

# TRABAJOS DE ESTADISTICA

Review published by "Instituto de Investigaciones Estadísticas" of the "Consejo Superior de Investigaciones Científicas." Madrid, Spain.

Vol. VII	CONTENTS	Cuaderno III
B. M. BENNETT.....	On the variance stabilizing properties of certain logarithmic transformations.	
ANGEL VEGAS.....	Inferencia estadística en los modelos biométricos y su aplicación al seguro de vida.	
SIXTO RIOS.....	Sobre la noción de estimador consistente.	
NOTAS.		
Algunas notas sobre la Estadística en Holanda.....		AZORIN
Programación lineal, un instrumento matemático al servicio de los Empresarios		E. CANSADO.
CRONICAS.	BIBLIOGRAFIA.	CUESTIONES.

For everything in connection with works, exchanges and subscription write to Professor Sixto Ríos, Instituto de Investigaciones Estadísticas of the Consejo Superior de Investigaciones Científicas (Serrano, 123), Madrid, Spain. The Review is composed of three fascicles published three times a year (about 350 pages), and its annual price is 100 pesetas for Spain and South America and \$4.00 U.S.A. for all other countries.

## THE 1955-56 PROCEEDINGS

### of the Business and Economic Statistics Section of the American Statistical Association

include a wealth of information, presented by outstanding authorities, designed to help deal with problems confronted by business economists and business statisticians in their day-to-day activities.

#### *How Stable the Economy?*

Criteria for Private Debt \* The Role of SUB \* Costs and Prices \* Productivity Cycles \* Stability vs. Instability

#### *Long-Term Growth*

Financial Implications \* Measuring Growth Potentials \* Projections Critically Appraised

#### *Progress in Business Statistics*

Impact of Electronic Computing \* Flow of Funds \* Labor Turnover \* Consumer Price Indexes \* An Integrated Federal Program

#### *Forecasts and Forecasting*

The Business Outlook \* Demands for Durable Goods \* Forecasting in Industry \* The Stock Market

The material contained in the Proceedings reflects the current state of thinking on questions which are not only of continuing interest to the academician but are crucial also in shaping decisions in business and Government. The price is \$3.75 (\$3.25 for members of the American Statistical Association). Copies of the 1954 Proceedings may be obtained for an additional charge of only \$1.00 if ordered in conjunction with these Proceedings. Please address orders to the:

# ASA

**AMERICAN STATISTICAL ASSOCIATION**  
BEACON BUILDING  
1757 K STREET, N. W.  
WASHINGTON 6, D. C.

# BIOMETRIKA

Volume 43

Contents Parts 3 and 4, December 1956

ROYSTON, Erica. Studies in the history of probability and statistics. III. A note on the history of the graphical presentation of data. WILLIAMS, C. B. Studies in the history of probability and statistics. IV. A note on an early statistical study of literary style. WALKER, A. M. A goodness of fit test for spectral distribution functions of stationary time series with normal residuals. GANI, J. Sufficiency conditions in regular Markov chains and certain random walks. DERMAN, C. Some asymptotic distribution theory for Markov chains with a denumerable number of states. LAWLEY, D. N. A general method for approximating to the distribution of likelihood ratio criteria. JAMES, G. S. On the accuracy of weighted means and ratios. BAILEY, N. T. J. On estimating the latent and infectious periods of measles. II. Families with three or more susceptibles. BAILEY, N. T. J. Significance tests for a variable chance of infection in chain-binomial theory. WHITTLE, P. On the variation of yield variance with plot size. WATSON, G. S. and WILLIAMS, E. J. On the construction of significance tests on the circle and the sphere. QUENOUILLE, M. H. Notes on bias in estimation. ROY, S. N. & MITRA, S. K. An introduction to some non-parametric generalizations of analysis of variance and multivariate analysis. KAMAT, A. R. A two-sample distribution-free test. BARTON, D. E. Addendum. The limiting distribution of Kamat's test statistics. RAY, W. D. Sequential analysis applied to certain experimental designs in the analysis of variance. BROADBENT, S. R. Lognormal approximation to products and quotients. BLISS, C. I., COCHRAN, W. G. and TUKEY, J. W. A rejection criterion based upon the range. CROW, E. L. Confidence intervals for a proportion.

## Miscellanea

Contributions by ANSCOMBE, F. J., BLANK, A. A., COX, D. R., DAVID, F. N., DAVID, H. A., DOUGLAS J. B., GILBERT, N. E. G., HUTTLY, N. A., MOORE, P. G., REIERSØL, O., RUBEN, H., STUART, A., TAYLOR, J., WATSON, G. S.

