

IN MEMORIAM
Edward F. Denison
1915—1992

Edward F. Denison was one of the pioneers in the development of the U.S. National Income and Product Accounts. Subsequently, he made a reputation among economists internationally as the originator of “growth accounting,” which involves identifying and quantifying the sources of growth in real national income/product.

Ed died in his sleep on October 23, 1992, after a day in his office at the Brookings Institution. He was born December 18, 1915, in Omaha, Nebraska. A graduate of Oberlin College, in 1936, he received his doctorate in economics from Brown University on June 14, 1941—the same day as he was married to Elsie Lightbown, who survives him.

Although he had been an Instructor at Brown, soon after his marriage Ed and Elsie came to Washington and he worked in the National Income Division of the Bureau of Foreign and Domestic Commerce. He was named acting chief of the division in 1948.

The early 1940s were a critical period of transition for the National Income Division. Beginning with the first estimates, going back to 1929, and published by the Department of Commerce in 1934, the official series were confined to national income and related aggregates by types of income. Work was also going on at the National Bureau of Economic Research and elsewhere on components of final expenditures. In the United Kingdom, under the direction of Keynes in 1940, Richard Stone and others prepared estimates of both national income and expenditures, which were published by the British Treasury in the 1941 Budget.

Work on selected final expenditures was begun in the U.S. National Income Division in 1940. When Milton Gilbert became Division Chief in 1941 he was determined to develop complete estimates of gross national product from the expenditure side, to facilitate current business analysis, forecasting, and as background for planning wartime defense expenditures. Ed was initially assigned the task of estimating expenditures for services. In May 1942 the first estimates of GNP were published in the *Survey of Current Business*, covering the years 1929–41, and quarterly estimates soon followed.

Subsequently Denison became a major player in developing the estimates within a framework of interlocking sector accounts, as published in 1947. It was considered desirable to coordinate the structure, concepts, and methodology used in the accounts with the British and Canadians. This was done in a meeting in Washington in September 1944, as described by Denison in his account, “Report on Tripartite Discussions of National Income Measurement” (Studies in Income and Wealth, Vol. 10, NBER, New York, 1947). The consensus there was a major step toward developing the standardized systems of national accounts subsequently adopted by the OECD and the United Nations.

When Denison was named a Distinguished Fellow of the American Economic Association the citation mentioned the work he had done with Milton Gilbert, George Jaszi, and Charles Schwartz in preparing new measures of national income and product during the 1940s.

In 1945 Denison was assigned to the U.S. Strategic Bombing Survey in Europe as chief of the aggregates unit. It was there that the present writer met Ed and several others from the Department of Commerce and, after demobilization, accepted an offer from the Department in early 1946. One of my assignments there was to “deflate” the GNP, and to develop methodology for the double-deflation or gross product originating in various industries. The resulting real GNP estimates (published in January 1951) and subsequent real product by industry estimates, were a necessary input into my later studies of total factor productivity for the National Bureau of Economic Research, and for Denison’s subsequent analyses of economic growth. Indeed, our years at the Office of Business Economics were an important training ground for both of us in our subsequent careers.

In 1949 Ed was promoted to the position of Assistant Director and Chief Economist of the OBE. This was a challenging assignment which he performed well. He was still involved to some extent in national income work, and remained active in both the Conference on Research in Income and Wealth and the International Association. However, he did not have as much time for his own research as he would have liked, and he left OBE in 1956 to join the Committee for Economic Development (CED).

At the CED, in association with the Research Director Herbert Stein (see Stein’s “Memories of a Model Economist” in *the Wall Street Journal* of November 3, 1992) Ed became heavily involved in studies of the sources of economic growth and policies to promote growth. He became dissatisfied with studies that partitioned economic growth rates into the portions explained by rates of change in tangible factor inputs and in the productivity “residual,” with passing references to the determinants of the latter variable. Ed went further and decomposed the residual, assembled and weighted indicators of rates of change in all the major causal variables except technological advances which he approximated with reference to his narrower residual. In examining policy options to accelerate growth, Ed introduced needed realism into the discussion by noting how little many of the options would contribute to growth and how expensive it would be to achieve any significant increase in growth rates. His analysis was published in the landmark 1962 CED report, *The Sources of Economic Growth in the United States and the Alternatives Before Us*.

At the Brookings Institution, which Denison joined in 1963, he applied his new growth accounting methodology to eight other OECD countries in *Why Growth Rates Differ* (1967), and, subsequently, in *How Japan’s Economy Grew So Fast* (with W. K. Chung, 1976). These volumes brought his work to the attention of economists throughout the industrialized world. Ed also updated and refined his estimates of sources of growth in the United States in a couple of other volumes. His final volume in 1989 went beyond the macro-economic level to examine output and productivity by industry, and to suggest comparison by product line.

Ed's personal life was as exemplary as his professional life. Ed and Elsie raised two children and were blessed with four grandchildren. The memorial service held at Westminster Presbyterian Church on October 27, 1992, testified to the warm and mutually supportive atmosphere within the family. The subsequent service at the Brookings Institution reflected the high esteem in which Ed was held by his colleagues and other friends. Brookings President, Bruce MacLaury, spoke of the "great contribution he made to the intellectual and collegial life of this Institution. He was never too busy to spare time to chat with his colleagues, young and old, about issues large and small. People who disagreed with Ed knew they were up against a tough adversary. . . . But they also knew that Ed was unfailingly a friend."

Others remarked on Ed's love of sports, and how knowledgeable he was, especially about baseball and basketball. He played a good game of golf.

Throughout the almost half century that I knew Denison, our relationship was friendly, cordial, and cooperative. The last major visit my wife, Maxine, and I had with Ed and Elsie was in April 1992 when we participated in a conference on economic growth, honoring Angus Maddison on his 65th birthday, at the University of Groningen in The Netherlands. We had several happy excursions together and sat together with the Maddisons at the farewell dinner. The festschrift containing the proceedings of the conference is being published by North Holland.

Maddison drew from the studies of both of us in his work, and he used a modified version of Denison's growth accounting approach in his article, "Growth and Slowdown in Advanced Capitalist Economies" (*Journal of Economic Literature*, June 1967).

I hold Denison and his work in high esteem. I admired his keen intellect, high productivity, and combination of insight and vision with a capacity for careful and detailed quantitative work. On a personal level I admired his happy family life, his geniality, and his generosity towards his friends. Along with many others, I miss Ed Denison very much.

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