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Can Catastrophic Long-Term Care Insurance Policies Increase Private Insurance Coverage and Reduce Medicaid Expenditure?

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Abstract:
Using an inter-temporal optimization model of long-term care insurance purchase decisions, we evaluate catastrophic long-term care insurance policies that cover the tail risk of long-term care costs at affordable premiums. Under our baseline model, we show theoretically that introducing catastrophic policies will induce 11 percent of middle-income men and 3 percent of middle-income women to initiate private insurance coverage. As a result, Medicaid costs will be reduced by 0.20 percent and 0.19 percent for men and women, respectively.

Keywords: catastrophic long-term care insurance policies, Medicaid expenditure, private insurance coverage, social welfare

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1 Introduction

For elderly Americans, the cost of long-term care represents a major financial uncertainty with significant tail risk. Brown and Finkelstein (2008) report that 40 percent of men and 54 percent of women will use care after age 65. Conditional on using care, 77 percent and 85 percent of men and women, respectively, will require care for more than 1 year, and 37 percent and 53 percent will require care for more than 3 years.[1] Care is costly too. The MetLife Mature Market Institute (2012) reports that the average cost of a semi-private room in a nursing home was $214 per day, or $78,110 annually, in 2011. Despite this substantial financial risk, only about 10 percent of older individuals purchase private insurance (Brown and Finkelstein 2007 and Brown and Finkelstein 2009). By surveying a sample of non-buyers, America's Health Insurance Plans (2012) finds that, for 87 percent of them, the "policy costs too much" is an important reason to forgo coverage.

Reflecting the low insurance take-up rate, Medicaid, the public health insurance program for the indigent, pays for the majority of long-term care costs.[2] The National Health Policy Forum (2013) shows that Medicaid paid 62.3 percent of total 2011 long-term care expenditure of $210.9 billion. Concerned at the high Medicaid costs, policy makers have designed several public policies, including tax subsidies and long-term care partnership programs, in order to reduce Medicaid spending by encouraging individuals to purchase private insurance. However, given the secondary payer status of Medicaid, Courtemanche and He (2009), Shah Goda (2011), Lin and Prince (2013), and Sun and Webb (2013) show that current policies have only limited effects on insurance coverage and increase, rather than reduce, Medicaid expenditure.

An alternative way to reduce Medicaid expenditure is to expand the private long-term care insurance market through innovative policy design. Therefore, more individuals could fund at least part of their long-term care costs by private insurance rather than completely relying on Medicaid. Using a modified Brown and Finkelstein (2008) model of optimal long-term care insurance purchase decisions, we evaluate one potential innovation, namely the catastrophic policy.[3] By design, individuals would be responsible for paying an initially specified period (in insurance terminology, the elimination period) of their long-term care services out-of-pocket.[4] The insurance company would then pay a daily benefit, up to a pre-determined cap, for the reminder of the policyholders' life. The catastrophic policy insures the tail risk of long-term care costs. Due to the longer elimination period, the catastrophic policy will be much cheaper than a conventional policy, potentially addressing the cost concern of non-buyers and inducing them to initiate coverage and, consequently, improving their welfare and reducing Medicaid costs.

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The rest of the paper is organized as follows: Section 2 presents the model. Section 3 explains our results. Section 4 concludes.

2 Model

We modify the inter-temporal optimization model of the long-term care insurance purchase decisions faced by rational single individuals in Brown and Finkelstein (2008) to evaluate proposed catastrophic policies.[5] In each month, the representative individual could be in one of five health states, healthy with no care, receiving home health care, living in an assisted living facility, living in a nursing home, or dead. Health transition probabilities vary with age and gender and are from Brown and Finkelstein (2008) .[6]

The individual derives utility from consumption, $C_{s,t}$. In a nursing home or assisted living facility, the individual also derives utility from provided food and shelter $F_{s,t}$. The consumer's problem is to maximize his expected discounted lifetime utility:

$$\sum_{t=1}^{T}\sum_{s=1}^{5}\beta^{t-1}Q_{s,t}\frac{\left(C_{s,t}+F_{s,t}\right)^{1-\gamma}-1}{1-\gamma} \tag{1}$$

where β is the time discount rate. $Q_{s,t}$ is the probability that the individual is in health state s at time t. γ measures the degree of risk aversion.

