Upward Mobility and Legislator Support for Education Reforms*

Luna Bellani§
University of Konstanz and IZA

Vigile Marie Fabella‡
University of Konstanz

This Version: May 2017

(This draft compiled: May 16, 2017)

Preliminary. Please do not quote without permission.

Abstract

This paper investigates how upward mobility affects legislator voting behavior towards education reforms. We develop an electoral competition model where voters are parents who value the future economic status of their children, while children's economic status is affected by public education and upward mobility. The model predicts a decrease in legislator support for redistributive education policy with a rise in upward mobility. We test this hypothesis using a newly compiled dataset of roll call voting on California education legislation matched with electoral district-level upward mobility. Our findings suggest that the likelihood of a legislator voting "no" on redistibutive education bills increases by 10% when upward mobility in his electoral district increases by a standard deviation.

Keywords: social mobility, education reforms, legislator voting behavior, California

JEL classification codes: I24, D72, H4

*We would like to thank SeenuArun AndiRajendran and Sebastian Jaysk for their excellent research assistance. We are grateful to Heinrich Ursprung, Francesco Scervini, Katja Kaufmann, Jan Mellert, Tommy Krieger and participants to seminar at IZA, to the EPCS 2017 for helpful comments on this or previous drafts. We also thank the Collaborative Research Center SFB 884 "Political Economy of Reforms" at the University of Mannheim for awarding this paper with the Best Young Scholar Paper prize at their conference in December 2016. Bellani acknowledges the financial support of the Young Scholar Fund-Excellence Initiative of the University of Konstanz (Project No. 83979915). Usual disclaimers apply.

§Department of Economics, University of Konstanz, Germany, IZA, Bonn, Germany and Dondena, Bocconi University, Italy. E-mail:luna.bellani@uni-konstanz.de

‡Department of Economics, University of Konstanz, Germany. E-mail:vigile.fabella@uni-konstanz.de

1 Introduction

Social mobility is defined as the ability of individuals to move from one social class to another. In particular, upward mobility refers to the ability of children of the poor to become rich adults. As income inequality swiftly rises in the U.S. (Piketty, 2014), social mobility begins to play an important role in the way democratic processes shape public policies. In democracies in which a relatively poor majority holds political power, one would expect large scale redistribution, if not expropriation. This, however, is not commonly observed in the real world.[1] An argument used to explain this phenomenon (or the absence thereof) is that the poor want for their children and grandchildren "some big prizes maintained in the game" (Okun, 1975). They do not expropriate the rich in the hope that their children will one day become rich, a conjecture known as the *prospect of upward mobility* (POUM) hypothesis. The logic of such a hypothesis implies that upward mobility and the incidence of redistributive policies have a negative relationship. While there has been some evidence linking upward mobility to voter preferences towards redistribution (Ravallion and Lokshin, 2000; Alesina and La Ferrara, 2005; Lind, 2007; Guillaud, 2013), little has been done in the way of linking social mobility to actual policy outcomes. In representative democracies, policies are enacted by gaining sufficient votes in the legislature. Therefore, to study the relationship between policy outcomes and social mobility, one must understand how social mobility influences legislator voting behavior.

In this paper we take a step in this direction by exploring the relationship between upward mobility and legislator voting towards education policy. Education policy, itself a form of in-kind redistribution, holds one peculiarity that makes it particularly fitting in this context: its benefits accrue mostly to the next generation. The people substantially affected by education policies are not the same people as the ones deciding on it.

Education reforms have clear intergenerational consequences, making it more likely for them to be influenced by upward mobility. We capture this idea in a simple probabilistic model of electoral competition where voters care about their disposable income and their child's future income, while legislators care about reelection. Both education and upward mobility serve the same purpose, which is to improve children's future economic status. As a consequence, an increase in upward mobility decreases the marginal benefit of education, thereby inducing reelection-seeking legislators to reduce their support for public education.

We test this prediction using a newly compiled dataset of legislative roll-call voting at the California State Legislature. This setting is an ideal testing ground for our model because legislators vote on bills across many policy areas, including education. When combined with the upward mobility corresponding to each legislator's district, we find robust evidence confirming our model prediction. The likelihood of a legislator voting against a redistributive education reform is higher when upward mobility in his district increases.

The remainder of the paper proceeds as follows. Section 2 discusses some related literature. Section 3 introduces our theoretical setting. Sections 4 and 5 elaborate on the data and empirical strategy, while Section 6 discusses the estimation results. Section 7 presents several robustness checks, and Section 8 concludes.

[1] Refer to Bellani and Ursprung (2016) for a review.

2 Related Literature

The interaction between public policy and socio-economic mobility has been observed by economists long before the formalization of the POUM hypothesis by Benabou and Ok (2001). In 1973, Albert Hirschman (1973) introduced the idea of mobility prospects affecting preferences towards inequality and redistribution. He compares social mobility to a two-lane tunnel in which drivers encounter a traffic jam. He observes that the left lane drivers begin to feel better as the right lane cars start to move because they expect that they too shall eventually move along. For Hirschman (1973), the driving force of social mobility is the observed experiences of others. Piketty (1995) also considers perceptions of social mobility. Assuming that perceptions are derived from past family mobility, he develops a theoretical model that shows how such perceptions influence attitudes towards redistribution. Redistributive politics can thus be affected by how social mobility is believed to depend on individual effort. While Hirschman (1973) and Piketty (1995) assume that true mobility is unknown to individuals, Benabou and Ok (2001) assume to have perfect information with respect to the mobility process, and formalize how this information may affect their voting choices. Their model proposes a simple condition for the POUM to hold: tomorrow's income must be a concave function of today's income. Danziger and Ursprung (2001), however, point out that the POUM argument relies on transition probabilities that are inconsistent with stylized facts. Nevertheless, empirical support for the negative relationship between upward mobility and policy preferences have been found using panel (Alesina and La Ferrara, 2005; Lind, 2007), cross-sectional (Ravallion and Lokshin, 2000; Guillaud, 2013; Alesina et al., 2017), and experimental (Checchi and Filippin, 2004; Alesina and La Ferrara, 2005) data.

