across asset levels

Previous findings suggest that the introduction of the PLTC program leads to an increase in both LTCI purchases and labor supply among individuals aged 50-64. However, individuals may respond heterogeneously to the PLTC program depending on their incentives, as illustrated in our theoretical framework. In this section, we specifically investigate these behavioral responses by asset level.

As detailed in Section 2.2, the PLTC program increases the Medicaid asset limit for private LTCI policyholders. Therefore, we expect that the program's influence on LTCI adoption and labor force engagement will differ by individual asset levels. We hypothesize that individuals with considerable assets, who are intent on protecting their wealth and capable of affording LTCI premiums, are more likely to be influenced by the PLTC program to purchase LTCI. In contrast, those with fewer assets may be less motivated to buy LTCI, potentially leading to a pronounced divide in LTCI adoption rates across different asset groups.

Regarding labor force participation, as elaborated in Section 3, the impact of the PLTC program is theoretically uncertain and dependent on asset levels. For affluent individuals, the program could incentivize continued or increased labor activity as a strategy for asset accumulation and financial security. Yet, this same sense of financial comfort might lessen the imperative to remain employed. Conversely, for those with less wealth, the program might encourage additional labor to afford LTCI premiums and secure future care. However, the improved access to LTC through the program could also reduce the urgency to work, especially for those close to qualifying for Medicaid.

To explore these hypotheses, we employ an approach similar to that of Lin and Prince (2013) and Brown (2023), constructing three dummy variables to denote

individual asset levels. These variables are subsequently incorporated into our analytical model, interacting with the PLTC policy variable to assess its divergent impact. Specifically, we estimate the following specification:

$$Y_{ist} = \sum_{\alpha} [\gamma_{\alpha} \cdot \mathbb{1}_{\alpha_{it}} \cdot \text{PLTC}_{st} + \mu_{\alpha} \cdot \mathbb{1}_{\alpha_{it}}] + \beta \mathbf{X}_{ist} + \alpha_s + \tau_t + \varepsilon_{ist} \tag{3}$$

where $\alpha \in \{\text{Low}, \text{Middle}, \text{High}\}$ are three asset-level bins. Consistent with Lin and Prince (2013) and Brown (2023), we classify total assets into three categories based on their distribution among the population studied. Assets falling below the 50th percentile are deemed "low", indicating a lower financial capability and potential vulnerability to economic shifts. Assets situated between the 50th and 80th percentiles are labeled "middle", representing a moderate level of financial security and some disposable income. Those above the 80th percentile are categorized as "high", signifying substantial financial resources and greater economic resilience. Indicator variables for middle and high assets are also included to distinguish the distinct impacts associated with each asset level.[11]

Table 4 presents the heterogeneous impact of the PLTC program by asset level. Column (1) presents estimates on LTCI adoption rates, column (2) on current labor force participation, and column (3) explores plans for future employment. From our analysis, two significant insights emerge. First, the findings reveal that individuals with low assets do not experience a significant shift in LTCI coverage, suggesting minimal

[11]To more precisely evaluate the capacity to finance LTCI premiums, our analysis incorporates a robustness check focusing on liquid (non-housing) financial assets. For this check, individuals with "low" assets are identified as those valued below $150,000, reflecting a minimal financial buffer. "Middle" assets are those ranging from $150,000 to $500,000, indicating a moderate level of financial security suitable for covering unexpected expenses. "High" assets exceed $500,000, representing a substantial financial foundation likely to support a comfortable retirement and the ability to afford LTCI premiums without compromising other financial goals. These asset thresholds are grounded in retirement planning principles, specifically the 4% rule, which advises that retirees can sustainably withdraw up to 4% of their retirement savings annually without depleting their funds prematurely. For instance, a monthly withdrawal of $500 for LTCI premiums would necessitate retirement savings of at least $150,000, calculated as $\frac{500 \times 12}{0.04} = \$150,000$. To support annual withdrawals of $20,000, one would need savings of $500,000, based on $\frac{20,000}{0.04} = \$500,000$. Further information on these strategies and their implications can be found at Yahoo Finance and Approach Financial Planning. The outcomes of this asset-specific analysis are detailed in Table A.3, offering insights into how financial resource levels impact LTCI adoption and labor force participation within the context of the PLTC program.

Table 4: Heterogeneous DID Estimates of the PLTC Program's Effect by Asset Level

	LTCI Coverage (1)	In the Labor Force (2)	Work After 65 (3)
PLTC×Low Assets	0.009	0.022	-0.001
	(0.010)	(0.016)	(0.017)
PLTC×Middle Assets	0.017*	0.026**	0.051***
	(0.010)	(0.013)	(0.016)
PLTC×High Assets	0.031**	0.024	0.030**
	(0.016)	(0.016)	(0.015)
Controls	✓	✓	✓
Year-Month FE	✓	✓	✓
State FE	✓	✓	✓
Observations	25,239	25,654	19,268

