

## **ROBERTO S. MARIANO**

### **Current Positions**

- Singapore Management University
  - Professor of Economics and Statistics and Dean, School of Economics
  - Vice Provost for Research and Graduate Studies
  - Deputy Director, the Wharton-SMU Research Center
- University of Pennsylvania
  - Professor Emeritus of Economics and Statistics

### **Other Current Professional Activities**

- Fellow, Wharton Financial Institutions Center, Wharton School (2004 – present)
- Editorial Services
  - Member of Advisory Board for Economics, World Scientific Publishing (2007 – present)
  - Member, Editorial Board of *Eurasian Review of Econometrics* (2006 – present)
  - Associate Editor, *Asia Pacific Financial Markets*.. Springer Verlag 1996-present.
- Board / Council Membership
  - Member, Advisory Council of Society of Financial Econometrics (SoFiE) (2008-present)
  - Member, Executive Council of the Economic Society of Singapore (2005 – present)
  - Member of Governing Board, Neptune Orient Lines (NOL) Fellowship, National University of Singapore (2006 – present)
  - Member of Overseas Advisory Board, College of Business Administration, University of the Philippines. 2002-present.
  - Member of the Board, Philippine Bayanihan Society Singapore (2004-present, President since July 2007)
- Conference Committees and Advisory Roles
  - Organizer and Program Committee Chair for Far Eastern – South Asian meeting of the Econometric Society (FEMES-SAMES) 2008 in Singapore;
  - Member of Program Committee, SoFiE (Society for Financial Econometrics) 2008 Inaugural Conference in New York .
  - Member of Advisory Committee for SETA (Symposium on Econometric Theory and Applications) – 2008 Conference in Seoul National University, Seoul, Korea
  - Co-organizer and co-chair of Program Committee - Singapore Econometric Study Group (SESG) Conference in Honor of Peter Phillips, July 2008

### **Current Research**

- Statistical Tests for Multiple Forecast Comparison
- Predictive Models of Economic/Financial Crises - A Markov Switching GARCH Approach
- Filtering Techniques in Forecasting with Mixed Frequencies and Constructing Business Cycle Indicators
- Real Estate Asset Securitization and Financial Markets in Asia
- Financial Integration and Regional Monetary Units in East Asia

### **Membership in Professional Organizations**

- American Economic Association
- American Statistical Association
- Econometric Society
- Society of Financial Econometrics
- International Statistical Institute
- Institute of Mathematical Statistics
- Philippine Economic Society
- Philippine Statistical Association
- Economic Society of Singapore

### **Degrees**

- Ph.D. Statistics, Stanford University, 1970
- M.S. Mathematics, University of Illinois, 1965
- M.S. Statistics, University of the Philippines, 1963
- B.A. Mathematics, Ateneo de Manila (magna cum laude), 1962

### **Research Projects (1999 – 2008)**

“Toward Greater Financial Stability in the Asian Region: Measures for Possible Use of Regional Monetary Units for Surveillance and Transaction” (with Chow Hwee Kwan, Peter Kriz, and Augustine H. H. Tan) – funding support from the ASEAN+3 Research Group; August 2007 – March 2008

“Impact of Real Estate Securitization in Asia” (with Sock Yong Phang and Augustine H.H. Tan and in collaboration with a WSRC grant to Susan Wachter and Andrey Pavlov). SMU research grant, February 2007 – December 2008.

“Toward Greater Financial Stability in the Asian Region: Exploring Steps to Create Regional Monetary Units” (with Chow Hwee Kwan, Peter Kriz and Augustine Tan) – funding support from the ASEAN+3 Research Group; September 2006 - March 2007.

“Product Bundling in Liner and Logistics Business” (with Vincent Chua, Leong Thin Yin, Yang Kum Khiong, Hercules Haralambides, Michele Acciaro, Maarten C. W. Janssen) – funding support from the NOL –NUS Fellowship Fund, May, 2006- April, 2008

“Regional Coordination of Policy Measures Forward: Financial Market Liberalization and Capital Market Development” (with Chow Hwee Kwan, Peter N. Kriz, and Augustine H. H.

Tan) – funding support from the ASEAN+3 Research Group; September 2005 – March 2006.

“Trade, Investment, and Financial Integration in East Asia” (with Chow Hwee Kwan, Peter Kriz, and Augustine Tan) – under the ASEAN+3 Research Group funded by the Japan-ASEAN Technical Assistance Research Fund; September 2004 – March 2005

“Real Estate Bubbles and Financial Markets: A Study of the Linkage Between Real Estate Speculation and Financial Crises in Emerging Economies” (with Winston Koh, Sock Yong Phang, Augustine H. H. Tan, and Susan Wachter) – a research project supported by the Wharton-SMU Research Center, September 2003 – September 2004.

“A Predictive Model of Currency Crises in Southeast Asia – A Markov Chain Approach” (with Bulent Gultekin, Augustine Tan, Celso Brunetti and Chiarra Scotti) – a research project for the Wharton-Singapore Management University Research Center; April 2002 – 2004

“Macromodeling for Inflation Targeting in the Philippines” (with Suleyman Ozmuur) – a research project for Bangko Sentral ng Pilipinas (the Central Bank of the Philippines); January 2001 – December 2002

“Macroeconometric Modeling for Monetary and Fiscal Policy in Malaysia” (with Lawrence Klein and Suleyman Ozmuur) – a research project for Bank Negara Malaysia; June 2000 – December 2001

“Macroeconometric Sectoral Modeling for Manpower Planning in Singapore” (with Lawrence Klein and Suleyman Ozmuur) – a research project for the Ministry of Manpower, Republic of Singapore; March 2000 – December 2001

