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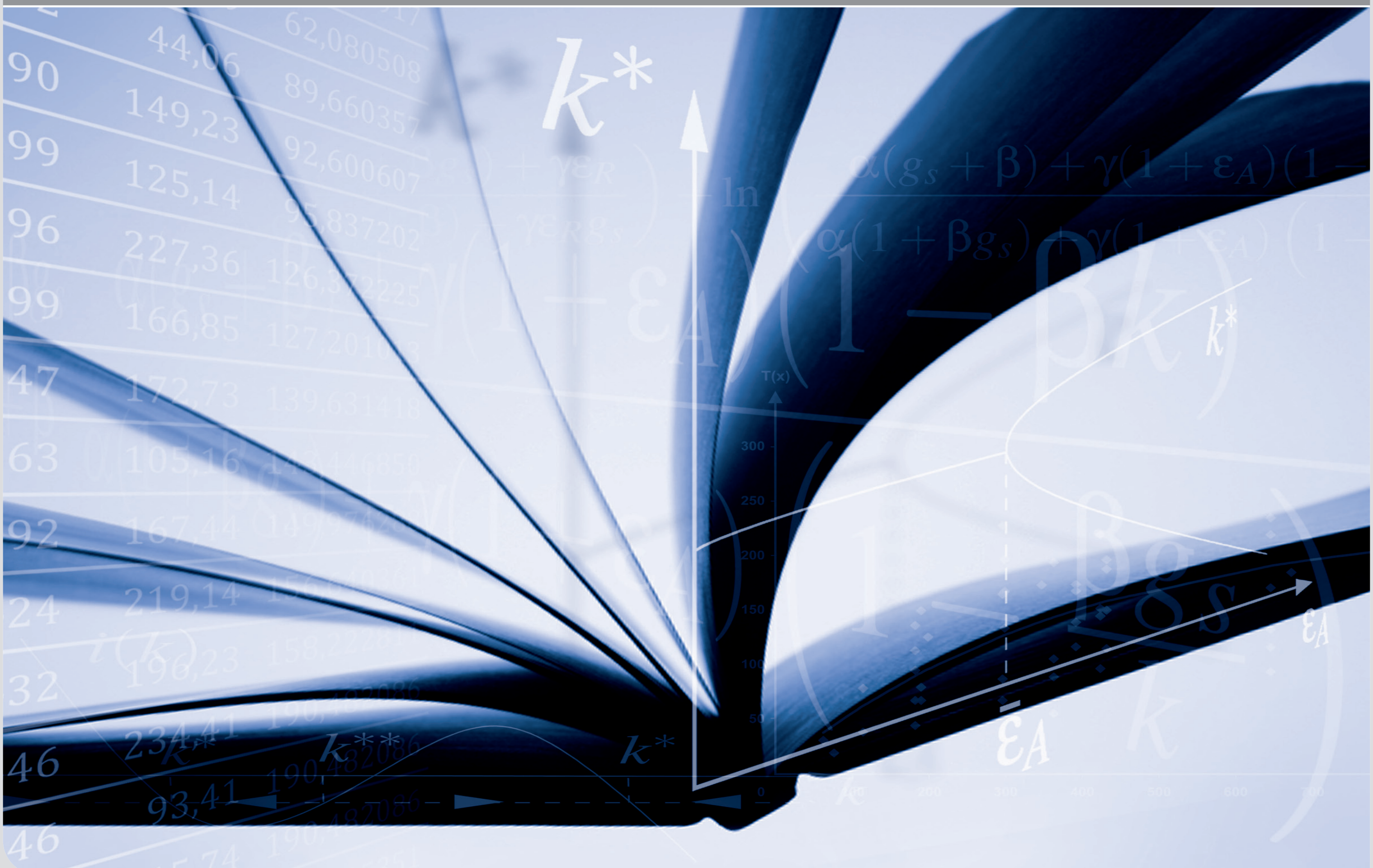

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When the affordable has no value, and the valuable is unaffordable

The U.S. market for long-term care insurance and the role of Medicaid

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Abstract

I consider the popular argument of Medicaid crowding out demand for private long-term care insurance. I show that this argument rests on a wrong counterfactual comparison. Furthermore, I question the welfare-decreasing impact of Medicaid as it neglects a large value of the program in providing access to care. I show that private insurance is unable to offer a similar value. I posit that the low take-up of private insurance is due to a dilemma prevalent in - but not exclusive to - the market for long term care insurance: a dilemma between access and affordability. Several empirical patterns in insurance uptake and lapsing behavior can be explained by considering the issue of limited affordability.

JEL Classification: G22; I11; I38

Keywords: Aging, Insurance, Long term Care, Medicaid

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1 Introduction

The state and development of the U.S. market for long-term care (LTC) insurance has caused worry among both researchers and policy-makers. Despite the facts that the cost of LTC is substantial, and that the risk of being in need of LTC is non-negligible, the uptake of LTC insurance is consistently low. Private insurance is responsible for as little as four per cent of funding of LTC. The main contributor is the public program of Medicaid that provides funding for the very poor.[1]

Several attempts have been made at explaining this low uptake of insurance. A prime suspect has been Medicaid as crowding out private demand for insurance (Pauly (1989), Pauly (1990), Brown, Coe, and Finkelstein (2006), Brown and Finkelstein (2008)). In that line of argument, Medicaid simply replaces insurance benefits thereby increasing the shadow price of insurance. This is particularly strong for low income groups, yet still relevant for those further up the income distribution. Brown and Finkelstein (2008) and Brown and Finkelstein (2011) argue that this crowding-out is particularly undesirable as the public program itself offers only very limited insurance value. In that way, Medicaid crowds out demand for a private market that could potentially offer a superior insurance value.

