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### EDITORIAL TEAM OF

*Assoc Prof Tay Boon Nga*

*Ms Annie Koh*

*Ms Khatini Bte Anuar*

THIS ISSUE

## *Economics Executive Programme (EEP)*

### SEMINAR ON MARRIAGE, FERTILITY, AND THE HOUSEHOLD

Singapore's diving fertility rate is one of the key challenges that Singapore is facing and the urgency of the problem has led to the forming of a ministerial level committee to tackle the issue. The Economics Executive Program (EEP) held a one day seminar on 14 May 2004 titled 'Marriage, Fertility and the Household' to take a closer look at this problem and the issues involved. Recognising that no one discipline holds the monopoly to the solution of the problem, the ten speakers for the seminar came from five departments from both NUS and NTU and also include members of the public and private sectors.



*From left: Assoc Prof Tan Khye Chong, Dr Lim Boon Tiong and Dr Malone-Lee Lai Choo*

The Director of the EEP, Assoc Prof Euston Quah, started the seminar by making introductory remarks on how economics has a role to play in the bedroom. He noted that like any other goods that are made at home, children have to be 'produced'. There are costs involved in the production of children, just as in the production of any good or service. Hence, the 'producers' - parents in this case - expect a net return or gain in terms of psychic income or intrinsic consumption (playing with and enjoying their children's presence) and, for some parents, children are viewed as investment goods, that is, providing a source of monetary income when the child matures.

The Chairman for the morning session, Assistant Head of the Department of Economics, Dr Lim Boon Tiong then took over and proceeded to present the first speaker - Ms Charlotte Beck, Director, Family Policy Unit, Ministry of Community Development and Sports. Ms Beck's presentation was on attitudinal

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and behavioural trends in marriage and parenthood in Singapore derived from studies undertaken by MCDS and other selected studies. She also looked at values that underpin the desirability of marriage and children and cross-country comparisons of policy initiatives as well as trends in marriage and parenthood were examined.

The next speaker, Assoc Prof Tan Khye Chong, Division of Economics, School of Humanities and Social Sciences, NTU, spoke about the population trends in Singapore over the medium to long term to the year 2050. Employing the component method which takes into account the main demographic factors, the projections showed that the local population will reach a maximum in about 20 years time before steadily declining to about 3.3 million by the year 2050. Also presented was the double decrement table of death and marriage for males and females.

Dr Malone-Lee Lai Choo, Department of Real Estate, NUS, next talked about the implications of the recent demographic trends in Singapore for Urban Planning. Her paper explored these implications and examined possible responses in the areas of planning norms and standards, institutional flexibility and planning choice.

After a short coffee break where the speakers and the 40 participants which included numerous representatives from various ministries, voluntary welfare organisations (VWO) and press, mingled and exchanged their views and comments, the seminar continued with Assoc Prof Ooi Giok Ling from NIE, NTU, giving a presentation focusing on the range of choices and options open to families and a society in a rapidly globalising world in which would-be parents consider job retrenchment, re-skilling and reaction against costlier and experienced workers. Because families appear to be coping by putting off the birth of children as they do their sums, consider job security, child care options and pay off their loan instalments for home and cars, there is the need for more effective public policies that appear more relevant to a growing economy.

Dr Ho Kong Weng, Department of Economics, NUS, next gave his views on how using an economic model to consider the costs and benefits related to the choice of marriage and divorce could help explain the trend that more Singaporeans are staying single while those getting married are doing so at a later age.

A sociological insight to the fertility problems in Singapore was what Assoc Prof Paulin Straughan from Department

of Sociology, NUS, presented. She argued that the ideology of child frames parenting expectations, and over time, these become tremendous barriers to family formation and childrearing. Also the more society promotes and idealize marriage and parenthood, the greater the perceived demands on parenting. In Singapore, family ideology coexists in the same sphere of influence as gender ideology, and the very powerful ideology of paid work and these contest for the allegiance of members in the society, and the outcome is a rationale-choice approach to maximize personal gains while minimizing cost to individual.

After lunch where participants and speakers took the opportunity to discuss the ideas that had been brought up earlier, Dr Chang Youngho, the afternoon chairman, presented the first speaker for the afternoon session – Dr Liu Haoming, Department of Economics, NUS.

Dr Liu presented the theoretical and empirical findings from economic analysis of women's contribution to the social welfare and child development. That though gender equity is a powerful reason for empowering women, another important rationale is the common belief that increasing the amount of household economic resources under women's control reduces fertility and improves child development.

Dr Cheolsung Park, Department of Economics, NUS, gave a presentation which consisted of two parts. In the theoretical first part, he discussed how economists estimate the effects of pronatalist policies such as tax rebates and maternity leaves on fertility. Different methods of estimation were examined based on their assumptions and interpretations and data structure and the estimation methods ideal in the Singaporean context were suggested. In the second part, he discussed the findings on the effects of pronatalist policies on fertility in other countries such as the US, Canada, and Germany.

After Dr Park's presentation, Ms Jeanne Cheng, General Manager (Services & Marketing), SP Service gave her view of procreation from a working mother's perspective where she attributed the low fertility rate among Singaporean women today to late marriages and late start to family life. With fair opportunities given to women in career development, she argued that more are putting their career and individual pursuits ahead of starting a family only to realize later that the timeline for having a baby or more babies has run out.

The final speaker, Dr Mohamad Maliki Osman, Department of Social Work and Psychology, NUS and also a MP for Sembawang GRC, gave a presentation using a case study approach, where he argued that socialization processes would have to be re-examined to ensure that men and women are equipped with the skills to negotiate these roles and rules for the development of effective and supportive relationships in marital and family life.

After the presentation, was a panel discussion chaired by Prof Lim Chong Yah, Emeritus Professor, NUS, former chairman of the National Wage Council and Professor of Economics, NTU. It was a lively and engaging discussion as Prof Lim engaged the speakers and the participants with several thought provoking questions, among them, if Singapore is on the road to mass suicide due to the declining fertility rate and what are the policies needed to curb this trend. Beside questions, Prof Lim also gave some suggestions which include getting the government

to pick up the tab for education due to the importance Singaporeans place on education and that one of the main reasons cited why parents are not willing to have more children is the cost of funding for education especially at higher level. He said that the government can do this at three different levels – free education from nursery to primary school for the first child, nursery to A level for the second child, nursery to university level for the third child and restrict this scheme to only Singaporeans. Other suggestions offered by Prof Lim include giving greater recognition to the value of being a mother.

Professor Åke Blomqvist, Head of Department of Economics, brought the seminar to a close with his closing remarks where he briefly touched upon the points brought up by the various speakers and thanked the speakers and Prof Lim for their time and presence. All in all, the seminar was well received by the participants and press with positive press coverage by The Straits Times.

## *Economics Executive Programme (EEP)*

### TRAINING PROGRAMMES WITH MINISTRIES AND STATUTORY BOARDS

Our longest running client is the Ministry of Foreign Affairs (MFA). The MFA is the primary facilitator of delegates from signatory countries under the Singapore Cooperation Programme (SCP) - Singapore's programme of technical assistance to some 150 developing countries in Asia-Pacific, Africa, Middle East, Latin America and the Caribbean.

Here, the Department plays a visible, important and relevant role through EEP. The delegates trained by EEP range from middle to very senior officers, with whom overseas contacts and networking for graduate programme recruitment, international projects, and related research and academic activities are established.

We have conducted eighteen courses for MFA so far:

- Prudential Regulations of the Banking Sector (November 1999; rerun in February 2001)
- Urban and Transportation Economics (May 2000; rerun in April 2001)

- Simplification of Administrative Procedures (May 2000)
- Singapore Financial Management (June 2000)
- ASEAN Economies (July 2000)
- Public Finance and the Economic Analysis of Government Sector (October 2000; rerun in April 2001)
- Top Management Programme for the Promotion of Foreign Direct Investment (March 2002)
- Debt Management (December 2002)
- Economic Development Experience of Singapore (November 2001; reruns in November 2002, October 2003)
- Contemporary Developments in Banking and Finance (September 2000, reruns in November 2001, 2002 & 2003)
- Listed among our clientele are also the Ministry of Trade & Industries (FIREfly Agencies), Ministry of Manpower, Institute of Policy Development and Civil Service College Consultants.

## TAN CHIN TUAN PROFESSORSHIP



Professor Nobuhiro Kiyotaki was appointed as the Tan Chin Tuan Professorship for two weeks from 25 March to 8 April 2004. During his visit, he conducted a series of lectures in his field to faculty and graduate students on money and finance, as well as presented staff seminars on his recent work. A brief biography of Professor Nobuhiro Kiyotaki is as follows: He obtained his

Ph.D. from Harvard University in 1985. He is one of the world's leading monetary theorist and macroeconomist, with publications in the top journals in Economics such as the *American Economic Review*, *Journal of Economic Theory*, *Journal of Political Economy*, *Review of Economic Studies*, *Quarterly Journal of Economics*, as well as others. Professor Kiyotaki is renowned for his seminal contributions in the micro-foundations of monetary theory. The search based model of monetary exchange developed by Professor Randall Wright and him, has been one of the major modern developments in monetary theory in understanding the role of money as a medium of exchange. His recent work is on understanding the role of credit and asset liquidity in business cycles. His contributions to the study of international currencies; models of monopolistic competition (neo-Keynesian macroeconomics); and search theory have also been very influential. He is currently Cassel

Professor of Economics (Money and Banking) at the London School of Economics and Political Science. Prior to this, he has held positions at the Massachusetts Institute of Technology, University of Minnesota, Federal Reserve Bank of Minneapolis, University of Western Ontario and the University of Wisconsin-Madison. His other professional activities and honours include: The Yrjo Jahnsson Award in Economics 1999 (Biannual award by the European Economic Association to "the best young economist in Europe"), Fellow of British Academy, Fellow and Council Member of Econometric Society, Council Member of Royal Economic Society, Council Member of European Economic Association, Editor of *Japan Economic Review*, Associate Editor of *Journal of Economic Theory*, and Associate Editor of *Economic Letters*. A brief description of the Tan Chin Tuan Chair is as follows: Distinguished academics in the areas of Monetary Economics, Financial Economics or Banking and Financial Institutions are invited to visit the Department of Economics, National University of Singapore under the *Tan Chin Tuan Professorship in Banking and Finance*. The appointment which ranges from 4 to 12 months is to allow greater research and other linkages to be forged between the Visiting Professor and the Department. The appointee is expected to contribute to the research and teaching missions of the Department through giving research seminars to staff and graduate students, teaching at the graduate or advanced undergraduate levels in the above fields, and/or giving public lectures. Distinguished academics will find this Professorship beneficial in establishing research networks with Asia.

