

## Conference Summary

The Workshop on Human Capital brought together new and preliminary work on many issues involving education and human capital. The organizing strategy of the workshop was to attract preliminary work so that the participants could get more actively involved in the construction of the model and the empirical implementation. One drawback of this approach, however, is that the conclusions and findings are also preliminary. The topics covered were wide-ranging. Generally, they can be classified under four categories:

- The acquisition of education and human capital
- University admissions policies
- School tax/finance reform
- The relationship between the changing structure of the economy and the returns to educational investment.

### Acquisition of Education and Human Capital

- **Early and Late Human Capital Investments, Borrowing Constraints, and the Family**, by Lance Lochner and Elizabeth Caucutt, was the first of two papers presented at the workshop that were motivated by the effects of credit constraints on the decision to enroll, or stay, in school. This paper empirically investigates if borrowing constraints inhibit family investments in their children. Lochner and Caucutt examine whether the cognitive test scores of children ages 5 to 14 depend on past, present, and future income of their parents. They find that family income has a larger effect on the outcomes of a child at any given age if the income is earned when the child is young. This and other evidence regarding the importance of future versus past income suggests that some families are constrained in their ability to borrow and that these constraints affect investments in children. Lochner and Caucutt then develop a dynastic model of families that recognizes that investments in children take place over a number of years and incorporates the fact that some families may be unable to borrow adequately to fund investments in their children at different points in the life cycle. Using the model, they analyze various government policies aimed at encouraging human capital development, including subsidies for early investments in children, subsidies for college, and loan programs for parents of young children and for college students. The effectiveness of affirmative action programs at the college level is also be studied.
- **Estimating a Learning Model of the College Dropout Decision**, by Todd Stinebrickner, examines possible explanations for the observation that students from low-income families are much less likely to graduate from college than

other students. One prominent explanation for this outcome is that students from low-income families may be affected by credit constraints that influence their ability to pay the direct costs of college or to finance consumption during school. However, other plausible explanations also exist. These possible explanations include the possibility that students from low-income families may be less prepared academically when they enter college, they may have different beliefs about the importance of college, or they may have less accurate beliefs about their academic ability. Quantifying the relative importance of the possible explanations requires that one posit a model of the educational decisions of low-income students. Unfortunately, the full set of data necessary to estimate the parameters of such a model is not available from traditional data sources. This paper describes how the estimation of this type of model is possible using unique new data from the Berea Panel Study.

- **Training and Union Wages**, by Uta Schoenberg, posits that the existence of unions can affect the investment in human capital. To the extent that unions implement wage compression, the returns to investment by workers is decreased. Therefore, individuals invest less in human capital compared to an environment without unions.
  
- **Education, Self-selection, and Intergenerational Transmission of Abilities**, by Adalbert Mayer, develops a model that connects the education level and wages of fathers to their sons' decision to attend college and the sons' resulting wages. This makes it possible to use observed intergenerational relationships to obtain the potential wages of a person for different levels of education. It can be inferred how much workers who never attended college would have earned with a college education and vice versa. A distribution for this hypothetical benefit of attending college can be constructed. The return to a college education varies substantially for different individuals. While some workers are much better off due to a college education, other workers do not benefit from attending college. Due to self-selection, the average return to college is substantially below the difference in average observed earnings of workers with and without a college education (0.06 percent vs. 35 percent of hourly wages). The distribution of the return to a college education can be used to quantify the contribution of a college education to human capital formation. Human capital is increased substantially by the most able college attendees. As the number of individuals in college increases, the additional human capital due to an extra college-educated worker diminishes. It is also possible to evaluate the effects of providing financial incentives to increase the number of college-educated workers. The wage benefit of a college education for additional college attendees would be much smaller than for the workers who chose to attend college in any case. The workers induced to attend college would be the ones with the highest income level among the noncollege educated.

## University Admission Policies

- **Racial Profiling in Higher Education**, by Dennis Epple, Richard Romano, and Holger Sieg, starts by observing that competitive public and private institutions of higher education in the United States take race into consideration when making decisions about admissions and financial aid, when they are able to do so. In public universities in states that have proscribed the use of race, substitute policies, intended to promote minority attendance, have been enacted. Universities seek out the highest achievers among those from under-represented races. Epple, Romano, and Sieg develop a theoretical model, with a computational counterpart, which explains university admissions policies. In the model, race provides a low-cost signal to admissions officers about likely hardships faced by potential matriculants. In a recent case challenging the University of Michigan's affirmative-action practices, the Supreme Court circumscribed the use of race by mandating a holistic approach to admissions. Implications of this decision are analyzed. In the model, a university maximizes an academic quality index that increases with the predicted academic potential of the student body and with the educational inputs the university provides. Student potential is imperfectly observed. A set of readily observable student measures, such as SAT score and high-school GPA, provides information about potential. However, better prediction requires observation of "hardship" experienced by applicants while growing up. Hardship lowers performance in grade school and high school, and masks simple measures of academic potential. Hardship will tend to increase with poverty and membership in minority populations, but can only be accurately assessed at considerable cost. An unregulated university selects, based on relatively low-cost observables, the set of applicants, if any, for whom hardship is accurately assessed. For the latter students, admission and financial aid are directly linked to the readily observed variables that predict potential (e.g., SAT score) and to the hardship measure. For other students, the university employs racial profiling, with admission and financial aid directly linked to race. The model predicts colleges' equilibrium tuition and financial aid policies, expenditures on educational inputs, and the allocation of students of varying characteristics across educational institutions. The recent Supreme Court decision is interpreted as requiring assessment of hardship for any admitted students, thus as disallowing racial profiling. Because assessments are costly, the set of potential student types that are considered is affected. The effects on the characteristics of the student body, tuition and financial aid policies, and provision of inputs are examined. Specific predictions about these effects are made by employing the counterpart computational model that is calibrated to U.S. data.

## School Finance Reform

- **Assessing the General Equilibrium Effects of School Finance Reform in Michigan**, by Maria Ferreyra, models a change in school finance reform from the use of property taxes to sales taxes. The use of property taxes certainly affects how much revenue is generated for the local school district. The evidence in the Detroit metro area showed extreme variance by school district in the amount of revenues. Thus, school expenditures per student were quite unequal, so children in poorer areas did worse than those in richer ones. In addition, many were leaving the inner city and moving to the suburbs. Tax reform in Michigan created an environment in which revenues were more equal across districts. To date it has been observed that families are moving back to the inner city.

## Structural Changes and Human Capital

- **Occupational Specificity of Human Capital**, by Iourri Manovskii, documents that the returns to human capital accrue mostly to occupation rather than industry or tenure with a firm. In other words, a change in occupation is much more likely to result in substantial loss of earnings compared to moving from one industry to another or from one firm to another. In addition, Manovskii finds that occupational mobility has been increasing over time.
- **Labor Mobility, Relative Wages, and the Growth of the Service Sector**, by Donghoon Lee, begins with the observation that the U.S. economy has witnessed substantial growth in the service sector over the past 50 years. In 1950, 57 percent of workers were employed in the service sector, but by 2000 that figure had risen to 75 percent. Lee examines the sources of this growth of the service sector. He finds that demand-side factors, that is, technical change and movements in product and capital prices, are responsible for the growth of the service sector. In addition, Lee finds that growth in the service sector increases the employment of females as well as their wages relative to males, and also increases the college-wage premium.