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## Focus on: Hashem Pesaran

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**1.100 H. Hashem Pesaran and R.G. Pierse and K.C. Lee, March 1993, "Persistence, cointegration and aggregation: a disaggregated analysis of output fluctuations in the US economy", Journal of Econometrics, Vol.56, Nos.1/2, pp.57-88. ..... 71**

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**1.114 "Expectations in Economics", 1991, H. Hashem Pesaran, D. Greenaway, M. Bleaney and I. Stewart (Eds.), Companion to Contemporary Economic Thought, Routledge. ..... 78**

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**1.116 H. Hashem Pesaran ,K. Lee and R.G. Pierse, 1990, "Aggregation bias in labour demand equations for the UK economy", in T. Barker and M.H. Pesaran (eds), Disaggregation in Econometric Modelling, Routledge, pp. 113-149. ..... 79**

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**1.122 H. Hashem Pesaran and R.G. Pierse, 1989, "A proof of the asymptotic validity of a test for perfect aggregation", Economics Letters, Vol. 30 No.1, pp 41-47. ..... 81**

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**1.131 H. Hashem Pesaran, 1985, "Formation of inflation expectations in British manufacturing industries", Economic Journal, 95, pp. 948-975. ..... 85**

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**1.133 H. Hashem Pesaran and R.A. Evans, 1984, "Inflation, capital gains and UK personal savings: 1953-81", Economic Journal, pp. 237-257. ..... 86**

**1.134 H. Hashem Pesaran, 1984, "Asymptotic power comparisons of tests of separate parametric families by Bahadur's approach", Biometrika, pp. 245-252. ..... 86**

**1.135 H. Hashem Pesaran, 1984, "Macroeconomic policy in an oil-exporting economy with foreign exchange controls", Economica, pp. 253-270. ..... 86**

**1.136 H. Hashem Pesaran and L.G. Godfrey, 1983, "Tests of non-nested regression models: small sample adjustments and Monte Carlo evidence", Journal of Econometrics, 21, pp. 133-154. ..... 86**

**1.137 H. Hashem Pesaran and J. Hausman, 1983, "The J-test as a Hausman specification test", Economics Letters, 12, pp. 277-281. ..... 87**

**1.138 H. Hashem Pesaran , 1983, "A note on the maximum likelihood estimation of regression models with first-order moving average errors with roots in the unit circle", Australian Journal of Statistics, 25, pp. 442-448. ..... 87**

**1.139 H. Hashem Pesaran, 1982, "On the Comprehensive method of testing non-nested regression models", Journal of Econometrics, pp. 263-274. ..... 88**

**1.140 H. Hashem Pesaran, 1982, "A critique of the proposed tests of the natural rate/rational expectations hypothesis", Economic Journal, pp. 529-54. Reprinted, 1999, in (ed) Kevin Hoover, The Legacy of Robert Lucas, Jr. Vol. I, chapter 18. Cheltenham: Edward Elgar. ISBN 1 85898 387 8 88**

**1.141 H. Hashem Pesaran, 1982, "Comparison of local power of alternative tests of non-nested regression models", Econometrica, pp.1287-1305. ..... 89**

**1.142 H. Hashem Pesaran, 1982, "The system of dependent capitalism in pre- and post-revolutionary Iran", International Journal of Middle East Studies, 14, pp. 501-522. ..... 89**

**1.143 H. Hashem Pesaran, 1981, "Identification of rational expectations models", Journal of Econometrics, 375-398. ..... 89**

**1.144 H. Hashem Pesaran, 1981, "Pitfalls of testing non-nested hypotheses by the Lagrange multiplier method", Journal of Econometrics, pp. 323-331 ..... 90**

**1.145 H. Hashem Pesaran and A.S. Deaton, May 1978, "Testing non-nested, non-linear regression models", Econometrica, pp. 677-694 ..... 91**

**1.146 H. Hashem Pesaran and G.E.J. Llewellyn, June 1976, "Determinants of United Kingdom import prices - a note", Economic Journal, pp. 315-320. ..... 92**

**1.147 H. Hashem Pesaran, 1974, "On the general problem of model selection", Review of Economic Studies, pp. 153-171. ..... 92**

**1.148 H. Hashem Pesaran, February 1973, "The small sample problem of truncation remainders in the estimation of distributed lag models with auto-correlated errors", International Economic Review, pp. 120-131. ..... 92**

**1.149 H. Hashem Pesaran, May 1973, "An alternative econometric approach to the permanent income hypothesis: an international comparison: a comment", Review of Economics and Statistics, pp. 259-261. ..... 92**

**1.150 H. Hashem Pesaran, October 1973, "The exact maximum likelihood estimation of a regression equation with first order moving-average errors", Review of Economic Studies, pp. 529-535. ..... 93**

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**2.1 H. Hashem Pesaran, Professor David Champernowne, obituary in Daily Telegraph, 4 September 2000.....94**

**2.2 H. Hashem Pesaran, "Recent Perspectives on the Iranian Economy", Kanoon Iran, February 1996, pp.7-11 (Text of a lecture given in London, October 1994).....94**

**2.3 H. Hashem Pesaran, "Banking and credit control in Iran", Euromoney (supplement), April 1975. 94**

**2.4 H. Hashem Pesaran, "The recycling dilemma", Keyhan International, October 1974, Tehran. .....94**

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**3.1 "Foreword" in (eds) Francois Grades and Georges Prat, Price Expectations in Goods and Financial Markets: New Developments in the Theory and Empirical Research, 2000, Cheltenham: Edward Elgar, ISBN 1-84064-322-6.....95**

**3.2 "Foreword" in (eds) Roberto Mariano, Til Schuermann, and Melvyn Weeks, Simulation-based Inference: Theory and Applications, 2000, Cambridge: Cambridge University Press, ISBN 0-521-59112-0. .....95**

**4 BOOK REVIEWS..... 96**

**4.1 "Rational Expectations Econometrics", by Hansen & Sargent, in Economica, 60, No.239, August 1993.....96**

**4.2 "Misspecification tests in econometrics: The Lagrange multiplier principle", by L.G. Godfrey, in Economic Journal, March 1990, Vol. 100, pp. 259-261.....96**

**4.3 "Instrumental variables", by R. Bowden and D. Turkington, in Economica, 1986.....96**

**4.4 "Economic theory and econometrics", by Lawrence Klein, edited by Jaime Marquez, in Economic Journal, December 1985.....96**

**4.5 "The international transmission of inflation", by M.R. Darby et al. in Economic Journal, June 1985.....96**

**4.6 "Rational expectations - an elementary exposition", by G.K. Shaw in Economic Journal, December 1984.....96**

**4.7 "Expenditure of oil revenue - an optimal control approach with application to the Iranian economy", by H. Motamen in Journal of Economic Dynamics and Control, 3, 1981, pp. 287-391. 96**

**5 BOOKS ..... 97**

**5.1 Jeff Nugent and M. Hashem Pesaran (Editors), January 2007. "Explaining Growth in the Middle East", Volume 278 (Contributions to Economic Analysis), Elsevier Science, .ISBN-10: 0444522409, ISBN-13: 978-0444522405. .....97**

**5.2 Tony Garrett, Kevin Lee, Hashem Pesaran and Yongcheol Shin, 2006. "Global and National Macroeconometric Modelling: A Long Run Structural Approach", Oxford University Press, ISBN 0-19-929685-5.....97**

**5.3 H. Hashem Pesaran, C. Hsiao, K. Lahiri and L-F Lee (eds), 1999, "Analysis of Panels and Limited Dependent Variables: A Volume in Honour of G S Maddala", Cambridge University Press, Cambridge, pp.338. ISBN 0 521 63169 6 ..... 97**

**5.4 H. Hashem Pesaran, R.P. Smith and T. Akiyama, 1998, "Energy Demand in Asian Developing Economies", Oxford University Press, Oxford, pp.226. ISBN 0 19 730020 0. ..... 97**

**5.5 H. Hashem Pesaran and B. Pesaran, 1997, "Working with Microfit 4.0: Interactive Econometric Analysis", (DOS and Windows versions), Oxford University Press, pp.511. ISBN 019 268 530 9 (DOS), 019 268 531 7 (Windows) ..... 97**

**5.6 H. Hashem Pesaran and Peter Schmidt (eds), 1997, "Handbook of Applied Econometrics: Microeconomics", Basil Blackwell, pp.453. ISBN 1 55786 209 5. ..... 97**

**5.7 H. Hashem Pesaran and Mike Wickens (eds), 1995, "Handbook of Applied Econometrics: Macroeconomics", Basil Blackwell, pp.482. ISBN 1 55786 208 7. ..... 97**

**5.8 H. Hashem Pesaran and S. Potter (eds), 1993, "Non-Linear Dynamics", Chaos and Econometrics, John Wiley, pp.244. ISBN 0 471 93942 0. ..... 97**

**5.9 H. Hashem Pesaran and B. Pesaran, 1991, "Microfit 3.0: An Interactive Software Econometric Package", Oxford University Press. This is a substantially revised and extended version of Microfit. ..... 97**

**5.10 H. Hashem Pesaran and T. Barker, 1990, "Disaggregation in Econometric Modelling", edited volume, Routledge. ..... 97**

**5.11 H. Hashem Pesaran, 1987, "The Limits to Rational Expectations", Basil Blackwell, Oxford, pp. 325. Reprinted with corrections, 1989. Reprinted in paperback, 1989. Chapter 8, Measurement of Expectations and Direct Tets of the REH, is reprinted in Van der Ploeg (ed.), Advanced Lectures in Quantitative Economics, Academic Press, London, 1990, pp. 445-499. ..... 97**

**5.12 H. Hashem Pesaran and B. Pesaran, 1987, "Data-FIT: An Interactive Software Econometric Package", Oxford University Press, pp. 205, reprinted in paperback (with corrections) as Microfit, Oxford University Press, 1989. ..... 98**

**5.13 H. Hashem Pesaran and T. Lawson (eds), 1985, "Keynes' Economics: Methodological Issues", Croom Helm, pp. 265, Reprinted in paperback by Routledge, 1989. ..... 98**

**5.14 H. Hashem Pesaran and L.J. Slater, 1980,"Dynamic Regression: Theory and Algorithms", No.5 in the series, "Computers and their Applications", Chichester: Ellis Horwood (publisher) and John Wiley (distributor), pp. 363. (Translated into Russian, 1984). ..... 98**

**5.15 H. Hashem Pesaran, November 1974, "World Economic Prospects and the Iranian Economy - a short term view". Institute for International Political and Economic Studies, Tehran, pp. 50. (Booklet in both Persian and English). ..... 98**

## INTRODUCTION

Dr M. Hashem Pesaran was born in Shiraz, Fars, Iran on March 30, 1946. He received his BSc in Economics at the University of Salford (England) and his PhD in Economics at Cambridge University.

Currently, Dr Pesaran is Professor of Economics at Cambridge University and a Professorial Fellow of Trinity College, Cambridge.

Previously, he was head of the Economic Research Department of the Central Bank of Iran and the Under-Secretary of the Ministry of Education, Iran. He has also been a Professor of Economics and the Director of the Applied Econometrics Program at UCLA, and Visiting Professor at the Institute of Advanced Studies in Vienna, at the University of Pennsylvania, and the University of Southern California.

He is a Fellow of the British Academy, a Fellow of the Econometric Society, and a Fellow of the Journal of Econometrics. He is the recipient of the 1990 George Sell Prize from The Institute of Petroleum, London, the 1992 Royal Economic Society Prize for the best article published in The Economic Journal for the years 1990 and 1991, and the joint recipient of the Econometric Reviews Best Paper Award 2002-2004 for his paper on Long Run Structural Modeling.

Dr Pesaran is the founding editor of the *Journal of Applied Econometrics* and a co-developer of *Microfit (versions 1-4),* an econometric software package published by Oxford University Press.

He has been a member of the Board of Trustees of the Economic Research Forum for Arab Countries, Iran and Turkey over the period, and has served as a member of the World Bank's Council of Advisers for the Middle East and North Africa, 1996-2000.

Dr Pesaran has served as a Director on the Board of Acorn Investment Trust and Cambridge Econometrics, and is now Honorary President of Cambridge Econometrics. In 1997 he became a Charter Member of the Oliver Wyman Institute, serving until January 2000. Between 2000 and 2002 he was appointed Vice President in charge of development and computerized trading systems at Tudor Investment Corporation, Connecticut, USA and in October 2004 he was appointed as Director of USC College Institute for Economic Policy Research.

He has over 130 publications in leading scientific journals in the areas of econometrics, empirical macroeconomics and the Iranian economy, and is an expert in the economics of oil and the Middle East.

His current research interests include:

- Real-time modelling in economics and finance
- Modelling credit risk
- Econometric analysis of dynamic panels
- Unit root testing and cointegration in panel data models
- Aggregation of dynamic heterogeneous models
- Decision theoretic approaches to model evaluation
- Empirical analysis of convergence and growth
- Econometric analysis of energy demand in Asian economies
- Exchange rate modelling
- Monetary and foreign exchange policy in Iran

The following list is a non-exhaustive, subjective selection of M. Hashem Pesaran's publications.

More information can be found at:

- The address of M. Hashem Pesaran's homepage at:

http://www.econ.cam.ac.uk/faculty/pesaran/

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# 1 WORKING PAPERS AND ARTICLES

## 1.1 M. Hashem Pesaran, Sean Holly and Takashi Yamagata, December 2009,"Spatial and Temporal Diffusion of House Prices in the UK".

This paper provides a method for the analysis of the spatial and temporal diffusion of shocks in a dynamic system. We use changes in real house prices within the UK economy at the level of regions to illustrate its use. Adjustment to shocks involves both a region specific and a spatial effect. Shocks to a dominant region - London - are propagated contemporaneously and spatially to other regions. They in turn impact on other regions with a delay. We allow for lagged effects to echo back to the dominant region. London in turn is influenced by international developments through its link to New York and other financial centers. It is shown that New York house prices have a direct effect on London house prices. We analyse the effect of shocks using generalised spatio-temporal impulse responses. These highlight the diffusion of shocks both over time (as with the conventional impulse responses) and over space. *Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp09/UKhouseprices_December 9 2009.pdf

## 1.2 M. Hashem Pesaran and Andreas Pick, November, 2009, "Forecast Combination across Estimation Windows",

This paper considers the problem of forecast combination when forecasts are generated from the same model but use different estimation windows. It develops theoretical results for random walks when their drift and/or volatility are subject to one or more structural breaks. The analysis is then extended to a linear regression model with an exogenous regressor. It is shown that compared to forecasts based on a single estimation window, averaging of forecasts over different estimation windows leads to a lower bias and to a lower root mean square forecast error for all but the

smallest of breaks. Similar results are also obtained when observations are exponentially down-weighted, although in this case the forecast performance critically depends on the choice of the weighting coefficient. An application to weekly returns on 20 equity index futures shows that averaging forecasts over estimation windows generally leads to a smaller RMSFE compared to a range of competing methods. *Full text available on-line at:*
http://www.econ.cam.ac.uk/faculty/pesaran/wp09/Pesaran_and_Pick_AveW_14Nov2009.pdf

### 1.3 M. Hashem Pesaran and Paolo Zaffaroni, October 2009, "Optimality and Diversifiability of Mean Variance and Arbitrage Pricing Portfolios".

This paper investigates the limit properties of mean-variance (mv) and arbitrage pricing (ap) trading strategies using a general dynamic factor model, as the number of assets diverges to infinity. It extends the results obtained in the literature for the exact pricing case to two other cases of asymptotic no-arbitrage and the unconstrained pricing scenarios. The paper characterizes the asymptotic behaviour of the portfolio weights and establishes that in the non-exact pricing cases the ap and mv portfolio weights are asymptotically equivalent and, moreover, functionally independent of the factors conditional moments. By implication, the paper sheds light on a number of issues of interest such as the prevalence of short-selling, the number of dominant factors and the granularity property of the portfolio weight. *Full text available on-line at:*
http://www.econ.cam.ac.uk/faculty/pesaran/wp09/pz_port_17_October_09.pdf

### 1.4 Hadi Salehi Esfahani, Kamiar Mohaddes, and M. Hashem Pesaran October 2009,"Oil Exports and the Iranian Economy".

This paper develops a long run growth model for a major oil exporting economy and derives conditions under which oil revenues are likely to have a lasting impact. This approach contrasts with the standard literature on the "Dutch disease" and the "resource curse", which primarily focus on short run implications of a temporary resource discovery. Under certain regularity conditions and assuming a Cobb Douglas production function, it is shown that (log) oil exports enter the long run output equation with a coefficient equal to the share of capital. The long run theory is tested

using a new quarterly data set on the Iranian economy over the period 1979Q1-2006Q4. Building an error correction specification in real output, real money balances, inflation, real exchange rate, oil exports, and foreign real output, the paper finds clear evidence for two long run relations: an output equation as predicted by the theory and a standard real money demand equation with inflation acting as a proxy for the (missing) market interest rate. Real output in the long run is shaped by oil exports through their impact on capital accumulation, and the foreign output as the main channel of technological transfer. The results also show a significant negative long run association between inflation and real GDP, which is suggestive of economic inefficiencies. Once the effects of oil exports are taken into account, the estimates support output growth convergence between Iran and the rest of the world. We also find that the Iranian economy adjusts quite quickly to the shocks in foreign output and oil exports, which could be partly due to the relatively underdeveloped nature of Iran's financial markets.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp09/Iran_VARX_08Oct09.pdf

### 1.5 Alexander Chudik, M. Hashem Pesaran and Elisa Tosetti, June 2009,"Weak and Strong Cross Section Dependence and Estimation of Large Panels".

This paper introduces the concepts of time-specific weak and strong cross section dependence. A double-indexed process is said to be cross sectionally weakly dependent at a given point in time, *t*, if its weighted average along the cross section dimension (*N*) converges to its expectation in quadratic mean, as *N* is increased without bounds for all weights that satisfy certain 'granularity' conditions. Relationship with the notions of weak and strong common factors is investigated and an application to the estimation of panel data models with an infinite number of weak factors and a finite number of strong factors is also considered. The paper concludes with a set of Monte Carlo experiments where the small sample properties of estimators based on principal components and CCE estimators are investigated and compared under various assumptions on the nature of the unobserved common effects.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp09/CPT_StrongWeakCSD_14June09.pdf

### 1.6 M. Hashem Pesaran, A. Pick and A. Timmerman. January 2009, "Variable Selection and Inference for Multi-period Forecasting Problems".

This paper conducts a broad-based comparison of iterated and direct multi-step forecasting approaches applied to both univariate and multivariate models. Theoretical results and Monte Carlo simulations suggest that iterated forecasts dominate direct forecasts when estimation error is a first-order concern, i.e. in small samples and for long forecast horizons. Conversely, direct forecasts may dominate in the presence of dynamic model misspecification. Empirical analysis of the set of 170 variables studied by Marcellino, Stock and Watson (2006) shows that multivariate information, introduced through a parsimonious factor-augmented vector autoregression approach, improves forecasting performance for many variables, particularly at short horizons.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp09/PPTiterated_22Jan2009.pdf

### 1.7 G. Kapetanios, M. Hashem Pesaran and T. Yamagata, July 2006, Revised June 2009,"Panels with Nonstationary Multifactor Error Structures".

