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State involvement in limiting textbook choice by school districts

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Abstract Who gets to decide what textbooks are used in America's public school classrooms varies by state. States can let each school district decide, provide standards that must be followed and make available an incomplete listing of books meeting those standards, or allow schools to choose books only from a list provided by the state. I present a model that provides an explanation for state limits on textbook selection by school districts. I examine the roles played by decision making costs, effectiveness of voters, religious composition, power of teachers, and propensity of state governments to interfere with or to help districts in textbook selection policies at the state level. There has been virtually no research on this topic. My findings corroborate the extant literature that addresses interference by state governments in local affairs and extend the morality politics literature by finding a strong link between religious fundamentalism and state-level policies. I also find that state book lists are less likely (1) in more educated states, where voters are better able to select the most appropriate textbook, (2) in states with smaller school districts, where voters are more involved in the schools, and (3) in states with stronger teacher unions, giving teachers more power in textbook selection.

Keywords Textbook · Government · Bureaucracy · Fundamentalist · Educational attainment

JEL Classification D72 · H70 · H75 · I28

1 Introduction

In the recent past, several states that require textbook selection at the state level have been in the spotlight for controversies regarding what they choose to include and exclude from their book lists. Most recently, attention was drawn to Texas where policymakers revised

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the state's curriculum in ways that question the separation of church and state doctrine and downplay the influence of figures such as Thomas Jefferson (Strauss 2010). Some conservatives dislike Jefferson because he advocated separation between church and state, while some liberals dislike him because he owned slaves.

The teachings of evolution in America's biology classes top the list of controversial school subjects nowadays. For scientists, evolution constitutes an important building block necessary for the understanding of modern biology, while for some Christians it constitutes a direct attack on their beliefs. Politicians and school board members often make headlines over their stances, comments and actions regarding evolution and creationism. In Florida, for instance, an intense debate over teaching evolution versus intelligent design and other theories culminated in the adoption of new state standards in 2008 explicitly requiring that Charles Darwin's theory of evolution be taught in the public schools. This requirement was so controversial that state legislators took actions attempting to undermine it (Postal 2011). In March 2011, Florida Senator Steve Wise sponsored the most recent attempt, a bill demanding "critical analysis of the scientific theory of evolution" (SB 1854 (2011)). The bill immediately sparked the interest of media outlets, and another round of fights between both sides erupted. Specifically, scientific groups saw it as an attack on the teaching of evolution in schools. The bill died three months after it was filed, but based on legislative actions over the past four years, a similar legislative proposal should be expected to resurface soon.

Who gets to decide what books are used in America's public school classrooms varies by state. States can (1) let each school district decide, (2) provide standards that must be followed and make available an incomplete listing of books meeting those standards (allowing petitioning of waivers for the use of other textbooks), or (3) allow schools to choose books only from a list provided by the state. Textbook adoption policies have a long history in the United States. Lists of acceptable textbooks arose because former Confederate states were worried about the way Northern textbook publishers would portray their history. Southern states established textbook selection policies to make sure anti-Confederate-leaning history was not taught in their schools. For years, different textbooks were published for the Northern and Southern states (Finn and Ravitch 2004). As noted by Finn and Ravitch (2004), for a very long time Southern textbooks were, for example, able to refer to the Civil War as "the War for Southern Independence" thanks, in large part, to these textbook adoption policies.

Selecting good textbooks is important for student success. The National Center for Education Statistics considers this an important enough topic to be included in its Digest of Education Statistics. In a study relating to Brazilian and Indian educational production functions, Pritchett and Filmer (1999) found that increases in test scores per dollar spent on learning materials, including textbooks, were about 19 times greater than those from increases in teacher salaries (Pritchett and Filmer 1999 quoted in Boissiere 2004).¹ According to Stream (2008), 80 % to 90 % of classroom and homework assignments in American schools are textbook-driven. Furthermore, substantial taxpayer dollars—roughly \$4.3 billion—are spent in the textbook market each year (Finn and Ravitch 2004). This paper provides an explanation for the adoption of state limits on textbook selection and for district decisions regarding the use of textbook list waivers.

Would a commission at the state level be more effective in knowing what textbooks the children of a remote rural district should use or would teachers and people familiar with the background of the students do a better job at choosing school materials? It is important to

¹There are very few studies examining the relationship between textbook use and school performance for developed countries. Other inputs, such as instructor characteristics and class size, are studied more widely and expected to have stronger impacts on test scores.

understand what characterizes states that choose between these options. Specifically, why is it that certain states have decided to impose limits on the materials that can be used by its teachers while others have not? Understanding what influences these policies should provide insight into what makes states more or less flexible regarding the delegation of authority for choosing textbooks. Given the importance of textbook use, who gets to make these types of choices could have important consequences for the performance of the educational sector.

In order to examine this question, the costs of decision-making, effectiveness of voters, religious composition, power of teachers, and propensity of state governments to intervene (or to help inept districts) in textbook selection are analyzed at the state level. This paper specifically addresses schools charged with educating students enrolled in 9th through 12th grade that are publicly financed. To my knowledge this is the first study to examine textbook selection policies empirically.² This study extends the existing literature in public choice, economics and political science. For instance, numerous studies have linked greater educational attainment to more involved electorates. This article provides some evidence for the idea that more educated people tend to demand more choice, are more involved in decision-making processes, and are more confident in their decisions. The study also examines the costs of decision-making. The second section of this paper provides support for the hypothesis that income heterogeneity makes it more costly to reach textbook adoption policy agreements. This study also provides evidence consistent with the adverse effects of less parental involvement in larger school districts. Furthermore, this paper corroborates the extant literature with respect to intervention by state governments in local affairs and extends the morality politics literature by finding a strong link between religious fundamentalism and both state-level and district-level textbook selection policies.³ The empirical analysis provides more evidence on the factors that affect how much influence special interests have on policies.

