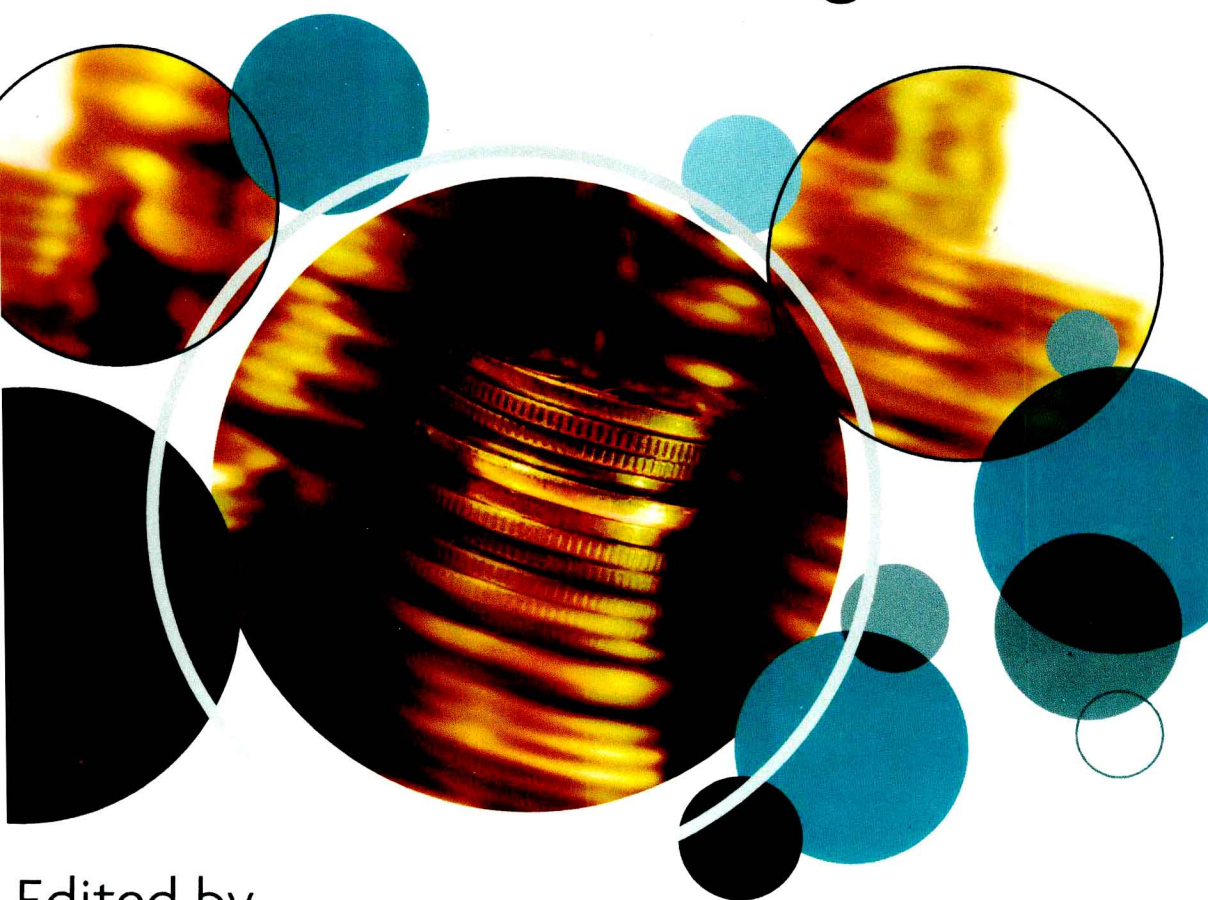


Volume 3



**Trygve Haavelmo,
James J. Heckman,
Daniel L. McFadden,
Robert F. Engle
and Clive W.J. Granger**



Edited by
Howard R. Vane and **Chris Mulhearn**

PIONEERING PAPERS OF THE NOBEL MEMORIAL LAUREATES IN ECONOMICS

Trygve Haavelmo, James J.
Heckman, Daniel L.
McFadden, Robert F. Engle
and Clive W.J. Granger

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General Introduction

Howard R. Vane and Chris Mulhearn

The ‘Sveriges Riksbank (Bank of Sweden) Prize in Economic Sciences in Memory of Alfred Nobel’, popularly known as the Nobel Prize in Economics, was first awarded in 1969. At the time of writing (July 2008), over the 39 years since its inception, there have been some 61 Nobel Laureates in economics. The Prize, like the Nobel awards in other disciplines, recognises specific discoveries, achievements or breakthroughs in economic science, rather than outstanding economists or a person’s lifetime work.¹

