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**Who Teaches and Where They Choose to Teach:
College Graduates of the 1990s***

Abstract

This paper investigates the key determinants of entry into the teaching profession, and the subsequent sorting of new teachers across urban, suburban, and rural schools. Of particular interest is the relative importance of teacher salaries, alternative labor market opportunities, and non-pecuniary job attributes or working conditions on this decision process. Results from a nested logit model applied to the Baccalaureate and Beyond (B&B) Longitudinal Study show that work conditions play a relatively more important role in determining where new teachers end up choosing to teach, rather than differences in teacher salaries. This is especially true for women. Meanwhile wages play a relatively more important role at the occupational entry decision. In addition, there is significant variation in teacher quality indicators across these school locations.

Keywords: teacher supply; teacher quality; urban schools

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I. Introduction

Concern is often voiced over the low academic achievement of U.S. K-12 students, especially gaps in achievement among income and racial or ethnic groups.¹ Despite policies aimed at equalizing per-pupil spending across schools, however, considerable differences in school resources and in teacher qualifications persist.² Given the disparity across schools in the quality and effectiveness of teachers, it is essential to understand the underlying mechanisms that drive who teaches and where they choose to teach. This paper examines the key determinants of entry into the teaching profession, and the subsequent sorting of new teachers across different kinds of schools.

Understanding the key determinants of teacher sorting is especially timely. Many teachers who entered the profession in the 1950s and 1960s to staff baby boom classrooms are about to retire. This mass of impending retirements, coupled with an increasing school-age population and class size reduction policies, are likely to generate teacher shortages.³ At the very least, these factors combine to exacerbate recruiting difficulties in already hard-to-staff urban schools. However policies aimed at teacher recruitment and retention are likely to have effects

¹ For example, African Americans continue to score lower than white Americans on reading and math tests, as well as on tests that claim to measure scholastic aptitude and intelligence (Jencks and Phillips 1998).

² For instance the CA Supreme Court in 1976 ruled in *Serrano v Priest* against disparities in per-pupil spending. Yet Betts, Rueben, & Danenberg (2000) continue to find differences in school resources that contribute to unequal student outcomes. Other studies also find substantial variation across schools in teacher quality, whether teacher quality is an input measure (teacher characteristics as in Ehrenberg and Brewer 1994) or output-based measure (conditional effect of teachers on student outcomes as in Hanushek, Kain, Rivkin 2005).

³ It is unclear whether there really exist shortages in the teacher market, or if it is merely a perception. Ballou (1996) makes the point that the teacher market is typically in a state of excess supply, since there exists a surplus of candidates for most teaching jobs. Discussions regarding the current shortages in math and science typically focus on requirements for certification as barriers and differences in salaries with alternative careers.

not only on the distribution of teachers across schools but also on the overall supply of teachers among college graduates.

In this paper I apply a nested logit framework to investigate the importance of teacher salaries, alternative wage opportunities, and working conditions on the decision of recent college graduates to teach, and the subsequent sorting of new teachers across urban, suburban, and rural schools. Since teaching has traditionally been a female-dominated occupation, analyses are also conducted separately for men and women to see if the relative importance of these factors varies by gender.

The findings below suggest that work conditions play a relatively more important role in determining where new teachers end up choosing to teach, rather than differences in relative teacher wages. Schools with more poor students attract significantly fewer teachers. This is especially true among female teachers. On the other hand, relative teacher wages play a more important role than work conditions at the occupational entry decision, when male and female new college graduates are deciding to teach.

This paper also presents findings on the sorting of teachers across schools by ability. Conditional on choosing to teach, those with higher scholastic aptitude (in terms of SAT scores and college GPA) are significantly less likely to teach in central city schools compared to suburban schools. Accounting for individual ability or teacher quality using these measures is important in understanding overall teacher supply.

While these findings on teacher supply and sorting are informative, any policy implications must be qualified by the limitations of the data at hand. The results are limited to fresh college graduates, which, while an important source of new teachers, is not the total

potential teacher pool. District hiring policies could also be influential in determining teacher sorting, and they are unexplored in this study.

In the remainder of this paper, the related literature is first briefly reviewed in Section II. Section III proceeds to discuss the empirical framework applied to the data described in Section IV. Results are presented and discussed in Section V, and Section VI concludes.

II. Background and Related Literature

There is an extensive literature that relates school and teacher characteristics with student outcomes. In a comprehensive summary of empirical estimates, Hanushek (2002) finds that various student outcomes are not consistently related to teacher salaries, per-pupil expenditures, and other inputs. This is in contrast to a handful of studies that do find that schools and teachers matter (for example, Ehrenberg and Brewer (1994), Ferguson (1991), Hanushek, Kain and Rivkin (several)). Loeb and Page (2000) argue that insignificant effects of teacher salaries could arise by failing to account for alternative labor market opportunities and variation in job attributes in these education production function regressions.

