Self-Control Preferences and the Pension Means Test

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Outline

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2. Means testing and Self-control
3. OLG Model
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What are Self Control Preferences?

A story

A guest asks their host to only offer them fruit at dessert time and not to offer cake.

The host fails to heed this instruction and offers the guest a choice of cake and fruit.

The guest then chooses to have cake for dessert instead of fruit.

What are Self Control Preferences?

- Developed by Gul and Pesendorfer (2001, 2004)
- Household utility
  - commitment utility function
  - temptation utility function
- Agents are tempted to deviate from the optimal long run choice by alternatives that provide more immediate gratification.
- There is a cost to exercising self control.

What are Self Control Preferences?

$$U = \max_{\{c \in C\}} \{u(c) + v(c)\} - \max_{\{\tilde{c} \in C\}} \{v(\tilde{c})\}$$

What are Self Control Preferences?

$$U = \max_{\{c \in C\}} \left\{ \underbrace{u(c)}_{\substack{commitment \\ utility}} + \underbrace{v(c)}_{\substack{temptation \\ utility}} \right\} - \underbrace{\max_{\{\tilde{c} \in C\}} \{v(\tilde{c})\}}_{\substack{temptation \\ penalty}}$$

Note that $v(c) - \max_{\{\tilde{c} \in C\}} \{v(\tilde{c})\} \leq 0.$

This is the cost of exercising self control

Intertemporal Self Control Preferences

- We are often interested in how SC preferences affect intertemporal decision making.
- SC preferences are a form of present bias. Households are tempted to consume more and save less than otherwise
- Saving is costly, since the agent must exercise self control to not consume all their wealth.
- Intertemporal value function with self control preferences:

$$V(x) = \max_{\{c,c'\}}\{u(c) + v(c) + \beta V(x')\} - \max_{\{\tilde{c}\}}\{v(\tilde{c})\}$$

Means Testing and Self Control

Means testing the age pension has both costs and benefits compared to a universal pension

- A means tested pension is more targeted and less costly than a universal pension
- Means testing can distort household behaviour.

Self control preferences can affect this trade off. If households have self control preferences:

- The cost savings from means testing the pension may be smaller than otherwise predicted
- Saving for retirement is costly for a household with self control preferences

OLG Model

I develop an overlapping generations (OLG) model for a small open economy to examine the effect of means testing the age pension when households have these self-control preferences.

I aim to answer two main questions:

- How do households with self-control preferences respond to changes in the taper rate of a means tested pension?
- How does the presence of self control preferences affect the optimal taper rate on a means tested age pension

OLG Model Overview

- Household choose their consumption and leisure each period to maximise lifetime utility subject to a budget constraint
- Households are assumed to have self control preferences and will be tempted to consume all of their accumulated savings each period.
- There is a publicly funded income-tested pension available to older households. The pension level is held constant throughout, but different taper rates are considered.
- Retirement choice is endogenous.

Model: Demographics and Household Sector

- Agents enter the model at age 21 by forming single person households, and live up to the age of 90.
- Agents face uncertain lifespan, with survival probabilities based on ABS life tables.
- Households have 1 unit of time each period, that they can allocate between leisure and labour.
- Wages are based on labour productivity, which depends upon an agent's age, education type and a persistent idiosyncratic shock.

Model: Household Sector

Households at age j have the following value function:

$$V_j(x) = \max_{\{c_j, l_j\}} \{u(c_j, l_j) + v(c_j) + \beta V_{j+1}(x')\} - \max_{\{\tilde{c}_j\}} \{v(\tilde{c}_j)\}$$

Households are tempted to consume their entire savings each period. The temptation function is:

$$v(c_j) = \lambda u(c_j, l_j)$$

where λ is a coefficient representing the intensity of the temptation.

Model: Production and Foreign Sectors

- There is a representative firm that uses labour and capital to produce a single good using a Cobb-Douglas production function with constant returns to scale
- The firm is a price taker with respect to labour and capital.
- The domestic interest rate is fixed at the world rate, with the supply of foreign capital adjusting to ensure that supply of capital equals demand for capital.

