Theoretical Concepts in the Economics of Education

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Introduction

Over the past two decades, the economics of education has grown rapidly as a field. Previously, scholars and policymakers tended to view education and economics as separate realms, with economics applied to the study of private goods and education as a public good. Economics has been characterized as cold and impersonal due to its focus on firms, rational self-interested individuals, and cost–benefit decision making, all of which on the surface appear to be unrelated to the social and moral values associated with educating children. As school systems in developed countries have come under pressure to improve quality and scale, the distance between the two realms has narrowed. It is well documented that better-educated workers have more favorable labor-market outcomes than those with less schooling. Moreover, a well-educated labor force is critical for a nation to compete in an increasingly global economy that rewards knowledge and skills. Given concerns with the productivity of educational institutions and the fact that the study of incentives, choice, and competition lie at the heart of economics, economists have become more relevant to education-reform debates. They bring increased attention to resource allocation and decision making at the school level, take the view of educational organizations as potentially competitive enterprises, and those running them as entrepreneurs. The study of incentives lies at the heart of economics, and an understanding of how actors in large complex systems respond to incentives, and changes in incentives, helps shed light on how teachers might react to merit pay incentives or schools might react to increased competition from choice programs and charter schools.

In this article, we briefly review several of the most important theoretical concepts in the economics of education. First, we define economics and then review three of the most commonly used ideas – human capital, markets, and education production. We focus here on explicating the major underlying theories (in a nontechnical manner), rather than their application. All three have been utilized in numerous empirical studies. These are reviewed in greater depth elsewhere in the encyclopedia.

Economics Defined

Economics is often defined as "the study of the allocation of scarce means to satisfy competing ends" (Gary Becker as quoted by Walberg and Bast, 2003:182). Economists study how individuals, organizations, and societies employ time, money, and effort. In the case of education, economists are interested in how society organizes and uses scarce resources to produce various types of knowledge and skills through formal schooling, and how these types of knowledge and skills are distributed to various groups in society. This broad definition means that many social and political issues and topics can fall under the purview of economics. John Maynard Keynes once wrote that economics was a "way of thinking" and it is this lens that has been brought to bear on a wide array of traditionally non-economics topics, including education policy.

Economists typically begin an explanation of observed phenomena by building a theory or a model in order to simplify reality and highlight key characteristics. A model contains a set of assumptions, and yields predictions, *ceteris paribus* (all other things being equal). Often this abstraction causes concern among noneconomists, but such simplifications are essential to understanding real-world settings. Economists would argue that what matters is whether the predictions of a model are correct on average rather than whether the assumptions underlying it are realistic. Economics, then, sits firmly within the tradition of theory–testing scientific method-based disciplines: a question is framed; a model/theory developed to explain behavior; and the hypotheses or predictions of that model/theory are then tested empirically using real-world data. It is often described as concerned with positive rather than normative issues, where the former are empirically testable and the latter are dependent on value judgments. The emphasis on hypothesis testing makes economists almost always use research designs that are quantitative in nature, attempting to discern whether predictions of cause and effect are valid, and the degree to which they are generalizable.

Economic theories are typically built on three basic foundations: scarcity, rationality, and optimization. Scarcity refers to the assumption that individuals and society will never have enough resources to completely satisfy their unlimited wants. Rationality refers to people's ability to make decisions in a systematic and purposeful way. It implies a "consistency of response to general economic incentives and an adaptability of behavior when those incentives change" (Ehrenberg and Smith, 2006: 4). The last assumption is the idea of optimization – either profit or goal maximization with reference to organizations or

utility maximization with reference to individuals. Individuals and groups have particular goals – be they happiness, profit, market share, or some combination of these or others – and will make choices that will maximize these benefits, subject to the constraints that they face (e.g., their income). This does not mean, however, that economists only care about selfish individuals; personal values are viewed more broadly, including all that individuals care about. Individuals behave subject to the constraints they face, the context in which they find themselves, and their perceptions of the consequences of alternative choices they make.

Economics provides a framework for understanding the behavior of individuals and organizations as they generate and allocate human, material, and financial resources. Using this perspective, economists have examined a wide range of education-related topics, and in the remainder of this article we discuss three of the major education questions of interest and the concepts that have been used to shed light on them. First, how much education (does and) should an individual acquire? This entails the notion of human capital. Second, how should education be produced and allocated by a society? This broad question examines conditions, characteristics, and behavior under alternative organizational forms, including both markets and hierarchies. Third, can we be more efficient and effective in organizing the production of education? The idea of 'education production' is helpful in answering this question. We discuss each of these in turn.

