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Long Term Care Partnerships: Are they 'Fit for Purpose'?

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Abstract

The risk of high costs of long-term care services and supports (LTSS) is one of the largest uninsured risks for American families and a major challenge to the sustainability of Medicaid. To address the latter, the so-called long-term care partnership (LTCP) program was designed to encourage middle-class individuals to purchase private long-term care insurance. The goal was to defer the time when an individual would become eligible for Medicaid to pay her LTSS expenses. This paper exploits the exogenous variation in the timing of state Partnership implementation (including four pilot states) to evaluate the program's effects on new yearly insurance applications and contract uptake. We draw in unique data from the National Association of Insurance Commission (NAIC) and from four individual state Partnership programs, which contains data on new insurance contracts. Results indicate no significant effect of LTCP on insurance uptake but we do find evidence of both a small increase in insurance applications and some substitution between traditional and partnership contracts.

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1. INTRODUCTION

Long-term care services and supports (LTSS) encompass a range of services to assist people with limited capacity for self-care due to physical or cognitive disability.[1] Expenditures for LTSS can be a significant financial burden to families, and they account for more than a third of Medicaid expenditures (Eiken *et al*. 2014). There is growing concern that as the baby-boomers age, many of them will not have sufficient incomes to pay for LTSS and will become eligible for Medicaid if they require costly formal LTSS. Barely 14 percent of Americans over the age of 50 annually purchase private insurance to protect against the costs of long-term care needs (Heath and Retirement Survey 2012).[2] Limited private insurance coupled with many people's failure to save enough to self-insure long-term care costs puts pressure on Medicaid to finance LTSS when people have exhausted their savings (Brown and Finkelstein, 2008). Hence, it appears that there is some space for policy interventions to stimulate insurance take-up.

Both the federal and state governments have developed strategies that attempt to shift long-term care costs away from Medicaid. These include *point of purchase* incentives, such as state and federal tax deductions, for purchasing long-term care insurance (LTCI). However, analyses of these strategies indicate limited returns of state tax deductions on the dollar (Goda 2011); the effect of the federal tax treatment of long-term care insurance

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[1] Most LTSS refers to personal assistance for activities of daily living (ADLs), and includes both medical and non-medical care (Centers for Medicare and Medicaid Services 2012).

[2] The costs of LTSS can be catastrophic for the 5% incurring amounting to 260,000 US$. In 2011, the average annual cost for nursing home care was over $78,000, while assisted living communities cost an average of almost $42,000, 18,000-day care and 30,000 home help (O'Shaughnessy 2012).

premiums is explored in Courtemanche and He (2009).[3] An alternative strategy for increasing LTCI purchases has been incentives targeting *the point of use*. The latter includes strategies that aim to reduce the coverage costs and avoid an inefficient spend down of savings to qualify for Medicaid. One such approach has been the Robert Wood Johnson Foundation Long-Term Care Partnership Program (LTCP) initiative. This strategy allows people to sequester a portion of their assets – equivalent to the value of a special LTCI policy – from Medicaid requirements that they spend all of their assets (other than their home or car) before becoming eligible for Medicaid coverage. It was originally implemented in four states[4] (with heterogeneous designs) but starting in 2005 it was extended to most US states after a decade moratorium (see Appendix D for dates of inception). In this paper we exploit primarily the LTCP extension. More specifically, after 2005, 36 additional states created LTCP programs, which have been more homogenous, and hence the short-term effects of LTCP can be more clearly identified. In addition to spreading the financial risk of LTSS needs and reducing Medicaid costs (of individuals who spend down to qualify for Medicaid eligibility), the LTCP programs attempted to increase private LTCI coverage by linking the purchase of specific LTCI policies to special eligibility rules for accessing Medicaid benefits.[5] However, they did

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[3] The federal tax treatment of long-term care insurance premiums is that they may be counted as deductible medical expenses but medical expenses may only be deducted if they exceed 10 percent of a person's income (for people under age 65; for those 65 years of age and older, the threshold for deducting medical expenses is 7.5 percent of income through 2016).

[4] The LTCP programs were initially developed in four states (California, Connecticut, Indiana, and New York – with variations among the four) in the early 1990s, with grants from the Robert Wood Johnson Foundation (RWJF).

[5] There has been considerable literature – which we substantiate later in the text – devoted to the effect of Medicaid as an implicit tax on long-term care insurance. The Partnership program has been conceived as a potential solution that groups both public and private insurance entitlements, which could plausibly eliminate the so-called implicit tax on Medicaid

not address the issue of insurance underwriting, where individuals apply and are denied coverage despite being willing to pay the insurance premium.

To date, there have been limited evaluations of the LTCP that draw upon econometric techniques. Lin and Prince (2013), using the Health and Retirement Survey (HRS), examines the effects of a state adopting a LTCP, and find only modest effects on total LTCI uptake. Greenhalgh-Stanley (2014) draws upon data from the HRS and finds similar results except when the effect among highly risk-averse and forward-looking individuals is evaluated, and then an increasing effect on LTC insurance purchase is found. However, the empirical identification of both studies is limited by the biannual data of the HRS, which bundles together the introduction of LTCP in different states. The HRS only surveys 36 states and ideally, one would expect to have data for all years and observations for every U.S. state. Furthermore, the HRS only identifies individual insurance subscription at the time of the interview but not yearly new contracts, which requires supply side data.[6] Similarly, Lin and Prince (2013) do not take account of the heterogeneous partnership penetration among partnership states. Importantly, one would expect differences between those states that adopted the program in the 1990's (RWJF states) and the states that did so after 2005. Finally, the HRS does not include data on applications for LTCI and does not have information on contract details, which remain in the error term. In contrast, our study accounts for purchases, and allows us to distinguish Partnership and non-Partnership contracts in the early adopting states.

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[6] As we show below, there is wide variability in the uptake of LTCP over time, and some states show a poor uptake, which makes the assumption of all states adopting a LTCP scheme quite heroic.

In this paper, we primarily draw upon data from the National Association of Insurance Commissioners (NAIC) on new LTCI purchases (traditional and Partnership) by US state (weighted by the population over age 65 to make the data comparable). We then estimate a difference-in-differences (DD) model where we measure the effect of the LTCP on the overall uptake of private LTCI contracts as well as LTCP contracts and applications for a subsample of states. We further adopt a flexible strategy using a triple interaction model so we can separate the pre-existing trends in the market for LTCI from the LTCP effect. In addition, we employ different subsamples and specification to provide us with a placebo and robustness checks. Our findings broadly indicate modest to no evidence of any robust effect of the LTCP on LTCI uptake overall. We find that there was an expansion of total LTCI contracts only in the year when a state implemented a LTCP program, which indicates some level of substitution between traditional and partnership contracts. Finally, there is some evidence of an effect on applications, which is consistent with the presence of insurance underwriting.

The plan of the paper is as follows. In the next section, we describe the market for long-term care insurance and the Partnership program. In section three, we discuss the data and our econometric strategy for analyzing the data. We then report our results and different robustness and other checks in section four, and conclude with a discussion of the results' policy implications in the final section.

2. BACKGROUND

2.1 The Market for Long-Term Care Insurance

Private LTCI was first offered in the United States in 1974 but it was not until the late 1980s that the National Association of Insurance Commissioners (NAIC) issued a model act for LTCI establishing minimum standards and practices for companies selling LTCI as well as regulations for state insurance commissioners (Society of Actuaries 2014). Since then, demand for LTCI has remained anemic despite the consumer safeguards embodied in the NAIC's initial and subsequent adoption of standards for LTCI (Somers and Merrill 1991). Given the small number of Americans over age 50 who hold policies, the LTCI market is only a fraction of its potential size (Stoltzfus and Feng 2011; AHIP 2012).[7] Finkelstein and McGarry (2006) find a lack of accurate perceptions regarding the risk of needing long-term care. In an effort to combat myopic decision-making and lack of consumer knowledge, a goal of the LTCP program is to educate consumers about potential long-term care needs and planning. Additional reasons for market underdevelopment include insurance underwriting and administrative costs (Norton 2000).

With the theoretical and empirical evidence indicating that price and affordability are strong factors in individuals' decision to purchase long-term care insurance, one

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[7] Norton (2000) provides summary explanations for a limited market for LTCI, including adverse selection, moral hazard, Medicaid crowd out, high administrative costs, and the long period between purchase and pay out. Below, we briefly review some additional demand side factors and the role of price elasticity of demand.

would expect high estimates of price elasticity of demand for LTCI. Premiums for LTCI are viewed as relatively unaffordable (Robert Wood Johnson Foundation 2014). Contributing to suggestions that LTCI is not for everyone, the NAIC discourages consumers from buying a policy if premiums account for more than 7 percent of their income or if they have less than $100,000 in assets (excluding the value of a home) (Society of Actuaries 2014).[8] Moreover, many people believe that Medicaid is available to cover LTSS costs (creating what is known as Medicaid crowd-out), and that Medicare covers more of the costs of LTSS than it actually does. Further, because a number of large LTCI insurers stopped selling policies after 2008, there are well-founded concerns that LTCI companies may not exist by the time an individual might need to use a policy.