The presence of cross-sectionally correlated error terms invalidates much inferential theory of panel data models. Recently, work by Pesaran (2006) has suggested a method which makes use of cross-sectional averages to provide valid inference in the case of stationary panel regressions with a multifactor error structure. This paper extends this work and examines the important case where the unobservable common factors follow unit root processes. The extension to the I (1) processes is remarkable on two counts. Firstly, it is of great interest to note that while intermediate results needed for deriving the asymptotic distribution of the panel estimators differ between the I(1) and I(0) cases, the final results are surprisingly similar. This is in direct contrast to the standard distributional results for I (1) processes that radically differ from those for I (0) processes. Secondly, it is worth noting the significant extra technical demands required to prove the new results. The theoretical findings are

further supported for small samples via an extensive Monte Carlo study. In particular, the results of the Monte Carlo study suggest that the cross-sectional average based method is robust to a wide variety of data generation processes and has lower biases than the alternative estimation methods considered in the paper. *Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp09/KPY_CCEunit_130609.pdf

### 1.8 M. Hashem Pesaran, L. V. Smith and T. Yamagata, December 2007, Revised September 2009, "A Panel Unit Root Test in the Presence of a Multifactor Error Structure".

This paper extends the cross sectionally augmented panel unit root test proposed by Pesaran (2007) to the case of a multifactor error structure. The basic idea is to exploit information regarding the m unobserved factors that are shared by *k* other time series in addition to the variable under consideration. Initially we develop a test assuming that $m^0$, the true number of factors is known, and show that the limit distribution of the test does not depend on any nuisance parameters, so long as $k \geq m^0 - 1$. Small sample properties of the test are investigated by Monte Carlo experiments and shown to be satisfactory. Particularly, in contrast to other existing panel unit root tests, our test has correct size and reasonable power for the case with an intercept and a linear trend as well as with an intercept only, for all combinations of cross section and time series dimensions. An illustrative application is also provided where the proposed panel unit root test is applied to Fisher's inflation parity and real equity prices. *Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp09/PSY_16Sept2009_Vanessa.pdf

*Gauss Codes and Supplemental Critical Value Tables:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp08/CIPSM.zip

### 1.9 Alexander Chudik and M. Hashem Pesaran, January 2010, "Infinite Dimensional VARs and Factor Models".

This paper introduces a novel approach for dealing with the 'curse of dimensionality' in the case of large linear dynamic systems. Restrictions on the coefficients of an unrestricted VAR are proposed that are binding only in a limit as the number of endogenous variables tends to infinity. It is shown that under such restrictions, an infinite-dimensional VAR (or IVAR) can be arbitrarily well characterized by a large

number of finite-dimensional models in the spirit of the global VAR model proposed in Pesaran et al. (JBES, 2004). The paper also considers IVAR models with dominant individual units and shows that this will lead to a dynamic factor model with the dominant unit acting as the factor. The problems of estimation and inference in a stationary IVAR with unknown number of unobserved common factors are also investigated. A cross section augmented least squares estimator is proposed and its asymptotic distribution is derived. Satisfactory small sample properties are documented by Monte Carlo experiments. An empirical illustration shows the statistical significance of dynamic spill-over effects in modelling of U.S. real house prices across the neighboring States.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp10/ChudikPesaran_RevisedPaper_22Jan10.pdf

### 1.10 M. Hashem Pesaran and Elisa Tosseti, August 2007, revised March 2009, "Large Panels with Spatial Correlations and Common Factors".

This paper considers estimation of slope coefficients in large panel data models where even after conditioning on common observed effects the cross section units might remain dependently distributed. This could arise when the cross section units are subject to unobserved common effects and/or if there are spill over effects due to spatial or other forms of local dependencies. Initially it focuses on a regression model where the idiosyncratic errors are spatially dependent and possibly serially correlated, and derives the asymptotic distributions of the (generalized) fixed effects and the mean group estimators under homogeneous and heterogeneous slope coefficients. Semi-parametric and non-parametric estimation of the variances of these estimators is considered. The paper then focuses on a panel data model with a multifactor error structure and spatial correlation. It is established that, under this framework, the Common Correlated Effects (CCE) estimator, recently advanced by Pesaran (2006), continues to provide estimates of the slope coefficient that are consistent and asymptotically normal. Small sample properties of the CCE estimator under various patterns of cross section dependence, including spatial forms, are investigated by Monte Carlo experiments. Results show that the CCE approach works well in the presence of weak and/or strong cross sectionally correlated errors.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp09/PesaranTosetti04Mar09.pdf

### 1.11 Bahram Pesaran and M. Hashem Pesaran, June 2007, "Modelling Volatilities and Conditional Correlations in Futures Markets with a Multivariate t Distribution".

This paper considers a multivariate t version of the Gaussian dynamic conditional correlation (DCC) model proposed by Engle (2002), and suggests the use of devolatized returns computed as returns standardized by realized volatilities rather than by GARCH type volatility estimates. The t-DCC estimation procedure is applied to a portfolio of daily returns on currency futures, government bonds and equity index futures. The results strongly reject the normal-DCC model in favour of a t-DCC specification. The t-DCC model also passes a number of VaR diagnostic tests over an evaluation sample. The estimation results suggest a general trend towards a lower level of return volatility, accompanied by a rising trend in conditional cross correlations in most markets; possibly reflecting the advent of euro in 1999 and increased interdependence of financial markets.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp2007/PP_TDCC(28Jun07).pdf

### 1.12 Emmanuel Dhyney, Catherine Fuss, M. Hashem Pesaran and Patrick Sevestre, April 2007, Revised August 2008, "Lumpy Price Adjustments: A Microeconometric Analysis".

Based on a state-dependent pricing model, we specify and estimate a non-linear factor model allowing us to identify the relative importance of the degree of price rigidity that is inherent to the price setting mechanism (intrinsic) and that which is due to cost and/or demand factors (extrinsic). We find that intrinsic price stickiness, related to price adjustment costs, is indeed an important determinant of the frequency of price changes. However, the volatility of the shocks affecting optimal prices also plays a significant role in the determination of the frequency of price changes. We also find that this volatility is the major determining factor of the magnitude of price changes.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp08/LumpyPriceAdjustments14Aug08.pdf

### 1.13 Cheng Hsiao, M. Hashem Pesaran and Andreas Pick, April 2007, Revised March 2009, "Diagnostic Tests of Cross Section Independence for Nonlinear Panel Data Models".

This paper considers the problem of testing for cross section independence in the case of non-linear panel data models. It derives a Lagrangian multiplier (LM) test and shows that in terms of generalized residuals of Gourieoux, Monfort, Renault and Trognon (1987), it reduces to the LM test of Breusch and Pagan (1970). Due to the tendency for the LM test to over-reject in panels with large *N* (cross section dimension), we also consider the application of the test proposed in Pesaran (2004) to nonlinear panels. In Monte Carlo experiments it emerges that the CD test has the correct size for any combination of *N* and *T*, whereas the validity of the LM test requires *T* (time series dimension) to be large relative to *N*. We illustrate the cross-sectional independence tests by an application to a probit panel of roll-call votes in the U. S. Congress and find that the votes display a significant degree of cross section dependence.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/wp09/CDP_28Mar2009.pdf

### 1.14 Katrin Assenmacher-Wesche and M. Hashem Pesaran, 2009, "A VECX* Model of the Swiss Economy", Swiss National Bank Economic Studies, no 6.

This paper applies the modelling strategy of Garratt, Lee, Pesaran and Shin (2003) to the estimation of a structural cointegrated VAR model that relates the core macroeconomic variables of the Swiss economy to current and lagged values of a number of key foreign variables. We identify and test a long-run structure between the variables. Moreover, we analyse the dynamic properties of the model using Generalised Impulse Response Functions. In its current form the model can be used to produce forecasts for the endogenous variables either under alternative specifications of the marginal model for the exogenous variables, or conditional on some pre-specified path of those variables (for scenario forecasting). In due course the Swiss VECX* model can also be integrated within a Global VAR (GVAR) model where the foreign variables of the model are determined endogenously.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/pp09/Economic_Study_2009-6.pdf

**1.15 Stephane Dees, M. Hashem Pesaran, L. Vanessa Smith and Ron P. Smith, 2009, "Identification of New Keynesian Phillips Curves from a Global Perspective", Journal of Money, Credit and Banking, vol 41, issue 7, pp. 1481-1502.**

This paper is concerned with the estimation of New Keynesian Phillips Curves (NKPC) and focuses on two issues: the weak instrument problem and the characterisation of the steady states. It proposes some solutions from a global perspective. Using a global vector autoregressive model (GVAR) steady states are estimated as long-horizon expectations and valid instruments are constructed from the global variables as weighted averages. The proposed estimation strategy is illustrated using estimates of the NKPC for 8 developed industrial countries. The GVAR generates global factors that are valid instruments and help alleviate the weak instrument problem. The steady states also reflect global influences and any long-run theoretical relationships that might prevail within and across countries in the global economy. The GVAR measure of the steady state performed better than the HP measure, and the use of foreign instruments substantially increased the precision of the estimates of the output coefficient.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/fp09/JMCB08-298.pdf
*Data:*
http://www.econ.cam.ac.uk/faculty/pesaran/fp09/JMCB08-298data_Individual_Excel_Worksheets.xls
*Data Notes:*
http://www.econ.cam.ac.uk/faculty/pesaran/fp09/JMCB08-298datanote.doc

**1.16 M. Hashem Pesaran, T. Schuermann and L. Vanessa Smith, 2009, "Forecasting Economic and Financial Variables with Global VARs", International Journal of Forecasting, vol 25, issue 4, pp. 642-675.**

This paper considers the problem of forecasting economic and financial variables across a large number of countries in the global economy. To this end a global vector autoregressive (GVAR) model, previously estimated by Dees, di Mauro, Pesaran, and Smith (2007) and Dees, Holly, Pesaran, and Smith (2007) over the period 1979Q1–2003Q4, is used to generate out-of-sample forecasts one and four quarters ahead for

real output, inflation, real equity prices, exchange rates and interest rates over the period 2004Q1–2005Q4. Forecasts are obtained for 134 variables from 26 regions, which are made up of 33 countries and cover about 90% of the world output. The forecasts are compared to typical benchmarks: univariate autoregressive and random walk models. Building on the forecast combination literature, the effects of model and estimation uncertainty on forecast outcomes are examined by pooling forecasts obtained from different GVAR models estimated over alternative sample periods. Given the size of the modelling problem, and the heterogeneity of the economies considered–industrialised, emerging, and less developed countries–as well as the very real likelihood of possibly multiple structural breaks, averaging forecasts across both models and windows makes a significant difference. Indeed, the double-averaged GVAR forecasts perform better than the benchmark competitors, especially for output, inflation and real equity prices.

*Full text available on-line at:*

http://dx.doi.org/10.1016/j.ijforecast.2009.08.007
*Supplement:*
http://www.econ.cam.ac.uk/faculty/pesaran/fp09/PSS_Supplement_31July09.pdf
*Rejoinder:*
http://www.econ.cam.ac.uk/faculty/pesaran/fp09/PSS_Rejoinder_31July2009.pdf
*Data for PSS Paper:*
http://www.econ.cam.ac.uk/faculty/pesaran/fp09/Data_and_Codes_For_PSS_Paper.zip
*Data for PSS Rejoinder:*
http://www.econ.cam.ac.uk/faculty/pesaran/fp09/Data_and_Codes_For_PSS_Rejoinder.zip

### 1.17 David F. Hendry and M. Hashem Pesaran, 2009, "Obituary in Memory of Clive Granger: An Advisory Board member of The Journal", Journal of Applied Econometrics, vol. 24, pp 871–873.

Professor Sir Clive William John Granger, Kt, Professor Emeritus at the University of California, San Diego, died on 27 May 2009. He was born on 4 September 1934. In a distinguished career spanning more than 50 years, Clive Granger greatly influenced the theory and practice of time-series econometrics, with major contributions to most of the key concepts and approaches during that period. It is almost impossible to undertake empirical analyses of economic time series without using some of his methods or ideas which spanned causality, spurious regressions, forecasting, long-

memory, non-linearity, aggregation and, most importantly, cointegration, where his formulation with Robert F. Engle, with whom he was awarded the Sveriges Riksbank Prize in Economic Science in Memory of Alfred Nobel in October 2003, changed forever our understanding of non-stationary data.

*Full text available on-line at:*

http://www3.interscience.wiley.com/cgi-bin/fulltext/122605331/PDFSTART

### 1.18 M. Hashem Pesaran, Ron P. Smith, Takashi Yamagata, Liudmyla Hvozdyk, 2009, "Pairwise Tests of Purchasing Power Parity", Econometric Reviews, vol. 28, pp 495-521.

Given nominal exchange rates and price data on $N+1$ countries indexed by $i = 0,1,2,\ldots, N$, the standard procedure for testing purchasing power parity (PPP) is to apply unit root or stationarity tests to $N$ real exchange rates all measured relative to a base country, 0, often taken to be the U.S. Such a procedure is sensitive to the choice of base country, ignores the information in all the other cross-rates and is subject to a high degree of cross-section dependence which has adverse effects on estimation and inference. In this article, we conduct a variety of unit root tests on all possible $N(N+1)/2$ real rates between pairs of the $N+1$ countries and estimate the proportion of the pairs that are stationary. This proportion can be consistently estimated even in the presence of cross-section dependence. We estimate this proportion using quarterly data on the real exchange rate for 50 countries over the period 1957-2001. The main substantive conclusion is that to reject the null of no adjustment to PPP requires sufficiently large disequilibria to move the real rate out of the band of inaction set by trade costs. In such cases, one can reject the null of no adjustment to PPP up to 90% of the time as compared to around 40% in the whole sample using a linear alternative and almost 60% using a nonlinear alternative.

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http://www.informaworld.com/smpp/content~db=all~content=a911103973

*Supplement:*

http://www.econ.cam.ac.uk/faculty/pesaran/SupplementMarch06.pdf

*Gauss Code:*

http://www.econ.cam.ac.uk/faculty/pesaran/fp2007/Pairwise11July08.zip

**1.19 Hadi Salehi Esfahani and M. Hashem Pesaran, 2009, "The Iranian Economy in the Twentieth Century: A Global Perspective", Iranian Studies, vol. 42, issue 2, pp 177-211.**

This paper examines the transformation of the Iranian economy through the twentieth century within a global context. At the start of that century, the Iranian economy had long remained stagnant, poor, and largely agrarian, with a marginal role in the world economy. By the turn of the twenty-first century, Iran had transformed into a complex and relatively large economy with important consequences for the economies of the Middle East and other parts of the world. While the initial conditions and the evolution of domestic institutions and resources played major roles in the pace and nature of that transformation, relations with the rest of the world had crucial influences as well. This paper focuses on the latter forces, while taking account of their interactions with domestic factors in shaping the particular form of economic development in Iran. We study the ways in which the development of the Iranian economy has been affected by international price movements and by the ebbs and flows of trade, investment, and economic growth in the rest of the world. In considering these effects, we also analyze the role of domestic political economy factors and policies in enhancing or hindering the ability of domestic producers to respond to external challenges and opportunities.

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http://www.informaworld.com/smpp/content~content=a910165424~db=all~jumptype=rss

**1.20 M. Hashem Pesaran and Allan Timmermann, 2009, "Testing Dependence Among Serially Correlated Multicategory Variables", Journal of the American Statistical Association, vol. 104, no 485, pp 325-337.**

The contingency table literature on tests for dependence among discrete multicategory variables is extensive. Standard tests assume, however, that draws are independent and only limited results exist on the effect of serial dependency - a problem that is important in areas such as economics, finance, medical trials, and meteorology. This article proposes new tests of independence based on canonical correlations from dynamically augmented reduced rank regressions. The tests allow for an arbitrary

number of categories as well as multiway tables of arbitrary dimension and are robust in the presence of serial dependencies that take the form of finite-order Markov processes. For three-way or higher order tables we propose new tests of joint and marginal independence. Monte Carlo experiments show that the proposed tests have good finite sample properties. An empirical application to microeconomic survey data on firms' forecasts of changes to their production and prices demonstrates the importance of correcting for serial dependencies in predictability tests.

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http://www.econ.cam.ac.uk/faculty/pesaran/pp09/PesaranTimmermannjasa.2009.pdf
*Supplementary Material:*
http://www.econ.cam.ac.uk/faculty/pesaran/pp09/PesaranTimmermannSupplement_JASA_Oct_11_2008.pdf

### 1.21 M. Hashem Pesaran, Christoph Schleicher and Paolo Zaffaroni, 2009, "Model Averaging in Risk Management with an Application to Futures Markets", Journal of Empirical Finance, vol. 16, issue 2, pp 280-305.

This paper considers the problem of model uncertainty in the case of multi-asset volatility models and discusses the use of model averaging techniques as a way of dealing with the risk of inadvertently using false models in portfolio management. Evaluation of volatility models is then considered and a simple Value-at-Risk (VaR) diagnostic test is proposed for individual as well as 'average' models. The asymptotic as well as the exact finite-sample distribution of the test statistic, dealing with the possibility of parameter uncertainty, are established. The model averaging idea and the VaR diagnostic tests are illustrated by an application to portfolios of daily returns on six currencies, four equity indices, four ten year government bonds and four commodities over the period 1991–2007. The empirical evidence supports the use of 'thick' model averaging strategies over single models or Bayesian type model averaging procedures.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/pp09/EMPFIN400.pdf
*Matlab Code for PSZ MARM:*
http://www.econ.cam.ac.uk/faculty/pesaran/fp08/MatlabcodeforPSZ_MARM.zip
*Documentation of Matlab Code:*
http://www.econ.cam.ac.uk/faculty/pesaran/fp08/MARMMatlabcode.pdf

**1.22 Rodrigo Dupleich Ulloa and M. Hashem Pesaran, 2008, "Non-nested hypotheses", The New Palgrave Dictionary of Economics. Second Edition. Eds. Steven N. Durlauf and Lawrence E. Blume. Palgrave Macmillan. The New Palgrave Dictionary of Economics Online. Palgrave Macmillan.**

This article provides an overview of the literature on hypotheses testing when the hypotheses or models under consideration are non-nested. Two models are said to be non-nested if neither can be obtained from the other by some limiting process, including the imposition of equality and/or inequality constrains on one of the model's parameters. Relevant concepts such as closeness measures and pseudo-true values are discussed and alternative approaches to testing non-nested hypotheses, including the Cox procedure, artificial nesting and the encompassing approach, are reviewed. The Vuong approach to model selection is also covered.

*Full text available on-line at:*

http://www.dictionaryofeconomics.com/article?id=pde2008_N000084&goto=nonnested&result_number=1225

**1.23 John Geweke, Joel Horowitz and M. Hashem Pesaran, 2008, "Econometrics", The New Palgrave Dictionary of Economics. Second Edition. Eds. Steven N. Durlauf and Lawrence E. Blume. Palgrave Macmillan. The New Palgrave Dictionary of Economics Online. Palgrave Macmillan.**

As a unified discipline, econometrics is still relatively young and has been transforming and expanding very rapidly. Major advances have taken place in the analysis of cross-sectional data by means of semi parametric and nonparametric techniques. Heterogeneity of economic relations across individuals, firms and industries is increasingly acknowledged and attempts have been made to take it into account either by integrating out its effects or by modelling the sources of heterogeneity when suitable panel data exist. The counterfactual considerations that underlie policy analysis and treatment valuation have been given a more satisfactory foundation. New time-series econometric techniques have been developed and employed extensively in the areas of macroeconometrics and finance. Nonlinear econometric techniques are used increasingly in the analysis of cross-section and time-series observations. Applications of Bayesian techniques to econometric problems have been promoted largely by advances in computer power and

computational techniques. The use of Bayesian techniques has in turn provided the investigators with a unifying framework where the tasks of forecasting, decision making, model evaluation and learning can be considered as parts of the same interactive and iterative process, thus providing a basis for 'real time econometrics'.

