Home School Rights & the Rise of Homeschooling in the United States

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Abstract

A growing number of families in the U.S. have turned towards educating their children at home in recent decades. Despite the increase in popularity, relatively little is known about the decision of families to home school, and in particular, how this decision may be influenced by state legislation governing home schools. During the late 1970s, debates about the legality of homeschooling were at the forefront of discussions on compulsory education. In response, a number of states adopted home school statutes that explicitly grant families the right to educate their children at home. Using a difference-in-differences model that exploits variation in the timing that states adopted home school statutes, we examine the impact of state legislation on the homeschooling decision. We find that the probability a child is homeschooled increases meaningfully, by approximately 0.6 percentage points (32% above the mean), following the passage of a home school statute in their state.

JEL Classification:

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1 Introduction

Homeschooling has experienced a rapid gain in popularity over the last two decades. Figure 1 displays the percentage of children between the ages of five and eight, from 1991 to 2007, that attended school at home. In 1991 less than half of one percent of children in this age

range were home schooled, whereas by 2007, close to 3.3 percent attended home schools.[1] Home schools are a popular alternative to traditional public, charter, and private (religious and non-religious) schools. For instance, Isenberg (2007) notes that the number of students attending home schools is roughly equal to the total in charter schools and voucher-based programs combined.

Homeschooling has potentially meaningful implications for school competition and finance, as well as residential location decisions. While the literature on school choice has traditionally framed school competition between public, charter, and private schools (hereafter, institution-based schools) (Hoxby, 2000; Zimmer et al., 2009; Holmes et al., 2006; Bettinger, 1999) home schools also increase the choice set of households. As a result, institution-based schools can face increased competition for students when homeschooling becomes a viable option for parents/guardians. This may have potentially adverse consequences for traditional schools since revenue for these institutions is tied to pupil enrollment via state funding formulas or tuition charges. The extent of losses (or gains) to these schools ultimately depends on the reduction in funds a traditional school experiences when a child is homeschooled rather than enrolled in school, compared to the costs of educating a child if he/she were enrolled (Nevada Policy Research Institute, 2005).[2]

With respect to residential location, the Tiebout model suggests that households choose where to live based on the level and quality of services offered in a particular community (Tiebout, 1965). School quality is a particularly valued neighborhood amenity (Black, 1999; Figlio and Lucas, 2004). For families that homeschool, education is detached from housing. As a result, the sorting of households across neighborhoods can be very different from what is otherwise predicted when households must live in the same area that their child attends school in (Brunner et al., forthcoming). Moreover, the large literature on neighborhood and peer effects suggests that residential location may have meaningful implications for achievement, labor market, and health outcomes (Kling et al. 2007; Sanbonmatsu et al.,

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[1]These numbers are based on the author's calculation using data from the National Household Education Survey (NHES). Data are weighted using weights provided by the NHES. Unfortunately, little systematic data exists about homeschooling prior to the 1990s, thus it is difficult to document trends in homeschooling prior to this time.

[2]Further complicating issues is that some schools may receive funds for providing auxiliary services to home school students such as standardized test administration (Howell and Sheran, 2008).

2006; Katz, 2001; Oreopoulos, 2003).

The history and legality of homeschooling in the U.S. is complicated, and a thorough discussion is deferred until Section 2. Briefly summarizing, starting in the late 1970s discussions about the legality of homeschooling came to the forefront of discussions about states' compulsory education laws. In response to the varying interpretations of state legislation and Constitutional rights, during the 1980s and early 1990s a number of states adopted legal statutes (hereafter, home school rights) that explicitly acknowledged the rights of parents/guardians to educate their children at home. In states without home school statutes parents have been allowed to educate their children at home if they register their home school as a private school (thus satisfying/creating exemptions from compulsory education laws) (Klicka, 2002; Ishizuka, 2000). That said, in these latter states debates have often arisen about whether a home school qualifies as a private school, resulting in litigation challenges to parents' rights even in the present day.[3]

This purpose of this paper is to examine how home school rights affect the decision of households to homeschool. Prior to the introduction of these laws, there was much debate and uncertainty about parents' rights to educate their children. Thus one consequence of home school rights legislation is that it clarifies to parents, educational administrators, and the broader community that home schools are a legal form of education. As a result, one would expect that the introduction of home school rights increases the likelihood that families engage in homeschooling. In addition, these laws may be viewed as a "sanction" for homeschooling, thus increasing the general publics' opinion of it as a legitimate form of education, and encouraging more families to try homeschooling as an alternative to traditional schools.

To estimate the effect of home school rights on homeschooling, we use a difference-in-differences model which exploits variation in the timing of adoption of home school rights across states. Using individual child-level data from the National Household Education Survey, we find that the probability a young child is homeschooled increases meaningfully if he/she resides in a state with home school rights. In particular, among elementary-school

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[3]Two examples of states without home school rights are California and Texas. In Section 2 we describe how families that home school in these states have been subject to prosecution (Gaither, 2008; HSLDA, 2011).

aged children, we find the probability a child is homeschooled increases on average, by 0.6 percentage points, if he/she is born in the years following their states adoption of home school rights, relative to being born before. This finding is economically meaningful, representing a 32 percent increase above the average. Moreover, our results indicate that decisions about a child's education are influenced by legislation that exists even before a child is age-eligible to enter into a traditional school (circa age five). All of our results are robust to the inclusion of state-linear time trends, as well as to specifications where we only use variation across states that ever adopted home school legislation.

The remainder of this paper is organized as follows: In Section 2 we summarize key events related to homeschooling in the U.S. and describe the literature in this area. In Section 3 we describe the data and in Section 4 describe our empirical methodology. In Section 5 we present the results and provide a discussion. Section 6 concludes.