As mentioned earlier, some states provide textbook lists that are highly recommended but allow districts to deviate from those lists by applying for waivers from them. The second section of this paper analyzes factors that are expected to influence petitions for adopting other textbooks at the school district level for the State of Indiana. Specifically, the second section of this paper provides some insight into what characterizes districts in Indiana that undertook the extra work required to deviate from the state's recommended biology textbook list during the year 2004. The results show evidence supporting the impact of decision-making costs as measured by Gini coefficients for the Indiana counties, suggesting that counties wherein incomes are distributed more unequally have harder times reaching agreement. Indiana school districts are expected to be less likely to get a textbook waiver if incomes are more unequally distributed. In addition to this, the results suggest that citizens who are more fundamentalist are more likely to opt out of Indiana's state list.

²Fuchs and Wößmann (2007) examine an international education production function to assess whether having textbook autonomy leads to higher test scores by looking at 15 year olds in 30 countries and find that autonomy in choosing textbooks matters only if a state administers an exit exam. Exit exams are tests that students have to take to be able to pass a class. In some instances, exit exams are required for graduation.

³In morality politics the term *traditionalist* is used to describe those who "take the Bible literally." I use the term *fundamentalist* instead to avoid confusion with the more common usage of the word *traditionalist*. The term *traditionalist* is commonly associated with churches, such as the Catholic Church, which are not part of the group encompassing religious traditionalism as defined by the morality politics literature. Please refer to the online Appendix for a complete description of what the term fundamentalist entails.

2 What characterizes states that give districts more choice in education?

2.1 Empirical model

This study examines several factors influencing state textbook selection policies utilizing a cross-sectional ordered logit model. Data availability dictated the use of this approach because there is a trade-off between keeping a larger sample with fewer variables and using a specification with fewer observations but more of the relevant variables. The State of Hawaii was dropped from all specifications because it has only one school district. Policies determining who can select textbooks vary by state; they can be classified into three major groups:⁴

1. Complete Choice States (“Local Choice States”): These are states that let each school district choose the textbooks it wants to use. In this case it is usually the duty of teachers, parents, and school principals to choose the textbooks. Twenty-nine states comprise this category.⁵
2. Recommended List States (“Recommended List States”): These are states that publish a textbook list that is recommended but not mandatory. These states usually have “correlation standards” that must be met and provide a list of books that have been shown to meet those standards (the students are then tested on the standards). Basically, these states have recommendations from a state agency, but school districts are allowed to choose books from outside that list. Currently, 12 states fall into this category.
3. Restricted Choice List (“Mandatory States”): These are states in which the list of books that a district can use is chosen at the state level. Presently, eight states fit into this category.

One hypothesis for explaining the adoption of a mandatory state list has to do with bureaucratic influences present in a state and ensuring that funds are used in appropriate ways (accountability). Withholding state funding unless a policy is adopted can often be used to dictate policies. States that supply large shares of school funding are expected to be more likely to dictate educational policies and, thus, textbook selection policies. A common reason given in favor of mandatory state lists is that state oversight of school books is cost- and time-efficient, saving the districts time by narrowing the lists they can choose from and helping to ensure alignment with standards set by the state.⁶ Textbook list restrictions also provide a way for states to help local districts deemed unfit (owing, perhaps, to lack of expertise or resources) to make wise choices for themselves. It is expected that states that are more bureaucratic are more likely to “help” districts by creating mandatory state lists.⁷ The bureaucratic aspect can be captured by the state revenue share variable (“State Revenue Share”), which equals the percentage of school district revenue allocated by the state and

⁴School textbook adoption policies are the same for all textbook subjects, meaning that a state that has restrictions for its biology textbooks also has restrictions for its history and mathematics textbooks. Otherwise, an interesting idea to explore would have been to see if biology textbooks face more restrictions than textbooks from less controversial subjects, such as mathematics and physics.

⁵California has a mandatory state list for grades 1–8, but is a local choice state for high school. Since this paper focuses on high school texts, California is classified as a local choice state.

⁶For a thorough discussion of arguments for and against textbook adoption, see Farr and Tulley (1989) and Finn and Ravitch (2004).

⁷State level funding may also reflect a desire to ensure basic levels of educational support for districts that are very poor.

represents expected state involvement in local affairs, following Husted and Kenny (2000). School system revenues are obtained from a combination of federal, state, and local sources. The state revenue share measures the importance of school system revenues coming from the state, and it is defined as: $\text{state revenue share} = (\text{state revenue} * 100) / \text{total revenue}$.

Some religious groups, known in the literature as fundamentalists, have been in the spotlight for championing issues related to textbook selection and adoption policies. Groups holding these beliefs are measured by the number of adherents to fundamentalist churches as a fraction of a state's total population ("Fundamentalist"). Fundamentalist churches are churches that are classified as "taking the Bible literally." This classification of fundamentalist churches has been used before in the morality politics literature and follows Johnson (1976). The morality politics literature comprises studies that look at how the political culture of an area can explain political outcomes and characteristics there. The Southern Baptist Convention and the American Baptist Association are examples of congregations classified as fundamentalist. The Appendix contains a listing of congregations that are so classified.⁸ The hypothesis regarding fundamentalism is that a state with a larger percentage of adherents to fundamentalist churches would be more likely to have a state-mandated textbook list. Citizens belonging to fundamentalist congregations strongly oppose the teaching of evolution and gay marriage in the public schools. Fundamentalist believers in creationism consequently tend to object to having their children exposed to evolutionary theories; thus they are expected to want to influence book lists in support of their ideologies.

These types of interest groups are powerful, concerned about this issue, well organized, and well known for their ongoing lobbying and strong political influence (Delfattore 1992; Batista Oliveira 1995).⁹ "Answers in Genesis" and other strong antievolution organizations have been known to use their hefty budgets to undermine the teaching of evolution (Cole 2000, as cited in Moore 2004). Furthermore, this does not seem to be a large enough issue for groups holding other views to organize and exert their influence. It also is less costly for fundamentalists to focus their efforts at the state level rather than at the district level for the simple reason that it is easier to lobby for a statewide textbook adoption policy than to apply pressure on numerous local school districts. For example, if an advocacy group were to tackle the districts in Florida, it would be waging 67 separate "battles," one with each school district, as opposed to one large "battle" at the state level.

