ECON 398 – Professor Underwood

Empirical Project Literature Review

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Teacher shortages have been an important issue of interest in the discussions on the United States educational system, especially concerning its stature in the world stage. After the Great Recession, an increasing demand for teachers met with deteriorating supply not only due to previous layoffs and retirements, but a significant rate of attrition of 8% compared to well-performing countries like Finland and Canada with 3-4% (Sutcher, 2016). While temporary market conditions are to blame for this crisis, many systematic problems exist. Temin (2002) have argued that the current market for teachers, coupling inflexible union regulations and decreases in funding from the government, is at a static equilibrium that would continue and worsen the educational quality nationwide if there are no radical shifts in how it is organized.

Concurrent and symptomatic of these trends are the high turnover rates in schools with 13.% annual turnover nationwide and 30% of new teachers leaving the profession within five years, and both hovering at higher rates for high-poverty, urban and low-performing schools (García and Weiss, 2019). There has been plenty of evidence relating teacher turnover rate with student performance, with the majority showing that high turnover affects student achievements negatively and decrease the overall faculty quality (Jackson and Bruegmann 2009; Sorensen and Ladd 2020; Ronfeld 2013). Therefore, in order to understand the teacher shortages and how it affects the quality of education, this research project aims to examine the causes of turnover’s effect on performance, with the goal to contribute to the economic discourse on hiring, spending, and organizational practices in public education.

Discussions in the literature on this topic have different approaches on determining the trends and causes of this correlation. A popular approach is the “compositional” one that points the disparity in performance to the quality of the teachers leaving and coming in, which influence the effect of the change in teacher quality whether it is negative or positive in the same direction. Looking through this lens, García and Weiss (2019) show that compared to those who stay, smaller shares of those who left (for other schools or another profession) are qualified in almost every category, which means that generally schools are not losing quality because of attrition alone. This does not necessarily mean the replacements would be of better quality, which is the case in high poverty schools across the nation. Improving on this measure of compositional quality after turnover, Sorensen and Ladd (2020) analyze the composition of North Carolina schools’ teachers through examining net effects of in-out flows, resulting in a negative correlation between turnover rates and rate of better-qualified teachers. A resulting policy recommendation of this approach - targeted increase in pay to the better performers in schools with difficulty retaining teachers - have seen success in the case of selective retention bonuses in Tennessee for high performing teachers in poor schools (Swain, et. al. 2019). By only focusing on the compositional changes in teachers, however, these researches leave out significant effects of turnovers on performance other than that of teacher characteristics, empirically demonstrated by Ronfeld et. al (2013) and theoretically examined by Ingersoll (2001).

The main alternative to the “compositional” approach focuses on these so-called “disruptive” effect of turnovers that are not necessarily explained by change in quality, such as the decrease in institutional knowledge and relationships (Jackson and Bruegmann 2009), and the costs of replacements and transitions placed on schools, teachers and students (Sutcher, 2016). Looking into a sample of more than 1 million grade 4 and 5 students in New York, Ronfeld (2013) shows that even when controlling for indicators of teacher quality, experience, and the outcome of students switching teachers, there are still lingering negative effects of turnover rate that might be related to more structural changes to schools caused by the disruption. This effect is especially salient for low-performance schools, as the students are more deeply affected by the same rate of change, and the schools’ turnover rate is often higher as well. While these signals point towards a ‘disruptive’ effect on performance, there has not been many significant research inferring endogeneity between turnover-induced performance shift and any number of single disruptors, with Jackson and Bruegmann (2009) showing only that peer-spillover effects should not be assumed away, not that it is an endogenous factor in student performance.

Therefore, further examinations of the non-individual characteristics within teacher turnover can be useful in isolating its effects on student performance. The previous literature suggests that having a favorable teaching environment is negatively correlated with the turnover rate (Ingersoll 2001; Perrachione 2008). The teaching environment can be measured by general school conditions, student behavioral measures, and with consideration of teachers, students and staff’s perceptions, which García and Weiss (2019) have touched on in a comprehensive nationwide report. The picture is grim, with large portions of the teachers reporting unprepared and ill-supported students, safety concerns, lack of voice and influence in job practices and materials. This leads to a high degree of dissatisfaction with their schools, especially in the high-poverty and underserved ones that need greater quality and retention the most. While teacher turnover has not been widely explored in terms of organizational conditions and traits, employee turnover theory can be applied as schools are often classified as relying on “uncertain and nonroutine technology” that can be disrupted by changes in the dynamics and composition of the working environment, which in turn leads to change in effectiveness (Ingersoll, 2001). Similarly, the environment and fit of teaching and school characteristics are shown to be significantly related to satisfaction and retention rates in a survey of Missouri public elementary teachers, while job concerns such as salary and workload are considered more minor factors (Perrachione, 2008). This is pertinent with the observation in the New York analysis of better teachers being reluctant to transfer even with lower income, lower performance schools (Ronfeldt, 2013). However, as Kraft et. al. (2016) point out, past research which has looked into the effects of environment on turnover and achievement either does not contain longitudinal data, which let time-invariant factors between schools or districts to affect the results, or only looks at one aspect of teaching environment. The researchers then proceed to analyze panel data on New York city schools, concluding that administrator’s leadership and a safe, orderly environment are closely related to turnover and student achievement.

This research, building on these existing findings and methods, use a panel dataset on public schools in Massachusetts to demonstrate the interrelationships between teacher turnover, student performance, and the educational environment including safety and order, administrator turnover, and in-district funding. When controlling for the teachers’ quality through the net compositional flow of teachers, the student’s characteristics, and school fixed effects, it examines whether measures of school environment contribute to a significant relationship between low turnover rates and good school performance. Additionally, in 2017, the Massachusetts Department of Education implemented a new student assessment format and benchmarks, providing data on its first 3 years of implementation in addition to that of the old test in the past. By looking into a wide range of factors, both compositional and disruptive, across a period of time and across change in assessment standards, hopefully the research can bring value to the policy debates on how to improve schools with limited resources and shortage of quality teachers.

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