

**Playing the Market is Fun:
Modeling Derivatives Prices by
DOLPHIN**

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 School of Physical and Mathematical Sciences

The Black Scholes (BS) models for pricing derivatives have become a standard tool for evaluating options and derivatives for the past several decades. The recent global financial tsunami and the US subprime crisis have, however, raised questions regarding the role of these models in financial chaos and cast doubt concerning the reliability of the BS models. The BS model is essentially a diffusion model that mimics many similar models used extensively in physics and ecology. Hence, insights and experience gained in these drift-diffusion-reaction models used in ecology to simulate ecosystem dynamics and stability are useful in developing innovative approaches to the classic BS models. The connection between mathematics, ecosystem concepts and economics is indeed strong, although not immediately apparent. This seminar hopefully will promote collaborative research among the relevant fields. The author has developed a set of pricing models codenamed DOLPHIN to evaluate asset and derivative prices, improving upon the framework of the BS models. DOLPHIN is used for example to analyze and explain the performance of the Kuala Lumpur Composite Index KLCI and Public Aggressive Growth Fund PAGF for the period between June 2006 and September 2008 (Figures 1 and 2), a period characterized by initial high growth for the first 18 months, followed by a subsequent sharp decline for the remaining 9 months.

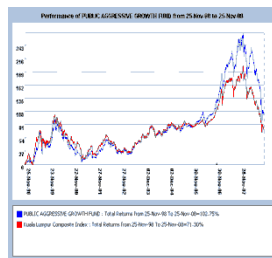


Figure 1. KLCI and PAGF indices

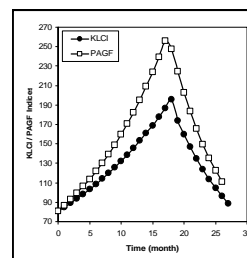


Figure 2. DOLPHIN simulation

Speaker Biography

Koh Hock Lye graduated with a PhD from the University of Wisconsin, Madison, USA under the Fulbright Fellowship. He is currently a professor in Applied Mathematics in the School of Mathematical Sciences. He has extensive experience in research and consultative experience in the field of environmental and ecosystem simulation. He has worked for many years with the USEPA and University of Tennessee.

Host: Prof. Chee Yeow Meng, Division of Mathematical Sciences, School of Physical and Mathematical Sciences

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