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ABSTRACT

Recent evidence on the large variance in teacher effectiveness has spurred renewed interest in teacher labor market policies. A substantial body of prior research documents that more highly qualified teachers tend to work in more advantaged schools, although this literature cannot determine the relative importance of supply versus demand factors in generating this equilibrium outcome. To isolate the importance of teacher labor supply, we attended three large teacher job fairs in Chicago during the summer of 2006 and collected detailed information on the specific schools at which teachers interviewed. We document a substantial variation in the number of applicants per school, with some schools having fewer than five applicants and others schools having over 300 applicants, even after controlling for the number and type of positions advertised at the school. We show that the demographic characteristics of schools strongly predict the number of applicants to the school in the expected direction. Interestingly, the geographic location of the school is an extremely strong predictor of applications, even after controlling for a host of observable school and neighborhood characteristics.

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1. Introduction

Interest in the distribution of teachers across schools has grown in recent years. Race to the Top, President Obama's $4 billion dollar state-level grant competition aimed at school improvement, focuses on recruiting and retaining effective teachers, particularly in disadvantaged schools and districts. This renewed focus on teachers as a key element of education reform stems, at least in part, from a substantial body of research indicating that teachers make an important contribution to student achievement and that teacher quality varies substantially (Aaronson, Barrow, & Sander, 2007; Hanushek, Kain, O'Brian, & Rivkin, 2005; Nye, Konstantopoulos, & Hedges, 2004; Rockoff, 2004).

The knowledge that teachers matter has been accompanied by an increased interest in understanding teacher labor markets. Research on teacher sorting finds that low income and minority students are more likely to have teachers who are both inexperienced and less qualified (Clotfelter, Ladd, & Vigdor, 2005, 2006; Lankford, Loeb, & Wyckoff, 2002). A substantial body of research also examines teacher mobility, finding that teachers who switch schools generally move to schools with lower concentrations of minority and disadvantaged students and higher levels of achievement (Boyd, Lankford, Loeb, & Wyckoff, 2005a; Hanushek, Kain & Rivkin, 2004; Scafidi, Stinebrickner, & Sjoquist, 2007), and that teachers who choose to transfer schools or exit the teaching profession generally have better qualifications (e.g. higher certification exam scores) than those who remain (Boyd, et al., 2005a; Goldhaber, Gross, & Player, 2007).

While we know that disadvantaged students are more likely to be taught by less qualified (and perhaps) less effective teachers, we know less about whether this disparity is caused by decisions on the part of teachers or school administrators. The distribution of teachers across

schools is a product of both supply and demand. Thus, it is difficult to parse out the extent to which this distribution results from supply (e.g. teachers' decisions to teach in particular districts or schools) versus demand-related factors (e.g. principals' hiring preferences or district rules and regulations). For example, studies of teacher mobility generally cannot tell us whether a teacher's exit from a particular school resulted from a decision made by the teacher himself or by administrators.

One important exception is a recent analysis that isolates teacher preferences by using data on teacher applications to transfer across schools (Boyd, Lankford, Loeb, Ronfeldt, Wyckoff, 2010). The authors find that teachers with better pre-service qualifications are more likely to apply to transfer, while teachers with higher value-added are less likely to do so. The authors also find that schools are more likely to select teachers who are better qualified across all measures. While this study makes an important contribution, it is limited by its focus on experienced teachers seeking to transfer schools.

In this paper, we use a unique data set composed of teacher applications to individual Chicago Public Schools (CPS) to explore the distribution of the teacher applicant pool within a large urban district. Many school districts maintain teacher applicant files centrally. However, in most cases, like CPS, the schools to which individual teachers apply remains unknown, making it very difficult to examine variation in the characteristics and qualifications of teachers applying to different types of schools within a district. In the summer of 2006, we attended three large job fairs hosted by CPS. At the job fairs, we compiled extensive data on the schools to which job fair attendees applied. We link this application data to administrative files containing candidates' demographic information, allowing us to describe the applicant pool and examine differences in applicant qualifications across schools. These data allow us to describe the

preferences of an entire district's applicant pool, expanding on recent contributions to understanding teacher labor supply made by Boyd and colleagues (2010).

We find that schools serving fewer disadvantaged students (as measured by percentage of students eligible for free lunch) have larger numbers of applicants, and that this measure of disadvantage is more consistently predictive of number of applicants than are other school demographic characteristics such as student racial/ethnic composition, academic achievement, and percent of students with limited English proficiency (LEP). Interestingly, the geographic location of the school is also an important predictor of applications, with more candidates applying to schools on the north and northwest sides of Chicago, which are generally more affluent with a smaller fraction of African-American and Latino households. However, the geographic region in which the school is located remains a significant and important predictor of applications even after controlling for a host of student, school and neighborhood characteristics (including distance from school to the downtown area, census measures of tract-level poverty and tract-level crime rates provided by the Chicago Police Department). This suggests that some harder-to-observe factors such as commute time or school/neighborhood reputation are important determinants of teacher supply.

We also find that preferences for school characteristics vary by applicant characteristics, with African American candidates more likely to apply to schools on the city's south side (a predominately African American area of Chicago), and Hispanic candidates more likely to apply to schools serving larger proportions of LEP students. Finally, we find that the small number of applicants with undergraduate degrees in mathematics or science (only 5% of the applicant sample) are more likely to apply to schools serving more academically proficient students.

It is interesting to consider these findings in light of recent efforts by CPS officials to recruit teacher candidates. While the 2006 applicant pool contained over 11 potential candidates for each eventual hire, our analyses indicate that the vast majority of those applicants – including many of the most highly qualified applicants – will not apply to the schools serving the most disadvantaged students. This suggests that targeted efforts to direct a larger number of qualified applicants to hard-to-staff schools could have important benefits.

Our paper proceeds as follows. Section 2 of this paper provides a review of the extant literature. In section 3, we describe teacher hiring and recruitment policies and procedures for the CPS. Section 4 describes the data used in this paper. In section 5 we present our findings, and in section 6 we share our conclusions.

2. Prior Literature on Teacher Labor Markets

Studies examining the distribution of teachers across both districts and schools find that teachers in urban schools serving large concentrations of low income and minority children are less experienced (Clotfelter, Ladd, & Vigdor, 2005; Lankford, et. al., 2002; Rockoff, 2004), more likely to be teaching out-of-field (Ingersoll, 2003), more likely to be uncertified, score lower on standardized tests, and tend to have graduated from less competitive colleges and universities (Lankford, et. al., 2002) than their suburban counterparts. Using data from New York State, Lankford, et. al. (2002) find that teachers in urban schools are substantially less qualified on pre-service measures, and that low income, low achieving and non-white students tend to be taught by the least qualified teachers within urban districts. Studies also find that variation in wages does not seem to substantially increase the likelihood that qualified teachers will teach in these school settings (Lankford, et. al. 2002; Hanushek, Kain, & Rivkin, 2004).

Clotfelter, Ladd and Vigdor (2006) find that even within schools, more advantaged students are taught by more qualified teachers.

In addition to describing the distribution of teachers across schools and districts, research also examines entry into teaching as well as teacher mobility and attrition. Teacher attrition rates are higher in urban schools and districts with larger concentrations of low income and minority students (Borman & Dowling, 2008; Ingersoll, 2001). Using Texas data to examine teacher mobility, Hanushek, Kain, and Rivkin (2004) find that teachers who transfer schools tend to move to schools serving more advantaged and higher achieving student populations, and that student demographic characteristics including race/ethnicity and academic achievement appear to exert a larger influence on teacher mobility than salary.