Meanwhile the importance of salaries and working conditions as determinants of who teaches and where teachers choose to teach has yet to be established. In contrast to education production function studies, there has been relatively little work on how teachers sort across schools. This gap in the literature can in part be attributed to the lack of reliable information across datasets on teacher quality, working conditions, and other measures of interest. Earlier work that considered how teacher preferences affect the selection of schools includes Antos and Rosen (1975) and Murnane (1981). More recently, Hanushek, Kain, and Rivkin (2004) find that

work conditions are more important than salaries in determining the mobility of Texas primary schoolteachers across districts and in leaving teaching. Using data of teachers from New York, Lankford et. al. (2002a,b) find similar descriptive patterns, which are supported by estimates of a structural matching model. High-achieving teachers from New York are especially more likely to leave low performing schools (Boyd et al 2005). Stinebrickner et. al. (2003) using a database of teachers from Georgia find teacher transitions are more likely from schools with large proportions of minority students.

The results presented below are consistent with these more recent studies using teacher databases. In addition, the investigation below compares the roles of salaries and work conditions not just on the distribution of teachers across schools, but also on the overall supply of teachers among college graduates. This overall goal is important because policymakers and researchers continue to debate whether paying teachers more would induce more highly skilled women to enter the profession itself. For example, studies by Ballou and Podgursky (1997) find that raising teacher wages have little to no effect on teacher quality, while Figlio (1997) finds that they do.

III. Empirical Framework

The decision to teach is actually based on a sequence of decisions. Typically the process for a prospective teacher (college student or college graduate) begins with a decision to enroll in teacher preparation classes, and with successful completion, acquire teacher certification. In some districts facing shortages in subjects such as math and science, course credits in the subject

can also qualify one for an emergency license. The next stage is the application and job matching process, involving not only the supply decision but also the district or school's hiring policies.

Following the econometric literature on discrete choice, suppose a recent college graduate assigns a value or utility U to each possible location-specific job j according to

$$U_j = V_j + \varepsilon_j.$$

This value or utility U may depend on an individual's characteristics such as gender, race, and ability, the salary and working conditions of job-location j , as well as person i 's tastes for each job j . V then denotes the non-random or deterministic component of the utility function, while ε is a residual that captures the effects of unmeasured variables such as tastes.

Logically, we may think of the choice process as a recent college graduate facing an occupational choice, and if he/she chooses to teach, whether to teach in an urban, suburban or rural school, as illustrated in Figure 1. This produces a nested logit model. Assuming ε follows an extreme value distribution, the conditional choice probabilities of teaching at an urban, suburban, or rural school will be given by:

$$\Pr_{j|teach} = \frac{\exp(\beta' X_{j|teach})}{\sum_j \exp(\beta' X_{j|teach})}$$

while the marginal probability of teaching is given by:

$$\Pr_{teach} = \frac{\exp(\alpha' Z_{teach} + \tau_{teach} I_{teach})}{\sum_{teach} \exp(\alpha' Z_{teach} + \tau_{teach} I_{teach})}$$

where $X_{j|teach}$ and Z_{teach} are attributes such as salary and work conditions of that choice, and I_{teach} is defined to be the inclusive value for the “teach” or “not teach” branch.⁴

The methodological advantage of the nested over multinomial logit for all four alternatives is in the assumption of independence of irrelevant alternatives (IIA). IIA is violated in multinomial logit if the choice to teach in an urban school versus not to teach were affected if the alternative choice of suburban schools is removed from the set, which is likely if the choice to teach is not conditioned on.

Estimating the teaching decision and school location decision in a nested logit framework also allows examination of the effect of relative teacher wages and working conditions at every stage of the decision process. Most previous work has focused on estimating the importance of these factors only among existing teachers (the lower branch of the logit tree in Figure 1). However, such an analysis amounts to estimating how salaries and work conditions influence the distribution of a relatively fixed supply of existing teachers across schools and districts, making them estimates of one school or district’s gain or another school or district’s loss. Yet we know that improvements in salaries and working conditions would do more than alter the distribution of teachers across schools; it should also affect the probability that skilled individuals enter the profession in the first place. More precisely, estimating the lower branch only addresses, “Do schools or districts that offer better salaries and work conditions attract more teachers among the teacher pool?” The nested logit framework also gets at “What will happen to the teacher pool?”

The analyses are also conducted separately for men and women. The typical supply side explanation for why women tend to choose occupations such as teaching is that since women

⁴ For a detailed discussion of the nested logit model and its derivation from the theory of stochastic utility maximization, see McFadden (1978). Early applications of the nested logit model include community choice and type of dwelling within a community.

anticipate shorter and less continuous work lives than men, they choose occupations where their human capital depreciates less from labor market exits (Flyer and Rosen 1997). One interpretation of Becker's (1985) sexual division of labor model is that women disproportionately select teaching because its tasks are more compatible with home production.

The literature on occupational choice also suggests factors that determine the occupation choice decision (Z_{teach}) do not completely overlap with those that determine the choice of location of a teaching job ($X_{j|teach}$). In the analyses below, various individual characteristics such as college major and family background characteristics are included in the occupational choice decision, but do not enter in the choice of location of one's teaching job.

It is also possible that teachers are drawn to a locale for reasons unrelated to the teacher market, such as a spouse's job. Observable characteristics such as marital status and race enter the choice of location and attempt to control for some of these non-market factors. However, it is worth noting other unobservable factors unrelated to the teacher market that may also drive location choice. There is evidence in the literature indicating that teachers prefer to stay close to home when choosing jobs (e.g., Boyd et al 2003). In the analyses below, failing to control for these unobserved factors, such as the distance of each respondent's home to a local school, potentially bias the estimates. On the other hand, it is unclear in what direction all the unobserved variables ultimately bias the estimates.