The aim of this series is to bring together, in a number of volumes, *some* of the pioneering papers of the Nobel Memorial Laureates that have helped shape the development of modern economic thought. Because the work of the Prize winners spans a wide range of fields it is possible to categorise the awards in a number of ways. However, as Lindbeck (1985; 2001) acknowledges, any chosen classification is going to be ‘rather arbitrary’ because of the ‘overlapping’ and, in some cases, ‘multidimensional nature’ of the Laureates’ contributions (see also Chapter 1 of Vane and Mulhearn, 2005). Wherever possible, we have sought to include in each volume Laureates working in the same *broad* area of study. In some cases deciding which Laureate’s papers should be grouped together was relatively straightforward because the sub-disciplines were readily identifiable, for example, in the case of the pioneering game theory papers of Harsanyi, Nash, Selten, Aumann and Schelling. For other volumes we have sought to identify a common link underlying the Laureates’ work. For example, in the case of the volume containing work by Friedman, Lucas and Phelps an initial unifying theme is their research in macroeconomics and, more specifically, their analyses of tradeoffs, most notably between inflation and unemployment. In some of the volumes where it is less clear that there is a single common thread we have grouped together the papers of Laureates working in two or more fields.

In this general introduction to the series we would like to highlight six main points.

- First, in order to keep the length and cost (given copyright permission fees) of each volume to manageable proportions we have imposed an arbitrary limit of not more than six papers under each Laureate’s name per volume (with one exception, Paul Samuelson whose influence on economics has been so profound and wide-ranging).
- Second, to avoid duplication across the series, no paper appears in more than one volume. For example, the joint papers by Franco Modigliani and Merton Miller in the field of financial economics only appear under Merton’s name and not in the volume containing papers by Modigliani.
- Third, the pioneering contributions of certain Laureates appear in book form rather than in papers. For example, some of Milton Friedman’s most influential work appears in his book *A Monetary History of the United States, 1867–1960*, co-authored with Anna J. Schwartz. In cases such as this we have sought to include some representative paper (for

example, Friedman and Schwartz's 1963 *Review of Economics and Statistics* paper on 'Money and Business Cycles'; paper 4, Volume 1), or the Laureate's Nobel Lecture (paper 6, Volume 1).

- Fourth, the impact of a Laureate's work is not necessarily just confined to one field of study or, within one field, a particular topic or theme. For example, in the case of Robert E. Lucas, Jr. his classic 1988 *Journal of Monetary Economics* paper 'On the Mechanics of Economic Development' (paper 12, Volume 1), in which he highlighted the importance of human capital accumulation and learning by doing, has (together with the work of Paul Romer) led to a resurgence of interest in the analysis of economic growth and, most notably, the development of endogenous growth theory. This important contribution might not be apparent to someone looking at the Prize citation for Lucas, which is 'for having developed and applied the hypothesis of rational expectations, and thereby transformed macroeconomic analysis and deepened our understanding of economic policy' (Nobel Foundation, 2008).
- Fifth, while the pioneering papers of some Laureates are easily identifiable, for others who have made numerous breakthroughs – such as Paul Samuelson who has contributed fundamental insights into nearly every major area of economic theory – we need to stress that, at the margin, the selection of papers involves a degree of personal judgement. No doubt other economists would have preferences different to our own. In choosing the papers for each volume we have been guided, in part, by the Laureates' statements of their principal contributions to economics as *they* perceive them (see Blaug, 1999; Blaug and Vane, 2003), and in certain cases by Laureates who, in correspondence, have indicated which papers they wanted included under their name.
- Finally it is important to stress that the rationale behind this series is *not* to produce either the *Collected Works* of individual Nobel Laureates or the *Collected Writings* of one or more Laureates on a particular topic. Instead our intention is to bring together in a series of volumes some of the pioneering papers of the Nobel Memorial Laureates that have shaped the development of modern economic thought and to set in context the selection of papers chosen for each volume by an editorial introduction to the Laureates' careers and main published works.

Note

1. The five original Nobel Prizes – in Physics, Chemistry, Physiology or Medicine, Literature and Peace – have been awarded annually since 1901.

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Part I
Trygve Haavelmo

Introduction to Part I: Trygve Haavelmo (1911–99)

Trygve Haavelmo was born in Skedsmo, near Oslo in Norway in 1911. He studied economics at the University of Oslo and was awarded his degree in 1933. The 1969 Nobel Laureate Ragnar Frisch was Professor of Economics at Oslo at this time and Haavelmo started working for Frisch after his graduation at the newly established Institute of Economics. In 1938 Haavelmo moved to Denmark, taking up an appointment as Lecturer in Statistics at the University of Aarhus. The following year he left for the United States on a Fulbright scholarship and remained there for the duration of the Second World War, both as a student (supported by the Rockefeller Foundation in 1940–41), and – following the German invasion of Norway – as a civil servant employed by the Norwegian government at its Shipping and Trade Mission in New York City.¹ Haavelmo completed his doctoral thesis at Harvard University in 1941 and submitted it to the University of Oslo after the war (he was awarded his PhD in 1946); in the interim the thesis was published in *Econometrica* as ‘The Probability Approach in Economics’. This work (Haavelmo, 1944 – paper 3) was instrumental in the Royal Swedish Academy’s decision to award the Nobel Prize to Haavelmo (Nobel Foundation, 2008). In 1946 Haavelmo joined the Cowles Commission – then in Chicago – before returning to Oslo in 1947 to work on plans for the reconstruction of the Norwegian economy (Moene and Rodseth, 1991). In 1948 he was appointed Professor of Economics and Statistics at the University of Oslo; he retired from this post in 1979.