NOTES: This table presents the heterogeneous impact of the PLTC program on LTCI coverage and labor force participation among individuals aged 50-64. As discussed previously (refer to Section 5.2.1 and Section 5.2.2), recently developed robust estimators have proven to be more reliable. Consequently, we present results using the methodology proposed by Gardner (2022). The approach developed by Borusyak et al. (ming), however, does not accommodate the analysis of three distinct levels of heterogeneity. In alignment with the classifications used by Lin and Prince (2013) and Brown (2023), assets are categorized according to their percentile in the total asset distribution: below the 50th percentile as "low", between the 50th and 80th percentiles as "middle", and above the 80th percentile as "high". Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI). Standard errors are clustered at the state level. The estimated coefficients that based on non-housing financial assets are presented in Appendix A.3.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

influence of the PLTC program on this group. Conversely, individuals within the middle asset category show a notable 1.7 percentage point increase in LTCI enrollment, a finding that achieves statistical significance at the 10% level. This impact is notably more pronounced among the highest asset group, which sees a 3.1 percentage point uptick in LTCI coverage. This estimates slightly exceeds the 2.5 percentage point increase observed among the 50-69 age group detailed by Lin and Prince (2013). We attribute this enhanced responsiveness in part to the potential misconceptions held by individuals over 65, who might incorrectly believe that Medicare covers LTC services (Brown et al. 2012). This misunderstanding could contribute to a dampening effect on the overall estimates, as it influences the behavior and decisions of older individuals regarding

LTCI coverage.

Moreover, an examination of labor market outcomes in columns (2) and (3) reveals that middle-asset individuals significantly adjust their labor force participation and future work plans, marking a 2.6 percentage point increase in labor force involvement and a 5.1 percentage point escalation in the likelihood of working past age 65. This pronounced activity may be attributed to the relatively younger demographic of our sample, which predominantly remains in the workforce. This demographic, possibly less committed to conservative spending, appears to be more receptive to the incentives provided by the PLTC program compared to the older cohorts analyzed in previous research. A comprehensive examination of the motivations underpinning the purchase of LTCI and the increase in labor force participation is elaborated upon in Section 5.3.

5.2.4 Other heterogeneous responses

Beyond the varying responses attributed to asset differences, other characteristics could also influence the likelihood of individuals considering their need for LTC services. We hypothesize that individuals who are more risk-averse, as well as those who are better informed about the benefits of LTCI and thus place a high value on it, are more likely to be responsive to the PLTC program. Consequently, our analysis further explores the program's impact across three specific dimensions: risk aversion, gender, and educational attainment.

Risk aversion is gauged using responses to the HRS "income gamble" questions, which assess individuals' willingness to take financial risks. Since these questions were last surveyed in 2006, we use individuals' most recent answers to categorize their level of risk aversion. We categorize individuals answering at the highest aversion level (level 6) as risk-averse, with all others deemed non-risk-averse. We posit that the most risk-averse individuals, according to this classification, would be more inclined to purchase LTCI.

Women, who are generally more risk-averse than men and tend to have longer lifespans, are expected to derive more benefits from the PLTC program, which aims to mitigate future financial risks. Moreover, individuals with better education, who

presumably have better access to information, may possess a more thorough understanding of the PLTC program's benefits, including its potential to reduce the financial burdens associated with LTC costs. Consequently, these individuals are expected to show a higher inclination towards participating in the PLTC program and may adjust their labor force participation accordingly.

Table 5 shows the PLTC program's varied effects across these characteristics. Risk-averse individuals show a higher increase in LTCI adoption rates compared to the non-risk-averse group, although this finding is limited by statistical power. Additionally, they experience a 3.6 percentage point increase in labor force participation, which is significant at the 10% level, as opposed to a non-significant 2.3 percentage point rise among their non-risk-averse counterparts. Similarly, women experience a significant 2.0 percentage point increase in LTCI adoption and a 3.7 percentage point rise in labor force participation, underscoring the program's pronounced impact on female participants. College-educated individuals also exhibit a more substantial response to the PLTC program, with increases of 2.2 percentage points in LTCI adoption and 2.6 percentage points in labor force participation. This supports the hypothesis that individuals with higher education, possessing greater access to information and resources, are able to understand and utilize the program's benefits more effectively.

These findings highlight the effectiveness of demystifying LTCI policies and targeting inherently risk-averse groups to elevate LTCI adoption rates. By enhancing the clarity and accessibility of policies, this approach supports the PLTC program's goal of diminishing long-term financial risks for individuals. Furthermore, it highlights the necessity of creating policies that are straightforward and user-friendly, ensuring that the most impacted demographics can easily navigate and benefit from the program.

5.3 Downstream Implications

Building on previous findings, the PLTC program has shown to positively influence LTCI adoption and labor force participation, particularly by providing asset protection for individuals with higher assets. This raises two critical questions: What drives people to respond to the PLTC program, and what are the unintended consequences the PLTC

Table 5: Heterogeneous Impacts of the PLTC Program by Other Dimensions

	LTCI Coverage			In the Labor Force		
	(1)	(2)	(3)	(4)	(5)	(6)
PLTC × Risk-Averse	0.021			0.036*		
	(0.016)			(0.022)		
PLTC × Non-Risk-Averse	0.017			0.023		
	(0.013)			(0.020)		
PLTC × Male		0.013			0.008	
		(0.009)			(0.011)	
PLTC × Female		0.020**			0.037***	
		(0.008)			(0.014)	
PLTC × College			0.022***			0.026**
			(0.008)			(0.011)
PLTC × Non-College			0.007			0.021
			(0.009)			(0.016)
Mean	0.109	0.109	0.109	0.694	0.694	0.694
Controls	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
Observations	19,192	25,239	25,239	19,482	25,654	25,654