Even though the relationship between fundamentalists and public policies has been studied extensively, this paper is unique in that it examines textbook selection policies in this framework for the first time. Hutcheson and Taylor (1973) found fundamentalism to be strongly correlated with various political system and policy outcome variables relating to education and tax policies. Hutcheson and Taylor (1973:418–419) analyzed fundamentalist groups and suggested both that "identification with fundamentalist religious groups represents an important factor in state political systems" and that "one may conclude that the values espoused by fundamentalist denominations represent a subculture influential in state policies." Morgan and Meier (1980:148) studied the relationship between religion and referendums on moral issues using statewide ballot propositions in Oklahoma, relating to questions such as repealing Prohibition and authorizing betting on horse races. The authors found that "religion does matter and, in fact, is clearly as important in its effect on moral votes as socioeconomic characteristics."

⁸The Appendix can be downloaded from the following website: www.phillipsmichelle.net/papers/.

⁹See Delfattore (1992) for a documented account of the disproportionate influence these groups have had over the years.

Using the fundamentalist classification, the states with the most fundamentalist groups as percentages of their populations were Arkansas (37 %), Mississippi (36.6 %), and Alabama (35.6 %). The states with the lowest percentages were Rhode Island (0.9 %), Connecticut (1.1 %) and New York (1.1 %). It is expected that the more fundamentalist the state, the more likely it is to prefer mandatory state lists. Nevertheless, it is possible that a rise in fundamentalism has no effect on policy until there are enough fundamentalists to influence policy choices. In order to account for this possibility, the fundamentalist variable is also measured as a binary variable taking a value of 1 if a state has a large number of fundamentalist church members, or a value of 0 if it does not (“Fundamentalist Dummy”). States with a large number of fundamentalists are defined as states that belong to the 5th to 10th upper deciles of fundamentalist religion presence.¹⁰ This range was chosen because it provided the best fit. The regressions that provided the best fits for each specification are reported in the tables.

The data regarding fundamentalism were obtained from Glenmary Research Center’s database. That database, in Jones et al. (2002:xv), defines total adherents as “all members, including full members, their children and the estimated number of other participants who are not considered members; for example, the ‘baptized,’ ‘those not confirmed,’ ‘those not eligible for communion,’ ‘those regularly attending services,’ and the like.”

Several studies have linked greater educational attainment to more confident, better informed and more involved electorates. Husted and Kenny (2007), for example, found that more educated voters are less likely to set limits on educational spending, given that more educated voters are generally more confident in their own abilities. Similarly, Adams and Kenny (1986) found that more educated voters are less likely to impose term limits on their governors. Schmidt et al. (1996) used an objective measure of deviation from voter wishes and found that reactions to voting records that were inconsistent with voters’ preferences were stronger in more educated states. In addition to these studies, Dewey and Kenny (2012) found that more educated cities were better represented than those with less education when examining the impact of the surge in property values on municipal expenditures for the 2000–2006 period. It is anticipated that states with more educated people would demand—or be given—more choice because they would be expected to be more involved in the decision process and to be more confident in their decisions. Furthermore, textbook list restrictions can provide a way for states to help local districts deemed unfit to make choices for themselves due, perhaps, to a lack of expertise or resources. The population’s adult educational attainment for each state is captured by two variables: bachelor’s degree (“Bachelor’s”), which represents the percentage of the state’s population holding a bachelor’s degree, and advanced degree (“Advanced Degree”), which represents the state population percentage holding a graduate or professional degree.

A state’s policy is also likely to be influenced by the size of its school districts. More choice would be expected in smaller districts since it is easier to reach agreement and more parental involvement is expected than in larger districts. On the other hand, if a district is large enough, there might be less of a need to rely on the state government for textbook choice if economies of scale can be reached at the district level. One also would expect less parental involvement in larger districts, since there is a stronger incentive to free ride, making a large local district less effective than a small one. Thus, for very large school districts, there would be less of a loss in going to a state decision. District size is defined as the number of students enrolled in the state divided by the number of districts in the state (“District Size”), and as a dummy taking a value of 1 if a district is large, or a value of 0 if a

¹⁰Similar results were obtained when using the average state to define the dummy.

district is small (“District Size Dummy”). Large districts are defined as districts that belong to the 8th to 10th upper deciles of district size. This range was chosen because it provided the best fit.¹¹

More heterogeneous districts might have a harder time reaching agreement and, for that reason, prefer to delegate the adoption decision to the state level. A Gini coefficient is entered to control for heterogeneity between households within each state, providing a measure of household income inequality at the state level.¹² The Gini variable (“Gini”) can range from 0 to 1. A low Gini represents a state with a more equal income distribution (value of 0 if districts are the same, meaning that everyone has the same income), while a high Gini represents a state with substantial income inequality (value of 1 if districts have perfect inequality). Utah and New Hampshire have the lowest Gini coefficients (0.4104 and 0.4151, respectively), indicating that the income distributions there are more equal than in other states, while New York and Connecticut have the highest Ginis (0.4985 and 0.4809, respectively), indicating that incomes there are distributed more unequally than in other states.

A state’s policy regarding textbook selection is also expected to be influenced by teachers. Teachers’ union expenditures at the state level provide a measure of the power teachers can have on their specific states. Powerful groups of teachers would likely exert their influence and require more of a say on what happens in the classroom. States where teachers’ unions are stronger would be expected to favor more choice in textbooks, since teachers would prefer selecting their own texts over having someone else make that decision for them. The teachers’ union variable (“Teachers’ Union”) is defined as total union expenditures per student at the state level for each state’s largest union, giving a measure of the influence and strength of teachers.

Finally, following Fischel (2005), a measure of homeownership is included in the model. Other things being the same, home values rise when schools are doing a good job, so one would expect states with more homeowners to be better monitors and to have less of a need to restrict choice. The homeownership variable (“Homeownership”) is defined as the percentage of homeowners in the state.

States were classified by examining their specific laws. A spreadsheet with this information is available upon request. In order to provide an explanation of state policies regarding textbook selection, I estimated the following cross-sectional ordered logit model.¹³

$$(a) \text{ State List } 1 = \beta_0 + \beta_1 \text{ State Revenue Share} + \beta_2 \text{ Homeownership} + \beta_3 \text{ District Size} + \beta_4 \text{ Education} + \beta_5 \text{ Fundamentalism} + \beta_6 \text{ Gini} + e_i$$

In addition to this, I also estimated model (b), taking into account teachers’ unions. The two models were tested because using the teachers’ union variable reduces the sample size by one: the State of South Carolina does not have a teachers’ union. The dependent variable (“State List 1”) is defined in the following way:

- 0 if a state has complete choice (local choice states)
- 1 if a state is in between the two extremes (recommended list states)
- 2 if a state has a mandatory state list (mandatory states).

