

## **BENEFITS OF PRIMARY AND SECONDARY EDUCATION**

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## Introduction

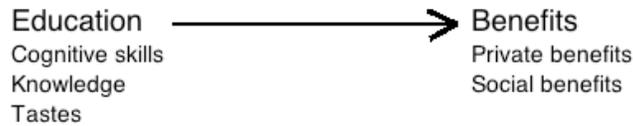
Education economists argue that rational individuals and societies invest in primary and secondary education because of their numerous benefits. An individual and her family enjoy *private benefits* of education such as improved earnings and health. Communities, states, and countries gain *social benefits* from an educated populace, such as larger tax revenues and savings in government expenditures on health and crime. This entry presents three conceptual models for understanding the relationship between education and its benefits, and reviews the international evidence on the various private and social benefits of primary and secondary education.

### Conceptual Models of Education and Benefits

Social scientists typically use three conceptual models to explain the association between benefits and education: the direct effects model, the correlated effects model, and the indirect effects model. Drawing from Nicholas Emler and Elizabeth Frazer's work, this section explores the economic interpretations of these models.

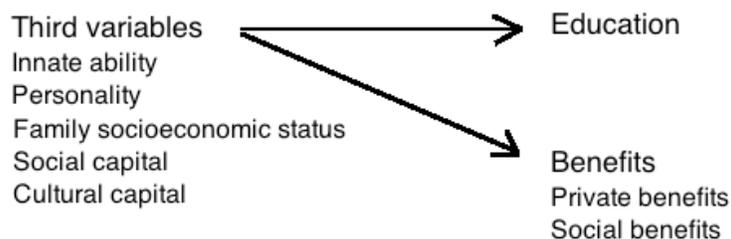
According to the *direct effects model*, increased quantity and quality of education enhances cognitive skills, knowledge, and tastes that lead to improved private benefits, such as greater productivity, earnings, health, and political participation. Notably, the human capital model is a direct effects model that emphasizes the positive effects of education on an individual's labor market productivity. Furthermore, raising the average quantity and quality of education raises the population average for private benefits, thereby spurring social benefits such as tax revenues.

#### Figure 1: "Direct Effects Model"



Unlike the direct effects model, the *correlated effects model* posits that education is influenced by the attributes of an individual, and in turn these ‘third variables’ are responsible for any consequent benefits. Key third variables include an individual’s innate ability (e.g., IQ) and personality (e.g., motivation, patience, and preference for risk). In other words, in this model the quantity and quality of education are correlated with benefits but do not actually cause the benefits. In economics, screening and signaling models are examples of correlated effects models: an individual with more innate ability pursues education credentials to signal her higher productivity to employers, while employers simultaneously screen job applicants and their productivity on the basis of education credentials. Other third variables include an individual’s family socioeconomic status, social capital (i.e., an individual’s relationships with parents and community members), and cultural capital (i.e., the extent to which an individual possesses the mannerisms, dress sense, and accents that impress her teachers and employers).

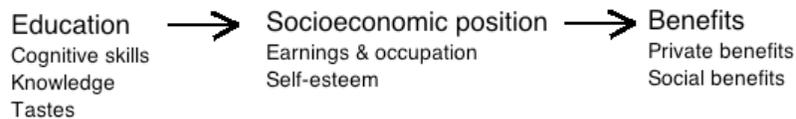
**Figure 2: “Correlated Effects Model”**



Finally, the *indirect effects model* consists of two stages. In the first stage, education affects an individual’s socioeconomic position, which influences labor market

earnings, occupation, self-esteem, and social position; for example, an individual with a higher quantity and quality of education earns more in the labor market. In the second stage, this socioeconomic position affects private and social benefits. For example, a more educated person bears larger opportunity costs (i.e., foregone labor market earnings) for committing a crime and being incarcerated. Like the correlated effects model, the indirect effects model posits that education does not produce private and social benefits. Unlike the correlated effects model, the indirect effects model does assume that education eventually affects benefits.

**Figure 3: “Indirect Effects Model”**



In summary, the three models provide competing conceptual explanations of the association between education and benefits. Economists have made major methodological contributions to disentangling the direct, indirect, and correlated relationships between education and benefits. Nevertheless, it remains challenging to determine which of the models are responsible for the observed association between education and benefits. One explanation for this difficulty is that in any given case, more than one model can hold.

The three models have different policy implications. The direct effects and indirect effects models suggest that educational policy (at the national, state, district, and school levels) have implications for private and social benefits. In contrast, the correlated effects model suggests that schools do not and cannot determine benefits; instead, the correlated effects model suggests that policy efforts should focus on ‘third variables’ such

as family poverty. Since researchers in educational economics and finance are interested in educational policy, the remainder of this entry focuses on explanations of benefits offered by direct effects and indirect effects models.

