

Dissertation Awards

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The Valuation of Human Capital: A Study of  
Education and Training: Dissertation Summary

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# The Valuation of Human Capital: A Study of Education and Training

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## OVERVIEW

Human capital accumulation has long been a point of interest for economists, particularly in recent years when rising wage inequality has been associated with increasing premiums on education and skills. As a result, national attention has focused more closely on the availability of educational opportunities and training programs in order to assist low-skilled individuals who are hurt the most by recent increases in inequality. In many cases, it is difficult to measure the value of these opportunities. What is the value of a better education? What is the value of firm-provided training?

A number of studies have focused on the "value" of education by relating the wages individuals earn when they are older to the quality of their education, measured either by inputs or outputs, when they were younger. However, a key limitation of this work is that there may be other factors influencing wages that are also related to school quality. For example, if parents who are more concerned about school quality are more likely to send their children to better schools, and the children will do better because their parents care more, regardless of the school quality, then we may see a positive relationship between school quality and wages even if none were there. In addition, the choice of using inputs (such as school spending) or outputs (such as test scores) to measure school quality affects the conclusions made. As a result, the literature has been controversial.

A very different way to approach the issue is to focus on the value that parents place on better schools. One way to do this is to look at the housing market and see how much more parents are willing to pay to live in an area with better schools. The first chapter in the dissertation looks at houses in three counties in Massachusetts and calculates the value, in terms of increased housing prices, of better schools as measured by higher test scores.

While understanding the value of better schools is essential when evaluating a number of educational

policies, other programs, such as the implementation of school vouchers, require an understanding of both the value of increased access to private schools and the effect of increased private school access on public school quality. There is a very limited understanding of the implications of voucher programs and the effects of increased private school access, and a first step in understanding the potential effects is to look at the value of private school access in the absence of school vouchers. We can then infer what the effects of increased access will be. The second chapter in the dissertation focuses on the valuation of private school access in terms of the value as capitalized in housing prices and the effect on public school quality, shedding light onto an area that has had few previous empirical findings.

Finally, schools are not the only avenue by which we can improve the skills of low-skilled individuals; another method is firm-provided training. If schools are not providing the necessary skills, it may be the responsibility of the firms to do so. However, firms may be unwilling to invest in workers if training is not profitable. In order to determine the value of firm-provided training and other workplace practices, we first must understand their relationship to firm productivity. The third chapter in the dissertation looks at different workplace practices and relates them to firm productivity, informing an area that has previously been lacking due to data limitations.

## DO BETTER SCHOOLS MATTER? PARENTAL VALUATION OF ELEMENTARY EDUCATION

From a policy perspective, understanding the value of better schools is integral to the improvement of our educational system. Relevant policies include busing programs, school choice, school voucher programs, and school finance laws. Of particular interest to policymakers are whether parents are informed enough as consumers of education to be sensitive to differences

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Sandra E. Black received her Ph.D. from Harvard University. Her dissertation advisor was Lawrence Katz.

in the performance of local schools and how they value these differences. The first part of this dissertation focuses on estimating the value parents place on education, and it does so by looking at the housing market. The first chapter looks at the valuation of public elementary school quality as capitalized into housing prices. Previous literature that used the housing market to look at the relationship between housing prices and school quality has been limited by the fact that better schools are located in better neighborhoods, so omitted neighborhood characteristics may be biasing estimates of the valuation of school quality upwards. It is therefore difficult to isolate the effect of school quality on house prices.

Ideally, we would look at similar quality houses on opposite sides of the same street, where the children on one side of the street attend one school and those on the other attend another school. There would be virtually no neighborhood variation, so differences in house prices would reflect only differences in school quality and school peers. Using Massachusetts data on individual house sales with exact geographic location information, I am able to observe something very close to this ideal, thereby minimizing the confounding effects of unmeasured neighborhood characteristics.

I do so by looking at houses on attendance district boundaries, the geographic boundaries that determine which school a child goes to within a district. By comparing houses within the same city, I eliminate all variation in property tax rates. By comparing houses within the same school district, I am controlling for differences in per-pupil spending. By comparing houses on opposite sides of the attendance district boundaries, I am comparing houses that are within a very small geographic distance of each other and therefore I am controlling for variations in neighborhoods. The only difference in the houses I am comparing is in the elementary school the child attends, so any difference in house price can be attributed to differences in elementary school quality.

