

This reviewer found the discussion of mean square error (MSE) somewhat incomplete. In sampling, up to five components have been identified in recent literature. To the author, the traditional focus of statistics courses on sampling theory (and the detailed computational methods avoidable in the age of computers) seems to be responsible for the confusing separation of ANOVA and regression analysis as two separate analytic tools. Skipping over MSE and avoiding the most recent achievements in the field, the author is only consistent with his general approach, but the reader should be aware of this one limitation.

There are complete indices, a brief but well-balanced bibliography, an elaborate list of contents (repeated helpfully with further elaborations at the beginning of each chapter), and the usual statistical tables required for the pursuit of the text.

University of Alberta,
Edmonton,
Canada.

Karol J. Krotki

Ismail Sirageldin (ed.). *Research in Human Capital and Development*. Vol. 1. Greenwich, Connecticut: JAI Press Inc. 1979. pp. xiii + 258.

Research in Human Capital and Development (RHCD) is a "Research Annual" which aims at investigating "the relationship between the development and utilization of human capital and the process of economic and social change" (p. vii). This series will consist of interdisciplinary studies which are typically longer than a journal article and shorter than a monograph and will be specifically addressed to "fertility, health, education and manpower, migration and the triangle of equity, distribution and efficiency" (p. vii). Edited by Professor Ismail Sirageldin, this first volume of RHCD has touched on most of these areas. Part I of this volume has three articles under the heading "Health and Fertility". Part II contains five articles under the title "Education and Manpower" and Part III has only one article on "Distribution and Equity".

The first paper by M. Ali Khan, entitled "Relevance of Human Capital Theory to Fertility Research: Comparative Findings for Bangladesh and Pakistan", is divided into two parts. The first part spells out the static theory of the household production model while the second part deals with dynamic extensions to the model presented in the first part. The static model is empirically formulated in terms of a simultaneous equation model with fertility, mortality, income and female labour force participation as endogenous variables. Income adequacy has a positive effect on the probability of Bangladeshi women wanting additional children whereas this findings is reversed in the case of Pakistani women. Female labour force

participation is positively related to the number of living children for Pakistan. This relationship does not hold good for Bangladesh, however. Female literacy has been found to have positive influence on rural fertility in the case of Bangladesh but negative influence in that of Pakistan. By using probit method for estimating the demand for additional children in Pakistan, Khan finds that the most important variables determining fertility are the numbers of living sons and living daughters. The coefficients for the number of boys are larger in absolute value than those for the number of living girls. The author, therefore, correctly concludes that this differential indicates a preference for sons. Khan's methodology for fertility research is a novel one. His paper convincingly demonstrates the usefulness of human capital theory to fertility analysis. His theoretical discussion is both lucid and authoritative. The editor's observation that Khan neglected biological determinants of reproduction and social income in his analysis is correct. Data deficiency and difficulties in conceptualization of such variables probably explain Khan's decision to ignore such variables in his analysis.

The second paper, entitled "Health and Economic Development: A Theoretical and Empirical Review", by Robin Barlow focuses on the role of health in the process of economic development. Barlow gives an impression that he is not satisfied with empirical studies, firstly, because of inadequate methodologies, inappropriate specification of the models and the crude nature of proxy variables, and, secondly, because conflicting findings on this subject make it difficult to draw broad generalizations. Barlow's basic model treats health, nutrition, education, fertility, consumption, income and leisure as endogenous variables. The model does not incorporate the impact of migration and urbanization on health or development. This is a serious shortcoming, as these variables play a very important role in the developing countries. For example, migration and urbanization as related to health may have a significant influence in Pakistan where 50 percent of the maternal and child-health centres and 80 percent of all hospital beds are located in urban areas when urban population constitutes no more than 35 percent of the total population.

The third paper, which is more descriptive than analytical, entitled "Health, Nutrition and Mortality in Bangladesh", by W. Henry Mosley analyses the health trends in Bangladesh in a Beckerian framework. He shows that mortality trends in Bangladesh are dictated by political, economic and social factors affecting the supply and availability of food. Analysed in a Beckerian framework, the problem of low average level of "Social Income", stemming largely from adverse 'Social Environment', presents a dismal picture of high mortality and precarious economic and health conditions of the majority of population in Bangladesh. The editor's comment that in countries like Bangladesh, where adverse environment depresses welfare levels, the application of individual human capital theory for valid policy prescriptions would be problematic cannot be easily accepted. The crucial question in this regard is that of operationalization of the concepts of 'social income and social environment'. Until this is done and the scope of analysis is broadened, such suggestions should be seen more as a plea for a richer data set than as a criticism of the existing methodologies.