Model: Government Sector

The government pays an age pension to households over the age of 67, subject to an income test.

$$P = \begin{cases} P^m & if\ y < y_1 \\ P^m - \phi(y - y_1) & if\ y_1 \leq y < y_2 \\ 0 & if\ y \geq y_2 \end{cases}$$

P^m - Maximum pension ϕ – taper rate

y_1, y_2 - threshold income for receiving full/any pension

The government collects a consumption tax and a progressive income tax to keep its budget in balance:

Model: Equilibrium Conditions

- Households choose consumption, savings and leisure to maximise their expected lifetime utility, subject to their budget constraint and taking the wage rate and interest rate as given
- Firms choose a mix of capital and labour each period to maximise profits, taking the wage rate and interest rate as given
- Government chooses a schedule of income tax rates to balance the budget given their other policy settings
- The current account is balanced, with foreign assets adjusting so that the domestic interest rate is equal to the world rate
- Goods and factor markets clear

Model: Solutions

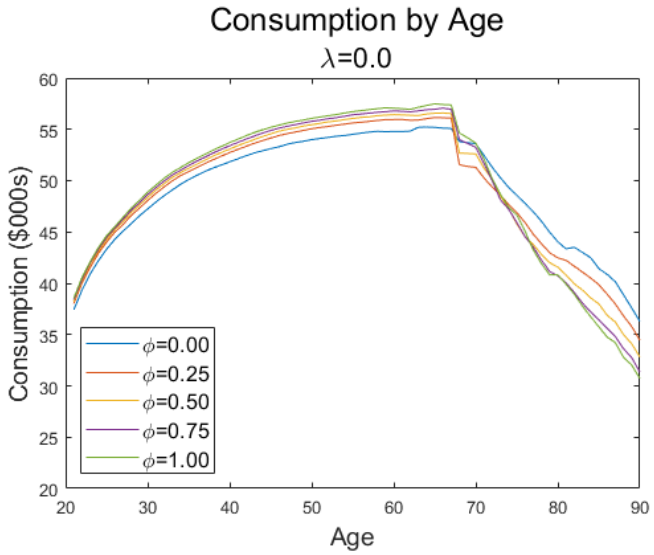
- I find a steady state solution to the benchmark model where $\phi = 0$ (universal pension) and $\lambda = 0$ (no self control costs)
- I then adjust the taper rate (ϕ) and consider the effect on household behaviour and utility
- I repeat the process for counterfactuals where λ increases.

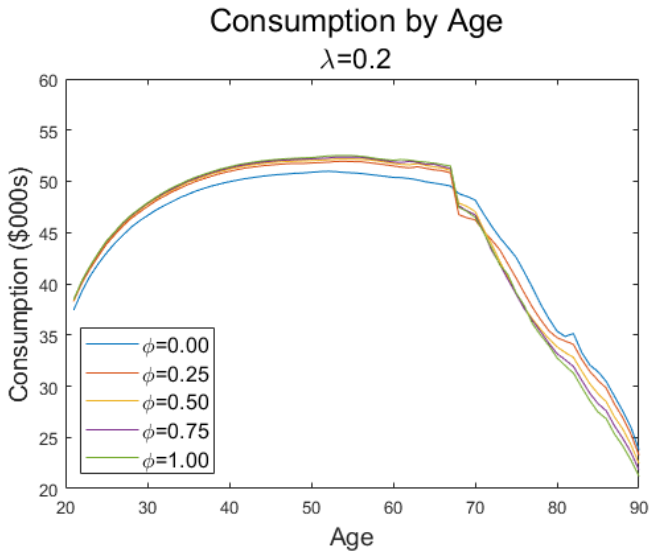
Results: Saving

Table 5: **Average Savings of Households at Age 60**

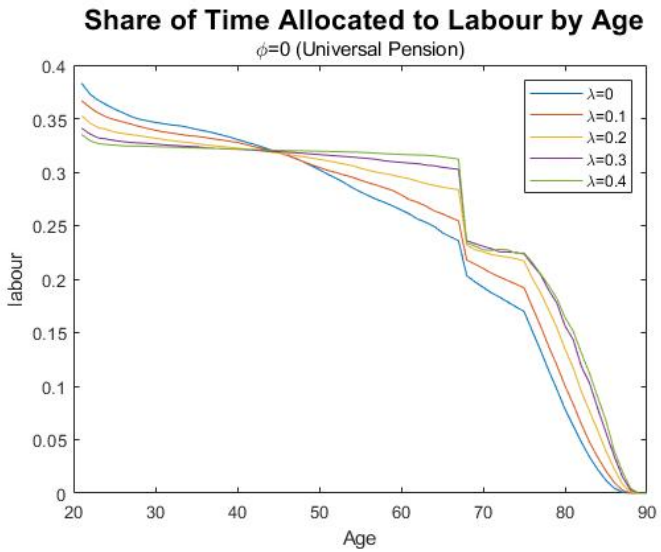
Taper Rate	Temptation Parameter (λ)						
ϕ	0.00	0.02	0.05	0.10	0.20	0.30	0.40
0.00	357.7	346.4	327.1	291.8	187.2	63.7	18.7
0.25	398.2	386.9	368.7	333.5	235.1	91.1	23.7
0.50	408.1	397.0	378.0	342.3	243.9	101.7	27.4
0.75	409.7	398.4	378.7	341.1	240.0	98.3	27.0
1.00	413.1	400.6	380.3	341.6	236.5	94.7	27.0