Haavelmo is remembered by those who knew him as a modest, even shy man who refused many of the honours that were offered to him, although he was president of the Econometric Society in 1957 and he accepted membership of the Danish Academy of Sciences in 1975 (Christiansen and Rodseth, 2000). His gracious Nobel banquet speech suggests that it is economists in general that are being honoured by his award, rather than him in particular. Haavelmo was awarded the Nobel Memorial Prize in Economics in 1989 ‘for his clarification of the probability theory foundations of econometrics and his analyses of simultaneous economic structures’ (Nobel Foundation, 2008).

Haavelmo’s doctoral thesis provided ‘the foundation of modern econometric methods’ (Nobel Foundation, 2008). This work proposed a new ‘probability approach’ in attempting to resolve some of the key problems in econometrics that had been previously explored by Ragnar Frisch. The most fundamental of these is the identification problem: that is, isolating causal parameters in economic data. A major challenge here is that a range of different economic models may be consistent with the same data (Heckman, 2000). How are appropriate choices to be made across this range? In the 1930s, Frisch had attempted to uncover causal economic relationships by means of ‘confluence analysis’. This involved running regressions on all possible relationships on a set of variables in order to work towards the true causations lurking in the data (Moene and Rodseth, 1991). Haavelmo, while generously attributing many of his ideas to Frisch,

proposed an alternative method: the prior specification of an economic model – formulated in probabilistic terms – that could be used to guide the statistical measurement, collection and interpretation of data (ibid.; Nobel Foundation, 2008). Haavelmo was also the first to clearly distinguish the identification and estimation problems in econometrics (Heckman, 1992; see also Morgan, 1990).

Again following Frisch, Haavelmo stressed the importance for policy analysis of delineating highly ‘autonomous’ structural relationships in economic models (Nerlove, 1990). More autonomous relationships hold under a wider variety of circumstances and are therefore particularly useful for the evaluation of alternative economic policies and institutional arrangements (Christiansen and Rodseth, 2000). It has also been suggested that Haavelmo’s emphasis on the significance of autonomy in economic modelling might have obviated the need for the Lucas critique:² there would have been no temptation to predict the consequences of alternative policy changes within a macroeconomic model as the behaviour of economic agents cannot be modelled at the necessary level of autonomy (Moene and Rodseth, 1991). Although Haavelmo’s Nobel citation focuses on his doctoral thesis, two other papers in which he extended and applied his insights are also highlighted: Haavelmo (1943a – paper 1) and, with M.A. Girshick, Girshick and Haavelmo (1947 – paper 4). Also notable is a further paper from the 1940s (Haavelmo, 1943b – paper 2) in which Haavelmo takes issue with Keynes following Keynes’s critique of Jan Tinbergen’s pioneering work on economic modelling (see Tinbergen, 1939; Keynes, 1939; Tinbergen, 1940).

According to the Royal Swedish Academy of Sciences (1990, p.12), ‘Haavelmo’s doctoral thesis had a swift and path-breaking influence on the development of econometrics.’ In particular it was adopted by the Cowles Commission as its econometric *modus operandi*, and directly influenced the work of other Nobel Laureates such as Koopmans and Klein (Haavelmo, 1997; Heckman, 1992).³

In the 1950s Haavelmo turned his attentions away from econometrics narrowly defined and concentrated instead on economic theory (Moene and Rodseth, 1991). His reasons for this switch – mostly to do with the need to improve theory – were outlined in his 1957 presidential address to the Econometric Society and reprised in his Nobel lecture (Haavelmo, 1958; 1997). The practical outcome included six books, two of which have been published in English: *A Study in the Theory of Economic Evolution* (1954) and *A Study in the Theory of Investment* (1960). Haavelmo’s name is also commonly associated with the theorem discussed in ‘Multiplier Effects of a Balanced Budget’, published in *Econometrica* in 1945. Although he was not the first to highlight the non-neutrality of increases in government expenditure balanced by higher taxes, his proof of the phenomenon was sufficient for it to become known as ‘Haavelmo’s theorem’ (Nerlove, 1990).

Notes

1. For a discussion of Haavelmo’s extended stay and work in the United States, see Bjerkholt (2007).
2. Named after Robert Lucas Jr, the 1995 Nobel Memorial Laureate.
3. For discussions of the limits to the work of the Cowles Commission, see Heckman (1992; 2000).

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