In this paper, I argue that this criticism of Medicaid is based on a wrong counterfactual comparison. In particular, it assumes away the risk of not being able to purchase long-term care. Yet, it is exactly this risk that justifies the existence of Medicaid. When the budget, that is available at the time when LTC is needed, is uncertain ex-ante, both Medicaid and private insurance are valuable in providing access to care in those cases in which it is unaffordable out of one's own resources.[2] However, given that most insurances specify a deductible and only pay benefits conditional on the insuree paying this deductible, the value of insurance in providing access is very limited. This changes the nature of crowding-out. In particular, there cannot be a crowding-out effect of insurance benefits for the poor, since these are unlikely to receive any insurance benefits as that would require a deductible payment that is beyond their means.

In addition, confining the value of insurance to consumption-smoothing while neglecting the access value assumes away the exact value that Medicaid provides. It is thus not surprising that Brown and Finkelstein (2008) and Brown and Finkelstein (2011) associate little value with the program. I show that private insurance markets are unable to provide the access value that a

[1] See Congressional Budget Office (2004).

[2] Compare Nyman (2003) proposing an access motive in buying health insurance.

government assistance program such as Medicaid can provide. This is due to a dilemma unique to private insurance. In order to maximize access, an insurance cannot prescribe a deductible. At the same time, a sizable deductible is needed to make an insurance policy affordable for a maximum of people. Public insurance faces no such dilemma as it allows for the possibility of redistribution. It is important to note that the idea of a welfare-decreasing crowding-out by Medicaid is a direct and necessary consequence of the state-of-the-art of insurance theory that confines insurance motives to a single one: risk aversion. It is the neglect of any different motive, in this case specifically the access motive, that underlies to the criticism of public insurance as decreasing welfare. This underlines how a narrow focus of economic theory can misinform our policy advice.

Finally, I consider the value of private LTC insurance for asset protection. I show that due to the way in which insurance benefits are paid, i.e., conditional on a deductible payment by the insuree, private insurance offers little value even to those who cannot rely on Medicaid. With limited liquid assets, a sizable deductible can mean that an insured individual has to give up the very asset that the insurance was intended to protect. In consequence, the largest value of insurance is created when it specifies a low deductible. However, a low deductible is only available at a high premium. This produces a dilemma for potential customers. The most affordable policies require a deductible payment that makes benefit collection highly unlikely and thus makes the policy close to worthless. At the same time, the policies, that specify a low deductible and thus are valuable, are simply unaffordable for a lot of people. I show how the model, despite being highly stylized, can explain a large amount of empirical evidence both on insurance uptake rates as well as lapsing behavior with regard to income, marital status, and gender.

The issue of affordability of premia has been part of the debate over LTC insurance before being quickly dismissed.[3] While estimated numbers varied considerably, it was argued that most people could afford at least some insurance. Yet, this comes with two caveats. First, as I argue in this paper, *some* insurance can have about the same value as no insurance. Affordability remains an issue if the only policies that indeed have value are unaffordable. Second, given the substantial increase of premia in the market in recent years, it is unlikely that affordability of premia has decreased in relevance. Consistent with this, the cost of insurance has taken the top position as reason for non-purchase for many years. According to AHIP (2012), the fraction of people citing policy cost as important or very important reason for nonpurchase remains high with 87%

[3]See e.g. Cohen, Tell, Greenberg, and Wallack (1987), Crown, Capitman, and Leutz (1992), Hagen (1992), Cutler (1993).

in 2010 as compared to 91% in 1990.[4] The economic literature does consider excessive cost as a potential reason for limited uptake. However, this is done exclusively in terms of loading factors: the difference between actual and actuarially fair premia.[5] While this tackles the question to what extent insurance policies are worth their cost, it completely ignores the question of affordability. Even a policy that is priced actuarially fair can fall outside a buyer's financial capabilities.

The paper proceeds as follows. In section 2, a simple model is used to restate the argument of crowding-out as proposed in the literature. I proceed by pointing out why this invokes the wrong counterfactual comparison and analyze the correct one. Based on these results, the true extent of crowding-out is derived in section 3. In section 4, the welfare provided by Medicaid is compared to the welfare that could be provided by a private insurance market without government assistance. I show that the private market is unable to provide a value as high as the one provided by Medicaid. In section 5, the value that private insurance confers to those who cannot rely on Medicaid is derived. Based on this analysis, I argue that insurance can only provide a significant value if it specifies a low deductible. This is the basis of my argument that an affordable, high-deductible policy has little to no value, while a valuable, low-deductible policy may simply be unaffordable. I point out how the model's predictions match empirical evidence both on insurance uptake and lapsing behavior with regard to income, marital status, and gender. In section 6, I conclude.

2 A Model of Insurance

A Simple Model of Crowd-Out

Suppose a risk-neutral individual faces a probability $\pi \in (0, 1)$ that he will be in need of nursing home care, something that he values at V if the event of need occurs.[6] This nursing home care costs $p < V$. The individual's budget at the time of need is a random variable at the time the insurance decision is made. Denote by x the individual's wealth at the time of need, by $F(x)$ the

[4] In contrast, reliance on government assistance was largest with 58% in 1990 but has decreased to 23% (28%) in 2010 for Medicaid (Medicare). Even more pronounced, the fraction of people citing policy cost as "very important" reason for nonpurchase varied between 53% and 57% between 1995 and 2010. In contrast, the fraction citing reliance on Medicaid as "very important" reason varied between 5% and 12% during that time.

[5] See Brown and Finkelstein (2009), Pestieu and Ponthière (2010), Brown and Finkelstein (2011) for survey articles.

[6] The crowding-out argument is independent of the insuree's risk preferences. I thus consider the simplest case of risk neutrality.

cumulative distribution function over x, and by $\hat{x} = \int x dF(x)$ the expected wealth at the time of need. If the individual is unable to afford p at the time of need, Medicaid closes the gap between the individual's budget x and the price of LTC p. This event happens with probability $\rho = F(p)$.[7] In the presence of Medicaid, remaining uninsured thus yields an expected utility of

$$\begin{aligned}
\mathbb{E}[\tilde{u}_0] &= (1-\pi)\hat{x} + \pi\left[(1-\rho)(\mathbb{E}[x|x>p] + V - p) + \rho(V)\right] \\
&= \hat{x} + \pi\left[(1-\rho)(V-p) + \rho(V - \mathbb{E}[x|x<p])\right] \\
&= \hat{x} + \pi\left[V - p + \int_0^p F(x)dx\right]. \qquad (1)
\end{aligned}$$

The equation readily shows that Medicaid ensures that everyone receives the (net) benefits of LTC $(V-p)$ in case of need regardless of the size of the own budget. To do so, Medicaid fills the gap between a person's budget and the price of LTC. Intuitively, Medicaid provides a price discount on LTC to those who cannot afford it, with the size of this discount being exactly the difference between a person's budget and the price of LTC. The value $\int_0^p F(x)dx$ denotes the expected value of this price discount.