NOTES: This table presents the heterogeneous impacts of the PLTC program on LTCI coverage and labor force participation, segmented by three distinct characteristics: risk aversion, gender, and educational attainment. "Risk-Averse" is measured through responses to the HRS "income gamble" questions, which evaluate an individual's propensity for financial risks. Those responding at the highest level of aversion (level 6) are classified as "Risk-averse", whereas all other responses are categorized as "Non-risk-averse". As discussed previously (refer to Section 5.2.1 and Section 5.2.2), recently developed robust estimators have proven to be more reliable. Consequently, we present results using the methodology proposed by Gardner (2022). The approach developed by Borusyak et al. (ming), however, does not accommodate the analysis of three distinct levels of heterogeneity. Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI). The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

program might have?

5.3.1 Changes in bequest intentions

Investigating the incentives for engagement, the appeal of the PLTC program may lie in its capacity to facilitate greater bequest intentions among policyholders. This hypothesis suggests that by safeguarding more assets against the costs of LTC, the program may enable individuals to leave more substantial bequests. To assess this possibility, we examine self-reported likelihoods of leaving bequests at various thresholds: the likelihood of leaving any bequest, a bequest exceeding $10,000, and a bequest surpassing $100,000. Table 6 reveals consistent bequest intentions among participants, showing no notable changes across different analytical methods. A detailed

Table 6: DID Estimators of the PLTC Program's Effect on Bequest Intentions

	Any Bequest			Bequest > 10K			Bequest > 100K		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PLTC	-0.0024	0.0024	-0.0005	-0.0017	0.0062	0.0039	-0.0087	-0.0057	-0.0085
	(0.0095)	(0.0082)	(0.0097)	(0.0064)	(0.0064)	(0.0077)	(0.0096)	(0.0088)	(0.0109)
Mean	0.917	0.917	0.917	0.923	0.923	0.923	0.774	0.774	0.774
Method	TWFE	BJS	Gardner	TWFE	BJS	Gardner	TWFE	BJS	Gardner
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	13,459	13,451	13,459	23,842	23,837	23,843	23,647	23,642	23,648

NOTES: This table presents the impact of the PLTC program on bequest intentions among individuals aged 50-64. The coefficient estimated is from DID regression equation (3). Columns (1), (4), and (7) provide DID estimates using the TWFE method. Columns (2), (5), and (8) display results employing the methodology proposed by Borusyak et al. (ming), and columns (3), (6), and (9) report outcomes based on the approach developed by Gardner (2022). The dependent variable is the self-reported probabilities of leaving a bequest in varying amounts: any bequest (columns 1-3), over $10,000 (columns 4-6), and over $100,000 (columns 7-9). Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI). The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

examination of the effects at different asset levels, as shown in Table A.4, further demonstrates that the PLTC program does not significantly alter bequest intentions. Intriguingly, our findings indicate a decrease in the intention to leave bequests over $100,000 among individuals with middle to high assets, pointing to alternative

motivations for program participation beyond the enhancement of bequest potential.

5.3.2 Expectation for the future

Another potential motivation for engaging with the PLTC program could stem from considerations of extended post-retirement planning. The program's asset protection feature may offer individuals an increased sense of financial security, thereby influencing their long-term planning strategies. Given the lack of impact on bequest intentions, it becomes imperative to explore how individuals might plan to utilize their assets differently. Table 7 shows a significant rise in individuals' self-reported expectations of living past age 80, with point estimates indicating an increase of 1.3-2.1 percentage points. This increase translates to a relative growth of about 2.7-4.3 percent from the

Table 7: DID Estimators: The Impact of the PLTC Program on Expectation

	Prob of Living to Age 80-100			Prob of Living to Age 75		
	(1)	(2)	(3)	(4)	(5)	(6)
PLTC	0.0208**	0.0132**	0.0180**	0.0145	0.0019	0.0065
	(0.0083)	(0.0065)	(0.0091)	(0.0103)	(0.0110)	(0.0136)
Mean	0.485	0.485	0.485	0.667	0.667	0.667
Method	TWFE	BJS	Gardner	TWFE	BJS	Gardner
Controls	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
Observations	23,357	23,353	23,359	23,549	23,545	23,551

NOTES: This table presents the effects of the PLTC program on expectations for the future for individuals aged 50-64. Columns (1) and (4) present DID estimates utilizing the TWFE method. Columns (2) and (5) reveal findings using the methodology proposed by Borusyak et al. (ming), while columns (3) and (6) delineate results following the approach by Gardner (2022). The dependent variables for columns (1)-(3) are the self-reported probabilities of living to age 80-100, while columns 4-6 examine the self-reported probabilities of reaching age 75. Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI). The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

mean baseline probability of 48.5 percent, as per different estimation techniques. This trend indicates a propensity among participants to preserve assets for their twilight

years. Conversely, perceptions regarding the probability of living to age 75 remain unchanged, possibly reflecting a widespread belief that reaching age 75 is expected, with current savings deemed adequate for needs until then. These findings underscore the complex interplay between the provision of asset protection measures like the PLTC program and the resultant behavioral and planning responses among individuals.