“Predictive Models of Economic/Financial Crises” (with Bulent Gultekin, Suleyman Ozmuur and Tayyeb Shabbir) – Economic Research Forum project # ERF 99-US-4004; January 1999 – December 1999

## **Conferences and Seminar Presentations (2002 – 2008)**

### **2008**

- Hitotsubashi University Symposium on Financial Engineering Education. Tokyo – March 3, 2008. Presented “Statistical Tests for Multiple Forecast Comparison” (with Anders Eriksson and Daniel Preve) and “SMU Activities Related to Financial Engineering Education”
- ASEAN+3 Research Group Wrap-Up Meeting and ADB Working Group Meeting. Hanoi – February 25-27, 2008. Presented final report on ASEAN+3 project to sub-ministerial level representatives of Ministries of Finance and Central Banks in ASEAN+3 countries.
- American Economic Association / Econometric Society North American Annual Conference, New Orleans, January 2008. Attended conference and conducted faculty recruiting interviews

### **2007**

- ASEAN+3 Research Group Kick-Off Meeting, Tokyo; August 2007

- Presented proposal report
- FEMES 2007, Taipei, July 2007. Chaired a session and served in the Advisory Committee,
  - SESG 2007. SMU, Singapore, July 2007 – participant and member of organizing committee
  - Singapore Economic Review Conference. Singapore; June 2007. Chaired a session
  - Barclays Global Investors. San Francisco, June 2007. Presented a seminar on “Testing Forecast Accuracy”
  - National Bureau of Economic Research-East Asia Seminar in Economics (NBER-EASE)., SMU, Singapore, June 2007. Attended the conference and paper presented at the conference by co-author
  - American Economic Association / Econometric Society North American Annual Conference, Chicago; January 2007. Attended conference and conducted faculty recruiting interviews, paper presented by co-author

## 2006

- Asia Bellagio Group of Experts Meeting. Seoul, November. participant
- Project LINK Meeting. United Nations, Geneva; October. participant
- ASEAN+3 Research Group Kick-Off Meeting. Tokyo, August. Presented proposal
- FEMES 2006, Beijing; July. served in Organizing and Advisory Committees
- SESG 2006, Singapore; July. served in Organizing Committee
- Federation of Asian Economic Associations (FAEA) Annual Conference, Singapore; July. Paper presented by co-author
- NBER-EASE, Kona, Hawaii; June. served as discussant
- ASEAN+3 Research Group Wrap-up Meeting, Seoul; March. presented report
- ASEAN+3 Research Group Wrap-up Meeting, Manila; February. presented report
- AEA Meetings, Boston; January

## 2005

- 2005 World Congress of Financial Executives. Manila; December 4-7. Presented “Attributes of a Global Financial Executive... Is This You?”
- Hong Kong Institute of Monetary Research-Bank of International Settlements (HKIMR-BIS) Conference on Monetary Policy Approaches and Implementation in Asia. Hong Kong; November 21-22. Presented “Monetary Policy Approaches and Implementation in Asia: The Philippines and Indonesia”
- ADB and BSP on EWS, Manila; November 15-19
- ASEAN+3 Research Group Kick-Off Meeting, Manila; October 18-22.
- NBER-EASE Annual Conference, Manila, June 22-28. Presented “External Debt, Adjustment, and Growth”
- PhD Thesis Defense (Stavros), Erasmus Universiteit Rotterdam, June 8
- ADB Early Warning System Workshop, Jakarta; April 24. presented a paper; commented on ADB reports
- ASEAN+3 Research Group Meeting, Manila; March 8-13. presented report
- ASEAN+3 Research Group Meeting, Beijing; February 23-25. presented report
- Asia Bellagio Group of Experts Meeting; Bangkok - February 22. presented report
- AEA Meetings; January, Philadelphia

## 2004

- 50<sup>th</sup> Anniversary of UP Statistics, Manila; December 10. keynote speaker
- Conference in Econometrics and Time Series, Hitotsubashi University, Tokyo, Japan; December. presented a paper
- 9<sup>th</sup> National Convention in Statistics, Manila, Philippines; October. presented a paper
- NBER-NSF (National Science Foundation) Workshop in Time Series, Dallas, Texas; September. paper presented by co-author
- Conference on Asia-Pacific Higher Education Research, Manila; August. presented a paper
- SMU-NUS Conference on Econometric Forecasting and High-Frequency Data Analysis; April-May. Co-organizer and session chair; paper presented by co-author
- AEA meetings; January

## 2003

- Project LINK Meeting, Bologna. Presented a paper
- Seminar at Department of Statistics, University of Florence, Florence
- North American Annual meeting of the Econometric Society – Washington D.C., January. presented a paper; conducted faculty recruiting interviews

## 2002

- European Community Economic / Econometric Conference – Bologna, Italy, September. presented a paper

## Publications and Research Papers (2000 – 2008)

### 2008

“Markov Switching GARCH Models of Currency Turmoil in Southeast Asia” (with Celso Brunetti and Chiara Scotti. Forthcoming in **Emerging Markets Review** 2008. Earlier versions – presented in European Community Economic and Econometric Conference in Bologna, September 2002; revision presented at Econometric Society Annual Meeting in Washington DC, January 2003; SMU-SESS Working Paper #3-2003, March 2003

***Econometric Forecasting and High-Frequency Data Analysis*** (Roberto S. Mariano and Yiu Kuen Tse, eds.). Institute for Mathematical Sciences (NUS) Volume 13, World Scientific Publishing, Singapore, March 2008. (completed July 2007)

Discussant comments on “Financial Liberalization under the WTO and the Macro Economy” by Lee-Rong Wang, Chung-Hua Shen, and Ching-Yang Liang, in **International Financial Issues Around the Pacific Rim: Global Imbalances, Financial Liberalization, and Exchange Rate Policy - NBER-EASE Volume 17** (Takatoshi Ito and Andrew Rose, eds.). University of Chicago Press, forthcoming 2008.. (completed June 2007)

