Vol. 4, no. 1 (Spring 2005)

Book Review

Shaping the Next One Hundred Years: New Methods for Quantitative Long-Term Policy Analysis

by Robert J. Lempert, Steven W. Popper and Steven C. Bankes, RAND Pardee Center, Santa Monica, CA 2003. Available free on the internet at http://www.rand.org/publications/MR/MR1626 or for purchase as 213-page paperback, $30.00.

reviewed by Jay Herson

Most futurists would agree that long term forecasts (35-200 years) are very difficult and many have been discouraged by the failure of the much-heralded Club of Rome *Limits to Growth* forecasts of the early 70s and the unexpected and sudden end of the Cold War in the early 90s. To celebrate the World's Columbian Exposition in Chicago in 1893 74 noted commentators from many fields were asked to predict what American life would be like in the 1990s. One commentator wrote that by the 1990s most businesses would communicate by means of electric transmissions while another suggested that rising productivity would result in a maximum three-hour workday. This contrast illustrates the central challenge of long term forecasting—any single description or model of the future is almost certain to prove wrong. However a diverse set of future visions may capture something important about the future that will actually transpire but we cannot identify the accurate scenarios at the time we make our forecast.

This was the starting point for the Long Term Policy Analysis (LTPA) project of the RAND Pardee Center. The latter's mission is to develop methods to enhance the overall future quality and condition of human life by improving long-range global policy and forecasting methods. The RAND methods consider large ensembles (hundreds to millions) of scenarios; seek robust not optimal strategies; achieve robustness through *adaptive* strategies and design software and analytic methods for the interactive exploration of the multiplicity of plausible futures. The authors illustrate this approach in detail using the example of global sustainable development.

The RAND approach differs from others first in use of computer software to generate many scenarios. Second, it does not seek *optimal* strategies to achieve somebody's long term expectations but rather near term strategies that are *robust* in the sense that they perform reasonably well compared to the alternatives across a wide range of plausible scenarios and value systems. Furthermore LTPA strategies must *adapt* or *evolve* over time in response to new information so as to shape options available to future generations.

The *Wonderland* scenario generator reduces selection bias that all futurists suffer from based on their prejudices, state of knowledge and worldview. Scenarios are created by many combinations of

econometric variables related to global sustainable development in their example. Wonderland uses the XLRM framework.

L- policy levers, near term actions

X- exogenous uncertainties outside the control of decision makers, e.g. economy, population, environment and future actions

M- performance standards / measures such as the HDI—Human Development Index, weighted average of income, level of education and longevity.

R—relationships, interaction of factors, how do the variables evolve over time separately and in combination. For this example a two-period approach is taken—strategies such as would be undertaken today and those that would be employed after a data-defined "crash".

Robustness is achieved using the principle of minimizing maximum *regret*. The regret of a strategy s for future (scenario) f is the strategy with maximum absolute or relative difference in performance (HDI) over all possible strategies for a given future. A robust strategy is one whose regret is small over an ensemble of possible futures using different performance measures (not just HDI). This searching is enabled by the Wonderland software. Computer-assisted policy makers search for plausible futures that could "break" a candidate strategy. This aspect of the methodology can either render the strategy inadmissible or suggest triggers for changing course.

In the example of global sustainable development the authors show all of the parameter values to be considered and with brilliant graphics develop several robust strategies. In the near term three possible levels of pollution tax strategies are evaluated. Various long term strategies are generated for three broad future scenarios – Conventional World, Barbarization and Great Transition. Each strategy is robust and adaptable for these scenarios and have the ability to change with the scenario.

This book is a good introduction to the future of long term forecasting where computer software supplements human intuition and where robustness and adaptability imply that no long term policy selected can be a total failure. The example will appeal most to those familiar with econometrics. However, the authors bring home the general principles even for those who choose to skip the example or are intimidated by it. Computer capacities for number crunching and data storage have allowed LTPA to take a giant step. The bearded sages of 1893 would likely take off their silk hats to the Pardee Center for this important contribution.

Jay Herson is a member of the adjunct faculty in biostatistics at the Johns Hopkins Bloomberg School of Public Health and an Associate Editor of Future Takes.

Further Reading:

"Shaping the Future" in *Scientific American,* April 2005, pp. 66-71

"Exploratory Modeling for Policy Analysis" Operations *Research,* 41: 435-449, 1993

Assumption- Based Planning by James A. Dewar, Cambridge University Press, 2002

"High Performance Government in an Uncertain World" in *High-Performance Government: Structure, Leadership, Incentives. Ed by Robert Klitgaard and Paul C. Light, RAND MG-256, 2005.*