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Two New Zealand pioneer econometricians

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Abstract

Two distinguished New Zealanders pioneered some of the foundations of modern econometrics. Alec Aitken, one of the most famous and well-documented mental arithmeticians of all time, contributed the matrix formulation and projection geometry of linear regression, generalized least squares (GLS) estimation, algorithms for Hodrick Prescott (HP) style data smoothing (six decades before their use in economics), and statistical estimation theory leading to the Cramér Rao bound. Rex Bergstrom constructed and estimated by limited information maximum likelihood (LIML) the largest empirical structural model in the early 1950s, opened up the field of exact distribution theory, developed cyclical growth models in economic theory, and spent nearly 40 years of his life developing the theory of continuous time econometric modeling and its empirical application. We provide an overview of their lives, discuss some of their accomplishments, and develop some new econometric theory that connects with their foundational work.

Keywords:

Aitken | Cramér Rao bound | HP filter | minimum variance unbiased estimation | projection | GLS | Bergstrom | continuous time | exact distribution | LIML | UK economy | pioneers of econometrics

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Notes

1. The matrix treatment of correlation and scatter analysis was originally promoted by Frisch (1929).

2. The Guiness book of records and internet list some astonishing recently recorded feats of memory and mental arithmetic of the same genre as those demonstrated by Aitken. Daniel Tammet (an autistic savant) is said to have recited π to 22,514 digits in 5 hours 9 minutes; Shakuntala Devi, known as the human computer in India, multiplied two 13 random digit numbers (picked by the computer science department at Imperial College) in 28 seconds in 1980 (a feat mentioned in the Guiness book of records, 1995, p. 26). One of the famous Chinese Kaohsiung siblings, Wang Chia-lu, multiplied two 13 digit numbers in 26.51 seconds in 2000. Alexis Lemaire (who, at the time of writing, is a PhD student in artificial intelligence) found the 13th root of a random 200 digit number in 70 seconds at the London Science Museum.

3. This paper is usually cited as Whittaker (1923), but in the journal records on Cambridge Online Vol. 41 is listed as appearing in February 1922. At the head of the article itself, it is recorded that it was ‘received in amended form’ in August 1923.

Additional information

Notes on contributors

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