College graduates with high test scores are less likely to enter and more likely to exit teaching (Podgursky, Monroe, & Watson, 2004; Stinebrickner, 2002). Studies of teacher mobility also find that teachers who choose to transfer schools or exit the teaching profession generally have better qualifications (e.g. higher test scores, degrees from more selective colleges) than those who remain (Goldhaber, Gross, & Player, 2007; Lankford, Loeb, & Wyckoff, 2002; Podgursky, Monroe, & Watson, 2004). Further, teachers who leave urban schools and, more generally, schools serving disadvantaged student populations tend to be more highly qualified than teachers who remain in those schools (Boyd, et. al. 2005a; Hanushek, Kain, & Rivkin, 2004).

Interestingly, however, studies that examine teacher mobility using estimates of teacher effectiveness along with or instead of pre-service qualifications tend to find that teacher quality varies more within than between schools (Hanushek, et. al., 2005), and that more effective teachers are actually more likely to remain in their schools than their less effective colleagues

(Boyd, et. al. 2008; Goldhaber, et. al., 2007; Hanushek, et. al., 2005). More experienced teachers are also more likely to remain in their schools (Ingersoll & Smith, 2003). Boyd, et. al. (2010) note that this evidence suggests that while teachers with stronger pre-service qualifications are more likely to both transfer schools and leave teaching, those with more experience and those with larger value-added estimates tend to remain in their schools, even if they teach in more challenging environments (e.g. Goldhaber, et. al., 2007).

Another factor that appears to strongly influence where teachers choose to teach is geography (Boyd, Lankford, Loeb, & Wyckoff, 2005a, 2005b). Specifically, the authors find that teachers prefer to teach close to where they live and close to where they are from. Boyd, Lankford, Loeb, and Wyckoff (2005b) find teacher labor markets to be very small in terms of geography, and that teachers tend to teach close to where they grew up, or in areas similar to where they are from. Reininger (2006) replicates these findings using nationally representative data. She also finds that teachers are more likely to remain close to their place of origin than the vast majority of other professionals.

3. Background on CPS Teacher Recruitment and Hiring

Principals of CPS schools interview and select the teachers for their schools autonomously. The CPS Department of Human Resources provides extensive support and resources to principals for the hiring process. The district maintains a large data base of job applicants for principals who are hiring, as well as a database of open positions for applicants. Human Resources is also charged with processing new teachers into the system and completing the hiring process once they have accepted an offer from a school principal.

Over the past decade, the CPS Department of Human Resources (HR) has implemented a comprehensive array of events and services aimed at recruiting teachers into the district. Efforts have been made to go beyond what has traditionally been a highly localized recruitment and hiring process to search regionally and even nationally for qualified teachers. CPS provides information sessions, both virtual and in person, to answer potential teaching candidates' questions about CPS, Chicago, and the hiring process. HR also participates in numerous college and university job fairs throughout the Midwest and invites qualified candidates to participate in "bus tours" that provide direct contact with school personnel and the opportunity to see Chicago neighborhoods first-hand. Job candidates and school principals also have access to an extensive online database which holds information about current and future teacher vacancies and provides principals with the opportunity to search for applicants and view their information and resumes.

The most intensive recruitment effort on the part of CPS has been the development of large-scale job fairs, exclusively for qualified teachers, hosted by the district. The district typically holds two smaller fairs during late winter/early spring and then hosts approximately three large-scale job fairs during late spring and summer. The larger job fairs are held at the largest venues in Chicago (e.g. Navy Pier, Soldier Field) and typically host over 200 schools and 2000 to 3000 teacher candidates per event. Candidates have the opportunity to drop off resumes and participate in preliminary interviews with school principals and administrators during the hiring cycle for a single school year.

To provide a broad sense of the number and type of individuals applying to the CPS, Table 1 shows some basic information on teachers who applied to the district during 2006 (i.e., for the 2006-2007 school year). In some cases, individuals applied electronically on-line. In other cases, they submitted an application through the mail and HR personnel entered this

information into the electronic teacher application database. Nearly 20,000 individuals applied to the district in 2006. Almost three-quarters of applicants were women and the majority was white (roughly 20 percent of the applicant pool reported to be African American). Of applicants for whom we were able to obtain degree information (two-thirds of the total sample), over 60 percent majored in education in college. Approximately 40 percent attended undergraduate institutions that are ranked as very competitive or higher by Barron's. Approximately 60 percent of applicants report prior teaching experience.

Column 2 provides comparable information on teachers who were newly hired by CPS for the 2006-07 school year. The 1,679 teachers who were hired by CPS are similar to the applicant pool in terms of gender and race, although they are somewhat more likely to be Hispanic and less likely to be white. Interestingly, the 2006-07 new hires attended schools with substantially lower Barron's ratings, on average, than the applicant pool as a whole. Over half (57%) of new hires attended schools in the bottom two Barron's categories, compared with only about 21 percent of CPS applicants. Similarly, while 40 percent of applicants attended colleges ranked in the top 3 Barron's categories, only 15 percent of new hires' had degrees from schools ranked 'very competitive' or higher.

CPS new hires were also less experienced, on average, than the applicant pool as a whole. Fully 70 percent of new hires had no prior teaching experience, compared with 39 percent of applicants. It is important to recognize that new hires reflect both demand factors (which applicants were offered positions) and supply factors (which candidates accepted the offers). The numbers in Table 1 do not help us understand the extent to which differences between CPS applicants and eventual hires result from decisions on the part of principals or on the part of applicants themselves.

4. Data

The data for the analyses presented here are drawn from a number of sources including electronic teacher applications to the district, school-level information about the number of vacancies in a particular school and the needs of the school in various subject areas, and information about the schools to which each candidate applied.

During the summer of 2006, we collected data at the three large CPS job fairs. The goal of this data collection effort was to gather information detailing each of the individual schools that job candidates applied to at the fairs. To obtain this information, prior to each job fair we acquired the list of schools registered to attend the fair from staff in CPS HR. Each school that attends a CPS job fair has an individual table at the fair where the school principal and/or administrators sit, place relevant literature and information, accept resumes and interview candidates. We used the list provided by CPS HR to generate school-level sign in sheets for every school that attended each of the three job fairs. With the support of HR staff, we informed all principals who were attending the fairs about the process, explaining that the sign-in sheets were being provided so that every job candidate who visited the schools' table would sign the sheet and provide the last four digits of her social security number. Sign-in sheets were placed on each school's table directly in front of the principal and other administrators who were available to talk with and interview applicants as they circulated through the fair and approached individual schools.

The CPS job fairs are large, chaotic and crowded. To improve our chances of collecting complete and accurate data, the authors and several research assistants attended each fair and circulated throughout the room during the event. We reminded principals and school personnel

to ask all applicants to sign the sign-in sheets when they approached the schools' tables. To encourage principals to use the sign-in sheets, we provided them with copies and explained that they could use them to keep track of candidates who had applied for vacancies at their schools. Throughout each fair, we circulated and answered principals' questions, provided additional sign-in sheets, and worked to ensure that sign-in sheets were being used by all schools and signed by all applicants. As schools finished up and closed down their tables, we collected their sign-in sheets.

