"Teacher Quality and Educational Production"

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The process by which economic agents acquire skills is at the heart of some of the most fundamental concepts in labor economics including economic growth, unemployment, crime, wage gaps and discrimination. Therefore, the majority of my research has focused on furthering our understanding of this process. Specifically, my dissertation evaluates teacher quality and its role as an input in the human capital production function. I consider not only the importance of teacher quality as an educational resource, but also the extent to which new methods can be implemented to improve incentive structures and reward high-quality teachers.

Re-examining the Role of Teacher Quality in the Educational Production Function (Koedel and Betts, 2006) evaluates the importance of variation in performance-based teacher quality as a determinant of educational output in elementary schools. This paper finds that the existing literature has understated the magnitude of the variance of teacher quality and proposes a method to improve the general student-achievement specification from which teacher effects are usually estimated. The paper also shows that teacher quality measured by student outcomes is virtually uncorrelated with the current determinants of teacher recruitment, retention and salaries. Motivated by this result, the costs and benefits associated with the implementation of performance-based teacher accountability are evaluated in detail.

In *Teacher Quality and Educational Production in Secondary School* **(job-market paper)**, I examine teacher quality and joint production in the secondary school educational production function. Teacher quality is measured by students' test scores and graduation outcomes. For the test-score analysis, I allow multiple teacher inputs to affect student performance and estimate teacher effects from a within-student, value-added specification to control for selective matching between students and teachers. I identify which teacher inputs affect output in both math and reading and find strong evidence of joint production. I also consider the extent to which teacher quality affects whether students graduate from high school. I use an exogenous set of instrumental variables based on school-level staffing changes from year to year to identify teacher effects and show that students' graduation decisions are indeed influenced by teacher quality. Furthermore, teacher quality measured by high school completion rates is positively correlated with that measured by test-score performance. The results from my analysis are applicable to incentive design and teacher accountability at the secondary level.

The two studies summarized above show that high-quality teachers have important effects on skill acquisition. Thus, it is straightforward to conclude that a shift in the resource of teacher quality toward disadvantaged students will reduce the achievement gap, possibly substantially. However, would such an equity-improving policy involve high efficiency costs? In *Teacher Quality, the Achievement Gap and Efficiency in Educational Production*, I address this question. Specifically, I ask whether students from worse socioeconomic backgrounds are differentially affected by teacher quality inputs. I start with a simple theoretical model showing that if human capital growth in children is a normal good to parents, higher parental resources will correspond to more home resources devoted to the development of children's human capital. Given this theoretical prediction, I evaluate the interaction between home resources and teacher quality in the human capital production function. Because teachers' classrooms are inherently small in the statistical sense, differential effects of teacher quality across student types (i.e. advantaged versus disadvantaged) are difficult to identify on a teacher-by-teacher basis. Instead, I estimate an alternative teacher-quality distribution that is generally faced by disadvantaged students. This alternative distribution is estimated based on teachers who teach both advantaged and disadvantaged students, thereby isolating the effects of the interaction between home resources and teacher quality in the human capital production function. My preliminary results indicate that all students are similarly affected by differences in teacher quality. This implies that the equity gains associated with a shift in teacher quality toward disadvantaged students could be obtained without lowering efficiency.