Suppose there is an insurance available at a premium w that covers the cost of care, but specifies a deductible $d < p$.[8] In that case, an insurer covers the part $(p-d)$ of LTC cost in case of need. The utility of buying insurance is then given by

$$\mathbb{E}[\tilde{u}_i] = \hat{x} + \pi\left[(1-\delta)(V-d) + \delta(V - \mathbb{E}[x|x<d])\right] - w = \hat{x} + \pi\left[V - d + \int_0^d F(x)dx\right] - w. \qquad (2)$$

with $\delta = F(d)$. With insurance, the individual is able to get LTC at a "price" of d and thereby ensures himself the value $V - d$ in case of need. If his own resources do not suffice to pay d, Medicaid closes the gap between the price d that he needs to pay to get LTC and his budget. $\int_0^d F(x)dx$ denotes the expected size of the price discount on LTC that Medicaid provides to someone with insurance. It is easy to see from the two equations that the maximum premium $\tilde{w}$

[7] Actually, Medicaid allows recipients to retain a certain amount of wealth. That can easily be captured by reinterpreting x as the individual's wealth in excess of that minimum. The results do not hinge on this, so I abstract from it for simplicity.

[8] In the context of long-term insurance, the elimination period is typically considered as the deductible. In the simple model that I employ here, I use the term *deductible* to refer to any cost of LTC that are borne by the insuree. It thus includes the cost of LTC during an elimination period and any cost of LTC beyond the maximum benefit.

that an insurer can charge is given by

$$\tilde{w} = \pi \left[(p-d) - \int_d^p F(x)dx \right] = \pi \int_d^p (1 - F(x))dx. \tag{3}$$

The willingness-to-pay falls below the actuarially fair price $\pi(p-d)$, i.e., the expected cost of coverage. This happens because the expected price discount provided by Medicaid is smaller for those who have insurance as Medicaid only acts as secondary payer. This is a simplified version of the argument of Medicaid increasing the shadow price of insurance as proposed in the literature. The discrepancy $\int_d^p F(x)dx$ reflects the increase in the shadow price and is particularly strong for lower income groups.[9] This argument is wrong, however. It correctly recognizes that budget constraints matter for the eligibility for Medicaid and thus influences the value of insurance in the presence of Medicaid as reflected in equation (3). Yet, it fails to recognize the importance of budget constraints *in the absence of Medicaid* by assuming that in this counterfactual case the individual's willingness-to-pay for insurance is given by $\pi(p-d)$ (plus a potential risk premium). Such a willingness-to-pay requires that an individual without insurance purchases LTC whenever in need. It thus fails to take into account the primary reason for the existence of Medicaid: the insight that some people are unable to purchase LTC when in need unless they receive assistance. To properly analyze the extent of crowding-out, we need to consider the value of insurance in a counterfactual environment without Medicaid where people can be unable to afford LTC.

The Correct Counterfactual

As in the case with Medicaid, suppose that x denotes the decision-maker's budget at the time he needs LTC, and $F(x)$ denotes the belief about this budget at the time of insurance purchase, more specifically the c.d.f. over x that describes this belief. Then the outside option of remaining uninsured yields a utility of

$$\mathbb{E}[u_0] = (1-\pi)\hat{x} + \pi \left[(1-\rho)(\mathbb{E}[x|x>p] + V - p) + \rho \mathbb{E}[x|x<p] \right] = \hat{x} + \pi(1-\rho)(V-p). \tag{4}$$

With probability ρ, the decision-maker is unable to afford LTC despite being in need of it. In this case, the individual has to forgo the (net) benefit $V-p$ of LTC.

[9] I assume throughout the paper that the budget risk $F(x)$ of a richer person first-order stochastically dominates the budget risk of a poorer person.

Let us next consider the utility of buying insurance. It turns out that the existence of a budget risk means that the utility of insurance strongly depends on how the insurance pays benefits.[10] Here, I consider the case of *conditional* payment, which is particularly prominent in the U.S. LTC insurance market. Under conditional payment, the insurance pays the the remaining $(p - d)$ of the nursing home bill only if the insuree pays his share d of the bill.[11] If the insuree is unable to make the payment d, which happens with probability $\delta = F(d)$, he cannot afford LTC despite having insurance. Note that beyond the inability to afford the nursing home stay, this also means that the insurance does not pay out any benefits for these are tied to the reception of long-term care. The expected utility from buying an insurance is then given by

$$\begin{aligned} \mathbb{E}[u_i] &= (1-\pi)\hat{x} + \pi\left[(1-\delta)(\mathbb{E}[x|x>d] + V - p + p - d) + \delta\mathbb{E}[x|x<d]\right] - w \\ &= \hat{x} - w + \pi\left[(p-d) + (1-\delta)(V-p) - \delta(p-d)\right]. \end{aligned} \tag{5}$$

One can easily derive the premium w that leaves an individual indifferent between insurance purchase and self-insurance:

$$\bar{w} = \pi[p - d \qquad \underbrace{+(\rho-\delta)(V-p)}_{\text{access value}} \qquad \underbrace{-\delta(p-d)}_{\text{claim risk}}] \tag{6}$$

There are two reasons for why this value differs from the wrong benchmark of $\pi(p - d)$. First, insurance provides an *access value* to the insuree who faces a budget risk. An individual profits from insurance as it helps to overcome his budget constraint.[12] It provides access to long-term care, and hence to the value V, whenever an individual is unable to to pay for it on his own. As long as the individual is able to pay the deductible d, the insurance benefit $(p - d)$ suffices to pay the necessary amount p. Second, when insurance pays benefits conditionally, there exists a *claim risk* that the insuree is unable to file a claim and therefore receives no benefits despite being in need. This happens whenever the insuree is unable to settle his part d of the bill. In essence, once the insuree faces a budget risk, the practice of conditional payment excludes those loss states from coverage in which the insuree cannot afford the deductible. This reduces the value of insurance.

