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School-based teacher hiring and achievement inequality: A comparative perspective

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ABSTRACT

The study examines associations between school-based teacher hiring and achievement inequality in mathematics and science. Using a nationally representative sample of 295,416 students from 34 OECD member countries who participated in the Program for International Student Assessment (PISA) 2012, the study finds that school-based hiring is associated with a larger gap in the distribution of teacher quality between advantaged and disadvantaged schools. This study also finds an association between school-based hiring and inequality of achievement based on socioeconomic status. This suggests that school-based hiring may contribute to exacerbating inequality in learning opportunities and increasing family background's positive effect on achievement.

1. Introduction

Since the early 1980s, school autonomy has frequently been proposed as a way of making schools more productive in both developing and developed countries. Cross-country evidence using international student achievement tests show that students perform better in countries with higher levels of school autonomy in process and personnel decisions (Arcia et al., 2011; Bruns et al., 2011; Fuchs and Woessmann, 2007), particularly in developed and high-performing countries (Hanushek et al., 2013). However, there is a lack of research on the degree to which school autonomy on staffing decisions are associated with inequality in student performance. Only a few studies have examined the relationship between school autonomy on staffing decisions and achievement inequality, and the findings are inconclusive (Woessmann et al., 2009).

It is important to examine the association between school autonomy on personnel management and inequality in student achievement because school autonomy on staffing decisions might be closely related to inequalities in teacher distribution (Akiba and LeTendre, 2009; Luschei and Chudgar, 2017; Luschei et al., 2013). Providing equale distribution of teacher quality is still a challenge in many countries (Akiba et al., 2007; OECD, 2013b, 2014b). Inequalities in teacher distribution matter greatly because teacher quality is one of the most important determinants for student success (Darling-Hammond, 2000; Hanushek et al., 2014; Muñoz et al., 2011; Rivikin et al., 2005). However, comparative studies have rarely assessed the degree to which school-based hiring is associated with inequalities in teacher distribution. This study attempts to fill the void in the literature by examining the degree to which school-based teacher hiring practices are associated with distribution of teacher quality and socioeconomic achievement inequality.

1.1. School-based hiring, distribution of teacher quality, and achievement inequality

Teacher quality is often considered to be a crucial school-level factor predicting student academic outcomes (Hanushek et al., 2014; Nye et al., 2004; Rivikin et al., 2005). Despite the important role of teachers in student achievement, in particular for low-achieving and disadvantaged students, disadvantaged students are more likely to have less qualified teachers in many countries (Akiba et al., 2007; OECD, 2013b). For example, in 30 of the 65 countries that participated in the Program for International Student Assessment (PISA) 2012, principals in socioeconomically disadvantaged schools reported more shortages of qualified teachers than those in advantaged schools (OECD, 2013b). Inequalities of teacher distribution across student and school social backgrounds vary across countries. Using data from the Trends in International Mathematics and Science Study (TIMSS) 2003, Akiba et al. (2007) found cross-national variation in access to highly qualified teachers between advantaged and disadvantaged students. While the national level of teacher quality in the United States was similar to the international average, the "opportunity gap" in students' access to highly qualified teachers between wealthy and poor students was the fourth largest of the 39 countries. They found that in Korea and Japan, there is no opportunity gap between wealthy and poor students in terms of access to highly qualified teachers.

Cross-country differences in equal access to high-quality teachers

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may be due in part to the degree of school autonomy in teacher hiring (Akiba et al., 2007; Kang and Hong, 2008; Luschei et al., 2013). For example, Akiba et al. (2007) suggest that the implementation of regional education authority-based hiring and the periodic rotation of teachers might explain the smaller opportunity gap in students' access to highly qualified teachers in some countries (e.g., Korean and Japan). In Korea, public school teachers are hired at the city or provincial level and assigned to schools in the city or province. Then every five years, they are required to move to different schools within the city or province. In doing so, they have a virtually equal probability of teaching in any given school within the city or province, and reduce school-based differences in overall teacher quality.

Several studies, mainly in the United States, show that: prospective teachers are more likely to apply to schools that serve more students who match their own social background; more qualified teachers are disproportionately concentrated among academically and economically advantaged children; and more school-based hiring is likely insufficient in increasing the equitable distribution of teachers across schools (DeArmond et al., 2010; Engel and Cannata, 2015; Engel et al., 2014). DeArmond et al. (2010) examined how school-based hiring plays out among schools serving different students in different locations within a single district in the United States. In this study, school-based hiring refers to school personnel, rather than central office bureaucracy, having the authority to make hiring decisions. DeArmond et al. (2010) found that fully qualified teachers are less equitably distributed among disadvantaged schools under school-based hiring systems.

