Long-term care social insurance. How to avoid big losses?

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Introduction

Long-term care (LTC):

- Care for people who are dependent on the help of others in their basic daily activities (dressing, eating, bathing, etc);
- Can be provided both formally and informally, at home and in special institutions;
- Mainly associated with the elderly (the need is highly related with age);
- "Hot" topic because of current demographic trends (population ageing).

Introduction

- Predicted **increase in the number of dependent old persons** in the EU from 2007 to 2060 (European Commission, 2009):
  - **90%** if age-specific disability rates decline in the future;
  - **115%** if age-specific disability rates remain constant.
- A number of issues:
  - High cost of care:
    - e.g. nursing home stay in the U.S. costs $40 000 - $70 000 per year; average cost in France is around €35 000 per year (Taleyson, 2003);
  - Social trends decreasing family availability;
  - Thin private market;
  - The role of the state is so far modest.
- Two major concerns for policy makers:
  - Providing LTC to those who cannot afford paying for it;
  - Protecting (middle class) elderly from being forced to spend all their wealth on LTC.
    - In the U.S., 5% risk of LTC costs $260 000.

Introduction

- The Dilnot Commission in the UK (2011) proposed a two-tier social program:
  - Means-tested support for those not able to pay for their LTC;
  - For the others, individuals' contribution to their LTC costs should be capped at a certain amount, after which they would be eligible for full state support.
- The second tier is in the spirit of Arrow's (1963) "theorem of the deductible": optimal (private) insurance policy takes the form of 100% coverage above a deductible minimum.
- Drèze et al. (2016): deductible to wealth ratio.
- Our paper explores whether Arrow's theorem applies in social LTC insurance and how such a social policy should be designed (redistributional issues).

The model

- Two types of individuals:
  - type h: high productivity (w_h);
  - type ℓ: low productivity ($w_\ell < w_h$).
- Earnings before retirement: $y_h = w_h \ell_h$ and $y_\ell = w_\ell \ell_\ell$.
- Disutility of labour: $v(\ell_i)$ $(i = h, \ell)$, with $v'(\ell_i) > 0$ and $v''(\ell_i) > 0$.
- Risk of dependence:
  - with prob. π_1: light dependence (LTC needs L_{1i});
  - with prob. π_2: heavy dependence (LTC needs $L_{2i} > L_{1i}$);
  - with prob. $1 - \pi_1 - \pi_2$: no dependence.
- Private LTC insurance: premium $\hat{P}_i$ and reimbursement of fractions $\hat{\alpha}_{1i}$ and $\hat{\alpha}_{2i}$ of LTC needs ($0 \leq \hat{\alpha}_{1i} \leq 1$, $0 \leq \hat{\alpha}_{2i} \leq 1$).
- Individuals arrive to their post-retirement stage with a wealth equal to $y_i - \hat{P}_i$.

The model

- Expected utility of type i ($i = h, \ell$):

$$EU_i = \pi_1 u(c_i^{D_1}) + \pi_2 u(c_i^{D_2}) + (1 - \pi_1 - \pi_2) u(c_i^I) - v(\frac{y_i}{w_i})$$

  where
  $c_i^{D_1} = y_i - \hat{P}_i - (1 - \hat{\alpha}_{1i}) L_{1i}$;
  $c_i^{D_2} = y_i - \hat{P}_i - (1 - \hat{\alpha}_{2i}) L_{2i}$;
  $c_i^I = y_i - \hat{P}_i$
  and
  $\hat{P}_i = \pi_1 (1 + \hat{\lambda}) \hat{\alpha}_{1i} L_{1i} + \pi_2 (1 + \hat{\lambda}) \hat{\alpha}_{2i} L_{2i}$;
  $\hat{\lambda} > 0$: loading cost of private insurance.

- Reduced form of

$$EU_i = u(y_i - s_i - \hat{P}_i) - v(\frac{y_i}{w_i}) + \pi_1 u(s_i - (1 - \hat{\alpha}_{1i}) L_{1i}) +$$

$$+ \pi_2 u(s_i - (1 - \hat{\alpha}_{2i}) L_{2i}) + (1 - \pi_1 - \pi_2) u(s_i)$$

The *laissez-faire*

- Individual i ($i = h, \ell$) chooses his labour supply ℓ_i (or, equivalently, his earnings y_i) and an insurance policy characterized by a premium $\hat{P}_i$ and insurance rates $\hat{\alpha}_{1i}$ and $\hat{\alpha}_{2i}$.
- Following Drèze and Schokkaert (2013), we show that the equilibrium insurance policy is in line with Arrow's theorem of the deductible.