[10] For an extensive derivation and discussion, see Fels (2015).

[11] This is straightforward if deductibles take the form of an elimination period as in the U.S. LTC insurance market. An elimination period requires the insuree to pay for the first n days of care, where n is specified in the contract. It follows that an insuree only receives insurance benefits, if he makes it to day $n + 1$ in a nursing home.

[12] This is a value created by insurance beyond the one that is based on insurance acting as a device to smooth consumption across states. See Nyman (2003). In Fels (2015), it is shown how this access value critically depends on how the insurance pays benefits: unconditionally, conditional on deductible payment, or by reimbursement.

While a budget risk changes the value of insurance to potential insurees, the resulting claim risk also changes the expected cost of insurance. Since an insuree who faces a budget risk can be unable to meet the financial requirements that are necessary to file a claim, there exist loss states in which the insurer does not need to pay. Denote by c the expected cost of insuring someone with a given budget risk $F(x)$. Then it is straightforward that

$$c = \pi(1-\delta)(p-d). \tag{7}$$

We proceed with the calculation of the extent of crowding-out under the correct counterfactual.

3 Crowding-out

To appropriately measure the extent of crowding out, we need to compare the willingness-to-pay for an insurance contract when Medicaid is absent $\bar{w}$ with the willingness-to-pay when Medicaid is present $\tilde{w}$ given that *in both cases* the individual faces a budget risk.

Proposition 1. *The presence of Medicaid changes the willingness-to-pay for insurance by*

$$\bar{w} - \tilde{w} = -\pi \left[(\rho - \delta)(V - p) + \int_d^p (F(x) - \delta) dx \right] \leq 0. \tag{8}$$

Most notably, since $\bar{w} - \tilde{w} \leq 0$, there is indeed crowding-out. However, the extent of crowding-out is substantially different from the prediction of $-\pi \int_d^p F(x)dx$ that neglects the budget risk. It is larger to the extent that Medicaid replaces the access value $(\rho - \delta)(V - p)$ that is provided by private insurance in the regime without Medicaid. At the same time the budget risk lowers the extent of crowding-out as the benefits of private insurance are replaced by Medicaid only in the cases in which (a) the insuree is eligible for Medicaid ($x < p$) and (b) the private insurance actually pays benefits ($x > d$). Acknowledging the latter has a major impact on the prediction for whom crowding-out is relevant. Crowding-out is negligible for the very rich since their budget risk is negligible, $\rho \approx \delta \approx 0$, and thus they are unlikely to ever receive Medicaid payments. In addition, crowding-out is also negligible for the very poor since $\rho \approx \delta \approx 1$, and this is the very group for which crowding-out is typically predicted to be the largest. However, the very poor are unlikely to ever receive insurance payments as this requires deductible payments that are beyond their means. Straightforwardly, Medicaid cannot replace insurance benefits that do not exist in the first place. Hence, government assistance cannot crowd-out a non-existent demand for private insurance of the very poor. The largest effect of Medicaid is thus present for those who are most likely able to pay the deductible but unable to pay the full cost of LTC, i.e. those for whom $(\rho - \delta)$ is the largest.

A major part of crowding-out stems from Medicaid replacing the access value $(\rho - \delta)(V - p)$ of insurance. This reduces customers' willingnes-to-pay for private insurance. At the same time, Medicaid eliminates the claim risk. To act as secondary payer, Medicaid ensures that every insuree who is in need indeed makes a claim by providing the necessary funds if the insuree cannot afford the deductible that is necessary to make a claim. This raises the insurer's cost from $c = \pi(1 - \delta)(p - d)$ to $\tilde{c} = \pi(p - d)$ above the remaining willingness-to-pay. The presence of Medicaid thus changes both demand of supply of LTC insurance, leaving little gains from trade in the market.

I conclude that the extent of crowding-out of insurance demand changes substantially if one considers the appropriate benchmark. The major source of crowding-out stems from replacing a potential access value of private insurance and not from duplicating potential insurance benefits. Yet, it is important to keep in mind that ensuring access to LTC is exactly the reason for Medicaid to exist. Any welfare comparison of government assistance to market provision should thus reflect the extent to which a private insurance market is able to provide this access value.

4 On the Value of Medicaid

Brown and Finkelstein (2008) and Brown and Finkelstein (2011) argue that, in addition to crowding out demand for private insurance, Medicaid itself provides little value as it offers only very limited value as a consumption-smoothing device. That argument is perfectly valid and could imply severe welfare consequences of Medicaid crowd-out. If Medicaid crowds out demand for private insurance, while insufficiently replacing it, then the presence of the government assistance program has severe welfare implications. However, this argument rests on the assumption that consumption-smoothing across states is the only value that insurance and also Medicaid can provide. This reflects the standard view of economists on the value of insurance being based on risk aversion, i.e. a preference for smoothing consumption across states. However, it is a misguided critique since Medicaid is not even intended to serve as a consumption-smoothing device. It is intended to grant those people access to LTC who cannot afford it. This access value is the value provided by Medicaid. If we want to understand why insurance uptake is low, and whether private insurance could be a superior means to finance LTC than government assistance, we have to ask whether private insurance can do a better job in providing this access.

