A Multi-Level Analysis of Charter School Development:
Isolating State and Local Effects on the Prevalence of District-Operated Charters

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Purpose

- This study examines the state and district-level factors that affect the prevalence of public charter schools in school districts across the United States. We focus on charter schools authorized by the local school district.

Multilevel Analysis

- State-Level Predictors
  - Partisanship of the governor and state legislature, population size, economy, education quality (8th grade NAEP math score), private school enrollment
  - Characteristics of the state charter laws
- District-Level Variables
  - Dependent Variables:
    - Presence of charter schools and number of charter schools
  - Independent Variables:
    - Percent of white, non-Hispanic students; number of students within the district; proportion of students who are eligible for Free/Reduced Lunch Programs; per-pupil spending; collective bargaining measure; urbanicity; and the proportion of district income from state sources

Nuanced Understanding of Charter Laws

- Employ Witte, Shober and Manna's (2003) measures of charter law strength
- Account for the variance between and within states' charter school laws

Role of Teacher Unions

- Improved measure of unionization
- Relationship to charter schooling
- If school choice is a policy innovation, do unions appear to promote or enhance its development?

Data

- Schools and Staffing Survey (1999-2000)
  - Unionization Measure
  - District-Level Characteristics
- Witte, Shober and Manna (2003)
  - 5 dimensions of charter law strength
    - Authorization and application, local oversight, fiscal support, employee issues, and accountability
- State-level characteristics from various sources

Models

- Charter Operation

  π_i = Probability that district i operates charters

  $\pi_i = 1/ (1 + e^{(-X\beta)})$

  X_i contains district-level (e.g. size, ppe, % minority, union strength) variables *and* state-level variables
- Partitioning Variance

$$P(Y_{ij} = 1) = \beta_{0j} + \Sigma_q{}^{Q}\beta_{qj} X_{qij} + r_{ij}$$

$$\beta_{0j} = \gamma_{00} + \Sigma_s{}^{S0} \gamma_{0s} W_{sj} + \mu_0$$

$$\beta_{qj} = \gamma_{q0} + \Sigma_s{}^{Sq} \gamma_{qs} W_{sj} + \mu_{qj} \quad \text{for district i in state j}$$

Results

Predicting Charter School Operation

	With Law	All States	With Law	All States
	Estimate (s.e.)	*Estimate (s.e.)*	*Estimate (s.e.)*	*Estimate (s.e.)*
WHITE_PERC	-0.79** (0.28)	-1.02*** (0.26)	-0.67** (0.31)	-0.67** (0.30)
K12ENRL	0.05*** (0.00)	0.04*** (0.00)	0.04*** (0.005)	0.04*** (0.004)
COLLBAR	0.85*** (0.15)	0.72*** (0.15)	0.28 (0.22)	0.15 (0.21)
MIDCITY	-0.26 (0.18)	-0.21 (0.17)	-0.27+ (0.18)	-0.28+ (0.18)
RURAL	-0.33+ (0.21)	-0.50*** (0.20)	-0.37* (0.21)	-0.39* (0.21)
STREV	1.71*** (0.41)	1.83*** (0.43)	0.47 (0.45)	0.45 (0.44)
AUTH			0.81*** (0.16)	0.75*** (0.16)
PUBACCT			-0.69*** (0.08)	-0.69*** (0.08)
DEMLEG			0.45** (0.18)	0.41** (0.18)
NAEP03			0.05** (0.02)	0.05*** (0.02)
STATEPOP			0.0005*** (0.000)	0.0005*** (0.000)
POVRATE			-6.89** (3.50)	-6.03* (3.41)
NOLAW				-2.16** (1.06)
Intercept		-3.15*** (0.43)	-17.78*** (5.12)	-15.14*** (5.03)
LR Chi Square	325.72***	347.46***	454.71***	556.22***
N	3621	4520	3621	4520

Estimates are logit coefficients. ***p<0.01, **p<0.05, *p<0.10, +p<0.15; two-tailed.

Hierarchical Predictions of District Charter Presence

	Model 1	Model 2	Model 3
Fixed Effects	Estimate (s.e)	Estimate (s.e.)	Estimate (s.e.)
Level-1			
Intercept (β_0)	-3.02 (0.61)***		
WHITE (β_1)	-0.06 (0.66)	-0.09 (0.69)	-1.40 (0.39)***
MIDCITY (β_2)	-0.55 (0.20)***	-0.54 (0.20)***	-0.36 (0.20)*
RURAL (β_3)	-0.75 (0.22)***	-0.76 (0.22)***	-0.64 (0.23)***
COLLBAR (β_4)	0.48 (0.20)**	0.45 (0.20)**	0.58 (0.24)**
K12ENRL (β_5)	0.04 (0.01)***	0.04 (0.01)***	0.04 (0.01)***
PPSPEND (β_6)	-0.03 (0.02)	-0.03 (0.03)	-0.04 (0.02)+
FRLELIG (β_7)	0.12 (0.23)	0.12 (0.23)	-0.05 (0.25)
STREV (β_8)	0.37 (0.58)	0.31 (0.58)	0.18 (0.61)
d.f.	3607	3607	3607
Level-2			
Intercept (γ_{00})		-3.04 (1.71)*	-1.20 (1.44)
AUTH (γ_{01})		0.75 (0.31)**	0.43 (0.24)*
PUBACCT (γ_{02})		-0.65 (0.20)***	-0.49 (0.21)**
DEMLEG (γ_{03})		0.10 (0.51)	0.03 (0.43)
POVRATE (γ_{04})		0.79 (7.05)	-3.76 (6.10)
d.f.		33	33^

Random Effects	Var. Component	Var. Component	Var. Component
μ_{0j}	2.23***	1.97***	1.14***
μ_{1j}			4.21***
r_{ij}	0.73	0.74	0.70

Variance Decomposition (No Predictors)

	s.d.	Var. Component	d.f.
μ_{0j}	1.46	2.12***	37
r_{ij}	0.90	0.81	

**p<0.01, **p<0.05, *p<0.10, +p<0.15; two-tailed (chi-square for variance components) ^37 d.f. for estimation of u1

Conclusions

- Importance of state-level factors
  - We find that the most important predictors of the probability that school districts operate charter schools are characteristics of the states within which the districts are located.
- Charter law strength is crucial to charter school formation.
  - The nature of state charter laws is perhaps the key predictor of charter presence, as are indicators such as the state's size and poverty rate.
  - Recognizing the variation within charter school laws is crucial to understanding charter school growth
- District demographics
  - At the district level, the size of the student population and the percentage of white students in the student body appear to influence the presence or absence of charter schools.
  - The prevalence of charter schools in urban school districts is evident.
- A teacher union effect?
  - In our most advanced models, teacher unionization also significantly predict district's charter operation.
  - Improved measures of teacher unionization allows for better understanding of the influence of teacher unions.

Future Directions

- Longitudinal data
  - More recent data that tracks the growth of charter schooling over time is critical
  - Analyze the effects of changes to charter school laws
- Black box?
  - A better understanding of the causal process is needed