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Optimal Consumption, Investment and Housing with Means-tested Public Pension in Retirement

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Abstract

In this paper, we develop an expected utility model for retirement behaviour in the decumulation phase of Australian retirees with sequential family status subject to consumption, housing, investment, bequest, and government-provided means-tested Age Pension. We account for mortality risk and risky investment assets, and we introduce a “health” proxy to capture the decreasing level of consumption for older retirees. Then, we find the optimal housing at retirement, and the optimal consumption and optimal risky asset allocation depending on age and wealth. The model is solved numerically as a stochastic control problem, and it is calibrated using the maximum likelihood method with empirical data of consumption and housing from the Australian Bureau of Statistics 2009-2010 Survey. The model fits the characteristics of the data well to explain the behaviour of Australian retirees. The key findings are as follows. First, the optimal policy is highly sensitive to means-tested Age Pension early in retirement, but this sensitivity fades with age. Second, the allocation to risky assets shows a complex relationship with the means-tested Age Pension. As a general rule, when wealth decreases, the proportion allocated to risky assets increases, because the Age Pension works as a buffer against investment losses. Third, couples can be more aggressive with risky allocations owing to their longer life expectancy compared with singles.

Keywords: Dynamic programming, Stochastic control, Optimal policy, Retirement, Means-tested age pension, Defined-contribution pension

2000 MSC: 91

JEL classification: D14 (Household Saving; Personal Finance), D91 (Intertemporal Household Choice; Life Cycle Models and Saving), G11 (Portfolio Choice; Investment Decisions), C61 (Optimization Techniques; Programming Models; Dynamic Analysis)

1. Introduction

The global shift from a defined-benefit pension system to a defined-contribution pension system transfers risk from the corporate sector to households, primarily via the investment and withdrawal decisions of pension assets. Although defined-benefit schemes remain available, most are closed for new members and have been replaced with defined-contribution schemes. For retirees, the main

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