Suppose there is a population of individuals each described by a type t that describes its budget risk $F_t(x)$. The share of people of type t is given by s_t, with $\sum_t s_t = 1$. Each individual faces the same probability π with which it will need LTC. In case of need, LTC provides a value V and is available at a price $p < V$. Then it can be shown that the access value provided by a private insurance market falls short of the access value that is provided by Medicaid.[13]

Proposition 2. *The welfare benefit created through Medicaid by providing access to long-term care exceeds the benefit that can be created by private insurance unless*

(a) private insurance provides full coverage, $d = 0$, and

(b) everyone can afford full insurance.

Private insurance can provide the access value that is created by Medicaid only if there is no deductible, and, hence $\delta_t = 0$, $\forall t$. Any significant deductible produces a claim risk, i.e. the possibility that someone in need is denied access to care due to insufficient financial means. Hence, if a private insurance system is to guarantee access it must offer (close to) full coverage. Unfortunately, private insurance offering full coverage can provide this access value only if everyone is able to actually pay the premium for full coverage. Given the expected cost of LTC this is hardly the case for households with low or even medium income. In contrast, if the private insurance market only serves those who can afford the premium, it excludes the very types for whom the access value is highest, i.e. the types who are most likely in need of financial assistance when they need LTC. A public insurance program such as Medicaid does not face such a dilemma for it can use means of redistribution to make sure everybody has access to some minimum level of LTC.

This points to an alternative explanation why demand for private insurance is low. If the primary motive for buying insurance for LTC is the access motive, then insurance provides only little value if Medicaid replaces that value. However, removing Medicaid would only increase

[13] This analysis abstracts from any deadweight loss of redistribution, or other transaction cost of either public or private insurance provision. While these are certainly relevant, I want to focus on the simple question whether private insurance can replace Medicaid in providing access to LTC.

private demand for insurance if people can actually afford the premia as well as the deductible payments. If that is not the case then the removal of Medicaid does little to boost insurance uptake. If budget constraints matter both at the time of insurance purchase and at the time of LTC need, then people face a rather unattractive choice set. The insurance policies that offer a high access value by specifying a low deductible are unaffordable, while those policies that are affordable due to a low deductible have little to no value. In the next section, I argue that this inhibits demand even among those who do not qualify for Medicaid.

Summing up, I argue that the value provided by Medicaid is the value of ensuring access to LTC for those who cannot afford it. A private market can only ensure this value if (a) it provides full coverage, and (b) premia are heavily subsidized such that everyone can afford private insurance. In conclusion, the crowding-out by Medicaid cannot be considered welfare-decreasing as it provides a superior access value.

5 Asset protection

One of the most frequently-cited arguments for middle- to high-income individuals in favor of buying LTC insurance is its value in protecting the insuree's assets such as a house or a certain bequest level.[14] I want to show that due to benefits being paid conditionally, there can be little incentive to purchase private insurance even for people who do not qualify for government assistance. Denote by A the utility of owning the asset, e.g. a house, net of its market value (i.e. its value net of the opportunity cost of selling it in the market). Without loss of generality, I normalize the market value of the asset to zero. I can now reinterpret $F(x)$ as the probability distribution over the liquid assets of the individual, or the probability with which an individual is unable to make a payment of size x without selling the asset. Then the utility from not buying insurance is given by

$$\mathbb{E}[u_0] = (1-\pi)A + \pi\left[(1-\rho)(A+V-p) + \rho \max\left\{A, V-p\right\}\right]. \tag{9}$$

[14] There are several other valid motives for buying LTC insurance, e.g. the reception of care that is superior to the one provided through Medicaid. Here, I focus on the motive of asset protection for two reasons. First, survey evidence suggests it to be among the top if not to be the top reason for buying insurance among actual purchasers of insurance (AHIP (2012)). Second, the simple model of access is easily adapted to model the motive of asset protection allowing for several interesting comparative statics.

In contrast, the utility from buying insurance is given by

$$\mathbb{E}[u_i] = (1-\pi)A + \pi\left[(1-\delta)(A+V-d) + \delta \max\{A, V-d\}\right] - w. \tag{10}$$

This yields the following willingness-to-pay:

$$\bar{w} = \pi\left[(p-d) + \rho \min\{A, V-p\} - \delta \min\{A, V-d\}\right]. \tag{11}$$

Since $p \geq d$, this allows a distinction of three cases. In case 1, $A \geq V-d \geq V-p$. Keeping the asset is paramount to the individual. In the event of needing LTC, he will forgo it if the deductible payment requires him to sell the asset, i.e., $x < d$. In case 2, $V-d > A \geq V-p$. The net value of LTC, $V-d$, is sufficiently large that he sells the asset of this is required to pay the deductible. However, the individual forgoes LTC if he has to pay the whole cost p. Finally, in case 3, $V-d \geq V-p > A$. In this case, the necessity for LTC is paramount. If acquiring LTC requires the sale of the asset, the individual does so.

In case 1, the insuree faces a claim risk. When keeping the asset is paramount, the insuree refrains from filing a claim when this requires giving up the asset, which happens with probability $\delta = F(d)$. In the other two cases, there is no claim risk. The insuree files a claim whenever in need of LTC. The actuarially-fair value of the insurance policy thus differs between case 1 and cases 2 and 3:

$$c = \pi\left[(p-d) - \mathbb{1}_{\{A \geq V-d\}}\delta(p-d)\right]. \tag{12}$$

In addition, the model predicts private insurance to create gains from trade in cases 1 and 3, i.e. to always have a value beyond its expected cost. When asset protection is paramount (case 1), it ensures access to LTC. When receiving LTC is paramount (case 3), it protects the insuree's asset value A. In that way, insurance can indeed have a value beyond the actuarial value for people that are concerned about protecting their assets.[15] Unfortunately, this does not necessarily translate into a high insurance take-up as gains from trade decrease rapidly with rising.

Proposition 3. *A deductible of size d reduces the value of insurance to a risk neutral individual by an amount strictly larger than πd. The gains from trade, as measured by the value of insurance*

[15] In case 2, the value of insurance $\bar{w}$ can fall below its actuarially fair value due to moral hazard. This happens if and only if $\rho(V-p) < \delta A$ holds.

above its actuarially fair value, vanish as $F(d) \to F(p)$. This implies that the most affordable policies offer little value, while the most valuable policies are the least affordable.