The *laissez-faire*

- Either $\hat{\alpha}_{1i} = 0$ or $(1 - \hat{\alpha}_{1i})L_{1i} = \hat{D}_i$

and

- Either $\hat{\alpha}_{2i} = 0$ or $(1 - \hat{\alpha}_{2i})L_{2i} = \hat{D}_i$
- We can thus write:

$$\hat{\alpha}_{1i} = max\left[0; \frac{L_{1i} - \hat{D}_i}{L_{1i}}\right]$$

and

$$\hat{\alpha}_{2i} = max\left[0; \frac{L_{2i} - \hat{D}_i}{L_{2i}}\right]$$

$\Rightarrow$ Arrow's theorem of the deductible.

The *laissez-faire*

Comparative statics with respect to a change in w_i:

- Earnings y_i always increase when w_i increases.
- The change in $\hat{D}_i$ depends on the absolute risk aversion (ARA) exhibited by the utility function:
  - $\hat{D}_i$ is increasing in w_i under decreasing absolute risk aversion (DARA);
  - $\hat{D}_i$ is decreasing in w_i under increasing absolute risk aversion (IARA);
  - $\hat{D}_i$ is constant in w_i under constant absolute risk aversion (CARA).
- Intuition:
  - DARA (resp. IARA and CARA): ARA decreases (resp. increases and remains constant) when wealth increases.
  - An increase in w_i increases wealth $\Rightarrow$ under DARA (resp. IARA) people become less (resp. more) risk averse and so require less (resp. more) insurance, i.e. a higher (resp. lower) deductible.

The *laissez-faire*

- Choices are made separately by each type of individuals $\Rightarrow$ no redistribution between the two types.
- The government might be able to provide insurance at a lower cost than private insurers.
  $\Rightarrow$ Optimal scheme of social LTC insurance?

Social insurance

- Individuals pay premiums P_i $(i = h, \ell)$.
- The government covers a fraction α_{1i} $(i = h, \ell)$ of the needs in state 1 and α_{2i} $(i = h, \ell)$ in state 2 $(0 \leq \alpha_{1i} \leq 1$ and $0 \leq \alpha_{2i} \leq 1$).
- Insurance is not costless for the government, but loading costs might be lower than for private insurers: $\lambda \leq \hat{\lambda}$.
- Two cases:
  - Both types of individuals have the same LTC needs ($L_{1h} = L_{1\ell} = L_1$ and $L_{2h} = L_{2\ell} = L_2 > L_1$);
  - Type h has higher needs ($L_{1h} > L_{1\ell}$ and $L_{2h} > L_{2\ell}$).

Identical needs: First-best

- The government has full information (can observe the type of an individual).
- The government maximizes (utilitarian) social welfare:

$$SW = \sum_{i=h,\ell} n_i \left[\pi_1 u(c_i^{D_1}) + \pi_2 u(c_i^{D_2}) + (1 - \pi_1 - \pi_2) u(c_i^I) - v(\frac{y_i}{w_i}) \right]$$

where
$c_i^{D_1} = y_i - P_i - D_{1i}$;
$c_i^{D_2} = y_i - P_i - D_{2i}$;
$c_i^I = y_i - P_i$.

- Resource constraint:

$$(1 + \lambda) \sum_{i=h,\ell} n_i \left[\pi_1 (L_1 - D_{1i}) + \pi_2 (L_2 - D_{2i}) \right] \leq \sum_{i=h,\ell} n_i P_i$$

Identical needs: First-best

- As long as $\lambda > 0$, optimal social insurance features a deductible.
- At the optimum:
  - $\ell_h > \ell_\ell$;
  - $y_h - P_h = y_\ell - P_\ell$ and $D_h = D_\ell$, i.e. wealth levels of the two types are equalized in each state. (Not achieved in the *laissez-faire* where type h always has a higher wealth).
- Decentralization:
  - If $\lambda < \hat{\lambda}$: social insurance.
  - If $\lambda = \hat{\lambda}$: either social insurance or lump-sum transfers from h to ℓ and insurance on the private market (individual insurance choices are efficient).

Identical needs: Second-best

- The government cannot observe the type of an individual (observes y_i but not w_i and ℓ_i).
- Self-selection: need to make sure that h will not mimic ℓ.
- Second-best optimal allocation:
  - Downward distortion of type $\ell's$ labour supply;
  - Informational rent left to type h (redistribution is incomplete);
  - Insurance tradeoffs are not distorted.
- As long as $\lambda > 0$, optimal social insurance features a deductible.
- Optimal deductibles D_h and D_ℓ are now not necessarily equal as in the first-best (due to incomplete redistribution); e.g.:
  - $D_h > D_\ell$ with $u(x) = lnx$ (DARA);
  - $D_h = D_\ell$ with $u(x) = -e^{-x}$ (CARA).
- If $\hat{\lambda} = \lambda$, insurance can be left to the private market without interference with individual choices; only need a non-linear income tax with a marginal tax for type ℓ (in line with Atkinson and Stiglitz, 1976).