Discussant comments on “Cross Border Acquisitions and Target Firms’ Performance” by K. Fukao, K. Ito, H. U. Kwon, and M. Takizawa, in **International Financial Issues Around the Pacific Rim: Global Imbalances, Financial Liberalization, and**

**Exchange Rate Policy - NBER-EASE Volume 17** ( Takatoshi Ito and Andrew Rose, eds.). University of Chicago Press, forthcoming 2008. (completed June 2007)

“Lawrence Klein Biography” Forthcoming in *The New Palgrave Dictionary of Economics, 2<sup>nd</sup> edition* (S. Durlauf and L. Blume, eds). Macmillan, London, forthcoming 2008. (completed in October 2006)

“Statistical Tests for Multiple Forecast Comparison” (with Anders Eriksson and Daniel Preve). SMU School of Economics Working Paper , February 2008. For presentation at the inaugural conference of the Society of Financial Econometrics in New York City, June 4-6, 2008. Preliminary draft presented at Hitotsubashi Conference on Financial Engineering Education in Tokyo, March 3, 2008.

“Toward Greater Financial Stability in the Asian Region: Measures for Possible Use of Regional Monetary Units for Surveillance and Transaction – Final Report” (with Chow Hwee Kwan, Peter Kriz, and Augustine H. H. Tan). Submitted to ASEAN+3 Research Group; February 2008; revised March 2008.

## 2007

“External Debt, Adjustment and Growth” (with Delano Villanueva). Chapter in **Fiscal Policy and Management in East Asia - NBER-EASE Volume 16** (Takatoshi Ito and Andrew Rose, eds.), pp. 199 – 222. University of Chicago Press, 2007. Earlier versions: presented at NBER-EASE Conference in Manila, June 2005; revised August 2006.

“Direction-of-Change Forecasts Based on Conditional Variance, Skewness and Kurtosis Dynamics: International Evidence” (with P. Christoffersen, F. Diebold, A. Tay, and Y.K. Tse). **Journal of Financial Forecasting 1** (Fall 2007), pp. 3-24. Earlier versions: SMU-SESS WP # 02-2005; January 2005.

“Toward Greater Financial Stability in the Asian Region: Measures for Possible Use of Regional Monetary Units for Surveillance and Transaction - A Proposal” (with Chow Hwee Kwan, Peter Kriz, and Augustine H. H. Tan). Proposal Report submitted to ASEAN+3 Research Group; August 2007.

“Mortgage Securitization in Asia: (with R. Green, A. Pavlov and S. Wachter). Presented at the 18<sup>th</sup> NBER-EASE Conference in Singapore; June, 2007.

“Toward Greater Financial Stability in the Asian Region: Exploring Steps to Create Regional Monetary Units – Final Report” (with Chow Hwee Kwan, Peter Kriz and Augustine Tan). Submitted to the ASEAN+3 Research Group; March 2007.

“Open versus Sealed Bid Auctions: Testing for Revenue Equivalence under Singapore’s Vehicle Quota System” (with Winston Koh and Yiu Kuen Tse), *Applied Economics Vol 39 Issue 1* (2007), pp 125 - 134. Earlier version: SMU-SESS Working Paper #16-2003, August 2003

## 2006

“Monetary Policy Approaches and Implementation in Asia: The Philippines and Indonesia” (with Delano P. Villanueva). In **Hong Kong Institute for Monetary**

**Research (HKIMR) - BIS Volume on Monetary Policy in Asia: Approaches and Implementation**, BIS Papers No. 31(December, 2006) pp. 207-226. Presented at HKIMR-BIS Conference on Monetary Policy Approaches and Implementation in Asia, 21 – 22 November 2005, Hong Kong.

“Product Bundling in the Liner and Logistics Business – Deliverable Activity I” (with Vincent Chua, Hercules Haralambides and Michele Acciaro). Report submitted to NOL-NUS Fellowship. November 2006

“Underpriced Default Spread Exacerbates Market Crashes” (with Winston T. H. Koh, Andrey Pavlov, S. Y. Phang, Augustine H. H. Tan and Susan M. Wachter). Revised – October, 2006.

“Capital Controls, Financial Crises and Cures: Simulations with an Econometric Model for Malaysia” (with Lawrence Klein and Suleyman Ozmucur). In **Recent Financial Crises: Analysis, Challenges and Implications** (L.R.Klein & T. Shabbir, eds). Elgar: Cheltenham, 2006.

“Regional Coordination of Policy Measures Forward: Financial Market Liberalization and Capital Market Development – Final Report” (with Chow Hwee Kwan, Peter N. Kriz, and Augustine H. H. Tan). Submitted to ASEAN+3 Research Group; February 2006.

## 2005

“Attributes of a Global Financial Executive ... Is this You?” December 2005. Presented at 2005 World Congress of Financial Executives (IVAFEI World Congress) 4 – 7 December 2005. Manila.

**The Economic Prospects of Singapore**, (Winston T. H. Koh and Roberto S. Mariano, eds. Addison Wesley; Singapore, August 2005.

*Trade, Investment, and Financial Integration in East Asia* (with Hwee Kwan Chow, Peter Kriz, and Augustine Tan). Report prepared under a research grant from the ASEAN+3 Secretariat with funding from the Japan-ASEAN Technical Assistance Research Fund. SMU-SESS WP # 06-2005; March 2005.

“Sustainable External Debt Levels: Estimates for Selected Asian Countries” (with Delano Villanueva). SMU-SESS WP # 07-2005; March 2005.

“The Singapore Economy: Performance and Prospects.” Presented at the Asia Bellagio Group of Experts Meeting in Bangkok, Thailand – February 22, 2005.