5.3.3 Health behaviors

In addition to exploring the PLTC program's direct incentives for participation, it is imperative to consider any unintended consequences it may engender. A critical concern

Table 8: The Impact of the PLTC Program on Health Behaviors

	Drinking			Smoking		Preventive	
	Ever Drinks	# Days/Week	# Drinks/Day	Ever Smokes	Smokes Now	Cholesterol Test	Flu Shot
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TWFE Model	0.0171	0.0426	0.0956**	0.0352**	0.0058	-0.0035	-0.0365*
	(0.0115)	(0.0564)	(0.0473)	(0.0174)	(0.0135)	(0.0101)	(0.0209)
Borusyak et al. (ming)	0.0236*	0.0567	0.1109***	0.0208	-0.0027	-0.0089	-0.0249
	(0.0135)	(0.0466)	(0.0343)	(0.0172)	(0.0188)	(0.0106)	(0.0215)
Gardner (2022)	0.0193	0.0326	0.1172***	0.0280	0.0007	-0.0066	-0.0320
	(0.0173)	(0.0594)	(0.0528)	(0.0224)	(0.0215)	(0.0122)	(0.0268)
Mean	0.607	1.239	0.905	0.567	0.183	0.804	0.517
Controls	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓	✓
Observations	25,733	25,706	25,689	25,580	25,643	16,507	16,568

NOTES: This table presents the impact of the PLTC program on health behaviors among individuals aged 50-64. Column (1) displays outcomes related to whether respondents have ever consumed alcohol. Column (2) presents data on the number of days per week the respondent consumes alcohol. Column (3) shows the average number of alcoholic drinks consumed by the respondent per day. Column (4) details whether respondents have ever smoked. Column (5) reports on current smoking status among respondents. Column (6) provides information on whether the respondent has undergone a blood test for cholesterol levels. Finally, column (7) reveals whether the respondent has received a flu vaccination. Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI). The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

regarding the PLTC program is the potential for a moral hazard problem, where the dual

protection offered might prompt participants to adopt riskier lifestyles. To investigate this possibility, our analysis encompasses both health-related (Table 8) and healthcare-seeking behaviors (Table 9). We examine risky behaviors including alcohol consumption (both frequency and quantity), smoking status, and preventive measures like cholesterol screenings and flu vaccinations. According to Table 8, there are negligible significant shifts in these behaviors, with the notable exception being a significant 12% rise in daily alcohol consumption (0.110/0.905), indicating the PLTC program's limited influence on the adoption of less healthy behaviors, apart from alcohol use.

Table 9: The Impact of the PLTC Program on Healthcare-seeking Behaviors

	Hospital Stay	Special Health Facility	Outpatient Surgery	Doctor Visit	Dental Visit	Regular Use of Drugs
	(1)	(2)	(3)	(4)	(5)	(6)
TWFE Model	0.0000	-0.0179	0.0139	-0.0029	-0.0094	0.0017
	(0.0083)	(0.0145)	(0.0145)	(0.0063)	(0.0119)	(0.0091)
Borusyak et al. (ming)	-0.0007	-0.0110	0.0138	-0.0081	-0.0009	-0.0023
	(0.0112)	(0.0136)	(0.0167)	(0.0069)	(0.0094)	(0.0100)
Gardner (2022)	-0.0019	-0.0161	0.0124	-0.0054	-0.0052	0.0000
	(0.0129)	(0.0154)	(0.0188)	(0.0084)	(0.0130)	(0.0127)
Mean	0.175	0.082	0.194	0.928	0.738	0.725
Controls	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
Observations	25,650	25,650	25,641	25,654	25,646	25,688

NOTES: This table presents the impact of the PLTC program on healthcare-seeking behaviors among individuals aged 50-64. Columns (1)-(6) assess various forms of medical care utilization, each represented as binary variables (0-1 dummies). The types of care analyzed encompass hospital stays, utilization of specialized health facilities, outpatient surgeries, as well as doctor and dental visits, and the consistent use of prescription medications. Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI). The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Furthermore, in evaluating healthcare-seeking behaviors, we consider different types

of medical care utilization, all measured as binary variables (0-1 dummies). These include hospital stays, visits to specialized health facilities, outpatient surgeries, doctor and dental appointments, and regular use of medications. The results, presented in Table 9, demonstrate no significant shifts in any of the healthcare-seeking behaviors examined. This outcome suggests that, within the observed period, the PLTC program has not significantly influenced moral hazard concerns related to increased healthcare consumption.

In summary, the section demonstrates potential downstream implications of the PLTC program beyond asset accumulation. Contrary to initial expectations, the program does not significantly influence bequest intentions. Instead, it shifts participants' expectations towards living beyond age 80, highlighting a shift towards prioritizing asset conservation for future life stages over leaving a legacy. Moreover, the anticipated risk of moral hazard, due to the program's comprehensive protection, is not supported by our findings, which show only minimal variations in health-related and healthcare-seeking behaviors, with the exception of a minor increase in alcohol consumption. These findings underscore the PLTC program's role in shaping not only financial security measures but also individual health perceptions and behaviors among near-elderly individuals.