The individual faces the following budget constraint when he is not eligible for Medicaid:

$$W_{t+1}=\left(W_t+A_t-\left(1-I_D\right)P_{s,t}+\min\left(I_D B_{s,t},M_{s,t}\right)-M_{s,t}-C_{s,t}\right)\left(1+R_f\right) \tag{2}$$

where W stands for the individual's financial wealth. A represents his annual income. P represents the insurance premium which is only paid when the individual is healthy or in the elimination period.[7] I_D is an indicator function which takes the value 1 when the individual has passed the elimination period and is eligible to receive benefits. It takes the value 0 otherwise.[8] B represents the insurance policy benefit cap. M represents long-term care costs, which vary by health state. The actual benefits received are capped at the long-term care costs incurred. R_f is the risk-free interest rate. The uninsured do not pay premium and receive zero benefit. There is the usual no-borrowing constraint, so $W_t < 0$ for all periods.

If the individual is eligible for Medicaid, the budget constraint becomes:

$$W_{t+1}=\left(\min\left(W_t,\underline{W}\right)+\min\left(A_t,\underline{C_s}\right)-C_{s,t}\right)\left(1+R_f\right) \tag{3}$$

where W and $\underline{C_s}$ are the Medicaid assets and income allowances. The income limit varies with care status. Medicaid pays an amount equal to:

$$M_{s,t}-\min\left(I_D B_{s,t},M_{s,t}\right)-\max\left(A_t-\underline{C_s},0\right)-\max\left(W_t-\underline{W},0\right) \tag{4}$$

To make the study comparable with Brown and Finkelstein (2008) , the parameter values and the wealth distribution are directly taken from their study. The individual enters the model retired and in good health at age 65. The terminal age T is set at 105. The coefficient of risk aversion is 3. The real interest rate, time discount rate, and inflation rate are all 3 percent. Real medical costs increase 1.5 percent a year. The insurance policy has a $100 daily benefit cap and no inflation protection. The costs of nursing home, assisted living facility, and home health care are set at $51,480 and $25,908 a year, and $18 an hour, respectively. The Medicaid asset limit is $2,000. The Medicaid income limit is $30 if the individual is in a nursing home, $545 if he is at home receiving home health care. The consumption value of food and accommodation in a nursing home or assisted living facility is assumed to be $515.

3 Results

In this section, we compare catastrophic policies with various lengths of elimination period with the policy studied in Brown and Finkelstein (2008) , which has no elimination period (the "BF policy" hereafter). First, we compare insurance premiums. Assuming the same market load, we find, for men, that catastrophic policies with 3, 6, 12, 18, 24 and 36 months of elimination period are 11.3, 21.2, 37.1, 49.5, 59.3 and 73.2 percent, respectively, cheaper than the BF policy. For women, the corresponding catastrophic policies are 7.9, 15.1, 27.7, 38.1, 47.0 and 60.9 percent, respectively, cheaper than the BF policy.

Next, we investigate individuals' long-term care insurance purchase decisions using willingness to pay. Willingness to pay is defined as the dollar amount that individuals without insurance must receive to make them indifferent, in terms of expected utility, between buying and not buying a specified long-term care insurance policy. By construction, individuals with a positive willingness to pay receive higher expected lifetime utility with the specified insurance policy and thus will be optimal to purchase the policy. A negative willingness to pay signifies that forcing individuals to purchase the policy will reduce their expected lifetime utility and thus non-purchase is rational. Individuals who have a negative willingness to pay for the BF policy but a positive willingness to pay for a catastrophic policy will be induced to initiate catastrophic coverage after catastrophic policies become available. Individuals with a positive willingness to pay for both the BF policy and a catastrophic policy, but whose willingness to pay for the catastrophic policy exceeds that for the BF policy, will choose to switch from the BF policy to the catastrophic policy after catastrophic policies become available.