¹¹ Similar results were obtained when using the average and the median district as cutoff points between large and small districts. The dummy was created following the same logic as for constructing the fundamentalism dummy.

¹² Similar results were obtained using the Theil Index of Income Disparity as an alternative to the Gini coefficient.

¹³ The estimates presented correspond to high school textbooks.

Descriptions and sources for the variables used can be found in Table 1. Table 2 presents summary statistics.

2.2 Robustness checks

2.2.1 Long and short lists

In order to account for differences that might arise from some states having long lists while others have short lists, the dependent variable was redefined as follows:

- 0 if a state has complete choice (local choice states)
- 1 if a state is in between the two extremes (recommended list states)
- 2 if a state has a long mandatory state list for the 9th grade. A long list is defined as a list that contains more books than the average of 24 books
- 3 if a state has a short mandatory state list for the 9th grade (i.e., shorter than average when counting books from all lists).¹⁴

Two models, (c) and (d), once again differing with respect to the inclusion or omission of the teachers' union variable, were estimated using the redefined dependent variable ("State List 2").

2.2.2 Choice/nonchoice panel

I also estimate the following panel data logit model (PLM) for the years 1970, 1980, 1990, and 2000:

$$(e) \text{ State List } 3_{it} = \beta_0 + \beta_1 \text{ State Revenue Share}_{it} + \beta_2 \text{ Homeownership}_{it} + \beta_3 \text{ District Size}_{it} + \beta_4 \text{ Education}_{it} + \beta_5 \text{ Fundamentalism}_{it} + \beta_6 \text{ Gini}_{it} + \lambda_t + e_{it}$$

The PLM model is very similar to the cross-sectional models except for two important differences:¹⁵ (1) the dependent variable is coded as "choice" and "nonchoice" because the authors who collected the data did not always distinguish between mandatory and recommended list states, and (2) the teachers' union variable is excluded because teachers' union data are not available for these years.¹⁶ The advantage of using a panel is that it increases sample size and should provide more powerful test statistics. The disadvantage of this specification is the lack of data for the variables mentioned above. The panel model uses time fixed effects and the robust standard errors are clustered at the state level.¹⁷ Once again, the State of Hawaii was excluded because it has only one district. For this reason, the panel has 196 observations.

¹⁴This was also tested by setting the cutoff at the median of 20 books. The empirical results using the median as a cutoff rather than the mean are very similar and are available upon request.

¹⁵For the PLM, educational attainment is measured only as bachelor's degree because advanced degree information is not available on a state-by-state basis prior to 1980.

¹⁶Watts (2009), Tulley (1985) and Zinth (2005) kept track of the states' status throughout the years. The data come from their articles.

¹⁷State fixed effects initially were entered, but given the shortness of the panel the model was over-parameterized.

Table 1 State-level textbook selection variable descriptions and sources

Independent variable	Description	Source
Bachelor's degree	Percentage of a state's population holding a bachelor's degree.	<ul style="list-style-type: none"> – Cross-section: US Census Bureau (Census of Population). Year: 2007. – Panel: US Census Bureau (Decennial Census of Population 1940–2000). Years: 1970, 1980, 1990, 2000.
Advanced degree	Percentage of a state's population holding an advanced degree.	<ul style="list-style-type: none"> – Cross-section: US Census Bureau Census of Population. Year: 2007.
District size	Total students in a state/number of districts in a state.	<ul style="list-style-type: none"> – Cross-section: Common Core. Year: 2007. – Panel: Common Core. Years: 1969–70, 1979–80, 1989–90, 1999–00.
District size dummy	Dummy takes value of 1 if average district is large, value of 0 if district is small. A large district is defined as a district corresponding to the 8 th through 10 th deciles.	<ul style="list-style-type: none"> – Cross-section: Common Core. Year: 2007.
Homeownership	Percentage of homeowners relative to renters.	<ul style="list-style-type: none"> – Cross-section: US Census Bureau: household vacancies and homeownership. "Homeownership rates by state: 1984–2007." Year: 2007. – Panel: US Census Bureau: Census of Housing, 1900–2000. Years: 1970, 1980, 1990, 2000.
Fundamentalist	Total adherents of fundamentalist churches as a percentage of total population.	<ul style="list-style-type: none"> – Cross-section: Glenmary Research Center. Year 2000. – Panel: Glenmary Research Center. Years: 1971, 1980, 1990, 2000.
Fundamentalist dummy	Dummy takes value of 1 if the state is strongly fundamentalist (corresponding to the 5 th through 10 th largest fundamentalist deciles).	<ul style="list-style-type: none"> – Cross-section: Glenmary Research Center. Year 2000.

Table 1 (*Continued*)

Independent variable	Description	Source
State revenue share	School system revenue from state * 100/total school system revenue.	<ul style="list-style-type: none"> – Cross-section: Census of Governments Survey of Local Government Finances—School Systems (US Census Bureau 2007). Year 2007. – Panel: US Dept. of Education, NCES, Statistics of State School Systems and Common Core. Digest of Education Statistics (2002). Years: 1969–70, 1979–80, 1989–90, 1999–00.
Gini	<ul style="list-style-type: none"> – Cross-section: state-level household income inequality measure (Gini coefficient). – Panel: state-level family income inequality measure (Gini coefficient). 	<ul style="list-style-type: none"> – Cross-section: US Census Bureau, Income Report 2007. Year 2007. – Panel: US Census Bureau, Historical Income Tables for States. Years: 1969–70, 1979–80, 1989–90, 1999–00.
Teachers' union	Total union expenditures by largest state teachers' union/student population by state.	<ul style="list-style-type: none"> – Cross-section: IRS990 forms and Common Core, following Johnathan Lott. Year: 2007.
ADA scores	Average senator ADA score for each state.	<ul style="list-style-type: none"> – Cross section: Americans for Democratic Action. Year: 2010