5.4 Robustness Checks and Alternative Explanations

5.4.1 Placebo tests

We provide evidence that individuals purchase LTCI and participate in the labor market primarily for the asset protection benefits offered by the PLTC program. However, concerns arise regarding other concurrent changes unrelated to the PLTC, which may also influence LTCI adoption and labor force participation. To address these concerns, we conduct a series of placebo tests.

One potential confounder is the simultaneous change in health status. To examine this, we present DID estimates for both mental and physical health outcomes in Table 10. These outcomes include the presence of any mental health issues (any CESD problem) and any doctor-diagnosed health problems. The coefficients obtained are not statistically

significant and are notably small for physical health issues. This lack of significant correlation suggests that the decision to purchase LTCI is not driven by changes in health status, reinforcing our assertion that the primary motivation is the asset protection feature of the PLTC.

Table 10: DID Estimates of the PLTC Program's Effect on Health Outcomes

	Any CESD Problem			Any Diagnosed Conditions		
	(1)	(2)	(3)	(4)	(5)	(6)
PLTC	-0.0155	-0.0175	-0.0212	-0.0003	-0.0004	0.0009
	(0.010)	(0.011)	(0.014)	(0.011)	(0.009)	(0.013)
Mean	0.524	0.524	0.524	0.726	0.726	0.726
Method	TWFE	BJS	Gardner	TWFE	BJS	Gardner
Controls	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓
Observations	25,735	25,730	25,736	25,735	25,730	25,736

NOTES: This table presents the effects of the PLTC program on health outcomes for individuals aged 50-64. Columns (1) and (4) present DID estimates utilizing the TWFE method. Columns (2) and (5) reveal findings using the methodology proposed by Borusyak et al. (ming), while columns (3) and (6) delineate results following the approach by Gardner (2022). The dependent variable in columns (1)-(3) pertains to mental health, encompassing any CESD issues, which include feelings of depression, exertion in everything, restless sleep, happiness, loneliness, sadness, inertia, and enjoyment of life. Conversely, columns (4)-(6) focus on physical health, covering any diagnosed conditions such as high blood pressure, diabetes, cancer, lung disease, heart issues, stroke, psychiatric problems, and arthritis. Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI). The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Others may also express concerns that the changes observed in LTCI adoption could result from shifts in other types of health insurance. In particular, we examine employer-sponsored health insurance (ESHI) and life insurance, which are prevalent among individuals aged 50-64 (Fairlie et al. 2011; Brown 2023). For instance, a reduction in the availability of ESHI or life insurance could compel individuals to obtain private health insurance and possibly increase their work hours. If such changes in these insurance types were detected after the PLTC program's rollout, it might suggest that

other policies are driving the observed variations in LTCI adoption. However, as evidenced in Table 11, the DID estimates are minimal and not statistically significant, regardless of the estimation method employed. This indicates that the adoption rates of ESHI and life insurance remains largely unchanged before and after the PLTC program's implementation, suggesting stability in these insurance types over the observed period.

Table 11: DID Estimates of the PLTC Program's Impact on Alternative Insurance Types

	Self ESHI			Self/Spouse ESHI			Life Insurance		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PLTC	0.0041	-0.0018	0.0039	0.0054	0.0050	0.0059	-0.0191	-0.0113	-0.0151
	(0.0106)	(0.0090)	(0.0114)	(0.0123)	(0.0110)	(0.0138)	(0.0164)	(0.0217)	(0.0243)
Mean	0.533	0.533	0.533	0.758	0.758	0.758	0.761	0.761	0.761
Method	TWFE	BJS	Gardner	TWFE	BJS	Gardner	TWFE	BJS	Gardner
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	25,573	25,568	25,574	25,605	25,600	25,605	25,490	25,485	25,491

NOTES: This table presents a placebo test of the PLTC program, analyzing its impact on areas outside its direct scope, namely employer-sponsored health insurance and life insurance. The table is structured into three sets of columns: (1), (4), and (7) offer DID estimates utilizing the TWFE method; (2), (5), and (8) display results based on the methodology by Borusyak et al. (ming); and (3), (6), and (9) outline outcomes applying the approach by Gardner (2022). The dependent variables across the table's columns are categorized as follows: columns (1)-(3) examine coverage through individual employer-sponsored health insurance, columns (4)-(6) investigate whether respondents have health insurance coverage through their own or their spouse's employer, and columns (7)-(9) focus on coverage by life insurance. Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI). The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Lastly, concerns may arise regarding other macroeconomic factors, such as economic growth, which could increase individuals' likelihood of purchasing insurance and accessing employment opportunities. To address these concerns, our analysis extends to examining the response of untargeted groups to the PLTC program. Specifically, we investigated a younger cohort, aged 35-49, who are less likely to purchase LTCI, and a financially disadvantaged group with negative financial assets, who may face financial barriers to purchasing LTCI. As illustrated in Table 12, neither group exhibited a

significant reaction to the PLTC program in terms of LTCI purchase or increased labor market activity.