The upper and lower panels of Table 1 present willingness to pay for various policies for men and for women respectively. Column 1 replicates willingness to pay for the BF policy. Columns 2–7 show willingness to pay for catastrophic policies with various elimination periods.[9] The italic numbers show the optimal policy for individuals at the corresponding wealth percentile. We show that the wealthy would like to purchase a policy with more comprehensive coverage. Middle-income individuals would purchase policies with longer elimination periods because the policies cost less and hedge the risk that long periods of care will be required. Individuals at the bottom of the wealth distribution would rationally choose not to purchase any type of policy, because they have little financial wealth to protect and could turn to Medicaid in the event they need long-term care services. To better illustrate, consider a single man at the 60th percentile of the wealth distribution. He has a negative willingness to pay for the BF policy. Forcing him to purchase the BF policy would decrease his expected lifetime utility, and he would be willing to pay $3,000 at age 65 in return for being relieved of a hypothetical obligation to purchase it. For catastrophic policies, as the elimination period gets longer, the individual's willingness to pay displays an inversed-U shape. This reflects the trade-off between a low premium and comprehensive coverage. He is not very wealthy, so the benefit of premium reductions outweighs the cost of increases in the elimination period until a 24-month elimination period, his optimal policy. His willingness to pay for the policy is $3,200. Thereafter the loss of coverage plays a more important role. His willingness to pay thus declines to $3,100 for a catastrophic policy with a 36-month elimination period. As a result of introducing catastrophic policies, the individual (originally a non-buyer) is induced to purchase a catastrophic policy with a 24-month elimination period and his dollar dominated welfare gain is $3,200.

Table 1: Willingness to pay (in $000s).

Wealth Percentile	Replicate BF	Elimination Period 3 months	6 months	12 months	18 months	24 months	36 months
			Men				
10th							
20th						–7.5	*–5.0*
30th	–18.2	–16.2	–14.3	–11.3	–8.9	–7.1	*–4.6*
40th	–16.3	–14.1	–12.2	–9.1	–6.8	–5.2	*–3.3*
50th	–11.4	–9.6	–8.0	–5.3	–3.4	–2.2	*–1.0*
60th	–3.0	–1.6	–0.3	1.6	2.7	*3.2*	3.1
70th	6.4	7.3	8.1	9.1	*9.4*	9.2	7.8
80th	17.8	18.3	18.6	*18.7*	18.3	17.4	14.7
90th	25.6	26.1	*26.3*	26.2	25.6	24.5	21.5
			Women				
10th							
20th							*–8.4*
30th	–20.7	–19.3	–18.0	–15.5	–13.3	–11.5	*–8.5*
40th	–18.9	–17.7	–16.5	–14.1	–12.1	–10.4	*–7.7*
50th	–11.5	–10.7	–9.9	–8.2	–6.8	–5.6	*–4.0*
60th	1.6	1.7	1.8	2.2	2.5	*2.7*	2.5
70th	*14.4*	13.9	13.4	12.4	11.5	10.6	8.9
80th	*29.8*	28.9	27.8	25.5	23.1	21.0	17.4
90th	*41.6*	40.6	39.6	37.2	34.7	32.1	27.1

Summarizing Table 1, we find that men at the 64th wealth percentile and above have a positive willingness to pay for the BF policy, and men at the 53rd percentile and above have a positive willingness to pay for the newly introduced catastrophic policies.[10] In the middle of the wealth distribution (53rd to 63rd percentile), 11 percent of men who previously declined the BF policy will be induced to initiate catastrophic coverage. For women, catastrophic policies would increase coverage by 3 percent, with the increase again occurring in the middle of

the wealth distribution (56th and 58th percentile), reflecting their higher probabilities of using long-term care services and smaller insurance loads (Brown and Finkelstein 2007 and Brown and Finkelstein 2009).

Lastly, we consider Medicaid expenditure. We report the Medicaid share of the expected present value of total long-term care expenditure in Table 2. Again, the upper panel presents shares for men and the lower panel for women. Column 1 reports shares if individuals do not purchase any insurance. Column 2 reports shares when individuals purchase the BF policy. Columns 3–8 present shares when individuals purchase catastrophic policies with various lengths of elimination period. In the absence of insurance, Medicaid pays 94 percent of men's long-term care costs at the 10th percentile of the wealth distribution, decreasing to 7 percent at the 90th percentile. The BF policy provides the most comprehensive coverage, so Medicaid shares are the lowest among all policies, from 48 percent at the 10th percentile to 5 percent at the 90th percentile.

Table 2: Medicaid share of the expected present value of total long-term care expenditure.