2.2 The Partnership for Long-Term Care

The Partnership program promotes the purchase of private long-term care insurance by offering policyholders access to Medicaid under special eligibility rules regarding asset levels (Meiners et al. 2002; Bergquist et al. 2015). Cost-effectiveness is a key rationale behind the Partnership program. Proponents of the program believe it can reduce Medicaid spending in the future by creating an incentive for individuals to assume responsibility through LTCI for at least the initial phase of their need for LTSS (Rothstein 2007). It is the inter-twining of private insurance with a public program that makes it a public-private partnership program. The goal is to attract individuals who might not otherwise purchase private LTCI, so that if they need formal LTSS the insurance will pay at least their initial LTC costs and thereby reduce the amount

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[8] In the years our data cover (the early 2000's), the NAIC discouraged people from purchasing LTCI if the value of their assets was less than $35,000 (Kaiser 2006; Feder et al. 2007).

Medicaid otherwise would have spent for their LTSS (Stone-Axelrad 2005; Meiners 2009).

The LTCP is a strategy to promote private LTCI purchases and reduce Medicaid expenditures in the future. But for this to occur, LTCP needs to alter historical trends in purchases of LTCI and attract middle-class individuals who otherwise might not believe they can afford LTCI. Further, if people who already are purchasing traditional LTCI choose to shift to the Partnership policies, contract substitution will occur and one would expect Medicaid expenditures not to decline. Thus, the overall effect of the LTCP is ambiguous. Although the Partnership plans were intended to appeal to middle-income individuals, there are no income restrictions or eligibility criteria regarding who may purchase a LTCP policy. In addition, they did not address the traditional problems of LTCI (Norton 2000; Barr 2010); specifically, uncertainty about future costs of LTSS, large administrative costs, insurance lapses due to premium increases over time, and the existence of insurance underwriting.

The RWJF initiated its Partnership program demonstration in 1987 and, as noted, the initiative led to four states implementing Partnership programs: California (1994), Connecticut (1992), Indiana (1993), and New York (1993) (Alper 2006). These state programs are referred to as the RWJF Partnership programs. Table A1 in the Appendix provides an overview of the different LTCP policy models that were developed in the RWJF programs and then evolved during their first dozen years of operation.[9]

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[9] Table B in the Appendix provides a summary of results from earlier studies of the RWJF programs.

The *dollar-for-dollar* model originated in California, Connecticut, and Indiana, and was adopted by New York in 2006 (Meiners et al. 2002; NYSPLTC 2011).[10] The dollar-for-dollar approach enables people to buy a policy that offers a specified dollar amount of services and protects that same amount of assets from eligibility determination for Medicaid coverage of LTSS. Insurance payments for long-term care are considered the equivalent of spending or divesting assets to establish Medicaid eligibility.[11] The dollar-for-dollar model is meant to be attractive to people with modest incomes because the limited coverage of the policy might be viewed as unaffordable without the asset protection. People with modest resources may also find dollar-for-dollar plans appealing because they are more likely to over-insure their assets (saving Medicaid money) than people with greater resources (who are more likely to over-insure risk but under-insure assets) (Meiners 2009). Participants must have LTSS expenses that reach their chosen policy maximum benefit before they can qualify for Medicaid, so holding a Partnership policy generally entails a limited amount of self-insurance and out-of-pocket spending (Meiners 2009). Policyholders who die before or while receiving policy benefits represent potential savings to Medicaid.

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[10] New York initiated the "total asset protection" policy model in its LTCP, and Indiana added it as an option in 1998 (ILTCIP 2011). The New York policies are required to pay for three years of nursing home care or six years of home care, or some combination of the two. A policyholder who exhausts these benefits does not have to spend any remaining assets before being eligible for Medicaid to pay for LTSS; such assets are protected under the terms of the *total asset protection model*. Thus, it provides a strong incentive to purchase long-term care insurance. The program is targeted more to middle and upper-income people as an alternative to transferring assets to become Medicaid eligible (Meiners et al. 2002; Rothstein 2007).

[11] Indiana added a total asset protection option to the dollar-for-dollar model in 1998; it operates such that up to a threshold amount of coverage (the dollar equivalent of the cost of four years in an average Indiana nursing home), the policyholder is eligible for dollar-for-dollar asset protection when determining eligibility for Medicaid benefits. But a person also can purchase a partnership LTCI policy that provides protection for costs above the dollar-for-dollar threshold. Anyone who does that receives total asset protection along with Medicaid benefits when they exhaust their policy benefits (Meiners et al. 2002).

Shortly after the four RWJF states established their Partnership programs, Congress passed a law effectively prohibiting other states from creating their own Partnership programs. It was concerned that the LTCP would not save Medicaid money. However, by the early 2000's, it was clear that federal and state Medicaid costs were rising due to LTSS expenditures. Congress passed the 2005 Deficit Reduction Act, which included a provision permitting all states to implement Partnership programs (this provision remains in effect today). As of November 2013, 36 states had implemented Partnership programs (Truven Health Analytics 2013). All new programs are required to use the dollar-for-dollar model.

Timing remains an issue for any evaluation of the Partnership programs because there is generally a lag between policy purchase and benefit payout. This is more important regarding the cost-effectiveness and Medicaid budgetary impact than it is for determining the programs' effects on LTCI market size (Meiners et al. 2002; Meiners 2009; Ahlstrom et al. 2004). Assessments of the Partnership programs' budgetary impact have different conclusions. The Department of Health and Human Services (HHS) assumed that the program is at least budget neutral, with opportunities for savings because it provides an alternative to transferring assets and because income from protected assets can be applied to the cost of care (Meiners 2009). A Government Accountability Office (GAO 2007) study found that Medicaid savings were not likely but that costs to Medicaid would be minimal because it assumed that many participants would still be too wealthy to qualify for Medicaid. The GAO study also assumed that policyholders do not over-insure their assets, which are a major source of potential

savings, and it assumed that people do not often transfer their assets to qualify for Medicaid (GAO 2007; Meiners 2009).

3. DATA AND EMPRIRICAL STRATEGY

3.1 Data

Our analysis of the Partnership programs' effects differs from earlier assessments because we take advantage of a dataset containing comprehensive data available on LTCI policies. It was constructed for the purpose of examining total and Partnership sales of private LTCI policies by state, and covers the time period 2000 to 2008. The data include information (for each state) on all newly purchased LTCI contracts each year, average premiums, GDP per capita, Medicaid expenditure per capita, population information by age and sex, as well as all newly purchased Partnership contracts and applications for the RWJF states and various summary statistics and demographic information. Appendix C contains a full list of details on the dataset and variable construction. Table 1 provides a description of the key variables used, with the total number of LTCI contracts (traditional and Partnership) per one million people age 65 and older in logs, and Partnership contracts and applications per one million people age 65 and older in logs. The number of contracts by population over age 65 is weighted simply to make the data comparable across states.[12] We distinguish four groups of states and time in Table 1: the four states that introduced LTCP initially (RWJF states) and the other states (non-RWJF states) for time periods 2000-2004 (before the option of implementing a LTCP was extended to all

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[12] However, trends are comparable when the number of contracts was not weighted.

states) and 2005-2008 (see Appendix D for dates of inception). Overall, the estimates on the number of contracts for different sub-periods indicate no significant differences in the uptake of contracts.

Note that our main focus of analysis is the total number of LTCI contracts in a given state. We focus on the total number of contracts because the potential exists for some substitution between traditional and Partnership contracts, which would not be captured by examining only Partnership contracts. However, we do provide a separate examination of traditional and Partnership policies in just the RWJF states as the data were available to us. Thus, note also that we examine "satisfied demand" but not unmet demand for both types of LTCI policies; our analysis does not include potentially wider demand of those who were underwritten by insurance companies or insurance agents and denied policies or quoted very high premiums due to the underwriting.[13] However, we include the number of applications for the Partnership programs in the RWJF states to be able to disentangle some evidence of the effect of individuals underwritten by insurance companies. We also have data on total Medicaid expenditures and the number of claims for LTSS.[14]

[Insert Table 1, Figure 1, 2, 3 around here]

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[13] Although it is common practice to equate demand and insurance uptake (e.g., Sloan and Norton (1997)), the latter might not necessarily apply.

[14] We are able to observe the number of policies purchased, the number of Partnership applications and the number of Partnership applications denied in each RWJF state.

Figure 1 contains the numbers of Partnership policies purchased and applications per one million people over the age of 65 in the each of the RWJF states. The number of Partnership policies purchased follows declining trend in 2005, which then picks up to the initial trend suggesting a potential knock on effect from other states. Figure 2 shows the total number of insured lives (combining traditional and Partnership contracts) for both Partnership and non-Partnership states, which suggest a very similar trend. [15] Importantly, we find comparable trends throughout the period consistent with the descriptive data analysis. So we can conclude that there are no clear differences in trends of purchases of LTCI in our data. [16]

Our identification strategy relies on a difference-in-differences approach where we define an intervention variable for the states that were able to implement a LTCP program after 2005 to capture the causal effects of the program (excluding the four RWJF states). Second, we measure the "exposure" to LTCP for the RWJF states that implemented the program before 2000 to examine potential long-term trends in the program. [17] We analyze data from 2000, taking advantage of the progressive implementation of the LTCP models over time. Because there are no publicly available individual level datasets that allow us to identify whether an individual purchased a Partnership policy, we have relied on aggregate data on the number of LTCI contracts per state (both traditional and

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[15] There are no yearly data for Connecticut in 2000. The total sales in 2007 in New York are an estimation based on Q1 and Q2 figures.