## STAFF ACTIVITIES

### *Prof Parkash Chander*

Prof Parkash Chander was interviewed live by the BBC World on 16 April 2004. The topic for the one-on-one interview was the Indo-US economic relations on the eve of the visit of the President and delegation of the US Chamber of Commerce to India.

He was an invited participant for the MIT Global Change Forum and FEEM Climate Policy Workshop held in Venice from June 9 to 11.

He chaired a session and presented a paper at the North American Summer Meeting, 2004, held at Brown University from June 17 to 20.

### *Assoc Prof Chia Ngee Choon*

Assoc Prof Chia Ngee Choon was invited by the Medical and Health Research Network at the University of Hong Kong on 19th May 2004 to present a paper on "Medical savings accounts in Singapore: How much is

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adequate?”. The seminar was well-attended by more than 80 participants from academics, hospital administrators and Hong Kong government policy-makers.

On 1 June 2004, Assoc Prof Chia addressed a group of university policy makers who were visiting from the Province of He Nan, China on “Economic Development Experience of Singapore” (in Mandarin).

Assoc Prof Chia was a Research Scholar at the Institute of Economic Research at the Hitotsubashi University under the Japan Society for the Promotion of Science (JSPS) Fellowship for a month starting from 11 June 2004. She was working on pension issues and reverse mortgages for the elderly in Japan with Prof Kitamura.

### *Assoc Prof Anthony Chin*

Assoc Prof Anthony Chin was seconded to the Land Transport Authority through the Economist Service of the Ministry of Trade and Industry from 1 July 2003 to 30 June 2004. The Economist Service is a new scheme in the Singapore Civil Service. It aims to attract top talent to provide sound economic analysis and advice on a broad range of policy issues that impact on Singapore’s macro and microeconomic competitiveness. The Economist Service is the umbrella service for Public Sector Economists across the public sector, in the same way as the Legal and Accountancy Services are the umbrella services for lawyers and accountants in the public sector. The Ministry of Trade and Industry is the lead agency driving the Economist Service. Through the Economist Service, the public sector will build up a core group of economic experts to enhance the depth and scope of economic analysis of public policies. There is a need to develop a conducive microeconomic environment that can serve as a vibrant enterprise ecosystem for Singapore and Singapore-based companies, an environment that nurtures innovation and wealth creation.

During his secondment to the Land Transport Authority, he worked on various land transport issues such as fine tuning of the Vehicle Quota Scheme, optimal road pricing, economic development impacts from urban rail schemes, public transport fare adjustments, competition in the public transport area and various aspects of transport policies. One of the interesting projects he worked on pertains to the impact of rail infrastructure investments and its economic impacts on the area adjacent to MRT stations and its alignment. The impacts include economic as well as land value enhancement.

In addition, Assoc Prof Chin has kept abreast with the following academic activities through the publication of an article entitled “Logistics outsourcing by manufacturers in China: A survey of the industry, (with Hong Junjie and Binglian Liu in *Transportation Journal*, Vol 43, No 1, 2004, 17-25). Earlier this year he co-authored and presented a paper, The location decisions of foreign firms in China: Does transport network capacity matter? In the conference on “China in Transition: Issues in growth and development” held in Singapore, February 11-12, 2004.

In December 2003 Assoc Prof Chin was invited to give a keynote paper at the International Symposium on Transportation Science and Engineering for Global Chinese Scholars, Beijing, China, August 27-30, 2003. The paper entitled “Public bus competition” focused on ascertaining the nature of intra-city bus competition by exploring the market for route and market area competition for public bus competition in a medium-size city. More than 120 prominent international and local Chinese scholars and researchers attended the Symposium.

### *Prof Basant Kapur*

Prof Basant Kapur delivered a talk on “The Singapore Economy: Development Strategy and Future Challenges” to a group of new Civil Service officers at the Civil Service College on 18 May 2004.

### *Assoc Prof Euston Quah*

Assoc Prof Euston Quah was appointed by the Minister of Education to be a member of the Board of Trustees, The Institute of Southeast Asian Studies, from November 2002 to November 2005. He is a committee member of the President’s Task Force on the Establishment of Practice Track Professorships at the National of Singapore from 2004, and is a member of the Singapore Green Plan on Clean Air, National Environment Agency since 2003.

Deputy Prime Minister, BG Lee referred to Assoc Prof Quah’s study on the social cost of smoking in Singapore in his Budget Speech 2004.

Assoc Prof Quah’s study on air pollution costs in Singapore was acknowledged by the Ministry of Environment as the first study done in Singapore.

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In March 2004, the Minister of Community Development and Sports cited his study on the cost of marriage and the impact of procreation benefits and incentives in Parliament.

He had also contributed to the cost-benefit study on the new national stadium and sports hub for the Ministry of Community Development and Sports.

Assoc Prof Quah is presently working with Professor Ezra J. Mishan (Emeritus Professor, London School of Economics) to revise the well-known book, *COST-BENEFIT ANALYSIS*, to a 5th edition to be published by Routledge, UK. Often referred as the standard text in cost-benefit analysis, it has been used by generations of students and lecturers in many universities all over the world since the first edition in 1971 and has remained a popular text over 4 editions since then. It is also a major source of reference for practitioners and government. The targeted date of publication of the 5th edition is in early 2005.

### *Assoc Prof Shandre Thangavelu*

Assoc Prof Shandre Thangavelu is attached to the Ministry of Manpower (MOM) as the Head of the Economics Unit where he primarily works on labour market issues pertinent to the competitiveness of the Singapore economy in the global economy. He is in charge of a team of economist to study manpower related issues and to direct manpower policies in the Singapore economy. The Economics Unit in MOM has completed studies on wage flexibility, output and wage dynamics, and various issues related to the labour market in Singapore.

### *Assoc Prof Jose L Tongzon*

In February 2004 Assoc Prof Jose L Tongzon in collaboration with NUS Consulting completed a study on maritime manpower requirements in Singapore. This study was commissioned by the Maritime and Port Authority and Ministry of Manpower of Singapore government, as an input for making Singapore an International Maritime Centre. It involved a comprehensive survey of the port, shipping companies and other maritime sectors to obtain their current employment profiles and other relevant data. Assoc Prof Tongzon's major contribution was his set of predictions of the future growth prospects and employment implications of the maritime industry for the next 15 years covering the major sectors of this industry. The major findings of the study were presented to the maritime industry in Singapore in a briefing session and

later to the press attended by journalists from major newspapers and representatives of the relevant government ministries/agencies.

He was a resource speaker at the 2004 Asia Pacific Maritime Summit held on 24-25 March 2004 in Singapore Expo – considered to be one of the major international events for maritime professionals and policy makers in the region. He was invited to present a paper on trade trends and patterns and the challenges facing Asia Pacific maritime industry. He was also invited to be one of the panelists which was organized to consider the issue of free trade agreements and their impact on Asia Pacific industry. This event was well attended and publicized in major Singapore newspapers and TV channels. The Summit was opened by the Guest of Honour – Minister Yeo Cheow Tong.

Assoc Prof Jose L Tongzon was invited as a resource speaker by Korea Trade Research Association (KTRA) and the City of Gwangyang at the 3rd International Gwangyang Port Forum, South Korea, held on 22-24 April 2004 on the occasion of the 30th anniversary of the Association. The theme of the forum was on strategies for the international trade and logistics-hub in Port. He presented a paper on Strategies for Developing Logistics Hubs: The Case of Singapore. The other invited speakers from various countries including Europe, North America and Asia, also presented papers based on their respective areas of expertise in the field of logistics and port management.

On 10 May 2004 he was interviewed live by Channel News Asia on the day when Filipinos had to elect their politicians from the presidential to the local levels. The topic for the interview was on the presidential candidates and their economic implications for the country if elected.

### *Assoc Prof Peter Wilson*

Assoc Prof Peter Wilson was invited to join a group of twenty-six experts from all Commonwealth regions in a Workshop on Economic Vulnerability and Resilience of Small States organized by the Commonwealth Secretariat and the University of Gozo, Malta, between 1 and 3 March 2004 in the context of preparations for the International Meeting for the review of the implementation of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States (SIDS). He presented a paper on The Economic Vulnerability and Resilience of Small Island States – The Case of Singapore, which will subsequently be published as part of the Proceedings.

He was also invited to participate in the Claremont Conference on The Political Economy of Exchange Rate Regimes under the auspices of the Freeman Programme on Asian Political Economy at Claremont McKenna Colleges, Claremont, California from April 1 to 3 April 2004. He presented a paper entitled: Don't Frighten the Horses: – the Political Economy of Singapore's Foreign Exchange Rate Regime since 1981, which will subsequently be published as part of the proceedings.