School-based teacher hiring varies across countries (OECD, 2009a, 2013b). For example, over 90% of teachers worked in schools with considerable responsibility for hiring and firing teachers in Belgium (Fl), Bulgaria, Estonia, Hungary, Iceland, Lithuania, Norway, Poland, the Slovak Republic and Slovenia, whereas there was less school autonomy for personnel management in Austria, Italy, Korea, Malaysia, Malta, Mexico, Spain and Turkey (OECD, 2009a). In countries where schools have responsibility for hiring teachers, the school principal tends to always be involved in this decision (European Commission, 2007). In countries where schools have less autonomy for personnel management, the level of central office that makes hiring decisions varies. For example, in Australia, either central authority or school or a combination of both decide whom to hire; in Korea, the regional school authority decides; in Japan, the prefecture (state) decides; in Mexico, state-level officials, including teacher union representatives in some cases, decide; and in Singapore, the Education Ministry does the hiring (Akiba and LeTendre, 2009; Kang and Hong, 2008; Luschei and Chudgar, 2017; Wang et al., 2003).

Even in countries where schools have responsibility for hiring teachers, there are variations in the mode of decision-making. On average across OECD countries,[1] 31% of decisions on personnel management are made at the school level (OECD, 2012). Around the half of these schools have full autonomy in personnel management, and the rest of schools made decisions after consulting with other levels of bodies, or within a framework set by a higher authority. For example, the majority of schools in the United States take responsibility for hiring teachers, but some schools frequently share authority over teacher hiring with local educational authorities (e.g., district administrators) (Engel and Cannata, 2015). In a nationally representative survey of school principals in 2007-08, principals were asked, "How much actual influence do you think each group or person has on decisions concerning hiring new full-time teachers of this school?" In this study, principals report whether or not a variety of stakeholders (e.g., teachers, principal, school district staff, local school board, and state department of education) exert major influence on these decisions. According to the results of this survey, about 90% of public school principals indicated that they have a major influence on hiring new full-time teachers at their school (Battle and Gruber, 2009). Nearly one-third (32%) of principals reported that local school district staff have a major influence on teacher hiring decisions (Engel and Cannata, 2015), indicating that some schools share responsibilities with local district authorities.

After teachers are hired, teacher assignments and transfer practices vary across countries. Most states in Australia, for instance, do not require teachers to transfer, whereas Japan and Korea have a more stringent teacher rotation policy administrated by the prefecture boards of education or the regional school authority (Akiba and LeTendre, 2009). In Japan and Korea, public school teachers are hired at the city or provincial level and assigned to positions in schools in that city or province (Kang and Hong, 2008; Okano and Tsuchiya, 1999). Then, teachers are regularly transferred from one school to another every few years, within the area governed by the city or province.

Several studies speculate about how school-based hiring might be linked to achievement inequality, but comparative studies have rarely examined associations between cross-national differences in school-based hiring and achievement inequality. Only a few studies have focused primarily on the association between the (de)centralization of staffing decisions and achievement inequality using large-scale international achievement data (Woessmann et al., 2009). The findings on achievement inequality are inconclusive, whereas giving schools greater autonomy over teacher hiring is positively associated with average performance (Arcia et al., 2011; Bruns et al., 2011; Fuchs and Woessmann, 2007; Woessmann, 2003), in developed and high-performing countries in particular (Hanushek et al., 2013). In Hanushek et al. (2013), for example, school autonomy over teacher hiring indicates that only a school entity–the principal, the school board, the department heads or the teachers–carries responsibility for hiring decisions. Hanushek et al. (2013) found that full school autonomy in teacher hiring is positively associated with average student performance in mathematics.

A few studies examined the degree to which school autonomy is associated with achievement inequality (Ammermüller, 2013; Horn, 2009), but they measured school autonomy as a general measure of autonomy. That is, school autonomy refers to the degree of freedom that schools have in making decisions on hiring and firing teachers, salaries, the curriculum, school budgets, and so forth. Woessmann et al. (2009) examined whether the effect of socioeconomic status (SES) on student achievement varied across levels of school autonomy in personnel management using data from PISA 2003. They measured school autonomy vis-a-vis personnel management with two indicators; staff in general, and teachers. They found enhanced equality in student achievement when schools have some influence on *staffing* decisions, but that equality in student achievement is reduced when schools have full autonomy in hiring *teachers*.

Inequalities in teacher distribution matter greatly: research consistently shows that teacher quality is associated with gains in student achievement, even after accounting for prior student learning and family background (Darling-Hammond, 2000; Muñoz et al., 2011; Rivikin et al., 2005). Moreover, narrowing the gap in teacher quality between high-poverty and low-poverty schools improves student achievement, particularly for those in high-poverty schools (Boyd et al., 2008). Consequently, inequalities in teacher distribution are considered one of the most important mechanisms constraining both students' opportunities to learn, and their learning outcomes. Several studies suggest that inequalities in teacher distribution might be closely related to hiring practices (Akiba and LeTendre, 2009; Luschei and Chudgar, 2017; Luschei et al., 2013), but there is a lack of empirical evidence on the association between school-based hiring and inequalities in teacher distribution and student achievement.

[1] On December 14, 1960, 20 countries originally signed the Convention on the OECD. Since then, 15 additional countries have become members of the OECD. OECD member countries include Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.