Since economic theory tells us that observed wages and employment may be due to either supply or demand factors, or a combination of both, interpretation of the above estimates may be confounded because the relationship between employment and salaries involve not just the potential teacher's preferences, but also a district or school's hiring policies. For instance, a

school with high minority enrollment may disproportionately prefer teachers of a similar racial background. Few studies document district hiring practices, but Ballou and Podgursky (1997) and Ballou (1996) show that districts do not always hire the most qualified candidates.

The empirical issue is that teacher salaries and work conditions are endogenous, in that observed salaries and work conditions are choices in themselves. While teachers and other workers do not set the salaries and work conditions in any job, by choosing an occupation and the locale of that job, workers are effectively selecting the combination of salary and work conditions in their job. This endogeneity makes it difficult to interpret differences in salaries and work conditions as variation in teacher demand. For example, the finding below that the more able are less likely to become teachers at urban schools with bad work conditions could be because these individuals chose not to teach there, or because they did apply but were not offered a teaching job. Since the data actually has information on whether an individual ever applied and was ever offered a teaching job, I can use this information to investigate whether they actually decided not to pursue teaching, or if they were never offered a position. Furthermore, the measures used in the analyses below are aggregated over wider areas than just the local school district, allowing for better demand proxies.

IV. Data

Data for this study mainly come from a restricted-use version of the National Center for Education Statistics' Baccalaureate and Beyond (B&B) Longitudinal Study. The B&B tracks the 1992-93 college senior class identified from the National Postsecondary Student Aid Study (NPSAS), providing a nationally representative sample of bachelor degree completers. The B&B

provides cross-sectional information of about 11,000 graduates one year after they completed their bachelor's degree, and longitudinal information from a follow-up survey in 1997.⁵

The B&B is especially suited for this study as it elicited data on each individual's status by 1997 in the "teacher pipeline," a useful way to describe progress towards becoming a teacher. For example, all respondents were asked whether they had any teaching preparation, if they were certified and at what level, if they ever applied for a teaching job, and were ever offered a teaching job. More importantly, if they had taught by 1997, they were asked for the locale of the school they had last taught in or were currently teaching at.⁶

In addition, the B&B has measures of academic proficiency to proxy for teacher quality, such as SAT & ACT scores. Measurement of teacher quality is itself an extensive research issue. While personal qualities such as dedication and a compassionate nature also contribute to a teacher's effectiveness, unfortunately such measures are unobserved. In a recent review of several estimates, Hanushek (2002) finds that of input-based measures of teacher quality (e.g., teacher experience and level of education), teacher test scores are most consistently related with student outcomes. Since improving student achievement is what we ultimately care about, these achievement test scores are good indicators of teacher quality.

From these data a teacher is defined as someone who had taught at the elementary or secondary levels at any time between graduating from college up to the spring term when the follow-up survey was administered (April to July 1997). Pre-school teachers, student teaching, teacher's aide, and substitute teachers were excluded from this definition. Even if these individuals were classified as "teachers," there is little to no information from which to infer the

⁵ All statistics and estimation below utilize the B&B's sampling weights (adjusted for non-response across surveys).

⁶ This means that for some graduates who have taught in multiple schools, this may not be of the same type and locale as their first school.

location of their teaching job. Finally, teachers with missing or blank teaching job locations are excluded from the analysis sample.⁷

Defining teachers as one who had taught at any time from college graduation up to three years later will tend to underestimate the relationship between salary and work conditions and teacher supply. This is because previous studies find exits from teaching to be higher at these younger ages (e.g., Murnane et al 1991). Furthermore high ability teachers are more likely to leave teaching than those with less talent (e.g., Podgursky, Monroe, and Watson 2004).

To assess the relative importance of teacher salaries and work conditions, I augment the B&B data with wage and non-wage attributes of teaching jobs from two additional data sources. Local area teacher and professional workers' wages were calculated from the 1990 and 2000 1% U.S. Census samples (IPUMS) and deflated using the CPI-U to be in 1982 dollars.⁸ Professional occupations include accountants, engineers, and professors, as defined by the Census. B&B respondents were then linked with these average occupational wages by gender, state, and central city/suburban/rural location. In addition, information on local schools' working conditions was derived from the 1997 Common Core of Data (CCD). The Department of Education's CCD is an annual database of public elementary and secondary U.S. schools. B&B respondents were also linked with enrollment-weighted averages of the percent of students eligible for free lunch and pupil to teacher ratio by state and central city/suburban/rural location. For the "not teach" option, B&B respondents were linked with occupational wages and work conditions by state.

⁷ Excluding teachers with missing location information from the analyses may introduce some bias. To investigate this, I classified these teachers' locale as "rural school," since it is more likely to be small schools in rural areas that were not matched when the survey was coded. The results below did not change qualitatively when these observations were added to the analyses as "rural."

⁸ I first derive average occupational weekly wages by gender and location, deflate them, and then take the average between census years 1990 and 2000 since the B&B cohort was in the teacher labor market during the 1990s.