In this manner, we obtained sign-in data for approximately 87 percent of the 371 schools that attended job fairs that summer. The sign-in data for the remaining schools was incomplete or problematic, most often because these schools arrived at the fair very late or left very early. Many of these schools left their sign-in sheets at the fair even after they left, and teacher candidates frequently listed their names on these sheets to receive additional information about the school. While this does indicate some interest on the part of the candidate, we felt it was different from waiting in line and interviewing with a school's principal. Thus, we decided to exclude this information from our analysis. In other cases, we observed some schools that did not utilize the sign-in sheets and a small number of schools refused to participate in the study. Other schools with problematic data were repeatedly observed not using the sign-in sheets or, at times, had so many applicants lined up at their tables or had such a loosely organized means for interviewing and screening candidates that they failed to use the sign-in sheets consistently.

Table 2 provides summary statistics on all schools in CPS, separated to allow one to compare the characteristics of schools that participated in the job fairs with those that did not. Schools that participated in CPS job fairs were more likely to serve a predominately African American student population and less likely to be predominately Hispanic. Job fair schools were

larger and lower achieving, on average, than schools that did not participate. Not surprisingly, schools that participated in job fairs reported more job openings in May of 2006 than those that did not; nearly six openings on average versus four, respectively. Although charter schools are allowed to participate in CPS job fairs, they are excluded from descriptive tables and from the analysis sample because the majority of charter schools attending the job fairs were part of charter organizations that interviewed candidates centrally for position openings in multiple schools. Thus, we are unable to disaggregate applications for individual charter schools.

Columns 5-8 compare the schools attending job fairs that had usable sign-in data (i.e., our analysis sample, n=321) to schools attending the job fairs with incomplete or problematic data. Schools with problematic sign in data were more likely to be predominately African American, and were lower achieving than schools with usable sign in data. Schools that are excluded from our analyses because of poor sign in data also had an average of two more positions open in May 2006.

The number of candidates that interviewed at each school (i.e., the count of the sign-ins) serves as the outcome measure in our analysis. We view this measure of the "number of applications" to the school as a reasonable proxy for teacher supply, although it has several important limitations. First, it contains some measurement error, as not every teacher who interviewed at the school signed the sheet. To the extent that this is classical measurement error in a dependent variable, however, it will merely make our regression estimates less precise without introducing any bias. Second, we observed that in some cases candidates were not willing to wait in very long lines to interview with particular schools. For this reason, our measure may actually understate teacher interest in the most popular schools. This will tend to

bias our regression estimates toward zero, suggesting that our results may underestimate the relationship between school characteristics and teacher labor supply.

While this is a limitation of our data, it is important to note that there is substantial variation in the number of applications across schools. Figure 1 shows a histogram of the number of applications per school using the total number of applications to the school across all three fairs. Table 3 provides participation and vacancy information reported by schools. The number of applicants per school varies substantially, with an average of 55 applicants per school per fair, and a standard deviation of 37. Schools at the 10^{th} percentile had 18 applicants per fair, compared with 102 applicants for schools at the 90^{th} percentile.

We match the application data to school-level data we obtained from the CPS. This data includes not only school demographics that might be relevant to job applicants (e.g., racial composition, poverty and achievement levels in the school), but also information on the number of open positions in the school as of May 2006 (prior to the first large job fair).

Finally, we have information about the specific needs of each school taken from online registration forms that schools completed prior to each job fair. This information includes the number of current vacancies, the number of anticipated vacancies and the number of new hires the school was looking to make at the fair. In addition, the school indicated whether it was looking to make one or more hires in a number of different fields (e.g., pre-kindergarten, elementary education, special education, bilingual education, math and science).

Table 3 shows summary statistics for our sample overall and separately for elementary and secondary schools. High schools were more likely to participate in job fairs than elementary schools, likely reflecting the fact that they were typically looking to hire more than seven people (7.3) compared with an average of less than four (3.7) for elementary schools. Despite the fact

that they had more vacancies, high schools typically had fewer applicants than elementary schools, with an average of 51 applicants per school compared with 56 for elementary schools. Schools attending job fairs were frequently looking to fill positions in areas that are often considered harder to staff such as special education and mathematics or science. Over half of schools reported needing to find candidates to teach special education classes. Fully 70 percent of schools reported vacancies in math or science compared with 65 percent of schools looking to hire in English or social studies.

5. Results

Our primary objective is to examine whether teacher labor supply is correlated with observable school characteristics. In particular, prior literature suggests that teachers are less likely to apply to disadvantaged schools as measured by student demographic composition including race/ethnicity, socioeconomic status, and academic achievement. To explore this issue, we regress the number of applications in school s at fair f on a variety of school demographic characteristics controlling for indicators for the number and type of vacancies in the school. In all cases, we present robust standard errors clustered at the school level. Missing data dummies are included for independent variables and controls.

Table 4 provides our main results. In all columns, we show results from OLS regressions where the dependent variable is number of job fair applicants per school. The various specifications show changes in the dependent variable as different school characteristics are added to the model. Column 1 shows coefficients from different regressions that estimate number of job fair applicants using either single variables or clusters of similar variables. In other words, the results shown in column 1 reflect many different regression specifications. The faint dotted lines indicate the different specifications. In terms of school racial/ethnic

composition, we see that schools with a larger proportion of White or Asian students had more applicants. A ten percentage point increase in White or Asian students is associated, on average, with nearly four more applicants per school. Free lunch eligibility is correlated with number of job applicants per fair in the expected direction, with a ten percentage point increase in free lunch eligible students associated with four fewer applicants per school for each job fair in which they participated. Academic achievement is positively associated with number of applicants, as is percent limited English proficient.

Interestingly, indicators for region suggest that geography may play an important part in candidates' school preferences. The omitted region, Region 1, is the region that encompasses Chicago's northernmost and northwest neighborhoods. Regions 2 and 3 encompass the areas closest to and west of the city center. Regions 4 through 6 move progressively southward, with Region 6 including Chicago's southernmost neighborhoods. The regressions including only CPS region show a preference for schools in neighborhoods on Chicago's north side, with far south side schools in Region 6 having an average of 29 fewer applicants per fair than schools on the far north side. The schools in Region 6 have a much higher fraction of African-American students than the schools in Region 1, suggesting a teacher desire to avoid high minority schools. It is also possible that these strong regional/geographic preferences reflect teacher preferences in terms of neighborhood desirability or proximity to the teacher's own neighborhood, which we discuss in more detail below.

As would be expected, schools reporting a larger number of anticipated vacancies and those looking to fill more positions typically had more applicants. Column 2 shows the coefficients on school-level racial/ethnic composition controlling for number and type of

vacancies, school enrollment, and grade level. Including controls does not alter the relationship substantially, with more teachers still applying to schools that serve fewer minority students.

Columns 3 through 5 show the relationship between school racial/ethnic composition and number of applicants adding percent eligible for free lunch, school-level academic achievement, and percent LEP, respectively. When the percentage of free lunch-eligible students is included with racial composition, both free-lunch eligibility and percentage of White and Asian students remain statistically significant, although the magnitude of each coefficient is reduced. The pattern is similar when percent proficient is included in the model, although percent proficient is no longer statistically significant. When percent LEP is added to the model including indicators for race/ethnicity, its magnitude drops to near zero, and it becomes statistically insignificant. Column 6 provides coefficients from a model that includes racial/ethnic composition indicators as well as percent proficient, percent free lunch-eligible, and percent LEP. Interestingly, when all of these variables are included, only free lunch eligibility remains statistically significant.

