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Unintended Consequences of Expanding Teacher Preparation Pathways: Does Alternative Licensure Attenuate New Teacher Pay?

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Texas reduced new teacher preparation requirements in 2001 to allow more alternate paths to licensure. Within 5 years, this policy change resulted in more than half of the state's new teachers being alternatively licensed. Using a series of first difference models, this study examines the relationship between the increased supply of new teachers in Texas and new teacher salaries prior to the policy change and in the 15 years thereafter. We find that the policy change did increase the supply of new teachers via alternative licensing, but pay for new EC-6 teachers declined by 2%–13% with differential effects based on the rate at which districts hired alternatively licensed teachers.

Keywords: *new teacher pay, alternative certification, teacher labor market, educational policy*

Context and Background

Teaching has historically been a licensed profession in which a limited number of schools of education were typically housed in universities and offered a traditional path to certification (Kleiner, 2000). However, 30 years of documented teacher shortages in the United States resulted in federal and state policies that reduce barriers to teacher licensure (Cross, 2017). The goal of these policies is to create a larger pool of new teachers in less time than it typically takes schools of education to produce teachers. Nonunion (also called right-to-work) states are states in which teacher union bargaining is prohibited by state constitutions. Those states have consistently ratified policies that open new pathways to teacher licensure (Guthery, 2018).

In 2001, the Texas State Board for Educator Certification (SBEC), which establishes teacher preparation and certification requirements, reduced the mandatory number of contact hours for teacher candidates to generate more teacher licensure programs (May et al., 2003). By reducing that number of required contact hours, the policy change facilitated the proliferation of alternative licensure programs and has consequently increased the number of new teachers with alternative licensure (Baines et al., 2001; May et al., 2003; Walsh & Jacobs, 2007).

Previous studies have examined the effects of instituting teacher licensure exams and found that increased credentialing barriers resulted in higher wages for new teachers (Angrist & Guryan, 2008; Goldhaber & Hansen, 2010). Collectively, these studies assert that when states increase barriers to teacher licensure, the number of newly licensed teachers decreases. In turn, this decrease of newly licensed teachers generates more competition among districts to hire fewer available people and tends to drive up wages. Our study considers the opposite: the consequences for wages when reduced preparation and licensure requirements make it easier—rather than harder—to enter the teaching profession. Specifically, we investigate what happens when a teaching license becomes more obtainable and the profession less restrictive. Previous research on licensed professions has found that licensed professionals were paid more for their skill set than were equivalent professionals in nonlicensed fields because the institution of licensure serves as a barrier and regulates the number of people in the profession, thus protecting the higher wages (Kleiner, 2000).

This study investigates whether reduced barriers to entry and the resultant increase in teacher supply influenced salaries for elementary Texas educators. We examine the implementation of a policy in 2001 (SBEC, 1999) that expands alternative licensure and its effects for wages among new Elementary (EC-6) teachers, the most commonly produced category of new teacher in Texas. We find that the 2001 Texas policy is associated with attenuated pay for all EC-6 new teachers. We also find that, prior to the implementation

of the policy, districts that hired more than 50% of their new teachers with alternative licensure were paying higher salaries relative to other districts. However, following the institution of the policy, the districts that hired 50% or more alternatively licensed teachers (ALTs) experienced stagnated teacher pay in real dollars, and the districts that hired less than 10% ALTs increased teacher pay.

Purposes and Consequences of Alternative Teacher Licensure

Texas has established numerous forms of alternative licensure to expand the supply of licensed teachers; by the 2016–2017 school year, 55% of new teacher licenses in Texas were issued through alternative pathways (Rubiera, 2018). In addition, Texas initiated several policies that deregulate teacher licensure, and similar policies are now in effect in many states throughout the country (Feistritzer et al., 2011; Walsh & Jacobs, 2007). The following section reviews the rationale for instituting alternative routes to teacher licensure, addresses changes in the teacher supply attributable to alternative licensure, and concludes by discussing potential consequences of alternative licensure policies.

Meeting a Need Through Alternative Licensure

The practice of licensing and then certifying American teachers dates to the colonial era; however, the rise of compulsory schooling and the proliferation of schools of education resulted in teaching being a licensed profession by the 20th century (Tyack, 1974). Under this system, a limited number of preparation programs run by universities—now known as traditional schools of education—were grantors of teacher licenses (Kleiner, 2000). As in other licensed fields (e.g., medicine or law), teacher certifications and licenses aimed to achieve two interrelated objectives. First, they ensured the quality of teachers educating students; the need for teacher quality was premised on the idea that teacher training was related to student outcomes. Second, licensure protected the profession of education from unfair competition and from "unethical, incompetent, or improperly prepared teachers" (LaBue, 1960, p. 148).

However, by the 1980s, critics were arguing that the certification rules governing university teacher preparation programs were also inhibiting the overall production of new teachers. School districts that served minoritized and economically disadvantaged students reported particular trouble hiring and retaining qualified teachers (Heilig et al., 2010). Moreover, teacher shortages became particularly acute in areas of critical need, such as bilingual education, computer science, science, mathematics, and special education—and some of these shortages had extended for decades (Cross, 2017). These long-standing critical shortages were used to justify the more rapid production of teachers (Texas Higher Education Coordinating Board [THECB], 2002). Traditional institutions of higher education were blamed for the bottleneck in teacher production, and so in 1983, New Jersey created the first alternative licensing program that was designed to license new teachers without requiring traditional university preparation (Walsh & Jacobs, 2007). Over the next 2 decades, alternative licensure was widely adopted throughout the United States.

By 2000, alternative teacher licensure was permitted in Texas, but not widespread. However, in August 2001, the Texas Higher Education Coordinating Board issued a memorandum stating that the number of contact hours for alternative licensure required by the SBEC were guidelines rather than rules (THECB, 2001). That wording change was significant because it allowed alternative teacher licensure programs to reduce their program length, while the length of traditional (university-based) preparation programs remained fixed. The subsequent 2001 legislative change made Texas one of three states that did not require a practical classroom component (e.g., student teaching) for teacher preparation toward licensure (Baines et al., 2001). The reduced requirements for teacher preparation would have a profound effect on the teacher labor market in Texas; specifically, the policy change created the pathway for the majority of teachers to obtain an alternative license throughout the state (Smith, 2021).