*Full text available on-line at:*

http://www.dictionaryofeconomics.com/article?id=pde2008_E000007&goto=E&result_number=437

### 1.24 M. Hashem Pesaran, Aman Ullah and Takashi Yamagata, 2008, "A Bias-Adjusted Lm Test of Error Cross Section Independence", The Econometrics Journal, vol. 11, pp. 105–127.

This paper proposes bias-adjusted normal approximation versions of Lagrange multiplier (NLM) test of error cross section independence of Breusch and Pagan (1980) in the case of panel models with strictly exogenous regressors and normal errors. The exact mean and variance of the Lagrange multiplier (LM) test statistic are provided for the purpose of the bias-adjustments and it is shown that the proposed tests have a standard normal distribution for the fixed time series dimension (T) as the cross section dimension (N) tends to infinity. Importantly, the proposed bias-adjusted NLM tests are consistent even when the Pesaran's (2004) CD test is inconsistent. Also alternative bias-adjusted NLM tests, which are consistent under local error cross section independence of any fixed order p, are proposed. The finite sample behavior of the proposed tests are investigated and compared to the LM, NLM, and CD tests. It is shown that the bias-adjusted NLM tests successfully control the size, maintaining satisfactory power in panel with exogenous regressors and normal errors, even when cross section mean of the factor loadings is close to zero, where the CD test has little power. However, it is also shown that the bias-adjusted NLM tests are not as robust as the CD test to non-normal errors and/or in the presence of weakly exogenous regressors.

*Full text available on-line at:*

http://www.blackwell-synergy.com/doi/abs/10.1111/j.1368-423X.2007.00227.x

**1.25 M. Hashem Pesaran and Takashi Yamagata, 2008, "Testing Slope Homogeneity in Large Panels", Journal of Econometrics, vol. 142, pp. 50-93.**

This paper proposes a standardized version of Swamy's test of slope homogeneity for panel data models where the cross section dimension (N) could be large relative to the time series dimension (T). The proposed test, denoted by $\tilde{\Delta}$, , exploits the cross section dispersion of individual slopes weighted by their relative precision. In the case of models with strictly exogenous regressors, but with non-normally distributed errors, the test is shown to have a standard normal distribution as $(N,T) \xrightarrow{j} \infty$ such that $\sqrt{N}/T^2 \to 0$. When the errors are normally distributed, a mean-variance bias adjusted version of the test is shown to be normally distributed irrespective of the relative expansion rates of N and T. The test is also applied to stationary dynamic models, and shown to be valid asymptotically so long as $N/T \to \kappa$ , as $(N,T) \xrightarrow{j} \infty$ where $0 \leq \kappa \infty$ . Using Monte Carlo experiments, it is shown that the test has the correct size and satisfactory power in panels with strictly exogenous regressors for various combinations of N and T. Similar results are also obtained for dynamic panels, but only if the autoregressive coefficient is not too close to unity and so long as $T \geq N$.

*Full text available on-line at:*
http://www.sciencedirect.com/science/article/B6VC0-4NT84WG-1/2/0eb602a751c2c2f54843fff6ecf83ae0

**1.26 Adrian Pagan and M. Hashem Pesaran, 2008, "Econometric Analysis of Structural Systems with Permanent and Transitory Shocks", Journal of Economic Dynamics and Control, vol. 32, issue 10, pp. 3376-3395.**

This paper considers the implications of the permanent/transitory decomposition of shocks for identification of structural models in the general case where the model might contain more than one permanent structural shock. It provides a simple and intuitive generalization of the influential work of Blanchard and Quah (1989), and shows that structural equations with known permanent shocks cannot contain error correction terms, thereby freeing up the latter to be used as instruments in estimating their parameters. The approach is illustrated by a re-examination of the identification schemes used by Wickens and Motto (2001), Shapiro and Watson (1988), King, Plosser, Stock, Watson (1991), Gali (1992, 1999) and Fisher (2006). The dynamic

effects of neutral and investment-specific technology shocks. Journal of Political Economy 114, 413–451].

*Full text available on-line at:*
http://dx.doi.org/10.1016/j.jedc.2008.01.006

**1.27 Samuel Hanson, M. Hashem Pesaran, and Til Schuermann, 2008, "Firm Heterogeneity and Credit Risk Diversification", Journal of Empirical Finance, vol. 15, issue 4, pp. 583-612.**

This paper examines the impact of neglected heterogeneity on credit risk. We show that neglecting heterogeneity in firm returns and/or default thresholds leads to under estimation of expected losses (EL), and its effect on portfolio risk is ambiguous. Once EL is controlled for, the impact of neglecting parameter heterogeneity is complex and depends on the source and degree of heterogeneity. We show that ignoring differences in default thresholds results in overestimation of risk, while ignoring differences in return correlations yields ambiguous results. Our empirical application, designed to be typical and representative, combines both and shows that neglected heterogeneity results in overestimation of risk. Using a portfolio of U.S. firms we illustrate that heterogeneity in the default threshold or probability of default, measured for instance by a credit rating, is of first order importance in affecting the shape of the loss distribution: including ratings heterogeneity alone results in a 20% drop in loss volatility and a 40% drop in 99.9% VaR, the level to which the risk weights of the New Basel Accord are calibrated.

*Full text available on-line at:*
http://dx.doi.org/10.1016/j.jempfin.2007.11.002

**1.28 Cheng Hsiao and M. Hashem Pesaran, 2007, "Random Coefficient Models", L. Matyas and P. Sevestre (eds), The Econometrics of Panel Data (Third Edition), Ch 6, pp. 185-213.**

This paper provides a review of linear panel data models with slope heterogeneity, introduces various types of random coefficients models and suggest a common framework for dealing with them. It considers the fundamental issues of statistical inference of a random coefficients formulation using both the sampling and Bayesian approaches. The paper also provides a review of heterogeneous dynamic panels,

testing for homogeneity under weak exogeneity, simultaneous equation random coefficient models, and the more recent developments in the area of cross-sectional dependence in panel data models.

*Full text available on-line at:*
http://www.econ.cam.ac.uk/faculty/pesaran/HsiaoPesaranRCM20July07.pdf

**1.29 Breitung, J. and M.H. Pesaran, 2008, "Unit Roots and Cointegration in Panels", L. Matyas and P. Sevestre (eds), The Econometrics of Panel Data (Third Edition), Ch 9, pp. 279-322.**

This paper provides a review of the literature on unit roots and cointegration in panels where the time dimension (T), and the cross section dimension (N) are relatively large. It distinguishes between the first generation tests developed on the assumption of the cross section independence, and the second generation tests that allow, in a variety of forms and degrees, the dependence that might prevail across the different units in the panel. In the analysis of cointegration the hypothesis testing and estimation problems are further complicated by the possibility of cross section cointegration which could arise if the unit roots in the different cross section units are due to common random walk components.

*Full text available on-line at:*
http://www.econ.cam.ac.uk/faculty/pesaran/fp2007/panelUnitCoin_final.pdf

**1.30 Katrin Assenmacher-Wesche and M. Hashem Pesaran, 2007, "Forecasting the Swiss Economy Using VECX* Models: An Exercise in Forecast Combination Across Models and Observation Windows", National Institute Economic Review 203, 91–108.**

This paper uses vector error correction models of Switzerland for forecasting output, inflation and the short-term interest rate. It considers three different ways of dealing with forecast uncertainties. First, it investigates the effect on forecasting performance of averaging over forecasts from different models. Second, it considers averaging forecasts from different estimation windows. It is found that averaging over estimation windows is at least as effective as averaging over different models and both complement each other. Third, it examines whether using weighting schemes from the machine learning literature improves the average forecast. Compared to

equal weights the effect of alternative weighting schemes on forecast accuracy is small in the present application.

*Full text available on-line at:*
http://www.econ.cam.ac.uk/faculty/pesaran/fp2007/SwissForecastingNIESR17Dec07.pdf

### 1.31 Stephane Dees, Sean Holly, M. Hashem Pesaran and L. Vanessa Smith, 2007, "Long Run Macroeconomic Relations in the Global Economy", economics - The Open-Access, Open-Assessment E-Journal, 2007-3.

This paper focuses on testing long run macroeconomic relations for interest rates, equity, prices and exchange rates within a model of the global economy. It considers a number of plausible long run relationships suggested by arbitrage in financial and goods markets, and uses the global vector autoregressive (GVAR) model developed in Dees, di Mauro, Pesaran and Smith (2007) to test for long run restrictions in each country/region conditioning on the rest of the world. Bootstrapping is used to compute both the empirical distribution of the impulse responses and the log-likelihood ratio statistic for over-identifying restrictions. The paper also examines the speed with which adjustments to the long run relations take place via the persistence profiles. We find strong evidence in favour of the uncovered interest parity and to a lesser extent the Fisher equation across a number of countries, but our results for the PPP are much weaker. Also as to be expected, the transmission of shocks and subsequent adjustments in financial markets are much faster than those in goods markets.

*Full text available on-line at:*

http://www.economics-ejournal.org/economics/journalarticles/2007-3

### 1.32 M. Hashem Pesaran, 2007, "A Simple Panel Unit Root Test In The Presence Of Cross Section Dependence", in Journal of Applied Econometrics, Vol. 22, Issue 2, pp. 265-312,

A number of panel unit root tests that allow for cross section dependence have been proposed in the literature that use orthogonalization type procedures to asymptotically eliminate the cross dependence of the series before standard panel unit root tests are applied to the transformed series. In this paper we propose a simple alternative where

the standard ADF regressions are augmented with the cross section averages of lagged levels and first-differences of the individual series. New asymptotic results are obtained both for the individual cross sectionally augmented ADF (CADF) statistics, and their simple averages. It is shown that the individual CADF statistics are asymptotically similar and do not depend on the factor loadings. The limit distribution of the average CADF statistic is shown to exist and its critical values are tabulated. Small sample properties of the proposed test are investigated by Monte Carlo experiments. The proposed test is applied to a panel of 17 OECD real exchange rate series as well as to log real earnings of households in the PSID data.

*Full text available on-line at:*

http://www3.interscience.wiley.com/cgi-bin/abstract/114211628/ABSTRACT
*Gauss Codes for Computation of the CADF Panel Unit Root Test Statistics:* http://www.econ.cam.ac.uk/faculty/pesaran/pub2007/CADFgauss6.zip

### 1.33 M. Hashem Pesaran, Davide Pettenuzzo and Allan Timmermann, 2007, "Learning, Structural Instability and Present Value Calculations", Econometric Reviews, Vol. 26, Issue 2-4, pp. 253-288.

Present value calculations require predictions of cash flows both at near and distant future points in time. Such predictions are generally surrounded by considerable uncertainty and may critically depend on assumptions about parameter values as well as the form and stability of the data generating process underlying the cash flows. This paper presents new theoretical results for the existence of the infinite sum of discounted expected future values under uncertainty about the parameters characterizing the growth rate of the cash flow process. Furthermore, we explore the consequences for present values of relaxing the stability assumption in a way that allows for past and future breaks to the underlying cash flow process. We find that such breaks can lead to considerable changes in present values.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/pub2007/LECR_A_221955_O.pdf

### 1.34 M. Hashem Pesaran, 2007, "A Pair-Wise Approach To Testing For Output And Growth Convergence", the Journal of Econometrics, Vol. 138, Issue 1, pp. 312-355.

This paper proposes a pair-wise approach to testing for output convergence that considers all N (N - 1)/2 possible pairs of log per capita output gaps across N

economies. A general probabilistic definition of output convergence is also proposed, which suggests that all such out- put gap pairs must be stationary with a constant mean. The approach is compatible with individual output series having unit roots, or other non-stationary common components and does not involve the choice of a reference country in computation of output gaps. It is also applicable when N is large relative to T (the time dimension of the panel). After providing some encouraging Monte Carlo evidence on the small sample properties of the pair-wise test, the test is applied to output series in the Penn World Tables over 1950-2000. Overall, the results do not support output convergence, and suggest that the findings of convergence clubs in the literature might be spurious. However, significant evidence of growth convergence is found, a result which is reasonably robust to the choice of the sample period and country groupings. Non-convergence of log per capita outputs combined with growth convergence suggests that while common technological progress seems to have been diffusing reasonably widely across economies, there are nevertheless important country-specific factors that render output gaps highly persistent, such that we cannot be sure that the probability for the output gaps to lay within a fixed range will be non-zero.

*Full text available on-line at:*

http://dx.doi.org/10.1016/j.jeconom.2006.05.024

### 1.35 Stephane Dees, Filippo di Mauro, M. Hashem Pesaran, and L. Vanessa Smith, 2007, "Exploring the International Linkages of the Euro Area: A Global Var Analysis", the Journal of Applied Econometrics, Vol. 22, Issue 1, pp.1-38.

This paper presents a quarterly global model combining individual country vector error-correcting models in which the domestic variables are related to the country-specific foreign variables. The global VAR (GVAR) model is estimated for 26 countries, the euro area being treated as a single economy, over the period 1979–2003. It advances research in this area in a number of directions. In particular, it provides a theoretical framework where the GVAR is derived as an approximation to a global unobserved common factor model. Using average pair-wise cross-section error correlations, the GVAR approach is shown to be quite effective in dealing with the common factor interdependencies and international co-movements of business cycles. It develops a sieve bootstrap procedure for simulation of the GVAR as a

whole, which is then used in testing the structural stability of the parameters, and for establishing bootstrap confidence bounds for the impulse responses. Finally, in addition to generalized impulse responses, the current paper considers the use of the GVAR for 'structural' impulse response analysis with focus on external shocks for the euro area economy, particularly in response to shocks to the US.

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http://onlinelibrary.wiley.com/doi/10.1002/jae.932/abstract?systemMessage=Due+to+scheduled+maintenance%2C+access+to+Wiley+Online+Library+will+be+disrupted+on+Saturday%2C+5th+Mar+between+10%3A00-12%3A00+GMT

*Supplement: A:*
http://www.econ.cam.ac.uk/faculty/pesaran/SupplementA(Data&Bootstrap)DdPS10Dec06.pdf

*Supplement B:*
http://www.econ.cam.ac.uk/faculty/pesaran/SupplementB(Additional Results)DdPS11April06.pdf

*Data:*http://www.econ.cam.ac.uk/faculty/pesaran/Data.zip

*GVAR code:* http://www.econ.cam.ac.uk/faculty/pesaran/GVAR.zip

### 1.36 M. Hashem Pesaran and Andreas Pick, 2007, "Econometric Issues in the Analysis of Contagion", the Journal of Economic Dynamics and Control, Vol. 31, Issue 4, pp. 1245-1277.

This paper presents a canonical, econometric model of contagion and investigates the conditions under which contagion can be distinguished from interdependence. In a two-market set up it is shown that for a range of fundamentals the solution is not unique, and for sufficiently large values of the contagion coefficients it has interesting bifurcation properties with bimodal density functions. The identification of contagion requires that the equations for the individual markets contain market specific regressors. This sheds doubt on the general validity of the correlation based tests of contagion recently proposed in the literature which do not involve any market specific variables. Furthermore, we show that ignoring endogeneity and interdependence can introduce an upward bias in the estimate of the contagion coefficient, and using Monte Carlo experiments we further show that this bias could be substantial. Finally, we analyse data on European interest rates spreads during the ERM and find a clear asymmetry in the contagion effects of sharp rises and falls; with only the former having some statistically significant effects.

*Full text available on-line at:*

http://dx.doi.org/10.1016/j.jedc.2006.03.008

**1.37 M. Hashem Pesaran and Allan Timmermann, 2007, "Selection of Estimation Window In The Presence Of Breaks", Journal of Econometrics, Vol. 137, Issue 1, pp. 134-161.**

In situations where a regression model is subject to one or more breaks it is shown that it can be optimal to use pre-break data to estimate the parameters of the model used to compute out-of-sample forecasts. The issue of how best to exploit the trade-off that might exist between bias and forecast error variance is explored and illustrated for the multivariate regression model under the assumption of strictly exogenous regressors. In practice when this assumption cannot be maintained and both the time and size of the breaks are unknown the optimal choice of the observation window will be subject to further uncertainties that make exploiting the bias-variance trade-off difficult. To that end we propose a new set of cross-validation methods for selection of a single estimation window and weighting or pooling methods for combination of forecasts based on estimation windows of different lengths. Monte Carlo simulations are used to show when these procedures work well compared with methods that ignore the presence of breaks.
*Full text available on-line at:*
http://dx.doi.org/10.1016/j.jeconom.2006.03.010

**1.38 M. Hashem Pesaran, L. Vanessa Smith, Ron P. Smith, 2007, "What if the UK or Sweden had joined the Euro in 1999? An Empirical Evaluation using a Global VAR", International Journal of Finance and Economics, Vol. 12, Issue 1, pp. 55-87.**

This paper attempts to provide a conceptual framework for the analysis of counterfactual scenarios using macroeconometric models. As an application we consider UK entry to the euro. Entry involves a long-term commitment to restrict UK nominal exchange rates and interest rates to be the same as those of the euro area. We derive conditional probability distributions for the difference between the future realisations of variables of interest (e.g UK and euro area output and prices) subject to UK entry restrictions being fully met over a given period and the alternative realisations without the restrictions. The robustness of the results can be evaluated by also conditioning on variables deemed to be invariant to UK entry, such as oil or US equity prices. Economic interdependence means that such policy evaluation must take account of international linkages and common factors that drive fluctuations across

economies. In this paper this is accomplished using the Global VAR recently developed by Dees, di Mauro, Pesaran and Smith (2005). The paper briefly describes the GVAR which has been estimated for 25 countries and the euro area over the period 1979-2003. It reports probability estimates that output will be higher and prices lower in the UK and the euro area as a result of entry. It examines the sensitivity of these results to a variety of assumptions about when and how the UK entered and the observed global shocks and compares them with the effects of Swedish entry.
*Full text available on-line at:*
http://www3.interscience.wiley.com/cgi-bin/abstract/114095826/ABSTRACT
*Code and Data:* Euroentry Code.zip

**1.39 G. Kapetanios and M. Hashem, Pesaran, 2007, "Alternative Approaches To Estimation And Inference In Large Multifactor Panels: Small Sample Results With An Application To Modelling Of Asset Return", Faculty of Economics, University of Cambridge, Cambridge Working Papers in Economics No. 0520.**

This paper considers alternative approaches to the analysis of large panel data models in the presence of error cross section dependence. A popular method for modelling such dependence uses a factor error structure. Such models raise new problems for estimation and inference. This paper compares two alternative methods for carrying out estimation and inference in panels with a multifactor error structure. One uses the correlated common effects estimator that proxies the unobserved factors by cross section averages of the observed variables as suggested by Pesaran, and the other uses principal components following the work of Stock and Watson. The paper develops the principal component method and provides small sample evidence on the comparative properties of these estimators by means of extensive Monte Carlo experiments. An empirical application to company returns provides an illustration of the alternative estimation procedures.
*Full text available on-line at:*
http://www.econ.cam.ac.uk/dae/repec/cam/pdf/cwpe0520.pdf

**1.40 M. Hashem Pesaran, Til Schuermann and Björn-Jakob Treutler, 2005, "Global Business Cycles And Credit Risk", in ' The Risks of Financial Institutions ', Mark Carey and Rene M. Stultz (eds.), Ch. 9, pp. 419-473,**

**with Comment by Richard Cantor. ISBN No.'s: 13: 978-0-226-09285-0 & 10: 0-226-09285-2.**

The potential for portfolio diversification is driven broadly by two characteristics: the degree to which systematic risk factors are correlated with each other and the degree of dependence individual firms have to the different types of risk factors. Using a global vector autoregressive macroeconometric model accounting for about 80% of world output, we propose a model for exploring credit risk diversification across industry sectors and across different countries or regions. We find that full firm-level parameter heterogeneity along with credit rating information matters a great deal for capturing differences in simulated credit loss distributions. Imposing homogeneity results in overly skewed and fat-tailed loss distributions. These differences become more pronounced in the presence of systematic risk factor shocks: increased parameter heterogeneity reduces shock sensitivity. Allowing for regional parameter heterogeneity seems to better approximate the loss distributions generated by the fully heterogeneous model than allowing just for industry heterogeneity. The regional model also exhibits less shock sensitivity.

