Theodore W. Schultz[1]

By James R. Walker
Department of Economics
University of Wisconsin-Madison
April 20, 2007

Theodore Schultz shared the Nobel Prize in 1979 with Sir Arthur Lewis "for pioneering research into economic development research with particular consideration of the problems of developing countries". Early in his career, Schultz studied agricultural organization and production which evolved into studies of economic growth and finally into studies of economic development. His training and early contributions were in agricultural economics, but it is too limiting to label him an agricultural economist (as did the press release announcing his Nobel Prize award). He made seminal contributions in agriculture but also was a twentieth century pioneer advocating the importance human capital and particularly education for understanding economic growth in developed and developing countries. In this brief sketch I review his intellectual contributions.

Biographical Details

T.W Schultz was born on April 30, 1902 in South Dakota and died on February 26, 1998. He received his undergraduate degree in 1927 from South Dakota State University. He was a student of John R. Commons and received his Ph.D. in Agricultural Economics from the University Wisconsin in 1930. Besides the Nobel Prize he received the Francis A. Walker Medal from the American Economic Association (1972), the Leonard Elmhurst Medal from the International Agricultural Economic Association (1976). He was the President of the American Economic Association in 1960, a member of the National Academy of Science (1974), and a fellow of the American Farm Economic Association (1957), The American Academy of Arts and Sciences (1958), the American Philosophical Society (1962), a guest of the Soviet Academy of Science (1960) and a Founding member of the National Academy of Education (1965). Also, he received about a half-dozen honorary degrees from universities in the U.S. and abroad. Nerlove (1999) offers a longer and more detailed appraisal of T.W. Schultz's contributions and provides a complete listing of Schultz's prolific writings. See Johnson (1998) and Nerlove (1999) for commentary on Schultz's personality. They give strong testimony to Schultz role as mentor and colleague.

Style

Three features of Schultz's style characterize his writings. First, Schultz's wit and humility are much on display Schultz traveled the world and served as an advisor to many governments and international organizations but he retained his humble Midwestern perspective and values. His work is serious and deeply considered, but presented with an irreverence to self and others that makes for easy and enjoyable reading. (A hint of this irreverence is evident in his Banquet Speech posted on the Nobel Prize web page.)

[1] The National Science Foundation and the National Institute of Child Health and Human Development provided research support. I thank Glen Cain, T. Paul Schultz and Ken Wolpin for comments.

Second, his analysis is thoroughly modern; he thought in terms of supply and demand, and gained much analytical depth through careful assessment of opportunities, incentives, and information. His analyses considered a broad sweep of potential factors such as political economy and institutional constraints besides the more obvious economic factors all economists are trained to recognize. Indeed, one characterization of Schultz's approach is that he merged the analytical insight of Irving Fisher with the breath and style of argumentation of (his mentor) John R. Commons. Schultz applied these tools with equal force to problems in agriculture, labor, public economics, macroeconomics and development. He was not bound by traditional field subfield definitions, but rather his writing is problem focused; e.g., understanding the economics of being poor. For example, in his Presidential Address to the AEA, Schultz applied ideas of human capital to age-earnings profiles, population flows from rural to urban areas and deciphering the mysteries of economic growth for developed and developing countries. And as another example, in *Transforming Traditional Agriculture*, analyses of the US agricultural market are seamlessly interwoven with analyses of agricultural markets in developing countries. This uniformity of approach is all the more astonishing when compared to his contemporaries who viewed farmers as "different" than non-farmers and especially saw differences between farmers in the US and those in developing countries. Schultz had enormous faith in people's commonsense response to incentives they face. Schultz believed people were knowledgeable of economic opportunities and responded to those opportunities. He tacitly assumed preferences were constant and sought explanation and prediction in responses to differences in opportunities or abilities. This perspective also made him critical of many government sponsored agricultural and anti-poverty programs. Schultz recognized the programs could distort individual incentives in unanticipated ways or would fail because they didn't remove the barriers to permit individuals to act on existing economic incentives.