Teacher Supply and Sorting Due to Alternative Licensure

Although several studies have investigated differences in the quality of teachers produced by alternative licensure programs, the outcomes are mixed. Goldhaber and Brewer (2000) find little evidence that teacher licensure is related to student achievement, instead noting that in-subject certification is a better predictor of student achievement than a teacher's licensure type. In a study of Florida data, Sass (2011) finds that alternative licensure programs are diverse, as are the teachers who engage in those pathways. However, he notes that "alternatively certified teachers have stronger preservice academic skills, as evidenced by higher initial pass rates on certification exams and higher college entrance exam scores than traditionally prepared teachers" (p. 17). Finally, von Hippel et al. (2016) urge caution when assessing the real differences in quality between teacher preparation programs. Any differences that exist are very small (resulting in differences in student achievement of just .02 standard deviation [SD] in reading and .03 SD in math). Moreover, the estimates of such differences are "sensitive and uncertain" and consist "mostly of noise" (p. 29). In short, any differences in teacher quality attributable to the type of licensure program remain a critical question in the research (Castro & Edwards, 2021).

Concerns about preparation quality and retention persist, but alternative routes have produced a significant number of new teachers for districts with persistent

shortages (Redding & Smith, 2016; Smith, 2021). Alternative licensure has also increased some dimensions of diversity in the teaching field. Specifically, more individuals from historically underrepresented groups are entering teaching through alternative rather than traditional licensure (Kane et al., 2008; Peterson & Nadler, 2009). The increase in ALTs of color has been a positive addition for students, with recent efficacy studies affirming the benefits to students of color when they have teachers of color in their schools (Dee 2005; Grissom & Redding, 2015). Additionally, although male participation in the teacher labor force is shrinking overall (National Center for Education Statistics, n.d.), the majority of male teacher candidates are entering the profession and obtaining licensure through alternative pathways. Men compose 22% of all ALTs, compared with only 16% of traditionally prepared teachers (National Center for Education Statistics, n.d.). Despite large increases in the number of ALTs, thousands of teaching jobs remain unfilled every year, indicating that the vacancies may not be due to the lack of traditionally prepared candidates (THECB, 2002).

What is clearer among extant studies are the ways in which the typical school context is different for ALTs than for traditionally licensed teachers. Darling-Hammond et al. (2002) find that "based on their graduates' feelings of preparedness, teacher education programs do differ in the quality of preparation they provide" and that alternative route teachers rated their preparation lower than did traditionally prepared teachers (p. 297). ALTs are more likely to work in low-achieving, low-income, urban schools with a majority of non-White students in conditions that are usually categorized as high-needs or priority schools (Ballou & Podgursky, 2000; Boyd et al., 2007; Lankford et al., 2002). However, the higher rate of turnover among ALTs fuels an ongoing debate regarding whether they leave the profession because they tend to teach in challenging school environments or because of a sorting effect associated with their alternative credentialing (e.g., Darling-Hammond, 2006; Guthery & Bailes, 2022; Redding & Smith, 2016).

The Great Recession and Teacher Retention

Importantly, the Great Recession took place during the time frame in which this study is set (2007–2009). Unprecedented teacher layoffs took place during and immediately after the Great Recession. Most teacher layoffs nationally took place between 2009 and 2012—a lag that resulted from depressed state education budgets concurrent to withdrawal of federal support for education. Such a systemic shock and ensuing job scarcity might have had the effect of compelling teachers to stay in the system who might otherwise have left. Although the specific literature addressing education labor market changes as a result of the Great Recession remains narrow, several studies inform our understanding of teachers' behavior during that time. Goldhaber (2016) identify similar trends among teachers in Washington State and in the Los Angeles Unified School District. Those teachers voluntarily left their schools at higher rates during times of increased layoffs, and those departure rates exceeded even what was needed to account for budget cuts. This result counters the idea that teachers might be compelled to stay in their roles during times of heightened job insecurity.

On the other hand, Fuchsman and Zamarro (2019) find that "increases in local unemployment lead to decreases in the probability that teacher turnover for this year were higher" (p. 19). These results change slightly, depending on teachers' experience, quality, and content; in Los Angeles Unified School District, experienced teachers were more likely to switch schools within the district (Goldhaber et al., 2016). Pendola's (2022) study of Texas schools shows the varied ways in which schools reapportioned their spending during the Great Recession: High-poverty schools redirected their limited funds from general support to targeted group support (e.g., special education), whereas lower-poverty schools tended to move money toward general support via their regular patterns of spending. Taken together, these studies suggest no consistent pattern regarding the turnover behaviors of teachers, and uncertainty remains regarding the degree to which the Great Recession instigated either turnover or retention among Texas educators.

The lasting and perhaps most devastating consequence of the Great Recession has been the drop in interest in teaching: Depressed salaries, increased costs of traditional educator preparation programs, and job insecurity have been associated with decreased enrollment in traditional and alternative licensure programs (Partelow & Baumgardner, 2016). Even so, historic layoffs seem not to have dissuaded prospective educators in Texas from entering the profession, because in 2010–2011, alternative licensure pathways became the primary mechanism by which novice teachers entered Texas classrooms.

Teacher Labor Market and Pay

The relative wage for an American teacher has been falling since the 1960s (Allegretto et al., 2011; Hanushek & Rivkin, 2007; Hoxby & Leigh, 2004). Lower teaching wages are attributable in part to the structure of teacher pay steps, which are typically negotiated through traditional union bargaining (Hanushek, 2007; Hoxby, 1996). The factors that tend to raise pay among teachers are years of service and additional educational attainment, such as advanced degrees (Hanushek, 2007). Teacher turnover, then, drives down the average aggregate salary for two reasons: lower average tenure pay and less time for teachers to get an advanced degree before they leave the profession. Although other studies have focused on teacher financial incentives (including teacher-designed incentives) and ensuing teacher quality or productivity (e.g., Springer & Taylor, 2016), we focus on the

pay structure for novice teachers produced through traditional and alternative licensure pathways. We are therefore able to isolate effects of lowered barrier to entry on new teacher pay, which tends to be more sensitive to policy changes because existing teachers tend to be in longer-term employment contracts (Guthery, 2018).

As teacher pay has trended downward over time, researchers have identified policy changes that have altered either teacher supply or district demand and resulted in changes to teacher wages. Theoretically, a professional's pay is tied to the barriers to entry for that profession and, specifically, the difficulty of obtaining a professional license (Kleiner, 2006). Angrist and Guryan (2008) illustrate this point within the field of education: They find that implementing a mandatory testing component for teacher licensure was associated with a smaller supply of teachers and a higher teacher wage of 3%–5%. Another state policy that influences teacher pay is the rate at which states allow districts to merge. Taylor (2010) finds that school district mergers suppressed market competition as well as teacher salaries. Increasing competition for new teachers by increasing independence among districts is, therefore, predicted to increase the base pay rate for 88% of the teachers in Texas (Taylor, 2010).