### *Assoc Prof Wong Wing Keung*

Assoc Prof Wong Wing Keung was invited by the University of Mauritius to be an External Examiner for their B.Sc. (Hons) Economics final year programme in applied econometrics and quantitative methods. He was also invited as the External Examiner by both the Department of Statistics (Risk Management) and the Department of Economics, Chinese University of Hong Kong for their Masters students in 2004. He was invited by Professor Nic Groenewold, University of Western Australia to jointly supervise his PhD student.

### *Thank you and Best Wishes to the following staff who had left the Department:*

**Professor Nobuhiro Kiyotaki** (Tan Chin Tuan Distinguished Visitor)  
- 8 April 2004

**Professor Peter J Hammond** (Visiting Professor)  
- 14 April 2004

**Assoc Prof Wong Chung Ming** (Associate Professor)  
- 31 May 2004

**Dr Wong Siu Kee** (Lecturer)  
- 30 June 2004

### *Welcome to the Department:*

**Dr Zhang Jie** who joined as Associate Professor with effect from 2 January 2004. He obtained his Ph.D. from the University of Western Ontario. His research covers a wide range of topics from public policy to theory, such as, the effects and optimal designs of public programs like social security, education subsidies, public schooling, welfare participation, price regulation, taxation, government debt, urbanization, population aging, and gender discrimination.

He conducted five workshops in 2004: One to the Singapore Microcomputer Society and the Technical Analysts Society of Singapore entitled “Will STI Peak in 2008? – A Lesson from USA”; the second to the Department of Economics, The Chinese University of Hong Kong on “Was there Abnormal Trading in the S&P 500 Index Options Prior to the September 11 Attacks?”; the third to the Technical Analysts Society of Singapore on “Cycle analysis and its application on Singapore Market, Will STI go to 4300 in 2008?”; the fourth to the East Asian Institute on “China's Stock Markets Going Global”; and the fifth will be presented to Great Eastern Insurance Limited on “Wealth Management”.

He was interviewed by the Zaobao, Singapore, on 28 April on the China Stock Market and this was published on 3 April 2004.

He also serves as member in the Consultative Committee for the International Statistical Institute's Committee on Statistics in Business and Industry, Associate Editor for the Journal of Applied Mathematics and Decision Sciences, and serves as reviewers for several international journals, such as Quantitative Finance and Review of Quantitative Finance and Accounting in 2004.

## *Social Outing*

For the purpose of a staff get-together and team building among the administrative staff of the Department, an outing to Johore Bahru was organized in March 2004. Everyone had an excellent time together and look forward to the next outing soon!!



*Photograph taken at Hutan Bandar, Johor Bahru*

## CONFERENCES

Conferences attended by our staff from January to June 2004 are given below:

Staff Name	Conference Title	Title of Paper	Venue	Date
A/P Lu Ding	ASSA/AEA Meetings	Western Region's Growth Potential: A Gravity Perspective	San Diego	3 Jan – 5 Jan
Dr Chang Youngho	International Conference on Electric Supply Industry in Transitions Issues and Prospects for Asia	Regulatory Framework of Singapore's Electricity Market	Bangkok, Thailand	14 Jan – 16 Jan
A/P Julian Douglas Wright	The Economics of Two-Sided Markets	Competing Payment Schemes	University of Toulouse, Toulouse, France	23 Jan – 24 Jan
A/P Peter Wilson	Workshop "Economic vulnerability and Resilience Building of Small States" organized by the Commonwealth Secretariat and the University of Malta	The Economic Vulnerability and Resilience of Small Island States – The Case of Singapore	University of Malta, Mgarr Gozo	1 Mar – 4 Mar
Dr Chang Youngho	Asia-Europe Environment Forum 2 <sup>nd</sup> Roundtable: Reinforcing Asia-Europe Cooperation on Climate Change	Equity, Efficiency and Effectiveness of Greenhouse Gas Emissions Reduction Paradigms: Agenda for Advanced Developing Economies	Jeju Island, South Korea	25 Mar – 26 Mar
Dr Gamini Premaratne	Applied Econometrics Association Conference on Stock Market Analysis and Prediction	Volatility Co-movement in the Stock Markets of North America, Europe and Asia: Some New Evidence	Paris, France	1 Apr – 2 Apr
A/P Peter Wilson	The Political Economics of Exchange Rate Regimes	Don't Frighten the Horses – The Political Economy of Singapore's Foreign Exchange Rate Regimes since 1981	Claremont Colleges, Claremont Institute for Economic Policy Studies, USA	1 Apr – 2 Apr
Dr Chang Youngho	The International Conference on Electric Utility Deregulation, Restructuring and Power Technologies	Deregulation in the National Electricity Market in Singapore: Competition and Efficiency	Kowloon Shangri-La Hotel, Hong Kong	5 Apr – 8 Apr
Dr Gamini Premaratne	Meetings on Econometric forecasting and high-frequency data analysis	Volatility Co-movement in the Stock Markets of North America, Europe and Asia: Some New Evidence	Singapore	5 Apr – 22 May
A/P Aditya Goenka	IXth Australasian Macroeconomics Conference	Factor intensity reversal and chaos	Australian National University, Canberra	15 Apr – 16 Apr
A/P Tongzon Jose	The 3 <sup>rd</sup> International Gwangyang Port Forum and An International Conference of Celebrating the 30 years Anniversary of KTRA	Strategies for Developing Logistics Hubs: The Case of Singapore	Community Center, Gwangyang, Korea	21 Apr – 23 Apr
Dr Sougata Poddar	International Industrial Organization Conference	On Software Piracy When Piracy Is Costly	Northwestern University Chicago	23 Apr – 24 Apr
A/P Wong Wing Keung	International Conference on Business, Banking and Finance	ASEAN DOLLAR: A Common Currency Establishment for Stronger Economic Growth of ASEAN Region	Spain	27 Apr – 29 Apr
A/P Kim Yoonbai	The Midwest International Economics Conference	Exchange Rate Targeting and Economics Stabilisation	USA	30 Apr – 2 May

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Dr Chung Wankyo	The Ninth Society of Labour Economists Meetings	Income Inequality and Health: Evidence from Indonesia	San Antonio, Texas, USA	30 Apr – 1 May
A/P Tongzon Jose	6 <sup>th</sup> ASEAN Inter-University Seminars on Social Development	Regional Trade Agreements: Their Implications for WTO and the ASEAN countries	School of Social Sciences Universiti Sains Malaysia, Penang	14 May – 16 May
A/P Peter Wilson	Asia Pacific Economics: Multilateral vs Bilateral Relationships	Prospects for Exchange Rate Cooperation: Why an ERM Solution might be the most palatable	City University of Hong Kong	19 May – 21 May
Dr Sougata Poddar	Intellectual Property Protection and International Trade	On Software Piracy when Piracy is Costly	City University of Hong Kong	24 May – 25 May
A/P Aditya Goenka	International Bond and Debt Market Integration Conference	International capital flows and transmission of financial crises	Institute for International Integration Studies, Trinity College, Dublin	31 May – 1 Jun
Prof Åke Blomqvist	38 <sup>th</sup> Annual Meeting of the Canadian Economics Association	A Game Price Competition in Pharmaceutical Markets	Toronto, Canada	4 Jun – 6 Jun
A/P Wong Wing Keung	8 <sup>th</sup> International Congress on Insurance: Mathematics and Economics	The Impact of Option Strategies in Financial Portfolios Performance: Mean-Variance and Stochastic Dominance Approaches	Rome	14 Jun – 16 Jun
Dr Lee Jin	2004 North America Summer Meeting of the Econometric Society	Wavelet Transform for Regression Estimation of nonstationary fractional time series	Brown University, RI, USA	17 Jun – 20 Jun
Dr Liu Haoming	2004 North American Summer Meeting of the Econometric Society	Women's Power and Child Quality	Providence, Rhode Island, USA	17 Jun – 20 Jun
Prof Parkash Chander	2004 North American Summer Meeting of the Econometric Society	The Gamma-Core and Coalition Formation	Brown University, Providence, Rhode Island, USA	17 Jun – 20 Jun
A/P Habibullah Khan	Travel and Tourism research Association (TTRA) 35 <sup>th</sup> Annual Conference	The Demand for Japanese Tourists in Singapore: A Cointegration Approach	Montreal, Canada	19 Jun – 25 Jun
A/P Aditya Goenka	13 <sup>th</sup> European General Equilibrium Workshop	Factor intensity reversal and chaos	Venice	19 Jun – 21 Jun
Dr Emily Cremers, Therese	79 <sup>th</sup> Annual Conference Western Economic Association International	Transfers and the Terms of Trade in a Two-Country Dynamic Model	Vancouver, B.C.	29 Jun – 3 Jul
Dr Gamini Premaratne	Far Eastern Econometric Society Meetings 2004	Stock Market Volatility: Examining North America, Europe and Asia	Seoul, Korea	30 Jun – 2 Jul
A/P Aditya Goenka	Far Eastern Econometric Society Meetings 2004	Are sunspots inevitable?	Seoul, Korea	30 Jun – 2 Jul
Dr Cheolbeom Park	Far Eastern Econometric Society Meetings 2004	Precautionary Saving, Borrowing Constraints, and Fiscal Policy	Seoul, Korea	30 Jun – 2 Jul
Dr Yohannes Eko Riyanto	Far Eastern Econometric Society Meetings 2004	1) Tunneling and Propping: A Justification for Pyramidal Ownership 2) On the Role of Local Content Requirement in Defusing the Threat of Quid-Pro-Quo FDI	Seoul, Korea	30 Jun – 2 Jul

## NUS FUNDED RESEARCH PROJECTS

The following NUS funded research projects were completed since January 2004 – June 2004:

### **Income Inequality and Health: Evidence from Indonesia**

*by Dr Chung Wankyo*

Using data from the second wave of the Indonesian Family Life Survey (IFLS2), this study analyses the relationship between income inequality and self-rated individual health status controlling for other individual, household, and community health risk factors. The study finds that income inequality has no statistically significant detrimental effect on individual health. More importantly, this result is robust to both the difference in the distribution of public health provisions between areas of equal income distributions and those of less equal income distributions and the migration of people between them. Rather than income inequality, this study suggests that relative income has a stronger association with individual health.