Column 7 adds the region indicators to the model. Free lunch eligibility, again, remains statistically significant. Although not all region indicators are statically significant, the pattern of results indicates that teachers' preferences for geography remain remarkably unchanged when included in the same model as school-level student demographic characteristics. Column 8 adds school neighborhood information by zip code including percent poverty, percent African American, percent Hispanic, miles to central business district, and prevalence of both property and violent crimes. While the magnitude of the region indicators drops, these variable remain statistically significant and substantively large. This suggests that there may be some unobservable (to the researcher) characteristics associated with certain regions within CPS that

are correlated with desirability on the part of teachers. Such factors could include reputation or perceived safety of the school or surrounding area.

Table 5 shows additional specifications of the baseline model (column 8 of Table 4) in order to assess the robustness of the results discussed above. Interestingly, we see that percent of students who are free lunch eligible remains a statistically significant predictor of the number of applicants to a school across a number of different specifications. The region indicators remain important determinants of teacher applications, although in models with only one observation per school (as opposed to observations for each school x job fair) the precision of these variables declines substantially.

Columns 5-8 in Table 5 show results separately for elementary and high schools. The first column for each level shows bivariate results or results for groups of similar variables, and columns 6 and 8 show the results for the preferred model for elementary and high schools respectively. While we lose considerable precision when we split the sample, several important findings stand out. First, the region indicators are important determinants of applications for both elementary and high schools. The fully specified models (columns 6 and 8) indicate that region appears to play an important role for applicants to elementary schools. The number of applicants per school varies substantially by region, with far south side schools having an average of 16 fewer applicants per school than far north side schools. While the region indicators are statistically insignificant in the fully specified high school models for all regions except Region 3, coefficients and standard errors suggest that this may be due to reduced precision and power rather than to a lack of association. Coefficients range from 20 to 33 fewer applicants per school in high schools not located on the city's far north side, substantially larger in magnitude than coefficients in the elementary school model.

Second, student poverty (conditional on the other variables, including student race and academic proficiency) appears to be a more important determinant of applications to elementary schools than high schools. Conversely, student academic proficiency (conditional on other variables) appears to be a more important determinant of high school applications. Unfortunately, the very low precision of our estimates precludes us from drawing strong conclusions from these results.

In addition to examining the application behavior of candidates in aggregate, we are interested in exploring whether the preferences of candidates vary by characteristics such as race, prior academic preparation and experience. To do so, we matched applicants from job fair sign-in sheet data to their centrally stored CPS applications using first and last names and the last four digits of applicant social security numbers. Figure 2 shows a histogram describing the fraction of applicants per school who we were able to match to CPS application files. In the average school, we matched 80 percent of individuals who signed-in at the school during a job fair to their application files. Matching rates ranged from 50 to 100 percent, and we were able to match over two-thirds (68%) of teachers for 90 percent of schools. Since we are only able to conduct the subgroup analysis below on those applicants who matched to the central CPS application data, a clear concern is whether the match probability is correlated with any factors that might be related to the applicant preferences for school type. Fortunately, an analysis of the predictors of matching (shown in the Appendix) suggests that observable school characteristics are not systematically associated with the match probability, providing reassurance that our estimates on the sample of matched applicants will provide reasonable estimates of the full population.

Table 6 shows results from models that regress the log transformed number of applicants to a school on school demographics, separately by various applicant groups. We use the log

specification here to allow easier comparison across the groups since group sizes (and thus the mean number of applications per group) differ substantially The subgroups of interest include Black, Hispanic, and White/Asian applicants, applicants with undergraduate degrees in mathematics or science, and applicants from the most competitive undergraduate institutions (about 13% of the total sample). We show models that include all of the school-composition and demographic variables of interest as well as controls (similar to specification shown in Table 5, Column 4). Importantly, column 2 shows that results for matched applicants are virtually identical to results for the full sample (Column 1), indicating that the 80 percent of job fair applicants that we were able to match to their centrally stored application files appear to have similar preferences to the full applicant pool.

Results indicate that applicant preferences for school characteristics vary substantially by applicant race/ethnicity. African American applicants are less likely to apply to schools with larger proportions of White or Asian students and more likely to apply to schools in Regions 3 through 6 than they are to schools in CPS Region 1. For example, the coefficient .936 on the Region 6 measure indicates that schools in Region 6 receive nearly twice as many (100 percent more) applications from African American candidates than schools in Region 1. Schools in regions 4 and 5 receive 42 and 54 percent more applications than Region 1 schools. Regions 3-6 are located on the South side of Chicago, which has a larger percentage of African American residents than other areas of the city. Yet, the region indicators are still large and significant in models that control for zip code racial composition. It is possible that African-American teacher applicants are more likely to be living in South side neighborhoods, or have friends and family in these neighborhoods, which could make the areas more appealing.

Not surprisingly, Hispanic applicants are more likely to apply to schools serving larger percentages of LEP students. They are also less likely to apply to schools with larger proportions of White or Asian students, and less likely to apply to schools serving more free lunch eligible students (all else equal).

In addition, we find that the preferences of applicants with undergraduate degrees in mathematics or science differ notably from those of other applicants. As Column 6 indicates, these candidates were statistically significantly more likely to apply to schools with larger proportions of students meeting basic levels of academic proficiency. Interestingly, controlling for other school demographic and composition indicators, applicants with mathematics or science degrees also show no geographic or regional preferences. The pattern of results for applicants who attended the most selective undergraduate institutions (Column 7) is very similar to results for the full sample (Column 1).

6. Conclusions

The distribution of teachers across schools results from a two-sided matching process in which both teacher and school administrator preferences play a role. This paper uses data on teacher applications to specific public schools in Chicago to disentangle supply from demand side factors, and credibly identify the relative importance of various school characteristics to teachers in the initial hiring process.

Not surprisingly, we find that teachers are substantially less likely to apply to higher-poverty schools. More interestingly, we find that there is little aggregate relationship between the number of teacher applications and school racial composition or achievement level once one controls for school poverty rate. In addition, there appears to be significant heterogeneity in

teacher preferences in ways that one might expect. For example, African American teachers are relatively more likely to apply to schools with a predominantly African-American student population and Latino teachers are relatively more likely to apply to schools with larger limited English proficient populations. Teachers with undergraduate degrees in mathematics or science are more likely to apply to schools serving larger proportions of academically proficient students.

Finally, we find that indicators for the geographic region of the city in which the district is located are extremely powerful predictors of teacher applications. Schools on the city's north and northwest sides, and those closer to the city center, get substantially more applications than those on the far south or far west sides. This relationship remains robust and significant even after we control for a variety of school demographic characteristics such as student poverty, racial composition and achievement as well as the number and type of positions available at the school. In fact, geography remains an important predictor when we control for several potentially important neighborhood-level characteristics such as poverty, racial composition and crime rates. It is likely the geographic region indicators are proxies for a number of hard-to-observe school and/or neighborhood characteristics, such as perceived safety, community attitudes toward education and school leadership. It is also possible that the geographic region indicators are picking up applicant preferences in terms of proximity to their own neighborhoods, reduced commute time, or ease of access using public transportation.

It is interesting to consider these findings in light of recent CPS recruitment efforts. Over the last decade, the CPS office of human resources has substantially increased efforts to recruit more widely, soliciting applicants from out of state and holding broadly publicized large-scale job fairs to bring in more candidates. While the 2006 applicant pool contained over 11 potential candidates for each eventual hire, our analyses indicate that the vast majority of those applicants

– including many of the most highly qualified applicants – will not apply to the schools serving the most disadvantaged students. With job fair applications ranging across schools from the single digits to nearly 500, it is clear that despite an abundance of applicants to the district as a whole, many schools – whether because they are situated in less geographically desirable locations, because they serve the most disadvantaged student populations, or a combination of these factors – are likely to experience a shortage of applicants who are qualified to fill their vacancies. This suggests that targeted efforts to direct a larger number of qualified applicants to hard-to-staff schools could have important benefits.

