



## The AMSS-PolyU Joint Research Institute

Distinguished Lecture on

### Optimal Investment Growth

by Professor David G. Luenberger

Department of Management Science and Engineering  
Stanford University

#### ABSTRACT

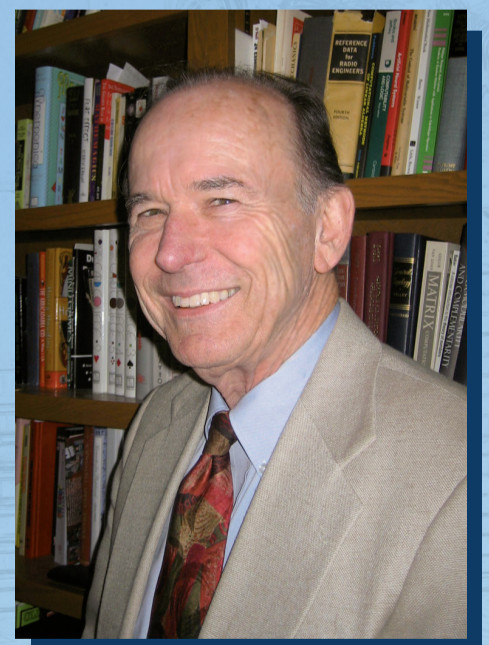
The use of optimal long-term growth as the criterion for portfolio design has a long history. Originally formulated by Kelly in the context of betting, the method is now known as the log-optimal strategy and is widely advocated. It is the strategy that produces the greatest rate of long-term return. There are several situations, however, where optimal growth is not equivalent to log-optimality. These include situations where investments are not liquid each period, where there are transactions costs, or where returns are correlated between time periods. In such situations the current level of wealth does not, by itself, completely characterize the state of an investment portfolio. A complete description requires a state of higher dimension. This leads to the problem of determining the growth rate associated with a product of random transformations. The solution to the matrix case was first solved by Bellman. This talk will discuss the background of this subject and present the solution for nonlinear transformations. Numerous applications to investment situations will be discussed.

#### BIOGRAPHY

Professor David G. Luenberger has been in the faculty of Stanford University since 1963, currently in the Department of Management Science and Engineering. His overall interest is the application of mathematics to issues in control, planning, and decision making. He has done fundamental work in the areas of control theory, optimization theory and algorithms, and investment theory for portfolios and project evaluation. He has published five major textbooks: *Optimization by Vector Space Methods*, *Linear and Nonlinear Programming* (jointly with Yinyu Ye), *Microeconomic theory*, *Investment Science*, and *Information Science*. He has published over eighty journal papers.

He served as Technical Assistant to the President's Science Advisor in 1971-72, was Guest Professor at the Technical University of Denmark (1986), Visiting Professor of the Massachusetts Institute of Technology (1976), and served as Department Chairman at Stanford (1980-1991).

His awards include: Member of the National Academy of Engineering, the Bode Lecture Prize of the Control Systems Society (1990), the Oldenburger Medal of the American Society of Mechanical Engineers (1995), and the Expository Writing Award of the Institute of Operations Research and Management Science (1999). He is a Fellow of the Institute of Electrical and Electronic Engineers (since 1975).



**Date: 25 March 2010 (Thursday)**

**Time: 2:00 pm – 3:00 pm  
(3:00 pm tea reception)**

**Venue: AG710**

ALL ARE  
WELCOME