### **IPO in China: Underpricing or Syndicates' Competition?**

*by Assoc Prof Wong Wing Keung*

In this paper we find that the average initial return of the 961 IPOs offered between August 1991 and May 2002 is 154.28%, much higher than that in any other country. Based on the main characteristics of China stock market that the syndicates dominate the stock prices and market transactions, we find that the high initial aftermarket return of IPOs in China, which is the return from the offering price to the closing price on the first trading day, is mainly because the aftermarket price is speculatively pushed up by the competition to be the biggest shareholder among the syndicates, but not because the IPOs are deliberately underpriced lower than their true value in efficient market. The syndicates target new issues to manipulate their stock price, or to steer the market indices, or to impawn these as

collateral for loans from banks, therefore syndicates are always interested in IPO's with low proportions of A-shares, small proceeds and small A-share size. The empirical tests on these variables and the oversubscription rate and turnover ratio on first trading day support our analysis. Although we firstly claim this explanation, the fierce syndicate manipulation in China's stock market is a widely-held view by the investors and the government, and we just incorporate it into the analysis of the IPO underpricing puzzle.

### **How Rewarding is Technical Analysis? Evidence from Singapore Stock Market**

*by Assoc Prof Wong Wing Keung*

The results indicate that in general, the single moving averages produce the best results, followed by the dual moving average and the relative strength index using the '50 crossover' method. Note that transaction costs are not included in this paper. In Singapore, the main transaction cost is the commission. The commission rate varies according to the type of market player involved. Retail investors pay a flat rate of 1%. Large institutional investors like mutual funds pay around 0.5% or less, depending on the size of the institution. Broking firms with seats in the Stock Exchange of Singapore (SES) effectively do not have to pay any commission, although they do have to fork out a considerable sum to buy the seat. Then again the cost of the seat is a fixed cost and therefore there is effectively no variable cost involved for members firms of the SES. Consequently, the results are applicable more to the members of the Stock Exchange of Singapore who effectively do not have to pay any commission. In general, we can conclude from the results that the technical indicators can play a useful role in the timing of stock market entry and exits. By applying technical indicators, member firms of the SES may enjoy substantial profits. It is thus not surprising that most member firms do have their own trading team that rely heavily on technical analysis.

## JOINT WORKSHOP WITH PEKING UNIVERSITY AND TSINGHUA UNIVERSITY



*Prof Åke Blomqvist presenting a gift to Prof Cao Heping,  
Vice-President of the School of Economics, Peking University*

Arising from a MOU signed with the School of Economics, Peking University, the Department organized a joint one-and-a-half day Workshop on 11 and 12 February 2004. The theme was “China in Transition: Issues in Growth and Development”. Economists from the Department, Peking University and Tsinghua University examined the nature of Chinese growth and development as it transits from a socialist economy dominated by government linked enterprises to one based more on a capitalist model led by the private sector, and the social and economic policies which will be required to sustain this progress. Selected papers from this workshop will be published in an edited book by World Scientific Publishing Pte Ltd.



*Participants of the Workshop*

STAY IN TOUCH

We would like to express our sincere appreciation to all those who have contributed to this issue of the Newsletter.

We welcome your contributions on teaching, research and learning topics, as well as feedback on this issue. Please write to: [ecskoha@nus.edu.sg](mailto:ecskoha@nus.edu.sg) or [ecssec@nus.edu.sg](mailto:ecssec@nus.edu.sg)

Do we have your correct name and address? Would you like us to send a copy of the Newsletter to your friends/colleagues? Please fill in the form below and fax (67752646) to:

Mrs Annie Koh  
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## THE SECOND SINGAPORE ECONOMIC REVIEW (SER) LECTURE



*Professor John Whalley*

The Second SER Lecture was delivered by Professor John Whalley, Director of the Centre for the Study of International Economic Relations, University of Western Ontario, on 5 April 2004. He spoke on “Rationality, Irrationality and Economic Cognition”.

Reproduced below is the Opening Speech by Assoc Prof Euston Quah, Editor of the Singapore Economic Review.

“Distinguished Guests, Colleagues, Friends, Students, Ladies and Gentlemen. Good Evening

Founded in 1956, the Singapore Economic Review (formerly, the Malayan Economic Review) is now in its 48th year of publication. Among its distinguished contributors were the late Sir John Hicks, Max Corden; Hans Singer; Sir Sydney Caine; Henry Wan; Herbert Grubel; Heinz Ardnt; and not forgetting the late Harry Johnson. This tradition is now carried on by renowned economists such as Ezra Mishan; Ronald McKinnon; Jerome Stein; Murray Kemp; and Peter Lloyd in a special eminent paper series as well as our own leading policy economist, Professor Lim Chong Yah, who was also Past Editor of the SER.

The journal has a wide international circulation, and among them include the libraries of Harvard University; Stanford University; the London School of Economics; Oxford University; and Cambridge University. In Australian universities, the Singapore Economic Review is particularly a respectable internationally refereed journal and in recent years increased submission of papers had come from the Australian National University; the University of Melbourne, University Queensland; and Monash University. In the mid-eighties, the journal was reportedly ranked 87 out of some 160 selected major internationally refereed journals by a paper published in the *Journal of Economic Literature*. Similar ranking of the journal was also reported in another published paper in *Economic Inquiry* during the same period. Although a general

economics journal, and notwithstanding the importance of publishing sound theoretically based papers; the Singapore Economic Review will continue to build on its established strength and comparative advantage of applied and policy economics pertaining to the economic problems and issues of the Asia-Pacific region.

I am encouraged by the strong support of my co-editors, Assoc Professor Hoon Hian Teck, and Assoc Professor Xing Xiaolin; members of the SER Editorial Board; and the advice from predecessor editors, two of whom are here today, Professor Lim Chong Yah and Professor Basant Kapur; our publisher, World Scientific; Dr Khor Hoe Ee, President, Economic Society of Singapore, and Council Members of the Society as well colleagues from our three universities NUS, NTU, and SMU.

In 2002, the First Singapore Economic Review Lecture was given by Professor David Greenaway, former Pro-Vice Chancellor and Dean of Economics at the University of Nottingham. This year, we are fortunate to have Professor John Whalley as our Speaker for the Second Singapore Economic Review Lecture. Professor Whalley is Professor of Economics and Director of the Centre for the Study of International Economic Relations at the University of Western Ontario, Canada. He is a Fellow of the Royal Society of Canada, Fellow of the Econometric Society and Foreign Fellow of the Russian Academy of Natural Sciences. He is also a Research Associate of the National Bureau of Economic Research and Joint-Managing Editor of *The World Economy*. Known widely for his work on computable general equilibrium and applications for public finance, international trade and development, Professor Whalley is a prolific writer with pioneering and scholarly works appearing frequently in leading journals such as the *American Economic Review*; the *Economic Journal*; *Review of Income and Wealth*; *Journal of Political Economy*; *Review of Economics and Statistics*; *Journal of Development Economics*; *Economica*; *Journal of Public Economics*; *Econometrica*; and *Journal of Economic Theory*; among others. Professor Whalley was and is centrally involved in the many facets of the world trading system including activities of WTO, World Bank, IMF, OECD, UNCTAD, among other global institutions. Professor Whalley obtained his PhD in economics from Yale University in 1973 and since then had held positions at the London School of Economics and the University of Warwick. Currently a Guest Professor at Peking University, Professor Whalley had recently written on a possible World Environmental Organisation and is increasingly promoting



a possible Global Visa Organisation to help address what he feels as a major contemporary global problem. Much of Professor Whalley's work had involved the emphasis on the interplay between pragmatic policies on the one hand, and analytical formulations on the other. His work also strongly reveals his long standing interdisciplinary collaborations with lawyers, political scientists, and faculty outside the domain of economics. I am told that Professor Whalley enjoys walking, swimming, music, collecting clocks, taking short but power naps and basically talking to people. I am also informed that his current work involves working with honeybees and bumble bees to discern new economic principles from their behaviour. Last but not least, on the implications of geese behaviour for stock markets.

The subject that Professor Whalley is speaking on this evening is increasingly on the minds of economists in that whether to a large extent economics can continue to explain human behaviour and social phenomena using our basic tenets of optimisation, maximising utility, or minimising costs in the face of counter evidence of actual observed behaviour and choices. Economics invariably involves assuming that people are rational in the sense that on the whole, they will act in their own best interests; and this in turn implies a general tendency to compare costs and benefits of options before making choices. Applying this seemingly intuitive approach to understanding a wide variety of human actions and behaviour such as love, marriage, fertility, divorce, and other elements in our social environment from the works of Nobel Laureate Gary Becker; and to understanding legal phenomena such as tort law, contracts; and the criminal law by Richard Posner are strongly persuasive of the reasoning behind economics and in pushing further the frontiers of what economics as a discipline could do to assist policy and decision making.