In all three cases, the value of insurance strongly decreases when a deductible is imposed. This is because a deductible can require a payment that is beyond the insuree's liquid means. If asset protection is paramount (case 1), then this means the insuree refuses to make a claim for that would require to loose the asset. In not making a claim, he forgoes both the value of LTC and the reception of any benefit payment, as the latter is conditional on filing a claim. As a result, the gains from trade $\bar{w} - c = \pi(\rho - \delta)(V - p)$ are largest for low deductibles. The same is true for someone who prefers to give up the asset if the deductible payment requires it (cases 2 and 3). The larger the deductible, the larger the probability δ that he has to give up the asset despite having insurance. In sum, the value of insurance is strongly decreasing in the deductible d in all three cases. However, $\bar{w}$ represents what a person is willing to spend, independent of what he is able to spend. If budget constraints limit a person's ability to spend on an insurance policy, then not all trades are actually feasible. If income constraints at the time of insurance purchase rule out trade of all but high-deductible plans, even a medium-income household can face an unattractive set of insurance options. The only policies that are affordable prescribe a very high deductible and therefore have little value beyond the actuarially fair payment. At the same time, the policies that actually offer a significant value - as they have a low deductible - are simply unaffordable. Note that this is in direct contrast to the predictions based on risk aversion as the only/main insurance motive. Under risk aversion, people derive a significant value from policies even if they offer incomplete coverage. In fact, the incremental value of insurance decreases as coverage becomes more complete.[16] If, in contrast, people face budget constraints and insurance payments are conditional, people can attribute close to no value to incomplete coverage.

There is nothing new about goods and services being more expensive when they are more costly. It is important to note, however, that the value of insurance can decrease much stronger in the deductible than the cost of insurance. This means that the value of a medium-deductible policy can already be close to its actuarially fair price (in case 2, it may even fall below the actuarially fair price due to moral hazard). If insurance companies need to charge a positive loading factor to cover administrative cost, the price of insurance is beyond its value. At the same time, the

[16]Note that under risk aversion, the value that an individual attributes to insurance beyond its actuarially fair value, commonly called the risk premium, approaches zero if and only if $d \to p$. Once people face a budget risk, this latter condition is sufficient but no longer necessary for them to see little value in insurance.

policies that specify a low deductible (or no deductible) are quite expensive. Even if they are worth the price, they are likely beyond the financial capabilities of a majority of households. The reason for low uptake is thus quite simple: while the affordable policies have (close to) no value, the valuable policies are simply unaffordable.

The model can thus explain why take up of private LTC insurance is low even for middle-income households that do not qualify for Medicaid (without spending down a large amount of their wealth). The major culprit for low uptake is then the unattractive set of insurance choices, not the presence of Medicaid. Consistent with this, 91% (87%) of people surveyed on obstacles for insurance uptake pointed at the cost of LTC insurance as a major obstacle in 1990 (2010).[17]

Lapsing Behavior

The simple model presented here may also help to understand lapsing behavior, i.e., why people stop paying insurance premia. Finkelstein, McGarry, and Sufi (2005a) find that people who lapse on paying for insurance have a median income of $28,150 and a median net worth of $126,000 as compared to a median income of $39,000 and a median net worth of $218,000 among those who do not lapse. This is well in line with people learning about their budget risk $F(x)$, in particular about their risk $F(d) = \delta$ of either not being able to file a claim if they want to keep their home or losing their home despite having insurance. In addition, the model predicts nursing home use among people for whom asset protection is paramount (case 1) to decline in the risk δ. Thus, the model may contribute to understanding the finding of Finkelstein, McGarry, and Sufi (2005b) that people who lapse have a lower tendency to make use of LTC, beyond their explanation based on learning about one's risk π of needing LTC. People may also learn that the deductible payment would require them to give up the asset that they sought to protect with insurance.[18] In addition to learning considerations, the model can help to understand why lapse rates are particularly high shortly after purchase (Finkelstein, McGarry, and Sufi (2005b)). Following the intuition pronounced in Finkelstein, McGarry, and Sufi (2005b), this could reflect people realizing their purchase decision to be mistaken. The model presented here suggests that there are two salient mistakes one can find out about after purchase. First, people can realize that they chose a policy

[17] See AHIP (2012).

[18] In contrast to the explanation based on learning one's risk π that is proposed in Finkelstein, McGarry, and Sufi (2005b), the model proposed here can also explain the finding by Konetzka and Luo (2011) that lapsing individuals tend to have both poorer health and poorer finances.

that offers high value but is simply beyond their financial means. These are the ones with the lowest deductible and the highest premia. Second, people can realize that they have chosen an affordable policy that has little to no value as it requires a very large deductible in the form of a very long elimination period. Hence, we should see the largest lapse rates on contracts with very short and on those with very long elimination periods. A different way in which people can realize that insurance has little value is by realizing that their budget risk ρ is rather low, i.e. if their financial situation turns out rather good. This can explain why Cramer and Jensen (2007) find that that lapse rates are highest for people with very low and people with very high asset levels.

Adverse Selection on Income

A second barrier to uptake can be gleaned from the model by observing that the positive gains from trade in case 1, $\bar{w} - c = (\rho - \delta)(V - P)$, only realize as long as the premium w is not too large. This requires it to be appropriately adjusted for the individual risk of filing a claim $\pi(1-\delta)$. Contrary to the standard model, this risk reflects both the probability π of needing LTC and the probability $(1-\delta)$ of having the liquid funds necessary to file a claim. While insurers take a lot of effort in adjusting for the first, the second is not a part of LTC insurance pricing. Yet, if premia are insufficiently adjusted for individual risks, a classic problem of adverse selection can occur. With premia reflecting the average claim cost of the insurance pool, lower- and medium-income households, who represent the "good" risks, have an incentive to select out of the market. As a result, the average cost of insurance rises, which, in turn, further increases the incentives for lower income-groups to leave the insurance pool. In consequence, we should see rising premia and a shift in the customer composition towards "bad risks", i.e. high-income households. Such a shift in the customer composition has indeed been observed. AHIP (2012) reports a remarkable shift in the composition between 1995 and 2010. While 29% of insurance buyers had an income of less than $20,000 in 1995, that number has dropped to only 2% by 2010. During the same period of time, the percentage of buyers with more than $50,000 of income increased from 21% to 77%. Such a shift is consistent with adverse selection based on income/wealth, as I point out here. It is also consistent with the previously-mentioned hypothesis that affordability concerns may greatly inhibit demand for private long-term care insurance.