Using a standardized test score administered by the state (the Massachusetts Educational Assessment Program [MEAP]) as my measure of school quality, I find that parents are willing to pay for better schools. Chapter One shows that parents are willing to pay about 2.1% more for houses associated with elementary schools having 5% higher test scores at the mean. This estimate is \$3,948 at the mean house price (\$188,000) and is approximately half the estimate I get when I run the more typical hedonic housing price regression with census block group controls for neighborhood

characteristics. This suggests that there was a significant amount of bias due to omitted neighborhood characteristics. The estimate provides information about the value of programs that would involve busing or sending students from poorer neighborhoods into better neighborhoods.

### **THE EFFECTS OF PRIVATE SCHOOL ACCESS: A STUDY OF THE HOUSING MARKET**

The second chapter focuses on the valuation of private school access, again as capitalized in housing prices, through its direct effect and its indirect effect (through changes in public school quality, which is also capitalized into housing prices). When considering policies such as the implementation of a school voucher program, which would essentially increase private school access for low-income families, understanding the implications of private school access is essential. There is a large theoretical literature focusing on the relationship between private school access and public school quality, and the results are ambiguous depending on the assumptions made. There is, however, very little empirical evidence resolving the uncertainty. Some evidence suggests that private school access increases public school efficiency, but tempering this are theories that private school access may lead to decreases in public school spending or reduced peer quality in public schools. The second chapter sheds light on this literature and provides evidence on this relationship.

By looking at the effects of private school access on the housing market, I am able to look at both the direct effect of private school access on house prices and the indirect effect through public school quality. I use data on the housing market in Middlesex County in Massachusetts, where approximately 16% of elementary school children in the county attended one of the 64 available private schools in 1993.

I find that, controlling for neighborhood characteristics, there is a significant positive effect of private school access, measured in a number of ways, on house prices. However, this effect is reduced somewhat by the fact that private school access seems to have a negative effect on public school quality as measured by elementary school test scores. Although I am only able to measure a partial equilibrium result (because my study is limited to one county in Massachusetts and is not able to pick up such things as beneficial increases in public school efficiency), these results still suggest that private school access does somewhat reduce public school quality and still on net raising house prices.

## **HOW TO COMPETE: THE IMPACT OF WORKPLACE PRACTICES ON FIRM PRODUCTIVITY**

The third chapter of the dissertation shifts focus from education to firm-provided training and workplace practices. In joint work with Lisa Lynch, we look not at the dollar value of additional training, but its value in terms of increased firm productivity. By looking at the relationship between training and workplace practices and firm productivity, we can better understand the skills that will be needed in the workplace. We use a new, nationally representative survey of U.S. establishments and look at the association between establishment workplace practices and productivity.

In earlier work, we examined the relationship between different types of firm training and the depth of firm training and workplace practices. Our results, which showed that types of training and training intensity vary significantly across manufacturing and nonmanufacturing sectors, across industries, and even across firms within industries, suggested the need for an understanding of how these practices are related to firm productivity. There is much discussion today of moving away from more traditional assembly-line production technology to technologies where workers have more input into the production process. We see examples of this type of workplace almost every day, even on television commercials advertising that products are superior because the employees have a voice in how it is produced, and therefore they "care" more.

In the third chapter, we evaluate this new type of workplace technology by assessing its relationship to firm productivity. We estimate a standard Cobb-Douglas production function with cross-section data that is augmented by measures of workplace practices and human capital investments, along with panel data estimation using data from the Longitudinal Research Database (LRD). Using a two-step procedure, we first

estimate our production function and calculate firm fixed effects (the firm average residual), which are then regressed on our measures of workplace practices and other employee and employer characteristics to determine their association with productivity.

We find that workplace practices do matter regardless of how the production function is specified. We also find that the key is not whether or not an employer adopts a particular workplace practice, but how the practice is implemented. That is to say, simply adopting a Total Quality Management (TQM) system has an insignificant effect on productivity, but raising the proportion of workers involved in decision making within the plant, either through regular meetings (an important component of TQM systems) or through unionization, does have a significant positive association with establishment productivity.

Our findings suggest that establishment practices that encourage workers to participate in the production process decisions are associated with higher firm productivity.

## **CONCLUSION**

While my dissertation presents evidence on the value of education and training, it is only a first step. In terms of education, a study of what elements of better schools parents are willing to pay for is a natural next step. Do they value better test scores because of the better students at the school, or is it the better teachers and administrators that are important? With respect to private school access, we still have many unanswered questions. Not only do we need to understand what are the more general equilibrium effects of private school access on public school quality, we also must determine the value of different types of private schools instead of looking at them as a homogenous group. Finally, my results suggest that workplace practices are related to firm productivity, but further research and more data are necessary in order to convincingly attribute causality.