The elegance and power of the models to explain such social behaviours go beyond the human world and in the seventies, a series of published papers on how birds and rats behave to changes in prices as measured by 'effort' and income as measured by 'food endowments'—the so-called Kagel papers— have also shown that these animals do conform to standard microeconomic theory! Being much of this persuasion with neo-classical theory and strong believer of utility maximising behaviour, my former colleague, Dr David Lee and I wrote our first book while being fresh tutors at NUS which we titled *Economics: Sense and Nonsense* published by Longman. We wanted then to disseminate this line of thinking to as wide a general audience as possible. I am happy to note that a forthcoming article in the *Journal of Economic Psychology* by a French economist had cited an extended an early paper of mine on search behaviour and marriage.

In recent years however, the persistence of some counter-evidence of observed behaviour such as multiple discount rates, disparities in choices of economic evaluation; behavioural findings from economics and behavioural finance cannot be neglected any further. We had a sampling of this literature from Colin Cammerra and Jack Knetsch when they were visiting NUS a few years ago. And now, Professor John Whalley adds to this quagmire by going back to the basics in questioning what do we really mean by rationality and how perhaps economists can learn from psychologists and anthropologists in redefining the notion of rationality. He will draw on the work of Nobel Laureate Herbert Simon who had an extraordinary career in making central contributions not only in economics but also in psychology, sociology, computer science, cognition, organizational theory and several other areas. Professor Whalley, please.

## WORKSHOP ON MARITIME ECONOMICS

The Department in cooperation with the Maritime and Port Authority of Singapore (MPA) attracted the leading maritime economists from around the world to come together for two events. The first was a two-day workshop titled "*The Industrial Organization of Shipping and Ports*" held on 5 and 6 March 2004. The second was an Economics Executive Programme Seminar on "*Critical Issues Facing the Port and Shipping Industry in the 21<sup>st</sup> Century*" held on 8 March 2004.



Assoc Prof Julian Wright, Chairman of the Workshop

Among the topics discussed were the topical issue of shipping conferences (which are under attack from policymakers in the US and Europe), the implications for pricing (freight rates), port competition in China, maritime safety and accidents, port labour issues, the network economics of shipping, governance structure and port performance, and container port production efficiency. A number of the papers presented have since been published in the June, 2004 special issue of the *Review of Network Economics*. The outside sponsor for the events was the Network Economics Consulting Group.

## STAFF PUBLICATIONS

### THE AGGREGATE CONSUMPTION PUZZLE IN SINGAPORE

By Tilak Abeyasinghe and Keen Meng Choy  
*Journal of Asian Economics (forthcoming)*

We draw attention to an apparent puzzle in the aggregate consumption behaviour of Singaporeans. In stark contrast to the rest of the world, the average propensity to consume has plummeted to a record low of two-fifths of income by the year 2003, leaving the Singapore economy without a dependable built-in stabilizer. This phenomenon represents a notable departure from the stable long-run equilibrium relationship between consumption, disposable income and wealth observed elsewhere. The explanation of this puzzle is the main focus of the paper but we also suggest some policy measures that may reverse the process.

### EDUCATION AND IMMIGRATION POLICY

By Parkash Chander and Shandre M Thangavelu  
*Journal of Development Economics (forthcoming)*

This paper explores a two-period model with complementarities between investment in/adoption of new technologies and human capital accumulation/investment in education. Workers invest in education in the first period and in the second period, entrepreneurs decide whether or not to adopt a new technology. Multiple rational expectation equilibria exist: if workers believe that a large (small) fraction of entrepreneurs will adopt the new technology next period, then their return to education will be high (low) and accordingly the level of investment in education will be high (low) too. Equivalently, entrepreneurs will adopt the new technology if the level of education is sufficiently high. Two policies are considered for ensuring that a welfare improving high-technology equilibrium will prevail, namely educational subsidies and immigration of high-skilled workers. A key result is that a commitment to immigration of high-skilled is sufficient to ensure new technology adoption.

### NON-FUNDAMENTAL EXPECTATIONS AND ECONOMIC FLUCTUATIONS: EVIDENCE FROM PROFESSIONAL FORECASTS

By Keen Meng Choy, Kenneth Leong and Anthony S Tay  
*Journal of Macroeconomics (forthcoming)*

It is theoretically possible that non-fundamental idiosyncratic shocks to agents' rational expectations are a source of economic fluctuations. Studies using data on consumer and investor sentiment suggest that this is indeed an important source of fluctuations. We present the results of a study that uses forecasts from professional forecasters to extract non-fundamental shocks to expectations. In contrast to previous studies, we show that non-fundamental expectations are not a significant source of output fluctuations, although such shocks contributed to inflation.

### CAN FASTER INCOME GROWTH REDUCE WELL-BEING?

By Basant K Kapur  
*Social Choice and Welfare (forthcoming)*

In his book *Luxury Fever: Why Money Fails to Satisfy in an Era of Excess* (1999) economist Robert Frank describes a number of significant trends in the U.S., and to a lesser extent in other industrial economies, since the late 1970's: rapidly rising incomes, for those at the upper end of the income scale, increasing hours of work, and increased consumerism (*share* of consumption of 'status goods'). We demonstrate that the first development can parsimoniously account for the latter two. Our novel specification of the utility function simultaneously incorporates a relative-consumption effect for status goods and non-homotheticity of preferences between status and non-status goods, and we also allow for endogenous labour-leisure choice. It is possible that well-being has declined, notwithstanding the faster income growth, or at least not risen *pari passu* with the growth in earnings. Comparisons are made with other studies, and policy implications briefly discussed.

### BIASED LENDING AND NON-PERFORMING LOANS IN CHINA'S BANKING SECTOR

By Ding Lu, Shandre M Thangavelu and Qing Hu  
*Journal of Development Studies (forthcoming)*

This paper uses a panel data set of public listing companies in China to empirically explore the relationship between banks' lending behavior and non-performing loans. Our results show that the state-owned enterprises (SOEs) got more loans than other firms, other things being equal, and

*continued on page 15*

SOEs with high default risks were able to borrow more than the low-risk SOEs and non-SOEs. This suggests that Chinese banks had a systemic lending bias in favor of SOEs, particularly those with high default risks, during the period under investigation. Causes and implications of this behavior are discussed.

### STOCK RETURN PREDICTABILITY AND THE DISPERSION IN EARNINGS FORECASTS

By *Cheolbeom Park*

*Journal of Business (forthcoming)*

Using monthly data for earnings forecasts by market analysts, this paper shows that the dispersion in forecasts has a particularly strong predictive power for future aggregate stock returns at intermediate horizons. The results are robust (1) regardless of whether Newey-West or Hodrick corrected t-statistics are used, (2) when other forecasting or macroeconomic variables are included, (3) when different scaling variables are used for the dispersion measure, and (4) after correcting for finite sample biases. Furthermore, additional results suggest that the dispersion in analysts' forecasts can be interpreted as a measure of the differences in investors' expectations rather than the risk.

### THE EFFECT OF TAKEOVER THREATS ON SHAREHOLDERS AND FIRM VALUE

By *Yohanes Eko Riyanto and Marco Haan*

*Journal of Economic Behaviour and Organization (forthcoming)*

We study the role of takeover threats as a corporate control mechanism using Aghion and Tirole's (1997) model of formal and real authority. Shareholders do not monitor the manager's actions, since ownership is widely dispersed. A corporate raider may monitor, and steps in if a profit opportunity exists. In our model, a takeover threat decreases managerial effort. A takeover threat may increase the value of the shares. We also look at the extent of anti-takeover defenses favored by individual shareholders, and institutional investors.

### ASEAN-CHINA FREE TRADE AREA: A BANE OR BOON FOR ASEAN COUNTRIES?

By *Jose L. Tongzon*

*The World Economy (forthcoming)*

At the ASEAN Summit in November 2000, the Leaders of ASEAN and China agreed to enhance economic cooperation and integration with the goal of establishing an ASEAN-China Free Trade Area (FTA). This decision was a natural response to a number of important global and regional developments of the past decade. Since the signing of the framework agreement, policymakers from China and ASEAN member states have already started their negotiations on the specific terms and features for this proposed FTA. While such a FTA would hold the potential of yielding enormous economic benefits, it also causes some sense of apprehension and uncertainty in some quarters, due to the common perception that China is already a strong competitor in trade and attracting foreign investment. To examine the economic basis for such concern, this paper analyzes the economic implications of this proposed free trade area from the ASEAN economies' perspective. Specifically, it examines how competitive ASEAN countries are vis-à-vis China, evaluates the scope for strengthening China-ASEAN trade and the impediments facing Chinese and ASEAN investors in each other's markets, and recommends policy measures to maximize the benefits and minimize the hardships resulting from an ASEAN-China FTA.

### A PARADIGM SHIFT FOR CHINA'S CENTRAL BANKING SYSTEM

By *Jose Tongzon and Connie Chung*

*Journal of Post-Keynesian Economics (forthcoming)*

Using the USA's Federal Reserve System (FRS) as a reference, we make an assessment of China's central banking system by analyzing the People's Bank of China's (PBC) in the areas of central bank independence, conduct of monetary policy, conflict between monetary and fiscal objectives and its organizational, financial regulatory and supervisory support structures. We conclude that it needs to make a paradigm shift from its current controlled disposition to one that calls the "shots" in all central banking decisions,

especially now that more is expected of it with China becoming a member of the World Trade Organization (WTO), which has implications on the financial sector.

