



CONDOLENCE MESSAGES

Prof. A.L.Nagar Memorial Meeting

Wednesday 16th April, 2014

at

DELHI SCHOOL OF ECONOMICS

University of Delhi

Delhi – 110007



DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI



Ref. No. DSE/.....
04 April, 2014

MEMORIAL MEETING : PROFESSOR ANIRUDH L. NAGAR

Dear Colleague,

You may have already heard the sad news that our former colleague, **Professor Anirudh L. Nagar**, passed away on Tuesday, February 04, 2014 in Pune.

During his association with University of Delhi as a faculty member of the Department of Economics, Prof. Nagar served as the **Head**, Department of Economics, **Director**, Delhi School of Economics, **Dean**, Faculty of Social Sciences and **Pro-Vice-Chancellor**, University of Delhi.

We are organizing a memorial meeting at the Delhi School of Economics on April 16, 2014, at 3.00 p.m. in the Lecture Theatre of the Department of Economics, to pay tribute to an eminent economist and great human being. Please do join us.

Please let us know if you would like to read your message or send your message to be read out at the memorial meeting. Please send these to Ms. Meena Rautela at director@econdse.org.

With regards,

Pami Dua.

(Prof. Pami Dua)
Director
Delhi School of Economics
and
Dean Research (H&SS)
University of Delhi

A. Bhattacharjee

(Prof. Aditya Bhattacharjee)
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Memorial Meeting Prof. A.L.Nagar, Wednesday, April 16, 2014

PROGRAMME

- Opening Remarks - Prof. Pami Dua, Director, DSE
(and coordination)
- Life Sketch - Prof. Aditya Bhattacharjea, Head, Deptt. of Economics
- Condolence Messages
 - Prof. Dinesh Singh
 - Prof. K.L. Krishna
 - Prof. V.N. Pandit
 - Prof. K. Sundaram
 - Prof. Pulin B. Nayak
 - Prof. T.C.A. Anant
 - Prof. Ashok Lahiri
 - Prof. S.C.Panda, Prof. Jagdish Bhagwati (read by Prof. Aditya Bhattacharjea)
 - Prof. Kaushik Basu, Prof. Prasanta K. Pattanaik (read by Prof. Pami Dua)
 - Dr. Ashok Lahiri
 - Prof. Arunava Sen
 - Prof. V. R. Panchamukhi
 - Prof. Dilip Nachane, Prof. Vikas Chitre, Prof. U. Sankar, Prof. Gopal Kadekodi (read by Prof. N.R. Bhanumurthy)
 - Prof. Aman Ullah, Prof. S. Mahendra Dev (read by Prof. Pami Dua)
 - Dr. Omkar Goswami, CESP, JNU – Prof. Jayati Ghosh (read by Prof. Aditya Bhattacharjea)
 - Dr. Charu Garg (Ph. D Student of Prof. A.L. Nagar)
 - Prof. Nagar's Family
 - Dr. Ashok Vyas
 - Dr. Satish Kaushal

Life Sketch of Prof. A.L.Nagar (Read by Prof. Aditya Bhattacharjea, Head, Department of Economics, DSE)

Professor Anirudh Lal Nagar (4 October 1930 -- 4 February 2014)

Anirudh Lal Nagar was born on 4 October 1930 in Allahabad. After completing his BSc and MSc from Lucknow University, he served in the same University as Lecturer in Statistics in the Department of Mathematics and Statistics from 1951 to 1957. He then did his Ph.D. in Economics from the Netherlands School of Economics, Rotterdam, in 1959, under the world-renowned econometrician Professor Henri Theil. After two years of post-doctoral work in Holland, Dr Nagar went to Purdue University, USA, in 1961 as a Visiting Professor and returned to India in 1962 to join IIT Kanpur. He joined the Delhi School of Economics, University of Delhi, as Reader in Econometrics in 1963 and became Professor of Econometrics in 1968.

Professor Nagar remained at the Delhi School of Economics and led a very active life in teaching and research till his retirement in 1995. He served with distinction as

- Head of the Department of Economics from 1973 to 1976,
- Dean of the Faculty of Social Sciences from 1974 to 1976;
- Director of the Delhi School of Economics from 1973 to 1976 and again from 1984 to 1987,
- and Pro-Vice Chancellor of the University of Delhi from 1990 to 1995.
- He officiated as Vice Chancellor for about eight months during 1994-95.

In a distinguished academic career spanning nearly six decades Professor Nagar was a visiting professor at the Brookings Institution; Wharton School of Finance and Commerce at the University of Pennsylvania; University of Western Ontario; Australian National University; McGill University, and many other reputed academic institutions. He had published extensively in leading international journals, including nine papers in *Econometrica*, four in the *International Economic Review* and two in the *Journal of Econometrics*. He had also authored three textbooks and several chapters in collective volumes.

Professor Nagar was elected as a Fellow of the Econometric Society, a signal honour, in 1971. He held a UGC National Fellowship during 1985-87, and in 1992 he was awarded the Jawaharlal Nehru Award for Social Sciences and the Australian Vice Chancellors' Committee Fellowship. He held the JP Naik National Fellowship of the ICSSR during 1998-2000. He served as President of the Indian Econometric Society from 1977 to 1980, and was Editor-in-Chief of its *Journal of Quantitative Economics*.

Subsequent to his retirement from Delhi University, Professor Nagar had been a Visiting Professor at the Jawaharlal Nehru University and an Honorary Fellow at the National Institute of Public Finance and Policy. He had also guided the doctoral research of a large number of theoretical as well as applied econometricians, many of whom are today prominent internationally.

Messages printed in Journals/Magazines

Prof. Vishwanath Pandit, ICSSR National Fellow, Sri Sathya Sai Institute of Higher Learning and Formerly, Professor Department of Economics, Delhi School of Economics

Economic and Political Weekly

The sad news about the passing away of Professor A L Nagar in Pune takes me back by five decades into late fifties and the early sixties. This period can retrospectively be seen as the start of a new phase of Economics not only as an academic discipline but also as a vital guide to economic policy formulation in this country. This was indeed the right time for many things to happen, the way they did.