The institution of teacher licensure has had an observable effect on the profession. When barriers to entry change, the supply and the demography of new teachers also change. This relationship suggests that some features of the teaching pool are sensitive to policies that alter barriers to entry. As detailed above, state policies that increase the difficulty of obtaining a teacher license result in a marked decrease in the total number of licensed teachers as well as in the diversity of entrants into the profession. Wages, finally, are also malleable to the number of teachers in the pool and the number of employers who compete for teachers in the labor force. According to market theory (Fama, 1970), as more teachers are licensed and the overall supply of teachers increases, each teacher's value in the market declines. We examine the effect of the Texas 2001 law change on the number of ALTs in Texas and how that number relates to the pay rate for new EC-6 teachers. Previous studies have concluded that implementing licensure tests restricted the supply of teachers, thereby increasing teacher pay. We investigate whether the lower salaries in Texas may be associated with falling barriers to entry and the increasing supply of ALTs. As alternative licensure provided a less costly and time-consuming path to classrooms, did the supply shift influence new teacher pay in the state?

Research Questions

Extant literature supports the idea that increasing the entry demands for teaching through such requirements as licensure exams decreases the teacher supply and increases teacher pay (e.g., Angrist & Guryan, 2008; Valenzuela, 2017). Applying Stigler's (1971) capture theory of regulation, professions use licensure as a barrier to entry for certain fields, thus raising the pay for everyone licensed within that field. This study examines an alternative proposition: the possibility that the 2001 easing of entry into the teaching profession in Texas resulted in reduced teacher pay. Specifically, we address the following research question:

> *Is the 2001 Texas policy, which reduced teacher licensure requirements and accelerated the production of alternatively certified teachers, associated with reductions in the starting salary of new teachers?*

Data and Sample

Variable Definitions

Data were obtained and merged from the Texas state longitudinal administrative data system and the National Center for Education Statistics Common Core of Data (National Center for Education Statistics, n.d.). The full data set includes approximately 1,282 districts with 15 years of observations at the district level. The number of new teachers hired by each district was calculated by using teacher-level data from approximately 1.5 million observations based on 786,724 unique teachers (defined below) from 2000 to 2015.

New Teacher Pay. The dependent variable, teacher pay, is the log of new EC-6 teacher base pay adjusted to 2015 dollars. *Base pay* is defined as all pay related to a teacher's main assignment, including hiring bonuses, but excluding any pay related to extra duties, such as coaching or driving a bus. We include hiring bonuses as part of salary because they are part of the guaranteed pay for the year, and hiring bonuses offered by a district are part of a hiring decision by a new hire. The outcome variable only measures changes to new teachers' salaries, and a *new teacher* is defined as a full-time teacher in a traditional or charter public school with 0 years of prior experience. In Texas, a right-to-work state, districts are more likely to focus on raising new teacher salaries than on rewarding tenure, which results in an overall flatter pay structure (Hoxby, 1996). Thus, we only included new teacher salaries because they are more sensitive to market changes of supply and unaffected by decreasing teacher tenure pay raises.

Teacher Licensure. Teacher licensure research includes a variety of ways to define teacher preparation paths because the paths are not always mutually exclusive (Guthery & Bailes, 2022). The following explains our definition of each variable as well as the exact specifications for measurement in this study. *Traditionally prepared teachers* are those who were trained in a university-based program with a field placement. Their preparation is inclusive of requirements for hours in reading, math, and special education instruction as well as a supervised teaching placement in a K–12 school

classroom. A teacher is counted as traditionally certified if their degree is standard and their program is classified as a traditional preparation program (university-based).

For ALTs, the state awards a standard licensure but identifies that teacher in the state database as having taken an alternative path to licensure. Examples of this path are online programs, community college programs, district-run programs, and university alternative programs. The state designates a teacher as alternatively certified when that person has completed an initial teacher-training program and passed the state tests that are used in Texas for licensure. Because traditional schools of education also run alternative programs, the state counts a teacher as alternatively certified if their preparation path is classified as alternative, even if their program code is traditional. We therefore define an ALT as one who has completed a teaching program classified by the state as an alternative licensure program. In the process of coding entrance paths, many teachers overlapped categories. Appendix A lists the priority order in which each entrant was assigned a single licensure path. Because we did not differentiate between for-profit alternative licensure programs and university licensure programs, it is not possible to compare the effect of alternative licenses issued by different types of educator preparation programs.

Data Descriptives

The average district in Texas has 256.4 teachers and hires about 20 novice teachers each year. The average annual district turnover rate for all teachers is 19.9%, meaning that teachers are retiring or transferring at the rate of almost one in five. The average district comprises 78.8% White teachers, and 36.9% of the teachers have fewer than 5 years of experience. Over the course of this study, the average district in Texas hired 31.6% of its novice teachers with an alternative licensure. We divided districts into quartiles based on the percentage of novice ALTs they hired relative to other districts. Districts in the highest quartile hired more than 50.2% of their new teachers with alternative licensure; by contrast, districts in the lowest quartile hired less than 10% of their novice teachers with alternative licensure. Table 1 illustrates the descriptives for all districts and the districts that are in the highest and lowest quartiles for hiring ALT novice teachers.

There is a statistically significant difference in the racial composition of districts that were hiring the largest and smallest percentages of ALTs as their new teachers. Districts in the top quartile (hiring the most novice ALTs) were composed of 42.5% White students, while districts in the lowest quartile of hiring ALTs were composed of 60.8% White students (sig. $p < .01$***). Additionally, districts that hired a majority of new ALTs also hired 29.9%*** more beginning teachers than districts that hired the least number of ALTs. Further, districts that were hiring in the highest quartile of ALTs were retaining fewer teachers than districts that were hiring the smallest number of ALTs. Districts in the lowest quartile for hiring ALTs tended to have characteristics associated with better working conditions (e.g., smaller schools or less teacher turnover), while districts in the highest quartile tended to have characteristics associated with less desirable working conditions (e.g., larger schools or more teacher turnover). The data show that districts that were hiring the most ALTs were larger than average, had more diverse staff and students, and had higher average annual teacher turnover, and a third of their teaching corps were novice teachers.