### THE ESTIMATION OF THE COST OF CAPITAL AND ITS RELIABILITY

By Wong, W K and R Chan

*Quantitative Finance, 4 (3), 365-372*

Gordon and Shapiro (1956) first equated the price of a share with the present value of future dividends and derived the well-known relationship. Since then, there have been many improvements on the theory. For example, Thompson (1985, 1987) combined the “dividend yield plus growth” method with Box-Jenkins time series analysis of past dividend experience to estimate the cost of capital and its “reliability” for individual firms. Thompson and Wong (1991, 1996) proved the existence and uniqueness of the cost of capital and provided formula to estimate both the cost of capital and its reliability. However, their approaches cannot be used if the “reliability” does not exist or if there are multiple solutions for the “reliability”. In this paper, we extend their theory by proving the existence and uniqueness of this reliability. In addition, we propose the estimators for the reliability and prove that the estimators converge to a true parameter. The estimation approach is further simplified, hence rendering computation easier. In addition, the properties of the cost of capital and its reliability will be analyzed with illustrations of several commonly used Box-Jenkins models.

### THE RELATIONSHIP BETWEEN STOCK MARKETS OF MAJOR DEVELOPED COUNTRIES AND ASIAN EMERGING MARKETS

By Wong, Wing-Keung, Jack H W Penm, Terrell and Karen Yann Ching Lim

*Journal of Applied Mathematics and Decision Sciences (forthcoming)*

With the emergence of new capital markets and liberalization of stock markets in recent years, there has been an increase in investors’ interest in international diversification. This is so because international diversification allows investors to have a larger basket of foreign securities to choose from as part of their portfolio assets, so as to enhance the reward-to-volatility ratio. This benefit would be limited one if national equity markets

tend to move together in the long run. This paper thus studies the issue of co-movement between stock markets in major developed countries and those in Asian emerging markets using the concept of cointegration. We find that there is co-movement between some of the developed and emerging markets, but some emerging markets do differ from the developed markets with which they share a long-run equilibrium relationship. Furthermore, it has been observed that there has been increasing interdependence between most of the developed and emerging markets since the 1987 Stock Market Crash. This interdependence intensified after the 1997 Asian Financial Crisis. With this phenomenon of increasing co-movement between developed and emerging stock markets, the benefits of international diversification become limited.

### STOCHASTIC DOMINANCE AND THE RATIONALITY OF THE MOMENTUM EFFECT ACROSS MARKETS

By Fong Wai Mun, Hooi Hooi Lean and Wing Keung Wong  
*Journal of Financial Markets (forthcoming)*

This paper applies recent econometric tests of stochastic dominance to examine an enduring puzzle in finance: the momentum effect in stock returns (Jegadeesh and Titman 1993). We use stochastic dominance tests to distinguish between the hypothesis that there exists general asset pricing models that can explain momentum versus the alternative hypothesis that there are no asset pricing model consistent with risk averse investors than can rationalize that effect. Using stock index data for 24 countries over the period 1989-2001, we show that winner portfolios stochastically dominate loser portfolios at second and third order. These results are robust to two subperiods with different risk and return characteristics and survive reasonable transaction costs for international index funds. Our results indicate that the search for rational asset pricing explanations for the momentum effect may be a futile one.

### INCOME RANKING AND CONVERGENCE WITH PHYSICAL AND HUMAN CAPITAL AND INCOME INEQUALITY

By Jie Zhang

*Journal of Economic Dynamics and Control (forthcoming)*

This paper presents an overlapping generations model with physical and human capital and income inequality. It shows



that inequality impedes output growth by directly harming capital accumulation and indirectly raising the ratio of physical to human capital. The convergence speed of output growth equals the lower of the convergence speeds of the relative capital ratio and inequality, and varies with initial states. Among economies with the same balanced growth rate but different initial income levels, the ranking of income can switch in favor of those starting from low inequality and a low ratio of physical to human capital, particularly if the growth rate converges slowly.

#### AN ECONOMIC ANALYSIS OF LIFE EXPECTATION WITH AN APPLICATION IN THE UNITED STATES

By Jie Zhang, Michael Leung and Junsen Zhang  
*Journal of Health Economics (forthcoming)*

This paper presents an economic model to explain the behavior of life expectancy of both sexes. It explicitly examines the relationship between the gender gap in life expectancy and the gender gap in pay. It shows that as the latter narrows over the course of economic development, the former may initially expand but will eventually shrink.

Simulation results from our model accord with the behavior of life expectancy for both sexes since the 1940's in the United States.

#### HOW DOES SOCIAL SECURITY AFFECT ECONOMIC GROWTH: EVIDENCE FROM CROSS-COUNTRY DATA

By Jie Zhang and Junsen Zhang

This paper investigates how social security interacts with growth and growth determinants (savings, human capital investment, and fertility). Our empirical investigation finds that the estimated coefficient on social security is significantly negative in the fertility equation, insignificant in the saving equation, and significantly positive in the growth and education equations. By contrast, the estimated coefficient on growth is insignificant in the social security equation. The results suggest that social security may indeed be conducive to growth through tipping the trade-off between the number and quality of children toward the latter.

### Upcoming Event

## NUS-UNIVERSITY OF MELBOURNE JOINT WORKSHOP

The fifth Annual Joint Symposium between the Department of Economics, NUS and the Faculty of Economics and Commerce, University of Melbourne, will be held on 16 and 17 September 2004 at NUS. The theme of the Symposium is "Competition Policy, Information Economics and International Economics". Speakers from the University of Stockholm, University of Nottingham, and University of Adelaide will also participate in the Symposium.

A brief of the Symposium is as follows: Globalization is not a new phenomenon but the pace which it has occurred has increased tremendously in the past few years. Seen as the integration of markets, nations and technologies, globalization has resulted in numerous changes in the economic landscape of the world and individual nations. The economies of the industrialized

countries as well as developing nations are being reshaped by the rapid development and diffusion of advanced information and communications technologies. Deregulation and free trade agreement (FTA) are being implemented in many market economies to promote competition. International economics is also growing in importance because of the rapid integration of international economic markets. Given this scenario, the main aim of this Symposium is to understand the implications of a global marketplace on consumers, businesses and governments from the perspective of competition policy, information economics, and international economics.

Those who are interested, may contact Ms Lim Meng Woan at [ecslimmw@nus.edu.sg](mailto:ecslimmw@nus.edu.sg) (tel: 68743962) or Mrs Annie Koh at [ecskoha@nus.edu.sg](mailto:ecskoha@nus.edu.sg) (tel: 68746012).

## STAFF SEMINARS

Staff Seminars presented by our staff and other economists from August to November 2003

Presenter	Topic	Date
Dr Ramkishen S. Rajan, Senior Lecturer, School of Economics, University of Adelaide	Managing New-Style Currency Crises: The Swan Diagram Approach Revisited  Why Are Crisis-Induced Devaluations Contractionary? Exploring Alternative Hypotheses	14 Jan 04
Professor Michael McAleer, School of Economics, University of Western Australia	Asymmetric Generalized Autoregressive Conditional Correlation	15 Jan 04
Dr Marco Haan, Department of Economics, University of Groningen, the Netherlands	Consumer Boycotts	27 Jan 04
Mr Minn Naing Oo, Deputy Director / Legal Advisor, Trade Directorate (B), Ministry of Trade and Industry, Singapore	The Singapore approach to FTAs in a multilateral trading world  <i>(Joint Departmental + Graduate Seminar)</i>	29 Jan 04
Professor Henry Tulkens, Université Catholique de Louvain	Cooperative Games and Dynamic Models of International Environmental Problems	3 Feb 04
Mr Chun-Seng Yip, University of Pennsylvania	Job Search and Labor Force Participation in Equilibrium: Theory and Estimation	10 Feb 04
Professor Shmuel Nitzan, Department of Economics, Bar-Ilan University	Lobbying and Transparency	17 Feb 04
Mr Ricard Gil, University of Chicago	Decision Rights Allocation in the Movie Industry: Understanding Vertical Integration	18 Feb 04
Dr Jangryoul Kim, Federal Reserve Bank of Minneapolis	Quest for Optimal Monetary Policy	19 Feb 04
Dr Huiwen Lai, SAS Institute Inc.	U.S. Exports and Multinational Production	24 Feb 04
Dr Chenghu Ma, Reader, Department of Accounting, Finance & Management, University of Essex	Mean-Preserving-Spread Risk Aversion and CAPM	26 Feb 04
Dr Andrew Warner, NBER	Once more into the breach: economic growth and global integration	2 Mar 04
Assoc Prof Aditya Goenka, Department of Economics, NUS	Factor Intensity Reversal and Chaos	3 Mar 04
Mr Jingfeng Lu, University of Southern California	Stochastic Private Values in Auctions: Identification and Estimation * <i>(via Video Conferencing)</i>	9 Mar 04