Table 2 Summary statistics for state-level textbook selection variables

Variable	Cross-section excluding South Carolina		Cross-section including South Carolina		Panel	
	Mean (S.D.)	Max (Min)	Mean (S.D.)	Max (Min)	Mean (S.D.)	Max (Min)
Bachelor's degree	26.7563 (4.7488)	37.9 (17.3)	26.6898 (4.7221)	37.9 (17.3)	17.4767 (5.972)	33.19 (6.7)
Advanced degree	9.65 (2.4515)	16 (6.4)	9.6204 (2.4346)	16 (6.4)	...	...
District size	4,831.359 (7,363.557)	35,237.5 (337,643)	4,897.953 (7,301.346)	35,237.5 (337,443)	4,745.5220 (6,411.5430)	37,500 (235,211)
District size dummy	0.2917 (0.4593)	1 (0)	0.3061 (0.4657)	1 (0)	0.3061 (0.4621)	1 (0)
Homeownership	70.1917 (4.3169)	77.6 (55.9)	70.2714 (4.3080)	77.6 (55.9)	66.6827 (4.9488)	75.2 (47.3)
Fundamentalist	9.8667 (10.6749)	37 (0.9)	10.2061 (10.8271)	37 (0.9)	11.5788 (11.6312)	47.0900 (0.1537)
Fundamentalist dummy	0.4792 (0.5049)	1 (0)	0.4897 (0.5051)	1 (0)	0.4898 (0.5012)	1 (0)
State revenue share	49.8532 (11.9998)	87.7584 (31.7056)	49.7302 (11.9053)	87.7584 (31.7056)	46.1500 (13.5360)	73.9902 (8.2357)
Grim	0.4483 (0.0194)	0.4985 (0.4104)	0.4458 (0.0192)	0.4985 (0.4104)	0.3820 (0.0325)	0.4720 (0.3170)
Teachers' union	21.9264 (13.0259)	63.8157 (2.1544)	...	...	...	...
ADA score	...	...	53.5714 (31.7789)	97.5 (7.5)	...	...

2.3 Alternative model specification

Politics are expected to play an important role in creating and maintaining textbook adoption policies. For this reason, an alternative model specification, model (f), incorporating a measure of political ideology using average Americans for Democratic Action (ADA) scores for US senators was examined. ADA scores can provide a basic picture of senator voting positions (percentage of votes cast for a liberal position), based on key votes in social and economic issues. The higher the ADA score for a state, the more liberal a state is. This model differs from model (a) in that ADA scores are used instead of religious fundamentalism.

On the one hand, more choice would be expected in states that are more liberal since conservatives are expected to favor restrictions on how much Darwinian evolution is covered in school textbooks. On the other hand, more liberal states are more likely to prefer larger governments. Since each state has two senators, the ADA score variable was constructed by averaging the ADA score for both senators for each state.

2.4 Results

Columns (1) and (2) from Table 3 present the ordered logit cross-section results excluding the teachers' union variable. Results with the additional teachers' union variable are shown in columns (3) and (4) of Table 3, while results using the four-year panel logit model are reported in columns (5)–(7). It is important to note that the coefficients presented in Table 3 estimate only the direction of the effects. Due to the nonlinear nature of logit models, the partial effects for a given explanatory variable are not revealed by its coefficient and are different for each observation. For this reason, two approaches routinely are followed in computing marginal effects: Average Partial Effects (APEs) and Partial Effects at the Average (PEAs). These can be found in the Appendix. Columns (1) and (2) and columns (3) and (4) differ in the definition of the dependent variable. For columns (1) and (3), the dependent variable is defined as local choice, recommended or mandatory state list, whereas for columns (2) and (4) the mandatory state list group is further subdivided into two groups to serve as a robustness check: short mandatory state list and long mandatory state list. Though different measures of several variables were tested, only the results that provided the best fits based on *R*-squared are presented given that they all yielded very similar results.

The coefficients of different measures of the fundamentalist variables are significant and, as hypothesized, positive in every specification except for one of the panel specifications. These results indicate that the probability of having a more restricted state list increases as more people belong to fundamentalist religious groups. Specifically, the marginal effects from the ordered logit cross-section presented in Table 7 of the Appendix indicate that the probability of being a local choice state decreases by 29 % for states that have more fundamentalist adherents than those that do not.¹⁸ These results are to be expected, given that fundamentalists feel more strongly about teaching evolution than others and thus are more active and effective in bringing about policies they prefer. The panel results suggest that the probability of having a mandatory state list increases as more people belong to fundamentalist groups for columns (5) and (6) of Table 3. This is not, however, the case for column (7). A downside of the fixed effects PLM specification requirements is that the South dummy variable is highly correlated with the variables that do not change much over time within a

¹⁸This example corresponds to the Average Partial Effect calculation in Table 7 of the Appendix for Outcome 0 (local choice states). Marginal effects for other specifications are available upon request.

Table 3 Regressions explaining state textbook selection policies

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Ordered logit no unions	Ordered logit no unions short/long lists	Ordered logit with unions	Ordered logit with unions short/long lists	Panel: time F.E., South dummy	Panel: time F.E., clustering	Panel: time F.E., South dummy, clustering
State revenue share	0.0821* (1.89)	0.0627 (1.63)	0.0451 (1.23)	0.0526 (1.64)	0.0467*** (2.70)	0.0502** (1.97)	0.0467* (1.79)
Homeownership	0.1664** (2.01)	0.1238 (1.12)	0.1090 (0.95)	0.1031 (1.24)	0.0065 (0.13)	0.0170 (0.27)	0.0065 (0.10)
District size	0.0002*** (4.43)	...	0.0001** (2.36)	0.0001** (2.67)	0.00005 (1.57)	0.00007* (1.71)	0.00005 (0.94)
District size dummy	...	2.8208*** (2.77)	...	...	...	...	...
Advanced degree	-0.5641*** (-2.91)	-0.5181** (-2.56)	...	...	...	...	...
Bachelor's degree	...	...	-0.1870* (-1.78)	-0.1774** (-2.34)	-0.1469* (-1.83)	-0.1354 (-1.07)	-0.1469 (-1.17)
Fundamentalist	...	...	0.971* (1.78)	...	0.0855*** (2.45)	0.1109** (2.21)	0.0855 (1.48)
Fundamentalist dummy	2.5901** (2.50)	2.2742*** (2.87)	...	2.1678* (1.67)	...	...	...
Gini	86.7099*** (2.85)	65.1559*** (3.21)	41.8208 (1.23)	58.9135* (1.86)	7.2462 (0.66)	9.3478 (0.68)	7.2462 (0.53)
Teachers' union	...	...	-0.0754* (-1.72)	-0.0509 (-0.82)	...	...	...