Wealth Percentile	No private Insurance	Replicate BF	Elimination period 3 months	6 months	12 months	18 months	24 months	36 months
				Men				
10th	0.94	0.48	0.53	0.57	0.65	0.70	0.75	0.81
20th	0.89	0.44	0.49	0.54	0.61	0.67	0.71	0.77
30th	0.80	0.41	0.45	0.49	0.56	0.61	0.64	0.70
40th	0.71	0.37	0.40	0.44	0.49	0.54	0.57	0.62
50th	0.60	0.32	0.34	0.37	0.41	0.45	0.47	0.51
60th	0.46	0.26	0.28	0.30	0.33	0.35	0.37	0.39
70th	0.32	0.20	0.21	0.22	0.24	0.26	0.27	0.29
80th	0.17	0.12	0.13	0.13	0.14	0.15	0.15	0.16
90th	0.07	0.05	0.05	0.05	0.05	0.06	0.06	0.06
				Women				
10th	0.95	0.52	0.55	0.58	0.63	0.68	0.72	0.78
20th	0.92	0.49	0.52	0.55	0.61	0.65	0.69	0.75
30th	0.88	0.46	0.49	0.52	0.57	0.62	0.65	0.71
40th	0.80	0.43	0.45	0.48	0.52	0.56	0.59	0.65
50th	0.72	0.38	0.40	0.42	0.46	0.49	0.52	0.57
60th	0.60	0.33	0.34	0.35	0.38	0.41	0.44	0.47
70th	0.45	0.24	0.25	0.26	0.28	0.30	0.31	0.35
80th	0.24	0.15	0.15	0.16	0.16	0.17	0.18	0.19
90th	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.06

We assume that individuals always purchase the available policy that offers them the highest willingness to pay (expected lifetime utility). Therefore, the impact of introducing catastrophic policies on Medicaid expenditure depends on the behavioral responses of individuals at various points on the wealth distribution. Specifically, there are four possible groups: 1) individuals who never purchase insurance; 2) individuals who previously optimally chose not to purchase the BF policy are induced to purchase catastrophic policies; 3) individuals who would have purchased the BF policy switch to cheaper but less comprehensive catastrophic policies; and 4) individuals who always purchase the BF policy. The second group will reduce Medicaid costs, while the third may increase costs. The remaining two groups have no effect on Medicaid expenditure.

For the 11 percent of men who are induced to initiate coverage (53rd to 63rd percentile), prior to initiating coverage, their average Medicaid share of the expected present value of the total long-term care costs was 48.9 percent. After initiating coverage, their average Medicaid share declines to 39.0 percent. But the 36 percent (64th percentile and above) who already purchase the BF policy will now switch to catastrophic policies, which provide less comprehensive coverage. Their average Medicaid share increases from 11.2 percent to 13.8 percent. Averaged over all groups, we find, for men, that Medicaid costs will decrease 0.20 percent after the introduction of the catastrophic policies. Similarly, we find women's Medicaid costs will decrease 0.19 percent.

Previous researches (Dolan & Gudex, 1995; Fuchs, 1980; Van Der Pol & Cairns, 2000) find evidence of heterogeneity in rates of time preference, an important preference parameter in our model. Thus, we perform sensitivity analysis with various plausible time discount rates. We consider more patient individuals who have a time discount rate of 1 percent. We also experiment with less patient individuals who have time discount rates of 5 percent and 10 percent.[11] We find our conclusion, that high-income individuals prefer comprehensive coverage, middle-income individuals prefer catastrophic policies and low-income individuals do not purchase any type of insurance, is robust. With all plausible time discount rates, some middle-income individuals would be induced to initiate coverage after introducing catastrophic policies.[12]

4 Conclusion

In this paper, we investigate the impact of introducing catastrophic long-term care insurance policies on private insurance coverage and Medicaid expenditure. We show that catastrophic policies are especially valuable for middle-income individuals who have some financial assets that could cover their long-term care services for a certain period of time but that would be rapidly exhausted if they required long-term care services for extended periods. After the introduction of catastrophic policies, 11 percent of middle-income men and 3 percent of middle-income women are able to hedge the tail risk of their long-term care costs at affordable premiums. A caveat of our model is that we assume homogeneous preferences and beliefs. Therefore, we predict that all individuals above a wealth threshold will purchase insurance, and introducing catastrophic policies would reduce the threshold. However, we observe in the data that many middle-income to wealthy individuals do not purchase insurance, likely reflecting heterogeneity in preferences and beliefs, concerns about insurers, substitutions of care, and behavioral biases (Brown, Goda & McGarry, 2012). With lower premiums, catastrophic policies may induce more individuals to initiate coverage than the model predicted and have a larger impact on Medicaid expenditure.

