Discussion on the paper "Eliciting preferences for long-term care insurance in Thailand: a discrete choice experiment"

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PIER Research Workshop
June 21-22, 2018

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The research question

Do people want a long-term care insurance?

What type of the insurance they want?

And how much they are willing to pay for it?

- These questions are very important for healthcare policymakers
- Nice review on the background and what other countries have done

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How the paper tries to answer these questions

- Uses a *stated-preference* method (that's involved a lot of work)
- Estimates *three consumer choice models*
- Derive mean willingness to pay for each feature of the program

Conclude that the total premium that the working-age population is willing to pay to receive the long-term care insurance is 4,285 Baht/year and recommend a universal program with a unified premium rate

A Stated Preference Method

- A common approach to assess demand (public's preference) for goods which are not (or not yet) bought and sold in the market.

- Still face criticism from many economists by their hypothetical nature
  (just get it done, strategic answer, misinterpret some attributes, etc.)

- Need to make the survey incentive compatible (Carson and Groves, 2007)
  People would tell the truth if they believe
  - their response might influence the actions taken by the government
  - the scenario described is plausible

Attribute	Choice 1	Choice 2	Choice 3
a) Provide home care products and assisted devices	Yes	No	Neither choice 1 nor choice 2
b) Provide care manager visit	No	Yes	
c) Government shares some percentage of the caregiver cost	25% of caregiver cost or 20,250 THB per year for housebound elderly 45,000 THB per year for bedridden elderly	50% of caregiver cost or 45,000 THB per year for housebound elderly 90,000 THB per year for bedridden elderly	
d) Provide daycare service for the elderly	Yes	No	
e) Annual premium	300 THB	1,000 THB	
I choose	☐	☐	☐

The hypothetical choice set

Did the respondents understand:

- at which age they will be eligible to claim the LTCI?
- if the program starts when they are 30, they will have to pay the premium every year until age 60?

The discussion about the choice models

Some discussion on econometric models are a bit unclear.

"...we rejected the IIA hypotheses... It suggested that attribute weights may vary with respondent characteristics. We then used a more flexible approach... G-MNL, developed by Fiebig et al. (2010). The utility weights were assumed to be random coefficients that varied over respondents

The Random Utility Model : $U_{njt} = \boldsymbol{\beta}_n \boldsymbol{X}_{njt} + \varepsilon_{njt}$

$$U_{n,1,t} = \beta_{1n} devices_{n,1,t} + \beta_{2n} visit_{n,1,t} + \cdots + \beta_{5n} premium_{n,1,t} + \varepsilon_{n,1,t}$$
$$U_{n,2,t} = \beta_{1n} devices_{n,2,t} + \beta_{2n} visit_{n,2,t} + \cdots + \beta_{5n} premium_{n,2,t} + \varepsilon_{n,2,t}$$
$$U_{n,3,t} = \varepsilon_{n,3,t}$$

$$prob(n\ chooses\ option\ 1\ in\ choiceset\ t) = prob(U_{n1t} > U_{n2t}\ and\ U_{n1t} > U_{n3t})$$
$$= prob(\beta_n X_{n1t} + \varepsilon_{n,1,t} > \beta_n X_{n2t} + \varepsilon_{n,2,t}\ and\ \beta_n X_{n1t} + \varepsilon_{n,1,t} > \varepsilon_{n,3,t})$$

Different distributional assumptions on $\boldsymbol{\beta}_n$ and $\{\varepsilon_{njt}\}$ imply different choice models

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Different distributional assumptions on $\boldsymbol{\beta}_n$ and $\{\varepsilon_{njt}\}$ imply different choice models

conditional logit model : $\boldsymbol{\beta}_n = \boldsymbol{\beta}$ and $\{\varepsilon_{njt}\} \sim i.i.d.$ across n, j, t

nested logit : $\boldsymbol{\beta}_n = \boldsymbol{\beta}$ but $\{\varepsilon_{njt}\}$ *are not* $i.i.d.$,
choices in the same "nest" are more correlated

mixed logit, G-MNL
latent class,
mixture-of-normal MNL : $\boldsymbol{\beta}_n$ follows certain distributions
some consumers like some attribute more