Table 3 (Continued)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ordered logit no unions	0.5099	Ordered logit no unions short/long lists	0.4643	Ordered logit with unions	0.4887	Ordered logit with unions short/long lists	0.4449
Pseudo R^2	49	49	48	48	196	196	196
N					0.3999	0.3952	0.3999
					Panel: time F.E., South dummy	Panel: time F.E., clustering	Panel: time F.E., South dummy, clustering

Notes: T -statistics in parenthesis, based on robust standard errors. (1) Dependent variable is 0 if local choice state, 1 if recommended state, and 2 if mandatory state list. (2) Dependent variable is 0 if local choice state, 1 if recommended state, 2 if long mandatory state list, and 3 if short mandatory state list. (3) Dependent variable is 0 if local choice state, 1 if recommended, and 2 if mandatory state list. (4) Dependent variable is 0 if local choice state, 1 if recommended, 2 if short mandatory state list, and 3 if long mandatory state list. (5) Includes time fixed effects and south dummy. (6) Includes time fixed effects and clustering by state. (7) Includes time fixed effects, south dummy, and clustering by state

state, which makes it impossible to estimate reliably their individual effects on school textbook selection policies. For this reason, it is not surprising that several variables, including the main variable of interest (fundamentalist), lose significance in the specification that also includes time fixed effects, a Southern dummy, and clustering.

According to the estimates, the district size variable and the district size dummy variable are always significant and positive for the cross-sectional specifications, indicating that the probability of having a more restricted state list increases as school districts become larger. District size is significant only in one out of three panel specifications. The marginal effect in Table 7 indicates that the probability of being a local choice state decreases by 13 % for states with a district size one standard deviation (i.e., 7,301) above the mean.¹⁹ This result is consistent with there being less parental involvement in larger districts. That conclusion follows because there is stronger incentive to free ride as well as larger gains from state government takeover in the sense that a state bureaucracy is seen as better than having decisions made by uninterested voters.

The coefficients on advanced and bachelor's degree are significantly negative in all cross-sectional specifications, as expected. However, these results are not corroborated by the panel, and as such should be viewed with caution.²⁰ The cross-sectional results suggest that the probability of having a more restricted state list falls as the residents of a state become more educated. The marginal effect in Table 7 indicates that the probability of being a local choice state increases by 12 % for a state that has a percentage of residents with advanced degrees one standard deviation above the mean. This is expected, since states with more educated people would be more confident in their choices and, hence, demand more choice.

The model provides some evidence for the state revenue share hypothesis. The coefficient for the state revenue share variable is significant and positive in four out of the seven regressions presented in Table 3; it indicates that the probability of being a more restricted state list increases as state revenue becomes larger as a share of total school revenue (i.e., more intervention in local decisions). Specifically in Table 7, the marginal effect indicates that the probability of being a local choice state decreases by 8 % for a state that has a state revenue share of total revenue one standard deviation above the mean. For the panel model, the marginal effects are always positive and significant, indicating that the probability of having a mandatory state list increases as state revenue becomes larger as a share of total school revenue. This is consistent with the bureaucratic involvement hypothesis. As expected, states that are more bureaucratic are more likely to have mandatory state lists since states where the state level government intervenes more in local affairs are more likely also to interfere by restricting textbook choice and “taking care” of their residents. It is important to emphasize that these results are not present in all the specifications.

The model does not provide support for the hypothesis predicting that homeowners have less of a need to restrict choice than other voters, suggesting that homeownership does not play a role in state level textbook selection policy restrictions. The state income inequality variable is marginally significant and positive in a few regressions, indicating that the probability of having a more restricted state list increases as states have more heterogeneous populations. Heterogeneous states are states in which there is a more unequal income

¹⁹This is obtained by multiplying the Average Partial Effect coefficient from Outcome 0 (local choice states) by the standard deviation: $-0.000018 * \text{standard deviation} = -0.000018 * 7,301.346 = 0.1314$.

²⁰The percentage of bachelor's degree holders has been steadily increasing since the 1970s. It is possible that it wasn't until the 2000s that bachelor's degree holders were numerous enough to make a difference in this matter. Another possibility is multicollinearity.

Table 4 Alternative model examining political influences using ADA scores

Variable	Coef (T-stat)
State revenue share	0.0937** (2.25)
Homeownership	0.2073* (1.93)
District size	0.0002*** (2.73)
Advanced degree	−0.5238** (−2.23)
ADA score	−0.0369** (−2.49)
Gini	105.315*** (3.31)
Pseudo R^2	0.5095
N	49

distribution. A possible explanation for this is that it might be harder for districts to reach agreement in the presence of more heterogeneous populations.

The results including the teachers' union variable are similar to the results that exclude it and are shown in Table 3, columns (3) and (4). Teachers' union is weakly significant in one specification, indicating that, as hypothesized, the probability of having a more restricted state list falls as teachers have more power (as reflected by union expenditures per pupil). This result is consistent with the idea that more powerful teachers exert their influence and require more of a say on what happens in the classroom.

The results for the alternative model using average ADA scores to measure political influence rather than the fundamentalist variable are presented in Table 4. The results for all of the variables are very similar to the results obtained using the fundamentalist variable, but the fundamentalist variable specification provides a slightly better fit. The ADA variable is negative and significant, implying that the probability of having a state list falls as states are more liberal. This is consistent with the hypothesis suggesting that more conservative states are more likely to favor restrictions on how much evolution theory is contained in school textbooks.