Methods

This study tests the extent to which reducing barriers to a teaching license is associated with changes to new teacher pay. To do this, we examined pay in the year preceding the Texas policy change as well as the 14 years thereafter. Although the official policy was approved in 2001, new educator preparation programs took several years to organize, recruit students, and produce new teachers. Therefore, there is not one discrete point of discontinuity; instead, we see observable change over time as alternative licenses gained popularity from a small percentage of annual licenses to the majority of new teachers. Due to the longitudinal panel structure of the data, each observation is dependent upon an observation in a previous time period, which violates a key assumption of independence in Ordinary Least Squares regression (Allison, 2009). Thus, we chose to use a first difference regression model to account for unobserved sources of heterogeneity among districts and the likely dependence of errors on the prior time period. Although we do control for time invariant predictors, such as geographic locale, in our models, estimates cannot be generated for invariant observations within districts across years.

Models Defined

Using the first difference regression model, we estimated the relationship between the percentage of new teachers hired that were alternatively licensed and new teacher pay. Specifically, we estimated the change in the log of new teacher pay measured at the district level from one year to the next while controlling for differences in districts and including other predictor variables by constructing the following model:

$$\text{Model 1}: \Delta Y_{it} = -Y_{it} - Y_{it-1} = \beta_{1:26}\left(\chi_{it-}\chi_{i(t-1)}\right) + \beta_{27:30}(\upsilon_i) + \varepsilon_{it} - \varepsilon_{it-1}$$
$$\text{for } i = 1:N \text{ and } t = 1:15$$

TABLE 1
District Descriptives

	All district model		Districts high ALT		Districts low ALT	
	Mean	*SD*	Mean	*SD*	Mean	SD
Number of campuses	6.60	*15.49*	9.78	*27.80*	2.92	*4.31*
Total teachers	256.41	*745.92*	404.32	*1,242.31*	69.94	*170.85*
N beginning teachers	20.93	*60.66*	34.46	*103.75*	4.56	*11.17*
Teacher turnover rate	19.89	*14.13*	21.55	*14.03*	14.38	*15.5*
% Black teachers	7.19	*17.47*	9.76	*18.97*	5.00	*15.44*
% Hispanic teachers	12.62	*21.64*	19.44	*27.99*	8.20	*17.17*
% Caucasian teachers	78.75	*27.53*	68.88	*31.97*	85.86	*23.11*
% Teacher < 5 yrs exp	36.89	*19.57*	42.22	*21.13*	33.13	*18.5*
% Alt cert new teachers	31.56	*25.63*	71.65	*17.18*	0.77	*2.4*
Dollars per student	12,146.02	9,470.94	12,033.23	*4,835.16*	12,740.83	*13,442.80*
% Black students	11.30	18.42	12.93	*20.05*	8.92	*16.53*
% Hispanic students	34.86	28.2	42.41	*31.81*	29.04	*25.5*
% Caucasian students	51.97	29.82	42.45	*32.54*	60.79	*27.12*

Note. ALT = alternatively licensed teacher; SD = standard deviation.

The outcome variable ΔY_{it} is change in the log of new EC-6 teacher pay for district *i* in year *t* minus the previous year *t*-1 (in 2015 real U.S. dollars). $\beta_{1:26}$ are the estimates generated from the years and a host of district-level time-varying controls, including the percentage of all new teachers who were novice, the number of students, per-pupil expenditure, teacher turnover rate, the racial composition of students and teachers, the percentage of students in special education, and the percentage of students eligible for free and reduced lunch. $\beta_{27:30}$ is added as a time invariant control for the urbanicity of each district, but no estimate will be generated because there is no difference over time. $\Delta\ \varepsilon_{it}$ represents the error term for district *i* in time *t* minus the previous year.

To test whether there was a differential effect on new teacher pay based on the rate at which districts hired ALTs, we subsetted districts into the highest and lowest quartiles of rates at which they were hiring ALTs. Districts that hired 50% or more of new teachers alternatively licensed each year were in the highest quartile of hiring rates, and we classified them as High ALT districts. Model 2 (m2) estimates the effect on new teacher pay for districts that hired at least 50% of their new teachers with alternative licensure and is specified the same as m1, but only composed of High ALT districts. Model 3 (m3) estimates the effect on new teacher pay for districts in the lowest quartile of hiring ALTs. We termed districts that hired less than 20% of their new teachers with alternative licensure as Low ALT districts.

Results

The first model (m1) tests the change in new teacher pay in real dollars for all districts over time (Table 2). The results from m1 show that, controlling for changes in district demographics over time, the average district pay for new EC-6 teachers declined by 2%–13% within 15 years after the policy change (Full Model Results Appendix B). To isolate the association between the hiring of ALTs and decreases in new teacher pay, we separated the districts into the highest and lowest quartiles based on the rate at which they hired ALTs. We found a noticeable separation in new teacher pay over time between districts that were hiring 50% or more of their new teachers with alternative licenses and those districts hiring less than 10% of their new teachers with alternative licenses. Table 2 illustrates the change in new teacher pay over time between High ALT districts (m2) and Low ALT districts (m3).

For Low ALT districts (m3), pay was stagnant in real dollars, while other districts lowered pay in real dollars over time (m2). In 2005, High ALT districts paid teachers 9% less than they did in 2000. By contrast, Low ALT districts paid teachers 4% less in 2005 than they did in 2000. While controlling for other demographic variables in the district, an increasing percentage of African American and Hispanic teachers was associated with further decreases in real pay for new teachers over time. This small but significant association warrants further inquiry into why new teacher pay was falling over time in districts with higher percentages of African American and Hispanic teachers (full model results are available in Appendix B).

As the policy had time to diffuse and take full effect, there were differential effects for districts, depending upon the rate of ALT hires. Figure 1 shows the changes in EC-6 new teacher pay over time in all districts (m1), High ALT districts (m2), and Low ALT districts (m3).