Human Capital

A primary research area within the economics of education is the association between schooling and individual outcomes, especially those associated with the labor market. Education (and training) is modeled as an individual investment decision that will receive a monetary return in the labor market, typically in the form of higher lifetime earnings. This notion of human capital has a rich history, with early economists such as Adam Smith, John Stuart Mill, and Alfred Marshall suggesting that individual's skills could contribute to their economic status. In 1776, Smith laid the foundation for human capital theory when he wrote that human effort lies at the root of all wealth. In 1848, Mill built upon Smith's notion; he considered human abilities as means to wealth (Sweetland, 1996). Modern-day human capital theory has further extended the central insight through the pioneering work of Schultz (1963), Becker (1964), and Mincer (1958, 1962).

Knowledge and skills acquired through educational investments increase human productivity. With each investment, one may incur costs in the form of out-of-pocket expenses, foregone earnings, and psychic costs associated with the pressure of studying and examinations. Benefits accrue later in life through enhanced earnings in the labor market, access to better jobs, a higher likelihood of being employed, and better health. There are also psychic benefits from enhanced social status and the prestige associated with higher levels of education. Although individuals' motivation for pursuing schooling may differ, and the psychic costs and benefits may be quite varied depending on personality, expectations of returns, and other traits, economists hypothesize that, other things equal, the more the education acquired, the higher the earnings achieved after the schooling is completed.

Prima facie evidence for human capital theory is to be found in the strong positive relationship between education levels and earnings that exist in almost every developed country. Generally, earnings rise with education level and they increase at an increasing rate in the immediate post education years, continue to increase at a slower pace, and then flatten as individuals approach retirement (Ehrenberg and Smith, 2006). This general pattern of earnings by education level holds for almost all subgroups, including men and women, and different racial and ethnic groups, but it is the differences among these groups that often fuels education policy debates about the distribution of education subsidies and services. Economists have devoted considerable attention to the challenge of estimating the returns to schooling taking account of these other factors. Analysis of such returns generally reveals a consistent positive relationship between investment in education and increased earnings for individuals, with an estimate of the average rate of return to an additional year of schooling of about 10% (Psacharopoulos and Patrinos, 2002). An overview of the empirical literature is provided elsewhere in the encyclopedia.

Economic research has also found nonmonetary benefits, both private and public, associated with educational attainment. Individuals who have invested in education and job training often have more job stability, improved health (e.g., exercise regularly, smoke less, and eat better), are more likely to receive employer-provided health insurance and pension benefits, are more inclined to vote, and have generally increased social and cultural capital that often enables upward mobility. These benefits are reviewed elsewhere in the encyclopedia.

Markets and Market Failure

There is general consensus that national investments in education lead to economic growth (for a review of the literature, see Sturm, 1993; Hanushek and Kimko, 2000). Countries spend a sizable percentage of their gross domestic product (GDP) on education each year. Educational spending can be undertaken by private individuals and by governments through public expenditures. The decision as to how education at different age levels should

be allocated is at its core an economic decision about how best to allocate scarce resources in order to maximize output (i.e., education).

Goods and services may get allocated in many different ways – for example, by tradition, force, or lottery. In modern societies, resources are allocated either by markets, by governments, or frequently through the interplay of both. K-12 schooling has traditionally been allocated by government at the federal, state, and local levels, with postsecondary education allocated by some combination of markets and government. As concerns about the effectiveness of existing schools have risen, policymakers have questioned the central role and functions of government in the allocation of educational resources, and turned toward market or market-related mechanisms.