Table 12: DID Estimators: The Impact of the PLTC Program on Non-Targeted Populations

	Younger Group: 35-49						Poorer Group: Financial Assets < 0					
	LTC Insurance			In the Labor Force			LTC Insurance			In the Labor Force		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
PLTC	-0.030	-0.028	-0.020	-0.044	-0.028	-0.066	-0.005	-0.012	-0.011	0.016	0.023	0.023
	(0.032)	(0.024)	(0.033)	(0.042)	(0.023)	(0.041)	(0.011)	(0.014)	(0.015)	(0.020)	(0.016)	(0.023)
Mean	0.084	0.084	0.084	0.831	0.831	0.831	0.031	0.031	0.031	0.233	0.233	0.233
Method	TWFE	BJS	Gardner	TWFE	BJS	Gardner	TWFE	BJS	Gardner	TWFE	BJS	Gardner
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	1,653	1,646	1,656	1,688	1,646	1,690	13,486	13,488	13,488	13,655	13,657	13,657

NOTES: This table presents a placebo test for the PLTC program, focusing on different groups not targeted by the policy. Columns (1), (4), (7) and (10) present DID estimates utilizing the TWFE method. Columns (2), (5), (8) and (11) reveal findings using the methodology proposed by Borusyak et al. (ming), while columns (3), (6), (9) and (12) delineate results following the approach by Gardner (2022). Columns (1)-(6) reports on younger individuals aged 35-49 who possess non-negative financial assets. Columns (7)-(12) focuses on those aged 50-64 with negative financial assets. Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI). The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

5.4.2 Robustness checks

In our primary analysis, as detailed in Section 5.2, we focused on individuals aged 50-64. This demographic is typically less susceptible to Activities of Daily Living (ADL) impairments. Concerns might arise regarding the accuracy of our findings, especially with the inclusion of individuals already experiencing ADL impairments, as this condition could influence their likelihood of purchasing LTCI. To mitigate these concerns, we refined our analysis to focus solely on individuals without ADL impairments. This adjustment, elaborated in Table A.5, led to the exclusion of about 8% of our original sample. Following this refinement, we observe a more pronounced increase in LTCI uptake post-implementation of the PLTC program, with the rate of adoption rising from an initial range of 11.0%-15.6% to a refined range of 13.4%-17.9%.

In contrast, the variation in labor force participation exhibited a marginal adjustment, moving from an original span of 3.3%-3.6% to a slightly higher range of 3.4%-3.9%. These revised outcomes further affirm the reliability and significance of our primary findings.

Additionally, there might be concerns about unobserved individual characteristics potentially undermining the reliability of our results. To address this issue, we have adjusted our approach by substituting the state fixed effects in equation (1) with individual fixed effects, thereby controlling for these unobserved characteristics. The results of this modification are illustrated in Figure B.1. Substituting state fixed effects with individual fixed effects neither alters the validity of the parallel trends assumption nor impacts the observed dynamic effects of the PLTC program on LTCI adoption and labor force participation. This adjustment underscores the robustness of our findings against potential biases introduced by unobserved individual differences.

6 Conclusion

This study has investigated the multifaceted impacts of the PLTC program, revealing significant insights into the financial behaviors and motivations of near-elderly individuals facing LTC costs. Our analysis confirms that the PLTC program significantly boosts LTCI uptake and labor force participation, with the most notable effects observed among individuals with moderate to high asset levels. Specifically, we observed an increase in LTCI adoption by approximately 11.8 to 16.7 percent and a rise in labor force participation by 3.5 to 3.8 percent. These findings underscore the value of asset protection features in LTCI, which not only encourage ongoing economic engagement but also ensure financial security against future care costs.

Moreover, the varied responses across different asset levels illustrate that the PLTC program is particularly beneficial for those with substantial assets, who clearly perceive the advantage of safeguarding their financial future. Conversely, individuals with limited assets remain less influenced, likely due to the perceived unaffordability and the lack of immediate necessity for such insurance coverage. This highlights a critical gap in the

reach of the PLTC program, suggesting the need for policy adjustments to enhance the attractiveness and accessibility of LTCI among a broader demographic.

Additionally, our findings indicate that the decision-making processes regarding LTCI and labor force participation are primarily driven by the desire to secure financial stability for future years, rather than to preserve wealth for bequeathing. This suggests a shift in the traditional understanding of savings behavior among the near-elderly, emphasizing the necessity for policies that support both the immediate and long-term financial needs of this population.

In light of these insights, policymakers and financial planners are urged to consider strategies that could simplify the decision-making environment and make asset accumulation and protection more intuitive and beneficial. Enhancing the visibility and perceived benefits of the PLTC program could motivate more proactive engagement in financial planning, potentially easing the public burden on Medicaid and improving the overall economic well-being of the aging population.

