



A new method to estimate the level and distribution of household human capital with application

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Abstract

This study introduces a new approach that enables, for the first time, the estimation of national and personal human capital (HC) in money value. National HC is estimated on the basis of the life cycle mean earned income by age using sample survey data which are smoothed with local linear filters. Personal HC is treated as a dimensionless latent endogenous variable. The estimation of each economic unit HC as a latent variable is benchmarked by the estimation of the average national HC in order to obtain estimates in money value. A model is fitted to study the distribution of personal HC. This new approach is illustrated using data from the U.S. Federal Reserve Board sample survey on income and wealth distributions. The new theoretical developments and empirical results provide the framework to advance socioeconomic policies on issues of endogenous economic growth with economic efficiency and social equity, hence, to deal with the problems of poverty and socially unacceptable inequality. This study is integrated with a discussion and evaluation of alternative methods of HC estimation proposed in the literature, i.e. the prospective, retrospective, and educational stock. It includes a brief comment on the contributions of the Chicago School which specifies an earning income function within the HC conceptual framework, without dealing with HC estimation. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

The concept of functional income distribution was introduced by Ricardo (1817). The first research on the personal (size) distribution of income was done by Pareto (1895, 1896, 1897). He was the first to specify, estimate and analyze a model of income distribution. Both the functional and personal income distributions are assumed to be generated by two variable factors, human capital (that generates earned income); and capital (that generates other incomes). The theoretical production function that underlies both of these concepts of distribution includes labor as an argument. Unfortunately, labor is generally measured in these production functions as man-hours worked or as persons employed full-time per year. While it is useful to partition the labor force (into full-time, part-time and unemployed workers) for labor market studies, it can be misleading to do so when analyzing economic processes involving production, growth, distribution and social welfare. The usual specification of the production function is,

$$Q = F(L, K) \quad (1a)$$

In virtually all micro and macro applications of the production function, what is really of interest is of course, employed human capital (H) and capital (K), not just a generic labor stock L . Output is produced, income is earned and input prices are set based on the quality of the experience, training and schooling embodied in labor (its skill set), not just based on the magnitude of the labor stock L . Denison (1967, 1974) was among the first to make this adjustment in empirical specifications of the production function and Dagum (1978) was among the first to note this in work on the functional income distribution. Thus, the production function should be specified as,

$$Q = F(H, K) \quad (1b)$$

The purpose of our study is to quantify human capital H and to examine its size distribution empirically. By doing so, a better understanding of the relationship between the functional income distribution and the personal income distribution can be achieved. The theoretical and applied relevance of an integration of these sub-fields becomes obvious when it is observed that the functional income distribution deals with the factor price formation and the allocation of total income among the factors of production. Whereas, the personal income distribution deals with the allocation of total income among the set of families, households or their disaggregation by various retained attributes.

Furthermore, the functional income distribution constitutes the primary economic process of income distribution. It is followed by a secondary or derived economic process consisting of the allocation of earned and property incomes to the persons that contributed to the generation of total income with their resources of HC and wealth. This second process leads, in a natural way, to the specification of the microeconomic income generating function (IGF) advanced in Dagum (1978, 1980, 1994). In symbols,

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