2   Background

2.1   Background

Homeschooling has a long history in the U.S. dating back to the settlement of the first colonies. During this time, parents either educated their children themselves, or hired a private tutor to teach individual or groups of children. In 1837, the first public school opened in Massachusetts, which is viewed as the defining shift of education from the home to a state controlled system (Patterson and Martin, 2009). Following this, states began to enact compulsory school attendance laws that mandated school attendance for children during certain ages. Subsequently, homeschooling dwindled as children were required to attend institution-based schools. Families that continued to home school did so quietly in order to avoid prosecution under truancy laws.

During the late 1970s, homeschooling moved to the forefront of discussions in education. This is largely attributed to the work of John Holt, and Raymond and Dorothy Moore, who were vocal critics of the public education system and began to talk openly about the benefits of delaying schooling and parent-led education in the popular press. At the same time, many religious families began to remove their children from public schools in order to

teach them in faith-based environments that were more closely aligned with their religious and moral beliefs. The rise in the number of home school students was dramatic; although official counts do not exist during this time, researchers estimate that in the 1970s there were 10-15,000 homeschooled children, but by the mid 1980s it was between 120-240,000 children (Gaither, 2008).

At this time, there was little precedent for whether homeschooling was legal or illegal in a particular state. The exceptions are Oklahoma, Nevada, and Utah which had state legislation approving homeschooling in place since 1904, 1956, and 1957, respectively. Outside of these states, parents that homeschooled were often accused (by their state's child welfare department or department of education) of breaking compulsory education laws, and subject to fines and even possibly jail time (Ishizuka, 2000). Courts began to decide whether or not home schools were lawful on a case-by-case basis. Proponents of homeschooling claimed their rights to home school based on the First Amendment (freedom of religion), Fourteenth Amendment (right to privacy which covers parental liberty), or by interpreting their states' compulsory schooling law in a way that favored homeschooling. One popular argument was that home schools qualified as private schools, which were exempt from/satisfied compulsory education laws (Klicka, 2002; Gaither, 2008).

During the 1980s, a number of states began to create home school statutes that explicitly granted parents and guardians the right to home school their children. Between 1982 and 1991, thirty-two states amended their education laws to allow for homeschooling, effectively making a home-based education a legitimate legal alternative to institution-based education in these states. In 1996-97 three states enacted formal home school statutes, followed by one more state and the District of Columbia in 2008-09. Figure 2 displays the adoption of home school statutes over time. Information on the year each state adopted home school rights was obtained from the Home School Legal Defense Association (HSLDA, 2011), and cross-verified using information from Klicka (1990 and 2002), Gaither (2008)and a review of numerous state legislative statutes. With the introduction of home school statutes, the ambiguity of whether or not a parent/guardian had the legal authority to educate their child at home effectively dissipated.[4] As a result, we expect that the passage of home school rights

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[4]Klicka (2002) highlights that much of the home school rights legislation was advanced by the creation

drives an increase in homeschooling.

States where no home school statute was ever adopted have evolved over time towards allowing households to homeschool children, however this is accomplished by operating a home school under the "umbrealla" of a private school. That is, parents must register as a private school or as an affiliate of an established private school to homeschool (Ishizuka, 2000).[5] From a practical standpoint, the private school option allows families to homeschool, but the lack of a specific statute has sometimes led to challenges to parents' rights. For instance, Texas does not have a home school statute, but allows for the private school option. In 1981, the Texas Education Agency declared that a home school did not qualify as a private school, and was therefore illegal. This was contested in court in 1987 (Leeper vs Texas Public Schools), but it was not until several trials and appeals later that in 1994, the Texas Supreme Court ruled that home schools qualified as private schools. As a result, not until 1994 was there legal precedence supporting homeschooling (Gaither, 2008). California is another state without a home school statute. California law exempts children from compulsory education if children are enrolled in private schools where instructors are "capable" of teaching, or are taught by a certified private instructor. Uncertainty over whether a parent is a "capable" teacher resulted in a series of court challenges in the 1990s and most recently again in 2011.[6] Overall then, it can be plausibly be argued that the lack of a specific home school statute leaves room for more challenges and uncertainty about parents' rights to homeschool, compared to states with explicit statutes.

A final aspect of states' regulatory requirements is whether-and the extent to which-home schools are monitored. Monitoring requirements vary from state to state and exist in states with and without home school statutes. The Home School Legal Defense Association categorizes states in one of four types of regulatory environments: (i) Eleven states with no regulation: These states have no requirement for parents that home school, (ii) Fourteen states with low regulation: In these states households must notify their local school district or state education agency that they are homeschooling, (iii) Nineteen states plus the Dis-

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of the HSLDA in 1983, whose mission is to defend and advance the rights of parents to home school.

[5]Many states that have home school statues also have have state statutes which allow them to home school under the umbrella of being a private school.

[6]See http://www.hslda.org/hs/state/ca/201112050.asp for more information.

trict of Columbia with moderate regulations: These states require parental notification of homeschooling, and in addition require homeschool students to take the same standardized tests as their public school counterparts or have their progress evaluated by professionals, and (iv) Six states with high regulations: These states impose all of the requirements of (iii), and in addition can require parents to submit their curriculum to the state, require parents to obtain teaching credentials, and/or make home visits.

Such monitoring requirements may affect whether a household homeschools; for instance, if monitoring requirements are high, the marginal household may decide not to homeschool. As discussed below, we examine how these regulatory requirements affect a family's decision to home school (Section 5), however one note of caution is that it is not possible to determine when each state adopted these regulations, therefore we are only able to present results from an OLS regression, which may be biased due to unobserved characteristics.[7] Finally, it is important to note that information on states' monitoring requirements explains the lack of systematic data on homeschooling–as can be seen, there are eleven states which don't even require homeschooling families to report their activities, thus it is not possible for districts to keep accurate counts of homeschooled children.

