Variable payout annuities and dynamic portfolio choice in retirement

Published online by Cambridge University Press: **27 January 2009**

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Abstract

Many retirees hope to continue earning capital market rewards on their saving while avoiding outliving their funds during retirement. We model a dynamic utility maximizing investor who seeks to benefit from holding both equity and longevity insurance. She is free to adjust her portfolio allocation of her financial wealth as well as of the annuity over time, and she can purchase variable payout annuities any time and incrementally. In this setting, we show that the retiree will not fully annuitize even without bequests; rather, she will combine variable annuities with withdrawals from her liquid financial wealth so as to match her desired consumption profile. Optimal stock exposures decrease over time, both within the variable annuity and the withdrawal plan. Welfare gains from this strategy can amount to 40% of financial wealth, depending on risk parameters and other resources; additionally, many retirees will do almost as well as the fully optimized outcome if they hold variable annuities invested 60/40 in stocks/bonds.

Type

Articles

Information

Journal of Pension Economics & Finance, Volume 9, Issue 2, April 2010, pp. 163 - 183
DOI: https://doi.org/10.1017/S1474747208003880

References

Bergstresser, D. and Poterba, J. (2004) Asset allocation and asset location: Household evidence from the survey of consumer Finance. Journal of Public Economics, 88: 1893–1915. CrossRef Google Scholar

Blake, D., Cairns, A., and Dowd, K. (2003) Pensionmetrics 2: stochastic pension plan design during the distribution phase. Insurance: Mathematics and Economics, 33(1): 29–47. Google Scholar

Bodie, Z. and Pesando, J. (1983) Retirement annuity design in an inflationary climate. In Bodie, Z. and Shoven, J. (eds) Financial Aspects of the US Pension System, Chicago, IL: University of Chicago Press. Google Scholar

Brown, J. R. (2001) Private pensions, mortality risk, and the decision to annuitize. The Journal of Public Economics, 82(1): 29–62. CrossRef Google Scholar

Brown, J. R., Mitchell, O. S., and Poterba, J. M. (2001) The role of real annuities and indexed bonds in an individual accounts retirement program. In Campbell, J. Y. and Feldstein, M. (eds) Risk Aspects of Investment-Based Social Security Reform, Chicago, IL: University of Chicago Press, pp. 321–360. CrossRef Google Scholar

Browne, S., Milevsky, M. A., and Salisbury, T. S. (2003) Asset allocation and the liquidity premium for illiquid annuities. Journal of Risk and Insurance, 70(3): 509–526. CrossRef Google Scholar

Brugiavini, A. (1993) Uncertainty resolution and the timing of annuity purchases. The Journal of Public Economics, 50(1): 31–62. CrossRef Google Scholar

Charupat, N. and Milevsky, M. A. (2002) Optimal asset allocation in life annuities: a note. Insurance: Mathematics and Economics, 30(2): 199–209. Google Scholar

Cocco, J. F., Gomes, F. J., and Maenhout, P. J. (2005) Consumption and portfolio choice over the life cycle. Review of Financial Studies, 18: 491–533. Google Scholar

Cogan, J. and Mitchell, O. S. (2003) Perspectives from the President's Commission on Social Security Reform. Journal of Economic Perspectives, 17(2): 149–172. CrossRef Google Scholar

Davidoff, T., Brown, J., and Diamond, P. (2005) Annuities and individual welfare. American Economic Review, 95(5): 1573–1590. Google Scholar

Dellinger, J. K. (2006) The Handbook of Variable Income Annuities, New Jersey: John Wiley & Sons. Google Scholar

Dus, I., Maurer, R., and Mitchell, O. S. (2005) Betting on death and capital markets in retirement: a shortfall risk analysis of life annuities versus phased withdrawal plans. Financial Services Review, 14: 169–196. Google Scholar

Feldstein, M. and Ranguelova, E. (2001) Individual risk in an investment-based social security system. American Economic Review, 91(4): 1116–1125. CrossRef Google Scholar

