

An Empirical Window on Rational Expectations Formation, by R. L. Pollock and J. P. Suyderhoud

Persons' expectations regarding their ultimate life span provide a tractable empirical opportunity to test for rational expectations. To the extent people only utilize information from "current life tables," they underestimate the more relevant *ultimate* life expectancy that results from on-going improvements in mortality experience not reflected in these tables. The expectations observed in the authors' empirical work are not consistent with rational-expectations models. All available information about life expectancies and their trends were not used by the surveyed households in forming life-span expectations. This deficiency precludes correct estimation of the ultimate life expectancy necessary for informed life-cycle choices. *Review of Economics and Statistics*, May 1992, 74(2): 320-324. (Reprinted with permission of North-Holland Publishing Company.)

ECONOMETRIC MODELS

State Space Modeling of Non-Standard Actuarial Time Series, by Bradley P. Carlin (University of Minnesota)

Insurance professionals have long recognized the value of time series methods in analyzing sequential business and economic data. However, the usual class of Box-Jenkins models are sometimes not flexible enough to adequately describe many practically-arising time series. By way of contrast, the state-space model offers a general approach for multivariate time-series modeling, forecasting, and smoothing. Versions of these models having linear mean structure and Gaussian error distributions have enjoyed actuarial application (for instance, in credibility theory) using the simple recursive updating formulae provided by the Kalman filter algorithm. Recently, fitting these models in more challenging non-linear and non-Gaussian scenarios has become feasible using Monte Carlo integration techniques [Carlin, Polson and Stoffer (J. Amer. Statist. Assoc., 1992)]. This paper gives a brief review of this new methodology, and subsequently demonstrates its usefulness in actuarial settings via three data examples. The non-standard modeling features illustrated include the explicit incorporation of covariates, direct modeling of non-stationary series without differencing, multivariate analysis, comparison of results under normal and non-normal error assumptions, density estimation for future observations, and non-linear model building and testing. *Insurance: Mathematics and Economics*, October 1992, 11(3): 209-222. (Reprinted with permission of North-Holland Publishing Company.)