EXPLORING THE IMPACT OF ORGANIZED LABOR ON PUBLIC SCHOOL EFFICIENCY USING DATA ENVELOPMENT ANALYSIS

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ABSTRACT

We classify 50 states in the United States into two categories by the level of unionization in education such as high and low and examine the comparative efficiency on their education systems. We include pertinent variables and analyze them using data envelopment analysis. We discuss the impact of labor unions on the relative efficiency of public schools.

INTRODUCTION

The effectiveness of public education in the United States has been the subject of criticism in recent years. The ability of American students to compete in the global economy is being challenged by foreign scholars. This study will seek to determine if the unionization of education has an impact on the efficiency of public education in the United States.

Supporters of organized labor assert that unions benefit the educational system in many ways. For example, unions protect educators from mandates set by inexperienced administrators and boards by giving them a collective voice to speak out about their interests. Additionally, union representation can result in job security and fair compensation. Recently, teacher unions have begun supporting education reform to further promote advancement of students. Finally, union membership often includes liability insurance to protect teachers in the event of unfounded lawsuits.

Opponents of organized labor argue that outdated contracts protect teachers against unfair policies that are no longer practiced. Teachers unions have the potential to block education reform that is necessary to improve educational systems. Additionally, many opponents point out that merit pay and tenure enable underperforming teachers to remain in the classroom, resulting in a negative impact on student performance.

Standardized test scores and graduation rates are typically used to evaluate student performance. Efficiency studies often examine teacher ratios, funding levels, and environmental conditions to further evaluate educational institutions. By comparing decision making units (in this case state education systems), DEA analysis can identify the most efficient unit in order to provide a benchmark for future performance. This study will use DEA analysis to compare primarily unionized states to those states with low union representation. Data will be collected from the U.S. Department of Education, the U.S. Census Bureau, and American College Testing.

Related Studies

Charnes et al. (1978) developed a model that was appropriate in evaluating the efficiency of decision making units, particularly in the public sector. The model worked well in public programs, because the required empirical data was generally available. Additionally, the assumption was that public programs were free from competition, leveling the manager's opportunity to efficiently utilize resources. As stated in their study "the objective is to measure the efficiency of resource utilization in whatever combinations are present (loose or tight) in the organizations as well as the technologies utilized." In the case of public education programs, the authors suggested using inputs such as number of teacher hours and community support activities. Suggested outputs included math scores, psychological tests, and student ability to control motor skills.

Bessent et al. (1982) applied DEA to 167 schools in the Houston Independent School District. The authors reviewed the difficulties inherent to other forms of analysis, such as least squares linear regression. No other model could simultaneously consider multiple inputs and multiple outputs as in the DEA models. The authors chose the Iowa Test of Basic Skills (ITBS), which had been administered in the Houston District. Specifically, they selected the mean of the 3rd grade and 6th grade composite scores to measure the outcome of the Houston schools. They chose twelve inputs, including socioeconomic factors like percent non minority enrollment, percent of students paying full lunch price, and attendance rates, along with managerial controlled inputs such as number of professionals per 100 students, percent of teachers with masters degrees, percent of teachers with more than three years experience, and expenditures per student, among others. DEA identified 46.7% of the schools as inefficient. The study identified managerial implications of DEA, such as principals could use the results to justify requests for additional resources, when classified their school was found to be efficient, yet had lower than average outcomes. In other words, the principals were able to show management that they were efficiently using the resources they had, but could not achieve higher results without additional resources. Additionally, management could use the results of DEA to evaluate goal achievement and to adjust resource allocation where necessary.

Bates (1997) provided a look at common methods for analyzing the efficiency of public education, including simple measures of average scores, proportions of pupils attaining a given standard to those incorporating previous levels of attainment, and those concerned with "efficiency" which measure both inputs and outputs. This study included a discussion of how to choose the correct DEA model. Additionally, the author fully discussed the use of categorical variables, such as economic status of parents and rural vs. urban impacts on efficiency. Care should be exercised when dealing with categorical variables, including the number of factors to consider, the treatment of returns to scale, and the treatment of individuals not possessing the measured characteristic. The author concluded that given the inherent problems to assessing educational efficiency, the best use of DEA assumed a constant return to scale. Additionally, inputs should not be taken at face value, but should be evaluated and adjusted. These adjustments required the use of further statistical analysis when including categorical input variables in the DEA analysis.

Chakraborty et al. (2001) analyzed 40 Utah school districts using DEA, a nonparametric method and the stochastic frontier method, a parametric method. Inputs included managerial controlled factors such as student teacher ratio, percentage of teachers with advanced degrees, and percentage of teachers with 15or more years' experience and environmental factors such as socioeconomic status, education level of local population and assessed real property value per student. The single output was a composite of reading, writing, and math skills of 11th graders.