Professor Nagar was very much a part of these developments. In fact, the beginning had been made many years earlier with the setting up of institutions committed to quality teaching programs, a rigorous research agenda and an open debate on national economic policies with clear concerns for social problems going beyond economics.

A particular mention must be made of the role played by Professor P C Mahalanobis who set up the Indian Statistical Institute (ISI) in Calcutta, Professor V K R V Rao who designed the Delhi School of Economics (DSE) in Delhi and Professor D R Gadgil under whose guidance the Gokhale Institute of Politics and Economics (GIPE) got revitalized in Pune. Some other institutions that come to one's mind in this context include Presidency College in Calcutta, Bombay School of Economics and Departments of Economics and Statistics in Andhra University. All of these played an important role in training young minds to understand and analyze problems facing the One factor which turned out to be vital in the process was an increased interaction between those with competence in Mathematics, Statistics and Economics.

Prominent social sciences also figured prominently in the new agenda for teaching and research at all institutions. This was prominently the case when I, as a young faculty member at DSE in the early sixties, recall major developments. These were initiated and sustained under the leadership of Professor K N Raj with implicit support of the its founding fathers Professors V K R V Rao, B N Ganguly and others who had moved to the newly created Institute of Economic Growth (IEG). The world of Economics in India made yet another major thrust forward when many internationally reputed theorists, econometricians and social scientists joined these institutions. Those who joined DSE included A K Sen (now a Nobel Laureate) ,

S Chakravarty, J Bhagwati, A L Nagar and T Raychaudhry. About the same time T N Srinivasan, and B S Minhas joined the ISI campus in Delhi, further strengthening the chances of success for the new agenda for economics in India.

Turning to some sustained achievements, I am tempted to point out that despite some difficulties in the early seventies the teaching and research programs at DSE continued to attract and train students of very high caliber. Many of them moved to other reputed academic institutions with impressive record of work. Those who earned the highly competed Fellowship of the Econometric Society (International) include Prasanta Pattanaik, Bhaskar Dutta, Dilip Abhue, Tapan Mitra, Vijay Krishna and Dilip Mukherji. Most of them were taught by Chakravarty and Nagar, among others and had opted for econometrics as their area of specialization though they eventually worked on different areas of economic theory. Those from other Indian academic institutions who must be included in this list of achievers include Abhijit Banerjee from Jawaharlal Nehru University, and Mukul Majumdar and Debraj Ray from Presidency Professor Anirudh Lal Nagar who passed away on February 04 in Pune has indeed come too soon. From all accounts we have had the end was peaceful though sadly unexpected and rather early. Born in 1930 to Gujarati parents who had settled in Lucknow and fully adopted the distinctive culture of this city in all its fascinating styles and modalities. Anyone who met Nagar Sahab would, no doubt, realize this immediately. Educated at University of Lucknow which was one of the best in the country at that time, Dr Nagar completed the Master's degree in Mathematics with specialization in Statistics. It was in 1956, or so, that A L Nagar and S Chakravarty were chosen by Professor J Tinbergen for doctoral work at the Netherlands School of Economics. One must mention that Professor Tinbergen has been the joint recipient of the Nobel Memorial Prize in Economics with Professor Ragnar Frisch of Norway in the very first year of this award. At the Netherlands School, while Chakravarty completed his celebrated thesis on planning models, under the guidance of Professor Tinbergen, Nagar worked with the reputed econometric theorist, Henri Theil. In response to the growing research agenda relating to macroeconomic policy articulation originally highlighted by the Cowles Commission at Chicago and promoted by Professors Tinbergen and Klein, econometric theory had to look rigorously into the estimation methods getting away from simple ordinary least square methodology.

Since one of the leading academics in this research paradigm happened to be Professor Theil the immediate task for Nagar was there waiting for him. About the time he completed his doctoral work on "k-class estimators" for simultaneous equations models, he had published a number of path breaking papers starting with *Econometrica* and followed up by publications in other

leading journals like International Economic Review, Journal of the American Statistical Association.

Sankhya and Indian Economic Review. Since small sample properties under the available statistical theory were impossible to establish except in special cases, and remain so till today, the work had to be focused on asymptotic properties like consistency and efficiency of the estimators ; the latter in terms of asymptotic moment matrices. From Netherlands School of Economics Nagar moved to United States to teach at Purdue University for a couple of years before his return to India to join the Indian Institute of Technology at Kanpur. It was in 1963 that he came over to DSE and joined the team mentioned above for a new beginning in the teaching and research program for economics with a rigorous policy agenda. In 1968 he was appointed to the newly created Professorship in Econometrics.

Nagar Sahab was much more than a distinguished academic. A man of simplicity and accessibility he attracted a number of research scholars for whom he remained accessible any time not only in office but even more at home. Results by way of doctoral degrees and reputed publications were there for any one to see. One is inclined to mention two of his outstanding students, namely, Nanak Kakwani and Aman Ullah, both of whom worked on different problems relating to simultaneous equations econometric models. The next significant thrust in his work came in 1966 when, on a visiting assignment to the Brookings Institution he propounded the idea of stochastic simulation of simultaneous equations models for more informative policy evaluation. Though this was published in the well known book on Brookings Econometric Model edited by Professor Duesenbury and others it has unfortunately not been properly utilized. Eventually, Professor Nagar turned to a number of important applied problems using his deep understanding of probability theory and multivariate analysis.

