Econ613 Reading Note

Do Better Schools Matter?

Parental Valuation of Elementary Education

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School quality measurement is getting increasing attention nowadays. Besides directly establishing a link between school quality and student outcomes, one alternative strategy is to estimate the relationship between student outcomes and the value that parents place on school quality, which can be inferred by house prices. The house prices, however, can be overestimated since better schools are more likely locates in better neighborhood. Thus, to control for neighborhood characteristics, the author restricted the sample to houses on opposite sides of attendance district boundaries that are associated with different schools. Basing on the typical hedonic price equation, the author added boundary dummies to address the problems of omitted neighborhood and school district variables, and estimated the model including sensitivity tests. The results showed that parents are willing to pay more for an increase in test scores.

The basic methodology to estimate the relationship between school quality and student outcomes bases on a hedonic price function, which describes the equilibrium that the price of house in attendance district in one school district can be determined by the characteristics of the house, neighborhood, school district characteristics and primary interest (average test score). This function can help explain the relationship of interest, however, results are biased due to omitted variables from two aspects: school district (in particular property tax rate and public goods provision) and neighborhood characteristics. One way to address both type of omitted variable problems is comparing houses on opposite sides of attendance district boundaries, so that factors vary at the school or city level are no longer a concern. In addition, pitfalls associated with omitted neighborhood characteristics can be avoided since the houses locates very close to the boundaries and neighborhoods don't change significantly around the boundaries. Therefore, the author replaced the vector of neighborhood and school district characteristics with a vector of boundary dummies, which explain unobserved characteristics shared by houses on either side of the boundary.

Basing on the above methodology, the author chose Massachusetts as the study sample, which contains 181 attendance district boundaries. To measure the school quality, the author took the fourth grade Massachusetts Educational Assessment Program (MEAP) as the indicator. Also, neighborhood characteristics are represented by a number of census block group variables and school district characteristics (such as pupil/teacher ratio, average per-pupil expenditure and average property tax) are also added into the dataset.

The author first estimated the original equation which has omitted variable problems to find the value parents place on school quality without limiting the comparison to houses on opposite sides of an attendance district boundary. The results show that bedrooms and bathrooms, per-pupil expenditure, average test scores are positively correlated with house price, while age of building, the distance from the center city and pupil/teacher ratio are negatively related to the house price. Even though the results seem reasonable, there still remains problem of omitted neighborhood characteristics. Thus, the next step of this paper is to focus on the second equation which restricts the sample to houses that are very close to the boundaries. The author first estimated the model including boundary fixed effect by restricting the houses that are 0.35 miles from the nearest boundary and found that the coefficient on elementary school test scores changes significantly. She further restricted the sample to houses that are 0.20 miles and 0.15 miles from the boundary and the coefficients on house characteristics and test scores don't change significantly compared to 0.35 mile.

To verify that neighborhood characteristics is controlled when focusing on the boundaries, the author added neighborhood characteristics into the model, and the results showed that the difference in means of houses on opposite sides of the boundary for the restricted sample over the difference in means for the whole sample decreases by looking closer to the boundary. She then compared the magnitude of effect (percent change in house price as a result of a 5% change in test scores) of each specification. The results show that with 0.15 miles from the boundary, the housing prices increase 2.1 percent ($3948 from the mean) with a 5% change in test scores, which can be overestimated if we omit some neighborhood characteristics. Finally, the author tested the sensitivity of the results and verified that the results are robust to a number of sensitivity checks, including no roads, census block group level, house quality, number of bedrooms and so on.

In conclusion, this paper estimates the relationship between school quality and student outcomes which reflect on house prices and test scores separately. To avoid overestimating the value of better schools, the author restricted the sample to houses on opposite sides of attendance district boundaries to control for neighborhood characteristics. Then, she estimated the model basing on both typical hedonic function and function which includes boundary fixed effect. She compared the magnitude of effect and the results showed that parents are willing to pay more for better schools. Furthermore, there may exist a possible limitation in this paper. This paper doesn't further clarify the reason of the differences in scores, which can be affected by peers, teachers and parents, etc. It may be better to include one more step to show what factors can lead to higher test scores, so that we can better understand the determinants of school quality.