Figure 1 illustrates how hiring varying levels of ALTs had a differential effect on district pay by comparing the main

TABLE 2
Change in New Teacher Pay Over Time for EC-6 New Teachers

	(m1) All districts			(m2) New teachers > 50% alt cert			(m3) New teachers < 20% alt cert		
Covariates	B	exp(B)	*SE*	B	exp(B)	*SE*	B	exp(B)	*SE*
2001	–0.02***	0.985	*0.005*	–0.03*	0.97	*0.02*	0.003	1.00	*0.01*
2002	–0.02***	0.978	*0.006*	–0.02	0.98	*0.02*	–0.01	0.99	*0.01*
2003	–0.03***	0.969	*0.007*	–0.04	0.96	*0.02*	0.002	1.00	*0.01*
2004	–0.06***	0.945	*0.010*	–0.07	0.93	*0.02*	–0.02	0.98	*0.02*
2005	–0.09***	0.917	*0.012*	–0.09***	0.91	*0.02*	–0.04**	0.96	*0.02*
2006	–0.12***	0.899	*0.015*	–0.11***	0.90	*0.02*	–0.03*	0.97	*0.02*
2007	–0.04**	0.961	*0.018*	–0.05**	0.95	*0.02*	0.04	1.04	*0.03*
2008	–0.06***	0.946	*0.021*	–0.08***	0.92	*0.02*	0.01	1.01	*0.03*
2009	–0.03	0.968	*0.023*	–0.04*	0.96	*0.03*	0.03	1.03	*0.03*
2010	–0.03	0.969	*0.025*	–0.05*	0.95	*0.03*	0.05	1.05	*0.04*
2011	–0.6**	0.938	*0.031*	–0.08***	0.92	*0.03*	0.01	1.01	*0.03*
2012	–0.11***	0.895	*0.036*	–0.11***	0.90	*0.03*	0.03	1.03	*0.02*
2013	–0.13***	0.882	*0.035*	–0.14***	0.87	*0.03*	–0.01	0.99	*0.03*
2014	–0.13***	0.882	*0.037*	–0.12***	0.89	*0.03*	0.03	1.03	*0.03*
Observations	11,256			2,086			1,755		

Note. *$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

effects on new teacher pay from m1, m2, and m3. In the year prior to policy implementation, the average district offered higher pay, which fell over time. Conversely, Low ALT districts initially offered lower wages, but increased pay over time. The districts that sought and hired a greater proportion of ALTs offered higher teacher wages in the year prior to the policy change (2000). However, as the rate of hiring ALTs increased in these districts, the pay models reversed, and they offered significantly lower wages (Figure 1).

Limitations

As teacher licensure options proliferated in Texas, so, too, did the ways that certified teachers were categorized in Texas administrative data sets. Thus, the defined licensure pathways in this study's data were not always mutually exclusive, and that feature of the data proved to be a limitation of the study. It was possible for an entrant to be classified as traditionally prepared and, in the same year, classified as alternatively certified by exam. Although we detail in Appendix A the process by which we categorized teachers, there were not clear lines in new teacher licensure. Another limitation is that the definition of pay that we employ in this study does not include any additional benefits, such as insurance or retirement. It is possible that, when excluding these benefits, the salary does not adequately capture total teacher compensation.

Discussion and Implications

This study examines the association between an increased supply of ALTs and attenuated pay of novice teachers—specifically, EC-6 general education teachers. Easing licensure requirements to rapidly produce more teachers is associated with at least one possible unintended consequence: decreasing new teacher pay. We find that the proliferation of alternative licensure programs drives down the pay of some novice teachers. Our findings contribute to the growing number of studies that associate ease of entry to the teaching profession with changes in teacher pay (Angrist & Guryan, 2008; Kleiner, 2000). Policies that aim to increase the supply of teachers may also lower teacher pay, thereby perpetuating the cycle of teacher shortages. In this section, we discuss these findings as well as their implications for research, policy, and practice.

Reductions in Teacher Pay and Quality

Our study focuses on changes to new teacher pay over time. Because there are not developed quality indicators, such as ratings or test scores, for novice teachers before they are hired, we are not able to assess whether lower new teacher pay results in lower candidate quality. However, previous research on labor unions and pay does link higher barriers to entry with higher-quality candidates (Barrett et al., 2022; Jabbar et al., 2020).

An extensive review of teacher preparation and student achievement concludes that reduced barriers to entry do not result in the same quality of entrants (Darling-Hammond, 2000). The issues of certifying and licensing teachers are of critical importance because low-quality practitioners present significant financial and relational costs in terms of human resource expenses and poor job performance (Ballou & Podgursky, 2000). Previous research finds that the quality of