*Full text available on-line at:*

http://fic.wharton.upenn.edu/fic/papers/05/0514.pdf

### 1.41 M. Hashem Pesaran, Davide Pettenuzzo and Allan Timmermann, "Forecasting Time Series Subject To Multiple Structural Breaks", 2006, Review of Economic Studies, October, Vol. 73, Issue 4, pp. 1057-1084.

This paper provides a new approach to forecasting time series that are subject to discrete structural breaks. We propose a Bayesian estimation and prediction procedure that allows for the possibility of new breaks occurring over the forecast horizon, taking account of the size and duration of past breaks (if any) by means of a hierarchical hidden Markov chain model. Predictions are formed by integrating over the parameters from the meta distribution that characterizes the stochastic break point process. In an application to US Treasury bill rates, we find that the composite-meta method leads to better out-of-sample forecasts than a range of alternative methods.

*Full text available on-line at:*

http://www.blackwell-synergy.com/toc/roes/73/4

**1.42 M. Hashem Pesaran and Ron Smith, 2006, "Macroeconomic Modelling With A Global Perspective", The Manchester School, Supplement, pp. 24-49.**

This paper provides a synthesis and further development of a global modelling approach introduced in Pesaran, Schuermann and Weiner (2004), where country specific models in the form of VARX* structures are estimated relating a vector of domestic variables, $x_{it}$, to their foreign counterparts, $x_{it}$, and then consistently combined to form a Global VAR (GVAR). It is shown that the VARX* models can be derived as the solution to a dynamic stochastic general equilibrium (DSGE) model where over-identifying long-run theoretical relations can be tested and imposed if acceptable. This gives the system a transparent long-run theoretical structure. Similarly, short-run over-identifying theoretical restrictions can be tested and imposed if accepted. Alternatively, if one has less confidence in the short-run theory the dynamics can be left unrestricted. The assumption of the weak exogeneity of the foreign variables for the long-run parameters can be tested, where $x^*_{it}$ variables can be interpreted as proxies for global factors. Rather than using deviations from ad hoc statistical trends, the equilibrium values of the variables reflecting the long-run theory embodied in the model can be calculated. The paper also provides some new results on the relative importance of external shocks for the UK and the euro area economies.
*Full text available on-line at:*
http://www.blackwell-synergy.com/doi/abs/10.1111/j.1467-9957.2006.00516.x

**1.43 M. Hashem Pesaran, 2006, "Estimation and Inference in Large Heterogeneous Panels with A Multifactor Error Structure", Econometrica 74 (4), 967-1012.**

This paper presents a new approach to estimation and inference in panel data models with a general multifactor error structure. The unobserved factors and the individual-specific errors are allowed to follow arbitrary stationary processes, and the number of unobserved factors need not be estimated. The basic idea is to filter the individual-specific regressors by means of cross-section averages such that asymptotically as the cross-section dimension (N) tends to infinity the differential effects of unobserved common factors are eliminated. The estimation procedure has the advantage that it can be computed by least squares applied to auxiliary regressions where the observed

regressors are augmented with cross sectional averages of the dependent variable and the individual-specific regressors. A number of estimators (refereed to as common correlated effects, CCE, estimators) are proposed and their asymptotic distributions are derived. The small sample properties of mean group and pooled CCE estimators are investigated by Monte Carlo experiments, showing that the CCE estimators have satisfactory small sample properties even under a substantial degree of heterogeneity and dynamics and for relatively small values of N and T.

*Full text available on-line at:*

http://www.blackwell-synergy.com/doi/abs/10.1111/j.1468-0262.2006.00692.x
*Gauss Code:*
http://www.econ.cam.ac.uk/faculty/pesaran/ppfiles/CCEgauss6_22Aug08.zip

**1.44 M. Hashem Pesaran and Allan Timmermann, 2005, "Small sample properties of forecasts from autoregressive models under structural breaks", Journal of Econometrics, 129, pp. 183-217.**

This paper develops a theoretical framework for the analysis of small-sample properties of forecasts from general autoregressive models under structural breaks. Finite-sample results for the mean squared forecast error of one-step ahead forecasts are derived, both conditionally and unconditionally, and numerical results for different types of break specifications are presented. It is established that forecast errors are unconditionally unbiased even in the presence of breaks in the autoregressive coefficients and/or error variances so long as the unconditional mean of the process remains unchanged. Insights from the theoretical analysis are demonstrated in Monte Carlo simulations and on a range of macroeconomic time series from G7 countries. The results are used to draw practical recommendations for the choice of estimation window when forecasting from autoregressive models subject to breaks.

*Full text available on-line at:*

http://dx.doi.org/10.1016/j.jeconom.2004.09.007

**1.45 Patrick J. Coe, M. Hashem Pesaran and Shaun P. Vahey, 2005, "The cost effectiveness of the UK's sovereign debt portfolio", Oxford Bulletin of Economics and Statistics, 67, pp. 467-495.**

This paper provides a recursive empirical analysis of the scope for cost minimization in public debt management when the debt manager faces a given short term interest rate dictated by monetary policy as well as risk and market impact constraints. It simulates the `real time' interest costs of alternative portfolios for UK government debt between April 1985 and March 2000. These portfolios are constructed using forecasts of return spreads based on a recursive modelling procedure. While we find statistically significant evidence of predictability, the interest cost savings are quite small when portfolio shares are constrained to lie within historical bounds. *Full text available on-line at:*
http://www.blackwell-synergy.com/doi/abs/10.1111/j.1468-0084.2005.00128.x

### 1.46 M. Hashem Pesaran, Michael Binder and Cheng Hsiao, 2005, "Estimation and inference in short panel vector autoregressions with unit roots and cointegration", Econometric Theory, Volume 21, No.4, pp. 795-837.

This paper considers estimation and inference in panel vector autoregressions (PVARs) where (i) the individual effects are either random or fixed, (ii) the time-series properties of the model variables are unknown a priori and may feature unit roots and cointegrating relations, and (iii) the time dimension of the panel is short and its cross-sectional dimension is large. Generalized Method of Moments (GMM) and Quasi Maximum Likelihood (QML) estimators are obtained and compared in terms of their asymptotic and finite sample properties. It is shown that the asymptotic variances of the GMM estimators that are based on levels as well as first-differences of the model variables depend on the variance of the individual effects; whereas by construction the fixed effects QML estimator is not subject to this problem. Monte Carlo evidence is provided showing that the fixed effects QML estimator tends to outperform the various GMM estimators in finite sample under both normal and non-normal errors. The paper also shows how the fixed effects QML estimator can be successfully used for unit root and cointegration tests in short panels. *Full text available on-line at:*
http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=318327

### 1.47 Hashem Pesaran and Allan Timmermann, 2005, "Real time econometrics ", Econometric Theory, 21, pp. 212-231.

This paper considers the problems facing decision makers using econometric models in real time. It identifies the key stages involved and highlights the role of automated systems in reducing the effect of data snooping. It sets out many choices that researchers face in construction of automated systems and discusses some of the possible ways advanced in the literature for dealing with them. The role of feedbacks from the decision maker's actions to the data generating process is also discussed and highlighted through an example.

*Full text available on-line at:*

http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=281018

**1.48 M. Hashem Pesaran and Allan Timmermann, July-August 2004, "How costly is it to ignore breaks when forecasting the direction of a time series?", International Journal of Forecasting, Volume, 20, No. 3, pp. 411-425.**

Empirical evidence suggests that many macroeconomic and financial time series are subject to occasional structural breaks. In this paper we present analytical results quantifying the effects of such breaks on the correlation between the forecast and the realization and on the ability to forecast the sign or direction of a time-series that is subject to breaks. Our results suggest that it can be very costly to ignore breaks. Forecasting approaches that condition on the most recent break are likely to perform better over unconditional approaches that use expanding or rolling estimation windows provided that the break is reasonably large.

*Full text available on-line at:*

http://dx.doi.org/10.1016/S0169-2070(03)00068-2

**1.49 Kyung So Im, M Hashem Pesaran and Yongcheol Shin, July 2003, "Testing for unit roots in heterogeneous panels", Journal of Econometrics 115, pp.53-74.**

This paper proposes unit root tests for dynamic heterogeneous panels based on the mean of individual unit root statistics. In particular it proposes a standardized t-bar test statistic based on the (augmented) Dickey-Fuller statistics averaged across the groups. Under a general setting this statistic is shown to converge in probability to a standard normal variate sequentially with T (the time series dimension) --> infinity,

followed by N (the cross sectional dimension) --> infinity. A diagonal convergence result with T and N --> infinity while N/T-->k, k being a finite non-negative constant, is also conjectured. In the special case where errors in individual Dickey-Fuller (DF) regressions are serially uncorrelated a modified version of the standardized t-bar statistic, denoted by Z_{tbar}, is shown to be distributed as standard normal as N--> infinity for a fixed T, so long as T>5 in the case of DF regressions with intercepts and T>6 in the case of DF regressions with intercepts and linear time trends. An exact fixed N and T test is also developed using the simple average of the DF statistics. Monte Carlo results show that if a large enough order is selected for the underlying ADF regressions, then the small sample performances of the t-bar test is reasonably satisfactory and generally better than the test proposed by Levin and Lin (Unpublished manuscript, University of California, San Diego, 1993).

*Full text available on-line at:*

http://dx.doi.org/10.1016/S0304-4076(03)00092-7

**1.50 Anthony Garratt, Kevin Lee, M. Hashem Pesaran and Yongcheol Shin, April 2003, "A long run structural macroeconometric model of the UK", Economic Journal, Volume 113, pp. 412-455.**

A new modelling strategy is introduced that provides a practical approach to incorporating long-run structural relationships, suggested by economic theory, in an otherwise unrestricted VAR model. The strategy is applied to construct a small quarterly macroeconometric model of the UK, estimated over 1965q1-1995q4 in nine variables: domestic and foreign outputs, prices and interest rates, oil prices, the nominal effective exchange rate, and real money balances. The aim is to develop a model with a transparent and theoretically coherent foundation. Tests of restrictions on the long-run relations of the model are presented. The dynamic properties of the model are discussed and monetary policy shocks identified using impulse responses for the effects of an oil price shock as the movements in interest rates beyond those explained by the implementation of an optimal interest rate rule and by oil price, exchange rate and foreign interest rate innovations.

*Full text available on-line at:*

http://www.res.org.uk/journals/abstracts.asp?ref=0013-0133&vid=113&iid=487&aid=801

*Program and Data:* http://www.econ.cam.ac.uk/faculty/pesaran/ukm99.zip

**1.51 M. Hashem Pesaran, March 2003, "Aggregation of linear dynamic models: an application to life-cycle consumption models under habit formation", Economic Modelling Volume 20, Issue 2, pp 383-415, Henry Special Issue.**

This paper provides a general framework for aggregating linear dynamic models by deriving the aggregate model as the optimal prediction (in the minimum mean-squared error sense) of the aggregate variable of interest with respect to an aggregate information set generated by current and past values of available aggregate observations. The approach is applied to a number of aggregation problems that have been considered in the literature. It is shown how the results in much of the literature can be readily obtained using the proposed forecasting approach, and a number of important extensions and generalizations are provided. Our approach does not require the assumption of independence of the micro distributed lag coefficients from the other micro coefficients, and establishes that in general the long-run coefficients obtained from the optimal aggregate relation are equal to the averages of the long-run coefficients from the micro relations. The approach is then applied to life-cycle consumption decision rules under habit formation and the implications of the heterogeneity in habit formation coefficients across individuals for the analysis of aggregate consumption is investigated. Using stochastic simulations it is shown that the estimates of the habit persistence coefficient are likely to be biased downward if they are based on analogue aggregate consumption functions, which could partly explain the excess smoothness and excess sensitivity puzzles in terms of neglected heterogeneity.

*Full text available on-line at:*

http://dx.doi.org/10.1016/S0264-9993(02)00059-7

**1.52 M. Hashem Pesaran and Allan Timmermann, 2002, "Market timing and return prediction under model instability", Journal of Empirical Finance, Vol.9 pp.495-510.**

Despite mounting empirical evidence to the contrary, the literature on predictability of stock returns almost uniformly assumes a time-invariant relationship between state variables and returns. In this paper we propose a new two-stage approach for forecasting of financial return series that are subject to breaks. The first stage adopts a reversed ordered Cusum (ROC) procedure to determine in real time when the most

recent break has occurred. In the second stage, post-break data is used to estimate the parameters of the forecasting model. We compare this approach to existing alternatives for dealing with parameter instability such as the Bai-Perron method and the time-varying parameter model. An out-of-sample forecasting experiment demonstrates considerable gains in market timing precision from adopting the proposed two-stage forecasting method.

*Full text available on-line at:*
http://dx.doi.org/10.1016/S0927-5398(02)00007-5

**1.53 Cheng Hsiao, M. Hashem Pesaran and A. Kamil Tahmiscioglu, 2002, "Maximum likelihood estimation of fixed effects dynamic panel data models covering short time periods", Journal of Econometrics, Vol.109 pp.107-150.**

A transformed likelihood approach is suggested to estimate fixed effects dynamic panel data models. Conditions on the data generating process of the exogenous variables are given to get around the issue of "incidental parameters". The maximum likelihood (MLE) and minimum distance estimator (MDE) are suggested. Both estimators are shown to be consistent and asymptotically more efficient than the instrumental variable (IV) or generalized method of moment (GMM) estimators. A Hausman type specification test is suggested to test the fixed versus random effects specification or conditions on the data generating process of the exogenous variables. Monte Carlo studies are conducted to evaluate the finite sample properties of the MLE, MDE, IV, and GMM. It is shown that the likelihood approach appears to dominate the GMM approach both in terms of the bias or root mean squares error of the estimators and the size and power of the test statistics.
*Full text available on-line at:*
http://dx.doi.org/10.1016/S0304-4076(01)00143-9

**1.54 M Hashem Pesaran and Yongcheol Shin, 2002, "Long run structural modelling", Econometrics Reviews, Vol.21 pp.49-87.**

The paper develops a general framework for identification, estimation, and hypothesis testing in cointegrated systems when the cointegrating coefficients are subject to (possibly) non-linear and cross-equation restrictions, obtained from economic theory

or other relevant *a priori* information. It provides a proof of the consistency of the quasi maximum likelihood estimators (QMLE), establishes the relative rates of convergence of the QMLE of the short-run and the long-run parameters, and derives their asymptotic distribution; thus generalizing the results already available in the literature for the linear case. The paper also develops tests of the over-identifying (possibly) non-linear restrictions on the cointegrating vectors. The estimation and hypothesis testing procedures are applied to an Almost Ideal Demand System estimated on U.K. quarterly observations. Unlike many other studies of consumer demand this application does not treat relative prices and real per capita expenditures as exogenously given.

*Full text available on-line at:*

http://www.informaworld.com/smpp/content~content=a713629093~db=all~order=page

### 1.55 M. Hashem Pesaran and Melvyn Weeks. 2001, "Non-tested hypothesis testing: an overview", In (ed) Badi H Baltagi, Companion to Theoretical Econometrics, Basil Blackwell, Oxford. ISBN 0 63121 254 X.

In econometric analysis non-nested models arise naturally when rival economic theories are used to explain the same phenomenon such as unemployment, inflation or output growth. We examine the problem of hypothesis testing when the models under consideration are “non-nested” or belong to “separate” families of distributions in the sense that none of the individual models may be obtained from the remaining either by imposition of parameter restrictions or through a limiting process. Although our primary focus is on non-nested hypothesis testing, we also briefly discuss the problem of model selection and discuss the differences and similarities of the two approaches. By utilizing the linear regression model as a convenient framework, we examine three broad approaches to non-nested hypothesis testing: the modified (centred) log-likelihood ratio procedure, the comprehensive models approach; and the encompassing procedure. Finally, we consider a number of practical problems which arise in the application of non-nested tests to non-linear models such as the probit and logit qualitative response models.

*Full text available on-line at:*

http://www.blackwellpublishing.com/book.asp?ref=9781405106764

**1.56 M Hashem Pesaran, Yongcheol Shin and Richard J Smith, 2001, "Bounds testing approaches to the analysis of level relationships", Journal of Applied Econometrics special issue in honour of J D Sargan on the theme "Studies in Empirical Macroeconometrics", (eds) D.F. Hendry and M.H. Pesaran, Vol.16 pp.289-326.**

This paper develops a new approach to the problem of testing the existence of a level relationship between a dependent variable and a set of regressors, when it is not known with certainty whether the underlying regressors are trend- or first-difference stationary. The proposed tests are based on standard F- and t- statistics used to test the significance of the lagged levels of the variables in a univariate error correction mechanism. The asymptotic distributions of these statistics are non-standard under the null hypothesis that there exists no level relationship, irrespective of whether the regressors are I(0) or I(1). Two sets of asymptotic critical values are provided: one when all the regressors are I (1) and the other if they are all purely I (0). These two sets of critical values provide a band covering all possible classifications of the regressors into purely I (0), purely I (1) or mutually cointegrated. Accordingly, various bounds testing procedures are proposed. It is shown that the proposed tests are consistent, and their asymptotic distribution under the null and suitably defined local alternatives is derived. The empirical relevance of the bounds procedures is demonstrated by a re-examination of the earnings equation included in the UK Treasury macroeconometric model. This is a particularly relevant application as there is considerable doubt concerning the order of integration of variables such as the unemployment rate, the union strength and the wedge between the "real product wage" and the "real consumption wage" that enter the earnings equation.

*Full text available on-line at:*

http://www3.interscience.wiley.com/cgi-bin/jissue/84502477?CRETRY=1&SRETRY=0

**1.57 Michael Binder and M. Hashem Pesaran, 2001, "Life-cycle consumption under social interactions ", Journal of Economic Dynamics and Control, special issue on Computational Methods in Economic Dynamics and Finance, (ed) Sean Holly, Vol.25 pp.35-83.**

In this paper we examine how social interactions affect consumption decisions at various levels of aggregation in a life-cycle economy made up of peer groups. For this

purpose, we consider two analytically solvable life-cycle models, one under certainty equivalent behavior and one under prudence, and explicitly allow for three different forms of social interactions in peer groups, namely conformism, altruism, and jealousy. We show that whether social interactions have any effects on individuals' optimal consumption decisions critically depends on intertemporal rather than static considerations. This is true regardless of whether individuals' preferences are time separable or exhibit habit formation, and whether information within peer groups is homogeneous or disparate. It implies that analyzing the effects of social interactions in static rather than intertemporal settings is likely to be misleading. We also show that social interactions, when coupled with either habit formation or prudence, can significantly strengthen the effects of habit formation or prudence in the direction of resolving two well-known puzzles in the literature on the permanent income hypothesis, namely excess smoothness and excess sensitivity.