2.2 Relevant Literature

There are a handful of studies in the economics and education literature which have examined the topic of homeschooling, and and these have primarily focused on describing the characteristics of families which home school. Houston and Toma (2003) use district level data from a single year for a subset of states in the U.S. and estimate a model of home school participation with state fixed effects. The authors find home school participation is influenced by the degree of female educational attainment in an area, and variation in income within a district. Isenberg (2007) uses cross-sectional micro-data from the National Household Education Survey (NHES) and concludes that families choose to home school for

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[7]A concerted effort was made by the author to determine the years each state adopted particular regulations about homeschooling, and whether there have been changes over time, but it was not possible to construct reliable information for each state. It is not necessarily the case that these regulations were adopted when a state implemented a home school statute. Moreover, as described above, even some states without home school statues still require monitoring of home schools, and it was particularly difficult to determine dates in which these monitoring requirements were implemented in these states.

academic as well as religious reasons, and mothers from low income families are more likely to home school. Howell and Sheran (2008) and Bauman (2001) also use NHES micro-data and find that white families are more likely to home school, as are larger households and households where an adult is not in the labor force.

While these papers provide interesting information about the characteristics of families that home school, next-to-nothing is known about how state laws governing homeschooling affect the decision to home school. The exception is the work by Houston and Toma (2003) which examines whether the decision to home school is affected by state laws requiring home school students to have their achievement assessed by standardized exams. The authors find that there are fewer home school students in states which mandate testing. It should be noted that this finding is based on a model that does not include state fixed effects, because this requirement does not vary within states across time.

3   Data

We examine how home school rights affect a family's decision to homeschool using data from the National Household Education Survey (NHES). The NHES is conducted by the National Center for Education Statistics and administered in most odd years starting in 1991 and most recently in 2007. The NHES was designed to provide descriptive data on the educational activities of individuals in the U.S., and in each survey year households with at least one child are interviewed. The NHES is composed of a series of topical survey questionnaires which vary from year to year. For our analysis, we draw data from the following questionnaires to build a pooled cross-section of individual children across time: Before-and-After School Programs and Activities (2001, 2005), Early Childhood Program Participation (1991, 1995), Parent and Family Involvement in Education (1996, 1999, 2003, 2007), School Readiness (1993). Each of these topical questionnaires contains questions about homeschooling, which we describe below.

In the data we observe basic demographic and socio-economic characteristics of house-holds such as the age, sex, and race of each household member, along with family income, parents' highest educational attainment, employment status, marital status, and state of res-

idence. Although surveyed households may have multiple children, detailed information is only collected for one randomly selected focal child. For this child we observe his/her year of birth, and whether or not the child is currently enrolled in a school or attends a home school (parents provide this information for the child).[8] In some years , follow up questions were asked about why the family decided to home school, and whether or not their homeschooled child took any classes at a traditional school. We describe parents' responses in more detail below.

We restrict our sample to children who are between the ages of five and eight; the grade equivalent for these ages is kindergarten through third grade. We do this for a number of reasons. First, only parents of children age five and above were asked about their child's school enrollment status or home school participation since this is generally the youngest age at which children are eligible to enter into Kindergarten.[9] Second, the age range of children who are are asked about their school enrollment status each NHES year varies (i.e. in 1991 and 1993, children five to eight are questioned about homeschooling, whereas in 1995, it is children five to fifteen), and only children up to age eight are consistently surveyed about their education each survey year. Moreover, by focusing on children at young ages, we can gain insight as to how legislation affects schooling decisions at children's earliest points of entry into school. While the decision to home school in later grades (i.e., high school) may be influenced by state regulations, it is also likely a function of other factors which we do not observe such as previous home school enrollment (the NHES only asks about current enrollment), and parent preparedness to teach more advanced subjects such as calculus, chemistry, etc.[10]

Appendix Table 1 displays the (weighted) average characteristics of children in our final sample, broken down by their home school status. The weighted number of home schooled

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[8]State of residence and month/year of birth are available on the restricted-use NHES data, which we applied for and obtained from the NCES.

[9]The exception is the survey years 2003 and 2007 where parents of children age 4 and above were asked if they attended a school or home school. The sample size of these individuals is small: In 2003, 7 out of 30 four year olds attended a home school and in 2007, 4 out of 42 four year olds were enrolled in a home school. To be uniform across all years, we focus only on children who are five and above.

[10]In two NHES years, 1995 and 1996, children who reported not attending a homeschool were asked whether-and in which grades-they attended homeschool in. In two other NHES years, 2003 and 2007, children that were currently enrolled in homeschool were asked what other grades they had been homeschooled in.

students is close to 3 million. Generally speaking, homeschoolers are more likely to be white, in families where the parents are married, and have parents with higher levels of education. All children in the final sample were born between 1982-2001 (inclusive). We merge in data on whether-and in which year-each state adopted home school rights to the NHES data. In addition, we merge in state level demographic and socio-economic characteristics from various sources for the years that the NHES was conducted. This includes information from the U.S. Census on median household income, male and female labor force participation rate, the percentage of individuals in a state with a college degree, and a measure of population density which we construct by dividing each state's yearly population by fixed land area. We obtained the percentage of individuals in a state that identify themselves as Protestant, Catholic, Jewish, other, or having no religion from the General Social Survey.[11] Finally we obtained state level school characteristics which includes the average pupil-teacher ratio and average expenditure per enrolled student in public schools, and the average pupil teacher ratio in private schools from the National Center for Education Statistics.[12] We include all these time-varying state characteristics in our regression models to control for observable differences across states and years that might affect the decision of families to home school.