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Table 1 - Characteristics of Teacher Applicants and New Hires in 2006-07

	Applicants	CPS New Hires
	(1)	(2)
Number	19,368	1,679
Demographics		
Female	0.736	0.724
Race/ethnicity		
White	0.663	0.616
Black	0.191	0.190
Hispanic	0.093	0.122
Other ethnicity	0.045	0.073
Applicant address		
Chicago	0.483	--
Illinois, outside Chicago	0.283	--
Out of state	0.234	--
Educational Background		
Has degree information	0.666	0.788
Education major	0.611	--
Math or science major	0.054	--
Humanities or social science major	0.223	--
Other major	0.138	--
Barron's rating of undergraduate school		
Most competitive	0.034	0
Highly competitive	0.099	0.064
Very competitive	0.279	0.098
Competitive	0.380	0.274
Less competitive	0.049	0.320
Not competitive	0.158	0.245
Has a masters degree	0.391	0.214
Prior Experience		
Certified	0.655	--
Has resume in applicant file	0.898	--
Years of teaching experience		
No prior teaching experience	0.391	0.699
1-3 years	0.327	0.300
4-10 years	0.196	0.001
11+ years	0.087	0

Missing cells indicate that data was not available.

Table 2 - Demographic characteristics of CPS schools that participated in job fairs, schools that did not, and by quality of sign in data (n=583).

					All schools that participated in the job fairs			
	Schools that participated in the job fairs (n=371)	Schools that did not participate in the job fairs (n=212)	Diff: (1) - (2)	P-value	Schools with good sign in data (n=321)	Schools with sign in problems (n=50)	Diff: (5) - (6)	P-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Predominately Black	0.51	0.36	0.14	0.001	0.49	0.62	0.13	0.085
Predominately Hispanic	0.11	0.19	-0.08	0.006	0.11	0.10	-0.01	0.799
Predominately minority	0.14	0.17	-0.04	0.230	0.15	0.08	-0.07	0.206
Racially mixed	0.08	0.11	-0.02	0.319	0.08	0.10	0.02	0.653
Integrated	0.16	0.16	0.00	0.966	0.17	0.10	-0.07	0.204
Student Achievement (natn'l % rank)	47.86	55.17	-7.30	0.000	48.99	40.66	-8.32	0.014
Enrollment	734	634	1.00	0.015	721	814	0.92	0.249
Percent ESL students	10.20	14.55	-4.35	0.001	10.34	9.31	-1.03	0.638
Percent low income students	85.86	84.64	1.22	0.459	85.27	89.63	4.36	0.122
Elementary school	0.80	0.85	-0.06	0.092	0.81	0.72	-0.09	0.141
Magnet school	0.10	0.09	0.00	0.916	0.10	0.08	-0.02	0.663
Number of open positions May 2006	5.61	4.00	1.61	0.000	5.34	7.33	1.99	0.001
Number of vacancies in June 2006	4.10	2.46	1.64	0.000	3.86	5.61	1.75	0.001

Actual sample size varies due to missing data for individual variables.
Table does not include charter schools, special education schools or alternative schools.
The coefficients in columns 3 and 7 are estimates from bivariate regressions predicting the variable from that row using whether schools attended at least one job fair (3) or whether job fair schools had problematic sign in data (7).
Columns 4 and 8 are the p-values for coefficients in columns 3 and 7, respectively.

Table 3 - Summary Statistics for Chicago Public Schools Participating in the Summer 2006 Job Fairs

	All Schools	Elementary Schools	High Schools
School Participation in Job Fairs			
Participated May job fair	0.673	0.610	0.878
Participated in June job fair	0.655	0.617	0.779
Participated in July job fair	0.540	0.504	0.656
Number of applications (per job fair)			
Mean	54.505	55.518	51.237
Standard Deviation	36.921	38.609	30.752
10th percentile	18	19	15
90th percentile	102	104	93
Vacancy Information			
Number of open positions as of May	5.604	4.796	8.215
Number of vacancies as of June 26th	4.277	3.335	7.322
On-Line Registration Information for Job Fairs			
Number of anticipated vacancies	1.810	1.738	2.029
Number of current vacancies	2.458	1.994	3.876
Number of new hires looking to make	4.556	3.671	7.324
Missing data from on-line registration	0.160	0.166	0.139
Information on Position Needs by Subject (yes/no)			
Kindergarten or Pre-K	0.131	0.131	
Grades 1-3	0.383	0.383	
Grades 4-8	0.346	0.346	
Special education	0.507	0.475	0.610
Bilingual	0.090	0.100	0.059
Gym	0.174	0.163	0.212
Administration	0.349	0.328	0.415
Foreign language	0.271		0.271
Fine arts	0.390		0.390
Math or science	0.695		0.695
Social studies	0.203		0.203
English	0.449		0.449
Vocational class	0.534		0.534
Other subject	0.008		0.008
Predominantly African-American	0.515	0.520	0.496
Predominantly Hispanic	0.108	0.138	0.008
Predominantly African-American and Hispanic	0.139	0.116	0.213
Racially mixed	0.097	0.078	0.157
Racially integrated	0.142	0.147	0.126
Percent proficient	46.644	52.573	21.355
Percent free-lunch eligible	86.387	86.414	86.292
Percent limited English proficient	10.304	11.988	4.436
Magnet school	0.090	0.087	0.099
Enrollment (in 100s)	7.427	6.480	10.726

This table includes information for the 321 schools that participated in the Summer 2006 job fairs that had good sign-in data. Schools with problematic sign in data are excluded.

Table 4 - Relationship between school and neighborhood characteristics and number of Summer 2006 job fair applicants applying to Chicago Public Schools

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable:	Number of job fair applicants							
School-level independent variables								
Percent White, Asian, Native American	0.350***	0.473***	0.258**	0.350***	0.470***	0.198	-0.102	-0.0716
	(0.111)	(0.0979)	(0.124)	(0.107)	(0.101)	(0.131)	(0.157)	(0.160)
Percent Hispanic	0.0827	0.0312	0.0478	-0.000907	0.0196	-0.0293	-0.0771	0.0271
	(0.0559)	(0.0474)	(0.0502)	(0.0472)	(0.0876)	(0.0845)	(0.0822)	(0.105)
Percent eligible for free-lunch	-0.404***		-0.321**			-0.320*	-0.399**	-0.352**
	(0.123)		(0.160)			(0.172)	(0.180)	(0.170)
Percent proficient	0.263***			0.221		0.0734	0.129	0.0787
	(0.0916)			(0.141)		(0.144)	(0.143)	(0.148)
Percent limited English proficient	0.322**				0.0334	0.189	0.183	0.106
	(0.133)				(0.217)	(0.218)	(0.210)	(0.212)
Region 2	-3.825						-3.931	-4.089
	(7.619)						(6.892)	(9.317)
Region 3	-17.03***						-9.096	-7.707
	(6.049)						(6.281)	(8.706)
Region 4	-16.11***						-15.16**	-13.85**
	(6.068)						(6.227)	(6.440)
Region 5	-21.55***						-17.36***	-13.53**
	(6.076)						(6.454)	(6.869)
Region 6	-29.11***						-25.54***	-16.14**
	(5.565)						(6.308)	(8.159)
Number of new hires	1.906***							
	(0.479)							
Anticipated vacancy count	3.189**							
	(1.307)							
June job fair	23.27***							
	(3.192)							
July job fair	22.64***							
	(4.041)							
Zipcode-level independent variables								
Percent poverty	-58.18							-6.340
	(38.17)							(33.96)
Percent Black	-19.76							-0.378
	(13.91)							(13.42)
Percent Hispanic	-33.14***							-20.41
	(12.02)							(13.39)
Miles to central bus. dist. regions 1-3	-1.844							-1.227
	(1.563)							(1.918)
Miles to central bus. dist. regions 4-6	-3.649***							-1.734
	(0.907)							(1.238)
Property crimes per 100,000, avg. 2003-2005	-0.147							-0.111
	(0.138)							(0.143)
Violent crimes per 100,000, avg. 2003-2005	0.760							0.0874
	(0.858)							(0.776)
School demographic, vacancy, position, and job fair controls*		X	X	X	X	X	X	X
Constant		-2.499	26.26	-6.392	-3.075	26.07	48.14**	52.33**
		(7.056)	(16.09)	(7.090)	(6.687)	(17.89)	(19.74)	(22.23)
Observations	554	554	554	554	554	554	554	554
R-squared		0.397	0.401	0.396	0.393	0.402	0.435	0.441