The second part of the book is entitled "Education and Manpower". The first paper in this part of the book is on "College Quality and Earnings" by James N. Morgan and Greg J. Duncan. For a sample of several hundred men and women, the authors determine the effect of college quality on earnings. Quality is measured by the ACT scores of entering college freshmen, expenditure per pupil and a subjective ranking of the college's prestige. For women, the findings indicate that none of the college quality variables has a significant relationship with earnings. In the case of men only, the ACT scores are related with earnings. One serious weakness of this study is that variables which measure quality of education actually measure quantities of educational inputs more than anything else. However, in countries like Pakistan where there is no equivalent of what is called the ACT test, and where the expenditure per pupil is almost uniform in nearly all colleges because all educational institutions are nationalised, the model developed by Morgan and Duncan may not be applicable.

The second paper by Mohiuddin Alamgir on 'Some Theoretical Issues in Manpower and Educational Training' examines the relevance and utility of various models to the actual educational and manpower planning experience in Bangladesh. This paper is essentially a review of literature: firstly, it covers the development of the concept of human capital and its use in rate-of-return analysis and growth studies; secondly, it addresses itself to various issues pertinent to manpower and educational development; and, lastly, it describes the manpower and educational planning experiences in developing countries. The author argues that a development plan which includes the educational sector must be based on a clear understanding of three separate production processes: the production of goods and services, the production of skills and the production of educational output. On this there is not much room for disagreement with the author. However, we cannot but note that he has failed to give serious thought to situations in which the three production processes mentioned above are confined to a certain class of people leading to uneven development of human capital, and, thereby, obstructing the achievement of the goals of social justice and equity.

The third paper by Kristin Tornes on "Barriers to Educational Development in Under Developed Countries: with special reference to Venezuela" is radical in approach as well as in interpretation of the evidence gathered for that article. The two important points made in the paper are that (i) the developing countries are subservient to and exploited by developed countries and (ii) the educational institutions and policies developed in the developing countries are designed to maintain and strengthen this dependency relationship. She makes a very valid point when she distinguishes between an explicit educational policy and an implicit education policy. The former, according to her, refers to official plans and programmes in the area of education and the latter to what is actually done in this field. She argues that implicit educational policies work against the achievement of explicitly stated goals, such as equality of educational opportunities. In this paper, Venezuela is given as an example of a country characterized by 'Dependent Capitalism'. We may extend the applicability of her hypothesis to other developing countries, particularly the non-oil-producing ones, whose economies are sometimes entirely dependent on large doses of foreign aid.

The fourth paper in this part of the book is on "Manpower and Choice of Technology" by S.C. Kelley. The author here has his doubts about the usefulness of the concept of the rate of return on human investment. Because of restrictive assumptions under which the labour market theory operates, he points out that the concept's role has become limited to allocation decisions of a peripheral nature. Kelley is of the view that in developing countries, because of large-scale unemployment and underemployment, an appropriate growth strategy would be one which emphasizes labour-intensive techniques in the short run. He points out that though other techniques could be more efficient, labour-intensive techniques would create a larger number of additional jobs. The comprehensive planning model developed by Kelley is definitely an improvement over previous models but it does have its limitations, especially for developing countries. Firstly, in such countries the data available may not fulfil the data requirements for this model, and, secondly, as Kelley observes, the entrepreneurs in these countries are unaware of alternatives to the production techniques they are currently using. Producers' ignorance of alternative techniques may, therefore, prevent the adoption of more labour-intensive methods of production. As a final note to Kelley's paper, it may be mentioned that labour-intensive technology is not an unmixed blessing. It has certain disadvantages, especially for poor nations which have negligible surplus labour but which are aspiring to make quantum jumps towards the improvement of technology. The more capital-intensive a country's choice of technology is, the greater the chances are that it will achieve an industrial base quicker than nations which choose less capital-intensive techniques.

The fifth and last paper in this part of the book is on "The Growth of Professional Occupations in U.S. Manufacturing 1900-1973" by Carnel Ullman Chiswick. The author tries to locate the reasons behind the rapid growth in the proportion of professional workers in the U.S. manufacturing sectors during the past three quarters of a century. She finds that the demand and supply functions of professional workers for the period 1900-1973 have been relatively stable. Changes in the direct cost of higher education relative to foregone earnings are used to predict changes in both the proportion and the relative earnings of salaried workers in manufacturing. The author finds that the elasticity of substitution between professional and non-professional workers is approximately 2.5. She tests three hypotheses to explain an excessive growth in the proportion of professional occupations of the labour force. The first hypothesis which maintains that technical change has brought about this change is rejected. The second hypothesis - that relative demand function for high level manpower during the period 1900-1973 has been affected by the accumulation of physical capital - is also found wanting. The third hypothesis - that the factor-substituting changes in production techniques induced by changes in relative factor proportions has brought about this rise in the proportion of physical manpower - finds considerable support from the analysis. She is of the view that the fairly high elasticity of substitution between two kinds of manpower validates the third hypothesis. According to the author, factor substitution was induced by increases in the supply of college-educated manpower. The supply of college