Different needs

- Assume that type h has higher needs: $L_{1h} > L_{1\ell}$ and $L_{2h} > L_{2\ell}$ (more "spoiled", needs more comfort, etc).
- Position of the government:
  - Recognizes all the needs as legitimate (no paternalism);
  - Paternalism: considers the needs of type h as a caprice and recognizes only a certain level of "legitimate" needs ($\bar{L}_1 = L_{1\ell}$ and $\bar{L}_2 = L_{2\ell}$).

No paternalism

- Second-best: The government cannot observe not only w_i and ℓ_i but also true LTC needs.
  - Can observe the severity level of dependence but not the true needs that an individual has at this severity level.
- If type h wants to mimic type ℓ, he has to accept that his insurance will be based on the needs of type ℓ.
- Insurance distortions for type ℓ:
  - Downward distortion of insurance coverage;
  - Generally no longer optimal to have a state-independent deductible for type ℓ. Instead: different deductible at each dependence level:
    - ⋆ $D_{2\ell} > D_{1\ell}$ if the difference between the needs of type h and type ℓ is larger in state 2 than in state 1 (i.e. if $L_{1h} - L_{1\ell} < L_{2h} - L_{2\ell}$);
    - ⋆ $D_{2\ell} < D_{1\ell}$ if the difference between the needs of type h and type ℓ is larger in state 1 than in state 2 (i.e. if $L_{1h} - L_{1\ell} > L_{2h} - L_{2\ell}$).

Paternalism

- The government considers only the "legitimate" needs.
- "Mismatch" between type $h's$ and socially optimal tradeoffs already in the first-best.
- Paternalism "softened" in the second-best:
  - Better coverage for type h against the legitimate needs;
  - Better balance between type $h's$ wealth levels in the two dependence states (state-dependent social insurance deductibles):
    - ⋆ Social insurance deductibles $D_{2h} < D_{1h}$ if the difference between the needs of type h and the legitimate needs is larger in state 2 than in state 1 (i.e. if $L_{1h} - \bar{L}_1 < L_{2h} - \bar{L}_2$);
    - ⋆ Social insurance deductibles $D_{2h} > D_{1h}$ if the difference between the needs of type h and the legitimate needs is larger in state 1 than in state 2 (i.e. if $L_{1h} - \bar{L}_1 > L_{2h} - \bar{L}_2$).
- For type ℓ, same distortions as with no paternalism.

Summary table

	Same needs
FB	Same deductible across individuals and states of nature.
SB	Same across states of nature and across individuals with CARA.

	Different needs. No paternalism
FB	Same as above.
SB	$D_{1h} = D_{2h} = D_h$;
	$D_{1\ell} < D_{2\ell}$ if needs gap is higher in state 2;
	$D_h < D_{1\ell}$ or $D_{2\ell}$ with CARA.

	Different needs. Paternalism
FB	Same social insurance deductible across individuals and states of nature,
	but h effectively faces a higher (possibly state-dependent) deductible.
SB	Social insurance deductibles $D_{2h} > D_{1h}$ if needs difference is higher in state 1;
	Social insurance deductibles $D_{1h} < D_{1\ell}$ and $D_{2h} < D_{2\ell}$ with CARA,
	but h might effectively face a higher deductible than ℓ
	(due to additional needs not covered by social insurance).

Conclusions

- The paper studies the design of optimal social LTC insurance which would address the concern of people being forced to spend all their wealth on LTC.
  - Explores the idea of capped spending in the spirit of Arrow's (1963) theorem of the deductible.
- As long as insurance provision is not costless for the government, optimal social LTC insurance features a deductible.
- Optimal deductibles for high and low productivity individuals are not always the same:
  - Presence or not of insurance distortions;
  - Differences in absolute risk aversion coming from differences in wealth.
- With identical needs and optimal non-linear taxation of earnings, socially optimal insurance does not interfere with individual choices.
- With different needs, interference with individual insurance choices is required and it might be optimal to have state-dependent deductibles.

Conclusions

- Open questions:
  - Difference in dependence probability (higher for the poorer);
  - Moral hazard;
  - Myopia;
  - Treatment of the very poor.