Insurance Behavior based on Marital Status and Gender

Finally, a simple application of the model may help to understand why we see men being willing to pay similar premia as women despite lower usage rates. Consider a couple's valuation for insuring the individual partners. Suppose for simplicity that the couple attributes a similar value to LTC for both partners when a need arises.[19] In contrast, the couple attributes lower value A to keeping the asset (the house) when one of the partners has already passed away. Suppose that A_1 denotes the asset's value when both are still alive and only one needs LTC and let A_2 denote the asset's value when there is no more spouse who still needs the house. For simplicity, assume $A_1 > V - d > V - p > A_2$. Let $\rho_t, \delta_t,\ t = 1, 2$ be the c.d.f. over the couple's budget at the time when both partners are alive ($t = 1$) and when there is only one of the partners left ($t = 2$). Suppose the couple knows with certainty who will live longer. Then the maximal willingness to pay for insuring the shorter-lived partner is given by

$$\bar{w}_1 = \pi \left[(1 - \delta_1)(p - d) + (\rho_1 - \delta_1)(V - p)\right]. \tag{13}$$

In contrast, the maximal willingness to pay for insuring the longer-lived partner is given by[20]

$$\bar{w}_2 = \pi \left[(p - d) + (\rho_2 - \delta_2)A_2\right]. \tag{14}$$

Taking into account that men face a higher probability of still having a living spouse at the time of LTC need, the willingness-to-pay to insure the man is better described by (13) while the willingness-to-pay to insure the woman is better described by (14). This has two implications. First, the model proposes a new reason why men have a lower usage rate than women and why usage rates are lower among married individuals. There is a higher probability for men that there is still a living spouse when they need LTC, and that living spouse may still need the house. Making use of LTC and having to pay the deductible could require the sale of the house. When there is a living spouse, keeping the asset is paramount and the couple rather forgoes LTC for the

[19] This is certainly an oversimplification. The spouse who needs LTC first can receive informal care by the partner. That changes the value V of receiving LTC. This simplification does not change the general argument I seek to make, however.

[20] When it is uncertain ex-ante, who will live longer, then the willingness to pay for insuring one of the partner is a convex combination of the two values, with the respective weights simply being the probability of being the shorter-lived/longer-lived partner.

partner in need than losing the house.[21]

Most notably, despite lower usage rates of men, insuring the man can have a similarly high value to the couple as insuring the woman in the relationship, i.e. $\bar{w}_1 \approx \bar{w}_2$. This is because the value $(\rho_1 - \delta_1)(V - p)$ can be higher than the value $(\rho_2 - \delta_2)A_2$. This has two reasons. The value of keeping the house can have substantially lower value once there is no more living spouse around who needs the house. This means the difference $(V - p) - A_2$ can be quite large. Second, the probability $(\rho_t - \delta_t)$ may be lower when widowed, in particular because the probability δ can be substantially higher in a single-person household.

This analysis formalizes the suggestion by Pauly (1990), p. 161 that "Impoverishing one's spouse [...] seems to be the major fear of many married elderly." Despite being highly stylized, it already fits quite well several empirical observations. First, Cramer and Jensen (2006) find a significantly higher uptake among those who are married and hold assets between \$200,000 and \$1.5 million. Second, the model predicts the usage rate to be lower when the insured is married. While this is also explained by the partner serving as an informal care-giver, this alternative explanation has two caveats. If spouses act as informal care-givers, then married individuals should have a lower tendency to buy LTC insurance, yet we see higher uptake among the married. In addition, those who are deprived of this opportunity for informal care, i.e. divorced and widowed individuals, are actually found to exhibit higher lapse rates (Li and Jensen (2012)). The latter can be explained by the above consideration of the surviving spouse ascribing lower value to protecting the remaining assets and thereby to insurance. It is also consistent with a rising difficulty to afford the insurance premium once a spouse passes away.

6 Conclusion

In this paper, I address the criticism of Medicaid being the prime reason for low insurance take-up while insufficiently replacing the value that private insurance could offer. I argue that this criticism is based on a wrong counterfactual analysis and guided by a wrong understanding of the value of insurance in the context of long-term care insurance. I posit that the value of insurance and the value of a government assistance program such as Medicaid is based on providing access to long-term care to those who cannot afford it. Based on this premise, I show that a private

[21] Note here that the value of insurance does no lie in protecting the asset but in allowing a spouse to receive LTC without loosing the house.

insurance market faces major obstacles in providing an access value that is as high as the one that a government assistance program can create. I further argue that the common practice of insurance benefits being paid conditionally is a major reason why insurance policies can only produce a significant value if they have a sufficiently low deductible. As the size of the deductible is a major determinant of the premium, the low uptake of insurance can be explained by the following dilemma. A household can either choose an affordable policy that has little to no value as its high deductible makes benefit collection unlikely. Alternatively, it can choose a policy that has value as it specifies a low deductible. Yet, due to the high premium of such a policy it is likely to be unaffordable and the household is likely to lapse on it. Thus, the choice set of insurance policies is rather unattractive: either a policy has little value or it is unaffordable.

Despite strong evidence that affordability is a major obstacle for insurance take-up, this issue does not play a prominent role in the current economic literature on LTC insurance. This paper is an attempt to put the topic of affordability (back) on the research agenda. In showing that a highly stylized model can already account for a vast amount of empirical regularities in this market, I hope to underline the large potential for further research on the issue.