Professor Nagar came to be deeply committed to teaching and research at DSE where he stayed on till his retirement in 1995 or so. In between he went out as a visiting professor to University of Pennsylvania, in the US, Universities of Western Ontario and McGill in Canada, and Australian National University in Australia. Nagar Sahab served University of Delhi as Chairman, Department of Economics, as Director Delhi School of Economics and eventually as its Pro Vice Chancellor. He was also appropriately chosen for many academic honors. He was chosen for the prestigious Fellowship of the Econometric Society in 1970; Jawaharlal Nehru award for social sciences in 1992; and J P Naik National Fellowship by Indian Council for Social Science Research.

After his retirement from the University of Delhi Professor Nagar agreed to teach at Jawaharlal Nehru University and later helped the National Institute of Public Finance and Policy in South Delhi as a senior advisor working on important problems relating to taxation. Three years back he had moved to Pune where he continued research on current economic problems at the Indian School of Political Economy.

One of his latest works there relating to the Interface of income, health and environment has been path breaking application of econometric methodology to an important national problem.

Finally, no view of Professor Nagar's contribution to the academic world is complete without putting on record the establishment and growth of The Indian Econometric Society (TIES) which is currently celebrating its Golden Jubilee with many conferences and schemes for promoting academic research and teaching. Four leading academics who played a major role in this task have been Professors P C Mahalanobis and C R Rao from the Indian Statistical Institute in its early phases, and Professors S Chakravarty and A L Nagar from the Delhi School of Economics at later times. Nagar serves as its President for five crucial years, 1976 through 1981. It was at about the end of this period that TIES established its own and now widely reputed journal, namely, The Journal of Quantitative Economics, under the editorship of Professor K L Krishna. It is gratifying that this journal, currently edited by Professor Dilip Nachane has maintained its high standards. Professor Nagar remained its managing editor, guiding its growth till his passing away.

Prof. Aman Ullah, University of California, Riverside

OBITUARY: A.L. NAGAR, 1930-2014

Journal of Quantitative Economics

Anirudh Lal Nagar (popularly and affectionately known as “Nagar Saheb”) passed away on February 4, 2014 , in Pune , India at the age of 83. He was born in 1930 in Allahabad, India, and was one of the most internationally known and influential Indian econometricians of the 20th century. After procuring a Master's(1951) in Statistics from Lucknow University and then teaching there from 1951 to 1957, he went to The Netherlands School of Economics (NSE) , Rotterdam and finished his PhD there in 1959 under Henri Theil. During the years 1959-63, he first served as a research associate till 1961 at NSE, then taught at Purdue University (1961-62) and then at IIT, Kanpur (1962-63). After that he taught at The Delhi School of Economics (DSE) for over three decades (1963 -1995). During this period he was a visiting professor at various universities including Brookings Institution, University of Pennsylvania, University of Western Ontario, University of Waterloo, Concordia University, University of Windsor, York University, and Australian National University. This was clear evidence of him being internationally recognized as an authority in Econometrics, especially in Finite Sample Econometrics. After this period he was associated as a visiting professor at Jawaharlal Nehru University (JNU) as well as being an Honorary Fellow at National Institute of Public Finance & Policy during 2001-11. Subsequently he moved to Pune to live with his son. He is survived by his wife, Meera Nagar; a daughter Anshu Kaushal; and two sons, Amit Nagar and Ashiesh Anirudh Nagar.

Nagar Saheb, as we know, taught Statistics and Econometrics over five decades at various universities around the world. He was the founding pillar of the development of Econometrics in India and published in top journals of Econometrics and Statistics. This included *Econometrica*, *JASA*, *IER*, *Journal of Econometrics*, among others. His research career began with the most fundamental and pioneering work in the area of Finite Sample Econometrics resulting in the paper “The bias and moment matrix of the general k-class estimators of the parameters in simultaneous equations “, which appeared in *Econometrica* (1959). This contribution of Nagar Saheb, along with his paper in *International Economics Review* (1962) on the finite sample properties of double k-class estimators, using an innovative application of a Taylor-type stochastic expansion, laid the foundation for future generations of econometricians, including many of his students, for developing the finite sample moments of a class of estimators in

various econometric models. In fact this is now known in the profession as "Nagar's Expansion" as coined in Sargan (1974). Since then there were research developments in Finite Sample Econometrics literature by T. W. Anderson and his students at Stanford University, D. Sargan and his students at LSE, R. L. Basman and his students at Texas A & M, G.D.A Phillips and his students at Exeter, P.C. B Phillips and his students at Yale University, V. K. Srivastava and his students at Lucknow University, and A. Ullah and his students at University of Western Ontario and University of California, Riverside, see Ullah (2004) for details. The beginning of the 90s saw a turn in which Nagar's theoretical results on bias and MSE of k-class estimators became a focal point because of its use in explaining the problem of high bias of the IV estimators under weak instruments (Bound, Jaeger, and Baker (1995) and Angrist and Krueger (1991)) in many empirical studies. His other major theoretical work, among others, was with Henri Theil and it is popularly known as the Theil-Nagar (1961) test, also as the adjusted Durbin-Watson test, for testing serial correlation; and with Goldberger and Odeh on deriving covariance matrices of both reduced form coefficients and of forecasts in structural models to study their efficiencies. The evidence of the impact of his theoretical contributions in Econometrics is clearly evident in the edited book in his honor by Carter, Dutta, Ullah (1990) in which contributed papers are published from world leading econometricians such as R. L. Basman, P.J. Dhrymes, J. Dreze, M. Mouchart, H. Theil, and Nobel Laureate L. Klein, among others.