As discussed above, in some survey years, follow up questions were asked about why parents decided to homeschool (1996, 99, 2001, 03, 07) and children's use of traditional schools for academic courses (2003, 07). Responses to these questions are given in Table 1, along with the breakdown of home school participation for all ages across all survey years.[13] First, consider the data on home school participation by age. Somewhat unexpectedly, the percentage of homeschoolers is similar across age ranges; a priori we may expect fewer homeschool students in older grades since the high school curriculum can be more challenging for parents to teach compared to elementary grade topics. Moreover, enrollment in traditional schools may be higher in older grades so that children can participate in extra-curricular academic and sports activities that are organized by the high school. However, as more states grant

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[11]We create these averages using micro-level data and appropriate survey weights.

[12]This information was compiled from a variety of NCES sources including the Common Core of Data, and Private School Universe Survey. Detailed information on how these characteristics were constructed are available upon request.

[13]We utilize responses from all parents that responded homeschooling their child, not just those of children ages five to eight to increase sample size.

equal rights access to home school students (allowing them to participate in public-school extra-curricular activities even though they are homeschooled), this may keep enrollment in home schools up in later grades (Batista and Hatfield, 2005).

The descriptive statistics in Table 1 also indicates that many home school students enroll in traditional schools for some of their academic courses. Moreover, the highest enrollment is for older teens; presumably these teens attend traditional schools for subjects that parents may find difficult or cost-prohibitive to teach (i.e., a foreign language, chemistry which requires lab equipment). This could also explain why home school attendance is at least as high in the older grades as younger grades. Finally, in the NHES parents indicated a variety of reasons for why they homeschooled. The two most popular reasons are dissatisfaction with traditional school education and the desire to teach their children in environments more closely aligned with their religious and moral beliefs.

4 Empirical Methodology

4.1 OLS

We begin by estimating the relationship between legislation and homeschooling using a simple OLS model. We estimate the probability a student is homeschooled as a function of whether or not the child lives in a state with home school rights. Formally, we estimate:

$$homeschool_{icst} = \delta_0 + \delta_1 X_{icst} + \delta_2 W_{st} + \delta_3 statute_{st} + C_c + T_t + \mu_{icst} \quad (Eq.1)$$

Here $homeschool_{icst}$ represents an indicator for wether or not child i in state s born in year c and observed in NHES survey year t is home schooled in year t. X_{icst} is a vector of individual and family characteristics and W_{st} is a vector of state-time varying characteristics. All the covariates are included in Table 1. $statute_{st}$ is the variable of interest-it is equal to one 1 if a child lives in a state and survey year where a home school statute exists. Note that because the majority of states passed legislation prior to the first survey in 1991, for the vast majority of states, $statute_{st}$ will equal 1 for every child that lives in that state, regardless of the survey year. Only for the three states where legislation was passed in 1996 and 1997, do

we observe some students prior to and after legislation passed [14] C_c and T_t are a set of year of birth and year of survey fixed effects. Note that the inclusion of these two sets of fixed effects effectively controls for a child's age we do not control for age seperately.[15] Moreover, although it is technically possible to include state fixed effects in this model, they would only be identified from the three states that enacted legislation in 1996 and 1997, thus we do not include them. Finally, we also estimate Eq. 1 including controls for the level of monitoring a state requires of homeschooling families(based on the HSLDA categories described above). We use survey weights provided by the NHES and cluster standard errors at the state level in all regressions.

4.2   Difference-in-Differences

The estimates from the OLS regressions will be biased if there are unobserved factors which differ across states with and without home school rights that also affect the decision of a family to home school. For instance, while we include controls for average pupil teacher ratio, and school spending to proxy for public and private school quality, there may be remaining differences in this dimension across states which are not captured by these controls. Consequently, it may be these differences, and not differences in legislation which drive differences in homeschooling rates. Consequently, we turn to a difference-in-differences model to establish the causal effect of legislation.

The difference-in-differences (DD) model exploits variation in the years that states adopted home school rights. It compares rates of homeschooling in a state before and after that state adopted legislation and then contrasts this with the same before and after comparison for states that did not adopt legislation in that particular year. This comparison nets out any changes in homeschool participation that would have occurred even in absence of legislation, under the assumption that these changes are common to all states.

A DD model is relatively straightforward to implement, however the timing of the NHES data and states' adoption of home school statutes requires us to structure the model in a

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[14]Note, there are two states which adopted legislation in 2008 and 2009, but since the last NHES survey occurred in 2007, we don't observe any students in these states after the home school statutes were adopted.

[15]An alternative specification would be to omit the year of survey dummies and include dummies for age. Results following this specification produce quantitatively similar estimates.

slightly different manner. Recall that the NHES is administered (mostly) every other year between 1991-2007, and we only observe whether a child is enrolled in a home school at the time of the survey. As noted above, the majority of states adopted home school rights legislation between 1982-1991; among the remaining that ever adopted such legislation three states adopted prior to 1960, three states in 1996-97, and one plus the District of Columbia in 2008-09. If we were to construct the DD model to compare home school attendance among children observed before and after their state adopted legislation, there would be very little identifying variation from which to measure the effects of legislation. That is, we would only have before and after observations for the three states that passed legislation between 1996-97. Since the last NHES was conducted in 2007, states that enacted legislation in 2008-09 would only provide "before" information, and states that enacted legislation prior to 1991 would only provide "after" information.