*Full text available on-line at:*

http://dx.doi.org/10.1016/S0165-1889(99)00069-X

### 1.58 M. Hashem Pesaran and Spyros Skouras, 2000, "Decision-based methods for forecast evaluation", Cambridge University.

This chapter provides an overview of quantitative and qualitative methods for evaluating forecasts when there exists a priori information regarding the use to which the forecasts will be put. The chapter discusses a decision-based approach for evaluation and comparison of forecasts, and shows how such an approach can provide a unifying theme for recent developments in the forecast evaluation literature - namely the use of generalized cost of error functions, probability event and density forecast evaluation and the evaluation of market-timing skills. The approach is illustrated by means of a number of simple examples. For forecast comparisons, the chapter discusses the use of the sample mean of the loss-differentials between using one forecast distribution relative to another. The problem of testing the "equivalence" of two forecast distributions in a decision-based context is also addressed briefly.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/chnov23.pdf

**1.59 M. Hashem Pesaran, 2000, "Economic trends and macroeconomic policies in post-revolutionary Iran", In (ed) Parvin Alizadeh, The Economy of Iran: Dilemmas of an Islamic State, London: I.B. Tauris, chapter 2, pp.63-100. ISBN 1-86064-464-3.**

This paper reviews some of the main trends in the Iranian economy over the past two decades and discusses the key economic policy issues that divide the reformist from the more conservative factions in Iran. It argues that the economic policy dilemma of whether to liberalize the economy has not gone away and very much lies dormant. For a small open economy such as Iran operating in an increasingly globalized world economic environment, the neglect of fundamental economic forces in favour of political vested interest can have dire consequences in the long run.

*Full text available on-line at:*

http://www.econ.cam.ac.uk/faculty/pesaran/iran98_0.pdf

**1.60 Clive W.J. Granger and M Hashem Pesaran, 2000, "Economic and statistical measures of forecast accuracy ", Journal of Forecasting, Vol. 19, pp.537-560.**

This paper argues in favour of a closer link between the decision and the forecast evaluation problems. Although the idea of using decision theory for forecast evaluation appears early in the dynamic stochastic programming literature, and has continued to be used with meteorological forecasts, it is hardly mentioned in standard academic texts on economic forecasting. Some of the main issues involved are illustrated in the context of a two-state, two-action decision problem as well as in a more general setting. Relationships between statistical and economic methods of forecast evaluation are discussed and useful links between Kuipers score used as a measure of forecast accuracy in the meteorology literature and the market timing tests used in finance are established. An empirical application to the problem of stock market predictability is also provided, and the conditions under which such predictability could be exploited in the presence of transaction costs are discussed.

*Full text available on-line at:*

http://www3.interscience.wiley.com/cgi-bin/jissue/76502342

**1.61 Anthony Garratt, Kevin Lee, M. Hashem Pesaran and Yongcheol Shin, 2000, "A structural cointegrating VAR approach to**

**macroeconometric modelling ", In (eds) Sean Holly and Martin Weale, Econometric Modelling: Techniques and Applications, Cambridge: Cambridge University Press, chapter 5, pp.94-131. ISBN 0-521-65069-0.**

In this paper we discuss the 'structural cointegrating VAR' approach to macroeconometric modelling and compare it to other approaches currently followed in the literature, namely the large-scale simultaneous equation macroeconometric models, the structural VARs, and the dynamic stochastic general equilibrium models. The structural cointegrating VAR approach has the attractive features that the estimated long-run relationships embedded in the model are theory consistent, and have a clear economic interpretation, and yet the short-run dynamics are flexibly estimated within a VAR framework. The approach is illustrated using a small quarterly macroeconometric model of the UK. The uses of the model in impulse response analysis and probability forecasting are also discussed.

*Full text available on-line at:*

http://www.cambridge.org/us/catalogue/catalogue.asp?isbn=0521650690

**1.62 M Hashem Pesaran, Yongcheol Shin and Richard J Smith, 2000, "Structural analysis of vector error correction models with exogenous I (1) variables", Journal of Econometrics, Vol. 97, pp.293-343.**

This paper generalizes the existing cointegration analysis literature in two respects. Firstly, the problem of efficient estimation of vector error correction models containing exogenous *I* (1) variables is examined. The asymptotic distributions of the (log-) likelihood ratio statistics for testing cointegrating rank are derived under different intercept and trend specifications and their respective critical values are tabulated. Tests for the presence of an intercept or linear trend in the cointegrating relations are also developed together with model misspecification tests. Secondly, efficient estimation of vector error correction models when the short-run dynamics may differ within and between equations is considered. A re-examination of the purchasing power parity and the uncovered interest rate parity hypotheses is conducted using UK data under the maintained assumption of exogenously given foreign and oil prices.

*Full text available on-line at:*

http://dx.doi.org/10.1016/S0304-4076(99)00073-1

**1.63 C.W.J. Granger and M. Hashem Pesaran, 1996, "A decision theoretic approach to forecast evaluation".**

This paper addresses the problem of forecast evaluation in the context of a simple but realistic decision problem, and proposes a procedure, for the evaluation of forecasts based on their average realized value to the decision maker. It is shown that by concentrating on probability forecasts stronger theoretical results can be achieved than if just event forecasts were used. A possible generalisation is considered concerning the use of the correct, conditional predictive density function when forming forecasts.

*Full text available on-line at:*

http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.38.7769&rep=rep1&type=pdf

**1.64 Michael Binder, M Hashem Pesaran and S. Hossein Samiei, 2000, "Solution of nonlinear rational expectations models with applications to finite-horizon life-cycle models of consumption", Journal of Computational Economics, Vol. 15, pp.25-57.**

This paper considers the solution of nonlinear rational expectations models resulting from the optimality conditions of a finite-horizon intertemporal optimization problem satisfying Bellman's principle of optimality (and possibly involving inequality constraints). A backward recursive procedure is used to characterize and solve the time-varying optimal decision rules generally associated with these models. At each stage of these backward recursions, either an analytical or numerical solution of the optimality conditions is required. When an analytical solution is not possible, a minimum weighted residual approach is used. The solution technique is illustrated using a life-cycle model of consumption under labor income and interest rate uncertainties (and possibly involving liquidity constraints). Approximate numerical solutions are provided and compared with certainty-equivalent solutions and, when possible, with exact solutions.

*Full text available on-line at:*

http://springerlink.metapress.com/content/q483h18038t76847

**1.65 M. Hashem Pesaran and Geoff Harcourt, 2000, "The life and work of John Richard Nicholas Stone 1913-1991", Economic Journal, Vol. 110, pp.F146-F165.**

Sir Richard Stone, knighted in 1978 and Nobel Laureate in Economics in 1984, was one of the pioneering architects of national income and social accounts, and one of the few economists of his generation to have faced the challenge of economics as a science by combining theory and measurement within a cohesive framework. He was awarded the Nobel Prize in Economics for his "fundamental contributions to the development of national accounts", but made equally significant contributions to the empirical analysis of consumer behaviour. His work on the "Growth Project" was also instrumental in the development of appropriate econometric methodology for the construction and the analysis of large disaggregated macroeconometric models. This paper provides an analysis of Stone's many contributions.

*Full text available on-line at:*

http://www.res.org.uk/journals/abstracts.asp?ref=0013-0133&vid=110&iid=461&aid=511

**1.66 Kees Jan van Garderen, Kevin Lee and M. Hashem Pesaran, 2000,"Cross-sectional aggregation of non linear models", Journal of Econometrics, Vol. 95, pp.285-331.**

This paper considers the problem of cross-sectional aggregation when the underlying micro behavioural relations are characterized by general non-linear specifications. It focuses on forecasting the aggregates, and shows how an optimal aggregate model can be derived by minimizing the mean squared prediction errors conditional on the aggregate information. The paper also derives model selection criteria for distinguishing between aggregate and disaggregate models when the primary object of the analysis is forecasting the aggregates, and establishes the consistency of the model selection criteria in large samples. In the case of standard non-linear micro relations with additive errors it also provides suitable small sample corrections. For more general non-linear specifications we consider bootstrap techniques to correct for small sample bias of the proposed model selection criteria. Some of the ideas in the paper are illustrated using log-linear micro relations, often employed in applied research. The paper also contains an empirical application where log-linear production functions are estimated for the UK economy disaggregated by eight industrial sectors and at the aggregate level over the period 1954-1995.

*Full text available on-line at:*

http://dx.doi.org/10.1016/S0304-4076(99)00040-8
*Tables:*
http://www.econ.cam.ac.uk/faculty/pesaran/aggtab.pdf

**1.67 M. Hashem Pesaran and Allan Timmermann, 2000, "Recursive modelling approach to predicting UK stock returns", Economic Journal, Vol. 110, pp.159-191.**

This paper applies an extended and generalized version of the recursive modelling strategy developed in Pesaran and Timmermann (1995) to the UK stock market. The focus of the analysis is to simulate investors' search in 'real time' for a model that can forecast stock returns. It demonstrates the extent to which monthly stock returns in the UK were predictable over the period 1970-1993. Due to a set of unique historical circumstances, UK stock returns were extremely volatile in 1974-1975, and we discuss how to design a modelling approach capable of accounting for this and similar low probability events. We find evidence of both long-term and short-term predictability in UK stock returns, which could have been exploited by investors to improve on the risk-return trade-off offered by a passive strategy in the market portfolio. Alternative interpretations of this finding are briefly discussed.
*Full text available on-line at:*

http://www.res.org.uk/journals/abstracts.asp?ref=0013-0133&vid=110&iid=460&aid=495
*Tables:*
http://www.econ.cam.ac.uk/faculty/pesaran/uktab.pdf

**1.68 Michael Binder and M. Hashem Pesaran. 2000, "Solution of finite-horizon multivariate linear rational expectations models and sparse linear systems", Journal of Economic Dynamics and Control, Vol. 24 pp.325-346.**

This paper presents efficient methods for the solution of finite-horizon multivariate linear rational expectations models, linking the solution of such models to the problem of solving sparse linear equation systems with a block-tridiagonal coefficient matrix structure. Two numerical schemes for the solution of sparse linear equation systems with a block-tridiagonal coefficient matrix structure are discussed, and it is shown how these procedures can be readily adapted to efficiently solve finite-horizon multivariate linear rational expectations models. As the two numerical schemes are fully recursive and only involve elementary matrix operations, they are also

straightforward to implement. The numerical schemes are illustrated by applying them to a general finite-horizon adjustment cost problem of expenditure shares, and to a finite-horizon linear-quadratic optimal control problem.

*Full text available on-line at:*

http://dx.doi.org/10.1016/S0165-1889(99)00008-1

**1.69 M. Hashem Pesaran, Nadeem U. Haque and Sunil Sharma, 1999, "Neglected heterogeneity and dynamic in cross-country savings regressions", IMF Working Paper No. 99/128.**

This paper examines the extent to which conclusions of cross-country studies of private savings are robust to allowing for the possible heterogeneity of saving behaviour across countries and the inclusion of dynamics. It provides a review of the econometric implications of neglected slope heterogeneity and dynamics for the fixed effects estimators routinely used in such studies, and illustrates the nature and extent of the biases involved by a re-examination of time series data from 21 OECD countries previously analysed in the literature. The paper shows that neglecting heterogeneity and dynamics in cross-country savings regressions can lead to misleading inferences about the key determinants of savings behavior. If differences across countries are ignored, one can overestimate the influence of certain factors on the private savings rates and at the same time obtain highly significant, but spurious, nonlinear effects for some of the potential determinants. The results indicate that among the many variables considered in the literature only the fiscal variables -- the general government surplus as a proportion of GDP and the ratio of government consumption to GDP-- seem to be the key determinants of private savings rates in the industrial countries in the post world war II period.

*Full text available on-line at:*

http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID267794_code010427510.pdf?abstractid=267794&mirid=1

*Tables:*http://www.econ.cam.ac.uk/faculty/pesaran/savtab.pdf

**1.70 M Hashem Pesaran and Yongcheol Shin, 1999, "An autoregressive distributes lag modelling approach to cointegration analysis", in (ed) S Strom, Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium, chapter 11. Cambridge University Press, Cambridge. ISBN 0-521-63323-0 (hb) 0-521 63365-6 (pb).**

This paper examines the use of autoregressive distributed lag (ARDL) models for the analysis of long-run relations when the underlying variables are I (1). It shows that after appropriate augmentation of the order of the ARDL model, the OLS estimators of the short-run parameters are pT -consistent with the asymptotically singular covariance matrix, and the ARDL-based estimators of the long-run coefficients are super-consistent, and valid inferences on the long-run parameters can be made using standard normal asymptotic theory. The paper also examines the relationship between the ARDL procedure and the fully modified OLS approach of Phillips and Hansen to estimation of cointegrating relations, and compares the small sample performance of these two approaches via Monte Carlo experiments. These results provide strong evidence in favour of a rehabilitation of the traditional ARDL approach to time series econometric modelling. The ARDL approach has the additional advantage of yielding consistent estimates of the long-run coefficients that are asymptotically normal irrespective of whether the underlying regressors are I(1) or I(0).

*Full text available on-line at:*

http://www.cambridge.org/u_s/catalogue/catalogue.asp?isbn=0521633230
*Tables:*
http://www.econ.cam.ac.uk/faculty/pesaran/ardltab.pdf

### 1.71 Michael Binder and M Hashem Pesaran, 1999, "Stochastic growth models and their econometric implications", Journal of Economic Growth, Vol. 4 pp.139-183.

This article considers the consequences of explicitly allowing for stochastic technological progress and stochastic labor input in the discrete time Solow-Swan and 'AK' growth models. It shows that the capital-output ratio, but not output per capita, is ergodic irrespective of whether there is a unit root in technology, and thus is the more appropriate measure to use in the cross-sectional analysis of the growth process. Furthermore, the paper derives the cross-sectional and time-series implications of the stochastic Solow-Swan model and contrasts these to those of its deterministic counterpart. Among these implications are that the mean of the capital-output ratio depends in a precise way not only on the saving rate and the growth rate of labor input, but also on the variance and higher-order cumulants of the capital-output ratio. Using the Summers-Heston data for 72 countries from 1960 to 1992, strong support is found for the predictions of the stochastic Solow-Swan model as compared to those of

its deterministic counterpart (as well as those of the 'AK' model), including a significant negative cross-sectional relationship between the mean and the variance of the capital-output ratio.

*Full text available on-line at:*

http://www.springerlink.com/content/t03g7x6k02w78345/

**1.72 M Hashem Pesaran, Yongcheol Shin and Ron Smith, 1999, "Pooled mean group estimation of dynamic heterogeneous panels ", Journal of the American Statistical Association, Vol. 94 pp.621-634.**

It is now quite common to have panels in which both *T*, the number of time series observations, and *N*, the number of groups, are quite large and of the same order of magnitude. The usual practice is either to estimate *N* separate regressions and calculate the coefficient means, which we call the Mean Group (MG) estimator, or to pool the data and assume that the slope coefficients and error variances are identical. In this paper, we propose an intermediate procedure, referred to as the Pooled Mean Group (PMG) estimator, which constrains the long run coefficients to be identical, but allows the short run coefficients and error variances to differ across groups. We consider both the case where the regressors are stationary and the case where they follow unit root processes, and for both cases derive the asymptotic distribution of the PMG estimators as *T* tends to infinity. We also provide two empirical applications: aggregate consumption functions for 24 OECD economies over the period 1962-93, and energy demand functions for 10 Asian developing economies over the period 1974-90.

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http://www.amstat.org/publications/jasa/index.cfm?fuseaction=toc_99
*Program and Data:* http://www.econ.cam.ac.uk/faculty/pesaran/jasa.exe
*Full text (previous version):* http://www.econ.cam.ac.uk/faculty/pesaran.jasaold.pdf

**1.73 Cheng Hsiao, M Hashem Pesaran and A. Kamil Tahmiscioglu, 1999, "Bayes estimation of short-run coefficients in dynamic panel data models", in C. Hsiao, K. Lahiri, L-F Lee and M.H. Pesaran (eds), Analysis of Panels and Limited Dependent Variables: A Volume in Honour of G S Maddala Cambridge University Press, Cambridge, chapter 11, pp.268-296. ISBN 0 521 63169 6.**

This study is concerned with estimating the mean of the coefficients in a dynamic panel data model when the coefficients are assumed to be randomly distributed across cross-sectional units. We suggest a Bayes approach to the estimation of such models using Markov chain Monte Carlo methods. We establish the asymptotic equivalence of the Bayes estimator and the mean group estimator proposed by Pesaran and Smith (1995), and show that the Bayes estimator is asymptotically normal for large N (the number of units) and large T (the number of time periods) so long as root N/T --> 0 as both N and T --> infinity. The performance of the Bayes estimator for the short-run coefficients in dynamic panels is also compared against alternative estimators using both simulated and real data. The Monte Carlo results show that the Bayes estimator has better sampling properties than other estimators for both small and moderate T samples. The analysis of Tobin's q model yields new results.
*Full text available on-line at:*
http://www.cambridge.org/catalogue/catalogue.asp?isbn=9780521631693&ss=toc

**1.74 M.H. Pesaran and Z. Zhao, 1999, "Bias Reduction in Estimating Long-run Relationships from Dynamic Heterogeneous Panels", in C. Hsiao, K. Lahiri, L-F Lee and M.H. Pesaran (eds), Analysis of Panels and Limited Dependent Variables: A Volume in Honour of G S Maddala Cambridge University Press, Cambridge, chapter 12, pp.297-321. ISBN 0 521 63169 6.**

No abstract available.

*Full text available on-line at:*

http://www.cambridge.org/catalogue/catalogue.asp?isbn=9780521631693&ss=toc

**1.75 M.H. Pesaran and L.W. Taylor, 1999, "Diagnostics for IV Regressions", Oxford Bulletin of Economics and Statistics, Vol.61 pp.255-281.**

The use of residuals from the structural equations in a simultaneous- equations model can lead to misleading measures of association and to invalid diagnostic statistics for heteroscedasticity and functional form misspecifications. In an important paper, Pagan and Hall (1983) suggest a few principals upon which asymptotically valid tests can be constructed, while the issue of appropriate measures of goodness-of-fit for IV regressions is add0072essed in Pesaran and Smith (1994). This paper is concerned with the optimal construction of diagnostics for IV regression, and examines the

finite-sample properties of several tests for functional form misspecifications and heteroscedasticity.

*Full text available on-line at:*
http://www3.interscience.wiley.com/journal/119075278/abstract?CRETRY=1&SRETRY=0

### 1.76 M.H. Pesaran, Jumps and F.J. Ruge-Murcia, 1998, "Analysis of Exchange Rate Target Zones using a Limited-Dependent Rational Expectations Model".