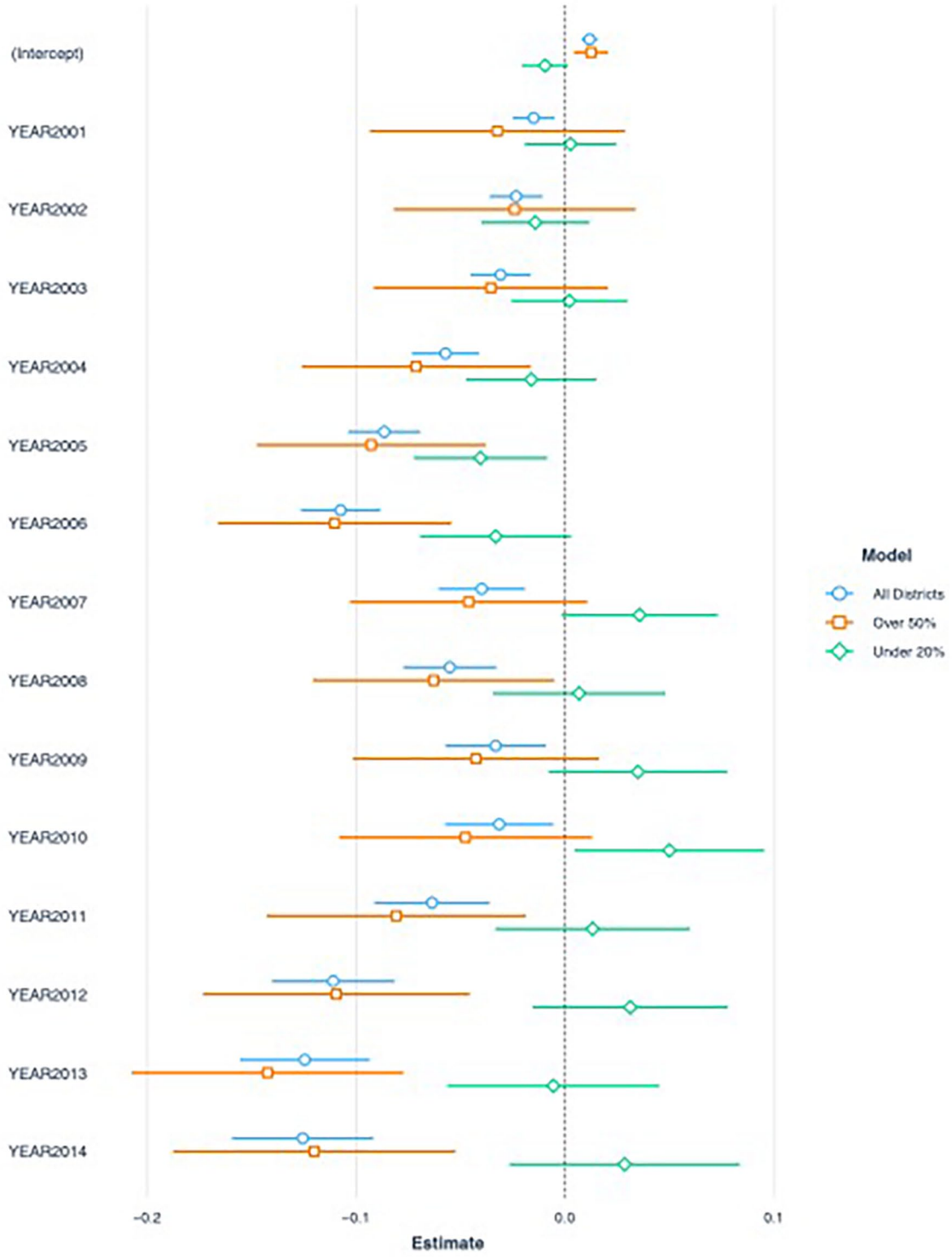

FIGURE 1. *Model estimates for percentage change to new teacher pay.*

a teacher preparation program does matter (e.g., Darling-Hammond, 2006). By reducing the barrier to entry in the licensed teaching profession, according to the theory of protected occupations, the shift is likely detrimental to the quality of the field.

The U.S. Department of Education continues to support alternative licensure programs to fill ongoing teacher shortages. As such, the degree to which changes to the difficulty of teacher licensing act as a lever for teacher pay is of increasing importance. If the 2001 policy change in Texas

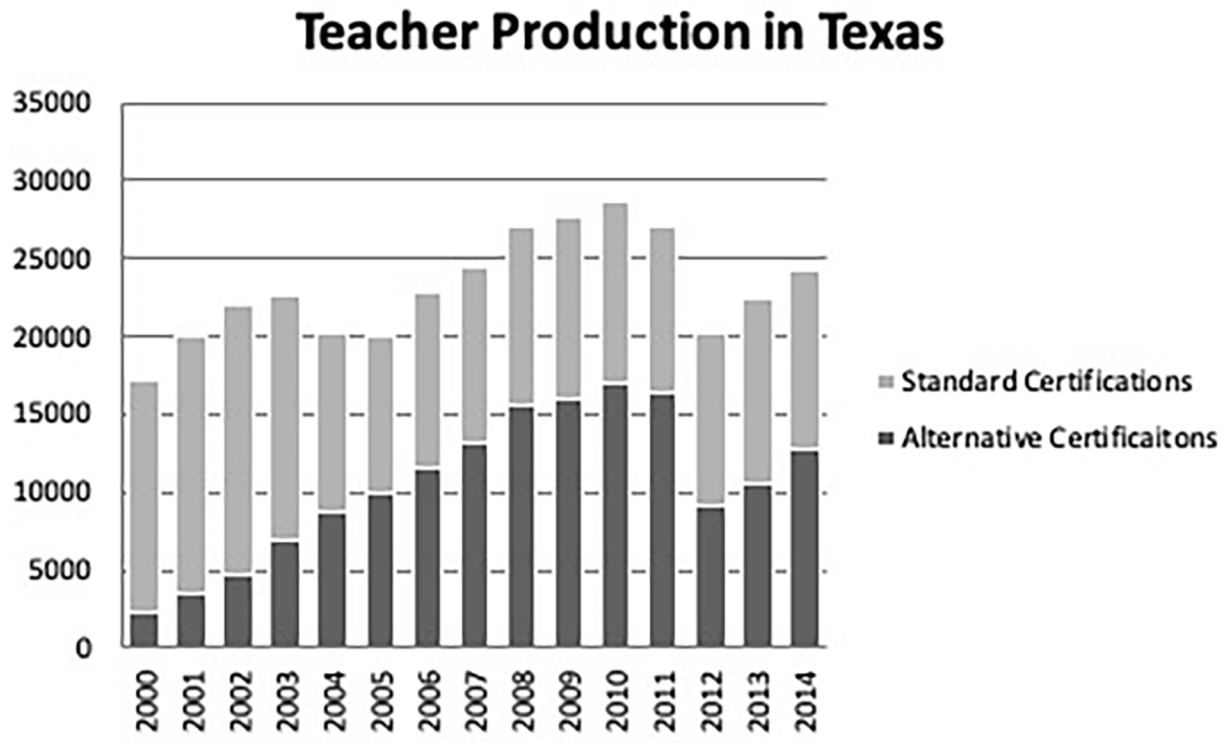

FIGURE 2. *Teacher production in Texas.*

resulted in teacher salaries that were too low to attract traditionally licensed candidates and the teacher pool was dominated by ALTs, then the quality of ALTs would be crucial to school improvement efforts. A further concern is that traditionally certified teachers may be dissuaded from remaining in the profession or advancing their instructional practice because fewer incentives are available to them in light of the competition from ALTs. A person in a protected occupation—that is, a profession bounded by rigorous credentialing—is incentivized to invest in their own professional development because they will not face competition from low-quality substitutes (Kleiner, 2000). Federal and state agencies, then, must attend to the quality of ALTs to ensure that those teachers possess the capacity to support improvement efforts in their typically challenging placement schools.

This study constitutes an important next step in analyzing the composition of new teacher pipelines. This study raises several important questions that merit further attention. We find that districts with higher percentages of teachers of color were also associated with lower new teacher pay over time. This finding warrants further investigation and likely has implications for the ways in which we understand teacher sorting to districts based on their preparation pathway. We encourage researchers to further investigate whether there are systemic differences in districts composed of more teachers of color and lower new teacher pay. As indicated above, teacher quality as a result of preparation pathway is an ongoing conversation. If there is an observable difference in the quality of teachers from different types of preparation programs, the rate at which the highest and lowest quality teachers are being produced is significant. Another topic for future research may be examining the low-performing K–12 districts that certify their own teachers in schools. How likely is it, for example, that a persistently failing school can train effective teachers?