A market is defined in an economic context as a collection of buyers who purchase and sellers who produce and sell goods and services; the interaction of buyers and sellers results in the possibility of exchange and, hence, in the allocation of goods and services. The transaction is facilitated through agreement on price. A graphical illustration of a market shows a downward-sloping demand curve and an upward-sloping supply curve. Sellers want to maximize profits, while buyers want to maximize satisfaction based on their preferences and budget constraints. The higher the market price, the more of a good or service a seller is willing to supply, but the lower quantity of that same good or service a buyer will demand, other things being equal. The function of a market is to adjust price to accommodate changes in supply and demand as efficiently as possible. When the price in a market reaches a level where the quantity that buyers want to purchase equals the quantity that sellers want to supply, then the market is said to be in equilibrium. Markets also act to keep prices low. Producers that fail to offer consumers what they want, or who charge too high a price, will lose business and eventually close. The dynamics of markets means a continuous process of adjustments that includes shortages and surpluses, and consumers and producers entering and exiting the market.

In many circumstances, markets are the preferred method for allocating resources because they are able to coordinate many buyers and sellers, give consumers considerable influence over price, characteristics, and quantity, and avoid relying on a handful of arbitrary decision makers. Under these circumstances, markets are an efficient mechanism for allocating resources, meaning that no more could be produced with the same resources, and the same output could not be produced with fewer resources. Efficiency is a specific criterion for judging an allocation mechanism. It does not say whether the resulting distribution of resources meets goals other than satisfying buyers and sellers (e.g., whether it is fair). Clearly, consumers of education have multiple goals (Gill *et al.*, 2001) and these need to be considered in deciding what is the best mechanism for allocating education from society's standpoint.

When markets do not efficiently organize production or allocate goods/services to consumers, then market failure is said to occur. There are several reasons why markets fail. First, market power may arise when a supplier of a good/service has the ability to control price. A monopoly is an example of such market power. Perfectly competitive markets have many buyers and sellers, so no single buyer or seller has a big impact on price. While certain inputs to schooling may be more characteristic of perfect markets than others (e.g., school supplies), markets in K-12 schooling are quite imperfect.

A second type of market failure is when consumers have incomplete information about price and product quality, in which case the market cannot respond efficiently and correctly. Under incomplete information, parents may or may not choose schools based on outputs important for broader society. (There is some evidence, e.g., that many parents care not only about student achievement but also the social and racial profile of a school's students, preferring settings where there are most students like their own child.) Hence, although their preferences may be satiated in a market setting, some may judge that these preferences are not desirable from society's standpoint.

Third, externalities exist when consumption or production have an indirect effect on others that is not reflected in market prices. In the case of education, the decision maker (e.g., an individual student) does not bear all the costs or reap all the rewards from his or her decision about how much education to obtain. Even though society may benefit more from an educated person, the person making the educational decisions may not see those benefits as his or her own. Thus, the good (education) will be underconsumed from the perspective of the market. This presence of social benefits arising from basic education is perhaps the chief reason why governments have typically made schooling compulsory at elementary and secondary levels.

Fourth, markets may fail for public goods – those that can be made available to additional people without additional cost (nonrival), and once provided are difficult to prevent others from consuming (nonexcludable). Schooling is to some degree a public good. As with externalities, markets will tend to undersupply public goods.

The possibility of market failure, especially the underconsumption of education by private individuals from society's standpoint, as well as the importance of educational goals other than efficiency, has historically led to significant government intervention in the education sector through regulation, financing, and operation. Regulation can take different forms including setting safety standards, mandating curriculum or student assessments, and requiring teacher credentials. Financing can be in the

form of direct funding to schools or various forms of financial aid to individuals. Revenues for schooling may be generated from general taxation, rather than user fees, such that there is no clear relationship between receipt of the service and the payment for it. The government may also directly operate educational enterprises, which means that the delivery units are embedded within a larger government hierarchical infrastructure controlled by political mechanisms, owned by the state, and in which the employees are civil servants.

Typically, regulation, finance, and operation have been combined in a vertically integrated public sector system. Further, because government-operated schools have been designed to serve all students in a geographic area, in that locality they constitute a virtual monopoly. From a market perspective, this means that schools do not face competitive pressure to keep quality high and costs down. In addition, many families (particularly low-income and minority families) do not have much choice over the schooling options for their children. Recent educational reforms are to some extent characterized by an attempt to unbundle regulation, finance, and operation – ranging from tax credit schemes, to magnet schools, to controlled-choice programs, to charter schools, and voucher programs. Several of these are discussed in much greater depth elsewhere in the encyclopedia.