## Corrigenda

GANI, J.; and *Tracts for Computers XXVI*

## Reviews

*Other Books Received*

The subscription price, payable in advance, is 45s. inland, 54s. export (per volume including postage). Cheques should be drawn to Biometrika and sent to "The Secretary, Biometrika Office, Department of Statistics, University College, London, W.C. 1." All foreign cheques must be in sterling and drawn on a bank having a London agency.

# MATHEMATICAL REVIEWS

*A journal containing reviews of the mathematical literature of the world, with full subject and author indices*

Publication of this journal is sponsored by the American Mathematical Society, Mathematical Association of America, Institute of Mathematical Statistics, London Mathematical Society, Edinburgh Mathematical Society, Union Matematica Argentina, and others.

Subscriptions accepted to cover the calendar year only.  
Issues appear monthly except July. \$20.00 per year.

*Send subscription order or request for sample copy to*

AMERICAN MATHEMATICAL SOCIETY  
80 Waterman Street, Providence 6, Rhode Island

# ECONOMETRICA

Journal of the Econometric Society  
Contents of Vol. 25, No. 1 - January, 1957

- ARTHUR SMITHIES ..... Economic Fluctuations and Growth
- TJALLING C. KOOPMANS AND MARTIN BECKMANN ..... Assignment Problems and the Location of Economic Activities
- R. L. BASMANN ..... A Generalized Classical Method of Linear Estimation of Coefficients in a Structural Equation
- HARRY M. MARKOWITZ AND ALAN S. MANNE ..... On the Solution of Discrete Programming Problems
- H. THEIL ..... Linear Aggregation in Input-Output Analysis
- G. STUVEL ..... A New Index Number Formula
- A. CHARNES AND W. W. COOPER ..... Nonlinear Power of Adjacent Extreme Point Methods in Linear Programming
- W. J. BERGER AND EDWARD SAIBEL ..... Power Series Inversion of the Leontief Matrix
- H. UZAWA ..... Note on the Rational Selection of Decision Functions
- S. FUJINO ..... A Theory of Economic Fluctuations in a Capitalist Economy—Economics of Cycles and Growth, by Michio Morishima (A Review Article)
- BOOK REVIEWS**
- Flow of Funds in the United States 1959-1953* (Board of Governors of the Federal Reserve System). Review by Gerhard Colm
- Rank Correlation Methods* (M. G. Kendall). Review by Wassily Hoeffding
- Politicheskaya ekonomiya: Uchebnik (Political Economy: Textbook)* (Academy of Sciences of the USSR, Economic Institute). Review by Eberhard Fels
- A (ndrei) A (ndreevich) Markov, Ibrannye trudy: teoriya chisel, teoriya vero'atnostei (Markov's Selected Works on the Theory of Numbers and the Theory of Probability)* (Yu. V. Linnik, ed.). Review by Eberhard Fels
- Kurs teorii vero'atnostei (A Course in the Theory of Probability)* (B. V. Gnedenko). Review by Eberhard Fels
- Income of the American People* (Herbert P. Miller). Review by Richard Ruggles
- La "Cowles Commission" ed. i modelli econometrici* (Adalberto Predetti). Review by R. S. Eckaus
- The Theory of Economic Growth* (W. Arthur Lewis). Review by K. K. Kuribara
- Interindustry Economic Studies: A Comprehensive Bibliography on Interindustry Research* (Vera Riley and Robert Loring Allen). Review by R. N. Grosse
- Analysis of Confounded Factorial Designs in Single Replications* (F. E. Binet, R. T. Leslis, S. Weiner, and R. L. Anderson). Review by O. Kempthorne
- Les Cadres de l'Industrie et du Commerce en France* (François Jaquin). Review by Walter Froehlich
- The Failures of Economics: A Diagnostic Study* (Sidney Schoeffler). Review by Gregor Sebba

## JOURNAL OF THE ROYAL STATISTICAL SOCIETY

Series B (Methodological)

Vol. XVIII, No. 1, 1956

- Some Tests of Significance with Ordered Variables ..... F. N. DAVID AND N. L. JOHNSON. (With Discussion).
- Economic Choice of the Amount of Experimentation ..... P. M. GRUNDY, M. J. R. HEALY, AND D. H. REES. (With Discussion).
- On a Test of Significance in Pearson's Biometrika Table (No. 11) ..... R. A. FISHER.
- A Test of Significance for an Unidentifiable Relation ..... P. A. P. MORAN.
- Confidence Limits for the Gradient in the Linear Functional Relationship ..... MONICA A. CREASY.
- Algebraic Theory of the Computing Routine for Tests of Significance on the Dimensionality of Normal Multivariate Systems ..... F. E. BINET AND G. S. WATSON.
- Some Notes on Ordered Random Intervals ..... D. E. BARTON AND F. N. DAVID.
- A Sequential Test for Randomness ..... D. J. BARTHOLOMEW.
- Partitions in More Than One Dimension ..... J. H. BENNETT.
- On the Estimation of Small Frequencies in Contingency Tables ..... I. J. GOOD.
- An Elementary Method of Solution of the Queueing Problem with a Single Server and Constant Parameters ..... D. G. CHAMPERNOWNE.
- Random Queueing Processes with Phase-type Service ..... R. R. P. JACKSON.
- The Within-Animal Bioassay with Quantal Responses ..... P. J. CLARINGBOLD.