Policymakers could also consider increasing long-term care supplies to reduce care costs and Medicaid expenditure. Recent presidential platforms propose to provide Social Security benefits and tax deductibles for caregivers who quit paying jobs and take care of elderly relatives. It would increase family providers of long-term care and reduce the demand for formal care. In addition, policies that would potentially increase the supply of market providers of long-term care (RN's, LPN's, CNA's, etc.) could be considered. For example, Auerbach et al. (2013) find promoting nurse-managed health centers and patient centered medical home could significantly reduce primary care physician shortages, even after accounting for the increased demand due to the affordable care act. Feng et al. (2008) find higher Medicaid payment rates could significantly increase total staffing levels of nursing homes. Finally, Sochalski (2002) finds stagnant wages and low levels of job satisfaction are the major difficulties to retain workforce in the long-term care industry. Therefore, there could be indirect impacts from introducing catastrophic policies. Although a detailed analysis is beyond the scope of this paper, we conjecture that well designed private long-term care insurance may lead to less sub-optimal and more flexible patterns of care use, and may alleviate the labor supply shortages in the formal care sector.

Notes

[1]The probabilities reported in Brown and Finkelstein (2008) are based on Robinson (2002) . Recent studies, such as Friedberg et al. (2014) and Hurd, Michaud, and Rohwedder (2014) , show even higher probabilities.

[2]Individuals have to pass stringent income and asset tests to be eligible for Medicaid; check Brown and Finkelstein (2008) for details.

[3]Munnell mentioned the idea of long-term care insurance with longer elimination periods in a web discussion at http://stream.wsj.com/story/experts-journal-reports/SS-2-135503/SS-2-193782

[4]In the current long-term care insurance market, the standard elimination period is 90 days and the length is usually not an optional choice for buyers. We consider much longer elimination periods of up to 36 months. There are two types of elimination periods. One accumulates over individuals' lifetime. The other requires individuals to pay their care costs first each time they start using care. We focus on the cumulative elimination period in the paper.

[5]We focus on rational individuals in the paper. Non-rational reasons, such as time inconsistency, may also contribute to the long-term care insurance purchase decisions. For example, with quasi-hyperbolic discounting as modeled by Gruber and Koszegi (2004) and Laibson (1997) , individuals will be less likely to purchase insurance to hedge their long-term care risk. In addition, we focus on single individuals in the paper as in Brown and Finkelstein (2008) . The Medicaid rules are much more complicated for married couples. The details are contained in Friedberg et al. (2016) which specifically investigate the long-term care insurance demand for married couples.

[6]We use the Brown and Finkelstein (2008) transition probabilities to facilitate comparison with their results. In results we do not report, we use more recent health transition probabilities estimated by Friedberg et al. (2014) . Our findings are robust.

[7]The premium is calculated by applying market loads of 50 percent for men and –6 percent for women as in Brown and Finkelstein (2008) . Insurance companies have, until recently, practiced unisex pricing, and the difference in loads reflects women's greater likelihood of using care and greater conditional mean durations of stay (Brown and Finkelstein 2007 and Brown and Finkelstein 2009). The premium is fixed in nominal terms.

[8]If a policy has no elimination period and pays immediately as in Brown and Finkelstein (2008) , I_D is always 1.

[9]As in Brown and Finkelstein (2008) , we do not report willingness to pay when it is worse than losing all financial wealth in order to avoid confusion.

[10]We apply linear interpolation for willingness to pay and other calculations between decile points.

[11]To keep the paper compact, we do not report the full table. The results are available upon request.

[12]At very high time discount rates, individuals would place a low value on future consumption and would be reluctant to forego current consumption, whether by accumulating financial wealth or by purchasing insurance. We hypothesize that the individuals in the top half of the wealth distribution who we identify as potential purchasers of catastrophic policies likely have reasonable rates of time preference, because a very high rate of time preference would be inconsistent with significant wealth accumulation.

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