3 What characterizes school districts that choose to opt out of a state's recommended textbook list? Evidence from Indiana

3.1 Background

The textbook selection policies studied focus on biology textbooks specifically because evolution has always been the most controversial subject taught in the public schools. Moore et al. (2003) indicate that in the 1920s, Tennessee, Arkansas, and Mississippi passed laws that prohibited the teaching of human evolution. According to these authors, Mississippi was the last state to nullify its ban on the teaching of evolution in 1970. Nowadays, teachers encounter pressure from both sides. On the one hand, several authors have noted that teachers are pressured to avoid teaching evolution (Zimmerman 1987; Kraemer 1995;

Randak 2001, as cited in Moore 2004). On the other hand, both court decisions and a variety of professional scientific societies have consistently supported the teaching of evolution (Moore 2004).

The State of Indiana, one of the 13 recommended list states, provides an ideal setting for studying factors characterizing the individual school districts that request waivers to opt out of their state’s recommended textbook list. The Indiana Department of Education has collected and published easily accessible data on their textbook adoption process, laws, adoption outcomes, and other district level variables of interest, which are described in Sect. 3.2. Indiana has 291 school districts in six regions.²¹ Waivers for high school science classes were requested in every region during the year 2004.²² Specifically, thirty-four out of 291 districts received an exemption that year.

For the year 2004, Indiana had a system in place in which parents were permitted to influence the choice of textbooks used in the classroom. This local decision was, however, subject to approval from the state, which also added to the difficulty of the process by requiring extra steps for the waiver procedure to be completed. Each school district desiring to deviate from the state’s recommended list had to agree on a textbook that both met the adoption committee’s requirements and allowed students to achieve proficiency in the state’s academic standards. The petitioning districts also had to submit a waiver form and obtain approval from the Indiana State Department of Education. The state’s evaluation was concerned mostly with authorizing textbooks that met the state standards.

It is important to note that the content of biology textbooks selected by the state plays a very important role. Recent studies found that even though Indiana has some of the most permissive standards regarding evolution, 43 % of its biology teachers avoid or “briefly mention” evolution, and at least 20 % reject or are undecided about its scientific validity (Rutledge and Warden 2000; Rutledge and Mitchell 2002, as cited in Moore 2004).

3.2 Empirical model

What characterizes school districts that opt out of a recommended state list? In order to explore this question, the following cross-sectional logit model is estimated:

$$(g) \text{ Textbook Waiver} = \beta_0 + \beta_1 \text{ Fundamentalist} + \beta_2 \text{ Gini} + \beta_3 \text{ DistrictSize} + \beta_4 \text{ Bachelor's} + \beta_5 \text{ Rural} + \beta_6 \text{ Region} + e_i$$

The dependent variable (“Textbook Waiver”) is defined in the following way:

- 0 if a school district uses a textbook from the state recommended list
- 1 if a school district opts out of the state recommended list by applying for a waiver.

These data come from the Indiana Department of Education’s (2004) textbook adoption report by category, which is available on its website at the school district level. Summary statistics and sources for the explanatory variables used can be found in Table 5.

As seen in Sect. 2, the results from the state-level analysis suggest that the probability of being a local choice state falls as states have more fundamentalist adherents than those that do not issue mandatory lists. These results do not, however, give us any insight with respect to what happens in states that do not have mandatory lists, perhaps because fundamentalists

²¹Technically, Indiana has 292 school districts, but one district was excluded because it didn’t have a high school. All special education districts were excluded as well.

²²First-year Biology, second-year Biology, and Earth/Space Science.

Table 5 Indiana district-level study summary statistics and sources

Independent variable <i>N</i> = 291	Mean (S.D.)	Max (Min)	Description	Source
Bachelor's	18.8084 (11.1516)	78.7505 (4.3919)	Percentage of population over 25 years old holding a bachelor's degree or higher. District-level variable.	School District Demographic System (SDDS). Year: 2000.
District size	3,449,014 (4,381,217)	39,989 (149)	Number of students enrolled in the district. District-level variable.	National Center for Education Statistics Common Core of Data. Year: 2004.
Regional dummies	...	...	Regions determined by the Indiana Department of Education. See Appendix for details.	Indiana Department of Education. Year: 2004.
Fundamentalist dummy	0.5017 (0.5009)	1 (0)	Dummy takes value of 1 if the county is more fundamentalist than the state by more than 1 percentage point and 0 otherwise. County-level variable.	Glenmary Research Center. Year: 2000.
Rural dummies	...	...	Categories: (1) Rural inside CBSA/MSA (2) Small town, Large town and Urban fringe of midsize city (3) Urban fringe of large city, Midsize city, and Large city. The omitted dummy is Rural outside CBSA/MSA. District-level variable.	NCES. Common Core. Year: 2004.
Gini	0.4031 (0.0258)	0.4719 (0.3447)	Gini coefficients measuring income inequality. County-level variable.	Burkey. Year: 2000.

do not comprise a large enough group to demand one, as seems to be the case with the State of Indiana. In Indiana, the percentage of fundamentalist adherents at the state level is 5.9 %, which is much lower than the percentage for the average state (10.20 %). Furthermore, judging by its textbook standards, Indiana could be classified as a “pro-evolution” state. Given these circumstances, one would expect fundamentalist districts to clearly be better off by requesting a waiver. It is important to note that what matters in this case is how fundamentalist each school district is relative to the state (given that the recommended list is chosen at the state level). For this reason, the fundamentalist variable (“Fundamentalist Dummy”) was calculated for each county using the following steps:²³

- Step 1: Calculate fundamentalist difference where:

$$\text{Fundamentalist Difference} = \% \text{ Fundamentalist in county} - \% \text{ Fundamentalist in the State of Indiana}$$
- Step 2: Create fundamentalist dummy where fundamentalist is:
 - 0 if the county is either less fundamentalist than the state or just slightly more fundamentalist than the state (by less than 1 percentage point).
 - 1 if the county is much more fundamentalist than the state (more fundamentalist by more than 1 percentage point).

The implicit assumption here is that being just slightly more fundamentalist than the state may not cause the district to undertake the extra effort required to change a textbook, but being much more fundamentalist than the state would. The cutoff used, suggesting support for this assumption, provided the best fit. As was the case with the state-level analysis, the classification of fundamentalist churches was taken from the morality politics literature and follows Johnson (1976).