V. Results

A. Who Teaches and Where They Teach: Descriptive Analysis

Of the 10,569 BA recipients in the analysis sample, 12 percent had taught by 1997. Teaching remains a female-dominated occupation; women comprise 73 percent of those who had taught or are currently teaching. They are not distributed uniformly across school locations, however, as Table 1 shows. Female teachers are primarily concentrated in central city schools and the suburbs. While only 47 percent of new male teachers are in these urban areas, the majority—about two-thirds—of female teachers are. In addition, Table 1 shows there are more than twice as many minority teachers in central city schools than rural schools, with schools in the suburbs in between these two in terms of minority composition, as we would expect.

Similar to previous findings on teacher quality, Table 1 shows teachers on average score significantly lower on standardized tests compared to non-teachers. In addition, teacher quality is not distributed uniformly across school locations, as measured by the SAT/ACT score (seen in Figure 2) and the undergraduate GPA of teachers. On both these measures, teachers in towns and rural areas tend to be of slightly higher quality compared to suburban teachers, followed by teachers in central city schools. The gap in teacher qualifications across schools is also reflected by differences in the fraction of certified teachers by location, with 7 percent more of rural teachers certified than central city teachers. Even within urban areas, there is a gap in teacher qualifications across the suburbs and city schools. Compared to city schools, 5 percent more teachers in suburban schools are certified to teach and 8 percent more majored in the field they are teaching in.

There are gender differences in these quality measures as well. Fifty four percent of male teachers come from the top two SAT quartiles, compared to 37 percent of female teachers. This gender gap in teacher quality also varies by location, with the gap most pronounced in rural areas and least in the suburbs. In contrast, the gender gap in qualifications goes the other way in that more female teachers are certified than male teachers, particularly in central city schools.

Because the decision to teach involves not only the supply decision but also the district or school's hiring policies, I examine if there are systematic differences in the number of job offers teachers received by their eventual school location. The idea is that if teachers in suburban schools had received more offers than teachers in central city schools, differences across areas in teacher supply come more from district hiring policies rather than a supply-side decision. Table 1 shows that while teachers in suburban and rural schools had sent out about 10 more applications on average than teachers in central city schools, there are no significant differences in their average number of offers (3). Of those who had never taught by 1997 six percent had applied to teaching jobs and received 1 teaching job offer on average. While certainly not conclusive, these patterns do suggest that the sorting of teachers in this data across school locations are driven more by supply decisions than district or school hiring policies.

B. Determinants of Who Teaches and Where They Teach

Table 2 suggests there is systematic variation across areas in teacher salaries, alternative wage opportunities, and work conditions that could be driving these supply decisions. As expected, schools located in city centers tend too have poorer students, more minority students,

and larger class sizes. Suburban schools tend to have the least poor students, while rural schools have the least minority students and the lowest class sizes on average.

Table 3 shows that these differences in relative teacher salaries and work conditions significantly determine who teaches and where they end up teaching. Table 3 reports the coefficients from the nested logit estimation using full information maximum likelihood. Hausman tests for IIA by estimating a conditional logit on the bottom nodes also indicate the nested logit is the preferred model.⁹

Teacher salaries and alternative wages are significantly related with the decision to teach among college graduate men and women. Notably, wages in alternative professional occupations are significantly negatively related with the choice to teach among college graduate women. If the wage measure used is instead relative teacher salaries, relative teacher salaries also significantly positively affect the teaching decision.

In addition, states with poorer schools tend to attract fewer of both male and female college graduates to teach. Male college graduates are significantly less likely to choose to teach in states with schools of large class sizes and more minority students. Conditional on choosing to teach, male and female teachers are less likely to choose schools with higher minority student body. These results are consistent with other findings in the literature using teacher databases. Given that the characteristics of schools are typically correlated, the interpretation of the separate effect of each measure of work conditions on teacher sorting is confounded. Stinebrickner et. al's (2003) study of teacher transitions suggests racial composition of the student body plays a more important role in attrition than student poverty using a competing risks framework. They find that teachers are more likely to leave a particular type of poor school, particularly schools with

⁹ These tests are available from the author on request.

higher proportions of minority students.

Including controls for the characteristics of college graduates in the last two columns of Table 3 further highlights these relationships. Further confirming the descriptive trends, minority college graduates are significantly less likely to teach. As expected, both men and women who graduated with degrees in Education are significantly more likely to teach while those with degrees in Math, Science, and Engineering are less likely to teach.

There are also differences by gender in the importance of these characteristics in the choice to teach and in teacher sorting. Consistent with Becker's hypothesis, married women are more likely to end up in teaching than married men. Father's and mother's education tend to have opposing effects on the likelihood of teaching by gender. While father's years of schooling is negatively related to the likelihood a woman chooses to teach, it is mother's education that is negatively related to the likelihood a man chooses to teach.

Meanwhile female minority teachers are more likely to choose urban schools than suburban schools in contrast to their male minority counterparts. Married female teachers are also most likely to teach in suburban schools.

Consistent with the descriptive analysis, college graduates with higher aptitude are significantly less likely to teach. In addition, conditional on having decided to teach, those with greater aptitude and potentially higher teacher quality are least likely to teach in a central city school, and most likely to teach in a suburban school. Differences in teacher quality across school locations are further highlighted in Figure 3. From the full specification in the last two columns of Table 3, the predicted probabilities of each individual at each of the bottom nodes are calculated. Figure 3 plots the median of these values on SAT/ACT scores separately by gender.