The Royal Statistical Society, 21, Bentinck Street, London, W. 1



# THE INSTITUTE OF MATHEMATICAL STATISTICS

(Organized September 12, 1935)

## OFFICERS

### *President:*

Alexander M. Mood, General Analysis Corporation, 710 Wilshire Blvd., Santa Monica, California

### *President-Elect:*

L. J. Savage, Committee on Statistics, University of Chicago, Chicago 37, Illinois

### *Secretary:*

G. E. Nicholson, Jr., Department of Statistics, University of North Carolina, Chapel Hill, North Carolina

### *Treasurer:*

A. H. Bowker, Department of Statistics, Stanford University, Stanford, California

### *Editor:*

T. E. Harris, The RAND Corporation, 1700 Main Street, Santa Monica, California

The purpose of the Institute of Mathematical Statistics is to encourage the development, dissemination, and application of mathematical statistics.

Membership dues including a subscription to the ANNALS OF MATHEMATICAL STATISTICS are \$10.00 per year for residents of the United States or Canada and \$5.00 per year for residents of other countries. There are special rates for students and for some other classes of members. Inquiries regarding membership in the Institute should be sent to the Secretary of the Institute.

---

*(Continued from inside front cover)*

mathematical formulae. The difference between capital and lower-case letters should be clearly shown; care should be taken to avoid confusion between such pairs as zero and the letter O, the numeral 1 and the letter l, numeral 1 used as superscript and prime ('), alpha and a, kappa and k, mu and u, nu and v, eta and n, etc. Subscripts or superscripts should be clearly below or above the line. Bars above groups of letters (e.g.,  $\overline{\log x}$ ) and underlined letters (e.g.,  $\underline{x}$ ) are difficult to print and should be avoided. Symbols are automatically italicized by the printer and should not be underlined on manuscripts. Boldface letters may be indicated by underlining with a wavy line on the manuscript; boldface subscripts and superscripts are not available. Complicated exponentials should be represented with the symbol exp. In writing square roots the fractional exponent is preferable to the radical sign. Fractions *in the body of the text* (as opposed to displayed expressions) and fractions occurring in the numerators or denominators of fractions are preferably written with the solidus; thus  $(a + b)/(c + d)$  rather than  $\frac{a + b}{c + d}$ .

Authors will ordinarily receive only galley proofs. Fifty reprints without covers will be furnished free. Additional reprints and covers will be furnished at cost.

Notes (*continued*)

A Central Limit Theorem for Multilinear Stochastic Processes	EMANUEL PARZEN	252
On the Enumeration of Decision Patterns Involving $n$ Means	R. L. WINE AND JOHN E. FREUND	256
Percentiles of the $\omega_n$ Statistic.....	B. SHERMAN	259
On the Serial Test for Random Sequences.....	I. J. GOOD	262
On the Specification Error in Regression Analysis	H. WOLD AND P. FAXÉR	265
Sets of Measures Not Admitting Necessity and Sufficient Statistics or Subfields.....	T. S. PITCHER	267
Correction to "A Note on Combined Interblock and Intra-block Estimation in Incomplete Block Designs".....	D. A. SPROTT	269
News and Notices.....		269
Report of the Editor.....		279
Publications Received.....		279

## MEETINGS OF THE INSTITUTE TENTATIVE SCHEDULE

ANNUAL MEETING—*Atlantic City, New Jersey*

September 10–13, 1957

Abstracts should be submitted in duplicate to the Editor, preferably on abstract blanks, which can be obtained from the IMS Secretary. Abstracts must be received at least 47 days before the first day of the meeting at which they are to be presented, indicating whether presented by title or in person. (Only one contributed paper may be given in person at any one meeting.) They may be printed prior to the publication of the report of the meeting. Those received by April 30 will appear in the *September Annals*, by July 31 in *December*, etc. Abstracts should be limited to 200 words or the equivalent, and should avoid displayed expressions and complicated formulae. They can be accepted from non-members of the IMS only if transmitted by members.