The criticism of Medicaid providing little value as an imperfect consumption-smoothing device is a necessary conclusion from the theoretic state-of-the-art that regards risk aversion as the only motive for insurance purchase. While it is certainly an important insurance motive, this should not misguide us to think that it is the only motive that can justify insurance behavior. Nyman (2003) has proposed the access motive as an important alternative motive in circumstances in which the insured service is costly. Long-term care is thus a prime candidate for this motive to be effective. The very existence of a government assistance program that seeks to mitigate problems of access further underlines the importance of this issue. It is not surprising that an economic analysis finds such a program to have little value if the analysis assumes away the very reason of why the program exists. Yet, this does not mean that the program indeed has little value. In this case, it only means that the theory that we use to employ when modeling insurance behavior is not reflecting its true value. In this way, the criticism of Medicaid can serve as an example of how a narrow focus of economic theory can misguide our policy advice.

There are many other insurance markets in which access is a major issue. The U.S. *Affordable Care Act* is an example of a policy that acknowledges problems of access in the health care market. Its explicit goal is to increase insurance take-up as a means to increase access of poor people. In order to keep premia affordable and in order to increase cost-consciousness of consumers, the choice of high-deductible health plans is particularly encouraged. The model suggests an important drawback of such an incentivization. It can lead to poorer people being less able to actually use their health plan once they get sick. In short, the encouragement to buy high-deductible plans may undermine the very intent of the policy to provide poor people with access. There is first anecdotal evidence in support of this prediction.[22] The dilemma of access and affordability that plagues private insurance is thus relevant for other insurance markets as well.

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[22]See Pear (2015) for a *New York Times* article titled "Many say High Deductibles Make Their Health Law Insurance All but Useless". See Jan (2015) for a similar article.

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Appendix

Proof of Proposition 1

The extent of crowding-out can simply be calculated by evaluating the difference $\tilde{w} - \bar{w}$ in the willingness to pay for insurance that the presence of Medicaid produces:

$$\tilde{w} - \bar{w} = -\pi \left[(\rho - \delta)(V - p) + \int_d^p (F(x) - \delta) dx \right] \leq 0. \tag{15}$$

Proof of Proposition 2

Without insurance, and without Medicaid, an individual of type t is able to afford the price p with probability $(1 - \rho_t)$ where $\rho_t = F_t(p)$. Hence, without insurance or Medicaid, welfare, as measured by aggregating utility across types, is given by

$$W_0 = \sum_t s_t \left[\hat{x}_t + \pi(1 - \rho_t)(V - p) \right]. \tag{16}$$

Suppose Medicaid ensures everyone to receive LTC whenever in need by redistributing resources. Then welfare in the presence of Medicaid is given by

$$W_M = \sum_t s_t \left[\hat{x}_t + \pi(V - p) \right]. \tag{17}$$

The value of Medicaid, measured as the dfference $W_M - W_0$, is then exactly the access value $\rho_t(V - p)$ aggregated across types:

$$\text{Value}_M = W_M - W_0 = \pi \sum_t s_t \rho_t (V - p). \tag{18}$$

Suppose that, instead of Medicaid, an insurance specifying a deductible d is offered at an actuarially fair premium. If insurance pays conditionally and *if everyone is able to afford the premium*, then this yields a welfare of

$$W_I = \sum_t s_t \left[\hat{x}_t + \pi(1 - \delta_t)(V - p) \right], \tag{19}$$

with $\delta_t = F_t(d)$ being the probability that an individual of type t is unable to afford the deductible d. This yields a value of insurance of

$$\text{Value}_I = W_{I(c)} - W_0 = \pi \sum_t s_t(\rho_t - \delta_t)(V - p). \tag{20}$$

The comparison ist straightforward:

$$\text{Value}_M \geq \text{Value}_I, \tag{21}$$

with strict inequalities for $0 < d < p$. Also note that any weakening of the assumption that everyone can afford the premium of private insurance further lowers W_I and, thereby, Value_I.

Proof of Proposition 3

I keep distinguishing the three cases:

(1) $A \geq V - d \geq V - p$,

(2) $V - d > A \geq V - p$,

(3) $V - d \geq V - p > A$.

In these cases, the maximum willingness-to-pay for insurance dependent on the deductible size d is given by

(1) $\bar{w}(d) = \pi\left[(1 - \delta)(p - d) + (\rho - \delta)(V - p)\right]$,

(2) $\bar{w}(d) = \pi\left[(p - d) + \rho(V - p) - \delta A\right]$,

(3) $\bar{w}(d) = \pi\left[(p - d) + (\rho - \delta)A\right]$.

The extent to which a deductible of size d reduces the value of insurance can then simply be calculated as the difference $\bar{w}(0) - \bar{w}(d)$:

(1) $\bar{w}(0) - \bar{w}(d) = \pi\left[d + \delta(p - d) + \delta(V - p)\right] > \pi d$,

(2) $\bar{w}(0) - \bar{w}(d) = \pi\left[d + \delta A\right] > \pi d$,

(3) $\bar{w}(0) - \bar{w}(d) = \pi\,[d + \rho(V - p - A) + \delta)A] > \pi d.$

The first two inequalities are straightforward, the third follows from $V - p > A$, which holds in case (3). Hence, in all three cases, the value of insurance to a risk neutral individual decreases by an amount larger than πd.

Consider the value of insurance beyond its actuarially fair value, i.e., the gains from trade,

(1) $\bar{w} - c = (\rho - \delta)(V - p),$

(2) $\bar{w} - c = \rho(V - p) - \delta A,$

(3) $\bar{w} - c = (\rho - \delta)A.$

It is straightforward to see that, as $\delta = F(d) \to \rho = F(p)$, the gains from trade cannot remain positive, which is necessary for trade to occur:

(1) $\lim_{\delta \to \rho}\,[\bar{w} - c] = 0,$

(2) $\lim_{\delta \to \rho}\,[\bar{w} - c] = \delta\,[(V - p) - A] < 0,$

(3) $\lim_{\delta \to \rho}\,[\bar{w} - c] = 0.$

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