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- rejecting IIA (prefer nested logit) :
  some choices are more similar (but unobserved to econometrician)
- observed heterogeneity :
  can be built in to all models by interacting respondent characteristics with attributes
- random coef. model :
  model to capture unobserved heterogeneity

From coefficient estimates to assess potential demand

- Predict market shares and simulate how they change when an attribute changes
- Compare changes in social welfare with various policy options
- Deriving marginal willingness to pay (WTP) for each attribute

This paper picks the last approach and report the average WTP.

Assumption underlying the WTP calculation

$$V_{njt} = \beta_{n1} devices_{n,j,t} + \beta_{n2} visit_{n,1,t} + \cdots + \beta_{n5} premium_{n,1,t}$$

Holding utility constant, how much a consumer is WTP for an attribute (say, assisted devices)

$$\beta_{n1}[devices_{n,1,t} = 0] + \beta_{n2} visit_{n,1,t} + \cdots + \beta_{n5} \text{premium}^{\,0} = \bar{v}$$
$$\beta_{n1}[devices_{n,1,t} = 1] + \beta_{n2} visit_{n,1,t} + \cdots + \beta_{n5} \text{premium}^{\,1} = \bar{v}$$

If other attributes are constant,

marginal WTP $=$ premium ^{1}- premium ^{0} $= -\beta_{n1} / \beta_{n5}$

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Note: Some researchers suggested reparameterizing the model and specifying the distribution of WTP directly (instead of specify the distribution of $\boldsymbol{\beta}_n$) and call that the model in “WTP space”

The policy implication:

Total premium WTP = 4,285 baht/year

Estimated mean willingness-to-pay

	G-MNL	
	WTP	95% CI
Material	1098	1034-1162
CM_Visit	851	794-909
CG_Subsidy	2019	1868-2169
Daycare	317	280-354

Total premium WTP = 4,285 baht/year

The total premium calculated by summing all marginal WTPs is likely inaccurate

- When deriving (marginal) WTP, other attributes are assumed to be constant & a choice would be chosen with certainty.
- Options: premium ranges 300-2000.
- Mean WTP doesn't tell us much. May want to look at the whole WTP distribution.

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The policy implication:

Total premium WTP = 4,285 baht/year

- Predicted probability for the insurance with premium = 4000 is only .31

	Option 1 (with LTCI)	Option 2 (No)
Experiment 1	provide device	
	provide manager visit	
	With 25% subsidy for caregiver salary	
	provide daycare	
	Premium = 4000	
Predicted probability	0.31	0.69

Note: market shares are simulated from the estimated coefficients of CL.

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	Option 1 (with LTCI)	Option 2 (No)
Experiment 1	provide device	
	provide manager visit	
	With 25% subsidy for caregiver salary	
	provide daycare	
	Premium = 4000	
Predicted probability	0.31	0.69
Experiment 2	Increase the subsidy for caregiver to 50%	
Predicted probability	0.42	0.58
Experiment 3	Reduce premium to 2000	
Predicted probability	0.72	0.28

Note: market shares are simulated from the estimated coefficients of CL.

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The policy implication:

"recommend that public provision of a LTCI program be universal & a unified premium rate"

Why do recommend so? Would like to see a deeper discussion on plausible options

- May want to calculate social welfare changes for various policy options

  social welfare change = changes in consumer surplus *from everyone*

  + change in total revenue - change in total cost

- Clear evidence that people have heterogeneous preference for LTCI.

	Conditional logit	Nested logit	Gen. MNL
BIC	29030	29062	**23545**

Availability of multiple products are likely increase total consumer surplus.
But would that be possible to implement?