Similar to the descriptive analysis, men are more likely to teach in rural areas than women, while women are more likely to teach in central city and suburban schools than men. Also consistent with the descriptive statistics, the conditional probability of teaching declines with individual ability except, interestingly, in suburban schools.

The magnitudes of the logit coefficients are a little difficult to interpret, however. In order to assess the relative importance of salaries and work conditions, Table 4 reports the maximized value of the log-likelihood of alternative nested logit models. For both men and women, the model fit is better when wages are controlled for compared to the models where work conditions are the only measures of job attributes. Meanwhile a comparison of the predicted probabilities to the actual proportions across these choices suggests that work conditions do a relatively better job of predicting the school location choices. This is especially true for women. Taken together with the results from Table 3, the model comparisons suggest that wages play a relatively more significant role at the teaching decision, while work conditions are relatively more significant when teachers decide where to teach.

VI. Summary and Conclusion

This paper investigates the key determinants of entry into the teaching profession, and the subsequent sorting of new teachers across urban, suburban, and rural schools. Findings suggest that work conditions play a relatively more important role in determining where new teachers end up choosing to teach, rather than differences in teacher salaries. This is especially true among women. However, wages play a relatively more important role at the occupational entry decision, when male and female college graduates are deciding to teach.

In addition, consistent with earlier findings, there is significant variation in teacher quality indicators across schools. Accounting for teacher quality is found to be very important in understanding teacher supply and teacher sorting.

Previous studies note that districts may privilege familiarity with a candidate or other worker traits (such as race) over ability indicators in their hiring decisions.¹⁰ While a comparison of teaching job offers received by teachers across their eventual school location suggests that locale choices in this data are driven more by supply decisions than demand-side forces, district hiring policies may still play a significant role above those of wages and work conditions.

Another important caveat is that this study investigates the determinants of supply only among new college graduates, not the total potential teacher pool. The traditional image of new teachers coming straight out of college may not be as prevalent today as in the past. In 1990-91, only a third of new hires in public schools and a fifth of new hires in private schools entered teaching straight out of college (NCES 2000). The findings highlighted in this paper do not necessarily represent the teacher pool, in that the career decisions made at older ages by teachers may vary from those of their younger counterparts. On the other hand, new college graduates remain a major source of teacher supply, and the rate at which they teach may become increasingly important with looming shortages.

¹⁰ See, for instance, Ballou (1996).

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Table 1. Average Characteristics of Teachers, Non-Teachers, and Teaching Jobs

Panel A. Descriptive Statistics from B&B93/97

	Never Taught	Location of School if Taught/Current Teacher		
		Central City	Suburbs	Town/Rural
No. of Obs	6,536	310	287	489
Age received BA	25.518	26.047	25.186	25.688
% Female	51.30%	81.00%	74.90%	66.00%
% of Female Teachers In	n.a.	35.00%	27.00%	37.00%
% of Male Teachers In	n.a.	23.00%	24.00%	53.00%
% Non-white	15.20%	14.00%	9.90%	6.10%
SAT/ACT Composite Score	997.574	928.145	954.988	945.328
% in top two SAT/ACT quartiles	48.90%	39.80%	41.00%	41.20%
College GPA	3.166	3.223	3.256	3.296
<i>By 1997:</i>				
Certified to Teach	2.90%	80.40%	84.00%	85.50%
College Major in Field Teaching	n.a.	36.00%	41.40%	41.20%
Years of Teaching Experience	n.a.	2.859	2.885	2.8
Total No. of Teaching Applications, if Applied	13.03	12.533	21.904	23.616
Total No. of Teaching Job Offers, if Applied	1.073	2.895	2.782	2.93

Note: Data come from the B&B. Sample excludes observations with missing location. The SAT or ACT score come from the ETS, and when not released, are self-reports. It refers to their SAT score, and if they didn't take the SAT, their ACT score converted to SAT.

Table 2. Wage and Non-Wage Characteristics of Teaching Jobs and Alternative Wages

	Location		
	Central City	Suburbs	Town/Rural
<i>Average Weekly Wages (in 1982\$) of:</i>			
Teachers	\$488.25	\$476.54	\$413.27
Professionals	\$578.60	\$626.67	\$477.60
Male Teachers	\$533.19	\$558.54	\$480.74
Male Professionals	\$676.61	\$755.73	\$581.64
Female Teachers	\$476.69	\$448.94	\$387.17
Female Professionals	\$481.14	\$485.81	\$380.52
<i>Characteristics of Schools:</i>			
% Eligible for Free Lunch	38.60%	21.30%	32.40%
% Minority (Black+Hispanic) Students	38.30%	16.50%	13.60%
Pupil to Teacher Ratio	17.97	17.68	17.16

Note: Wage data are calculated from 1990 and 2000 IPUMS. School characteristics come from NCES Common Core of Data 1997.