[16] In Figure D1 in the Appendix when we compare Medicaid expenditures for people age 65 and older receiving LTSS across states with and without Partnership programs, we find that Partnership states follow similar trends but exhibit higher expenditure patterns than non-Partnership states. Finally, Figure D2 shows the growth (between 2000 and 2008) in average total Medicaid claims paid for people age 65 and older for states with and without Partnership programs

[17] In some robustness checks we run the analysis for the subsample excluding New York, which is the only state that does not follow a 'dollar-for-dollar' model.

Partnership), along with data on Medicaid expenditures and claims for the study period. Our study complements earlier evidence by examining the long-term effect of the four original Partnership states (RWJ states) and the immediate short-term effects of the Partnership programs implemented after 2005. Specifically, we address the question of whether the progressively evolving market for private LTCI, which followed a pre-LTCP trend, might have been modified by the growth in the number of Partnership programs.

Our dataset includes a number of different control variables. In particular, we consider the size of the market and how concentrated it is by including the total number of LTCI policies purchased, the number of companies earning premiums, the state income per capita, average LTCI premium (note we cannot distinguish the traditional and Partnership policy premiums), and total state population. Figure 3 plots the evolution of average premiums for states that implemented LTCP and non-LTCP programs. Importantly, trends are comparable across the two types of states and indicate that only after 2005 the premiums for partnership contracts seem to have increase, which can suggest the existence of differences in coverage after 2005.

3.2 Empirical Strategy

Early studies of the LTCP programs focused primarily on their sales relative to potential buyers and the programs' budgetary impact on Medicaid (Meiners et al. 2002). As noted, two previous studies employ the HRS data but the authors assume that expansions in insurance uptake are attributed to the Partnership programs (Lin and Prince 2013; Greenhalgh-Stanley (2014)), which does not appear to have played out after

implementation (see Appendix B). Moreover, it is not possible with the HRS to differentiate Partnership and non-Partnership polices. We are similarly limited in our ability to distinguish between traditional and Partnership policies, but for the original RWJF states we can differentiate the two types of contracts and examine Partnership applications during the study period.

To our knowledge there are no studies that perform a subsample econometric analysis of the LTCP specifically. Importantly, as Figure 2 shows, the Partnership LTCI contract development was similar to that of private LTCI: sluggish market penetration, with substantial declines in sales in both 2004 and 2007.[18] The latter confirms the hypothesis that LTCP exhibit comparable market penetration barriers as traditional contracts.

One of the difficulties in examining effects of programs such as LTCP using a difference –in-differences methodology is that one needs to separate pre-existing trends from the dynamic effects of a policy change. The LTCP might be subject to state specific effects, which could be captured easily, but the development of the policy itself might give rise to a shift in the pre-policy trend. To address this concern, we control for time specific effects (triple interaction effects) in purchases of total LTCI policies and Partnership policies, Medicaid expenditures and claims for LTSS. We supplement our analyses with descriptions of characteristics of Partnership versus non-Partnership states.

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[18] There were several contributing factors to the large decline in 2004, including general consumer perception of rate increases, rate stability regulation, and the exit of insurers CNA and AEGON from the industry, which is likely responsible for much of the decrease (Society of Actuaries 2005). The lower sales in 2007 and 2008 also may be attributed to rising premiums and more insurers exiting the market.

Specifically, our empirical strategy uses a quasi-treatment effect approach where we define an intervention variable for the states that were able to implement a LTCP program – either binary or continuous when referring to market shares – and has a value of zero in non-Partnership states.[19] All specifications have been estimated using STATA 14:

The specification that we primarily utilize is the following:

$$Y_{it} = \alpha + \delta LTCP_{it} + \gamma LTCP_{it} * POST + \beta X_{it} + \zeta \varphi_t + \epsilon_{it} \qquad (1)$$

where (as in Table 1) Y_{it} can either refer to the log of total (including Partnership) LTCI policy sales per one million people age 65 or older, or to the log of total Partnership applications (including policies) per one million people age 65 or older (in RWJF states only). We define a variable 'LTCP' which is state and time specific to identify the states i (those implementing LTCP programs) in a given point in time t, and another variable 'POST' to refer to the period post treatment (see Appendix D for date of inception) so that the coefficient of the interaction between the treatment and the post treatment period (γ) refers to the difference-in-differences effect of being a Partnership state on the dependent variable of interest. The vector X_{it} refers to a set of potential characteristics where treatment and control states can differ (and are likely to influence the uptake of insurance). Specifically, we identify total and age specific population groups, as well as state per capita income (GDP); the number of insurance companies operating in each

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[19] Table D2 in the Appendix reports the regression results assuming a standard difference-in-differences model without a trend interaction.

state, the size of the insurance market (NLTCI65), which can influence the number of policies purchased in each state. Given that the coefficient is likely to overestimate the effect in the presence of strong pre-trends, we include a variable time trend to capture such an effect and we specify a flexible structure of time specific effects, and a linear trend (φ_t).

We have estimated several different specifications with and without state fixed effects. Specifically, in fixed effect specifications, $\varepsilon_{it} = \sigma_i + \eta_{it}$ where σ_i reflects systematic variations by state that are constant over time. For instance, it accounts for those unobserved effects that are state specific – e.g., state specific insurance preferences or nursing home regulations. In alternate specifications the error term refers to an idiosyncratic effect η_{it}.

In addition, given that the effect of LTCP might be heterogeneous over time, some specifications allow for a flexible interaction between time specific effects and Partnership policies (LTCP). Finally, we conduct some important robustness checks, a placebo test (by estimating the effect for a period before LTCP were implemented in non-RWJ states) and we have experimented with varying the time trends. The parameter of interest is the value of γ, which captures the difference-in-differences (DD) estimator of the introduction of LTCP on the different dependent variables of interest.

All specifications provide robust standard errors when non-clustered. The baseline specifications are estimated by OLS. However, the number of observations (N) might not

be large enough relative to the number of time periods to permit the first order asymptotic approximation to be sufficiently precise to provide an accurate inference. If this is the case, we should not observe significant differences between least squares (OLS) and generalized least squares (GLS) coefficients. Given that the observations are not independent due to the correlation of insurance contracts within states, we chose to use both approaches to account for potential different distributional assumptions.

Including the set of control variables (X_{it}) is important because each relates to potential explanations for differences in the expansion of the number of contracts. Each of these variables is combined with state-specific effects. To take advantage of the panel nature of the data, we clustered by state and estimate a random effects specification. The motivation for this approach is to control for unobserved state-specific effects that are constant over time. Empirically, the null hypothesis of the Hausman test is generally rejected ($\chi^2 = 21.60$), which confirms the use of fixed effects rather than random effects estimation. We estimate a series of regressions with overall sales per person 65 and older as the dependent variable, and then a series with total Partnership sales and applications for Partnership policies as the dependent variable.

Given that LTCP programs were originally introduced in only four states before 1994, we also conducted a specific analysis of those four states when we estimated our main model specification since we cannot observe the pre-post 2005 effects for those states.

Finally, our data contain information on the average insurance premium in each state in each point in time. Each state's average premium is included because demand for insurance policies is likely to be price sensitive, which has justified the introduction of tax breaks to incentive insurance uptake. Such information is treated as unobservable in studies using individual level data, whilst here it is modeled explicitly and we were able to compute elasticities. That said, a limitation in using this variable is its potential endogeneity, which we do not address here as it is not the purpose of the analysis. Figure 3 suggests that premiums seemed to increase more in Partnership states in the "post" period than in non-Partnership states. One plausible explanation is that Partnership asset-protection may elicit demand in the intensive margin. That is, although there is no expansion in the total number of LTCI contracts, people who purchase Partnership policies may be buying more generous coverage than they would buy with traditional policies. If this were the case, controlling for premium price would negatively bias the observed program effect toward zero. Hence, to capture the program effect one should not control for premium. However, we have provided a separate estimate of price elasticities to compare with that of previous studies as an additional robustness check, which is not included in the main set of results.

4. RESULTS

We begin our results discussion by reporting the baseline estimates of specification (1) allowing two different definitions of time trends. We first report the model using a flexible specification with time specific effects (which we draw upon below) and then with a linear time trend. Table 2 shows the effect of a Partnership program state on the total number of LTCI policies purchased in a given state. We are interested in the evolution of the coefficient LTCP after the implementation of the Partnership program, controlling for time specific effects and a number of controls. Table 2 reports evidence of a significant DD coefficient, suggesting that when a specification without controls is estimated the effect is actually negative, and suggesting a negligible reduction of 0.15 in the number of contracts relative to the elderly population (in millions) in a given state. However, this effect disappears once we control for competition. That is, the inclusion of the number of companies renders the DD coefficient insignificant. Importantly, we find no difference in the effect when the trend is linear or non-linear. However, given the clear non-linearities in year specific effects, the non-linear trend specification cannot be ruled out.