Gerrard, R., Haberman, S., and Vigna, E. (2004) Optimal investment choices post-retirement in a defined contribution pension scheme. Insurance: Mathematics and Economics, 35(2): 321–342. Google Scholar

Gomes, F. and Michaelides, A. (2005) Optimal life-cycle asset allocation: understanding the empirical evidence. Journal of Finance, 60: 869–904. CrossRef Google Scholar

Horneff, W. J., Maurer, R., Mitchell, O. S., and Dus, I. (2008) Following the rules: integrating asset allocation and annuitization in retirement portfolios. Insurance: Mathematics and Economics, 42: 396–408. Google Scholar

Horneff, W. J., Maurer, R., and Stamos, M. (2008a) Life-cycle asset allocation with annuity markets. Journal of Economic Dynamics and Control, 32: 3590–3612. Google Scholar

Horneff, W. J., Maurer, R., and Stamos, M. (2008b) Optimal gradual annuitization: quantifying the costs of switching to annuities. The Journal of Risk and Insurance, 75: 1019–1038. CrossRef Google Scholar

Kaplan, P. D. (2006) Asset allocation with annuities for retirement income management. Journal of Wealth Managament, 8(4): 27–40. Google Scholar

Kapur, S. and Orszag, J. (1999) A portfolio approach to investments and annuitization during retirement. Working Paper, Birbeck College, University of London, UK. Google Scholar

Kingston, G. and Thorp, S. (2005) Annuitization and asset allocation with HARA utility. Journal of Pension Economics and Finance, 4: 225–248. CrossRef Google Scholar

Koijen, R. S., Nijman, T., and Werker, B. J. M. (2006) Optimal portfolio choice with annuitization. Working Paper, Center for Economic Research, Tilburg University. Google Scholar

McKinsey, (2006) Cracking the Consumer Retirement Code. McKinsey & Co. Google Scholar

Milevsky, M. A. (1998) Optimal asset allocation towards the end of the life cycle: to annuitize or not to annuitize? Journal of Risk and Insurance, 65(3): 401–

426. CrossRef Google Scholar

Milevsky, M. A. (2002) How to completely avoid outliving your money: an introduction to variable payout annuities for retiring Canadians. Working Paper, IFID Centre, The Schulich School of Business, York University, Toronto, Canada. Google Scholar

Milevsky, M. A. and Young, V. (2002) Optimal asset allocation and the real option to delay annuitization. Working Paper, IFID Centre, Schulich School of Business, York University, Toronto, Canada. Google Scholar

Milevsky, M. A. and Young, V. (2006) The timing of annuitization: investment dominance and mortality risk. Insurance: Mathematics and Economics, 40(1): 135–144. Google Scholar

Milevsky, M. A. and Young, V. (2007) Annuitization and asset allocation. Journal of Economic Dynamics and Control, 31: 3138–3177. Google Scholar

Milevsky, M. A., Moore, K. S., and Young, V. (2006) Asset allocation and annuity-purchases strategies to minimize the probability of financial ruin. Mathematical Finance, 16(4): 647–671. Google Scholar

Mitchell, O. S., Poterba, J., Warshawsky, M., and Brown, J. (1999) New evidence on the money's worth of individual annuities. American Economic Review, 89: 1299–1318. CrossRef Google Scholar

Purcell, P. (2006) Summary of the Pension Protection Act of 2006. Congressional Research Service, Domestic Social Policy Division, Working Paper, US Congress. Google Scholar

Stabile, G. (2003) Optimal timing of the annuity purchases: a combined stochastic control and optimal stopping problem. Working Paper, Universita degli Studi La Sapienza di Roma, Rome, Italy. Google Scholar

Yaari, M. (1965) Uncertain lifetime, life insurance, and the theory of the consumer. Review of Economic Studies, 32: 137–150. CrossRef Google Scholar

Yagi, T. and Nishigaki, Y. (1993) The inefficiency of private constant annuities. The Journal of Risk and Insurance, 60(3): 385–412. CrossRef Google Scholar

Young, L. (2004) Funds that adjust as the years go by. *Business Week*, 26 July. Google Scholar

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