Table 3. Nested Logit Results

Coefficients: With and Without Controls for Individual Characteristics and Teacher Quality

	Female	Male	Female	Male
Choice: Teach				
Log weekly wage of teachers in state of residence	0.002 [0.000]***	0.002 [0.000]***	0.002 [0.000]**	0.008 [0.000]**
Log weekly wage of professionals in state of residence	-0.005 [0.000]***	0.002 [0.000]***	0.012 [0.000]**	0.003 [0.000]**
Characteristics of teaching jobs in state of residence:				
% eligible for free lunch	0.107 [0.061]*	0.121 [0.171]	-14.782 [0.672]**	-20.864 [1.619]**
pupil to teacher ratio	0.028 [0.002]***	-0.031 [0.005]***	1.060 [0.040]**	4.198 [0.103]**
% minority (blacks+hispanics)	1.489 [0.048]***	-2.404 [0.169]***	27.540 [0.673]**	-5.433 [1.435]**
Individual characteristics:				
Non-white*Teach			-9.831 [0.396]**	-1.526 [0.447]**
married*Teach			3.341 [0.121]**	-7.404 [0.338]**
BA Education*Teach			0.594 [0.020]**	1.281 [0.031]**
BA Math/Science/Engineering*Teach			-0.928 [0.029]**	-0.103 [0.028]**
SAT score in highest 2 quartiles*Teach			-4.673 [0.157]**	-6.854 [0.290]**
father's years of schooling*Teach			-0.031 [0.004]**	0.005 [0.004]
mother's years of schooling*Teach			0.008 [0.004]*	-0.022 [0.005]**
Choice: Location of school if teach				
Characteristics of teaching job in area				
Log weekly wage of teachers in area	1.637 [0.056]***	1.007 [0.067]***	0.478 [0.007]**	-0.132 [0.001]**
% eligible for free lunch	2.981 [0.071]***	4.726 [0.122]***	-1.030 [0.044]**	0.362 [0.033]**
pupil to teacher ratio	0.074 [0.005]***	-0.139 [0.008]***	0.066 [0.002]**	-0.084 [0.002]**
% minority (blacks+hispanics)	-1.672 [0.061]***	-3.924 [0.092]***	1.748 [0.038]**	0.097 [0.029]**

con't, Table 3.

	Female	Male	Female	Male
Non-white*City			0.657 [0.023]**	-0.072 [0.024]**
married*City			-0.155 [0.010]**	0.230 [0.017]**
certified to teach*City			0.077 [0.008]**	0.028 [0.010]**
teaching in one's college major*City			0.316 [0.010]**	0.240 [0.021]**
SAT score in highest 2 quartiles*City			-0.341 [0.012]**	-0.765 [0.027]**
Non-white*Rural			0.529 [0.021]**	0.156 [0.024]**
married*Rural			-0.208 [0.009]**	0.464 [0.018]**
certified to teach*Rural			0.629 [0.009]**	0.329 [0.006]**
teaching in one's college major*Rural			0.557 [0.011]**	0.532 [0.012]**
SAT score in highest 2 quartiles *Rural			-0.164 [0.010]**	-0.107 [0.017]**
Inclusive Value Parameters:				
Teach=0	1.253 [0.088]***	-0.264 [0.070]***	37.899 [0.331]**	-21.223 [0.000]
Teach=1	1.054 [0.076]***	0.096 [0.086]	23.827 [0.563]**	28.621 [0.000]
Log-Likelihood	-588275.1	-260057.7	-256587.5	-120256.2
Observations	1952408	1667308	1773164	1541856
Number of groups	4241	3381	3864	3127

Note: Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Cols 1-2 do not control for individual attributes, while Cols 3-4 do. See discussion in text for a description of the variables.

Table 4. Wages vs Work Conditions

Difference in Predicted Probabilities to Actual

	Model with Wages, No Work Condtns		Model with Work Condtns, No Wages	
	Female	Male	Female	Male
Central City	-0.019	0.017	0	0.016
Suburbs	-0.008	0.003	-0.007	0
Town/Rural	-0.021	0.038	-0.002	0.04
Max Log-Likelihood	-316984	-140299	-319523	-146432

Note: Predicted probabilities are calculated from model with controls as in the last two columns of Table 3, except for as noted in column headings.