Changes to Teacher Licensure Pipelines

Over the course of the decade following the 2001 policy change, the number of ALTs who were credentialed has increased fivefold in Texas. In 2000, the year prior to the policy change, 88 programs provided initial teacher licensure in Texas. In the subsequent decade, the number of programs training and credentialing new teachers almost doubled. The number of programs peaked in 2010–2011, when 161 separate programs licensed teachers in the state of Texas (Texas Education Agency, n.d.). In 2005, alternative licensure became the preferred preparation route for the majority of Texas teachers (Figure 2). Thus, deregulating program requirements allowed innovation in types of new teacher programs, as evidenced by the fact that for-profits, online programs, community colleges, traditional schools of education, and K–12 school districts all launched teacher licensing programs. This policy change increased the number of teacher preparation programs and, thus, the state's capacity to license new teachers.

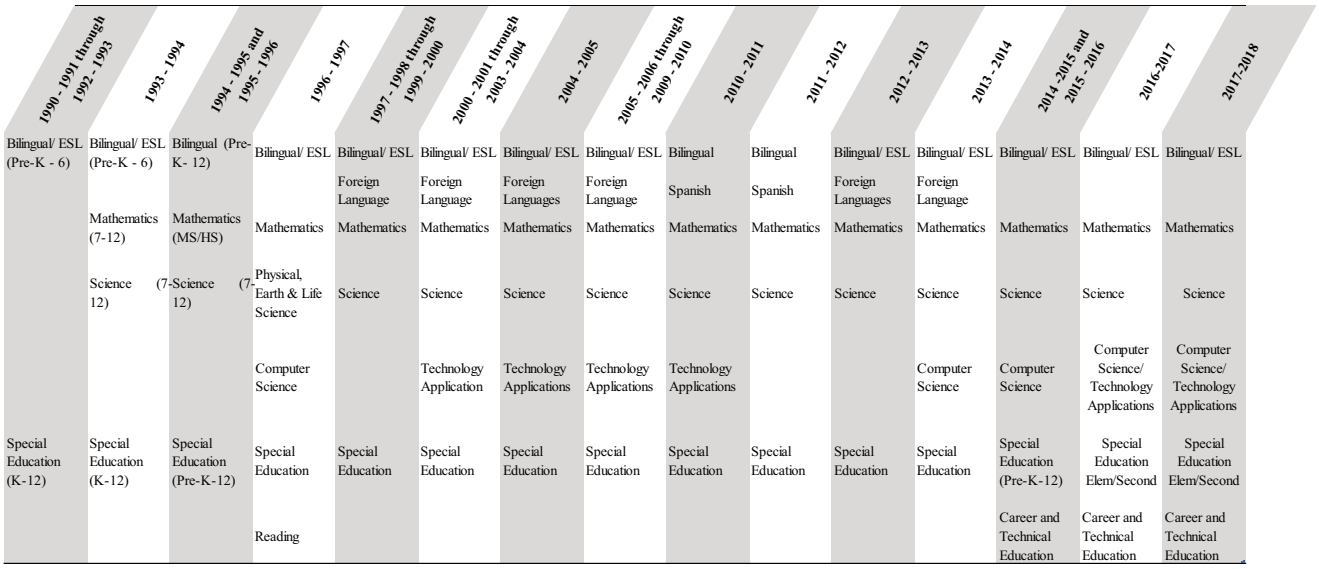

FIGURE 3. *Critical shortages.*

We can be certain that as the number of teacher preparation programs increased in Texas, that proliferation was not equally distributed between standard and alternative licensure pathways. The 2001 policy allowed for innovation in alternative licensure, but maintained requirements for a standard licensure. As a result, the dramatic increase in programs occurred only where the regulations were lifted. Our data do not allow us to distinguish between candidates who chose alternative pathways in lieu of traditional ones or the ways in which the proliferation of alternative licensure precluded candidates from entering traditional programs—or from entering the teaching profession altogether. Our findings do show that the 2001 policy and the resultant changes to teacher licensure fundamentally altered how the average novice teacher in Texas was trained and certified (Figure 2). At present, the modal novice teacher in Texas is alternatively certified.

As depicted in Figure 2, the total number of initial teacher licenses has increased when compared to the amount produced annually prior to the policy change in 2001. The number of teachers licensed by traditional programs did not hold constant, regardless of the number of teachers entering through alternative licensure. The data on teacher preparation reveal that although the percentage of new teachers who were alternatively licensed increased, the licensing by traditional programs simultaneously decreased. Although introducing a large number of new teacher licensure programs did result in a net gain to the number of new licenses, the increase in new teacher preparation volume was not wholly in addition to the standard programs that already existed.

The 2001 policy was designed to encourage the rapid production of new teachers outside traditional schools of education to meet district shortage needs. Texas implemented the 2001 policy to address its persistent teacher shortages. Teacher shortage is self-reported by each state's secretary of education (or equivalent office) and chronicles teacher shortage areas geographically and by subject. Unfortunately, the ways the shortage areas are reported make it impossible to measure the severity of the shortage or to quantify change in shortage areas over time. However, it is possible to identify patterns of continuous teacher shortage. Figure 3 is a visual representation of 20 years of Texas reports listing shortage areas for teachers.

Figure 3 illustrates that although naming conventions have changed slightly, mathematics, science, technology, special education, and bilingual teachers have been and continue to be in short supply. The annual report on teacher shortages in Texas is static over time, despite the increase in teachers alternatively prepared since 2001 (Figure 3).

Incentivizing Traditional Teacher Licensure With Pay

One way to compensate traditionally certified teachers for their lengthier preparation in teacher training would be to pay traditionally certified teachers more than ALTs. However, in 2008, *Renee v. Spellings* (later *Renee v. Duncan*) codified alternative licensure in two notable ways. First, it officially recognized traditionally certified teachers and ALTs as highly qualified (Schuster, 2012). This effectively made the two pathways indistinguishable in terms of qualification because "highly qualified" then applied to traditionally certified teachers and ALTs. Thus, teachers currently have no financial incentive to invest their time or finances into a traditional preparation program because the "highly qualified" distinction now applies to alternative preparation pathways—some of which are faster and less expensive (Fenstermacher, 1990).

Second, the legislative change codified equal recognition of the two credentialing pathways and thereby standardized

a single salary schedule for all teachers, regardless of licensure type. This precludes states, districts, or schools from financially incentivizing traditional licensure. *Renee v. Duncan* continues to shape the ways in which traditionally and alternatively certified teachers are promoted and paid. Specifically, this case law eliminates some incentives in terms of pay and prestige that were previously associated only with traditional licensure.