It is anticipated that states with more educated people would demand (or be granted) a waiver if the state list does not match their beliefs, because they would be expected to be more involved in the decision process and to be more confident in their decisions. It is also expected that states with more educated residents would be more likely to prefer relatively evolutionist textbook content, given that they would be expected to have a better understanding of science. Several studies have found a link between education and evolution beliefs. As an example, a recent Gallup poll found that “there is a strong relationship between education and belief in Darwin’s theory [...] ranging from 21 % of those with high school educations or less to 74 % of those with postgraduate degrees” (Newport 2009). Furthermore, Indiana’s science education standards have been evaluated as “pro-evolutionist,” so one would expect school districts with more educated citizens to be less likely to request a waiver of that standard. The population’s adult educational attainment for a school district is captured by the variable bachelor’s degree (“Bachelor’s”).

Since several steps and agreements between school district parents and teachers are required to be able to decide to opt out from a state list and to apply for and obtain a waiver, the size of a school district is expected to influence the use of waivers. District size in this context is defined as the total number of students enrolled in the school district (“District Size”). In a similar fashion, one would expect heterogeneity between households within a district to affect the use of waivers. For this reason, a Gini coefficient is entered. School districts are expected to be less likely to get a waiver when their incomes are distributed

²³Religious fundamentalism data are available only at the county and state levels. The data for this section were collected preferably at the school district level, but when that was not possible, county level data were used instead. For a description of the variables used and their levels, refer to the summary statistics section.

Table 6 Indiana district-level logit model explaining textbook waiver use

Variable	Mean (S.D.)	Coef (T-stat)
Fundamentalist dummy	0.5017 (0.5009)	0.9366** (2.26)
Gini	0.4031 (0.0258)	−13.7255* (−1.84)
Rural_1 dummy	...	0.9540* (1.77)
Rural_2 dummy	...	0.5405 (0.96)
Rural_3 dummy	...	1.1611 (1.60)
District size	3,449.014 (4,381.217)	−0.00004 (−0.78)
Bachelor's degree	18.8084 (11.1516)	−0.0300 (−0.92)
Regional_1 dummy	...	0.1007 (0.17)
Regional_2 dummy	...	−0.5916 (−0.94)
Regional_3 dummy	...	−1.3440* (−1.69)
Regional_4 dummy	...	−0.1566 (−0.31)
Regional_5 dummy	...	−1.2932 (−1.26)
Pseudo R^2	...	0.08

Notes: *T*-statistics in parenthesis, based on robust standard errors. $N = 291$. Dependent variable is 0 if do not use a waiver, 1 if use a waiver. Robust standard errors are clustered at the county level

more unequally. The Gini coefficients were calculated from the 2000 US Census by Burkey (2000).

A variable measuring urbanization levels relative to rural areas is also included. This is because urban inhabitants “may possess a different stock of information than their rural counterparts that induces differential consumption choices” (Sass and Saurman 1993). The categories used are listed in Table 5 and correspond to Census Locale definitions. In addition to this, regional dummies are included based on the Indiana Department of Education’s regional classification. Given that some variables were available only for counties, errors were clustered at the county level.

3.3 Results

The logit model results for the analysis of waivers in the State of Indiana are available in Table 6. Results with the marginal effects calculated as Average Partial Effects (APEs) and Partial Effects at the Average (PEAs) for each outcome can be found in the Appendix.

The fundamentalist variable is defined as a dummy taking a value of 1 if the county is more fundamentalist than the State of Indiana by more than 1 percentage point and 0 otherwise. The coefficient of this variable is significant and, as hypothesized, positive. These

results indicate that the probability of having a waiver increases when a county is more fundamentalist than the State of Indiana by more than one percentage point than those counties that are not (i.e., those counties that are either less fundamentalist than the state or more fundamentalist, but by less than 1 percentage point). The marginal effects from Table 8 indicate that the probability of having a waiver increases, for example, by 9 % when a county is more fundamentalist than the State of Indiana, by more than one percentage point. These results are to be expected given that, as explained in the background section, Indiana is a mostly pro-evolution state that does not have a mandatory textbook list. Under these circumstances, one would expect fundamentalists to be better off by requesting a waiver.

The Gini coefficient is slightly significant and negative, indicating that the probability of having a waiver decreases when the income distribution in a county is more unequal. There is no statistical support for the predictions regarding educational attainment and district size.

4 Conclusions

This paper presented several models examining textbook selection policies for biology high school students in US public schools. The first section examined the factors influencing state level textbook policies, while the second section examined factors associated with Indiana districts opting out of the state list of approved textbooks. Religious composition, effectiveness of voters, costs of decision-making, power of teachers, and propensity of state governments to intervene or to help inept districts are all found to be important factors in those decisions.

This analysis extends the extant morality politics literature and provides strong evidence on the link between religious fundamentalism and government policies. As expected, the probability of being a local choice state falls with more faithful adherence to fundamentalist religions. This is expected because those groups tend to have more interested and focused constituents relative to other groups. Fundamentalism seems to also play a very important role in the applications for waivers in the State of Indiana, a state that has a smaller proportion of fundamentalists than many other states, strong pro-evolutionist educational standards and relatively pro-evolutionist content coverage in recommended biology textbooks. The evidence suggests that, as expected, it is the fundamentalist groups that stand to benefit the most from applying for waivers in this type of environment.

The results of this study are consistent with those of Husted and Kenny (2007), Adams and Kenny (1986), Schmidt et al. (1996), and Dewey and Kenny (2012), all offering some evidence that states having more educated populations demand—or are given—more local choice, because they tend to be more involved in the decision processes and to be more confident in their decisions.

The evidence suggests that the probability of having more restricted textbook lists increases as school districts become larger, supporting the notion that less parental involvement is expected in larger districts, since there is a stronger incentive for parents to free ride, making a large local district less effective than a small one. Thus, as expected, for very large school districts, there seems to be less of a loss in going to a state textbook adoption decision. The study also finds support for decision-making costs being greater in more income-heterogeneous districts. Specifically, greater income inequality within a county is found to lessen the probability that a district seeks a waiver from Indiana's list of state-approved textbooks.

Furthermore, this paper corroborates the extant literature in regard to intervention by state governments in local affairs by suggesting that there is a link between how much a

state government contributes to school revenues and how much it intervenes in a school district's affairs.

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