Figure 1. Specification of the Nested Logit

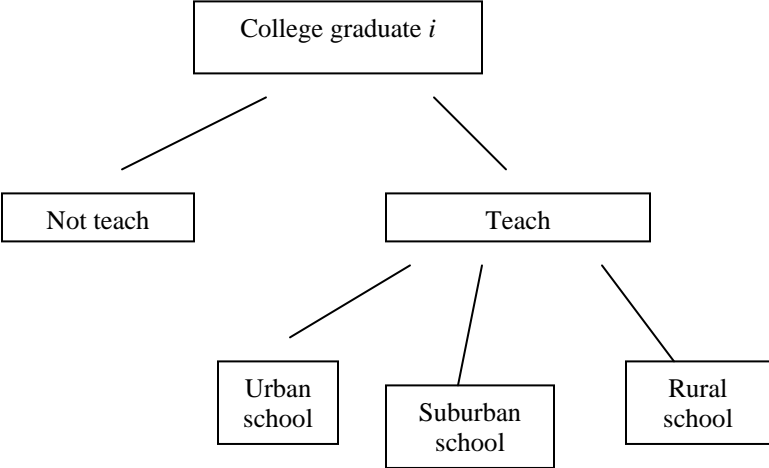
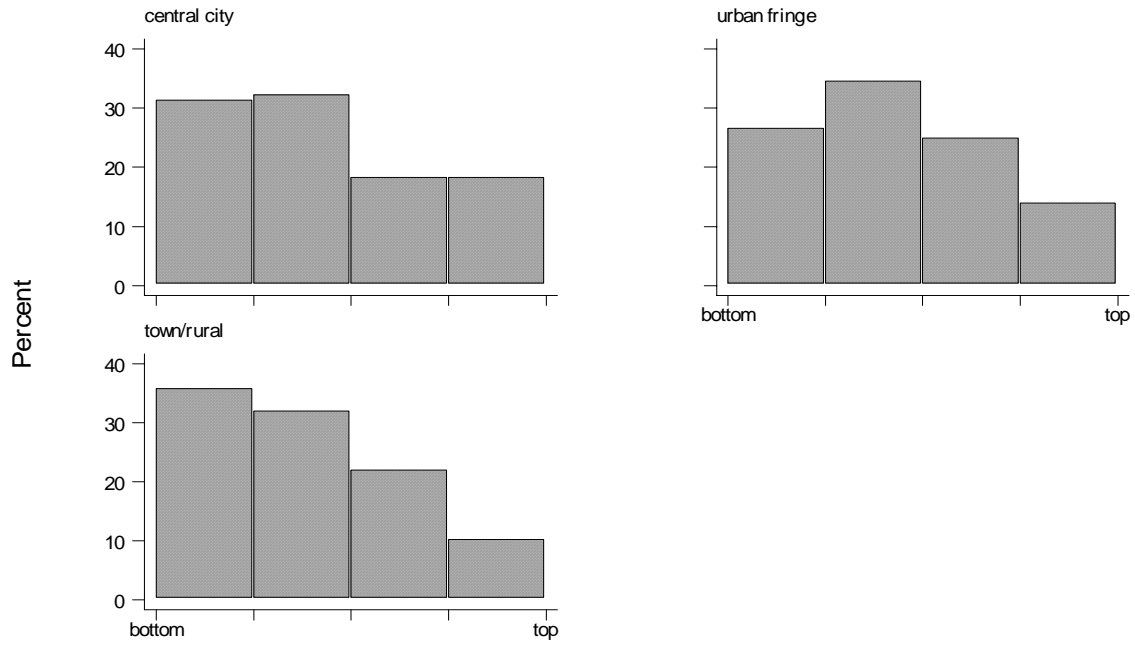
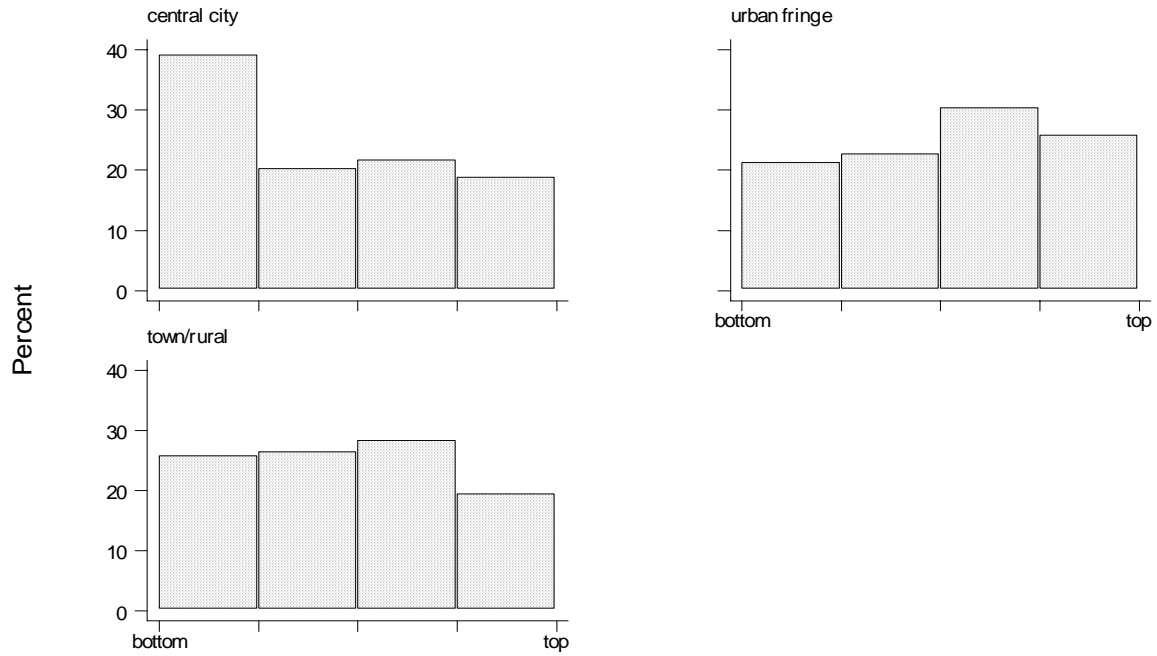


