

## Office of Research

### Successful Recipients of External Grants

Dear Faculty,

The Office of Research is pleased to share the following news regarding recent successful external grant applications:

#### 2011 MOE ACADEMIC RESEARCH FUND TIER 2 PROGRAMME

The Ministry of Education (MOE) funds research projects on a competitive basis across Singapore-based universities through its Academic Research Fund (AcRF) Tier 2 Programme. Launched twice each year in February and August, this programme supports research that has academic significance, creates new knowledge and with potential for future innovations and discoveries.

Professor of Economics and Finance, **Yu Jun** has won a grant award of \$423,500 over three years for his project titled **"Econometric Analysis of Nonstationary Explosive Processes: Theory & Applications"**. Prof Yu shares a bit more about his project below.



Empirical research in economics and finance has been at a cross road after the global financial crisis (GFC) broke out in 2007. Traditional wisdoms show that, if markets operate in full efficiency and economic decision makers are fully rational, economic and financial time series, whether univariate or multivariate, should be unpredictable and hence must contain unit roots. This unit root hypothesis is at odds with the GFC.

This project aims to build on a recursive regression technique proposed by Peter Phillips, Wu Yangru and Yu Jun (PWY hereafter), a method based on expanding subsamples to conduct the unit root test against the explosive alternative. The technique has been shown to be able to successfully identify bubbles in the context of collapsing bubble processes, and to provide consistent estimates for the bubble origination and collapse dates. Such estimates have proven to be useful in designing an early warning detection system for an overheated economy and for bubbles in asset prices.

There are five main project objectives in the proposed project: (1) to extend the method of PWY, (2) to design an improved method to detect bubbles by combining the PWY method and the indirect inference estimation method, (3) to examine the implications of the finite sample properties and develop new asymptotic theory in the context of explosive continuous time models, (4) to introduce a Bayesian method to conduct the statistical inference in the context of time varying volatilities based on the posterior distributions, and (5) to consistently estimate the starting, peak and conclusion dates of a bubble that may die off gradually.

#### 2011 NOL FELLOWSHIP (NOLF) PROGRAMME

The NOL Fellowship Programme is an initiative by Neptune Orient Lines Ltd and NUS. Its aim is to develop a first-rate research programme on important global transportation, cargo and supply chain & logistic issues. The Call for Proposals is around April each year.

Assistant Professor of Operations Management, **Lim Yun Fong** has been successful in the 2011 NOLF Programme and won an award of \$140,000 over two years for his project titled **"Robust Warehouse Management"**. Prof Lim elaborates a little about the proposed research:



The operational efficiency of warehouses, which are consolidated hubs of various products, is crucial to a supply chain's competence in a global economy. In this project, we propose an integrated, robust solution technology to manage the operations of unit-load warehouses where products are handled in pallets.

Arriving pallets are stored at their storage locations where they will be retrieved later when demand arises. While arrivals of products to a unit-load warehouse generally follow some production schedules, the departures of products are less predictable due to uncertain demand.

Using robust optimization technology, we minimize the total operating cost of the warehouse under demand uncertainty over a multi-period planning horizon. Our preliminary studies suggest that substantial savings can be obtained by optimizing both the lot sizes of arrivals and assignment of storage locations to the pallets. The proposed work will have a significant impact in practice because unit-load warehouses are commonplace in nearly every industry.

#### OPPORTUNITIES FOR EXTERNAL RESEARCH FUNDING

More external research funding opportunities can be found [here](#). You may also contact Alvin Goh ([alvingoh@smu.edu.sg](mailto:alvingoh@smu.edu.sg), Tel: 6828-0997) or Joanne Liang ([joanneliang@smu.edu.sg](mailto:joanneliang@smu.edu.sg), Tel: 6808-5151) in the Office of Research if you have any questions on external grant applications.