Nagar Saheb's contributions were beyond theoretical Econometrics. He had been engaged in doing empirical research in collaboration with Nobel Laureate Lawrence Klein on understanding policy changes and forecasting within the framework of the Brookings quarterly Macro Econometric models in the mid-1960s. From 1990 he began a new wave of research activities in the measurement of human development and quality of life (Nagar and Basu (2002)) and in forecasting tax revenue (e.g. Nagar, Kumar, and Samanta (2007)). His thoughts for new ideas and research were unending which he continued to have till the last moments of his constructive and productive life. Towards the end he was still working on the econometric analysis of health and pollution issues in India (e.g. Nagar, Ray, Sawhney, and Samanta (2009)), and was thinking about ways to construct a structural model which would incorporate economic, social and environmental issues and provide a better understanding of their linkages in making proper policy predictions on the current global economy. Apart from contributing to frontier Econometrics research, Nagar Saheb was truly a great mentor, teacher, and PhD dissertation supervisor to legions of students around the world and he always found time to passionately discuss research matters. He was truly a GURU whose door was always open for giving "Shiksha" (education) to his "Shishyas" (students). Also, he was an extremely kind and generous

human being who provided unfailing intellectual and moral support. For all, he was not only a great teacher and a visionary researcher but, above all, a humble and caring humanist.

Along with his fundamental research advances and dedication to teaching and mentoring, Nagar Saheb's contributions to the profession have been invaluable and have made a lasting impact. He was one of the founding members of the society, its first Vice President(1972-76), and then its President (1977-81). Also, he made numerous contributions as the Editor-in-Chief of the Society's Journal of Quantitative Economics until the end and was associated with Sankhya D, Indian Economics Review, and Mathematical Reviews. He was elected as Fellow of the Econometric Society in 1971. In addition, he was awarded UGC Lecturer (1972-73), Jawahar Lal award for Social Sciences (1972), UGC Fellowship (1983-85), Australian Vice Chancellor's Committee Fellowship (1992), and J.P.Naik National Fellowship of ICSSR (1998-2000), among others. Also, he participated in several Indian, European, and World Econometric Conferences . Apart from these professional services Nagar Saheb's contributions to the university service had been phenomenal. He served as the Head of Department of Economics (1973-76) , Director of DSE (1973-76 & 1984-89), Dean of Social Sciences, Delhi University (1974-76), and Pro-Vice Chancellor , Delhi University (1990-95) and its officiating Vice Chancellor (1994-95).

In summary, Nagar Saheb was a born teacher who guided us all, made tremendous contributions to both the Indian and the international econometric profession, worked till his last moment, and has left a great and inspiring legacy for all of us and the future generation of econometricians. With his death the Economics , Econometrics, and Statistics profession have lost one of its most influential and pioneering member , a man who was loved and revered by so many of us.

REFERENCES

- Angrist, J.D. and Kreuger , A. B. (1991), Does compulsory school attendance affect schooling and earnings, Quarterly Journal of Economics, 106: 979-1014.
- Bound, J., Jaeger, D.A. and Baker, R. (1995), Problems with instrumental variables estimation when the correlation between the instruments and endogenous explanatory variables is weak, Journal of American Statistical Association, 90: 443-50.
- Carter, R.A.L., Dutta, J., and Ullah, A. (1990), Contributions to Econometric Theory and Application: Essays in Honour of A.L. Nagar , Springer Verlag New York
- Goldberger, A.S., Nagar, A.L., and Odeh, H.S. (1962), The covariance matrices of reduced form coefficients and forecasts for a structural econometric model, Econometrica, 29: 1962

- Nagar, A.L. (1959), The bias and moment matrix of the general k-class estimators of the parameters in simultaneous equations, *Econometrica*, 27:575-95
- Nagar, A.L. (1962), Double k-class estimators of parameters in simultaneous equations and their small sample properties, *International Economic Review*, 3:168-88.
- Nagar, A.L., Kumar,S., and Samanta,S. (2007), Indexing the effectiveness of tax administration , *Economics & Political Weekly*, 50:
- Nagar, A.L., Ray, A.S, Sawhney,A., and Samanta, S., (2009), The interface between income, health and particular air pollution in India : An econometric investigation, Manuscript, National Institute of Public Finance and Policy, New Delhi.
- Nagar, A.L.and Basu, S.R. (2002), Weighting socio economic indicators of human development :A latent variable approach, in *Handbook of Applied Econometrics and statistical inference* (eds. A.Ullah , A T.K. Wan, and A. Chaturvedi), Marcel Dekker, New York.
- Sargan, J.D. (1974), The validity of Nagar's expansion for the moments of econometrics estimators , *Econometrica*, 42:169-76.
- Theil, H and Nagar, A.L. (1961), Testing the independence of regression disturbances, *Journal of American Statistical Association*, 56:793-806
- Ullah, A. (2004), *Finite Sample Econometrics*, Oxford University Press, Oxford



By Omkar Goswami

COMMENT

IN PRAISE OF GREAT TEACHERS

This is a tribute to some great teachers who I have learnt from at the Delhi School of Economics

O

N 4 FEBRUARY, PROFESSOR ANIRUDDH LAL (A.L.) NAGAR passed away in Pune. Nagar Sahab, as he was called by students and colleagues alike, was one of India's finest academic econometricians and a legendary expositor of statistics and econometrics at the Delhi School of Economics (D.School) where he taught for decades. As long as I can remember as an M.A. student and later as a faculty member of the D.School, the first lecture of Monday, Tuesday and Wednesday were Nagar Sahab's for teaching statistics to first year students; and three lectures a week were for those who specialised in 'six-tries', the D.School short form for the final year M.A. option involving six papers in statistics and econometrics.

Nagar Sahab was such a superb teacher that very few students could ever think of bunking his lectures. A standard, and often heard, reason for ending an evening of bridge or post-dinner *adda* at the university post-graduate hostels such as Gwyer and Jubilee Halls was "Tomorrow is Nagar Sahab's lecture" which meant that you wanted to get up early and be clear headed enough to get to D.School well in time to attend the 9.20 a.m. class. Nagar Sahab's lectures were too brilliant to give them a miss and, in many ways, it was great to start a day with someone giving such a clear-headed exposition of the subject. I could bore you with a bibliography of some of the seminal work that Nagar Sahab did in theoretical econometrics, especially in the area of regressions and simultaneous equation models, but I shan't. This is about remembering great teachers. Nagar Sahab was an internationally acknowledged econometrician; but above all, he was a truly great teacher, one of the giants of D.School. When I joined the faculty, he also taught me, as he did Ashok Lahiri before me, how to enjoy a post-lunch *paan* with 120-number *zarda* — a habit that Ashok and I have now forsaken.