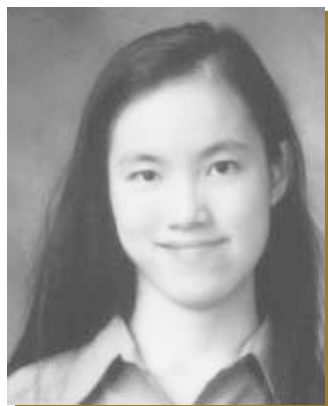
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Professor James Markusen, Department of Economics, University of Colorado, Boulder	A Multi-Country Approach to Multi-Stage Production	16 Mar 04
Mr Ryuichi Tanaka, New York University	On the Costs and Benefits of a Mixed Educational Regime	17 Mar 04
Assoc Prof Jinpeng Ma, Department of Economics, Rutgers University-Camden	Jobless Recovering and Equilibrium Involuntary Unemployment with a Simple Efficiency Wage Model	18 Mar 04
Professor Rabah Amir, CORE	Market Structure, Scale Economies and Industry Performance	19 Mar 04
Associate Professor John Morgan, Hass School of Business, University of California, Berkeley	Brand Awareness and Price Competition in Online Markets <i>(Joint Seminar with Dept of Business Policy)</i>	22 Mar 04
Dr Changhui Kang, Department of Economics, NUS	University Prestige and Choice of Major Field: Evidence from South Korea	23 Mar 04
Professor R. G. Gregory, Research School of Social Sciences, Australian National University	Exploring the Impact of Interrupted Education on Earnings: The Educational Cost of the Chinese Cultural Revolution	24 Mar 04
Professor Bjarne S. Jensen, Copenhagen Business School	General Equilibrium Dynamics of Multi-Sector Growth Models	25 Mar 04
Professor Nobuhiro Kiyotaki, Tan Chin Tuan Distinguished Visitor, Department of Economics, NUS	Liquidity, Business Cycles, and Monetary Policy	30 Mar 04
Dr Mau-Ting Lin, Department of Economics, NUS	Maximum Likelihood Estimation of Linear Rational Expectation Model with Unique Stable Solvability Constraints	1 Apr 04
Professor Nobuhiro Kiyotaki, Tan Chin Tuan Distinguished Visitor, Department of Economics, NUS	A Model of Job and Worker Flows	6 Apr 04
Assoc Prof Wong Wing Keung, Department of Economics, NUS	On the Estimation of Cost of Capital and its Reliability	7 Apr 04
Assoc Prof Trichy V. Krishnan, NUS Business School	Bypassing the Dominance of Big Manufacturers: A Recent trend in Supplier Strategy	8 Apr 04
Professor Peter J. Hammond, Stanford University; Visiting Professor, Department of Economics, NUS	History: Sunk Cost, or Widespread Externality?	12 Apr 04
Dr Younghwan In, Department of Economics, NUS	A Fictitious Play of the Nash Demand Game Implements the Nash Bargaining Solution	13 Apr 04
Assoc Prof Nicolaas Groenewold, Dept of Economics, University of Western Australia	Consumption and Stock Prices: Can We Distinguish Signalling from Wealth Effects?	15 Apr 04
Assoc Prof Kim Yoonbai, Department of Economics, NUS	Exchange Rate Targeting and Economic Stabilization: An Empirical Exploration	20 Apr 04

## STUDENT ACHIEVEMENTS

### ONG SIEW HOON

#### - SPECIAL ACHIEVEMENT



I was thrilled when I was offered a place in the Arts and Social Sciences faculty at the National University of Singapore (NUS) in June 2001. As I am suffering from Cerebral Palsy, there was the feeling of uncertainty and I did not have the slightest idea of what to expect out of my three years of education

here. But one thing was sure for me: I wanted to major in Economics because it really interests me then. I was glad that I had made the best out of my three years of varsity life in NUS and managed to graduate with a Bachelor of Arts (Economics Major) degree with Merit.

I have had to struggle to get where I am because I had to work harder than normal students and persevere. Instead of taking down notes during lectures, I taped the lectures and transcribed them at home by myself so that I can understand the contents. If time were running out for me, I would just listen to the tapes one or two weeks before the exams to get the main ideas, not to leave out going through the lecture notes and tutorial answers. Despite my physical disability, I had been able to submit all my past term projects or assignments on time without asking for extension of deadline. I was able to do so by sacrificing a few hours of my sleeping time and leisure time of watching television programmes. I felt that the sacrifices I made were worthwhile and my efforts were certainly paid off.

I was blessed with some Economics major friends who were very warm and helpful towards me since year one of my study. They would willingly lend me their lecture notes to zap especially for modules like EC3151, EC3152 and EC3231, which were very mathematical. We guided one another along the way for the modules that we took together. Thus, they had an impact on my performance too. They would also cheer me up whenever I was down or stressed up.

Although I have some speech disturbances, I tried to contribute my ideas and answers whenever I could during tutorial discussions and presentations. Apart from gaining some participation marks, I knew that I had learnt

something useful at the end of the day. I was grateful to most of my tutors, who were very tolerant towards me. They really made an effort to decipher what I was saying and repeated my points to the class. In addition, they were approachable and friendly, making it easy for me to go to them for clarifications. At the start of each semester, the Economics modules that I took seemed intricate in the beginning but most of my lecturers were willing to help me at every step of the way (for example, giving me permission to tape their lectures, making mid-term special arrangements in the Silcock Journal Room) and I managed to pull through.

Though my parents left me to handle my studies by myself, it was sometimes demoralizing when my results were not up to my expectations. But I often told myself that the grade should serve as a motivation for me to fight on and never give up on the module. On occasions when I did not score satisfactorily in my Economics mid-term tests, I aimed to do better the next time round for the final examinations.

It was mentally draining for me to study for examinations. I was being cooped up in my room for almost the whole day and had to give up usual activities like watching television programmes and shopping. Since I could better concentrate in the quiet of the night, I usually stayed up till 2:00 am during the Reading Period to study. When my mind was tired, I would stop and do something else - enjoy some music or chat with my parents. Of course, a cup of "Lipton" tea or a bottle of "Brands" Chicken Essence was always at hand to keep me awake.

I admit that it was difficult to score good grades for Economics. Memorizing the textbook or lecture notes for an Economics module and regurgitating it during the examinations did not guarantee good grades. What I have learnt from Economics during these three years is to truly understand what is being taught and being able to apply them to real world or hypothetical situations. Being someone who does not believe in wasting time, I would not dwell on any topic that I could not understand. I would move on to other topics before returning to that topic again. I feel that no one can understand everything in this world and it may not be worthwhile pouring all the time and effort into one topic and neglecting others. It is also impossible to study everything within one or two weeks. My advice to others is to study smart and manage their time well so that most materials can be covered. I had come to realize that the mid-term questions or topics are unlikely to appear again in the finals for Economics.

*continued on page 21*



Though I was not a straight 'A's Economics student, I felt happy and was contented with the overall results that I had achieved. Considering the handicap I had to deal with and since Economics required a lot of thinking and application skills, my overall results showed that I was capable of doing the work as well and often better than other Economics students. I was able to do so because I received a helping hand from God, lecturers, tutors, Economics major friends as well as my Church friends from the "Tabernacle University

Fellowship" who were always there to pray for me and give me encouragement.

In short, I have no regrets looking back my varsity life because I know that I have made good use of my knowledge in Economics to give my best in whatever I do. I considered getting a Bachelor of Arts degree a personal accomplishment for me and I attributed my achievement to "hard work and sacrifice". I hope to find a permanent job after graduation and, in time, go into the area of research or statistics.

## LIM YEN PIN

### - WINNER OF THE RACHEL MEYER BOOK PRIZE AND MONETARY AUTHORITY OF SINGAPORE BOOK PRIZE

My decision to study Economics at university surprised many friends. Reading Science subjects at junior college, most of my peers went on to pursue degrees in Engineering or the Physical Sciences. In fact, on my way to sit for my final Economics paper in April, I had a busy time explaining to a former JC classmate that I had been majoring in Economics for the past four years.

The time spent on studying Economics has been most enjoyable and intellectually stimulating. My analytical and reasoning skills have certainly been honed through integrating current economic issues with complex models. No longer was I simply memorising principles and theories word-for-word; Instead, I found myself trying to understand them thoroughly so as to apply them flexibly. For this, I am immensely grateful to all my lecturers and tutors for their inspiring lessons, patient guidance and dedication. Despite their hectic schedules, they have always been forthcoming in clearing my doubts. Their tireless efforts in probing and understanding the rationale of my, at times, flimsy arguments have truly sharpened my mind and propelled my passion for the subject.

A special note of appreciation goes out to Assoc Prof Albert Tsui, my honours thesis supervisor who also taught me Financial Economics. I would not have been able to complete my thesis successfully without his invaluable advice, continuous support and encouragement. His constant efforts in ensuring that I grasped the correct approach to problem solving have indeed enriched my learning experience

I also thank Assoc Prof Peter Wilson for supervising my Independent Study Module (ISM) and sharing his insights and expertise on Optimum Currency Areas. His knowledge

in the field of International Economics has also spurred me to read beyond the texts. Another person whom I am thankful to is Dr Zhu Lijing. Besides supervising my first ISM, he also went out of his way to ensure that I gained wide exposure in my learning, resulting in my participation in the Asia Institute of Political Economic (Hong Kong) two years ago.



Prof Basant Kapur's lessons have truly been memorable, as his quick thinking and enthusiasm in Macroeconomics were truly invigorating and never failed to engage my interest. I have also greatly benefited from my other lecturers and tutors who were always able to explain new concepts clearly. They include: Dr Younghwan In, Dr Lim Boon Tiong, Dr Liu Haoming, Dr Wong Siu Kee and Assoc Prof Xing Xiaolin. Many thanks go out to the staff of the Economics Department as well.

These four years as an Economics student at NUS have been rewarding and gratifying. I never once regretted my choice, but I would not have been able to make it so far without the unwavering support from my family and friends. I thank all of you from the bottom of my heart.

## TAN CHUN YONG

– WINNER OF THE YOU POH SENG PRIZE IN ECONOMETRICS

Markets' anticipation of interest rate hikes by the U.S. Federal Reserve, rising oil and commodities prices, massive jobs outsourcing and the engineering of a soft landing for the overheating Chinese economy. The abovementioned are some major economic concerns of many nations at the point of penning this article. As I reflect back in time, I recall that in my younger days macroeconomic issues did not catch much of my attention whenever I browse the daily papers. Even if they did, I would have made little sense of the huge consequences that they can have on the livelihood of people. Many thanks to the rigorous Economics training undergone in NUS, I can now analyze the causes and impacts of such phenomenon with a much deeper set of understanding.

