Economies, Human Capital, and Natural Assets

Forming Empirical Linkages

MARK D. AGEEa and THOMAS D. CROCKERb,*

aDepartment of Economics, The Pennsylvania State University, Altoona, PA 16601, USA
bDepartment of Economics and Finance, University of Wyoming, Laramie, WY 82071, USA
(*Corresponding author, email: tcrocker@uwyo.edu)

Abstract. Human capital concerns are used to structure links between the economy and the environment. Suggestions for empirical work to explore these structures are provided. Particular attention is devoted to connections between environmental hazards and influences upon parents’ decisions to invest in forming children’s human capital.

Key words: economy-environment linkages, human capital formation

JEL classification: Q20, J24

1. Introduction

Man opposes himself to Nature as one of her own forces . . . in order to appropriate Nature’s production in a form adapted to his own wants. By thus acting upon the external world and changing it, he at the same time changes his own nature.

(Marx, n.d., p. 177)

This paper reviews past work and suggests opportunities to examine empirically the influence that human capital or disembodied knowledge and, more broadly, the ability to function in life has upon the structure of linkages between economies and environments. Differences in environments (e.g., Montesquieu 1947, p. 245) and in human capital (e.g., Lucas 1988) have been independently advanced as explanations for disparities in human accomplishments and well-being. But when incomplete markets are part of the landscape, separability of human use of the environment and human capital investment decisions no longer holds (Crocker 1995). One’s human capital can affect his treatment of the environment and the environment can mold his accumulation and protection of this capital. We consider some implications of this behavioral reciprocity for learning about linkages between economies and natural systems.

The next section provides a brief background on research efforts to capture economy-natural system linkages empirically. None explicitly use human capital to link economic and natural systems reciprocally, though some recent empirical prac-
tice recognizes that neither the economy nor the environment need be autonomous, and empirical studies which consider separately the impact of the environment upon human capital and vice versa have been performed for at least three decades. The third section presents a simple model that uses human capital to form the link. A fourth section offers examples of potential empirical work that could provide insight into when and how human capital affects the linkage structure of these nonautonomous systems.

2. Some Background

Similarities in fundamental problems faced by organisms that inhabit economic systems and natural systems are striking. Though only economics tries consistently to connect mind to matter, scarcity and thus demand and supply, competition, substitution, and path-dependent evolution are central concepts in the disciplines, respectively economics and ecology-epidemiology, that study each system (Hershleifer 1977; Rapport and Turner 1977). However similar the fundamental nature of their problems and core analytical concepts and their common intellectual roots in Smith, Malthus, and Darwin, relationships between the two disciplines can be characterized as much by tensions and recriminations about what knowledge is and how to get it than by mutual respect and reinforcement.1

Progress is nevertheless being made in identifying and working in settings in which involvement of one discipline in the other causes the results of the other discipline to differ in that other discipline’s terms. In economics, for example, the standard Walrasian paradigm (e.g., Baumol and Oates 1975), which views natural systems as vessels carrying interacting economic agents as passengers and asks only whether allocation institutions are designed to cause the passengers to be fully accountable for the direct consequences their choices have for their fellow voyagers, sets aside the state of repair of the vessel (Mohring and Boyd 1971). In contrast, ecology focuses squarely on the state of the vessel as an asset for its passengers. Ecology has consistently tried to understand the vessel’s ability to stay or to become intact when stressed. It views the core environmental problem not as one of inducing the passengers to compensate each other for direct offenses and gifts but rather in terms of keeping the vessel afloat, i.e., of sustaining it.

Before sustainability, the provision of a non-declining capital stock over time (Hartwick 1977), achieved prominence in economic discourse, empirical explorations of the linkages between economic and natural systems near-universally neglected their mediating behavioral interactions. Whether studied by ecologists (e.g., Watts 1968) or economists (e.g., Isard et al. 1968), linkages between the systems were always mechanistic and one way, whether from natural systems to economic systems or the opposite. Similarly, early studies by economists on the health hazard consequences of environmental pollution (e.g., Lave and Seskin 1977) presumed that the hazards were exogenous. The perfectly reasonable principle that nature could exist autonomously was extended in practice to the doctrine