As a result, we define our DD model in the following way: We model the probability that a child is homeschooled as a function of whether or not that child was born before or after their state adopted home school rights. The children in our sample were born between 1982 and 2001, which overlaps with many of the years that states were adopting home school legislation. In that way, we are able to observe children from the same state, some of whom were born before legislation was passed and some who were born after. A priori, if home school legislation clarifies the legality of homeschooling, and/or acts as a sanction, then we expect to observe that children who were born after their state adopted homeschooling legislation to have an increased likelihood of being homeschooled compared to those who were born before. Formally, we estimate:

$$homeschool_{icst} = \gamma_0 + \gamma_1 X_{icst} + \gamma_2 W_{st} + \gamma_3 legislation_{cst} + S_s + C_c + T_t + \eta_{icst} \quad \text{(Eq.2)}$$

Here, all variables are defined as in Equation 1. $legislation_{cst}$ is our policy variable, and it is equal to one for children who are born after their state adopted a home school statute and zero otherwise. S_s is a set of state dummies, which, along with the dummies for cohort of birth (C_c) allow us to interpret the coefficient estimate for γ_3 as the DD estimate of home school legislation.

Equation 2 is constructed to test whether children who are born after their state passed home school legislation are more likely to be educated at home at any point in the future,

compared to students who are born prior to legislation. In all likelihood though, even children born before their state adopts legislation are likely to be affected by any subsequent state adoption. For instance, consider a child born three years before their state adopted legislation. In that case, schooling decisions can still be impacted by legislation, since by the time the child is age-eligible to be enrolled in school, a home school statute exists in that state. This logic applies to all children born prior to their state passing legislation: Given that we focus on children age five to eight, at the extremes, any eight year olds born up to eight years before legislation passed in their state could be affected by the subsequent passage of legislation, and any five year olds born up to five years before legislation was adopted could be affected.

On a similar note, there may be differential effects of legislation based on the number of years a child is born after legislation has passed. For instance, a child born nine years after may have an increased probability of homeschooling compared to a child born three year after simply because the former is born under a setting where the legislation has already been in place for a number of years. Nine years out, it is likely that there are more resources and a more established homeschooling communicty compared to three years out.

We amend Equation 2 to allow for different effects based when children were born in relation to when their state passed homeschool legislation. Formally, we estimate the following dynamic DD model:

$homeschool_{icst} = \beta_0 + \beta_1 X_{icst} + \beta_2 W_{st} + \sum_{j=-10}^{10} \delta_j * D_{cst} + S_s + C_c + T_t + \epsilon_{icst}$ (Eq.3)

Again, all variables are defined as in Equations 1 and 2. D_{cst} is a set of dummy variables denoting the year each child was born in, in relation to when their state passed a home school statute. These dummies span the years leading up to a state's adoption of legislation, the year of adoption, and the years following adoption. In practice, we group years together so that we have eight dummies representing the years prior to and including adoption (10 plus years before, 7-9, 4-6, 0-3) and after adoption (1-3 years after, 4-6 years after, 7-9 years after, 10 plus years after). A dummy is set equal to one if a child is born in that particular range of years.[16] For instance, a child who resides in New Mexico (a state which adopted legislation in 1985) and was born in 1989 will have the dummy for 4-6 years after set equal

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[16]These groupings were constructed with the objective of equating sample sizes across groups.

to one, and zero for all other dummies. Similarly, a child who resides in New Mexico but was born in 1982 will have the dummy for 0-3 years before set equal to one. All dummies are equal to zero for children residing in states that did not adopt legislation prior to 2007 (the last year of the NHES survey). Finally, we exclude the dummy for 10 plus years before from our regression as our omitted category.

The intuition behind the dynamic DD model is visually illustrated in Figure 3. The dashed line represents states which adopted a home school statute before 2007, whereas the solid line is for those that never adopted legislation before 2007. We construct the dashed line by centering each state on the year that they adopted legislation, and identifying students who were born in the years leading up to, including, and after that year (in practice, we group years together as described above). We then graph the fraction of students born in each of those years that are home schooled. As a comparison point, we construct the solid line following the approach outlined by Ayres and Levitt (1998), where we peg each of the states that did not adopt to the years that adopting states passed legislation, and take the average across those states and years to construct the fraction of students born in particular years that we observe being homeschooled.

To the left of the vertical axis, we observe that trends in homeschooling are somewhat similar across adopting and non-adopting states, although the slope of the dashed line is slightly steeper than that of the solid line. To the right of the vertical axis, we observe a steep increase in the fraction of home schoolers in adopting states, whereas the fraction for non-adopters exhibits only a slightly increasing trend in comparison. Overall this graph suggests that the legislation had the largest effects on the likelihood of homeschooling for children born after the legislation was introduced.

The identifying assumption for the DD model is that the before and after calculation among our control states (states which never adopted legislation and those that didn't adopt in a particular year) is a good comparison for before and after calculation for our treated states (states that adopted legislation in a particular year). Such an assumption will fail if there are changes in unobserved state-specific factors that are correlated with a state's decision to adopt home school legislation, and at the same, influence the decision to home school. To that end, we also estimate the DD models with state-linear time trends, which

should control for any underlying trends in states over time. Moreover, because there may be concern that those states which adopt legislation are fundamentally different from those that don't, we also estimate Equations 2 and 3 using just states that adopted legislation by 2007.

5 Results & Discussion

Table 2 provides the results from three OLS regressions (Eq. 1). Column 1 provides the results where our independent variable of interest is an indicator for whether or not the child resides in a state that adopted a home school statute before 2007 (=1 if no, =0 if yes), and Column 2 provides the results where control for the level of home school monitoring in the state (based on the HSLDA categorization). The estimates from these regressions indicate that children that reside in states without home school statutes are -0.6 percentage points more likely to be homeschooled, however the result is not statistically significant. Surprisingly, we find no evidence that the level of monitoring affects the probability of home schooling-the estimates are close to zero and not statistically significant.