[Insert Table 2 about here]

Table 3 displays the effect of the state exposure to the Partnership programs on total LTCI uptake using a flexible time specific triple interaction format (for non-RWJF states). Indeed, the DD now includes time specific effects for the period after the

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introduction of LTCP. Table 3 contains estimates of the DD for non-RWJF states

considering the effects for the different post treatment years for both OLS and fixed

effects estimates for our preferred baseline specification. They all indicate that although

there was a small increase in the number of contracts inn 2006, ranging from an increase

of 0.67- 0.39%, such an effect halved by the following year and turns out to be

insignificant in 2008 (the comparator year). These results are suggestive of some

individuals substituting from traditional LTCI policies to Partnership policies. The

statistical test of joint significance of the overall effect lead us to reject the hypothesis of

an overall significant effect, consistent with the results in Table 2. An alternate

interpretation is that troubling economic indicators in 2007 and the stock-market crash in

2008 might have exerted a negative effect on purchases in states that implemented LTCP

plans after 2006. We have controlled for state GDP, which should capture partially such

an effect, especially under the fixed effects specification.

[Insert Table 3 about here]

Next, Table 4 contains the results when the model is specified by sub-periods for non-

RWJF states. This is important, as it should provide a test for the validity of previous

results. Further, examining the effect of LTCP previous to 2004 for non–RWJF states

can serve as a placebo analysis of our results since it analyzes the LTCP states in a period

before the implementation of the program. Again we find no robust evidence of an effect

irrespective of the period examined. We also examine penetration of the Partnership

programs over time and the effect on sales and applications in the early adopting states,

and find a positive and significant increase (Appendix B). Hence, we conclude that the results appear to be robust to the inclusion of controls, and the different specifications and placebo tests.

[Insert Table 4 about here]

Finally, Table 5 includes results examining the increase in Partnership policy purchases and applications for the sample of states where we observe applications in addition to purchases. Our findings show that least squares estimate an approximate increase of a small magnitude, namely eight contract application per million elderly in a given state (which includes purchased contracts). The latter is suggestive of the presence of some degree of underwriting, but the effect disappears when we include state fixed effects. Such results are suggestive of the potential effect of some insurance underwriting for LTCP contracts that counteracted the potential increase in contract uptake.

[Insert Table 5 about here]

5. Discussion

Taking advantage of the fact that the introduction of Partnership programs in a given state was largely an exogenous (unexpected) event after 2005, and employing a DD empirical strategy that includes triple time interactions, we analyzed the impact of Partnership programs on LTCI uptake. We find that the LTCP had no significant effect on the total

number of LTCI contracts (both traditional and LTCP). Although the LTCP contract seemed to be appealing to new insurance subscribers, insurance underwriting appears to have limited the growth of the Partnership programs – just as it restricts sales of traditional LTCI. Finally, we find evidence of a potential one-off substitution effect of Partnership policies for traditional LTCI in the initial years of the states' program implementation. Importantly, the results remain once we control for a long list of potential explanations including state per capita income, premium trends, demographics, and the competitive insurance environment at the state level.

Limited growth of LTCI seems likely due to the poor targeting of the LTCP to middle-class individuals together with poor information and marketing campaigns about the programs, as well as underwriting issues (Alper 2006; Bergquist et al. 2015). It is also possible that consumers who can afford LTCI policies may be averse to the Medicaid element in the Partnership plans, and instead continued to purchase traditional plans. This also could partially explain why Partnership sales are not a higher percentage of overall LTCI sales, particularly in New York and California, which have been less proactive about consumer education (Connecticut Partnership for Long-Term Care, 2008). Welfare aversion also may motivate middle-income individuals to forego purchasing a Partnership policy in favor of limited self-insurance or to gamble on not needing long-term care. Given the basic difficulty and myopia surrounding long-term care planning, it is not surprising that some would be averse to the idea of planning on becoming a Medicaid participant. Further evidence of welfare aversion is limited, and Norton (1995) shows that

welfare aversion may increase savings in some instances as elderly individuals receive asset transfers to avoid Medicaid eligibility.

Using the model's parameter estimates, we implicitly determine price and income elasticities of aggregate LTCI purchase parameters, capturing time differences between states. These are informative but not as precise as individual level estimates of price and income elasticities.[20] The estimates indicate that aggregate demand for LTCI is relatively price inelastic but income elastic, and the estimates are close to previous elasticity studies (Courtemanche and He 2009). However, given that the insurance premium is potentially endogenous, such estimates should be interpreted with some caution. Nonetheless, the estimates are consistent with Brown and Finkelstein (2011), which also argue that increased tax incentives will be ineffective until certain Medicaid reforms take place. Ultimately, the Partnership program has no real control over the stability of the LTCI market or dynamic contracting issues with the LTCI market (Bergquist et al. 2015).

6. **Conclusion**

Drawing on a unique dataset from the National Association of Insurance Commissioners (NAIC) spanning the years 2000-2008, we examined whether the introduction of a Partnership program (LTCP) that was designed to expand take-up of LTCI policies attained its goal. This is important because insurance uptake would reduce the likelihood of Medicaid spend down among middle-class individuals. However, the LTCP also could

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[20] However, given that HRS data does not include data on insurance premiums to provide an estimate we did proceed to produce some estimates (Appendix E)

have induced a substitution of policies for traditional LTCI contracts, and the LTCP design did not address most of the LTCI market constraints such as underwriting, affordability, and myopia. Our findings indicate LTCP managed did not exert an influence on insurance uptake even though we find some moderate effects on insurance application in a subgroup of states. We interpret this result as suggesting a moderate effect of LTCP design on applications but no evidence that there is any effect on actual purchases, which did not manage to mitigate the practice of insurance underwriting. Finally, we find evidence that the availability of LTCP led to some moderate one-off contract substitution from traditional LTCI contracts to LTCP contracts.

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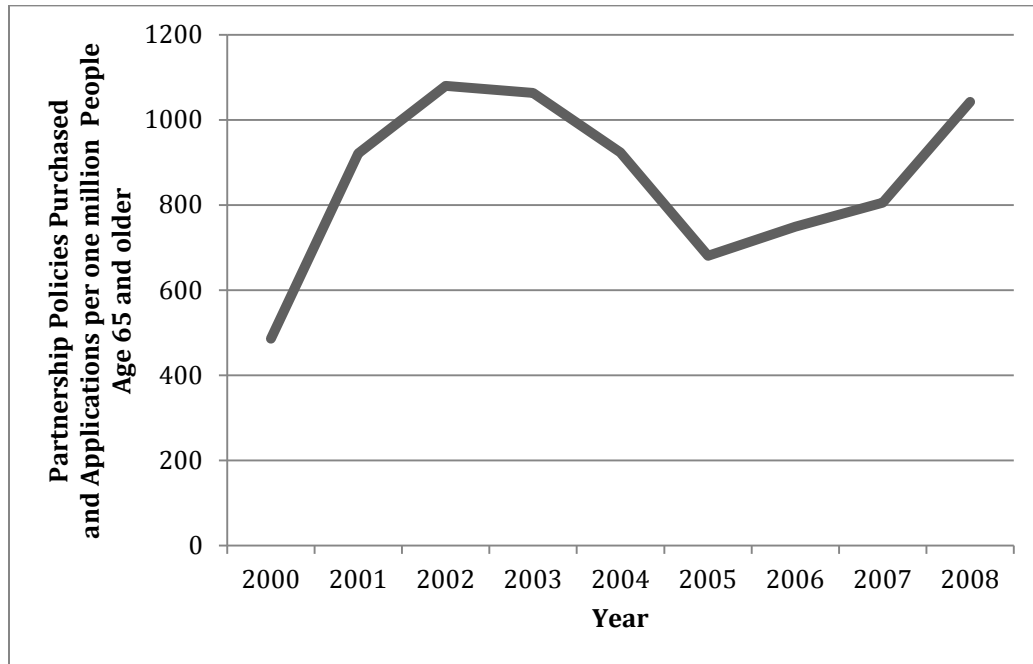
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Table 1: Descriptive Statistics and Variable List