Mean number of job applicants per school per fair was 55, with a standard deviation of 37.

Robust standard errors, clustered by school, in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Column 1 shows coefficients from regressions that estimate number of job fair applicants using either single variables or clusters of similar variables. Coefficients from separate regressions are denoted by horizontal lines in these columns.

*Controls include school enrollment, number of anticipated vacancies, dummies for elementary school, magnet school, indicators for specific number of hires school was trying to make at job fairs, indicators for types of positions school had openings in, which job fairs school attended.

Observations in these analyses are school by job fair, meaning that schools that attended multiple job fairs have separate observations for each fair they participated in. Observations with poor sign in data (schools that had poor quality sign in data for a particular job fair or multiple fairs) are excluded for those months.

Table 5 - Relationship between school characteristics and number of job fair applicants applying to Chicago Public Schools participating in the Summer 2006 Job Fairs, additional specifications and separately for elementary and high schools

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Table 4, Column 8	One observation per school Unweighted	Weighted by May Vacancy Count	Log # applications	Elementary Schools		High Schools	
School-level independent variables								
Percent White, Asian, Native American	-0.0716	-0.252	-0.0749	-0.137	0.313***	0.0283	0.718***	-0.140
	(0.160)	(0.344)	(0.365)	(0.288)	(0.119)	(0.176)	(0.261)	(0.518)
Percent Hispanic	0.0271	-0.0542	-0.133	-0.0896	0.132**	0.101	-0.277***	-0.0760
	(0.105)	(0.248)	(0.255)	(0.236)	(0.0614)	(0.134)	(0.104)	(0.253)
Percent eligible for free-lunch	-0.352**	-0.958***	-0.765**	-0.493	-0.368***	-0.343*	-0.659***	0.492
	(0.170)	(0.365)	(0.382)	(0.316)	(0.138)	(0.204)	(0.209)	(0.455)
Percent proficient	0.0787	-0.135	-0.222	0.153	0.303**	0.00471	0.544**	0.563
	(0.148)	(0.350)	(0.355)	(0.326)	(0.136)	(0.164)	(0.210)	(0.369)
Percent limited English proficient	0.106	0.209	0.627	0.317	-14.77**	-0.0824	3.192	-1.138
	(0.212)	(0.496)	(0.506)	(0.449)	(7.220)	(0.253)	(7.496)	(1.248)
Region 2	-4.089	9.893	31.81**	-0.0800	1.586	-0.749	-16.70	-28.91
	(9.317)	(15.49)	(14.83)	(0.153)	(9.005)	(10.93)	(14.24)	(17.91)
Region 3	-7.707	-9.356	14.35	-0.150	-15.93**	-4.003	-23.16*	-32.57*
	(8.706)	(16.15)	(14.64)	(0.147)	(6.798)	(10.16)	(13.06)	(18.38)
Region 4	-13.85**	-8.282	4.798	-0.202*	-17.30**	-14.62*	-13.10	-26.35
	(6.440)	(13.90)	(13.38)	(0.114)	(7.286)	(7.499)	(11.38)	(18.24)
Region 5	-13.53**	-25.56*	-14.32	-0.303**	-20.29***	-12.72*	-25.16**	-20.20
	(6.869)	(13.93)	(13.44)	(0.127)	(7.078)	(7.383)	(11.98)	(22.13)
Region 6	-16.14**	-23.37	-12.51	-0.369**	-28.61***	-16.20*	-30.47**	-24.34
	(8.159)	(19.36)	(18.59)	(0.157)	(6.319)	(8.907)	(11.84)	(29.15)
Zipcode-level independent variables								
Percent poverty	-6.340	76.98	129.9	-0.0387	-71.54	-18.24	-15.28	46.50
	(33.96)	(82.45)	(82.71)	(0.742)	(46.15)	(40.34)	(62.23)	(59.52)
Percent Black	-0.378	22.63	18.60	0.0969	-18.92	-0.699	-33.70	-36.84
	(13.42)	(31.84)	(30.68)	(0.274)	(16.92)	(15.53)	(24.13)	(34.24)
Percent Hispanic	-20.41	-37.83	-61.75**	-0.248	-22.62	-10.59	-73.04***	-48.69
	(13.39)	(30.80)	(29.33)	(0.244)	(13.93)	(14.97)	(18.66)	(33.28)
Miles to central bus. dist. regions 1-3	-1.227	-1.430	2.812	0.00187	-1.679	-0.0402	0.0578	-3.446
	(1.918)	(3.285)	(3.195)	(0.0324)	(1.778)	(2.124)	(3.579)	(2.880)
Miles to central bus. dist. regions 4-6	-1.734	-3.705	-2.662	-0.0358	-4.136***	-1.716	-1.986	-0.811
	(1.238)	(3.096)	(3.170)	(0.0269)	(1.175)	(1.350)	(1.409)	(4.086)
Property crimes per 100,000, avg. 2003-2005	-0.111	-0.141	-0.0853	0.00145	-0.0745	0.0308	-0.142	-0.291
	(0.143)	(0.275)	(0.248)	(0.00362)	(0.187)	(0.165)	(0.229)	(0.221)
Violent crimes per 100,000, avg. 2003-2005	0.0874	-2.005	-3.199*	-0.0171	0.836	-0.0678	0.503	1.276
	(0.776)	(1.808)	(1.759)	(0.0181)	(1.087)	(0.892)	(1.313)	(1.503)
School demographic, vacancy, position, and job fair controls*	X	X	X	X		X		X
Constant	52.33**	111.8**	68.16	3.424***		44.49*		-13.11
	(22.23)	(43.62)	(45.67)	(0.425)		(25.26)		(42.12)
Observations	554	369	359	554	423	423	131	131
R-squared	0.441	0.379	0.489	0.414		0.446		0.662
Mean	54.505	100.09	107.19	54.505	55.52		51.24	
Standard Deviation	36.921	75.66	73.48	36.921	38.61		30.75	

Robust standard errors, clustered by school, in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

*Controls include school enrollment, number of anticipated vacancies, dummies for elementary school, magnet school, indicators for specific number of hires school was trying to make at job fairs, indicators for types of positions school had openings in, which job fairs school attended.

Columns 5 and 7 show coefficients from regressions that estimate number of job fair applicants using either single variables or clusters of similar variables. Coefficients from separate regressions are denoted by horizontal lines in these columns.