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Appendices

A Tables

Table A.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 A.2: Event-Study Estimators

	LTC Insurance			In the Labor Force			Work After 65		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	TWFE	BJK	Gardner	TWFE	BJK	Gardner	TWFE	BJK	Gardner
Pre-PLTC:									
Year -6	-0.012	-0.004	-0.006	-0.027	0.020	0.010	0.008	0.027	0.016
	(0.017)	(0.011)	(0.007)	(0.021)	(0.013)	(0.007)	(0.020)	(0.016)	(0.011)
Year -5	-0.014	0.001	-0.005	-0.035	0.006	-0.006	0.004	0.018	0.010
	(0.014)	(0.011)	(0.005)	(0.023)	(0.015)	(0.009)	(0.015)	(0.014)	(0.007)
Year -4	0.000	0.013	0.004	-0.032	0.008	-0.004	-0.017	0.002	-0.005
	(0.014)	(0.012)	(0.006)	(0.017)	(0.015)	(0.006)	(0.014)	(0.016)	(0.007)
Year -3	-0.002	0.015	0.004	-0.013	0.022	0.006	-0.017	-0.005	-0.010
	(0.017)	(0.015)	(0.008)	(0.016)	(0.018)	(0.006)	(0.012)	(0.016)	(0.007)
Year -2	0.001	0.013	0.001	-0.018	0.017	-0.001	-0.007	0.011	0.004
	(0.012)	(0.013)	(0.006)	(0.018)	(0.019)	(0.008)	(0.015)	(0.018)	(0.009)
Year -1	0	0.020	0	0	0.033	0	0	0.011	0
	N/A	(0.014)	N/A	N/A	0.026	N/A	N/A	(0.016)	N/A
Post-PLTC:									
Year 0	-0.007	-0.008	-0.006	-0.001	0.009	0.011	-0.008	-0.008	-0.002
	(0.014)	(0.010)	(0.013)	(0.025)	(0.013)	(0.019)	(0.017)	(0.010)	(0.018)
Year 1	-0.005	0.002	0.003	-0.000	0.014	0.015	0.017	0.022	0.025
	(0.013)	(0.009)	(0.010)	(0.021)	(0.014)	(0.022)	(0.013)	(0.011)	(0.014)
Year 2	0.029	0.032	0.034	-0.009	0.021	0.020	-0.003	0.006	0.008
	(0.012)	(0.008)	(0.010)	(0.022)	(0.010)	(0.014)	(0.022)	(0.009)	(0.024)
Year 3	0.015	0.021	0.022	-0.009	0.027	0.026	0.020	0.029	0.030
	(0.016)	(0.010)	(0.014)	(0.021)	(0.012)	(0.016)	(0.014)	(0.013)	(0.014)
Year 4	0.033	0.023	0.023	-0.007	0.040	0.039	0.007	0.017	0.019
	(0.017)	(0.009)	(0.013)	(0.020)	(0.011)	(0.014)	(0.020)	(0.013)	(0.020)
Year 5	0.000	-0.009	-0.009	-0.021	0.021	0.022	0.025	0.038	0.038
	(0.021)	(0.012)	(0.014)	(0.028)	(0.018)	(0.021)	(0.023)	(0.022)	(0.024)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	25,238	25,233	25,239	25,653	25,648	25,654	19,267	19,262	19,268

NOTES: This table shows the event-study coefficients developed using three different estimators: the TWFE model, the model proposed by Borusyak et al. (ming), and the estimator developed by Gardner (2022). In the context of the TWFE model, the year preceding the implementation of the PLTC is purposely excluded, and as a result, estimates are normalized to zero for that year. Standard errors are clustered at state level.

Table A.3: Heterogeneous DID Estimates of the PLTC Program's Effect

	LTCI Coverage	In the Labor Force	Work After 65
	(1)	(2)	(3)
PLTC×Low Assets	0.010	0.019*	0.021
	(0.008)	(0.011)	(0.014)
PLTC×Middle Assets	0.040**	0.055***	0.044**
	(0.017)	(0.015)	(0.020)
PLTC×High Assets	0.064	0.038	0.002
	(0.041)	(0.037)	(0.028)
Controls	✓	✓	✓
Year-Month FE	✓	✓	✓
State FE	✓	✓	✓
Observations	25,239	25,654	19,268

NOTES: This table presents the heterogeneous impact of the PLTC program on LTCI coverage and labor force participation for individuals aged 50-64 using the robust estimator developed by Gardner (2022). The approach developed by Borusyak et al. (ming), however, does not accommodate the analysis of three distinct levels of heterogeneity. Here we use the liquid assets which facilitate the financing of LTCI premiums more easily to construct the three asset categories. We define low assets as individuals' non-housing financial assets valued below \$150,000. Medium assets are those valued between \$150,000 and \$500,000, while high assets are those exceeding \$500,000. These threshold values are informed by retirement planning advice, notably the application of the 4% rule. This rule suggests that retirees may safely withdraw up to 4% of their retirement savings annually. For instance, a monthly withdrawal of \$500 requires savings of \$150,000, calculated as $\frac{500\times12}{0.04} = \$150,000$. Similarly, to withdraw \$20,000 annually, an individual would need \$500,000 in savings, determined by $\frac{20,000}{0.04} = \$500,000$. Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI), aligning with variables utilized in Lin and Prince (2013) and Brown (2023). Additionally, as we account for year-month fixed effects (e.g., 2010m3), which offer more granularity than year-level state controls, we have opted not to include year-level state controls. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