Figure 2. Distribution of Teacher Quality by School Location

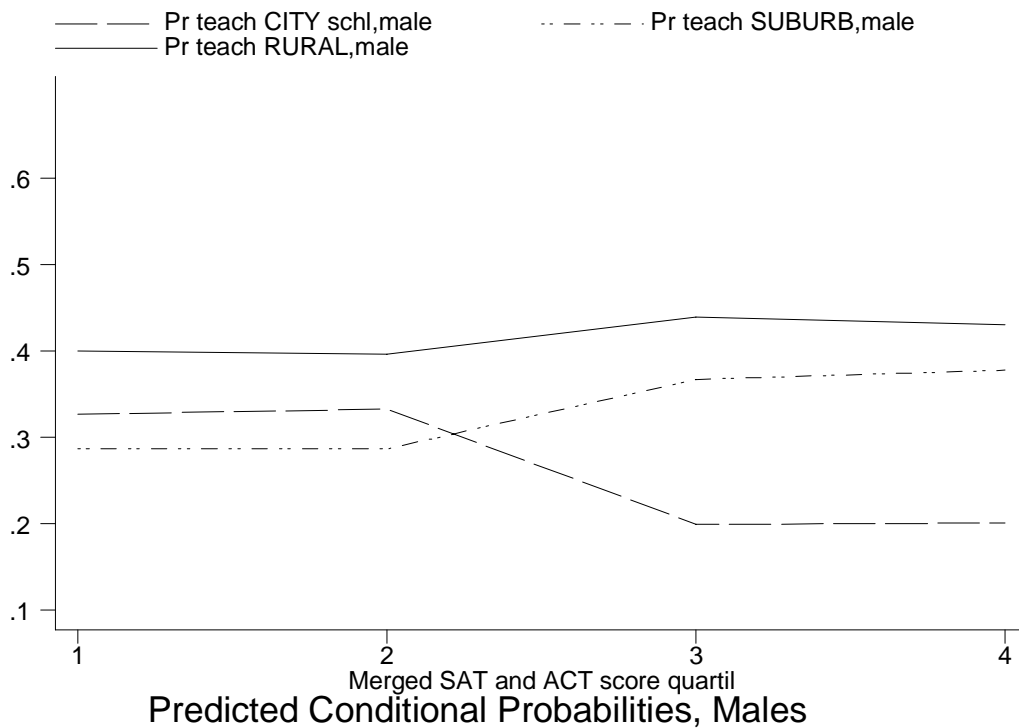
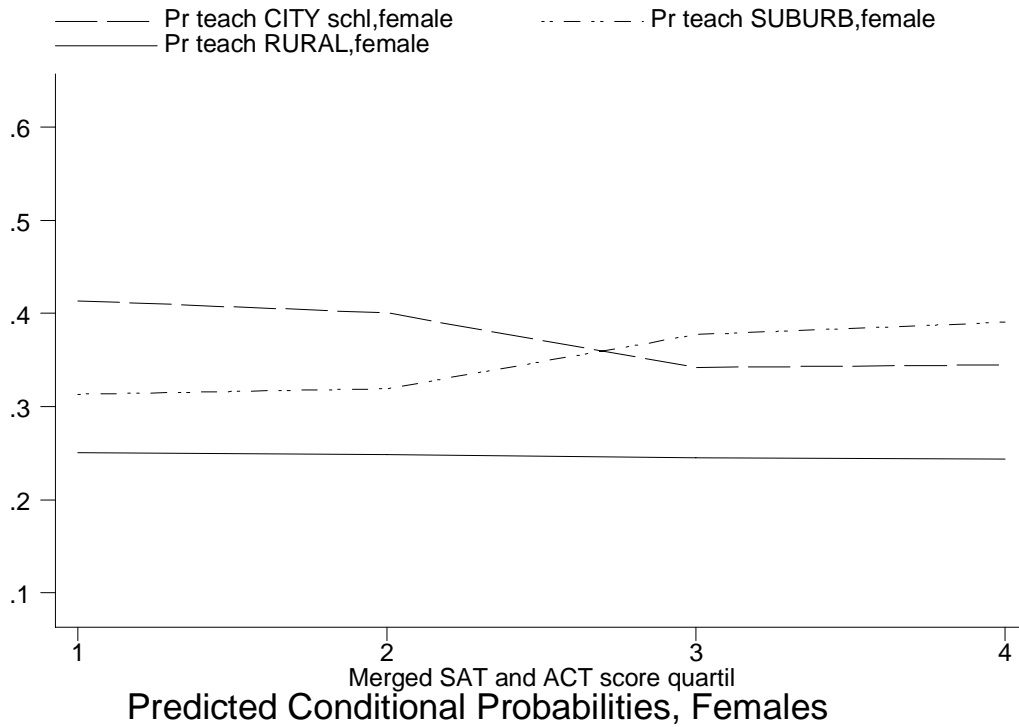


Merged ACT, SAT quartile
SAT/ACT Distribution By Location of School: Females



Merged ACT, SAT quartile
SAT/ACT Distribution By Location of School: Males

Figure 3. Conditional Predicted Probabilities by Gender and Teacher Quality



Note: Figures plot the median values of conditional predicted probabilities from the full specification in the last two columns of Table 3, and are calculated as each individual's predicted probabilities at each of the bottom node.