“Econometric Models for Forecasting Trade Value and Trade Volume in the Singapore Stock Exchange” (with Y. K. Tse), January 2005.

“Bank Lending and Real Estate in Asia: Market Optimism and Asset Bubble,” (with Winston T. H. Koh, Andrey Pavlov, S.Y. Phang, Augustine H. H. Tan and Susan Wachter), **Journal of Asian Economics** 15 (2005), 1103-1118. SMU-SESS WP # 28-2004.

## 2004

“The BSP Structural Long-Term Inflation Forecasting Model for the Philippines” (with Francis Dakila and Racquel Claveria). April 2004. Presented at the SMU-NUS Conference on Econometric Forecasting and High-Frequency Data Analysis; April-May 2004.

“The NEDA Quarterly Macroeconomic Model: Theoretical Structure and Some Empirical Results” (with Carlos Bautista and Bayani Victor Bawagan). Presented in the 9th National Convention in Statistics in Manila, Philippines, October 4-5, 2004.

“Constructing a Coincident Index of Business Cycles without Assuming a One-Factor Model” (with Y. Murasawa). SMU-SESS WP # 22-2004; October 2004. Presented at the NBER-NSF Workshop in Time Series – September 2004 in Dallas, Texas and in Hitotsubashi University Conference in Econometrics and Time Series – December 2004.

“Developing a Research Culture: The Singapore Management University Experience.” Presented at the Conference on Asia-Pacific Higher Education Research held in Manila, Philippines; August 2004.

“Capital Controls, Financial Crises and Cures: Simulations with an Econometric Model for Malaysia” (with L. R. Klein and S. Ozmuur) 2004.

## 2003

“A New Coincident Index of Business Cycles Based on Monthly and Quarterly Series,” (with Yasutomo Murasawa), *Journal of Applied Econometrics* **18** (2003), 427-443. SMU-SESS WP # 18-2002.

“Markov Chains in Predictive Models of Currency Crises – With Applications to Southeast Asia”. (with Abdul Abiad, Bulent Gultekin, Tayyeb Shabbir and Augustine H. H. Tan), *Taiwan Economic Review* **31** (2003), 401-436.

*Investment Management and the Philippine Stock Market, Second Edition* (co-edited with A. Ilano and R. Ybanez). Manila, Philippines, 2003.

## 2002

“Testing Forecast Accuracy.” Chapter 13 in *Companion to Economic Forecasting* (D. Hendry and M. Clements, eds.), pp 284-298. Blackwell Publishers, Ltd, 2002.

“Predictive Models of Economic and Financial Crises” Report for the Economic Research Forum (ERF) for the Arab countries, Iran and, Turkey. December 2002

“A Structural Long-Term Inflation Forecasting Model of the Philippines.” Project Report submitted to Department of Economic Research, Bangko Sentral ng Pilipinas; March 2002

## 2001

“Simultaneous Equation Model Estimators: Statistical Properties and Practical Implications.” Chapter 6 in *Companion to Theoretical Econometrics* (edited by B. Baltagi), pp.122 – 143. Blackwell Publishers Ltd., 2001.

“BNM Macroeconometric Model of Malaysia” (with Lawrence R. Klein and Suleyman Ozmucur). Project report submitted to Bank Negara Malaysia in Kuala Lumpur, Malaysia; November 2001.

“A Macroeconometric Model of Singapore – with Special Attention to Manpower Requirements and Potential” (with Lawrence R. Klein and Suleyman Ozmucur). Report submitted to the Ministry of Manpower in Singapore; December 2001.

## 2000

***Simulation-Based Inference in Econometrics: Methods and Applications*** (co-editor with Til Schuermann and Melvyn Weeks). Cambridge University Press, 2000.

“Simulation-Based Inference in Nonlinear State-Space Models: Application to Testing the Permanent Income Hypothesis,” (with H. Tanizaki). In ***Simulation-Based Inference in Econometrics: Methods and Applications*** (edited by R. Mariano, T. Schuermann, and M. Weeks), 218-234. Cambridge University Press, 2000.

“Financial Intermediation and Growth: Modeling Issues and Empirical Evidence from the Philippines,” (with Tayyeb Shabbir). Presented at Project LINK Conference, 2000.

“Predictive Models of Economic and Financial Crises” (with B. Gultekin, S. Ozmucur, and T. Shabbir). ***MEEA (Middle East Economic Association) Electronic Journal, Vol 2*** (2000)

## BOOK PUBLICATIONS (1985 – 1999)

- (1) ***A Review and Appraisal of the Government Response to the 1983-84 Balance-of-Payments Crisis***, (with M. Lamberte, R. Manasan, E. Medalla, M. Montes, and C. Reyes). Monograph No. 8, Philippine Institute for Development Studies. October, 1985.
- (2) ***Forecasting Monthly Inflation in the Philippines***. Monograph No. 10, Philippine Institute for Development Studies. December, 1985.
- (3) ***Advances in Statistical Analysis and Statistical Computing, Vol. 1***, (ed.), JAI Press, Greenwich, Connecticut, 1986.
- (4) ***Advances in Statistical Analysis and Statistical Computing, Vol. 2*** (editor). JAI Press: Greenwich, Connecticut, 1989.
- (5) ***Asian Capital Markets: Regional and Global Perspectives*** (co-editor). New York-Asian Securities Industry Institute, May 1992.
- (6) ***Asian Capital Markets: Dynamics of Growth and World Linkages*** (co-editor). New York: Asian Securities Industry Institute, July, 1993.
- (7) ***Asian Capital Markets: Strategic Investing in Asia*** (co-editor). New York: Asian Securities Industry Institute, April 1994.