Then there was Professor K.L. Krishna. Universally called KLK or KL, he was another truly great teacher, whose lectures in applied econometrics and industrial economics were truly outstanding. Like Nagar Sahab, KLK would walk in without a scrap of paper, teach fundamentally profound stuff, fill the blackboard with a series of equations and complete precisely what he had planned for the lecture a minute or two before the end of class — doing so day in and out. From both these D.School stalwarts I learnt how to plan a lecture and, most importantly, how to use a large blackboard so that, at the end of a class, you could take away the key elements of an hour-long discourse just by looking at what was left on the board. KLK was also a master of understanding, using and interpreting large data sets. Several times in my professional life, I approached him with queries on data produced in various rounds of the National Sample Surveys. KLK always provided exactly the correct answer.

Then there was Professor Mrinal Datta Chaudhuri, or MDC, a larger than life hero of D.School, the object of gushing admiration of almost all women students, who taught the theory of growth, planning and transport economics. Far from being a conventional lecturer, MDC showed you how to think of the fundamental ideas behind a subject and, in that way, opened up economics in ways that you could not dream of as an M.A. student.

And then there was the triad of economic historians: Om Prakash (OP), J. Krishnamurthy (Kicchu) and Dharma Kumar. OP took you through Mughal India and the Portuguese and Dutch East India companies like none other; Kicchu explained various aspects of colonial economic history, labour markets and employment; and Dharma, alas no more, made you think differently and creatively about economic history without really bothering to 'teach' in the officially understood sense of the word.

These were great teachers. They taught me and many generations how to think. To learn. And to love economic theory, econometrics and economic history. This is my tiny tribute to them. □

The author is chairman of CERG Advisory. omkar.goswami@cergindia.com
For other columns by Omkar Goswami, visit www.businessworld.in

Journal of Indian School of Political Economy

Professor A.L. Nagar, a doyen among world econometricians, Emeritus Professor, and former Pro-Vice Chancellor, Delhi University passed away on February 4, 2014, at the age of 84 years. He was Visiting Fellow at the Indian School of Political Economy during the past three years.

After doing his Ph.D. in econometrics from Netherlands School of Economics, Rotterdam in 1959, Prof. Nagar joined Delhi School of Economics in 1963 and taught there till his retirement, when he was made Pro-Vice Chancellor of Delhi University. He spanned a long and illustrious career in teaching and research in econometrics and economics. He was visiting professor at the Brookings Institution; Wharton School of Finance and Commerce, University of Pennsylvania; University of Western Ontario; Australian National University; McGill University, and many other institutions. He has extensively published in international journals (*Econometrica*, *Journal of American Statistical Association*, *Indian Economic Review*, etc) and authored many books. He was elected Fellow of the Econometric Society in 1971.

Professor Nagar made profound contributions to structural modelling as well as time series econometrics. The Theil-Nagar test for serial correlation in small samples is, of course, well-known. In his highly acclaimed work on k-class estimators of parameters in simultaneous equations models, of which two-stage least squares estimator as well as Limited Information Maximum Likelihood estimators are special cases, Prof. Nagar established the properties and biases in these estimators in small samples. As most simultaneous equations economic models are estimated over time spans often involving relatively small number of observations, these results are very pertinent.

His work on simulations of the Brookings econometric model has been referred to in almost all econometric works on the working of macroeconomy and policy simulations. He helped the Ministry of Finance, Government of India, to develop an econometric model to forecast tax revenues and contributed to the UNCTAD Report on Trade and Development Index.

Prof. Nagar's paper (jointly with others) on Interface of Income, Health and Environment: An Econometric Investigation, published in the present volume is nothing short of a path breaking study. It presents a structural model econometrically estimating the interdependent relationships among per capita income, health and respirable particulate air pollution in a simultaneous equations framework for the Indian economy during the last 25 years. In the process, the paper also suggests a new method of constructing indices of a large number of variables by using *all* and not a few selected Principal Components. This can potentially enable one to estimate the effect of any particular variable from the index, if deemed necessary. Use of such indices could help compress the number of variables in the equations enough to convert, as Professor Nagar frequently emphasized to me, an over-identified model to a just identified one, making it possible to estimate the structural parameters from the reduced form. He was greatly excited about the potentialities of such applications of the index developed in this paper. In his hand-written correspondence during the last few months, sent through couriers, he suggested the possibility of writing a joint paper on this theme. As he lived at the other end of Pune city from our residence, when I said to him over the telephone that I would visit him at his residence to discuss this idea in detail, as soon as I get a driver to take me there, he exclaimed in his characteristic way: "Our paper cannot wait for the driver!" Now those words will keep ringing in my ears all the time.

He was working till his very last moment, and has left a great and inspiring legacy for all of us and the future generation of econometricians.

**Messages of those who
were not present for the
Memorial Meeting**

**Prof. Santosh C. Panda, on leave from Delhi School of Economics,
Dean (Economics), South Asian University**

It saddens me to learn that Professor Nagar is no more. I also feel sorry that I am unable to attend the memorial meeting and this message is getting read. Professor Nagar has been my teacher for two years in my M.A. and colleague for many years at D'School. I cherish some fond memories of him and would cite some personal anecdotes, which will indicate his kindness as a person.

The year was 1974. It must have been July 16 because that was always the first teaching day at D'School. Our first lecture was at 9 am and it was on Statistical Methods. Professor Nagar came in and started teaching. Those days we had a corded mike in the LT and often there will be a power cut. It happened the very first day and he moved to the center of the LT and spoke from there so that everybody can listen to him. From there he will walk back to the black board if he has to write something and then come back to the middle. I exactly do not remember now what was taught in the first class but what I remember is that he was an excellent teacher with clarity and my coming to Delhi for my Masters was worthwhile.