Schultz wrote frequently about "disequilibrium" and its importance. However, I think the appropriate modern term is "dynamics" not disequilibrium. Academic economists perceive a clinical Walrasian Auctioneer at work to obtain equilibrium. Schultz saw a myriad of "equilibrium distortions" that create profit opportunities, which individuals perceive and arbitrage. Schultz was interested in how farmers, students, entrepreneurs reallocate resources in response to new information on economic costs and returns. In "The Value of the Ability to Deal with Disequilibrium", Schultz argues that the more educated are more able and thus quicker to process information on the economic environment. Their early arbitrage activity provides, Schultz argued, another return to education.

Third, even more impressive than Schultz's broad conceptual approach to economics was his tireless work to link economic theory with economic measurement. In his empirical studies, understanding the economic phenomenon take center stage, not statistical technique or theoretical elegance. Empirical measures are fully described. He considered possible biases and other deficiencies in each. Finally, Schultz assesses the likely quantitative magnitude of each bias and the consequences on the empirical analysis. Every effort is made to get the closest connection between available (generally aggregate or tabular) measures and the theoretical concepts. The honesty and the fullness of the presentation makes the analysis compelling.

Agricultural Economics

In his Nobel Prize Lecture Schultz summarized the motivation for his research as: "Most of the people in the world are poor, so if we knew the economics of being poor, we would know much of the economics that really matters. Most of the world's poor people earn their living from agriculture, so if we knew the economics of agriculture, we would know much of the economics of being poor." His seminal works on agriculture include *Agriculture in an Unstable Economy* (1945) and *Production and Welfare of Agriculture* (1953), and *Transforming Traditional Agriculture* (1964).

According to Schultz (1993, p. 2) understanding the economics of being poor starts with the hypothesis that there are relatively few significant economic inefficiencies in established communities where most people are poor. In these traditional agricultural settings, farmers have used the same technology and the same factor inputs for generations. Consequently, they have acquired significant experience in their abilities and the means of production available to them. They live and operate within a stationary environment in which there has been no significant change in technology for generations. Thus, contrary to the claims of Schultz's contemporaries it is not that these households saved and invested too little and did not respond to normal economic incentives. Rather, it was that they did not have profitable opportunities. Schultz pushed the frontier on technological change in agriculture as the key factor for transforming traditional agriculture by creating profit opportunities for investment. Schultz recognized that the Green Revolution created new high yielding varieties, which were more responsive to fertilizers, and other modern inputs that helped offset the diminishing marginal utility of land and created profit opportunities that led to investment and economic growth. Indeed, it is the availability of new technology and high return investment opportunities characterize modern agriculture. Schultz encouraged his student, Zvi Griliches, to investigate the diffusion of the new hybrids (Griliches 1957). *Transforming Traditional Agriculture* (1964) is Schultz's forceful summary of the transition. Thomas Balogh's (1964) vitriolic review of *Transforming Traditional Agriculture* is the best evidence of its revolutionary nature.

Human Capital

Schultz's research in agricultural production evolved into a study of economic growth. In the 1930s, Schultz began to see that new fertilizers expanded the productivity capacity of land. Yet, he quickly realized the technological advances could not explain all the gains in productivity. A search was on for a more complete explanation. In the 1940s he came to see "acquired ability of labor" as a major source of the unexplained gains in productivity. Scarce resources produced these augmented abilities; the stage was set for a formal study of the investment in man.