graduates could not have increased without a prior increase in demand. One could say that there could not have been an increase in demand for professional manpower without some kind of a technical change favouring the growth of professional manpower. This leads one to believe that, given the right specification, each of the three hypotheses could partly explain the growth of professional manpower in the United States. The author has not discussed either definitional changes that might have occurred over the past 75 years or expansion in the number of professional categories of occupations which might have influenced the findings of the paper.

The third part of this book on 'Distribution and Equity' contains only one paper, entitled "Equity, Social Striving and Rural Fertility", by Ismail Sirageldin and John Kantner. The authors here explore the relationship between equity, social mobility and rural fertility. They have investigated the relationship of social mobility with family size and fertility regulation. The authors have cited various studies that have tested the social mobility-fertility hypothesis in the context of the United States and other countries. These studies have a wide variety of theoretical specifications, and, because of that, findings are mixed so that it becomes difficult for a researcher to either accept or reject this hypothesis. The negative relationship between social mobility and fertility holds true only under specific social conditions and for certain types of individuals. The authors are of the view that psychological or personality traits that are success-oriented lead to decisions in which the utility of children relative to status-enhancement becomes subject to rational calculation. The authors also bring out the relevance of the concept of 'social income'. Social income, as defined by the authors, is what individuals achieve through their own efforts and, secondly, what is ascribed to them because of their relative status in their own community. In countries like Pakistan, India, and Bangladesh, because of the social values and the traditional culture set-up, it would not be wrong to say that with an increase in the family size and particularly in the number of living sons the relative status of a person is enhanced in his own community. Now this amounts to an increase in social income. This will lead one to believe that there is a direct relationship between an increase in social income and an increase in fertility (number of living sons). This is contrary to the hypothesis pertaining to social advancement based on the 'social capillarity' theory. In this paper by Sirageldin and Kantner, there are two other points that need special mention. Firstly, the authors contend that the extent to which individuals perceive a sense of control over their status depends partly on the rigidity of the system of social stratification and partly on their ability to escape the limitations of local opportunity structures, as, for example, through migration. Secondly, the average levels of social mobility may influence the effect of mobility on fertility behaviour. If the system of stratification is such that it allows social mobility only within a very narrow range and for a fraction of its members, then children may not act as a serious constraint on advancement since for those who are mobile, status achievement is easily consolidated and relatively unchallenged. The authors have diagrammatically illustrated these relationships with respect to fertility within a rural community. In the end, the authors have raised two policy issues for the reduction of fertility. The policy issues are basically two points of view which aim at the reduction of fertility. The first issue emphasises the general

improvement in the health standards and educational levels of people combined with the betterment of their economic conditions which will lead to the collapse of traditional social values and behaviour, thus leading to fertility reduction. The second strategy relates to an alteration in local community organizations as a way of bringing down fertility levels. The authors conclude that further research is needed on the interrelationships between the process of rural community development and the change in fertility.

The idea of developing RHCD into a forum for important empirical and theoretical research is a brilliant one and will definitely be fruitful in the years to come. The importance of the relationship between development and utilization of human capital and the process of economic and social change cannot be overemphasized. This is a key issue and research is needed on all aspects of this issue. This is precisely the objective of the RHCD. Three more volumes of the RHCD are still to come. The plan is to examine issues like fertility, health, education and manpower, migration and the triangle of equity, distribution and efficiency individually in greater detail. The RHCD is a great contribution to the argument for a strict interdisciplinary approach in social sciences research.

On the whole, one could say that the book is sound and comprehensive in that it discusses almost all the important factors related to fertility behaviour. Human capital theory in its various dimensions has been applied very skilfully to different issues of fertility research. One drawback of the book is that occasionally one comes across repetition and overlapping as far as theoretical structures and findings of these different papers are concerned. One can conclude that without doubt the book is an extremely valuable contribution to research on human capital theory.

Population Planning Division,
Government of Pakistan,
Islamabad.

A. Razzaque Rukanuddin

Note: Dr. Rukanuddin was Senior Research Demographer in the PIDE, when he wrote this book review for this journal. (Editor)