For the regression in Column 3, we interact the monitoring levels with the indicator for a home school statute and find evidence that increased monitoring by the state decreases the probability of homeschooling in states without home school rights compared to those with. For instance, consider the interaction between not having a home school statute and being a state with low regulations. This estimate indicates that a child that lives in a state without home school rights is 1.6 percentage points less likely to be homeschooled if he/she lives in a low regulation state (compared to a no regulation state) compared to a child living in a low regulation state where there is a home schools statute. The deterrent effects are even stronger for more stringent levels of regulation. These findings are consistent with a story where families are more deterred by state regulations when they live in a state without home school rights, compared to if they reside in a state with a statute explicitly granting them the rights to home school.

Table 3 provides the results from our estimation of Equation 2. We provide the results of regressions with and without controls for individual characteristics and state-level char-

acteristics in Columns 1 and 2. The estimates indicate that there is a 0.5 to 0.6 percentage point increase in the probability that a child is home schooled if he/she is born after their state implemented home school legislation. The results change negligibly when we include controls for individual and state characteristics. This suggests that the policy variable has little relation with observed covariates of children and states, providing some evidence that the passage of the laws in particular states and years is exogenous to other observed (and presumably, unobserved) characteristics of individuals and states. The results are economically meaningful and represent a 32 percent increase from the average rate of homeschooling in this age group. The third column presents the results when we include state-linear time trends. The estimate on the policy variable is not statistically significant, but the point size is within the range of estimates calculated in Columns 1 and 2. The lower precision is due to the fact that the state-time trends remove much of the variation within states over time.

In Columns 4 and 5 we provide the results where we only estimate Equation 2 using the set of states that adopted home school legislation before 2007. The estimates are even larger in magnitude, and remain statistically significant (except when including state-time trends). This suggests that even if there is concern that those states which never adopted home school statutes are fundamentally different than those that did, using only variation in the timing of adoption among adopting states, we still estimate a positive, significant, and economically meaningful effect of the legislation on the decision to homeschool.

Table 4 provides the dynamic difference-in-differences model results. Focus first on the estimates in Columns 1 and 2, which are estimated using data on all states. Recall, we exclude the dummy for children born 10 plus years prior to their state adopting a home school statute. Focusing on the lag years, we find positive and significant effects of being born prior to legislation on the probability of home schooling for all years except the 7-9 year grouping. The results for 4-6 and 0-3 years is in line with our discussion above that children who are born prior to legislation can still be affected by its subsequent passage, since it will be in place during at least some of the years when they are making their schooling decisions. The small and insignificant result for 7-9 years could reflect the fact that for children born 7, 8 , or 9 years prior to legislation passing, much of their schooling decision has already been determined under a setting without home school rights (recall we only

consider children up to age 8), and thus there is no measurable effect of the legislation. For the years following legislation, we observe a higher and monotonically increasing probability of being homeschooled, with the largest effect observed for children born 10 or more years after legislation is passed. The increasing probability is consistent with a scenario where after a state adopts legislation, more resources and infrastructure are available for homeschooling families. In a sense, because the precedence for home schooling has been set, families may be even more likely to home school. In Column 2, we include individual and state covariates, which change the results negligibly, indicating that the policy variable is not strongly related to these observed characteristics.

In Column 3 we omit any states which did not pass home school legislation, and find largely similar estimates as in Columns 1 and 2. In particular, we continue to see larger estimates of the probability of homeschooling for children born in the years following passage of legislation, compared to before. Moreover, we find non-zero probabilities of homeschooling for those children born up to 6 years before legislation was passed. The similarity in these results compared to our findings when all states are included suggests that even when we restrict our analysis to states that may be more similar to one another in terms of their approaches to home-education, we still find meaningful evidence of an increase in home-schooling as a result of home school rights legislation.

6   Conclusion

Homeschooling has experienced a rapid increase in popularity in recent decades, yet very little is known about the decision of families to home school. This largely stems from two factors: (i) a lack of data on homeschooling, and (ii) difficulties with addressing the non-random selection into homeschooling. This paper provides the first evidence on the role of legislation on the decision to home school using a large, nationally representative sample of school-aged children. Using a difference-in-differences analysis that exploits the variation in the timing of home school rights adoption across states, we find that state legislation has had a meaningful impact on home school participation. Such findings can have important implications for school choice, achievement and residential sorting.

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Figure 1: Home school Participation Among Children Ages 5-8
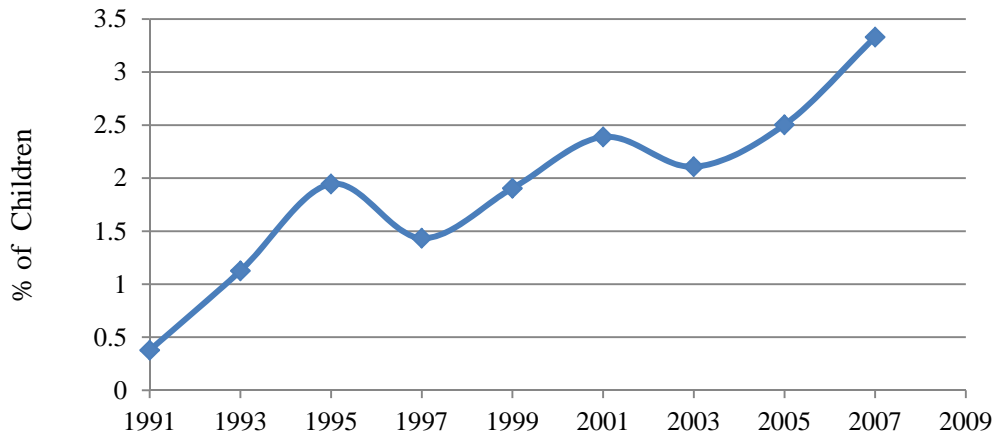
Source: Author's calculation using weighted NHES data