Education Production

Economists have sought to understand how education is produced. This has taken two different forms. One is to treat education as a production function wherein schooling inputs are processes from which outputs are produced. In this formulation of schooling, processes occur within a black box of the school system. The second approach explicitly looks inside the black box and examines the organization as a web of interpersonal contracts wherein individuals seek to coordinate others (and are in turn coordinated by others) in the performance of work. This latter arena is most often referred to either as transaction cost economics (accounting for the newly recognized costs of coordination or transactions) or as applications of principal–agent theory (seeking to capture the complex issues of delegation of decision rights between bosses or principals, and their subordinates or agents).

The production function approach uses an input–output framework to help think about schooling. The main inputs may include teachers, administrators, supplies, and facilities while the main outputs are student achievement (knowledge, skills). The relation between the educational inputs and outputs is usually statistically estimated using multiple regression techniques. While the education production function is simple in theory, it is very complex in practice (Goldhaber and Brewer, 1997). For example, it is hard to identify and measure all inputs and outputs of schooling. Multiple outputs (e.g., basic skills, vocational skills, creativity, and attitudes) are valued, may accrue in a cumulative manner, and may only be discernable many years into the future. Inputs can be hard to measure, and the dimensions most easily measurable may not capture the important features of that input adequately. For example, the way in which a teacher interacts with students is important in the students' learning process; however, the characteristics of effective teachers may not be well captured by readily available proxies such as years of experience or qualifications. Nonschool inputs, such as peer influence and family background clearly affect how much students learn. Moreover, outputs are themselves joint products (i.e., students experience multiple teachers and carry with them knowledge from other classes and from home). The value of the production function approach, however, is as a framework for thinking about what resources, in which combinations, make a difference for student outcomes. Many studies have attempted to determine the relationship between inputs and outputs as currently exists in the United States and elsewhere.

The second economics-oriented perspective on organizations, achieved largely through applied principal–agent theory, was originally conceived by economist Nobel Laureate Ronald Coase in the early 1930s, who argued that markets and hierarchies, heretofore examined as separate topics, were in effect, substitutes for each other. The factors in a specific firm or division of a firm that made one alternative superior to another were often associated with the differing costs of coordination (the costs associated with transactions among individuals). This perspective has been extended to include a third substitutable form of organization, alliances or networks. In agency theory (Moe, 1984; Ferris and Winkler, 1991) principals (superiors in organizations, e.g., school superintendents) seek to ensure that agents (subordinates in organizations, e.g., school principals) carry out the principal's goals, in recognition of four primary factors that make this difficult. An adverse selection problem occurs when principals (e.g., school superintendents) are not fully informed about the abilities and values of the agents (e.g., school principals) and select agents that are not the best choice. A diverse objectives problem occurs when agents pursue their own objectives at the expense of pursuing the principals' objectives. This problem is compounded when compliance is achieved only by costly monitoring and controlling of the agents. An information asymmetry problem occurs when information within the accountability relationship is not evenly distributed. The agent typically has the information advantage. Finally, a weak incentives problem occurs when principals lack sufficient decision rights to cause the agents to either share principals' values or to behave as if they did. Although the full implications of agency theory and the

concepts embedded with it are still being explored, they have become common in analyses of current educational policies.

Concluding Thoughts

Economics, as a framework for understanding the allocation of resources, and human and organizational behavior more generally, has made important contributions to the study of education. The core concepts of human capital, markets, and education production have over several decades become increasingly common in education policy debates as well as familiar to practitioners. The contributions and the impact of economics on education (past and projected) are uneven. The concept of human capital, for example, is well established, and has expanded beyond simple rate of return calculations to considerations useful for policymakers – for example, in determining the relative contributions of different types of institutions or programs of study. The interplay between markets, regulation, and individual and organizational performance in education has attracted considerable academic interest, and that is expected to continue, albeit frustrated by the absence of large-scale demonstrations of different structures of the sort that would permit more definitive statements about what works. Applying economics to policies affecting the design of education organizations has been a mixed bag. With some exceptions, production function and cost effectiveness studies have had limited policy impact. Agency theory and transaction cost economics, intuitively appealing concepts, have not yet been rigorously applied to education organizations. However, as the education world begins to flatten this field should be expected to grow.

See also: Education and Economic Growth; Education Production Functions: Concepts; Human Capital; Returns to Education in Developed Countries; Returns to Education in Developing Countries; The Economic Role of the State in Education; The Economics of Charter Schools; The Efficacy of Educational Vouchers.

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