### **Evidence of the Benefits of Primary and Secondary Education**

A large body of social science research has examined the direct, indirect, and correlational relationships between primary and secondary education and various private and social benefits. Economic research often expresses these benefits in monetized forms. Furthermore, economic research is distinguished by its use of particular concepts, such as human capital theory and concepts opportunity costs, to explain the relationship between education and benefits. Methodologically, in studies of private benefits, the unit of observation is a person and data are gathered from numerous individuals. Next, researchers use statistical methods to establish a relationship between education (typically a quantity of education) and a benefit. For instance, high school graduation is associated with an X percent lower likelihood of incarceration. In monetizing the benefits of education, a study may suggest that high school graduation results in \$Y increased earnings over the lifetime.

To compute a region or country's social benefits, researchers consider the increases in tax revenues and reduction in government expenditure that result from high local rates of educational quality and quantity. Cross-country studies are another approach to assessing the social benefits of education. In these studies, a country is the unit of observation, and researchers investigate the relationship between education (e.g., share of individuals that have completed secondary education) and a benefit for one or

more time periods. Given that data availability is inversely related to a country's level of development, far more research exists on industrialized countries than on developing ones. Furthermore, the research on benefits deals with educational *quantity* but not *quality*; this is because it is easier to collect data on educational quantity (e.g., attainment) than quality measures (e.g., the many class sizes experienced over an individual's entire formal schooling career) in large-scale surveys of adults.

### *Productivity*

As suggested earlier, foundational work on human capital articulated that education has a direct effect on an individual's labor market productivity. In turn, educated and productive individuals earn higher wage rates in the labor market. But what is it about education that directly affects productivity? While visiting farms in developing and industrialized countries in the mid-1900s, Theodore Schultz observed that farmers with primary and secondary education were more likely to adopt new technology. A high quantity and quality of education provided farmers with the cognitive skills (e.g., literacy and numeracy) and knowledge (e.g., science) necessary to operate equipment; thus, compared to uneducated farmers, it took educated farmers less time and effort to learn new technology. To uneducated farmers, the extended time and effort required for technology adoption typically did not justify the benefits of productivity. This farming analogy can be extended to understand the benefits of primary and secondary education in manufacturing and services sectors. From a social perspective, a state or country with more educated workers should experience higher rates of economic growth.

As discussed elsewhere in this Handbook, international research typically shows a positive relationship between individual earnings and quantity of primary and secondary education. Since earnings are often used as a measure of productivity, these findings suggest that productivity is a private benefit of education. According to Clive Belfield and Henry Levin's estimates of private educational benefits, male high school graduates in the U.S. earn \$117,000 to \$322,000 more than male high-school dropouts, and female high school graduates earn \$120,000 to \$244,000 more than their counterparts without a diploma. The majority of other studies present productivity benefits as a rate of return. According to estimates from 52 developing countries compiled by Harry Patrinos and George Psacharopoulos, the rate of return is 23.0 percent for primary education (versus attainment below primary education) and 17.9 percent for secondary education (versus primary education attainment). In industrialized countries, the rate of return for secondary education varies from 7.0 percent to 23.9 percent. Given the universal rates of primary education completion in industrialized countries, returns to primary education are not typically reported for these countries.

One approach to gauging the social benefits of increased productivity (shown in earnings) is to measure the additional tax revenues. Belfield and Levin estimate that male graduates pay \$76,000 to \$153,000 more than dropouts, and female graduates pay an additional \$66,000 to \$84,000. Numerous cross-country studies have analyzed the relationship between education and national productivity or economic growth (i.e., the annual increase in mean per-capita income). Evidence from industrialized countries over the 1991-2000 period suggests that secondary educational quality, measured by scores on international assessments, has a stronger effect on economic growth than educational

quantity. The cross-country evidence from developing countries indicates that educational quantity matters only in a high-quality education system.

### *Health*

A recent body of research examines the relationship between education and health. According to the direct effects model, education improves the cognitive skills necessary for acquiring and processing health information as well as understanding complicated instructions from doctors. Furthermore, well-educated people know more about medical science. The indirect effects model suggests that educated individuals interact with higher status peers who are more health conscious (e.g., have increased access to fitness facilities and nutritional resources) or who work in the health sector (e.g., doctors and surgeons). In addition, the indirect effects model suggests that higher socioeconomic status enhances the ability to pay for superior health insurance, health care, and nutrition. Furthermore, more educated individuals are not discouraged by earnings foregone during health-related activities because of additional earnings accrued over a longer and more economically productive life.

Evidence from industrialized countries indicates that secondary education has a negative relationship with health indicators and outcomes, such as nights spent in the hospital, trouble with stairs, disability that limits personal care, disability that limits mobility, smoking, obesity, long illness, reduced activity, hypertension, and death. In the U.S., high school graduates live six to nine year longer than high school dropouts. However, evidence from England, France, and Wales suggests that increases in secondary education are not associated with longer life expectancy. Some argue that

education matters less in Western Europe than in the U.S. because Europe's more generous government policies (especially health care access and financial support) are stronger predictors of health than education. The economic evidence on the relationship between education and health in developing countries is limited, and has focused mostly on how parental education contributes to child health; this phenomenon will be covered later in this entry.

For society, the health benefits of education can result in significant savings for the public sector. In the U.S., educational attainment is associated with lower enrollment in public sector health care. Belfield and Levin estimate that between the ages of 20 and 65, a high school dropout will receive a total of \$60,800 in government support, whereas a high school graduate will only receive \$23,200.