During those days there was a great team of Econometricians at DSE led by Professor Nagar. Later we came to know that Theil-Nagar statistic was due to him and we looked at him with awe. He lived a very simple life, cycling all the way from Ashok Vihar and seemed always approachable. Later, with a four-year gap, when I was applying to some U.S. universities for Ph.D. admission and aid, I approached him with some reluctance, thinking that he will not know who I am. To my surprise, he recognized me by face, saying that one does not forget the first class students so easily (those days, the first division students were rather few) and wrote four recommendation letters in a day so that I can collect those and go back to Bhubaneswar where I was teaching then. I have never forgotten this kindness.

When I joined Delhi School as a Reader in 1985, Prof Krishna was the HOD. That day, Prof Krishna was on leave. Prof Nagar was probably officiating as HOD. All formalities were done in a jiffy and he took me personally to the library, to introduce me to the library staff. He introduced me to the library person, saying that do not mistaken him as a student – he has joined as a Reader in the department. I had the benefit of being his colleague for many years until he became the Pro-Vice Chancellor and his visits to the department became fewer.

Professor Nagar was an excellent teacher and researcher and I have seen in him a kind-hearted man. Generations of students still remember him and cherish the way he taught them. When I

assumed the charge of Director, DSE in 2011, one of my classmates, who was an Executive Director in Asian Development Bank in Manila, wrote: “ So, now you will occupy a position which Professor Nagar once occupied! Great feat!!” To many of his students of my genre, this was the ultimate!

We all miss him dearly. May his soul rest in peace!

Professor Jagdish Bhagwati, Columbia University.

"I had the privilege of overlapping with Professor Nagar at Delhi School of Economics. At the time, DSE was filled with other luminaries such as Sukhamoy Chakravarti, Padma Desai, Dharma Kumar, Tapan Raychoudhuri and Amartya Sen. Even among these, Professor Nagar stood out.

Students flocked to him to study Econometrics where he was a giant. And they loved him, clearly, because he always gave of himself to them. K.L. Krishna and V.N. Pandit were among his distinguished students.

With his death, his former colleagues such as myself have lost an illustrious economist and a generous, gentle friend. We will always remember him.

Prof. Kaushik Basu, Professor of Economics and C. Marks Professor of International Studies, Department of Economics, Cornell University, and Senior Vice-President & Chief Economist, World Bank.

I was deeply saddened to hear of the passing of Professor Nagar. For me, in those heydays of the Delhi School of Economics, Nagar Saab was one of the most admired personalities. Because his research was in such a specialized technical field, namely, theoretical econometrics, people outside of a narrow band of specialists may not have known his name. But Professor Nagar's early contributions were of international standing in the same way as those of Amartya Sen, Jagdish Bhagwati and Sukhamoy Chakravarty. He was one of India's earliest Fellows of the Econometric Society. His research on K-class estimators was cutting-edge work. I say this somewhat self-consciously because I have no clue what k-class estimators are. This just shows how specialized his research was. We did research in very different areas but in an odd way Nagar Saab was both a friend and mentor to me.

For me the main reason for admiration went beyond his research. It has to do with the fact that he epitomized what is at times said in the tone of a cliché--simple living and high thinking. He lived simply, coming in to work on a bicycle, taking his teaching seriously, and supervising a large number of students. For a person as famous as him, this simple life-style was something one could not but admire.

I saw him last some three years ago, when he came to see me in the North Block when I worked at the Ministry of Finance. It was the same Nagar Saab I knew many years ago when I worked at the Delhi School of Economics--simple, and soft-spoken, but frail due to his advancing age.

Professor Nagar is a person I will deeply miss.

Prof. Prasanta K. Pattanaik,
University of California, Riverside.

It was with deep sadness that I received the news of Professor Nagar's passing away. Professor Nagar's death is a huge loss for our profession. He was the quintessential scholar with a total commitment to research and teaching. With numerous path-breaking contributions, he was a towering figure in econometrics. But he never rested on his laurels and he continued to explore new ideas and problems till the end of his life. I understand that, even a couple of months before his death, Professor Nagar had discussed with a friend his ideas for a new research project.

Professor Nagar was an extraordinary teacher, who could, with equal ease, communicate with students with very different levels of prior academic training and with very different intellectual orientations. Over his long teaching career, he trained, in different countries, generations of doctoral students, many of whom, in their turn, have become well-known econometricians. Anyone, who had the privilege of knowing Professor Nagar personally, knows that he was also an exceptionally compassionate and generous person; despite his renown as a scholar, he never lost the common touch. I was a colleague of Professor Nagar for four years in the Delhi School of Economics and I shall always cherish the memory of "Nagar Saab's" unfailing kindness to me during those years.

**Prof. Dilip Nachane, Professor Emeritus at Indira Gandhi Institute of Development
Research and Past President, TIES**

Prof. Nagar's sad demise marks the end of a glorious epoch in Indian Econometrics. He is rightly regarded as one of the Founders of Modern Econometrics in India and he nurtured the growth of the subject both in India and abroad through his research papers and scholarly expositions. His contributions in the areas of estimation and inference of simultaneous equation modelling were path breaking and in his lectures and personal interactions he always emphasized the dualism between system and time series identification. He was one of the founding fathers of the TIES and as Editor-in-Chief of the Journal of Quantitative Economics guided its development for the last three decades. While mourning his death, the Indian Econometrics profession can seek solace in the fact that his rich legacy will continue to inspire generations of aspiring econometricians in India and abroad".

Prof. Vikas Chitre, Indian School of Political Economy, Pune

Professor A.L. Nagar, a doyen among world econometricians, Emeritus Professor, and former Pro-Vice Chancellor, Delhi University passed away on February 4, 2014, at the age of 84 years. He was Visiting Fellow at the Indian School of Political Economy during the past three years.