Variable	Description	Type	RWJF States, 2000-2004: Mean (S.D)	Non-RWJF States, 2000-2004: Mean (SD)	RWJF States, 2005-2008: Mean (SD)	Non-RWJF States, 2005-2008: Mean (SD)	All States, 2000-2008
Dependent Variables							
NLTCI65$_{it}$	Number of insured lives per one million people age 65 and older	Continuous	14,404.29 (3,877.648)	16,191.03 (10,885.58)	14,996.56 (7,098.489)	17,181.28 (17,685.17)	16,477.13 (13,821.23)
LTCPA$_{it}$	Partnership policies and applications per one million people age 65 and older	Continuous	11,980.64 (7,247.839)	- -	8,858.554 (4,225.363)	- -	1,0603.25 (6,221.223)
Treatment Variables							
LTCP$_{it}$	Dummy variable; 1= Partnership state (RWJF or Expansion)	Binary	1 -	- -	1 -	0.489 -	0.529 -
Controls							
NCom$_{it}$	Number of companies earning premiums or paying out benefits	Continuous	43.15 (12.180)	40.264 (12.240)	48.063 (13.359)	50.277 (13.049)	44.763 (13.469)
GDP$_{it}$	Per capita real GDP (chained 2005 dollars)	Continuous	45,352.4 (6,420.186)	40,591.78 (15,219.1)	49,238.5 (7,503.883)	43,404.54 (17,133.43)	42,252.69 (15,679.13)
POP$_{it}$	Total population 65 and older (in thousands)	Continuous	1,850 (301)	600 (38)	1,935 (360)	636 (45)	716 (35)

Figure 1. Evolution of New Partnership Applications, 2000 - 2008

Source: California Long-Term Care Partnership Program, Connecticut Long-Term Care Partnership Program, Indiana Long-term Care Partnership Program, New York Long-Term Care Partnership Program, 2012

Figure 2. Evolution of the Total New Number of Contracts between partnership and non-partnership states (2000 – 2008)
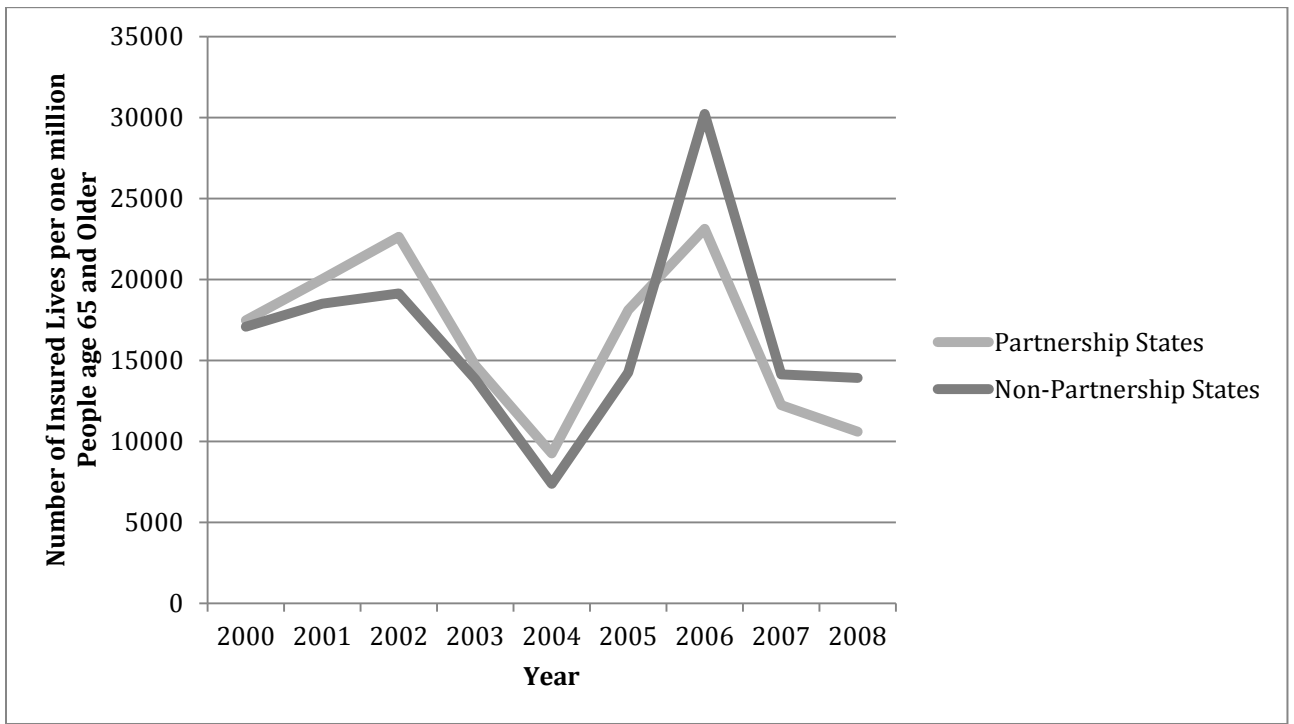
Source: National Association of Insurance Commissioners (NAIC), 2012

Table 3. Average Premium Comparison: Partnership vs. Non-Partnership States
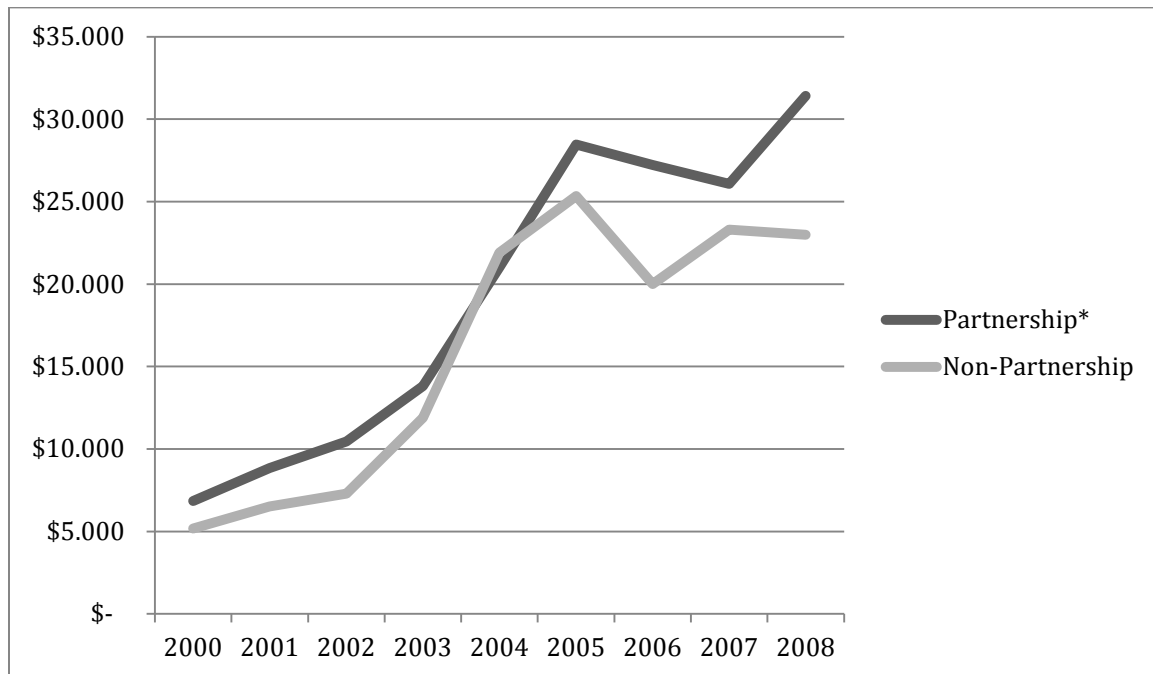
Note: *Classification based on Partnership program status in the current year for which average is computed.
Source: National Association of Insurance Commissioners (NAIC), 2012

Table 2: Total LTC Insurance Uptake per one million people age 65 and older (in logs) ($NLTCI65_{it}$) – Baseline specification

	(1) No controls	(2) Income	(3) Income and competition	(4) Time Trends
Panel A: OLS				
$NLTCI65_{it}$	9.529	9.529	9.592	9.529
	(0.563)	(0.563)	(0.576)	(0.563)
$LTCP_{it}$	0.129**	0.077*	0.071	0.167***
	(0.046)	(0.046)	(0.046)	(0.349)
$LTCP_{it}$ x $POST_{it}$	-0.152**	-0.147**	-0.085	-0.153**
	(0.058)	(0.058)	(0.089)	(0.066)
$YEAR_{2001}$	0.106	0.112	0.121	
	(0.091)	(0.089)	(0.096)	
$YEAR_{2002}$	0.165*	0.187*	0.201**	
	(0.095)	(0.094)	(0.101)	
$YEAR_{2003}$	-0.224**	-0.231**	-0.238**	
	(0.090)	(0.088)	(0.094)	
$YEAR_{2004}$	-0.765***	-0.806***	-0.832***	
	(0.091)	(0.087)	(0.092)	
$YEAR_{2005}$	-0.121	-0.166*	-.0181**	
	(0.090)	(0.085)	(0.091)	
$YEAR_{2006}$	0.251**	0.174*	0.169*	
	(0.095)	(0.094)	(0.101)	