### *Crime*

According to the economic literature, education may enhance the cognitive skills that are more appropriate for legitimate work than for criminal activities. Knowledge of math and reading can also help individuals assess the benefits and costs of crime and the probability of incarceration. In addition, education instills distaste for crime, which raises the psychological cost of committing criminal activities. Similarly, education may inculcate patience, which reduces the likelihood of participating in criminal activities made attractive by immediate gratification. The indirect effects model also offers clear economic predictions; higher earnings from a greater quantity of education make it more costly to plan and commit a crime. The would-be criminal will not only forego his

legitimate earnings while planning and engaging in this crime, he also stands to lose a large amount of future earnings if ultimately incarcerated as a consequence of that crime.

Economic research from the U.S. and U.K. has used the indirect effects model to demonstrate that crime increases in areas with rising unemployment rates and declining wage rates. Evidence from the U.S. indicates that completing secondary education is associated with a significant decrease in probability of incarceration. U.S. estimates indicate that high school graduates are 0.76 percentage points less likely to be incarcerated than dropouts. This benefit is considerably larger for African American graduates—incarceration probabilities become 3.4 to 8 percentage points lower upon the completion of high school.

The social benefits of decreased crime take the form of savings on several components of the criminal justice system: policing, trials, and sentencing, incarceration costs (e.g., parole and probation), state-funded victim costs (i.e., medical care and lost tax revenue), and expenditures by government crime prevention agencies. According to Belfield and Levin, the average cost saving per new high school graduate in the U.S. is \$26,600.

### *Politics*

Politically, education may only offer psychic benefits for an individual, but it creates important benefits for society. The work of classical philosophers and modern political economists alike—from Aristotle and Plato to Thomas Jefferson and John Stuart Mill—indicates that education has long been viewed as a prerequisite for desirable political outcomes; these outcomes are foundational to the social obligations involved in

political life, and include political attitudes (e.g., tolerance and partisanship), political engagement (e.g., voting, campaigning, and protesting), political skills (e.g., collective decision-making and organization, listening, speaking, and writing), political knowledge (e.g., knowledge of the constitution, policies, ideology, current affairs, and history), and a sense of political efficacy (i.e., faith in government).

According to the direct effects model, education affects political outcomes through knowledge accrued in civics and social science courses that teach facts about historical and current affairs. In terms of cognitive skills, science and other inquiry-based courses could instill values of openness and skepticism, which may enhance political outcomes. Pedagogy may shape students' tastes and habits, especially if children are encouraged to ask questions and express opinions. Economic research from both the U.S. and U.K demonstrates that the quantity of secondary education has a direct effect on awareness of public affairs and support for free speech, both important political outcomes.

The indirect effects model predicts that individuals with a higher quantity and quality of education forego more income in order to engage in politics. This explanation was used in a study of New Zealand twins that found that an additional year of education resulted in a 12.5 percent lower likelihood of volunteering. However, a competing prediction is that more educated, richer individuals can better afford to participate politically. Both the indirect effects model and direct effects model can explain the global research that suggests higher levels of primary and secondary education correlate with more democratic political tendencies, such as voting and tolerance towards ethnic minorities. At the social level, however, cross-country studies show mixed evidence on

the relationship between education and democracy. Furthermore, it is difficult to express the monetary benefits of most political outcomes.

### *Intergenerational benefits*

Educated parents pass intergenerational benefits on to their children. Economic arguments for the intergenerational benefits of mothers' education are based on the direct effects model. Essentially, an explanation for the positive relationship between mothers' education and children's outcomes is that the cognitive skills and knowledge gained from education help with parenting skills. From 1970 to 2000, infant mortality rates sharply declined in countries with higher adult literacy rates; this can be interpreted as an intergenerational benefit of primary education. Perhaps the most consistent finding in international education research is the relationship between mothers' educational attainment and children's educational and health outcomes, including higher birth weight, child survival, earlier entry into school, and years of schooling completed on reaching adulthood. Economic estimates of intergenerational social benefits, such as increases in tax revenues and reduction in government health and welfare expenditures, are unavailable but presumably large.

### **Conclusion**

Much social science research has examined the private and social benefits of primary and secondary education. Several compelling but competing conceptual models frame the relationship between education and benefits. In general, economic research typically finds strong associations between education and benefits like better

productivity, health, lower crime, political outcomes, and intergenerational outcomes. Several challenges remain, however. Methodologically, it is immensely challenging to disentangle the direct effects, indirect effects, and correlations. Furthermore, data limitations have prevented inquiry into educational quality, benefits in developing countries, and computation of monetized private and social benefits.

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**See also** Benefits of Higher Education; Demand for Education; Education and Civic Engagement; Education and Crime; Education and Health; External Social Benefits and Costs; Human Capital Theory; Labor Market Rate of Return in Developing Countries; Market Signaling; Opportunity Costs; Public Good; Social Capital; Socioeconomic Status (SES)/Social Class.

### **Further Readings**

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