Table A.4: Heterogeneous Estimates of the PLTC Program's Effect on Bequest Intentions

	Any Bequest	Bequest > 10K	Bequest > 100K
	(1)	(2)	(3)
PLTC×Low Assets	-0.006	0.010	0.017
	(0.016)	(0.012)	(0.016)
PLTC×Middle Assets	-0.004	-0.003	-0.027***
	(0.010)	(0.008)	(0.010)
PLTC×High Assets	-0.001	-0.009	-0.062***
	(0.010)	(0.007)	(0.008)
Controls	✓	✓	✓
Year-Month FE	✓	✓	✓
State FE	✓	✓	✓
Observations	13,459	23,843	23,648

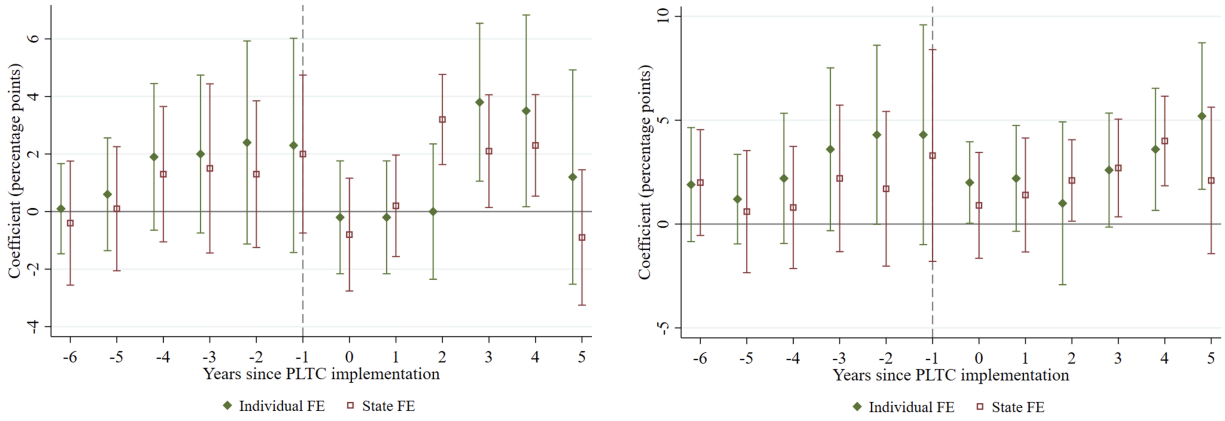
NOTES: This table presents the heterogeneous impact of the PLTC program on bequest intentions by asset level among HRS individuals aged 50-64 using the more robust TWFE estimator proposed by Gardner (2022). The approach developed by Borusyak et al. (ming), however, does not accommodate the analysis of three distinct levels of heterogeneity. In alignment with the classifications used by Lin and Prince (2013) and Brown (2023), assets are categorized according to their percentile in the total asset distribution: below the 50th percentile as "low", between the 50th and 80th percentiles as "middle", and above the 80th percentile as "high". Standard errors are clustered at the state level. Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI).
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Table A.5: Robustness Check: DID Estimators of the PLTC Program's Effect

	LTCI Coverage			In the Labor Force			Work After 65		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PLTC	0.019**	0.015**	0.020**	0.012	0.025***	0.028***	0.021**	0.018*	0.024*
	(0.008)	(0.007)	(0.008)	(0.013)	(0.009)	(0.011)	(0.010)	(0.010)	(0.015)
Mean	0.112	0.112	0.112	0.726	0.726	0.726	0.306	0.306	0.306
Method	TWFE	BJS	Gardner	TWFE	BJS	Gardner	TWFE	BJS	Gardner
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year-Month FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	23,143	23,142	23,144	23,543	23,542	23,544	17,929	17,928	17,930

NOTES: This table presents the impact of the PLTC program on LTCI coverage and labor market outcomes among individuals aged 50-64 without ADL impairments. Columns (1), (4), and (7) provide DID estimates using the TWFE method. Columns (2), (5), and (8) display results employing the methodology proposed by Borusyak et al. (ming), and columns (3), (6) and (9) report outcomes based on the approach developed by Gardner (2022). Controls include age, gender (male), marital status (married), education level completed, religious affiliation, an indicator for Hispanic ethnicity, an indicator for U.S. birthplace, self-reported health status, and body mass index (BMI). The mean values are calculated based on data prior to the PLTC program's inception in 2006. Standard errors are clustered at the state level.
*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

B Figures



(a) LTCI Adoption

(b) In the Labor Force

Figure B.1: Robustness Check: Event-Study Estimates of the PLTC Program's Effect

NOTES: This figure displays the event-study plots developed using the model developed by Borusyak et al. (ming), chosen for its robustness in handling evolving treatment effects over time. The methodology detailed by Gardner (2022) is omitted due to the computational complexities involved in estimating individual fixed effects coefficients. The methodology from Borusyak et al. (ming) involves a three-step process, using non-treated observations to estimate potential outcomes for treated individuals as if they had remained untreated. Thus, this approach allows for the inclusion of data from the year preceding the policy's implementation without exclusion. The bars represent 95 percent confidence intervals. Standard errors are clustered at the state level.