This paper examines the exchange rate determination in target zone regime using a Limited-Dependent Rational Expectations (LD-RE) model where the bounds can be fixed for an extended period, but are subject to occasional jumps. In this case, the behavior of the endogenous variable is affected by the agents' expectations about both the occurrence and the size of the jump. The RE solution is derived and shown to encompass the cases of perfectly predictable and stochastically varying bounds examined by earlier literature. We demonstrate that the solution exists for all the parameter values and is unique if the coefficient of the expectational variable is less than or equal to one. These results hold even when the jump probability is stochastically varying and the error terms are conditionally heteroskedastic. The model is estimated using data for the Franc/Mark exchange rate. Empirical results provide support for the non-linear model with time-varying realignment probability and indicate that the agents correctly anticipated most of the observed changes in the central parity.

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http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.153.4703&rep=rep1&type=pdf
*Program and Data*: http://www.econ.cam.ac.uk/faculty/pesaran/jumpa.exe

### 1.77 H. Hashem Pesaran and Y. Shin, 1998, "Generalised Impulse Response Analysis in Linear Multivariate Models". Economics Letters, Vol.58, pp.17-29.

Building on Koop, [Koop et al. (1996) Impulse response analysis in nonlinear multivariate models. Journal of Econometrics 74, 119–147] we propose the 'generalized' impulse response analysis for unrestricted vector autoregressive (VAR) and cointegrated VAR models. Unlike the traditional impulse response analysis, our

approach does not require orthogonalization of shocks and is invariant to the ordering of the variables in the VAR. The approach is also used in the construction of order-invariant forecast error variance decompositions.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V84-3T51RH8-1B&_user=10&_coverDate=01%2F01%2F1998&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=7b82cb4d1f7289475773a2255f5bf7e2

### 1.78 H. Hashem Pesaran and R.P. Smith, 1998, "Structural Analysis of Cointegrating VARs", Journal of Economic Surveys, Vol.12, pp.471-506.

This survey uses a number of recent developments in the analysis of cointegrating Vector Autoregressions (VARs) to examine their links to the older structural modelling traditions using Autoregressive Distributed Lag (ARDL), and Simultaneous Equations Models (SEMs). In particular, it emphasizes the importance of using judgment and economic theory to supplement the statistical information. After a brief historical review it sets out the statistical framework, discusses the identification of impulse responses using the Generalized Impulse Response functions, reviews the analysis of cointegrating VARs and highlights the large number of choices applied workers have to make in determining a specification. In particular, it considers the problem of specification of intercepts and trends and the size of the VAR in more detail, and examines the advantages of the use of exogenous variables in cointegration analysis. The issues are illustrated with a small U.S. Macroeconomic model.

*Full text available on-line at:*

http://www3.interscience.wiley.com/journal/119127378/abstract?CRETRY=1&SRETRY=0

**1.79 H. Hashem Pesaran and M. Binder, 1998, "Decision making in the presence of heterogeneous information and social interactions", International Economic Review, Vol.39, pp.1027-1052.**

The authors consider the solution of multivariate linear rational expectations models in the presence of heterogeneous information and social interactions. To overcome the 'infinite regress in expectations' problem that arises in the solution of these models, we assume that agents' expectations about the decisions and expectations of other agents are based solely on public information. They show that the resulting solutions satisfy the key postulates of the rational expectations hypothesis, but can nevertheless exhibit dynamic properties quite different from those under homogeneous information. The authors illustrate this by analyzing a model of firms' optimal factor demand decisions. In this model, the presence of information heterogeneity may accentuate the propagation effects of external shocks on firms' factor demands.

*Full text available on-line at:*

http://www.jstor.org/pss/2527351

**1.80 H. Hashem Pesaran, 1997, "The role of economic theory in modelling the long-run", Economic Journal, "Controversy", Vol.107 No.440, pp.178-191.**

This argues for a closer link between the modelling of the long-run relations in applied economics and the intertemporal equilibrium notion from economic theory.

*Full text available on-line at:*

http://www.jstor.org/

**1.81 H. Hashem Pesaran and S.M. Potter, 1997, "A Floor and Ceiling Model of US Output", Journal of Economic Dynamics and Control, Vol.21 Nos.4-5, pp.661-695.**

Building on previous nonlinear time-series models we further examine the form of nonlinearity in US output. We develop a model of US output that allows for floor and ceiling effects to alter the dynamics of output growth. The model estimated on post-Korean War quarterly data, displays features similar to nonlinear trade cycle models of the 1940s and 1950s. Thus, as predicted by many of the earlier theoretical models, our empirical results suggest that the turning points of the business cycle provide new

initial conditions for the ensuing growth process. We also find important asymmetries in the responses of output to positive and negative shocks. This history and shock dependence property is not present in linear or approximately linear models of the type that arise in the standard implementations of Real Business Cycle theory.

*Full text available on-line at:*

http://www.sciencedirect.com/science/article/B6V85-3SWY0XD-1/2/13d038c2cc2ea46fb091ac83277626ad

**1.82 H. Hashem Pesaran, K. Lee and R.P. Smith, 1997, "Growth and convergence in a multi-country empirical stochastic Solow model", Journal of Applied Econometrics, Vol.12, No.4, pp.357-392.**

The paper considers international per capita output and its growth using a panel of data for 102 countries between 1960 and 1989. It sets out an explicitly stochastic Solow growth model and shows that this has quite different properties from the standard approach where the output equation is obtained by adding an error term to the linearized solution of a deterministic Solow model. It examines the econometric properties of estimates of beta convergence as traditionally defined in the literature and shows that all these estimates are subject to substantial biases. Our empirical estimates clearly reflect the nature and the magnitude of these biases as predicted by econometric theory. Steady state growth rates differ significantly across countries and once this heterogeneity is allowed for the estimates of beta are substantially higher than the consensus in the literature. But they are very imprecisely estimated and difficult to interpret. The paper also discusses the economic implications of these results for sigma convergence.

*Full text available on-line at:*

http://www.eui.eu/Personal/Banerjee/courses/spring2007/Topics%20in%20Integrated%20Panel%20Data%20Econom/lee-pesaran-smith.pdf

**1.83 H. Hashem Pesaran and M. Binder, 1997, "Multivariate linear rational expectations models: characterization of the nature of the solutions and their fully recursive computation", Econometric Theory, Vol.13, pp.887-888.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.84 H. Hashem Pesaran and Y. Shin, 1996, "Cointegration and Speed of Convergence to Equilibrium", Journal of Econometrics, Vol.71, No.2, pp.117-143.**

This paper is concerned with the time profile of the effects of shocks on cointegrating relations in the context of a multivariate VAR (*p*) model. It considers alternative methods of characterizing and estimating such a time profile, and in particular proposes the application of the 'persistence profile' approach introduced in Lee and Pesaran (1993). It is shown that the estimator of the persistence profile of the cointegrating relations is root-*T*-consistent with a limiting normal distribution. The paper also shows that the persistence profile approach is invariant to the way shocks in the underlying VAR model are orthogonalized, which is not true of the traditional impulse response analysis. The theoretical framework is applied to an exchange rate and interest rate data set, and it is found that the persistence profile of the purchasing power parity (PPP) relation converges to zero very slowly, while the persistence profile of the uncovered interest parity (UIP) relation converges to zero reasonably quickly.

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http://www.sciencedirect.com/science/article/B6VC0-3VWPP00-5/2/490ff57d5f5cd35a57cab2e5bf6663b1

**1.85 H. Hashem Pesaran, G. Koop and S.M. Potter, 1996, "Impulse Response Analysis in Nonlinear Multivariate Models", Journal of Econometrics, Vol.74, No.1, pp.119-147.**

This paper presents a unified approach to impulse response analysis which can be used for both linear and nonlinear multivariate models. After discussing the advantages and disadvantages of traditional impulse response functions for nonlinear models, we introduce the concept of a generalized impulse response function which, we argue, is applicable to both linear and nonlinear models. We develop measures of shock persistence and asymmetric effects of shocks derived from the generalized

impulse response function. We illustrate the use of these measures for a nonlinear bivariate model of US output and the unemployment rate.

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http://www.sciencedirect.com/science/article/B6VC0-3XDS2R2-6/2/f8b1713c81765453e1a5e9a52593b52e

**1.86 H. Hashem Pesaran and M. Karshenas, 1995, "Economic Reform and the Reconstruction of the Iranian Economy", The Middle East Journal, Vol.49, pp.88-111.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.87 H. Hashem Pesaran and R.P. Smith, 1995, "The Role of Theory in Econometrics", Journal of Econometrics, Vol.67, pp.61-79.**

This paper discusses the way that theory is used in applied econometrics. The traditional strategy of marrying theory and evidence relied on the fact that older theory implied explicit restrictions on the conditional distribution of observable variables and could be evaluated in terms of the conditional predictions of the model embodying the theoretical restrictions. However, this is not true of newer theories based on dynamic stochastic optimisation of models which are not based on quadratic objective functions and linear constraints; the so-called 'LQ form'. Because these models do not usually have closed-form solutions, they tend to be calibrated rather than estimated and cannot be readily evaluated in terms of their conditional predictions. The application of the stochastic version of the Maximum Principle to such models results in Lagrange multipliers, often shadow prices corresponding to missing markets, which are not observed by the econometrician. Just as agents condition their decisions on unobserved expected prices when forward markets do not exist, they also condition on unobserved shadow prices when particular current or contingent markets do not exist. The approach suggested in this paper is to substitute out the Lagrange multipliers in terms of their determinants, just as is often done with

expectations. The approach is illustrated in some detail for two examples: consumer behaviour under liquidity constraints, and oil production.

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http://www.sciencedirect.com/science/article/B6VC0-4002HWY-9/2/e5db0b724580294f8d80e2d8806eea84

**1.88 H. Hashem Pesaran and R.P. Smith, 1995, "Estimating Long-Run Relationships from Dynamic Heterogeneous Panels", Journal of Econometrics, Vol.68, pp.79-113.**

In panel data four procedures are widely used: pooling, aggregating, averaging group estimates, and cross-section regression. In the static case, if the coefficients differ randomly, all four procedures give unbiased estimates of coefficient means. In the dynamic case, when the coefficients differ across groups, pooling and aggregating give inconsistent and potentially highly misleading estimates of the coefficients, though the cross-section can provide consistent estimates of the long-run effects. The theoretical results on the properties of the four procedures are illustrated by UK labour demand functions for 38 industries over 30 years.

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http://www.sciencedirect.com/science/article/B6VC0-4002K66-4/2/198f4570f03958867c5d7802e2b3c90f

**1.89 H. Hashem Pesaran and A. Timmermann, 1995, "Predictability of Stock Returns: Robustness and Economic Significance", Journal of Finance, Vol.50, pp.1201-1228.**

This article examines the robustness of the evidence on predictability of US stock returns, and addresses the issue of whether this predictability could have been historically exploited by investors to earn profits in excess of a buy-and-hold strategy in the market index. We find that the predictive power of various economic factors over stock returns changes through time and tends to vary with the volatility of returns. The degree to which stock returns were predictable seemed quite low during the relatively calm markets in the 1960s, but increased to a level where, net of

transaction costs, it could have been exploited by investors in the volatile markets of the 1970s.

*Full text available on-line at:*

http://www.nes.ru/~agoriaev/Papers/Pesaran-Timmermann%20Predictability%20of%20Stock%20Returns%20Econ%20Signif%20JF95s.pdf

**1.90 H. Hashem Pesaran and H. Samiei, 1995, "Limited-Dependent Rational Expectations Models with Future Expectations", Journal of Economic Dynamics and Control, Z Vol.19, pp.1325-1353.**

This paper examines limited-dependent rational expectations (LD-RE) models containing *future* expectations of the dependent variable. Limited dependence is of a two-limit to bit variety which may, for example, arise as a result of a policy of imposing limits on the movement of the dependent variable by means of marginal as well as intra marginal interventions. We show that when the forcing variables are serially independent the model has an analytical solution which can be computed by backward recursion. With serially correlated forcing variables, we discuss an approximate solution method, as well as a numerically exact method that, in principle, can be implemented by stochastic simulation, although in practice it is limited by available computational capacity. The paper discusses some properties of the approximate solutions and reports the results of a limited number of Monte Carlo experiments in order to illustrate the computational feasibility of using the exact solution when the fundamentals are serially independent and the approximate solution when they are serially correlated.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V85-3YB56J6-2&_user=10&_coverDate=11%2F30%2F1995&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1310886741&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=78890d7da4481cfd1ca4e9aeb1290b4a

**1.91 H. Hashem Pesaran and B. Pesaran, 1995, "A Non-Nested Test of Level-Differenced versus Log-Differenced Stationary Models", Econometrics Reviews, Vol.14, pp.213-228.**

This paper considers the application of the simulated Cox test procedure developed in Pesaran and Pesaran (1993) to test linear versus log-linear models. The test procedure can also be applied to other generalized linear regression models such as level-difference stationary models versus the log-difference stationary models. In order to compare the small sample performance of the proposed test with other tests extant in the literature, the paper also reports the results of a number of Monte Carlo experiments using the experimental framework of Godfrey et al. (1988). The Monte Carlo results provide strong support for a simplified version of the simulated Cox test over the PE and the BM tests, but suggest that there is little to choose between the simulated Cox test and the DL test.

*Full text available on-line at:*

http://www.informaworld.com/smpp/content~db=all~content=a773519740

### 1.92 H. Hashem Pesaran and H. Samiei, 1995, "Forecasting Ultimate Resource Recovery", International Journal of Forecasting, Vol.11, pp.543-555.

This paper considers Hubbert's model for forecasting ultimate resource recovery and its extensions by Kaufmann (1991, Resources and Energy 13, 111–127) and Cleveland and Kaufmann (1991, Energy Journal 12, 17–46). The emphasis of the paper is on econometric and forecasting issues, and it discusses alternative methods of estimating Hubbert's model. Using data on oil production in the U.S. lower 48 states, the paper reports the results of estimating the various specifications of the model and its extensions by the maximum-likelihood method, and provides the implied estimates for ultimate resource recovery and their associated standard errors. When economic factors are taken into account the estimates of ultimate resource recovery become state-dependent, and we find that in this case the estimates are higher than those obtained from the various specifications of Hubbert's original model. Although the accuracy of the estimates of ultimate recoverable reserves cannot be evaluated before oil reserves are actually exhausted, we examine how the various models estimated over the periods 1926–1985 and 1948–1985 perform in predicting oil production over the 1986–1990 period.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V92-3XWRN36-4&_user=10&_coverDate=12%2F31%2F1995&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1310898289&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=2b3eff97a3f371ba3e4c6a0a98fbb7fa

**1.93 H. Hashem Pesaran and M. McAleer and C.R. McKenzie, 1994, "Cointegration and Direct Tests of the Rational Expectations Hypothesis", Econometric Reviews, Vol.13, No.2, pp.231-258.**

The paper is concerned with direct tests of the rational expectations hypothesis (REH) in the presence of stationary and non-stationary variables. Alternative methods of converting qualitative survey responses into quantitative expectations series are examined. Testing of orthogonality and the issue of generated regressors for models estimated by two step methods are re-evaluated when the variable to be explained is stationary. A methodological approach for testing the REH is provided for models using qualitative response data when there are unit roots and cointegration, and alternative reasons are examined for rejecting the null hypothesis of orthogonality. The usefulness of cointegration analysis for both the probability and regression conversion procedures is also analysed. Cointegration is found to be directly applicable for the probability conversion approach with uniform, normal and logistic distributions of expectations and for the linear regression conversion approach. In the light of new techniques, an existing empirical example testing the REH for British manufacturing firms is re-examined and tested over an extended data set.

*Full text available on-line at:*

http://www.informaworld.com/smpp/content~db=all~content=a773516273

**1.94 H. Hashem Pesaran, R. Pierse and K. Lee, 1994, "Choice Between Disaggregate and Aggregate Specifications Estimated by IV Method", Journal of Business and Economic Statistics, 12, pp. 111-121.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.95 H. Hashem Pesaran and A. Timmermann, 1994, "A Generalization of the Non-parametric Henriksson-Merton Test of Market Timing", Economic Letters, 44, pp.1-7.**

The paper shows that the Henriksson-Merton (1981) test (Journal of Business 54, 513–533) of market timing is better interpreted as an exact test of independence within a 2×2 contingency table in which the column and row sums are fixed. We provide a generalization of the test of market timing from the special case of a 2×2 contingency table to the case with *n* categories. This generalization has a number of potential applications in the forecasting and finance literature. The generalized test is applied to analyze the market timing performance of a two-fund investment strategy in the presence of transaction costs.

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http://www.sciencedirect.com/science/article/B6V84-45BCN2J-2/2/8cca264c25b22675327dd32aa832e56d

**1.96 H. Hashem Pesaran and R.J. Smith, 1994, "A Generalized R2 Criterion for Regression Models Estimated by the Instrumental Variables Method", Econometrica, Vol.62 No.3, pp.705-710.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.97 H. Hashem Pesaran and A. Timmermann, 1994, "Forecasting Stock Returns: An Examination of Stock Market Trading in the Presence of Transaction Costs", Journal of Forecasting, Vol.13 No.4, pp.335-367.**

The paper presents new evidence on the predictability of excess returns on common stocks for the Standard and Poor's 500 and the Dow Jones Industrial portfolios at the monthly, quarterly, and annual frequencies. It shows that recursive predictions obtained on the basis of the excess returns regressions are capable of correctly predicting a statistically significant proportion of the signs of the actual returns. The

paper also shows that the switching portfolios constructed on the basis of the signs of the recursive predictions mean-variance dominate the respective market portfolios when trading takes place on a quarterly or annual basis. This result holds even under a high transaction cost scenario. However, due to the larger number of transactions at the monthly frequency the monthly switching portfolios only mean-variance dominate the respective market portfolios when transaction costs are zero or low.

*Full text available on-line at:*

http://www3.interscience.wiley.com/journal/113453288/abstract

**1.98 H. Hashem Pesaran and Carlo Favero, 1994, "Oil Investment in the North Sea", Economic Modelling, Vol.11, No.3, pp.308-329.**

Investment in oil production on the UK continental shelf (UKCS) involves three separate but highly interrelated activities: exploration, development and extraction. The exploration and extraction decisions have recently been analysed by Pesaran and Favero. The aim of this paper is to provide a model of the investment decision on the UKCS, where the development process is explicitly modelled within an intertemporal optimization framework. The model highlights the importance of the lengthy time lags that exist between price and tax changes and changes in oil supplies from UKCS. The empirical results show significant improvements over the previous studies, demonstrate the importance of theoretical considerations in modelling the oil supply process and illustrate the pitfalls involved in relying on standard unrestricted distributed lag models in the econometric analysis of oil investment.

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http://www.sciencedirect.com/science/article/B6VB1-46KC3JD-M/2/afccfa46c80c359ab5fe2b9540ead792

**1.99 H. Hashem Pesaran, Carlo Favero and Sunil Sharma, 1994, "A Duration Model of Irreversible Oil Investment: Theory and Empirical Evidence", Journal of Applied Econometrics, Special Issue "Calibration Techniques and Econometrics", Adrian Pagan (ed), Vol.9 Supplement, pp S95-S112.**

The aim of this paper is to analyse the implications of the theory of irreversible investment under uncertainty for investment in oil fields on the United Kingdom

Continental Shelf (UKCS). We consider the problem of an operator who owns a license to develop and extract oil from a field of known capacity. An intertemporal optimization model in discrete time is developed to derive decision rules for the timing of the irreversible development investment and for the optimal rate of extraction. Model simulation is then used to describe the properties of the numerical solutions. The predictions of the theory on the determinants of the irreversible investment decision are then examined using statistical duration analysis. Data on the length of the time period between discovery and development are available for individual fields on the UKCS. We measure the duration of the irreversible investment gestation lag for each field and test the model by assessing the significance of the theoretical variables in explaining the significance of such a lag. Both our theoretical model and our empirical results suggest the importance of a nonlinear interaction of the level of oil prices and the volatility of oil prices in determining the development lag. The simulation of our theoretical model shows a nonlinear impact of oil price volatility on the trigger level of oil prices. Our empirical results suggest that the effect of price volatility is a function of the expected price level, with increased price volatility having a positive impact on the duration of investment appraisal when expected prices are low and a negative impact when they are high.