To study the investment in man, a new concept of capital was needed. Schultz recognized that many eminent economists before him (notably Adam Smith, Irving Fisher and Frank Knight) considered human abilities as capital. In his writings in the 1950s and 1960s, Schultz was critical of Alfred Marshall's perspective on capital to include only physical equipment.[2] Schultz argued Marshall's narrow definition of capital among other deficiencies led to the popular perception that economics studied only material things. And more perniciously the restricted definition led to the notion that productivity of labor is homogenous, independent of capital so only the number of hours of work matter.[3]

By the mid-1950s while a Fellow at the Center for Advanced Study Schultz's research in the economics of education took shape:

[2] Schultz (1993, p. 4) presents a revised, more generous assessment of Marshall's perspective on human capital. From interactions with Marshall's defenders, Schultz accepted that analytically Marshall saw human investments as a form of capital but considered human capital as impractical because it was divorced from the marketplace.

[3] Marshall's view remained popular among leading theorists outside of Chicago and Columbia. The role of physical capital was emphasized by the World Bank, for example, through the 1960s and 1970s. Human capital made its way into aggregate growth models only in the 1980s. It's telling that the 1979 Nobel Committee press release considers "Schultz on the Human Factor" and makes only one reference to human capital, and then only in quotes. Thirteen years later human capital was more accepted and used without quotes in the press release announcing Gary Becker's Nobel Award.

> "During the year at the Center, I began to see that the productive essences of what I was identifying as capital and labor were not constant but were being improved over time and that these improvements were being left out in what I was measuring as capital and labor. It became clear to me also that in the United States many people are investing in man are having a pervasive influence upon economic growth, and that the key investment in human capital is education." (*Economic Value of Education*, p. viii)

Schultz spent the last forty years of his career understanding investments "in man."

Human capital to Schultz was the acquisition "of [all] useful skills and knowledge … that is part of deliberate investment." Rather than offer formal definitions, Schultz defined human capital by example:

> "Much of what we call consumption constitutes investment in human capital. Direct expenditures on education, health, and internal migration to take advantage of better job opportunities are clear examples. Earnings foregone by mature students attending school and by workers acquiring on-the-job training are equally clear examples. Yet, nowhere do these enter our national accounts. The use of leisure time to improve skills and knowledge is widespread and it too is unrecorded. In these and similar ways the *quality* of human effort can be greatly improved and its productivity enhanced. I shall contend that such investments in human capital accounts for most of the impressive rise in real earnings per worker." (*Investment in Human Capital,* p.1)

Schultz's research on human capital sought to clarify the investment process and the incentives to invest in human capital. He studied mainly formal education and organized research. The application of the investment approach in the intervening forty years expanded to consider an array of different forms in many vistas.

T.W. Schultz's overarching view of human capital that made him a twentieth century pioneer in human capital theory. Jacob Mincer and Gary Becker were pioneers as well, but they focused on the effect of human capital for the level and distribution of earnings. But it was Schultz who pushed the profession to see human capital investments in their totality – education, training, work experience, migration and health.

This totality of vision made T.W. Schultz a leader in the reemergence of economic demography. He organized two conferences, in 1972 and 1973 whose proceedings were originally published in the March 1973 and March 1974 issues of the *Journal of Political Economy* and subsequently published in book form as *Economics of the Family: Marriage, Children and Human Capital.* The conferences generated several seminal papers, including Willis on fertility, Becker and Lewis on the quality-quantity dimensions of children and Mincer and Polacheck on human capital and women's earnings. In "Fertility and Economic Values" Schultz recognized the large advances published in these studies but pushed the field to extend the static models to consider richer models of life cycle behavior and to collect panel data necessary to support their estimation. A prophetic vision, as this neatly summarizes work in economics of fertility for the next thirty years.

Envoi

As I reread several of Schultz's papers, I lament the cost of the short half-life of ideas in economics; of what we miss by not reading some of the original formulations. Textbook treatments offer modern notation and language with a well-honed presentation of ideas that speeds initial learning. Yet,

the vibrancy and freshness (and yes sometimes confusion over issues that get sorted out later) of the original frequently is lost. We have lost sight of T.W. Schultz's original contributions and it is our loss. Researchers interested in migration, economic demography, development and economic growth would be well served to read some of T.W. Schultz classics. His broad view of economics continues to be fresh and makes for fruitful reading.

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