After doing his Ph.D. in econometrics from Netherlands School of Economics, Rotterdam in 1959, Prof. Nagar joined Delhi School of Economics in 1963 and taught there till his retirement, when he was made Pro-Vice Chancellor of Delhi University. He spanned a long and illustrious career in teaching and research in econometrics and economics. He was visiting professor at the Brookings Institution; Wharton School of Finance and Commerce, University of Pennsylvania; University of Western Ontario; Australian National University; McGill University, and many other institutions. He has extensively published in international journals (*Econometrica*, *Journal of American Statistical Association*, *Indian Economic Review*, etc) and authored many books. He was elected Fellow of the Econometric Society in 1971.

Professor Nagar made profound contributions to structural modelling as well as time series econometrics. The Theil-Nagar test for serial correlation in small samples is, of course, well-known. In his highly acclaimed work on k-class estimators of parameters in simultaneous equations models, of which two-stage least squares estimator as well as Limited Information Maximum Likelihood estimators are special cases, Prof. Nagar established the properties and biases in these estimators in small samples. As most simultaneous equations economic models are estimated over time spans often involving relatively small number of observations, these results are very pertinent.

His work on simulations of the Brookings econometric model has been referred to in almost all econometric works on the working of macroeconomy and policy simulations. He helped the Ministry of Finance, Government of India, to develop an econometric model to forecast tax revenues and contributed to the UNCTAD Report on Trade and Development Index.

Prof. Nagar's paper (jointly with others) on Interface of Income, Health and Environment: An Econometric Investigation, published in the present volume is nothing short of a path breaking study. It presents a structural model econometrically estimating the interdependent relationships among per capita income, health and respirable particulate air pollution in a simultaneous equations framework for the Indian economy during the last 25 years. In the process, the paper

also suggests a new method of constructing indices of a large number of variables by using *all* and not a few selected Principal Components. This can potentially enable one to estimate the effect of any particular variable from the index, if deemed necessary. Use of such indices could help compress the number of variables in the equations enough to convert, as Professor Nagar frequently emphasized to me, an over-identified model to a just identified one, making it possible to estimate the structural parameters from the reduced form. He was greatly excited about the potentialities of such applications of the index developed in this paper. In his hand-written correspondence during the last few months, sent through couriers, he suggested the possibility of writing a joint paper on this theme. As he lived at the other end of Pune city from our residence, when I said to him over the telephone that I would visit him at his residence to discuss this idea in detail, as soon as I get a driver to take me there, he exclaimed in his characteristic way: "Our paper cannot wait for the driver!" Now those words will keep ringing in my ears all the time. He was working till his very last moment, and has left a great and inspiring legacy for all of us and the future generation of econometricians.

Prof. U. Sankar, Honorary Professor, Madras School of Economics, Past President, TIES

I am very sorry to hear the demise of Prof A.L.Nagar. When I was in Madison in mid sixties I learnt his contributions to estimation. I had several opportunities to work with him. He was gentle, affectionate and friendly. May his soul rest in peace.

**Dr. Gopal K. Kadekodi, Hon. Professor, CMDR Dharwad, Former
Director, ISEC Bangalore, Former Secretary, TIES**

It is indeed a very sad event with the passing away of Professor A L Nagar. Till I lived in Delhi (1998), I had the most valued opportunities of meeting him and interacting with him, on academic and personal matters. He was my teacher in Econometrics in the year 1965. Those were the days of heights in econometrics with K-class estimation and also Nagar methods.

After I returned from USA in 1973, I renewed my interaction with him, and got to know him much closely. He was always in his best with a 'pan' in his mouth. I had the privilege of working under him as Secretary of TIES. With his guidance, I even managed to distribute a long back log of Mahalanobis Medals in Barcelona.

We were neighbours in Ashok Vihar in Delhi (where he lived for quite a long time). On his bicycle from Ashok Vihar, he used to beat me in time to reach DSE.

A very pleasing personality, always very positive in outlook, always behind students at all times of their problems and difficulties. It is a great loss for all the academicians working on empirical economics.

May God bless him with eternal peace.

Prof. Aman Ullah, University of California, Riverside

Nagar Saheb, as we know, taught Statistics and Econometrics over five decades at various universities around the world. He was the founding pillar of the development of Econometrics in India and published in top journals of Econometrics and Statistics.

His research career began with the most fundamental and pioneering work in the area of Finite Sample Econometrics resulting in the paper “The bias and moment matrix of the general k-class estimators of the parameters in simultaneous equations “, which appeared in *Econometrica* (1959). This contribution of Nagar Saheb, laid the foundation for future generations of econometricians, including many of his students, for developing the finite sample moments of a class of estimators in various econometric models. In fact this is now known in the profession as "Nagar's Expansion" as coined in Sargan (1974).

The evidence of the impact of his theoretical contributions in Econometrics is clearly evident in the edited book in his honor by Carter, Dutta, Ullah (1990) in which contributed papers are published from world leading econometricians.

Apart from contributing to frontier Econometrics research, Nagar Saheb was truly a great mentor, teacher, and PhD dissertation supervisor to legions of students around the world and he always found time to passionately discuss research matters. He was truly a GURU whose door was always open for giving “Shiksha” (education) to his “Shishyas” (students). Also, he was an extremely kind and generous human being who provided unfailing intellectual and moral support. For all, he was not only a great teacher and a visionary researcher but, above all, a humble and caring humanist.

Nagar Saheb was a born teacher who guided us all, made tremendous contributions to both the Indian and the international econometric profession, worked till his last moment, and has left a great and inspiring legacy for all of us and the future generation of econometricians. With his death the Economics, Econometrics, and Statistics profession have lost one of its most influential and pioneering member, a man who was loved and revered by so many of us.