Figure 2: Number of States with Home School Rights
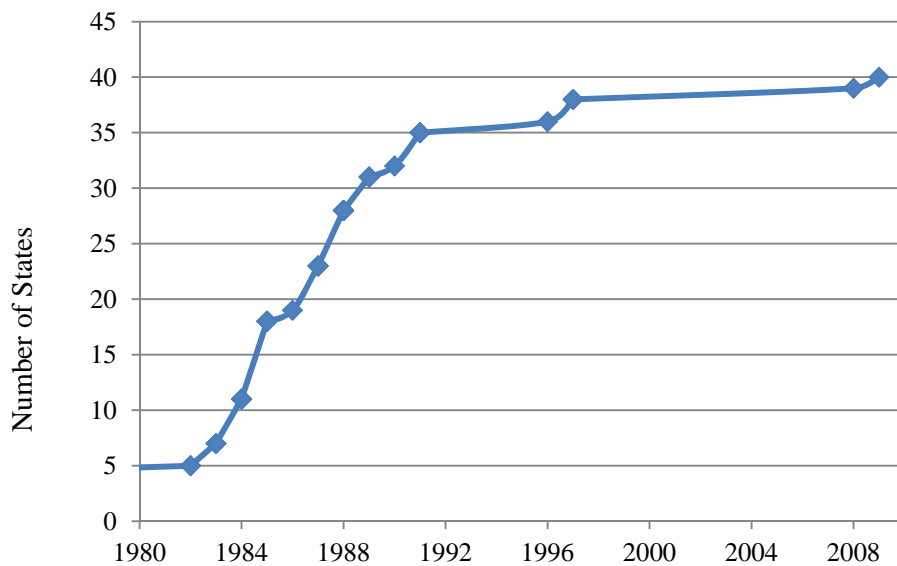
Note: There are three states which had home school statutes prior to the 1980s: Oklahoma (1904), Nevada (1956), Utah (1957).

Figure 3: Trends in Homeschooling For States with and without Home School Rights Statutes
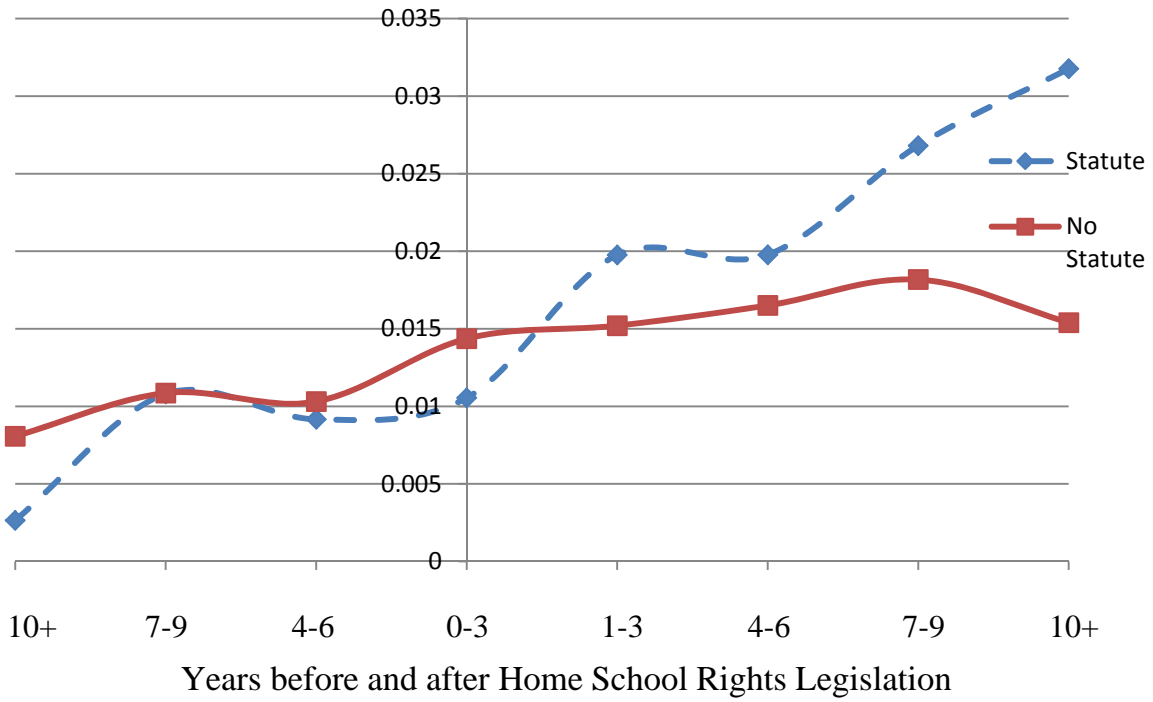
Table 1: Descriptive Characteristics of Homeschooled Children

Home School Participants

Age	5-6	7-8	9-10	11-12	13-14	15-16	17-18
%	2.1	1.8	2.2	2.2	2.0	2.3	2.2

Attend School for Some Academic Courses

Age	5-6	7-8	9-10	11-12	13-14	15-16	17-18
%	15.6	12.5	14.3	16.4	17.2	27.2	24.6

Reasons that Homeschool Child

Year	1996	1999	2001	2003	2007
Religious/Moral/Character	23.9	51.2	53.4	72.4	81.4
Not Satisfied with Schools	58.2	66.3	59.6	67.9	72.0
Disability/Illness	18.4	17.1	14.7	17.7	13.4

Estimates are calculated using NHES survey weights.