	(1)	(2)	(3)	(4)
YEAR$_{2007}$	-0.366***	-0.459***	-0.470***	
	(0.088)	(0.088)	(0.096)	
YEAR$_{2008}$	-0.382***	-0.482***	-0.504***	
	(0.091)	(0.092)	(0.111)	
TREND				-0.054***
				(0.014)
Constant	0.648	-1.454	-1.433	106.2098***
	(1.164)	(1.329)	(1.358)	(28.148)
Panel B: Fixed Effects				
NLTCI65$_{it}$	9.529	9.529	9.529	9.529
	(0.563)	(0.563)	(0.576)	(0.563)
LTCP$_{it}$	0.344*	0.367*	0.344	28.396
	(0.184)	(0.204)	(0.229)	(28.137)
LTCP$_{it}$ x POST$_{it}$				
	-0.173**	-0.175**	-0.199**	-0.172**
	(0.060)	(0.061)	(0.064)	(0.077)
YEAR$_{2001}$	0.111**	0.110**	0.122**	
	(0.049)	(0.050)	(0.052)	
YEAR$_{2002}$	0.181**	0.179**	0.201**	
	(0.068)	(0.068)	(0.072)	
YEAR$_{2003}$	-0.195***	-0.195***	-0.196**	
	(0.055)	(0.055)	(0.059)	
YEAR$_{2004}$	-0.715***	-0.712***	-0.728***	
	(0.060)	(0.062)	(0.065)	
YEAR$_{2005}$				
	-0.057	-0.053	-0.056	
	(0.060)	(0.062)	(0.065)	
YEAR$_{2006}$				
	.3282227***	0.337***	0.348***	
	-0.066	(0.078)	(0.084)	
YEAR$_{2007}$				
	-0.277***	-0.267**	-0.248**	
	(0.067)	(0.083)	(0.090)	
YEAR$_{2008}$				
	-0.294***	-0.282**	-0.248**	
	(0.070)	(0.092)	(0.102)	
TREND				
				-0.015
				(0.016)
Constant	9.553	9.646	10.293	38.695
	(6.079)	(6.144)	(6.376)	(28.718)
Income	Yes	Yes	Yes	Yes
Competition and demographics	No	Yes	Yes	Yes

N = 459 (columns (1), (2), and (4)); N = 423 (column (3))
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: The dependent variable, $NLTCI65_{it}$, is a continuous variable denoting the log number of insured lives per one million people age 65 and older, and the mean and standard deviation are reported for each model. The right-hand side variables LTCP and POST have a binary interaction, as well as main effects for LTCP and YEAR effects. LTCP is a binary variable indicating status as a Partnership state (RWJF or Expansion). POST is binary variable indicating if the state actively has a Partnership program in the given year. YEAR is year effects with 2000 as the reference year. Panel A contains coefficients of OLS estimates. Panel B contains coefficients of fixed effects estimates. The first column contains state level controls for logged GDP per capita,but no other right-hand side variables. Column (2) controls for competition and logged GDP per capita, Column (3) includes the same controls as column (2), but includes non-RWJF states only. Column (4) includes the same controls as column (2), but includes a linear time trend (TREND) rather than yearly time effects.

Table 3 Total LTC Insurance Uptake per one million people age 65 and older (in logs) (NLTCI65$_{it}$)
– OLS and Fixed Effects Estimates, non-RWJF states

	(1) Income and Competition
Panel A: OLS	
NLTCI65$_{it}$	9.529
	(0.576)
LTCP$_{it}$	0.148**
	(0.057)
LTCP$_{it}$ x POST$_{it}$	-0.468***
	(0.080)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2006}$	0.669**
	(0.280)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2007}$	0.290**
	(0.120)
Constant	0.500
	(1.615)
Panel B: Fixed Effects	
NLTCI65$_{it}$	9.529
	(0.575)
LTCP$_{it}$	0.344
	(0.270)
LTCP$_{it}$ x POST$_{it}$	-0.315***
	(0.056)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2006}$	0.392**
	(0.170)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2007}$	0.171*
	(0.091)
Constant	18.402***
	(6.435)
State Income	Yes
Demographics and Competition	Yes

N = 423
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: The dependent variable, NLTCI65$_{it}$, is a continuous variable denoting the log number of insured lives per one million people age 65 and older, and the mean and standard deviation are reported. The right-hand side variables LTCP and POST have a binary interaction, and there is a three-way interaction between LTCP, POST, and YEAR, as well as a main effects term for LTCP is included. LTCP is a binary variable indicating status as a Partnership state (RWJF or Expansion). POST is binary variable indicating if the state actively has a Partnership program in the given year. YEAR is year effects. Panel A contains coefficients of OLS estimates. Panel B contains fixed effects estimates. The specification controls for competition, logged GDP per capita, and demographics (average state age and population).

Table 4 Robustness Checks: Total LTC Insurance Uptake per one million people age 65 and older
(in logs) (NLTCI65$_{it}$) – OLS, 2005-2008, 2000-2004

	(1) Income	(2) Income and Competition
Panel A: OLS, Non-RWJF 2005-2008		
NLTCI65$_{it}$	9.542	9.542
	(0.570)	(0.570)
LTCP$_{it}$	0.082	0.031
	(0.074)	(0.068)
LTCP$_{it}$ x POST	-0.043	-0.043
	(0.101)	(0.097)
YEAR$_{2006}$	0.375***	0.340***
	(0.094)	(0.094)
YEAR$_{2007}$	-0.256**	-0.309***
	(0.085)	(0.088)
YEAR$_{2008}$	-0.292**	-0.353***
	(0.099)	(0.104)
Constant	-2.478	-4.882**
	(1.720)	(1.865)
Panel B: OLS, Non-RWJF 2000-2004		
NLTCI65$_{it}$	9.520	9.520
	(0.581)	(0.581)
LTCP$_{it}$	0.148**	0.089
	(0.059)	(0.061)
YEAR$_{2001}$	0.118	0.122
	(0.097)	(0.095)
YEAR$_{2002}$	0.189*	0.205**
	(0.100)	(0.099)
YEAR$_{2003}$	-0.220**	-0.229**
	(0.096)	(0.094)
YEAR$_{2004}$	-0.771***	-0.814***
	(0.096)	(0.091)
Constant	3.274**	1.268
	(1.215)	(1.498)
State Income	Yes	Yes
Competition and Demographics	No	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
N = 188 (Panel A) N=16 (Panel B)
Notes: The dependent variable, NLTCI65$_{it,}$ is a continuous variable denoting the log number of insured lives per 10,000 people age 65 and older, and the mean and standard deviation are reported for each specification. The coefficients in Panel A are for OLS estimates using the non-RWJF states for the period of 2005-2008. The coefficients in Panel B are for OLS estimates using the non-RWJF states from 2000-2004 as a falsification test, examining the effect of the Partnership in years prior to implementation. Panel C contains an OLS estimate using year effects for RWJF only states. The right-hand side variables LTCP and POST have a binary interaction, and there is a main effects term for LTCP for Panels A and B. LTCP is a binary variable indicating status as a Partnership state (RWJF or Expansion). POST is binary variable indicating if the state actively has a Partnership program in the given year. YEAR is year effects. The first column contains state level controls for logged GDP per capita, but no other right-hand side variables. Column (2) controls for competition, logged GDP per capita, and demographics (average state age and population).

Table 5: Partnership Policy Applications (including Purchases) per one million people age 65 and older (in logs) (LTCPA65$_{it}$) – OLS, Fixed Effects Estimation

	(1) No Controls	(2) Income	(3) Income and Competition	(4) Time Trends
Panel A: OLS				
LTCPA$_{it}$	0.734	0.734	0.734	0.734
	(2.488)	(2.488)	(2.488)	(2.488)
LTCP$_{it}$	-.0382	-0.033	-0.019	0.009
	(.0348)	(0.031)	(0.025)	(0.009)
LTCP$_{it}$ x POST	8.892***	8.876***	8.875***	8.849***
	(0.236)	(0.246)	(0.246)	(0.272)
YEAR$_{2001}$	0.014	0.013	0.011	
	(0.037)	(0.037)	(0.037)	
YEAR$_{2002}$	0.040	0.038	0.033	
	(0.034)	(0.034)	(0.034)	
YEAR$_{2003}$	0.040	0.035	0.037	
	(0.033)	(0.033)	(0.034)	
YEAR$_{2004}$	0.028	0.022	0.032	
	(0.030)	(0.030)	(0.032)	
YEAR$_{2005}$	0.007	-0.001	0.011	
	(0.025)	(0.025)	(0.027)	
YEAR$_{2006}$	0.013	0.003	0.023	
	(0.023)	(0.024)	(0.027)	
YEAR$_{2007}$	0.002	-0.009	0.016	
	(0.026)	(0.0268)	(0.031)	
YEAR$_{2008}$	-0.316	-0.325	-0.296	
	(0.313)	(0.319)	(0.305)	
TREND				-0.013
				(0.013)
Constant	0.190	-1.100	-0.520	24.833
	(0.035)	(0.888)	(0.600)	(25.867)
State Income	No	Yes	Yes	Yes
Competition and Demographics	No	No	Yes	Yes

N = 422

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: The dependent variable a continuous variable denoting the log number of partnership policies and application per one million people age 65 and older, and the mean and standard deviation are reported for each specification. The right-hand side variables LTCP and POST have a binary interaction, and there is a main effects term for LTCP. LTCP is a binary variable indicating status as a Partnership state (RWJF or Expansion). POST is binary variable indicating if the state actively has a Partnership program in the given year. YEAR is year effects, with 2000 as the reference year. Regressions contain coefficients of OLS estimates.. Column (2) controls for logged GDP per capita and logged average premiums, but no other right-hand side variables. Column (3) controls for competition, logged GDP per capita, and logged average premiums, demographics (average state age and population). Column (4) controls for the same variables as column (3), but replaces the year effects with a linear time trend (TREND).