Observations in these analyses, unless otherwise noted, are school by job fair, meaning that schools that attended multiple job fairs have separate observations for each fair they participated in. Observations with poor sign in data (schools that had poor quality sign in data for a particular job fair or multiple fairs are excluded for those months).

Table 6 - Relationship between school and neighborhod characteristics and log number of job fair applicants applying to Chicago Public Schools participating in the Summer 2006 Job Fairs for various applicant subgroups

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Log Number of job fair applicants						
	Total	Matched	Black	Hispanic	White/Asian	BA Math/Sci.	Top 2 Bar.
School-level independent variables							
Percent White, Asian, Native American	-0.137	-0.0516	-0.632*	-0.934**	0.369	0.0802	-0.355
	(0.288)	(0.307)	(0.368)	(0.436)	(0.376)	(0.474)	(0.377)
Proportion Hispanic	-0.0896	-0.0478	-0.251	-0.0898	0.00930	-0.00731	0.0450
	(0.236)	(0.252)	(0.274)	(0.344)	(0.276)	(0.383)	(0.287)
Prop. eligible for free-lunch	-0.493	-0.451	-0.118	-0.717*	-0.248	0.232	-0.466
	(0.316)	(0.330)	(0.359)	(0.431)	(0.390)	(0.441)	(0.367)
Prop. proficient	0.153	0.148	-0.147	0.154	0.214	0.813*	0.481
	(0.326)	(0.339)	(0.380)	(0.408)	(0.380)	(0.432)	(0.399)
Prop. limited English proficient	0.317	0.115	-0.571	2.372***	-0.390	0.0786	0.0995
	(0.449)	(0.487)	(0.493)	(0.650)	(0.585)	(0.853)	(0.579)
Region 2	-0.0800	-0.0425	0.0686	0.217	-0.0259	0.0224	-0.0793
	(0.153)	(0.160)	(0.163)	(0.182)	(0.195)	(0.182)	(0.178)
Region 3	-0.150	-0.143	0.287*	0.201	-0.167	-0.0704	-0.185
	(0.147)	(0.153)	(0.160)	(0.188)	(0.179)	(0.184)	(0.164)
Region 4	-0.202*	-0.218*	0.427***	-0.100	-0.442***	-0.0375	-0.440***
	(0.114)	(0.122)	(0.149)	(0.173)	(0.147)	(0.168)	(0.144)
Region 5	-0.303**	-0.322**	0.542***	-0.140	-0.523***	-0.0697	-0.515***
	(0.127)	(0.131)	(0.159)	(0.184)	(0.153)	(0.184)	(0.150)
Region 6	-0.369**	-0.362**	0.936***	-0.214	-0.675***	-0.230	-0.685***
	(0.157)	(0.167)	(0.187)	(0.246)	(0.189)	(0.247)	(0.208)
Zipcode-level independent variables							
Percent poverty	-0.0387	0.0447	0.722	-0.950	0.403	0.608	0.951
	(0.742)	(0.762)	(0.883)	(1.028)	(0.847)	(1.048)	(0.910)
Percent Black	0.0969	0.106	0.202	-0.515	0.00149	0.136	-0.116
	(0.274)	(0.286)	(0.328)	(0.373)	(0.330)	(0.412)	(0.335)
Percent Hispanic	-0.248	-0.212	-0.674*	-0.289	-0.133	0.0189	-0.412
	(0.244)	(0.256)	(0.343)	(0.352)	(0.327)	(0.394)	(0.323)
Miles to central bus. dist. regions 1-3	0.00187	-5.10e-05	-0.00320	0.0318	0.00117	0.0128	0.00777
	(0.0324)	(0.0338)	(0.0370)	(0.0367)	(0.0400)	(0.0476)	(0.0376)
Miles to central bus. dist. regions 4-6	-0.0358	-0.0373	-0.0446	-0.0634	-0.0414	-0.00697	-0.0385
	(0.0269)	(0.0281)	(0.0330)	(0.0426)	(0.0322)	(0.0425)	(0.0358)
Property crimes per 100,000, avg. 2003-2005	0.00145	0.00109	0.00150	-0.00256	-0.000280	-0.000617	0.00190
	(0.00362)	(0.00336)	(0.00434)	(0.00289)	(0.00358)	(0.00636)	(0.00339)
Violent crimes per 100,000, avg. 2003-2005	-0.0171	-0.0166	-0.0290	0.0160	-0.0102	4.62e-05	-0.0220
	(0.0181)	(0.0179)	(0.0215)	(0.0225)	(0.0197)	(0.0307)	(0.0206)
School demographic, vacancy, position, and job fair controls*	X	X	X	X	X	X	X
Constant	3.424***	3.151***	0.254	1.467***	2.636***	0.170	1.784***
	(0.425)	(0.433)	(0.519)	(0.507)	(0.537)	(0.659)	(0.488)
Observations	554	554	515	426	553	382	516
R-squared	0.414	0.400	0.459	0.512	0.428	0.412	0.385
Mean	54.51	44.68	6.57	4.08	27.29	2.40	6.10
Standard Deviation	36.92	31.09	6.16	5.48	22.20	3.55	5.18

Robust standard errors, clustered by school, in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

*Controls include school enrollment, number of anticipated vacancies, dummies for elementary school, magnet school, indicators for specific number of hires school was trying to make at job fairs, indicators for types of positions school had openings in, which job fairs school attended.

Observations in these analyses are school by job fair, meaning that schools that attended multiple job fairs have separate observations for each fair they participated in. Observations with poor sign in data (schools that had poor quality sign in data for a particular job fair or multiple fairs) are excluded for those months.