Prof. S.Mahendra Dev, Director and Vice Chancellor, Indira Gandhi Institute of Development Research, Goregaon, Mumbai

Nagar Saheb was one of the outstanding econometricians in India. I had the good fortune of being taught by him in the early 1980s when I was at Delhi School of Economics. He taught us statistics and econometrics. He was a born teacher and made the subject simple so that everyone could follow it. I have benefited a lot in later life from his teaching. His contributions to both Indian and International econometrics (theoretical as well as empirical) are well known. He was supposed to attend the Golden Jubilee conference of TIES at IGIDR in Mumbai in December 2013 but could not attend due to health reasons. We missed him at the Golden Jubilee conference. He was a source of inspiration to many of us in our work and personal lives. With his death the profession has lost one of the greatest econometricians of the country.

Dr. Omkar Goswami, Chairman, Chairman, Corporate and Economic Research Group (CERG) Advisory Pvt. Ltd.

4 February, Professor Aniruddh LaL Nagar passed away in Pune. Nagar Sahab, as he was called by students and colleagues alike, was one of India's finest academic econometricians and a legendary expositor of statistics and econometrics at the Delhi School of Economics (D.School) where he taught for decades. As long as I can remember as an M.A. student and later as a faculty member of the D.School, the first lecture of Monday, Tuesday and Wednesday were Nagar Sahab's for teaching statistics to first year students; and three lectures a week were for those who specialised in 'six-trics', the D.School short form for the final year M.A. option involving six papers in statistics and econometrics.

Nagar Sahab was such a superb teacher that very few students could ever think of bunking his lectures. A standard, and often heard, reason for ending an evening of bridge or post-dinner adda at the university post-graduate hostels such as Gwyer and Jubilee Halls was "Tomorrow is Nagar Sahab's lecture" which meant that you wanted to get up early and be clear headed enough to get to D.School well in time to attend the 9.20 a.m. class. Nagar Sahab's lectures were too brilliant to give them a miss and, in many ways, it was great to start a day with someone giving such a clear-headed exposition of the subject. I could bore you with a bibliography of some of the seminal work that Nagar Sahab did in theoretical econometrics, especially in the area of regressions and simultaneous equation models, but I shan't. This is about remembering great teachers. Nagar Sahab was an internationally acknowledged econometrician; but above all, he was a truly great teacher, one of the giants of D.School. When I joined the faculty, he also taught me, as he did Ashok Lahiri before me, how to enjoy a post-lunch paan with 120-number zarda — a habit that Ashok and I have now forsaken. both these D.School stalwarts I learnt how to plan a lecture and, most importantly, how to use a large blackboard so that, at the end of a class, you could take away the key elements of an hour-long discourse just by looking at what was left on the board.

Centre for Economic Studies and Planning, School of Social Sciences, Jawaharlal Nehru University - Prof. Jayati Ghosh, Chairperson, CESP

The faculty and students of CESP, JNU would like to express a deep sense of sorrow at the passing away of Professor AL Nagar. Prof. Nagar was a doyen of theoretical econometrics and empirical economic investigations into the Indian economy, as well as a brilliant teacher who trained and inspired generations of students and researchers. We remember with appreciation his acute mind, his important insights and the clarity with which he expressed them, and the generosity and simplicity of his nature. His death is a loss not only for economics and social sciences but for the entire academic community in India and elsewhere. We extend our sincere condolences to his family and to his former colleagues at the Delhi School of Economics.

**Dr. Shridhar Dwivedi, Personal Physician of Prof. A. L. Nagar, and
Professor of Medicine Hamdard Institute of Medical Sciences & Research, Jamia
Hamdard, Hamdard University**

Nagar he was – A Physician's Perception

Almost two decades back spring at its pleasant best,
Phone call from UCMS principal office,
Beloved Nagar sir unwell,
Till then I knew only one Nagar,
The great Hindi writer,
Amrit Lal Nagar chewing betel quid ,
Smiling always symbolizing Lucknow culture,
Encyclopedic Indologist he was |

This time it was Ashok Vihar near DU,
Home of that economist great,
Nagar sir with infectious smile,
Quid in his mouth left eye bit wide,
Angle of mouth asymmetrical Bell's it was,
Sure enough lurking diabetes in hide,
Wary about medicines battery of tests,
Reluctantly accepted diabetes in stride |

Hard to say was it famous 'Gujrati genes',
Tobacco masala tea epigenetics,
Weakness for sweets terrible stress,
Caused diabetes and Bell's |

Wonderful patient a bit of persuasion,
Madam Meera's untiring effort quit tobacco,
Trusted heavily his physician far way from new abode,
Unseen such a humility fought diabetes in own mode |

Years passed by come this February,
Early morning SMS from Pune,
Sir no more towering figure gone,
Lost feeling his ever smiling image in mind,
Came sixteenth April twenty fourteen D School,
I can see lecture halls lawns staff rooms tea stall,
Standing silent paying respect to its departed beloved,
His invisible script still shining behind blackboard |

An unmatched embodiment of teaching and research,
Early morning cycling all the way entering dot nine,
Lecturing with passion biting December cold,
Power gone moving middle of hall writing back & forth,
Black board filled with intricacies of econometrics,

Where are the teachers of such high order and caliber,
DSE bereft of that shadow support and bliss |

A treasure trove we have lost great void in so many life,
Colossus institution in himself friend philosopher guide,
Heartfelt I pray Lord may his soul rest in peace,
Solace to his countless disciples family and fraternity,
Econometrician 'Anirudh' universally acclaimed 'Lal' of D School,
Loveable affable true 'Nagar' great academician humane he was |

Abbreviations:

UCMS – University College of Medical Sciences – constituent medical college of Delhi University

DU – Delhi University

Bell's – Bell's palsy in which face becomes asymmetrical and eye lids become weak to cover eye fully when desired .One of the cause is hidden diabetes

DSE – Delhi School of Economics

D School – Delhi School of Economics

Meera – Mrs. A L Nagar