This study identifies a link between the increased production of ALTs in Texas and reduced pay for new EC-6 teachers. As the quantity of new teachers surged, the valuation of each individual teacher fell, and new teachers' salaries decreased on average. This association has the potential to instigate a vicious cycle of turnover: Teachers may exit the classroom because reduced wages make the profession unsustainable, and districts must scramble to recruit each successive round of rapidly certified teacher replacements, offering lower salaries. Focusing only on the point of teacher production has not alleviated the state's shortage of teachers. Texas districts may, in this regard, provide a useful illustration to other states that aim to fill shortages solely through increased access to alternative teacher licensure. As the United States struggles nationwide to fill vacant teaching positions, we must consider the possibility that expanding alternative licensure programs alone may not be an efficient solution to mitigating teacher shortages.

Appendix A

"Out of State" is calculated first because it is the most distinct category. A separate decision rule was also used to reverse the order of alternative and traditionally certified teachers to check the sensitivity to categorization order. The "Teacher Aide" category is for an aide assigned with the job code of a teacher and assigned to a class in a district. A teacher aide is categorized after the training programs so that the highest certification program is Aide and does not count people who worked as an aide and then trained to be a teacher in a program. "No Program" is categorized last because a majority of teachers have added a credential by exam at some point in their career, so if they have any other path, it is not the most indicative of how they were trained. This path includes teachers who were certified by exam with no preparation program or given credit through work experience. Teachers certified through the Jamison Bill (which was discontinued in 2013–2014) are included here. If a teacher has classroom assignment in a district but was not listed anywhere in the certification database for any year, they were designated as "No Data."

The *alternative certification* category is used first because it is less likely to be applied to a certification outside the conventional meaning. The label *traditional* is used more liberally than *alternative certification* when Texas Education Agency assigns a path to their certification. For example, Visiting International Teachers are typically assigned the label *traditional* in the Texas Education Agency database as their preparation path, even though the label does not necessarily mean a traditional school of education.

APPENDIX A
New Teacher Preparation Path Decision

Out of State	If a teacher ever was OOS, regardless of appearing in any other category
Alternative Prep	If a teacher was not OOS and was Alternative Prep
Traditional Prep	If a teacher was not OOS, not Alternative Prep, and was Traditional Prep
Educational Aide	If a teacher was not OOS, not Traditional Prep, not Alternative Prep and was an Educational Aide
No Program	If a teacher was not OOS, not Traditional Prep, not Alternative Prep, not an Educational Aide, anyone else in the certification data with exam only
No Data	If a teacher was not located at all in the teacher certification data

APPENDIX B
Full Model Results for Outcome Variable Log of New Teacher Pay

	(m1) All districts			(m2) New teachers > 50% alt cert			(m3) New teachers < 20% alt cert		
Covariates	B	exp(B)	*SE*	B	exp(B)	*SE*	B	exp(B)	*SE*
2001	–0.02***	0.99	*0.01*	–0.03*	0.97	*0.02*	0.003	1.00	*0.01*
2002	–0.02***	0.98	*0.01*	–0.02	0.98	*0.02*	–0.01	0.99	*0.01*
2003	–0.03***	0.97	*0.01*	–0.04	0.96	*0.02*	0.002	1.00	*0.01*
2004	–0.06***	0.95	*0.01*	–0.07	0.93	*0.02*	–0.02	0.98	*0.02*
2005	–0.09***	0.92	*0.01*	–0.09***	0.91	*0.02*	–0.04**	0.96	*0.02*
2006	–0.12***	0.90	*0.02*	–0.11***	0.90	*0.02*	–0.03*	0.97	*0.02*
2007	–0.04**	0.96	*0.02*	–0.05**	0.95	*0.02*	0.04	1.04	*0.03*
2008	–0.06***	0.95	*0.02*	–0.08***	0.92	*0.02*	0.01	1.01	*0.03*
2009	–0.03	0.97	*0.02*	–0.04*	0.96	*0.03*	0.03	1.03	*0.03*
2010	–0.03	0.97	*0.03*	–0.05*	0.95	*0.03*	0.05	1.05	*0.04*

(continued)

APPENDIX B. (CONTINUED)

	(m1) All districts			(m2) New teachers > 50% alt cert			(m3) New teachers < 20% alt cert		
Covariates	B	exp(B)	*SE*	B	exp(B)	*SE*	B	exp(B)	*SE*
2011	–0.6**	0.94	*0.03*	–0.08***	0.92	*0.03*	0.01	1.01	*0.03*
2012	–0.11***	0.90	*0.04*	–0.11***	0.90	*0.03*	0.03	1.03	*0.02*
2013	–0.13***	0.88	*0.04*	–0.14***	0.87	*0.03*	–0.01	0.99	*0.03*
2014	–0.13***	0.88	*0.04*	–0.12***	0.89	*0.03*	0.03	1.03	*0.03*
% Alt cert	–0.0002***	0.99	*0.0001*	–0.0003*	0.99	*0.00*	0.001	1.00	*0.001*
% New teachers	0.002***	1.00	*0.0001*	–0.0004	0.99	*0.00*	0.002***	1.00	*0.0003*
Num students	0.00	1.00	*0.00*	0.00	1.00	*0.00*	0.00***	1.00	*0.000*
Rev per student	0.0004	1.00	*0.0001*	0.0003	1.00	*0.001*	–0.001	0.99	*0.001*
Teacher turnover rate	0.0001	1.00	*0.0001*	–0.0004	0.99	*0.0003*	–0.0005	0.99	*0.0003*
% AA students	0.0001	1.00	*0.001*	0.003***	0.99	*0.001*	0.01***	1.01	*0.001*
% Hispanic students	–0.0002	0.99	*0.0004*	0.004***	1.00	*-0.001*	–0.001	0.99	*0.001*
% AA teachers	–0.001**	0.99	*0.0004*	0.001	1.00	*0.002*	0.0003	1.00	*0.001*
% Hispanic teachers	–0.002***	0.99	*0.0004*	0.001	1.00	*0.001*	0.001	1.00	*0.001*
% Bilingual students	0.002***	1.00	*0.001*	0.001	1.00	*0.002*	0.001	1.00	*0.002*
% Special ed students	0.0003	1.00	*0.001*	–0.003	0.99	*0.002*	0.001	1.00	*0.002*
% Econ disadvantaged	0	1.00	*0.0002*	–0.001	0.99	*0.001*	–0.0005	0.99	*0.001*
Constant	0.012***	1.01	*0.003*	0.01***	1.01	*0.00*	–0.01*	0.99	*0.01*
Observations	11,256			2,086			1,755		

Note. *$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

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Open Practices Statement

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