*Full text available on-line at:*

http://www.jstor.org/

**1.100 H. Hashem Pesaran and R.G. Pierse and K.C. Lee, March 1993, "Persistence, cointegration and aggregation: a disaggregated analysis of output fluctuations in the US economy", Journal of Econometrics, Vol.56, Nos.1/2, pp.57-88.**

A framework is developed for measuring the persistence of shocks to aggregate output in the context of a multisectoral model. It is argued that persistence coefficients can be estimated more precisely using a disaggregated model of output growths rather than univariate representations. The effect of cointegration among sectoral output series on the persistence measure is also analysed, and a decomposition of the persistent effect of output innovations into 'monetary' and 'other' shocks provided. The framework is applied to U.S. data, and although 'money' shocks are shown to be

statistically significant, their contribution to the total persistence of output fluctuations is found to be relatively unimportant.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VC0-4582FTS-1X&_user=10&_coverDate=03%2F31%2F1993&_rdoc=1&_fmt=high&_orig=gateway&_origin=gateway&_sort=d&_docanchor=&view=c&_searchStrId=1665122618&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=7f64bc1e49ce483cecb69fdb98d5ad28&searchtype=a

**1.101 H. Hashem Pesaran and K. Lee, 1993, "The Role of Sectoral Interactions in Wage Determination in the UK Economy", Economic Journal, 103, No.416, pp.21-55.**

A multisectoral union-firm model of wage-setting is developed to analyze intersectoral interactions that take place through expectations of outside wage opportunities in the economy as a whole. The technical issues involved in the solution and estimation of models of this type are discussed, noting the significance of the assumed structure of information across sectors. These issues are investigated empirically using data for sixteen industrial sectors o f the UK economy. It is found that (1) expected outside wages exert an important influence on real wages in all sectors; (2) pressure on wages which are internal to the sector are found primarily outside the "service-producing" sectors; (3) unemployment rates and unemployment benefits show up significantly only in a few sectors; (4) there are complicated dynamic adjustments influencing wage formation across the sectors; and (5) the aggregate wage equations considered in the paper r are subject to serious aggregation problems.

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**1.102 H. Hashem Pesaran and B. Pesaran, 1993, "A simulation approach to the problem of computing Cox's Statistic for Testing Non-nested Models", Journal of Econometrics, Vol. 57, Nos.1-3, pp.377-392.**

This paper proposes a new procedure for computing the Cox statistic for tests of non nested hypotheses using the method of stochastic simulation. The procedure is

applicable to a wide class of probability distributions, is relatively simple to implement, and does not require an analytic derivation of the pseudo-true estimators that enter the Cox test statistic. The paper also contains an application of the proposed method to the test of probit versus logistic formulations of the univariate binary choice models. The empirical results show that the simulation method works reasonably well even for a moderate number of replications.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VC0-46921D2-M&_user=10&_coverDate=06%2F30%2F1993&_rdoc=1&_fmt=high&_orig=gateway&_origin=gateway&_sort=d&_docanchor=&view=c&_searchStrId=1665124532&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=f694440f2e7466d88efa7faab4fad983&searchtype=a

**1.103 H. Hashem Pesaran and K. Lee, 1993, "Persistence Profiles and Business Cycle Fluctuations in a Disaggregated Model of UK Output Growth", Ricerche Economiche, Vol. 47, No.3, pp.293-322.**

This paper builds on recent work dealing with the measurement of the long-run response of output to different types of shocks at a multisectoral level. The paper re-examines the issues that surround the identification of shocks to particular sectors in a multisectoral model, and proposes “persistence profiles” of shocks as a method of carrying out impulse response analysis in multivariate systems. It is shown that, unlike the impulse response analysis familiar in the literature, the proposed “persistence profiles” are robust to the alternative parameterization of the underlying moving average representation. The analysis is applied to a simple multisectoral model of U.K. output growths, disaggregated by eight industrial sectors.

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http://www.sciencedirect.com/science/article/B6WWV-4DBJ9VW-W/2/776ee14ea3deefdbbf5678cddb827ff9

**1.104 H. Hashem Pesaran, 1992, "The Iranian Foreign Exchange Policy and the Black Market for Dollars", International Journal of Middle Eastern Studies, 24, pp.101-125. (Persian translation in Planning & Development, Vol.2 No.2, 1992).**

As a result of the oil price shocks, the 1979 revolution, and the eight-year war with Iraq, fundamental changes have taken place in Iran's foreign exchange position as well as in its exchange rate policy. The viable data over the period 1979–1980 to 1988–1989 clearly show that, despite the revolutionary rhetoric, very little has been done to reduce the country's dependence on oil exports as a source of foreign exchange and government revenues. Instead, in the face of falling oil revenues and the country's increasing international isolation, coupled with the regime's unwillingness to incur foreign debt, the government has adopted a severe 'import compression' policy through selective tariffs and quotas, strict control of private and government imports by means of import licenses, and the imposition of foreign exchange allocations on government agencies. The result has been an ever-rising premium on the U.S. dollar in the 'black' market, a highly overvalued official exchange rate, a substantial increase in rent-seeking activities at the expense of production, a severe misallocation of resources, and loss of output and industrial capacity.

*Full text available on-line at:*

http://www.jstor.org/

**1.105 H. Hashem Pesaran and Hossein Samiei, 1992, "An Analysis of the Determination of Deutsche mark/French franc Exchange Rate in a discrete-time target-zone model", Economic Journal, 102, pp.388-401.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.106 H. Hashem Pesaran, K. Lee and R. Pierse, March 1992, "Persistence of Shocks and their Sources in a Multisectoral Model of UK Output Growth", Economic Journal, 102, pp.342-356.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.107 H. Hashem Pesaran and H. Samiei, 1992, "Estimating limited-dependent rational expectations models: with an application to exchange rate determination in a target zone", Journal of Econometrics, Vol.53, pp.141-163.**

This paper is concerned with the solution and estimation of a simple class of linear rational expectations models with current expectations of the endogenous variables when there are *a priori* bounds on the dependent variable. We show that for plausible values of the parameters, the model has a unique RE solution. We first consider the exact maximum likelihood estimation of such a limited-dependent rational expectations (LD-RE) model and perform a number of Monte Carlo experiments to shed light on the small sample properties of a number of alternative estimators. The results clearly illustrate the importance of taking proper account of the limited nature of the dependent variable and its expectations in the estimation of the parameters of the LD-RE models. We then extend the analysis to a two-limit situation where the dependent variable is within a band, prove the existence and uniqueness of the RE equilibrium for this case, and present an empirical application to the Deutsche mark/French franc exchange rate within the Exchange Rate Mechanism of the European Monetary System.

*Full text available on-line at:*

http://www.econ.ucla.edu/workingpapers/wp612.pdf

**1.108 H. Hashem Pesaran, A.K. Bera and M. McAleer, Mann J. Yoon, 1992, "Joint test of non-nested models and general error specifications", Econometrics Reviews, Volume 11, No.2.**

This paper is concerned with joint tests of non-nested models and simultaneous departures from homoskedasticity, serial independence and normality of the disturbance terms. Locally equivalent alternative models are used to construct joint tests since they provide a convenient way to incorporate more than one type of departure from the classical conditions. The joint tests represent a simple asymptotic

solution to the “pre-testing” problem in the context of non-nested linear regression models. Our simulation results indicate that the proposed tests have good finite sample properties.

*Full text available on-line at:*

http://www.informaworld.com/smpp/content~db=all~content=a773522959

**1.109 H. Hashem Pesaran and A. Timmermann, 1992, "A simple non-parametric test of predictive performance", Journal of Business and Economic Statistics, 10, pp. 461-465.**

This paper derives a distribution free procedure for testing the accuracy of forecasts when the focus of the analysis is on the correct prediction of the direction of change in the variable under consideration. The test applies to a general m x n contingency table and it is shown that the standard null hypothesis of independence in a contingency table implies the null hypothesis of the proposed test of predictive failure but not vice versa. As a test of predictive performance the chi-squared test of independence will, in general, be more conservative than the suggested test of predictive failure. The paper also contains two applications: A dichotomous version of the test is applied to the CBI's Industrial Trends Surveys of actual and expected price changes in the manufacturing sector, and a trichotomous version of the test is applied to the demand data from business surveys of French manufacturing industry conducted by INSEE.

*Full text available on-line at:*

http://www.jstor.org/

**1.110 H. Hashem Pesaran and Simon Potter, 1992, "Non-linear dynamics and econometrics: an introduction", Journal of Applied Econometrics Special Issue, Vol.7, Supplement, pp. S1-S7.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.111 H. Hashem Pesaran and H. Samiei, 1991, "Persistence, Seasonality and Trend in the UK Egg Production", Applied Economics, Vol. 23, pp. 479-484.**

This paper discusses the time-series properties of UK egg production in order to provide an empirical analysis of the possible long-run impact of the shock on the industry following the recent incidence of salmonella poisoning. Our analysis shows that although the short-run properties of the UK egg production are consistent with the presence of persistent shocks, a shock duration is unlikely to have large long run effects. This result is remarkably robust to the choice of the persistence measure obtained.

*Full text available on-line at:*

http://www.informaworld.com/smpp/content~db=all~content=a739331645

**1.112 H. Hashem Pesaran, 1991, "Estimation of a simple class of multivariate rational expectations models: A test of the new classical model at a sectoral level", Empirical Economics, pp. 211-232.**

This paper extends the results obtained by Pagan (1984) and Turkington (1985) for single equation rational expectations (RE) models to multivariate RE models and shows that the errors in-variables method and the substitution method discussed in Wickens (1982) lead to exactly the same likelihood function. The paper also considers multivariate RE models with unanticipated variables and includes an empirical application to the problem of testing the natural rate-rational expectations (NR-RE) hypothesis at the disaggregate level using U.S. data over the period 1955–1985.

*Full text available on-line at:*

http://www.springerlink.com/content/k210521081un121k/

**1.113 H. Hashem Pesaran, 1991, "An Interview with Sir Richard Stone, Econometric Theory", Vol. 7, pp. 85-123.**

Sir Richard Stone, knighted in 1978 and Nobel Laureate in Economics in 1984, is one of the pioneering architects of national income and social accounts, and is one of the few economists of his generation to have faced the challenge of economics as a science by combining theory and measurement within a cohesive framework. He was awarded the Nobel Prize in Economics for his but he has made equally significant contributions to the empirical analysis of consumer behavior. His work has also been instrumental in the development of appropriate econometric methodology for the construction and the analysis of large disaggregated macroeconometric models.

*Full text available on-line at:*

http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=2900252

**1.114 "Expectations in Economics", 1991, H. Hashem Pesaran, D. Greenaway, M. Bleaney and I. Stewart (Eds.), Companion to Contemporary Economic Thought, Routledge.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.115 H. Hashem Pesaran, 1991, "Costly adjustment under rational expectations: a generalisation", Review of Economics and Statistics, Vol.73, pp. 353-358.**

This note provides a generalization of the standard adjustment cost-rational expectations model due to Sargent (1978), which, in addition to the cost of changing the level of the decision variable, also allows for the cost of altering the "speed" with which decisions are changed. It establishes the existence of a unique stable solution for this more general model, derives an explicit solution for the underlying decision problem, and provides a necessary order condition for identification of the structural parameters. The note also contains an application of the model to the determination of employment in the U.K. coal industry over the 1956-83 period.

*Full text available on-line at:*

http://www.jstor.org/

**1.116 H. Hashem Pesaran ,K. Lee and R.G. Pierse, 1990, "Aggregation bias in labour demand equations for the UK economy", in T. Barker and M.H. Pesaran (eds), Disaggregation in Econometric Modelling, Routledge, pp. 113-149.**

No abstract available.

*Full text available on-line at:*

http://www.econ.ucla.edu/workingpapers/wp492.pdf

**1.117 H. Hashem Pesaran, R.J. Smith, 1990, "A Unified Approach to Estimation and Orthogonality Tests in Linear Single-Equation Econometric Models", Journal of Econometrics, Vol.44, pp. 41-66.**

Maximum-likelihood estimation is considered for a generalisation of the model of Anderson and Rubin (1949) in which the exogenous variables in the structural equation may not be included in the reduced-form equations. Classical and specification tests are derived for orthogonality hypotheses. A necessary and sufficient condition for their equivalence is presented. The classical tests are compared using Bahadur's asymptotic relative efficiency criterion. It is shown that a generalisation of the Durbin-Wu-Hausman $T_2$ statistics is asymptotically Bahadur-efficient.

*Full text available on-line at:*

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VC0-4582D12-2X&_user=10&_coverDate=05%2F31%2F1990&_rdoc=1&_fmt=high&_orig=gateway&_origin=gateway&_sort=d&_docanchor=&view=c&_searchStrId=1665131340&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=e705c4d3768614c845b808f62739d53d&searchtype=a

**1.118 H. Hashem Pesaran, K. Lee and R.G. Pierse, 1990, "Testing for aggregation bias in linear models", Economic Journal (supplement), Vol. 100, pp. 137-150.**

This paper discusses alternative methods of testing for aggregation bias and proposes direct tests of the discrepancy of the macro parameters from the average of the corresponding micro parameters, and derives tests of aggregation bias in the general case where the parameters of interest may possibly be nonlinear functions of the micro parameters. The paper also develops a Durbin-Hausman type misspecification test of the disaggregate model. These tests are then applied to disaggregate and aggregate specifications of employment functions for the U.K. economy disaggregated by forty industries.

*Full text available on-line at:*

http://www.jstor.org/

**1.119 H. Hashem Pesaran, June 1990,"An econometric analysis of exploration and extraction of oil in the UK Continental Shelf", Economic Journal, Vol. 100, pp. 367-390.**

This paper develops an econometric model for the analysis of exploration and production policies of "price-taking" suppliers, and derives theoretically consistent exploration and output equations for oil which explicitly take account of the oil discovery process and the intertemporal nature of exploration and production decision. The model is then applied to an empirical analysis of oil exploration and extraction on the United Kingdom Continental Shelf (UKCS) over the period 1978(1)-1986(4). The analysis explicitly takes account of the available engineering information concerning the pressure dynamics of the petroleum reserves and the geological knowledge pertinent to the discovery process, and presents formal statistical tests of the significance of these factors for the explanation of output and exploration in the North Sea.

*Full text available on-line at:*

http://www.jstor.org/

**1.120 H. Hashem Pesaran, A. Bera and M. McAleer, 1990, "Alternative approaches to testing non-nested models with autocorrelated disturbances: application to models of U.S. unemployment", Communication in Statistics: Theory and Methods, Vol. 19, pp.3619-3644.**

Since departures from the classical assumptions regarding the disturbances in a linear regression model arise frequently in empirical application, several computationally straightforward procedures are presented in this paper for testing non-nested models when the disturbances of these models follow first- or higher-order autoregressive processes. An empirical example is used to illustrate how the procedures may be used to test competing Keynesian and New Classical non-nested models of unemployment for the U.S using annual time series data for 1955-85.

*Full text available on-line at:*

http://www.informaworld.com/smpp/content~db=all~content=a780032148

**1.121 H. Hashem Pesaran, 1989, "Consistency of short-term and long-term expectations", Journal of International Money and Finance, Vol.8, pp. 511-516.**

This paper provides an alternative derivation of the cross-equation restrictions obtained by Froot and Ito in this issue, for the purpose of testing the consistency of short-term and long-term expectations. The derivation offered here is more generally applicable and yields restrictions that are much simpler to deal with in practice.

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http://www.sciencedirect.com/science/article/B6V9S-45RXBTD-3/2/9cbde59f1218c8704350b95260c2341f

**1.122 H. Hashem Pesaran and R.G. Pierse, 1989, "A proof of the asymptotic validity of a test for perfect aggregation", Economics Letters, Vol. 30 No.1, pp 41-47.**

An asymptotic proof is presented for a test of perfect aggregation in linear models developed in Pesaran, Pierse and Kumar (1989). The limiting distribution is derived by letting the degree of disaggregation increase without bound for a fixed sample size.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V84-458XSVF-BP&_user=10&_coverDate=12%2F31%2F1989&_rdoc=1&_fmt=high&_orig=gateway&_origin=gateway&_sort=d&_docanchor=&view=c&_searchStrId=1665132963&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=40cb036a15cdbe90b55c151c72ee4e43&searchtype=a

**1.123 H. Hashem Pesaran, R.G. Pierse and M. Kumar, 1988, "Econometric analysis of aggregation in the context of linear prediction models", UCLA Department of Economics in its series UCLA Economics Working Papers number 485.**

This paper deals with the problem of aggregation where the focus of the analysis is whether to predict aggregate variables using macro or micro equations. A new test is proposed of the hypothesis of «perfect aggregation» which tests the validity of aggregation either through coefficient equality or through the stability over time of the composition of the regressors across the micro units. The tools developed in the paper are then applied to employment demand functions for the UK economy disaggregated by 40 industries.

*Full text available on-line at:*

http://www.econ.ucla.edu/workingpapers/wp485.pdf

**1.124 H. Hashem Pesaran and A.D. Hall, 1988, "Tests of non-nested linear regression models subject to linear restrictions", Economics Letters, pp. 341-348.**

The standard methods for testing between non-nested or separate regression models require that the models have the same dependent variable. If the models are subject to non-homogeneous linear restrictions, substituting out these restrictions results in a redefinition of the dependent variable before estimation and the standard results will not apply. We derive a Wald-type test statistic to cater for this situation.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V84-45GNX68-27&_user=10&_coverDate=12%2F31%2F1988&_rdoc=1&_fmt=high&_orig=gateway&_origin=gateway&_sort=d&_docanchor=&view=c&_searchStrId=1665138905&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=bcbe2e228c25d08760c48786e9d1adcf&searchtype=a

**1.125 H. Hashem Pesaran, 1988, "The role of theory in applied econometrics", Economic Record, pp. 336-339.**

No abstract available.

*Full text available on-line at:*

http://www3.interscience.wiley.com/journal/119451163/abstract

**1.126 H. Hashem Pesaran, 1987, "A rejoinder: On the policy ineffectiveness proposition and a Keynesian alternative", UCLA Department of Economics in its series UCLA Economics Working Papers with number 470.**

No abstract available.

*Full text available on-line at:*

http://www.econ.ucla.edu/workingpapers/wp470.pdf

**1.127 H. Hashem Pesaran, 1987, "Global and partial non-nested hypotheses and asymptotic local power", Econometric Theory, pp. 69-97.**

This paper addresses two related issues in the literature of non-nested hypotheses testing. Firstly, by means of a measure of probability density functions, it shows how any two hypotheses can be placed into the nested and the non-nested categories with the latter category being subdivided further into and non-nested hypotheses. Secondly, by emphasizing the distinction between a and a the paper shows that only in the case of partially non-nested hypotheses is it possible to specify local alternatives. In this case the paper derives the asymptotic distribution of the Cox test statistic under local alternatives and shows that it is distributed as a normal variate with a mean which is directly related to the measure of the alternative to the null hypothesis.