- (8) ***Asian Capital Markets: Growth Frontiers*** (co-editor). New York and Kuala Lumpur: Asian Securities Industry Institute, April 1995.
- (9) ***Investment Management and the Philippine Stock Market*** (co-edited with A. Ilano). Manila, Philippines, 1995.
- (10) ***Asian Capital Markets: Innovations and New Products*** (co-editor). New York: Asian Securities Industry Institute, 1996.

#### **PUBLISHED PAPERS (1962 – 1999)**

- (1) "The Foundations of Finite Conditional Probability," ***The Philippine Statistician***, March, 1962. Manila Philippines.
- (2) "A Macro-Economic Model of the Philippines, 1950-1969," (with J. Encarnacion, Jr. And R. Bautista), ***Philippine Economic Journal 10*** (1971), 131-157.
- (3) "The Exact Finite-Sample Distribution of the Limited-Information Maximum Likelihood Estimator in the Case of Two Included Endogenous Variables," (with Takamitsu Sawa), ***Journal of the American Statistical Association 67*** (1972), 159-163.
- (4) "On the Existence of Moments of the Ordinary Least Squares and Two-Stage Least Squares Estimators," ***Econometrica 40*** (1972), 643-652.
- (5) "Approximations to the Distribution Functions of the Ordinary Least Squares and Two-Stage Least Squares Estimators in the Case of Two Included Endogenous Variables," ***Econometrica 41*** (1973), 67-77.
- (6) "Approximations to the Distribution Functions of Theil's k-Class Estimators," ***Econometrica 41*** (1973), 715-722.
- (7) "A Survey of Philippine Economic Development, 1946-1970," (with A. Castro and G. Jurado). In ***The Economic Development of East and Southeast Asia***, edited by S. Ichimura; University Press of Hawaii, 1975. Presented in the International Symposium on Postwar Economic Development in Major Asian Countries, Center for Southeast Asian Studies, Kyoto University, Japan, October, 1972.
- (8) "Some Large-Concentration Parameter Asymptotics for the k-Class Estimators," ***Journal of Econometrics 3*** (1975), 171-177.
- (9) "Finite Sample Properties of Instrumental Variable Estimators of Structural Coefficients," ***Econometrica 45*** (1977), 487-496.
- (10) "Commodity Market Modeling: Methodological Issues and Control Theory Applications," in F.G. Adams and J. Behrman (eds.), ***Econometric Modeling of World Commodity Policy***. Lexington Books, D.C. Heath and Co., 1978.

- (11) "A Note on the Distribution Functions of LIML and 2SLS Structural Coefficient Estimators in the Exactly Identified Case," (with J. McDonald), ***Journal of the American Statistical Association* 74** (1979), 847-848.
- (12) "Testimony on Census Issues: Impact," ***Civil Right Issues of Asian and Pacific Americans: Myths and Realities***, 54-59. Washington, DC: US Commission on Civil Rights; May, 1979.
- (13) "Finite-Sample Analysis of Misspecification in Simultaneous Equation Models," (with C. Hale and J.G. Ramage), ***Journal of the American Statistical Association* 75** (1980), 418-427.
- (14) "Econometric Modeling of the World Wheat Market for Stabilization Policy Analysis," (with Reynaldo S. Mariano), in ***Proceedings of the 42<sup>nd</sup> Session of the International Statistical Institute***; Manila, Philippines, December 4-14, 1979.
- (15) "Iterated Maximum Likelihood Estimators," ***The Encyclopedia of Statistical Sciences Vol. IV*** (1983), 168-262; J. Wiley and Sons.
- (16) "Analytical Small-Sample Distribution Theory in Econometrics: The Simultaneous Equations Case," ***International Economic Review* 23** (1982), 503-533.
- (17) "Specification Error Analysis in Linear Simultaneous Systems," (with J.G. Ramage), ***Advances in Econometrics: Vol. 2*** (1983); JAI Press, Inc.
- (18) "Asymptotic Behavior of Predictors in a Nonlinear Simultaneous System," (with B.W. Brown), ***International Economic Review* 24** (1983), 523-536.
- (19) "Prediction-Based Tests for Misspecification in Nonlinear Simultaneous Systems," (with B.W. Brown), in T. Amemiya, S. Karlin, and L. Goodman (eds.), ***Studies in Econometrics, Multivariate Statistics and Time Series Analysis***, 131-151, Academic Press, 1983.
- (20) "Comments on 'On the Relevance of Finite Sample Distribution Theory' by W.M. Taylor," ***Econometric Reviews* 2** (1983), 71-74.
- (21) "Stochastic Prediction in Dynamic Nonlinear Econometric Systems," (with B.W. Brown), ***Annales de l'INSEE – No. 59/60*** (1983), 267-278.
- (22) "Residual-Based Procedures for Prediction and Estimation in a Nonlinear Simultaneous System," (with B.W. Brown), ***Econometrica* 52** (1984), 321-343.
- (23) "New Tests of the Life Cycle and Tax Discounting Hypotheses," (with J. Seater), ***Journal of Monetary Economics* 15** (1985), 195-215.
- (24) "On the Effects of Multicollinearity Upon the Properties of Structural Coefficient Estimators," (with J.B. McDonald and A. Tishler), ***Advances in Econometrics* 5** (1986), 311-323. JAI Press.