APPENDIX A:

**Table A1. Long Term Care Partnership Models in the four RWJF states**

State	First Year Operational	Program Model	Reciprocity	Total Policies Purchased	**Total Policies Dropped**	**Total Policies Denied**
California	1994	Dollar for Dollar	No	142,474 as of 2011 Q1	**20,571 as of 2011 Q1**	**27,178 as of 2011 Q1**
Connecticut	1992	Dollar for Dollar	Yes, with Indiana in 2001; National Reciprocity Compact 2009	54,969 as of 2011 Q3	**Unavailable**	**8,809 as of 2011 Q3**
Indiana	1993	Dollar for Dollar; hybrid model with Total Asset 1998	Yes, reciprocity with CT in 2001; National Reciprocity Compact in 2009	52,070 as of 2011 Q4	**6,461 as of 2011 Q4**	**9,826 as of 2011 Q4**
New York	1993	Total Asset; Dollar for Dollar 2006 Q1	Yes, 2012	95,702 as of 2011 Q2	**23,292 as of 2011 Q2**	**22,531 as of 2011 Q2**

Table A2. Summary of previous literature

Subject	Author	Results
Partnership policyholder Income Level[1]	Feder et al. (2007)	CA, CT, IN majority greater than $350,000 in assets
	GAO (2007)	CA, CT majority monthly household incomes $5,000+; 53% of households with assets $350,000+; nationally only 36% of traditional LTC policyholders and only 17% without LTC insurance have assets $350,000+
	CT OPM (2012)	Cumulative, 44% policies sold to households with assets $350,000+ (not including home and car)
Traditional policyholder age	HIAA (2000); AHIP (2012)	Average buyer age in 2000: 67; average buyer age in 2010: 59; non-buyer: 67
Partnership policyholder age	CPLTC (2011)	Median age 59
	CT OPM (2012)	Average age 58
	ILTCP (2011)	Average age 61
	NYSPLTC (2011)	Average age 60
Market size	Stevenson et al. (2010)	Growth of 18% per year during 1987-2001; decline by 9% per year from 2000-2005
	Stoltzfus and Feng (2011)	Significant sales declines in 2008 and 2009; sales increase 18% 2010
Price elasticity of demand	Cramer and Jensen (2006)	Demand for private long-term care insurance: -0.23 to -0.87
	Courtemanche and He (2009)	Demand for private long-term care insurance: -3.9
	Goda (2011)	Demand for private long-term care insurance with respect to after-tax price: -3.3

Appendix B.

Figure B1. Partnership policies purchased by 10,0000 in RWJF States California, Connecticut, Indiana, New York
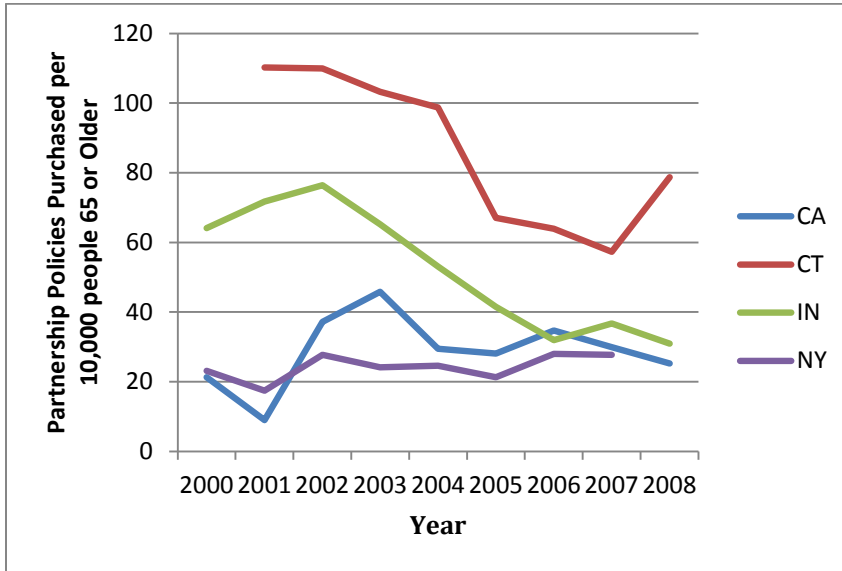
Source: National Association of Insurance Commissioners (NAIC), 2012

Figure B2. Percentage of partnership policies purchased in RWJF Partnership States
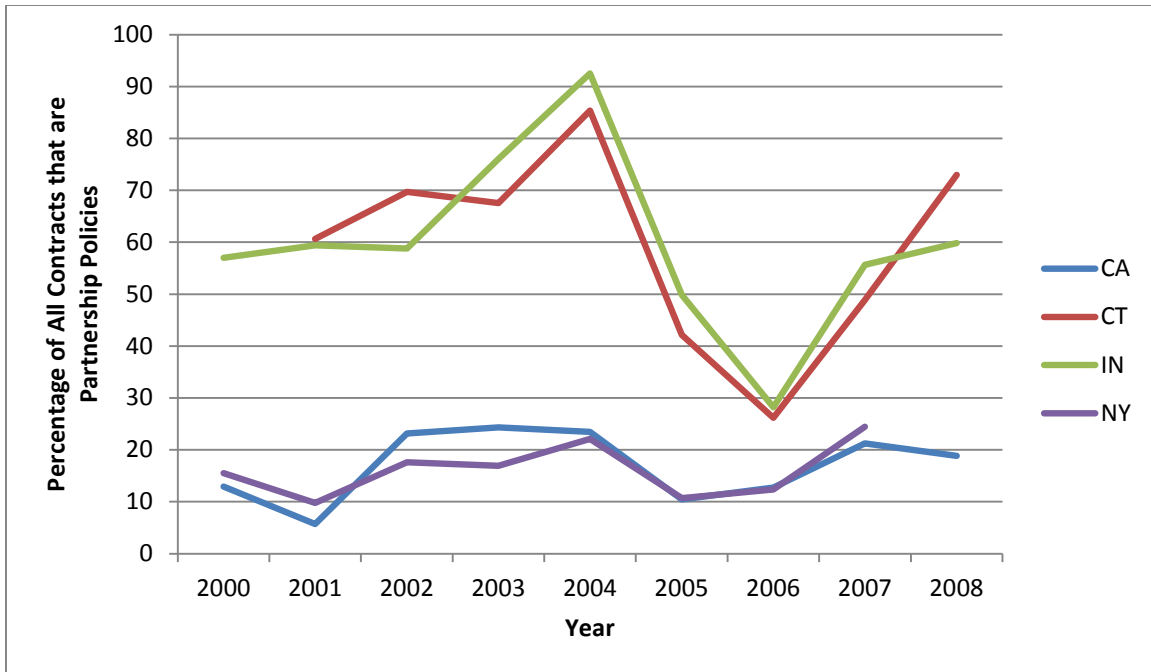**California, Connecticut, Indiana, New York**

Table B2: Partnership Policy Applications and Purchases per one million people age 65 and older

(in logs) (LTCPA65$_{it}$) – OLS, Fixed Effects Estimation

	(1) Income and Competition
Panel A: OLS	
LTCPA$_{it}$	0.734
	(2.488)
LTCP$_{it}$	0.014
	(0.009)
LTCP$_{it}$ x POST$_{it}$	8.876***
	(0.285)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2001}$	0.163
	(0.498)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2002}$	0.496
	(0.391)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2003}$	0.490
	(0.390)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2004}$	0.349
	(0.383)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2005}$	0.069
	(0.359)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2006}$	0.161
	(0.322)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2007}$	0.063
	(0.343)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2008}$	-2.096
	(2.011)
Constant	-0.481
	(0.462)
Panel B: Fixed Effects	
LTCPA$_{it}$	0.734
	(2.488)
LTCP$_{it}$	--
LTCP$_{it}$ x POST$_{it}$	0.284**
	(0.086)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2001}$	-0.079
	(0.049)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2002}$	0.256***
	(0.049)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2003}$	0.248***
	(0.049)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2004}$	0.101**
	(0.049)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2005}$	-0.191***
	(0.049)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2006}$	-0.102**
	(0.050)
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2007}$	-.2022476***
	-0.050
LTCP$_{it}$ x POST$_{it}$ x YEAR$_{2008}$	-0.287***
	(0.053)
Constant	-3.224**
	(1.066)
Income	Yes
Competition and Demographics	Yes

N = 423
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: The dependent variable a continuous variable denoting the log number of partnership policies and application per one million people age 65 and older, and the mean and standard deviation are reported for each specification. The right-hand side variables LTCP and POST have a binary interaction, and there is a three-way interaction between LTCP, POST, and YEAR, as well as a main effects term for LTCP is included. LTCP is a binary variable indicating status as a Partnership state (RWJF or Expansion). POST is binary variable indicating if the state actively has a Partnership program in the given year. YEAR is year effects. Panel A contains coefficients of OLS estimates. Panel B contains coefficients for fixed effects estimates. The specification controls for competition, and logged GDP per capita,

Appendix C: Data Appendix

C.1. Dataset Sources: NAIC

The principal source of data on the general long-term care insurance market is the National Association of Insurance Commissioners (NAIC), which collects experience reports from companies selling insurance in the US. For long-term care insurance, the purpose is to monitor the amount of long-term care coverage provided and compliance with lifetime loss ratio standards. The Long-Term Care Reporting Forms A through C are filed whenever long-term care insurance is sold, regardless of the category of annual statement that the company files, which can be either Life, Accident and Health, Property and Casualty, Fraternal, and Health.