Figure 1. Applicants per school for all Summer 2006 CPS Job Fairs

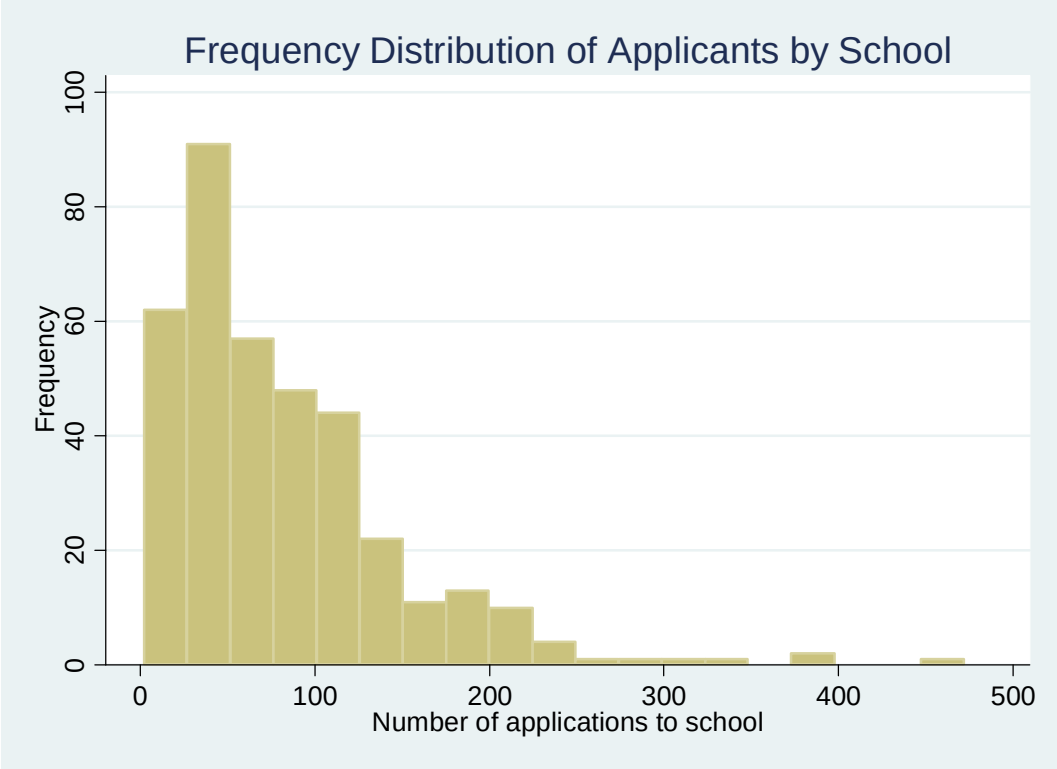
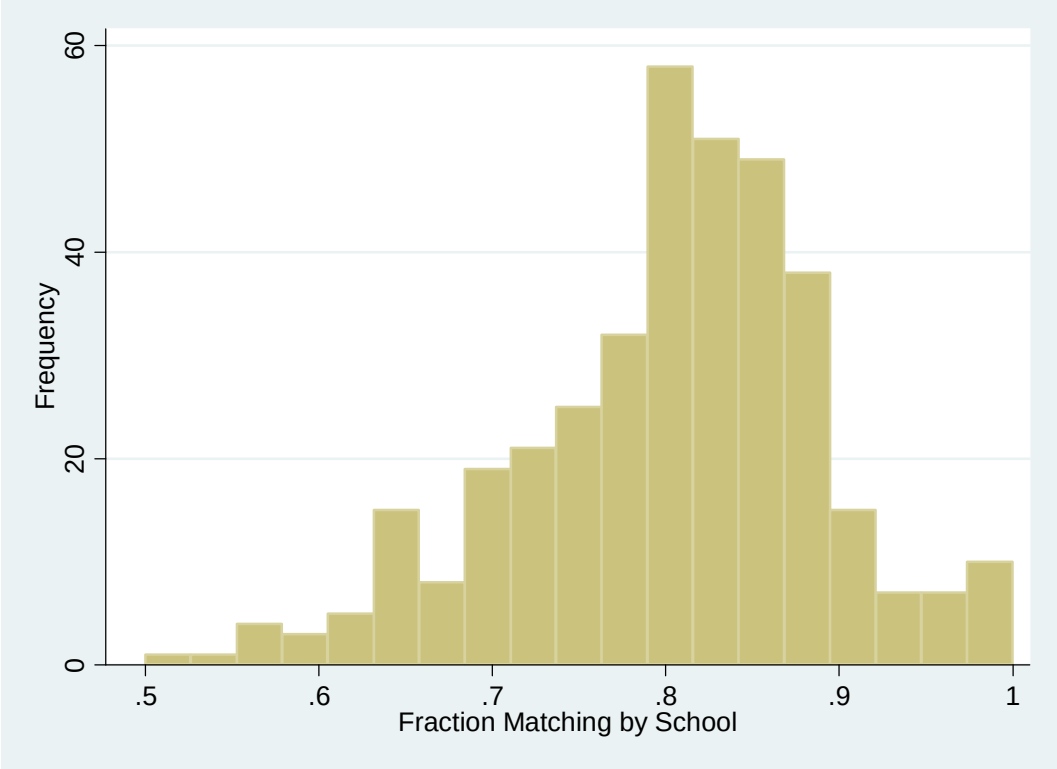


Figure 2: Histogram of fraction of applicants matching by school



Appendix

In order to test for possible selective non-matching, the appendix table shows results from regressions predicting the fraction of applicants whose sign in data was successfully matched to CPS application files by school by job fair. The dependent variable in the first two columns is fraction matching, and in the second two is the log transformation of fraction matching. Columns 1 and 3 show bivariate regressions or regressions for clusters of variables, while columns 2 and 4 show fully specified models. Overall, relatively few variables of interest are predictive of fraction matching. For example, fraction matching did not vary significantly by region. Percent of students identified as LEP is the only statistically significant predictor of fraction matching in the fully specified models. Descriptive results on fraction matching suggest that match rates were quite good, and that they did not vary significantly by key variables of interest.

Appendix Table - Regressions predicting percent of applicants whose sign in data matched to CPS application files by school

	(1)	(2)	(3)	(4)
	Fraction Matching		Log Fraction Matching	
Predominately Hispanic	-0.0209*	0.0151	-0.141**	0.0564
	(0.0110)	(0.0239)	(0.0674)	(0.145)
Predominately Minority	-0.0112	0.0171	-0.0650	0.120
	(0.0123)	(0.0141)	(0.0795)	(0.0914)
Racially mixed	-0.0241*	0.0230	-0.199**	0.110
	(0.0142)	(0.0179)	(0.0838)	(0.101)
Racially integrated	-0.00863	0.0151	-0.0459	0.143
	(0.0104)	(0.0179)	(0.0712)	(0.111)
% Eligible for free-lunch	0.000153	0.000187	0.000678	0.00171
	(0.000177)	(0.000338)	(0.00121)	(0.00214)
% Proficient	0.000246	-0.000104	0.00207*	-0.000116
	(0.000197)	(0.000395)	(0.00122)	(0.00257)
% Limited English Proficient	-0.000507**	-0.00128**	-0.00326**	-0.00744**
	(0.000250)	(0.000559)	(0.00153)	(0.00331)
Region 2	-0.00425	0.0108	-0.0289	0.0774
	(0.0155)	(0.0135)	(0.0905)	(0.0814)
Region 3	0.0176	0.0142	0.128	0.109
	(0.0133)	(0.0137)	(0.0811)	(0.0817)
Region 4	-0.00749	0.00122	-0.00537	0.0612
	(0.0118)	(0.0129)	(0.0800)	(0.0839)
Region 5	-0.0140	-0.0210	-0.0941	-0.128
	(0.0126)	(0.0134)	(0.0772)	(0.0785)
Region 6	0.00675	-0.00198	0.0906	0.0617
	(0.0129)	(0.0129)	(0.0844)	(0.0789)
Number of new hires	-0.00166*		-0.00952	
	(0.000961)		(0.00611)	
Anticipated vacancy count	-0.000342		0.000141	
	(0.00222)		(0.0143)	
June job fair	-0.0627***		-0.382***	
	(0.00743)		(0.0478)	
July job fair	-0.0233***		-0.123**	
	(0.00880)		(0.0615)	
School demographic, vacancy, position, and job fair controls*		X		X
Constant		0.798***		1.280***
		(0.0410)		(0.259)
Observations	554	554	542	542
R-squared		0.319		0.324

*** p<0.01, ** p<0.05, * p<0.1

Fraction of applicants whose sign in data matched to applicatn files ranged across schools from .5 to 1, with an average fraction matching of .803 (median .813) across the 369 schools in the sample.

*Controls include dummies for elementary school, magnet school, school enrollment, number of anticipated vacancies, indicators for specific number of hires school was trying to make at job fairs, indicators for types of positions school had openings in, which job fairs school attended.

Columns 1 and 3 show coefficients from regressions that estimate fraction of job fair applicants matching per school using either single variables or clusters of similar variables. Coefficients from separate regressions are denoted by horizontal lines in these columns.

Observations in these analyses are school by job fair, meaning that schools that attended multiple job fairs have separate observations for each fair they participated in. Observations with poor sign in data (schools that had poor quality sign in data for a particular job fair or multiple fairs are excluded for those months).