- (25) "The ET Interview: Professor L.R. Klein," *Econometric Theory* **3** (1987), 409-460.
- (26) "An Annual Econometric Model for Macro-Policy Analysis in the Philippines," (with W.M. Constantino), *Proceedings Volume of the 5<sup>th</sup> National Convention on Statistics* (November, 1987). Also PIDS Discussion Paper – May, 1987. Revision presented at the UN-ESCAP Regional Seminar on Interlinked Country Model Systems – Bangkok, November 17-20, 1987.
- (27) "A Test for Misspecification in Nonlinear Simultaneous Systems Using the Bootstrap Predictor," (with A. Tabunda), *Proceedings Volume of the Second Southeast Asian Statistics Conference* (September, 1987); Bangkok, Thailand.
- (28) "Predictors in Dynamic Nonlinear Models: Large-Sample Behavior," (with B.W. Brown), *Econometric Theory* **5** (1989), 430-452.
- (29) "Measures of Deterministic Prediction Bias in Nonlinear Models," (with B.W. Brown), *International Economic Review* **30** (1989), 667-684.
- (30) "Stochastic Simulation, Prediction, and Validation of Nonlinear Models," (with B.W. Brown), in L.R. Klein and J. Marquez (eds.), *Economics in Theory and Practice: An Eclectic Approach*, 17-36. Kluwer Academic Publishers: Netherlands, 1989.
- (31) "Stochastic-Simulation Tests of Nonlinear Econometric Models," (with B.W. Brown), in *Comparative Performance of US Econometric Models* (ed. By L.R. Klein), 250-259. Oxford University Press, 1991.
- (32) "Capital Markets and Macroeconomies in Asia." In *Asian Capital Markets: Regional and Global Perspectives* (ed. by L.C. Clemente and R.S. Mariano). New York: Asian Securities Industry Institute, May, 1992.
- (33) "Defense Expenditures and Economic Growth in the Philippines: A Macrosimulation Analysis," (with F.G. Adams and Inn Won Park) in *The Macroeconomic Dimensions of Arms Reduction* (edited by F.G. Adams), pp. 107-128. Westview Press, 1992.
- (34) "Stochastic Simulations for Inference in Nonlinear Errors-in-Variables Models," (with B.W. Brown). In *Handbook of Statistics Vol. 11 – Econometrics* (edited by G.S. Maddala, C.R. Rao and H.D. Vinod); pp. 611-627. Academic Press, 1993.
- (35) "Complementarity and Conflict Among Population and Other Policies: Specifying an Economic-Demographic Model for a Developing Country," *The Pakistan Development Review*, **32** (1993), 523-540.
- (36) "Stochastic Simulations for Econometric Forecasting and Policy Analysis – Practical Applications in Models for Developing Economies," (with Wesley Basel), June, 1993. Presented at the Far Eastern Econometric Society Meetings in Taipei – June 25-27, 1993. In *Economics, Econometrics and The LINK* edited by M. Dutta. Elsevier/North-Holland, 1995.

- (37) “An Annual Philippine Macroeconometric Model for Policy Analysis,” (with W.M. Constantino). ***Econometric Models of Asian-Pacific Countries*** (edited by S. Ichimura and Y. Matsumoto); pp. 391-429. Springer Verlag, 1994.
- (38) “Prediction, Filtering, and Smoothing in Nonlinear and Nonnormal Cases Using Monte-Carlo Integration,” (with Hisashi Tanizaki). ***Journal of Applied Econometrics 9 (1994)***, 163-179. Also in ***Econometric Inference Using Simulation Techniques*** (edited by Herman van Dijk, Alain Monfort and Bryan W. Brown); J. Wiley, 1995.
- (39) “Comparing Predictive Accuracy,” (with F.X. Diebold). ***Journal of Business and Economic Statistics, 13, (1995)***, 253-265. Reprinted in ***JBES 21(2002)***, the Twentieth Anniversary reprint issue of the ten most cited papers in JBES in the past twenty years.
- (40) “Prediction of Final Data with Use of Preliminary and/or Revised Data,” (with H. Tanizaki). ***Journal of Forecasting, 14, (1995)***, 351-380.
- (41) “Quantitative Techniques for Philippine Stock Market Analysis,” in ***Investment Management and the Philippine Stock Market*** (edited by A. Ilano and R.S. Mariano). Manila, Philippines, (1995), 217-252.
- (42) “Nonlinear Filters Based on Taylor Series Expansions,” (with H. Tanizaki). ***Communications in Statistics, Theory and Methods 25 (1996)***, 1261-1282.
- (43) “H-Share Index: A New Window on China,” (with Tayyeb Shabbir) in ***Asian Capital Markets: Innovations and New Products*** (edited by L.C. Clemente, R.S. Mariano and S. Chintanaseri). New York: Asian Securities Industry Institute, 1996; 153-169.
- (44) “Stock Market Returns, Expected Returns, and Economic Fundamentals in an Emerging Market: The Case of Korea,” (with Fangxiong Gong), ***Financial Engineering and the Japanese Markets 4, (1997)***, 147-169. Presented at the Seventh Annual PACAP Finance Conference in Manila, Philippines – July 1995.
- (45) “Nonlinear and Non-Gaussian State-Space Modeling with Monte-Carlo Stochastic Simulations,” (with H. Tanizaki). ***Journal of Econometrics 83 (1998)***, 263 – 290.
- (46) “Discussion of Asian Lessons from the Asian Crisis.” Presented at the UN Expert Group Meeting on “What Have We Learned One Year Into the Financial Crisis in Emerging-Market Economies?” held at the United Nations headquarters, New York: July 21-23, 1998. In ***Global Financial Turmoil and Reform*** (edited by Barry Herman), pp. 115 – 118, United Nations University Press, 1999.

