Review of Economic Dynamics **3**, 831–840 (2000)
doi:10.1006/redy.2000.0097, available online at http://www.idealibrary.com on IDEAL®

Efficient Timing of Retirement

Geoffrey H. Kingston[1]

School of Economics, University of New South Wales, Sydney 2052, Australia
E-mail: g.kingston@unsw.edu.au

Received December 10, 1998; revised October 22, 1999

This study introduces a retirement decision into the classic Merton model. A familiar result is that you should retire if and when the marginal utility of another year's wages is equal to the disutility of work. A new result is that at the point of retirement your exposure to risky assets should not jump. Under power utility and constant time preference, the retirement timing problem has a closed form solution; the nine inputs to the formula in question give rise to nine comparative-static results on retirement timing. Further specialization of preferences, to log consumption utility and zero time preference, reduces the required number of inputs to four. *Journal of Economic Literature* Classification Numbers: E21, G11, J26.

Key Words: retirement; life cycle model; optimal stopping problem.

1. INTRODUCTION

Fundamental questions in personal finance are deciding when to retire, and whether to rebalance your portfolio at the point of retirement. These questions are considered here within a theoretical life cycle setting. Highlighted are two closed-form solutions to the retirement timing problem. One solution, based on power utility and constant time preference, identifies nine variables that could affect the retirement decision. The other solution, based on log utility and zero time preference, sees the number of variables reduced to four; this simplified formula is especially easy to

[1] I thank Hazel Bateman, John Burbidge, Lisa Magnani, Olivia Mitchell, John Piggott, Sachi Purcal, Mike Sherris, David Throsby, Rob Trevor, and Graham Voss for helpful feedback. Two anonymous referees made insightful comments. Thanks are due to Carol White for research and editorial assistance. Financial support from the Australian Research Council is gratefully acknowledged. In 1999 the author visited the Department of Economics at the University of Sydney, which proved to be a hospitable environment for revising this paper.

1094-2025/00 $35.00

interpret. Portfolio rebalancing, by contrast, is considered within a fairly general setting, without resort to a specialized utility function.

The life cycle model is of an agent with rational expectations and full current information. Its main antecedents are Merton (1969) and Bodie, Merton, and Samuelson (1992). The agent is free to retire at any time during her maximum feasible span of working life, but cannot return to work. The agent has no choice along any margin of labor supply apart from retirement timing. This "zero-one" characterization of labor supply over the life cycle was pioneered by Burbidge and Robb (1980), Fields and Mitchell (1984), and Mitchell and Fields (1984).

2. A LIFE CYCLE MODEL

At the outset of working life the agent's life cycle problem is to make contingent plans for a retirement date R, consumption profile $C(s)$, and proportionate exposure $x(s)$ to risky assets that maximize

$$E_0\left\{\int_0^R [u(C(s),s) - l(s)]\, ds + \int_R^T u(C(s),s)\, ds\right\}, \tag{1}$$

where E_0 is the expectations operator at the start of working life (time zero), $u(C(s), s)$ is instantaneous utility from consumption, assumed concave in C, $l(s)$ is the disutility of work, assumed deterministic,[2] and T is the agent's death date, assumed known.[3] Both $u(C(s), s)$ and $l(s)$ are assumed continuous in s. For simplicity, the objective (1) abstracts from bequests.

Before retirement ($0 \leq s < R$), the transition equation for nonhuman or fungible assets $F(s)$ is described by an Itô process,

$$\begin{aligned} dF(s) = {} & [(x(s)(\alpha - r) + r)F(s) + Y(s) - C(s)]\, ds \\ & + x(s)F(s)\sigma\, dz(s), \end{aligned} \tag{2}$$

where α is the instantaneous expected return to risky assets, r is the return to safe assets ($0 \leq r < \alpha$), σ^2 is the instantaneous conditional

[2] This is readily generalized to the case of disutility of effort that is described by an Itô process; see Stock and Wise (1990) for a related assumption (in a discrete-time framework).

[3] See Merton (1971) and Richard (1975) on the case of uncertain lifetimes.