Form C collects cumulative claim experience by state, and the reports from 2000 to 2008 are one of the main components of the Private/Partnership Long-Term Care Insurance dataset used in this paper (Figure C.1). Form C requires information on all long-term care insurance policies and contracts except for accelerated death benefit-type products (which is often the type of rider included in life insurance combined products). Long-term care insurance policies are those meeting the definition in the NAIC Long-Term Care Insurance Model Act or anything that would have met the definition in previous versions of the Model Act. The experience reported is the direct experience on all long-term care insurance policies and contracts issued within the state, including Partnership policies if the state considers them long-term care insurance at the time of the report. The experience reported in Form C is the experience in that statement year.

The experience reported for each plan is broken down by calendar duration categories of 0, 1, 2, 3, 4, 5-9, 10+ years. Information for a plan of calendar duration 0 years applies to plans sold the same year as the statement form. Actual earned premiums and incurred claims are determined for each combination of calendar duration and calendar year of issue starting with the first year of issue; actual earned premiums are interest adjusted. Actual incurred claims are calculated by discounting appropriate claim payments and are adjusted for interest. The number of insured lives as of the end of the experience period is reported by calendar duration for each plan. Form C also contains information on policy type (individual or group), anticipated earned premiums, anticipated incurred claims, policy reserves, and the company identification code (NAIC 2009).

The data purchased from the NAIC was originally broken into four categories of company reports by year: Fraternal, Health, Life, and Property and Casualty. The first step was to label the columns within the .csv files and convert them into .xls files. We then combined the spreadsheets within each category into one single spreadsheet with data from 2000 to 2009. We imported the .xls files into Stata 12.1, and combined them into a single data file that contained all of the Form C data across all years. We sorted the data file by state, company code, and year. Then we order to isolate the policies newly active each year, and used the line number variable to create a calendar duration variable that corresponds to the calendar duration indicated in the text version of Form C. We dropped all observations except those in which the calendar duration equals zero. At this point it became clear that it would not be possible to separate out plans newly in force in 2009, so all 2009 observations were dropped from the dataset.[21] We consolidated the dataset by collapsing the number of insured lives variable by year and state, and then dropped all observations except for the 50 US states and the District of Columbia.

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[21] In 2009 the NAIC introduced a new set of forms to replace Forms A through C, in order to shift the reporting focus to monitoring assumptions about morbidity and persistency. Form 5 is the corresponding replacement for Form C; it includes data on earned premiums, incurred claims, and policies in force at the end of the year (NAIC 2012a).

The key variables in the dataset from the NAIC reports are: *Year, NLTCI* (number of insured lives at end of experience period), *PREMIUMS* (average actual incurred premiums), and *NCom* (number of companies earning premiums or paying out benefits).

C.2. Partnership Programs

C.2.1 California

The quarterly reports issued by the California Partnership for Long-Term Care (CPLTC) program provided data on California from 2000 to 2008. The reports include information on participating insurers, quarterly and cumulative statistics, maximum benefit amounts, policyholder age, trends, policyholders and asset protection earned, and service utilization. The reports were obtained from the CPLTC website (CPLTC 2008).

C.2.2 Connecticut

Data for Connecticut was gathered from the Annual Progress Reports on the Connecticut Partnership for Long-Term Care from 2000 to 2008. These reports provide information on agent training and outreach, public forums, public relations activities, outreach to associations and employers, program reciprocity, outreach to nursing facilities, presentations and media coverage, and summary statistics. The reports were obtained courtesy of David Guttchen of the Connecticut Partnership for Long-Term Care, along with Annual Program Evaluations (CT OPM 2008).

C.2.3 Indiana

The quarterly reports issued by the Indiana Long-Term Care Program (ILTCP) provide the data on Indiana's program from 2000 to 2008. The reports include summary statistics, statistics on policyholders in benefits, claimant profiles, and age distributions. The reports were obtained from the ILTCP and Indiana Department of Insurance (ILTCP 2008).

C.2.4 New York

Quarterly reports issued by the NYSPLTC provided the main source of data on the New York program. The quarterly reports contain information on participating insurers, summary statistics, age distribution, and policy features. However, reports were only available covering the time period of Q1 2000 to Q2 2007. The data for the first half of

2007 is doubled to obtain full estimates for 2007 in the primary dataset (NYSPLTC 2007).

We created .xls files with information from each of the states' reports, and then imported the spreadsheets into Stata 12.1. The four files were appended into a single Stata data file, which were merged into the primary dataset.

The key variables from the original four Partnership programs include: *Apps_Received* (number of Partnership applications received) and *Policied_Purchased* (number of Partnership policies purchased). *Policies_Purchased* and *Apps_Received* combine to form *LTCPA*.

C.3. Population

The primary source of population data is the US Census Bureau. The state resident populations are drawn from the Annual Estimates of the Resident Population by Sex and Age for each state, covering April 1, 2000 to July 1, 2009 (U.S. Census Bureau Population Division 2010a). The population estimates for the US are from the Annual Estimates of the Resident Population by Sex and Selected Age Groups for the United States: April 1, 2000 to July 1, 2009 (U.S. Census Bureau Population Division 2010b). The individual .xls files were downloaded from the Census Bureau and imported into Stata. After appending the state and US data files, all groups were removed except for total population (*Total_Pop*), 65 and older (*_65_older*). These variables were merged with the primary dataset and used to create a number of variables weighted by population.

We calculated the percentage of people in each age group (total population, 65 and older) with private long-term care insurance, e.g. *NLTCI65* is the total number of insured lives per one million people age 65 and older in logs.

C.4. Medicaid

Medicaid expenditure data comes from Centers for Medicare & Medicaid Services (CMS) data on state health expenditures by state of residence (CMS 2011). We use these estimates instead of expenditure by state of provider because per capita estimates are only appropriate when using state of residence estimates. We merged the total expenditure variable (*Medicaid_Exp*) with the primary dataset.

C.5. GDP

Per capita real GDP by state (chained 2005 dollars) comes from the Bureau of Economic Analysis (BEA 2012). We merged the state GDP per capita variable (*GDP*) into the primary dataset. For the logarithmic model, we take the log of GDP per capita (*lgdp*).

C.6. Expansion Partnership Programs

The Long-Term Care Partnership Program Technical Assistance website operated by Truven Health Analytics for HHS provided information on the expansion Partnership programs (Truven Health Analytics 2012). We use the state reports to help code the dummy variable (*LTCP*) on Partnership status to equal 1 if the state has a Partnership program in effect that year, and to equal 0 if it does not; this variable includes both original RWJF and expansion Partnership programs.

Appendix D: State Introduction of Partnership Program (State Plan Amendment Passage)

State	Year
CT	1992
IN	1993
NY	1993
CA	1994
ID	2006
MN	2006
NE	2006
FL	2007
GA	2007
KS	2007

MD	2007
MO	2007
MT	2007
ND	2007
NH	2007
NJ	2007
NV	2007
OH	2007
PA	2007
SD	2007
VA	2007
AR	2008
AZ	2008
CO	2008
KY	2008
OK	2008
OR	2008
RI	2008
TN	2008
TX	2008
AL	2009
LA	2009
ME	2009
SC	2009
WI	2009
WY	2009
IA	2010
WV	2010
NC	2011
WA	2011
DE	2012

Appendix E

Table E1: Income and Price Elasticity – Total Insurance Uptake per one million people age 65 and older (in logs) (NLTCI65$_{it}$) – OLS, Random Effects Estimation

	(1)	(2)
Panel A: OLS		
Income elasticity	0.667***	0.794***
	(0.094)	(0.089)
Price elasticity	-0.360***	-0.437***
	(0.075)	(0.076)
Panel B: GLS		
Income elasticity	0.323**	0.373**
	(0.163)	(0.160)
Price elasticity	-1.003***	-1.012***
	(0.026)	(0.025)
Controls	No	Yes

N = 459
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: Panel A contains income and price elasticity using OLS estimate coefficients of logged state GPD per capita and logged average premiums. Panel B contains income and price elasticity estimates GLS random effects estimations of logged GDP per capita and logged average premiums. The first column contains no additional right-hand side control variables. Column (2) controls for competition and demographics.