#### **Reports and Research Papers (1990 – 1999)**

- (1) “Sectoral Needs Assessment and Allocation of Technical Assistance in the Philippines.” Report submitted to the United Nations Development Programme

- for a UNDP Consultancy for “An Evaluation of the Official Foreign Technical Assistance Programs in the Philippines;” July-August, 1989. Chapter 1 in R. Mariano (ed.), *Impact of Technical Assistance Programs on Development Priorities and Strategies in the Philippines*. Final Report submitted to the United Nations Development Programme; July, 1990.
- (2) *Impact of Technical Assistance Programs on Development Priorities and Strategies in the Philippines* (editor). Final report submitted to the United Nations Development Programme; July, 1990.
  - (3) “Economic Impact of Military Service: A Survey of Military Pensioners in the Philippines,” (with F.G. Adams and J.R. Behrman). Preliminary Report to FPRI and the Pew Memorial Trust Fund. January, 1991.
  - (4) *Complementarity and Conflict Among Population and Other Policies: Policy Models/Applications - Chile*, (with L.R. Klein, D. Salvatore, and F. Campano). Report for a joint UNFPA/DESD Project. July 1996.
  - (5) “Testing Under Non-Standard Conditions in Frequency Domain: With Applications to Markov Regime Switching Models of Exchange Rates and Federal Funds Rate,” (with Fangxiong Gong). Federal Reserve Bank of New York Technical Staff Report, 1997. Revised discussion paper, University of Pennsylvania, Department of Economics, 1998.
  - (6) *Medium-term Strategic Development Plan for the Stock Exchange of Thailand* (with P. Knapp and W. Albrecht). Report submitted to the Stock Exchange of Thailand by the Catalyst Institute in Chicago – May, 1997.
  - (7) *Forecasting Inflation in a Period of Globalized Finance*. Final report submitted to the Central bank of the Philippines. December, 1997.
  - (8) *Assessment of the Credit Rating Industry in APEC Member Economies*. Final report submitted to the Asian Development Bank, Manila, Philippines. 1998.
  - (9) “The Asian Financial Turmoil: Causes, Social Costs and Policy Cooperation” (with Tayyeb Shabbir). Presented at a special meeting of the Japanese Global Foundation for Research and Scholarship held in Tokyo, Japan; October 26, 1998 and the annual meeting of the Japan Society of International Economics held at Kantogakuin University, Yokohama, Japan; October 24-25, 1998.
  - (10) “Conversion of Military Bases to Civilian Use in the Philippines and the Nuclear Race in India and Pakistan” (with Tayyeb Shabbir). Presented at the ECAAR Symposium held at the UN University, Tokyo, Japan; October 27, 1998.

## Awards

- Research grants from National Science Foundation (USA), Rockefeller Foundation, U.S. Department of Commerce, U.S. Department of Agriculture, PEW Memorial Trust Fund, United Nations Development Programme, UNFPA, UN-DESD, UN-ESCAP, Asian Development Bank, US-AID, International Food

- Productivity Research Institute, University of Pennsylvania Research Foundation, Wharton-SMU Research Centre, ASEAN Secretariat / Japan-ASEAN Financial Technical Assistance Fund, NUS NOL Fellowship Research Fund, SMU Internal Research Fund
- Recipient of Irving Kravis undergraduate teaching award in Economics, University of Pennsylvania, 1999-2000
  - United Nations TOKTEN (Transfer of Knowledge Through Expatriate Nations) Fellow, 1987-1988
    - visiting professor and main thesis adviser in the Ph.D. program in statistics at the University of the Philippines Statistical Center
    - research consultant at NEDA to study income inequality in the Philippines
  - Scholarship grants from Fulbright-Hays Fellowship, Stanford University, University of Illinois, University of The Philippines, Rockefeller Foundation. 1964 - 1970

### **Academic Positions Held**

- Professor of Economics and Statistics, Department of Economics, University of Pennsylvania, 1980 – 2004
- Associate Professor of Economics, University of Pennsylvania, 1973 – 1980
- Visiting Lecturer in Economics, University of Pennsylvania, 1971 – 1973
- Assistant Professor of Economics, University of the Philippines, 1970 – 1971

### **Visiting Appointments**

- Centro Universitario de Econometria (CIDE) Summer School in Econometrics at Capaccio de S. Sofia, Italy. June 18-30, 1990
- Institute for Advanced Studies, Vienna, Austria. 1980, 1983, 1988
- School of Statistics, University of the Philippines, 1987-1988
- Philippine Institute for Development Studies, Philippines. 1983-1984
- CORE (Center for Operations Research and Econometrics), Universite Catholique de Louvain, Belgium, 1980.
- Department of Economics, University of California, Berkeley, 1978-79.
- Department of Economics, University of Western Australia, Perth, Australia, 1975.

### **Past Professional Activities**

- **Past Editorial Services**
  - Associate Editor, *Journal of the American Statistical Association*. 1977-1979.
  - Associate Editor, *International Economic Review*. 1978-1994.
  - Associate Editor, *Econometric Theory*, Cambridge University Press. 1985-1987.
  - Senior Editor, *Journal of Asian Economics*. JAI Press, U.S.A. 1994-2003
  - Editor, *Advances in Statistical Analysis and Statistical Computing*, JAI Press, Inc.: Greenwich, Connecticut. 1986-1997.
  - Associate Editor, *Philippine Development Studies*. 1995-1999.
  - Associate Editor, *Pakistan Development Review*. 1995-1999.