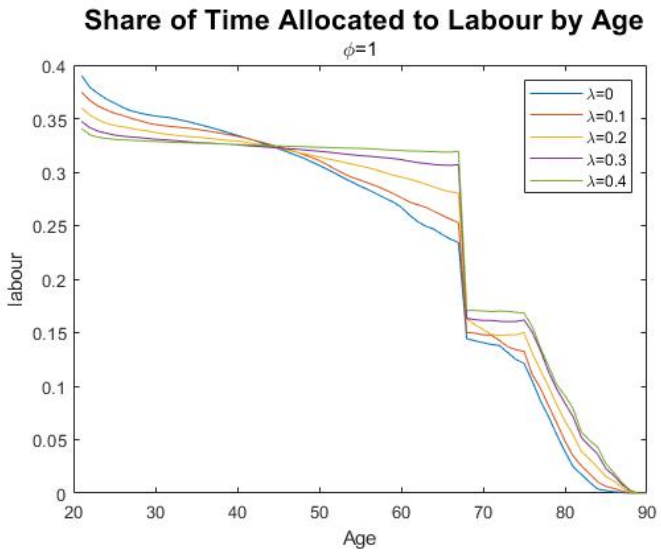
Results: Consumption





Results: Labour





Results: Pensions

Table 8: Pension Outlays per Capita ($'000s)

Taper Rate	Temptation Parameter (λ)						
ϕ	0.00	0.02	0.05	0.10	0.20	0.30	0.40
0.00	3.83	3.83	3.83	3.83	3.83	3.83	3.83
0.25	3.01	3.02	3.03	3.05	3.10	3.15	3.17
0.50	2.70	2.72	2.75	2.81	2.95	3.09	3.11
0.75	2.45	2.48	2.53	2.62	2.83	3.06	3.15
1.00	2.23	2.27	2.33	2.44	2.72	3.02	3.11

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0.25	3.01	3.02	3.03	3.05	3.10	3.15	3.17
0.50	2.70	2.72	2.75	2.81	2.95	3.09	3.11
0.75	2.45	2.48	2.53	2.62	2.83	3.06	3.15
1.00	2.23	2.27	2.33	2.44	2.72	3.02	3.11

Results: Utility

Table 10: Expected Lifetime Utility

Taper Rate	Temptation Parameter (λ)						
ϕ	0.00	0.02	0.05	0.10	0.20	0.30	0.40
0.00	-0.4683	-0.4759	-0.4875	-0.5067	-0.5479	-0.5899	**-0.6116**
0.25	-0.4640	-0.4717	-0.4832	-0.5026	**-0.5428**	**-0.5863**	-0.6117
0.50	-0.4634	-0.4710	-0.4828	-0.5024	-0.5432	-0.5865	-0.6131
0.75	-0.4630	-0.4707	-0.4825	-0.5025	-0.5436	-0.5874	-0.6140
1.00	**-0.4623**	**-0.4701**	**-0.4820**	**-0.5021**	-0.5440	-0.5882	-0.6139

Results: Summary

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0.75	-0.4630	-0.4707	-0.4825	-0.5025	-0.5436	-0.5874	-0.6140
1.00	**-0.4623**	**-0.4701**	**-0.4820**	**-0.5021**	-0.5440	-0.5882	-0.6139

Results: Summary

- Higher self control costs are associated with lower lifetime savings and consumption
- When self control costs are higher, households allocate more time to leisure while young, but more time to labour while old.
- When self control costs are higher there is generally increased access to means tested pensions, increasing the cost of the means tested pension.

Conclusions

- In line with our expectations, a means tested age pension will cost more if the population has higher self control costs
- Household savings are more sensitive to changes in the taper rate in populations with higher self control costs.
- When there are no or low self control costs in the population, a means tested pension with $\varphi = 1$ is preferred. A pension with a low taper rate is preferred if self control costs are high.