*Full text available on-line at:*

http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=1856296

**1.128 H. Hashem Pesaran and M. McAleer, 1986, "Statistical inference in non-nested econometric models", Applied Mathematics and Computation, pp. 271-311.**

The purpose of this paper is to discuss some procedures that are available for testing non-nested (or separate) hypotheses in the statistics and econometrics literature. Since many of these techniques may also be exploited in other disciplines, it is hoped that an elaboration of the principal theoretical findings may make them more readily accessible to researchers in other disciplines. Several simple examples are used to illustrate the concepts of nested and non-nested hypotheses and, within the latter category, “global” and “partial” non-nested hypotheses. Two alternative methods of testing non-nested hypotheses are discussed and contrasted: the first of these is Cox's modification of the likelihood-ratio statistic, and the second is Atkinson's comprehensive model approach. A major emphasis is placed on the role of the Cox principle of hypothesis testing, which enables a broad range of hypotheses to be tested within the same framework. The problem associated with the application of the comprehensive model approach to composite non-nested hypotheses is also highlighted; Roy's union-intersection principle is presented as a viable method of dealing with this problem. Simulation results concerning the finite-sample properties of various tests are discussed, together with an analysis of some attempts to correct the poor size of the Cox and related tests.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6TY8-45DB29N-B&_user=10&_coverDate=11%2F30%2F1986&_rdoc=1&_fmt=high&_orig=gateway&_origin=gateway&_sort=d&_docanchor=&view=c&_searchStrId=1665139737&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=d9bb5f17267e72f5822732070455b23f&searchtype=a

**1.129 H. Hashem Pesaran and R.P. Smith, 1985, "Evaluation of macroeconometric models", Economic Modelling, 2, pp. 125-134.**

The disparity between the practice of applied econometricians and the econometric methodology they claim to profess has been widely noted. This paper attempts to examine and systematize the practice in a way that recognizes the variety of practical, theoretical and statistical considerations that applied econometric work must take

account of. The discussion is organized under three criteria: relevance, consistency and adequacy; and the relationship between these criteria and the current critiques of applied econometrics are examined.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VB1-45W3G57-W&_user=10&_coverDate=04%2F30%2F1985&_rdoc=1&_fmt=high&_orig=gateway&_origin=gateway&_sort=d&_docanchor=&view=c&_searchStrId=1665143271&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=9cc56293fbed19e26a6b60e78ff239c4&searchtype=a

**1.130 H. Hashem Pesaran, R.P. Smith and S. Yeo, September 1985, "Testing for structural stability and predictive failure: a review", Manchester School, pp. 280-295.**

No abstract available.

*Full text available on-line at:*

http://www3.interscience.wiley.com/journal/120154861/abstract

**1.131 H. Hashem Pesaran, 1985, "Formation of inflation expectations in British manufacturing industries", Economic Journal, 95, pp. 948-975.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.132 H. Hashem Pesaran and Tony Lawson, 1985, "Methodological issues in Keynes' Economics: An Introduction", in Keynes' Economics: Methodological Issues, (eds) T. Lawson and M H. Pesaran, Croom Helm, pp. 1-9.**

No abstract available.

*Full text available on-line at:*

http://www.informaworld.com/smpp/title~db=all~content=t911883450

**1.133 H. Hashem Pesaran and R.A. Evans, 1984, "Inflation, capital gains and UK personal savings: 1953-81", Economic Journal, pp. 237-257.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.134 H. Hashem Pesaran, 1984, "Asymptotic power comparisons of tests of separate parametric families by Bahadur's approach", Biometrika, pp. 245-252.**

The paper investigates asymptotic power comparisons of tests of separate parametric families when the size of the test is allowed to tend to zero as the sample size tends to infinity. It shows that Bahadur's method of asymptotic comparison by means of the approximate slope of the tests can be extended to the case of separate parametric families. The paper contains a number of applications.

*Full text available on-line at:*

http://www.jstor.org/

**1.135 H. Hashem Pesaran, 1984, "Macroeconomic policy in an oil-exporting economy with foreign exchange controls", Economica, pp. 253-270.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.136 H. Hashem Pesaran and L.G. Godfrey, 1983, "Tests of non-nested regression models: small sample adjustments and Monte Carlo evidence", Journal of Econometrics, 21, pp. 133-154.**

The most popular procedures for testing a regression model against a single non-nested alternative can be substantially oversized in small samples. Also, when a regression model is to be tested in the presence of several non-nested alternatives, the

null model is sometimes accepted only if testing against each alternative in turn produces no significant outcomes. This approach leads to an implicit overall test with a significance level that is not known, even asymptotically. It is shown that the bootstrap can be used to control significance levels in both types of situation. Power estimates for various tests using bootstrap critical values are also obtained and compared.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VC0-45H2TMH-44&_user=10&_coverDate=01%2F31%2F1983&_rdoc=1&_fmt=high&_orig=gateway&_origin=gateway&_sort=d&_docanchor=&view=c&_searchStrId=1665145667&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=29415f6b43e53ae213c341a0b86a86f1&searchtype=a

**1.137 H. Hashem Pesaran and J. Hausman, 1983, "The J-test as a Hausman specification test", Economics Letters, 12, pp. 277-281.**

The purpose of this note is to show that the *J*-test of non-nested regression models proposed by Davidson and MacKinnon (1981) can also be viewed as a test of misspecification along the lines put forward by Hausman (1978). We give a proof for the case of single-equation linear models.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V84-458X26G-D&_user=10&_coverDate=12%2F31%2F1983&_rdoc=1&_fmt=high&_orig=gateway&_origin=gateway&_sort=d&_docanchor=&view=c&_searchStrId=1665145994&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=93bed79405198ce865797bd235d60092&searchtype=a

**1.138 H. Hashem Pesaran , 1983, "A note on the maximum likelihood estimation of regression models with first-order moving average errors with roots in the unit circle", Australian Journal of Statistics, 25, pp. 442-448.**

This note gives an alternative derivation of Sargan and Bhargava's results concerning the probability of observing on the unit circle a local maximum of the likelihood function of regression models with first order moving average errors. The note also

discusses the relevance of these results for the computation of the exact maximum likelihood estimation of regression models with moving average errors.

*Full text available on-line at:*

http://www3.interscience.wiley.com/journal/120826261/abstract

**1.139 H. Hashem Pesaran, 1982, "On the Comprehensive method of testing non-nested regression models", Journal of Econometrics, pp. 263-274.**

The paper derives the specific form of the exponentially combined likelihood function of two competing multivariate non-linear regression models and shows that the application of the comprehensive approach to testing non-nested regression models will, in general, be indeterminate. It establishes that in the univariate case there exists a large number of tests of non-nested regression models which are consistent in addition to having the same asymptotic distribution under the null hypothesis. The paper then derives a set of conditions under which all these consistent tests are asymptotically equivalent not only under the null hypothesis but also under local alternatives. As an application of this latter result the paper establishes the asymptotic equivalence of the tests recently proposed by Davidson and MacKinnon, and Fisher and McAleer under local alternatives, and shows that within the class of tests considered in the paper these proposed tests possess maximum local power. The latter test has this property only when the number of explanatory variables of the 'true' model is not more than that of the 'false' model.

*Full text available on-line at:*
http://www.sciencedirect.com/science/article/B6VC0-4599HMN-N/2/f0e6f4b813edc2d1934c38ce719d05d2

**1.140 H. Hashem Pesaran, 1982, "A critique of the proposed tests of the natural rate/rational expectations hypothesis", Economic Journal, pp. 529-54. Reprinted, 1999, in (ed) Kevin Hoover, The Legacy of Robert Lucas, Jr. Vol. I, chapter 18. Cheltenham: Edward Elgar. ISBN 1 85898 387 8**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.141 H. Hashem Pesaran, 1982, "Comparison of local power of alternative tests of non-nested regression models", Econometrica, pp.1287-1305.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.142 H. Hashem Pesaran, 1982, "The system of dependent capitalism in pre- and post- revolutionary Iran", International Journal of Middle East Studies, 14, pp. 501-522.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.143 H. Hashem Pesaran, 1981, "Identification of rational expectations models", Journal of Econometrics, 375-398.**

This paper deals with the problem of the identification of simultaneous Rational Expectations (RE) models. In the case of RE models with current expectations of the endogenous variables, the necessary and sufficient conditions for the global identification are derived explicitly in terms of the structural parameters and the linear homogenous identifying restrictions. It is shown that in the absence of *a priori* restrictions on the processes generating the exogenous variables and the disturbances, RE models and general distributed lag models are 'observationally equivalent'. In the case of RE models with future expectations of the endogenous variables, a general solution that highlights the 'non-uniqueness' problem and from which other solutions such as forward or backward solutions can be obtained, is derived. It is shown that untestable and often quite arbitrary restrictions are needed if RE models with future expectations are to be identifiable. Certain order conditions similar to those obtained for the identification of RE models with current expectations are also derived for this case.

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http://www.sciencedirect.com/science/article/B6VC0-4582CXP-1S/2/8587ffca5f01c5f4ca7d62766fdfd729

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**1.144 H. Hashem Pesaran, 1981, "Pitfalls of testing non-nested hypotheses by the Lagrange multiplier method", Journal of Econometrics, pp. 323-331.**

In applied research in econometrics a general model determined from the current knowledge of economic theory often establishes a 'natural' method of embedding a number of otherwise non-nested hypotheses. Under these circumstances, significant tests of various hypotheses can be carried out within the classical framework, and tests of non-nested or separate families of hypotheses do not require development of new statistical methods. The application of some suitable variant of likelihood ratio testing procedure will be quite appropriate.

There are, however, many occasions in applied econometrics where the hypotheses under consideration are intended to provide genuine rival explanations of the same given phenomenon and the state of economic theory is not such as to furnish us with a general model that contains both of the rival hypotheses in a 'natural' and theoretically consistent manner. A number of investigators have advocated that even when a 'natural' comprehensive model containing both of the hypotheses under consideration cannot be obtained from theoretical considerations, it is still appropriate to base significant tests of non-nested hypotheses upon a combined model 'artificially' constructed from the rival alternatives. Moreover, in a recent paper on the application of Lagrange Multiplier (LM) tests to model specification, T.S. Breusch and A.R. Pagan (1980) have claimed that Cox's test statistic is connected to an LM or 'score' statistic derived from the application of the LM method to an exponentially combined model earlier employed by A.C. Atkinson (1970).

Although the use of 'artificially' constructed comprehensive models for testing separate families of hypotheses is analytically tempting, nevertheless it is subject to two major difficulties. Firstly, in many cases of interest in econometrics, the structural parameters under the combined hypothesis are not identified. Secondly, the log likelihood function of the artificially constructed model has singularities under both the null and alternative hypotheses.

The paper firstly examines the derivation of LM statistics in the case of non-nested hypotheses and shows that Atkinson's general test statistic, or Breusch and Pagan's

result, can be regarded as an LM test if the parameters of the alternative hypothesis are known. The paper also shows that unless all the parameters of the combined models are identified, no meaningful test of the separate families of the hypotheses by the artificial embedding procedure is possible, and in the identified case an expression for the LM statistic which avoids the problem of the singularity of the information matrix under the null and the alternative hypotheses is obtained.

The paper concludes that none of the artificially embedding procedures are satisfactory for testing non-nested models and should be abandoned. It, however, emphasizes that despite these difficulties associated with the use of artificial embedding procedures, Cox's original statistic (which is not derived as an LM statistic and does not depend on any arbitrary synthetic combination of hypotheses) can still be employed as a useful procedure for testing the rival hypotheses often encountered in applied econometrics.

*Full text available on-line at:*
http://www.sciencedirect.com/science/article/B6VC0-45H2TBT-1W/2/4e4718d5309b95df390fac13c08772e7

### 1.145 H. Hashem Pesaran and A.S. Deaton, May 1978, "Testing non-nested, non-linear regression models", Econometrica, pp. 677-694.

In Pesaran [9], the test developed by Cox for comparing separate families of hypotheses was applied to the choice between two non-nested linear single-equation econometric models. In this paper, the analysis is extended to cover multivariate nonlinear models whenever full information maximum likelihood estimation is possible. This allows formal comparisons not only of competing explanatory variables but also of alternative functional forms. The largest part of the paper derives the results and shows that they are recognizable as generalizations of the single-equation case. It is also shown that the calculation of the test statistic involves very little computation beyond that necessary to estimate the models in the first place. The paper concludes with a practical application of the test to the analysis of the U.S. consumption function and it is demonstrated that formal tests can give quite different results to conventional informal selection procedures. Indeed, in the case examined,

five alternative hypotheses, some of which appear to perform quite satisfactorily, can all be rejected using the test.

*Full text available on-line at:*

http://www.princeton.edu/~deaton/downloads/Testing_Non-nested_Non-linear_Regression_Models.pdf

**1.146 H. Hashem Pesaran and G.E.J. Llewellyn, June 1976, "Determinants of United Kingdom import prices - a note", Economic Journal, pp. 315-320.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.147 H. Hashem Pesaran, 1974, "On the general problem of model selection", Review of Economic Studies, pp. 153-171.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.148 H. Hashem Pesaran, February 1973, "The small sample problem of truncation remainders in the estimation of distributed lag models with auto-correlated errors", International Economic Review, pp. 120-131.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.149 H. Hashem Pesaran, May 1973, "An alternative econometric approach to the permanent income hypothesis: an international comparison: a comment", Review of Economics and Statistics, pp. 259-261.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

**1.150 H. Hashem Pesaran, October 1973, "The exact maximum likelihood estimation of a regression equation with first order moving-average errors", Review of Economic Studies, pp. 529-535.**

No abstract available.

*Full text available on-line at:*

http://www.jstor.org/

# 2 NEWSPAPER AND MAGAZINE ARTICLES

**2.1 H. Hashem Pesaran, Professor David Champernowne, obituary in Daily Telegraph, 4 September 2000.**

**2.2 H. Hashem Pesaran, "Recent Perspectives on the Iranian Economy", Kanoon Iran, February 1996, pp.7-11 (Text of a lecture given in London, October 1994).**

**2.3 H. Hashem Pesaran, "Banking and credit control in Iran", Euromoney (supplement), April 1975.**

**2.4 H. Hashem Pesaran, "The recycling dilemma", Keyhan International, October 1974, Tehran.**

# 3 FOREWORD AND PREFACES

**3.1 "Foreword" in (eds) Francois Grades and Georges Prat, Price Expectations in Goods and Financial Markets: New Developments in the Theory and Empirical Research, 2000, Cheltenham: Edward Elgar, ISBN 1-84064-322-6.**

**3.2 "Foreword" in (eds) Roberto Mariano, Til Schuermann, and Melvyn Weeks, Simulation-based Inference: Theory and Applications, 2000, Cambridge: Cambridge University Press, ISBN 0-521-59112-0.**

# 4 Book Reviews

**4.1 "Rational Expectations Econometrics", by Hansen & Sargent, in Economica, 60, No.239, August 1993.**

**4.2 "Misspecification tests in econometrics: The Lagrange multiplier principle", by L.G. Godfrey, in Economic Journal, March 1990, Vol. 100, pp. 259-261.**

**4.3 "Instrumental variables", by R. Bowden and D. Turkington, in Economica, 1986.**

**4.4 "Economic theory and econometrics", by Lawrence Klein, edited by Jaime Marquez, in Economic Journal, December 1985.**

**4.5 "The international transmission of inflation", by M.R. Darby et al. in Economic Journal, June 1985.**

**4.6 "Rational expectations - an elementary exposition", by G.K. Shaw in Economic Journal, December 1984.**

**4.7 "Expenditure of oil revenue - an optimal control approach with application to the Iranian economy", by H. Motamen in Journal of Economic Dynamics and Control, 3, 1981, pp. 287-391.**

# 5 BOOKS

**5.1** **Jeff Nugent and M. Hashem Pesaran (Editors), January 2007. "Explaining Growth in the Middle East", Volume 278 (Contributions to Economic Analysis), Elsevier Science, .ISBN-10: 0444522409, ISBN-13: 978-0444522405.**

**5.2** **Tony Garrett, Kevin Lee, Hashem Pesaran and Yongcheol Shin, 2006. "Global and National Macroeconometric Modelling: A Long Run Structural Approach", Oxford University Press, ISBN 0-19-929685-5.**

**5.3** **H. Hashem Pesaran, C. Hsiao, K. Lahiri and L-F Lee (eds), 1999, "Analysis of Panels and Limited Dependent Variables: A Volume in Honour of G S Maddala", Cambridge University Press, Cambridge, pp.338. ISBN 0 521 63169 6**

**5.4** **H. Hashem Pesaran, R.P. Smith and T. Akiyama, 1998, "Energy Demand in Asian Developing Economies", Oxford University Press, Oxford, pp.226. ISBN 0 19 730020 0.**

**5.5** **H. Hashem Pesaran and B. Pesaran, 1997, "Working with Microfit 4.0: Interactive Econometric Analysis", (DOS and Windows versions), Oxford University Press, pp.511. ISBN 019 268 530 9 (DOS), 019 268 531 7 (Windows)**

**5.6** **H. Hashem Pesaran and Peter Schmidt (eds), 1997, "Handbook of Applied Econometrics: Microeconomics", Basil Blackwell, pp.453. ISBN 1 55786 209 5.**

**5.7** **H. Hashem Pesaran and Mike Wickens (eds), 1995, "Handbook of Applied Econometrics: Macroeconomics", Basil Blackwell, pp.482. ISBN 1 55786 208 7.**

**5.8** **H. Hashem Pesaran and S. Potter (eds), 1993, "Non-Linear Dynamics", Chaos and Econometrics, John Wiley, pp.244. ISBN 0 471 93942 0.**

**5.9** **H. Hashem Pesaran and B. Pesaran, 1991, "Microfit 3.0: An Interactive Software Econometric Package", Oxford University Press. This is a substantially revised and extended version of Microfit.**

**5.10** **H. Hashem Pesaran and T. Barker, 1990, "Disaggregation in Econometric Modelling", edited volume, Routledge.**

**5.11** **H. Hashem Pesaran, 1987, "The Limits to Rational Expectations", Basil Blackwell, Oxford, pp. 325. Reprinted with corrections, 1989. Reprinted in paperback, 1989. Chapter 8, Measurement of Expectations and Direct Tets of the REH, is reprinted in Van der Ploeg (ed.), Advanced Lectures in Quantitative Economics, Academic Press, London, 1990, pp. 445-499.**

**5.12 H. Hashem Pesaran and B. Pesaran, 1987, "Data-FIT: An Interactive Software Econometric Package", Oxford University Press, pp. 205, reprinted in paperback (with corrections) as Microfit, Oxford University Press, 1989.**

**5.13 H. Hashem Pesaran and T. Lawson (eds), 1985, "Keynes' Economics: Methodological Issues", Croom Helm, pp. 265, Reprinted in paperback by Routledge, 1989.**

**5.14 H. Hashem Pesaran and L.J. Slater, 1980,"Dynamic Regression: Theory and Algorithms", No.5 in the series, "Computers and their Applications", Chichester: Ellis Horwood (publisher) and John Wiley (distributor), pp. 363. (Translated into Russian, 1984).**

**5.15 H. Hashem Pesaran, November 1974, "World Economic Prospects and the Iranian Economy - a short term view". Institute for International Political and Economic Studies, Tehran, pp. 50. (Booklet in both Persian and English).**