- Editorial Board Member, *Abstracts of Working Papers in Economics*, Cambridge University Press, 1991 - 1996.
- **Past Board Memberships, Directorships, Public Service**
  - Associate Director, Wharton Center for Quantitative Finance. 1997-1998.
  - Academic Director, Wharton Asian Securities Executive Program. 1996-1997.
  - Member, Board of Directors, Environmental Enterprises Assistance Fund. 1996-2002.
  - Member, Board of Directors, Science and Technology Advisory Council of the Philippines, New York Chapter. 1993-1996.
  - Member, Faculty Advisory Board, Wharton Emerging Economies Program, University of Pennsylvania, 1992-1996.
  - Member, Advisory Committee for Academic Affairs, China Securities Industry Institute (SCII), Beijing, China, with the task of assisting in the development of training programs to be administered by CSII for Chinese practitioners in the securities industry in China. 1992-1996.
  - Founding Executive Director and member of the Board of Governors of the Asian Securities Industry Institute – a nonprofit foundation for training and research in securities and investments in Asia. 1991-1996.
  - Member, Governing Council for the International Association for Statistical Computing 1987-1991.
  - Member, official Philippine panel for debt negotiations with international commercial banks, 1986.
  - President, Philippine American Academy of Science and Engineering, 1987-1988.
  - One of seven US economists invited by the Ministry of Education in Taiwan to lecture on econometric techniques in Taipei. 1982 and 1983.
  - Testified at the US Commission of Civil Rights hearings on census issues regarding Asian Americans. Washington, DC. 1979.
  - Member, National Institute of Mental Health Task Force to study economic conditions of Asian Americans, 1976.
- **Past Conference Organizing and Advisory Roles**
  - Far East Meeting of the Econometric Society (FEMES) 2008, main organizer and chair of Program Committee
  - Society of Financial Econometrics (SoFiE) inaugural conference in 2008, member of Program Committee
  - Symposium on Econometric Theory and Applications (SETA) 2008, member of Advisory Committee (Seoul national University)
  - Singapore Econometric Study Group (SESG) Conference in Honor of Peter Phillips in 2008, co-organizer and co-chair of program committee
  - FEMES 2007 (Taipei), member of Advisory Committee
  - SETA 2007 (HKUST), member of Advisory Committee
  - FEMES 2006 (Beijing), member of Advisory Committee
  - Organized annual conferences in Asia on “Asian Capital Markets” – for the Asian Securities Industry Institute, 1991-1996; in partnership with the stock exchanges in Asia.
  - 3rd World Congress of the Econometric Society (Toronto), member of Program Committee

- **Past Consultancies**

- Research consultant to KPMG, LLP - on management strategy planning based on a survey study of professional consulting services in tax, audit and consulting in the U.S. March – June, **1999**.
- Econometrics consultant to Hill & Robbins Law Office, Denver, Colorado – on the determination of economic damages in a legal case concerning an international power plant project in the Philippines – **1997 – 1998**.
- Consultant, Asian Development Bank, “Credit Rating Industry Study in APEC Member Economies.” **1997 - 1998**.
- Consultant, Central Bank of the Philippines on, “Short-Term Forecasting of Inflation in a Globalized Finance Environment.” **1997-1998**.
- Expert witness (International Court of Arbitration, Hong Kong) on econometric projections of revenues of an international power plant project in the Philippines. **1997 – 1998**.
- Consultant, the Stock Exchange of Thailand and Catalyst Institute (Chicago), “The Five- Year Strategic Plan of the Stock Exchange of Thailand.” **1996-1997**.
- Senior Consultant, Quantitative Financial Strategies, Inc. – a Philadelphia-based currency fund management group. **1996-1998**.
- Chairman and CEO, Asia Quantitative Resources – a Philippine-based company engaged in economic-business analysis in Asia. **1996-2000**.
- Senior Research Consultant (**1989-1996**) to the First Philippine Fund, Inc. and Clemente Capital, Inc. (an investment and asset management company in New York involved in investing funds in Asia, especially in the Philippines and China) on
  - development issues in Asia-Pacific economies
  - emerging capital markets in Asia
  - asset allocation and risk assessment models in financial markets
- Consultant, National Economic and Development Authority (NEDA) of the Philippines, **1983-1995**, on
  - econometric policy analysis and medium-term macroeconomic forecasting
  - economic impact of foreign debt obligations
  - income distribution and poverty alleviation
- Adviser, Cathay Clemente Fund Holdings, Ltd. **1992-1993**.
- Consultant Professor, CIEMEX training program in Applied Economic Analysis for the Instituto Tecnológico de Estudios Superiores en Monterrey, Mexico. **1991-1993**.
- Consultant, San Miguel Corporation, **1988-1991**
  - sales forecasting and commodity price movements
  - regional modeling
- Consultant, Faith Ando and Associates, Haverford, PA **1988-1990**
  - Analysis of the characteristics and performance of minority-owned business enterprises in the US
  - Coverage and cost of health insurance in small businesses in the US
- Consultant, United Nations Development Programme (UNDP) for the
  - assessment of foreign-funded official technical assistance programs in the Philippines. June-September, **1989**
- Expert Reviewer, Department of Energy, Washington, DC, **1988**.

- Evaluation of submodels in the energy forecasting system of the US Department of Energy
  - Review of the Coal Supply and Transportation Model of the Energy Information Administration
- Consultant, UN-ESCAP (United Nations Economic and Social Commission for Asia and the Pacific) -- Econometric Modeling, Economic Planning Unit, Office of the Prime Minister, Kuala Lumpur, Malaysia. **1987**.
- Research Consultant, UN-ESCAP. Series of lectures on advanced quantitative methods in economics for the State Economic and Information Center, Beijing, People's Republic of China. **1987**.
- Consultant, Philippine Institute for Development Studies (PIDS), **1983-1985**:
  - established and trained staff for econometric in-house capability in quantitative methods for forecasting and policy analysis – as an in-house consultant in PIDS for two years under the auspices of the United Nations Development Programme
  - constructed a short-term forecasting model of inflation for the Philippines
  - constructed a macroeconometric model of the Philippines now used by NEDA for the five-year economic plan for the Philippines
- Consultant, JACA Corporation, Management Consultants and Engineers, **1982-1983**. Statistical applications in business analysis.
- Consultant, Asian Development Bank (**1982-1983**) on
  - econometric modeling of Southeast Asian economies
  - project benefit monitoring and evaluation
- Consultant, Wharton Econometric Forecasting Associates (WEFA), **1971-1981**. Modeling and forecasting world commodity markets.
- Consultant, Bureau of the Census and Statistics and the National Economic Council, Philippines – **1970-1971**.

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