Table 2: OLS Estimates of The Impact of State Regulation on Homeschooling

DV: Homeschool	(1)	(2)	(3)
No HS Rights	-0.006		0.006
(s.e.)	(0.004)		(0.006)**
Level 2		-0.006	0.004
(s.e.)		(0.004)	(0.005)**
Level 3		0.002	0.007
(s.e.)		(0.004)	(0.003)**
Level 4		0.005	0.012
(s.e.)		(0.004)	(0.005)**
No HS Rights * Level 2			-0.016
(s.e.)			(0.007)**
No HS Rights * Level 3			-0.023
(s.e.)			(0.011)**
No HS Rights * Level 4			-0.017
(s.e.)			(0.008)**
R^2	0.0141	0.0143	0.0144
N	45033	45033	45033
Controls	Y	Y	Y
Year of Birth F.E.	Y	Y	Y
Year of Survey F.E.	Y	Y	Y

Standard errors are clustered at the state level. Estimates are weighted using NHES survey weights.
 *** denotes significant at 1%, ** at 5%, * at 10%.

Table 3: Difference-in-Difference Estimates of the Effect of Home School Rights

DV: Homeschool	All States			States with Home School Rights	
	(1)	(2)	(3)	(4)	(5)
Policy	0.005	0.006	0.003	0.007	0.005
(s.e.)	(0.0028)*	(0.003)**	(0.004)	(0.004)*	(0.004)
R^2	0.011	0.018	0.022	0.019	0.0231
N	45033	45033	45033	27861	27861
Controls	Y	Y	Y	Y	Y
Year of Birth F.E.	Y	Y	Y	Y	Y
Year of Survey F.E.	Y	Y	Y	Y	Y
State F.E.	Y	Y	Y	Y	Y
State Linear Time Trends	N	N	Y	N	Y

Standard errors are clustered at the state level. Estimates are weighted using NHES survey weights.
 *** denotes significant at 1%, ** at 5%, * at 10%.

Table 4: Difference-in-Difference Estimates of the Effect of Home School Rights

	All States		States with Home School Rights	
	(1)	**(2)**	**(3)**	**(4)**
Before (Omitted category: 10 + years before)				
7-9 years	0.007	0.006	0.010	0.009
(s.e.)	(0.012)	(0.013)	0.013	0.013
4-6 years	0.014	0.012	0.019	0.018
(s.e.)	(0.004)***	(0.005)**	(0.008)**	(0.007)**
0-3 years	0.010	0.012	0.019	0.025
(s.e.)	(0.005)*	(0.006)**	(0.011)*	(0.011)**
After				
1-3 years	0.015	0.019	0.027	0.036
(s.e.)	(0.007)**	(0.008)**	(0.015)*	(0.014)***
4-6 years	0.013	0.016	0.027	0.035
(s.e.)	(0.008)	(0.009)*	(0.017)	(0.017)**
7-9 years	0.018	0.020	0.036	0.044
(s.e.)	(0.009)**	(0.010)**	(0.022)*	(0.02)**
10 + years	0.021	0.022	0.043	0.049
(s.e.)	(0.009)**	(0.011)**	(0.024)*	(0.022)**
R^2	0.011	0.018	0.011	0.020
N	45033	45033	27861	27861
Controls	N	Y	N	Y
Year of Birth F.E.	Y	Y	Y	Y
Year of Survey F.E.	Y	Y	Y	Y
State F.E.	Y	Y	Y	Y

Standard errors are clustered at the state level. Estimates are weighted using NHES survey weights.
 *** denotes significant at 1%, ** at 5%, * at 10%.

Appendix Table 1: Descriptive Statistics of Children in NHES (1991-2007)

	Home school		Non Home school	
	Mean	S.D.	Mean	S.D.
Individual & Family Covariates				
Age***	6.39	1.11	6.53	1.08
Male	0.52	0.50	0.51	0.50
Minority***	0.21	0.41	0.37	0.48
Income Level (omit <20 k)				
20 to 40	0.29	0.46	0.28	0.45
40 to 75***	0.33	0.47	0.27	0.44
75 plus**	0.24	0.42	0.19	0.39
Marital Status (omit married)				
Div/Sep/Widow***	0.13	0.34	0.29	0.45
Not Married***	0.01	0.12	0.05	0.22
Education (omit less hs)				
HS Grad***	0.16	0.37	0.28	0.45
Some College	0.28	0.45	0.30	0.46
College Grad***	0.29	0.46	0.18	0.39
Grad/Prof***	0.24	0.43	0.15	0.36
State Level Covariates				
Demographics				
Median HH Income	50323.87	6625.88	50149.42	6851.20
Male LFP	74.45	2.96	74.48	3.10
Female LFP***	59.89	3.64	59.24	3.77
Percent of College Graduates	25.06	4.37	24.91	4.72
Density***	191.05	172.51	244.47	457.06
Religion (Omit No Religion)				
% Protestant	55.86	13.92	55.98	15.30
% Catholic**	23.70	9.11	24.73	10.45
% Jewish***	1.86	1.35	2.03	1.52
% Other Religion***	5.17	2.68	4.83	2.97
School Characteristics				
Pupil-Teacher Ratio (public)*	16.65	2.39	16.81	2.70
Real Expenditure Per Student (public)**	4777.92	1000.27	4702.17	1111.33
Pupil-Teacher-Ratio (private)***	12.56	1.73	12.98	1.89
N	681		44352	
N Weighted	2473456.11		127,049,838	

Estimates are calculated using NHES survey weights. *** denotes significant at 1%, ** at 5%, * at 10%.