For me, deciding to major Economics in NUS was no great difficulty simply because Economics interests me much more than the sciences. Initially, I entered NUS with a naïve mentality that studying Economics was plainly about composing lengthy essays that commence with precise definitions explaining key terms in the questions, and presenting arguments supported by little diagrams of demand and supply curves. I expected Economics to be much like what we were taught to do in junior colleges. I was wrong and was in for a shock. Instead, Economics at the tertiary level was largely mathematical in nature and as described in the candid words of Prof Basant Kapur, "the concepts must tally algebraically, geometrically and economically" (An interesting remark that I had noted in Prof Kapur's class. Unfortunately, I was unable to remember exact word for word and the above statement represents a vague idea of what I can recall). I soon adapted to the unexpected changes and fell in love with the mathematical and analytical challenges of Economics. Being a practical person rather than an abstract thinker, Econometrics appeals to me strongly for it provides me with a powerful tool for empirical studies. As I looked back over the four years, I must admit that the Economics education had helped me developed strong quantitative and analytical capabilities as well as an inquisitive mind. Overall, it was an enriching and fulfilling experience.

I would like to make special use of this opportunity to express my heartfelt gratitude to my honours thesis supervisor, Assoc Prof Shandre M Thangavelu. Certainly, he has been very encouraging and offered me much systemic



*Tan Chun Yong (front man) and friends of the Economics Honours Programme.*

guidance in completing the demanding dissertation. His confidence in me has spurred me to excel in my work and prompted me to look into the possibility of furthering my studies. A word of thanks to Assoc Prof Hui Weng Tat for allowing me a chance to learn much about academic research as a research assistant. Not forgetting all other committed lecturers in the Economics Department who have dedicated their lives to make learning in NUS fun and challenging, a big thank you to all of you too.

As a Chinese saying goes: "When one is at home, he relies on his parents. When he is out of home, he would have to depend on the friends around him". What a marvellous and true proverb! Indeed, I would not have achieved what I have achieved in NUS without the peers around me who constantly motivated me to strive beyond what I can accomplish. The numerous hours of intellectually gratifying discussions as well as the lighthearted 'canteen breaks' have definitely made our university life rewarding and memorable. To Jerel, who has been the best of friends in our pursuit of the Economics degree, no amount of words can express my deepest appreciation for your motivation and friendship throughout the four years. Finally, I am also immensely grateful to my family for their unwavering support and encouragements.

## TAN HAN SONG, BOBBY

- WINNER OF THE LIM TAY BOH MEMORIAL MEDAL

My choice to major in economics was predetermined before I matriculated into NUS, as I accepted a PSC for scholarship to read economics. I had enjoyed economics at JC level and opted for it as my first choice at the scholarship interview. Nonetheless, I was initially overwhelmed by the array of mathematical notations that was used in the teaching of economics. After four years of I study in the NUS economics program, I am glad to say that I do not regret my choice. Not only have I learnt more about the world we live in, my training in economics has taught me valuable skills that will be handy in the future.

Economics as a discipline combines the use of simple conceptual frameworks with the extensive utilization of mathematical tools. As such, it is often misunderstood as too abstract and/or too simplistic to be applicable to actual social phenomenon. However, through the efforts of the tutors in the Economics Department, I managed to see the applicability of various economic concepts, from job search theory to imperfect information, and to appreciate the reasoning behind the equation and matrices.

At the same time, I feel that the value of the economics program goes beyond the enrichment of my knowledge (as precious as it is). The quantitative approach that was used

in many of the courses enabled me to handle quantitative data with ease, while the attention to economic logic sharpened my critical thinking skills. Special mention must also go to my thesis supervisor, Professor Basant Kapur, who encouraged me to think widely yet thoroughly on a variety of issues, while retaining the focus on the big picture. Finally, I am grateful to all my friends: those in the economics program, for taking time to help me with many of the courses; and those outside the program, whose seemingly innocuous questions about economics made me think harder and deeper about the discipline.



*Bobby Tan standing at the right corner.*

## TAN YEW KIAT

- WINNER OF THE JOANNA WONG GOLD MEDAL AND  
ECONOMICS SOCIETY OF SINGAPORE GOLD MEDAL

It did not take me long in my first year to realize that I have entered a mathematics course instead. The modules were challenging, especially Macroeconomics and Econometrics and I was determined to excel in them. But having to work through complex equations of the models is not something I imagined doing on a weekend; well, at least not until Professor Basant said, "... be rigorous to fully appreciate the elegance of the model."

Inspired, thereafter I would even leap out of bed whenever I suddenly thought of solutions to difficult tutorials or ideas for research. The realm of economics never ceases to fascinate me: I was to discover my passion in Public Finance under the dedicated guidance of Associate Professor Chia Ngee Choon. The thesis ranks as the most memorable and meaningful assignment in my honours course. Despite the arduous process of data collection and the nerve-wrecking moments when the computer hangs while running simulations, the invaluable insights, together with the sheer pride on completion of the thesis made it all worthwhile.

I take away from these four years in Economics not just a wealth of knowledge but also a network of good friends



*Tan Yew Kiat, second left from the front row.*

and memories of exceptional lecturers. I found the discipline both intellectually fulfilling and enjoyable. In future, though I may not solve a Lagrangian when making my purchases, nor have a dozen children just to better ensure I have enough to spend in my elderly years, the economic education I have received has equipped me with the knowledge and ability to make sound decisions.



## MEMORANDUM OF UNDERSTANDING (MOU) BETWEEN DEPARTMENT OF ECONOMICS, LUND UNIVERSITY AND DEPARTMENT OF ECONOMICS, NATIONAL UNIVERSITY OF SINGAPORE

In May 2004, Professor Lars Soderstrom, Head of the Department of Economics, School of Economics and Management, Lund University (LUSEM) and Professor Åke Blomqvist, Head of the Department of Economics, National University of Singapore (NUS) signed an Agreement for Department-level Exchange Programme for students for a

period of three years. LUSEM and NUS are to establish an undergraduate and a postgraduate exchange programme for students (SEP). The exchange of students will commence in the 2004/2005 academic year. A selected student may participate in the SEP for one semester or academic year of study at the host university.

## AUSTRALIAN NATIONAL UNIVERSITY (ANU) / NATIONAL UNIVERSITY OF SINGAPORE (NUS) JOINT HONOURS DEGREE IN ACTUARIAL STUDIES AND ECONOMICS

The Joint Degree programme in Actuarial Studies and Economics is offered by the School of Finance and Applied Statistics, Faculty of Economics and Commerce, ANU and the Department of Economics, Faculty of Arts and Social Sciences, NUS, leading to the degree of ANU / NUS Bachelor of Social Sciences with Joint Honours in Actuarial Studies and Economics. A student in this programme will spend four semesters at NUS (for economics and the foundational courses) and four semesters at ANU (for the actuarial courses).

The programme contains the core of the Economics Honours curriculum as well as the actuarial education that grants students who perform sufficiently well exemptions from parts 1 and 2 of the professional examinations of the Institute of Actuaries of Australia (IAAust). (For more information on the actuarial education and profession, please go to <http://www.actuaries.asn.au/>). The programme also includes elements of the NUS broad-based curriculum.

For NUS students, semester 1 of the programme will begin at NUS. Students will spend their first three semesters at NUS, joining ANU in their fourth semester. The eighth and final semester will be spent at NUS.

### Outline of the Programme

Students might be able to alter slightly some of the sequencing in the table below. However, all the listed modules must be completed. In addition, students are recommended to take MA1102R Calculus. Students enrolled on the programme who elect to take this module will be permitted to waive the requirement of a second exposure module.

**Semester 1**  
NUS EC1101E Introduction to Economic Analysis  
EC2303/EC2231 Foundations for Econometrics  
BH1002 Financial Accounting  
MA1101R Linear Algebra 1  
FASS exposure module

**Semester 2**  
NUS EC2101/EC2151 Microeconomic Analysis I  
EC2102/EC2152 Macroeconomic Analysis I  
EC3303/EC3231 Econometrics I  
BH2004 Finance  
1 of GEM / exposure / Singapore Studies

**Semester 3**  
NUS EC3101/EC3151 Microeconomic Analysis II  
EC3102/EC3152 Macroeconomic Analysis II  
EC3304/EC3237 Econometrics II  
1 of GEM / exposure / Singapore Studies

**Semester 4**  
ANU BUSN1002 Accounting Process and Systems  
STAT2001 Introductory Mathematical Statistics  
STAT3037 Life Contingencies  
STAT2032 Financial Mathematics

**Semester 5**  
ANU STAT3032 Survival Models  
STAT3004 Stochastic Modelling  
FINM2002 Financial Instruments and Risk Management  
STAT3038 Actuarial Techniques 2

**Semester 6**  
ANU STAT4031 Actuarial Control Cycle 1  
STAT3035 Risk Theory (Distributional Models)  
FINM3001 Investments  
FINM3003 Continuous Time Finance

**Semester 7**  
ANU STAT3036/ST8036 Credibility Theory  
STAT4032 Actuarial Control Cycle 2  
1 elective module (e.g. STAT2009 Generalised Linear Models)  
1 elective module (e.g. STAT3014 Statistical Inference)

**Semester 8**  
NUS EC4101/EC4151 Microeconomic Analysis III  
EC4102/EC4152 Macroeconomic Analysis III  
EC4401 Honours Thesis (8 MCs)  
4 more MCs from Economics Level 4000 module