Previous contributions in the political economy literature have already emphasized that in socially mobile communities, support for redistribution may be lower. Most of the previous work have however focused on *individual preferences* towards redistribution or redistributive policies, and not on the outcomes of these policies.[2] Little is known about how social mobility affects the formation of actual policy. Furthermore, much of the attention has been on tax policy. As Alesina and La Ferrara (2005) argue, tax reforms, although they may be persistent across generations, has a contemporaneous effect, i.e., voters who vote on a policy are directly affected by the policy, and therefore have a direct stake in its enactment. One paper that also considers other public policies apart from taxation in relation to social mobility is the study by Alesina et al. (2017), who find that a pessimistic view of future opportunities increases support for public education and health care. In the model they develop however, education plays no intergenerational role.

This study differs from the existing literature in a number of aspects. First, we explore the direct link between social mobility and policy formation. We thus do not assume that policy outcomes depend directly on voter preferences, as the bulk of the literature do. We adopt instead the perspective of representative democracies, where a politician represents his constituency in a legislature. To the best of our knowledge, this is the first study to explore this link outside the confines of direct democracy. Second, we will investigate the effects of social mobility on education policies and exploit its peculiar intergenerational attributes. This approach allows us to theoretically highlight a new mechanism through which the negative policy-mobility relationship can takes place. As education and mobility both improve the prospects of the next generation, higher mobility induces a substitution effect that

[2]See Corneo and Gruener (2002); Alesina and La Ferrara (2005); Gaviria et al. (2007); Lind (2007); Rainer and Siedler (2008); Guillaud (2013).

reduces the need for education policy.

3 Theoretical Model

3.1 Basic setting

Consider a district with a continuum of adult individuals normalized to one. The population is perfectly partitioned into 2 distinct groups $i = r, p$, representing the rich and the poor class, respectively. The population share of group i is γ_i and both groups are characterized by an income y_i, with $y_p < y_r$. By definition, the average income $y = \gamma_p y_p + (1 - \gamma_p) y_r$.[3] Furthermore, we assume that each adult person has a child. Every child is assigned an exogenous level of innate ability, which can either be high (a_H) or low (a_L). We assume that the probability of being high ability, $Pr(a = a_H) = q < 0.5$, is the same in both groups. Parents are assumed to know their income, and the distribution of income and ability in society.

The opportunities faced by children of the rich and the poor are not the same: children from rich parents get disproportionately better opportunities to find high paying jobs than children from poor families due to, for example, connections and neighborhood networks, the possibility of extracurricular activities etc. Rich children are therefore more likely to become rich adult, regardless of their innate ability. We denote the superior opportunities of rich children as ξ. There are two factors that can mitigate the disadvantage of the poor: an exogenous upward mobility shock, m, and public education, e. The former can be seen as an increase in the equality of opportunities in the society, decreasing the importance of families networks, etc. The latter helps the poor signaling their ability type. Public education thus increases the poor's chances of moving up the income ladder, and is a form of in-kind redistribution.

Denote by v_i the probability that a child grows up to become rich. We assume that with perfect mobility, belonging to the rich class depends entirely on ability, that is, $v_p = v_r = q$. With imperfect mobility instead, the probability of belonging to the rich class differs across parental economic status according to:

$$\begin{aligned} v_p &= q\sqrt{\frac{e}{y} + m} \\ v_r &= q(1 + \xi - m) \end{aligned} \tag{1}$$

where ξ denotes the disproportionate advantage of the rich. Exogenous parameters m and ξ are bounded by $0 \leq m \leq 1$ and $0 \leq \xi \leq 1$. The expression $\frac{e}{y}$, which is bounded by $0 < \frac{e}{y} < 0.5$, is the public spending on education as share of income.[4] Notice that with imperfect mobility ($m \neq 1$), mismatching across ability and social status occurs.[5] High-ability poor children could end up poor, since $\sqrt{\frac{e}{y} + m} < 1$, and low-ability rich children could become rich, since $0 < (1 + \xi - m) \leq 2$. However, upward mobility reduces the mismatching to some degree by counteracting the asymmetric advantage of the rich, as indicated by the expression $\xi - m$, and that with perfect immobility ($m = 0$), $0 < v_p < q < v_r \leq 1$. Observe furthermore that the probability that a child

[3] For a population normalized to one, y is both the average and the total.

[4] Although this assumption is needed to ensure the probabilities remain within the unit interval, it is not really binding, e.g. US Public spending on education (Primary to tertiary) as a percent of GDP, as the latest available data in 2013 is of 4.6 (see OECD (2017)).

[5] On this topic refer to the contribution of Bernasconi and Profeta (2012), who develop a politico-economic model where public education provides opportunities for the children of the poor to be recognized for their talent, reducing the probability of a mismatch, which takes place when individuals with low talent who come from rich families find jobs that should go to people with high talent (and vice versa).

with poor parents becomes rich, v_p, increases with education and mobility, but the marginal benefit of education decreases with mobility, to a minimum of zero in a perfectly mobile society. On the other hand, the probability that a low-able child of rich parents becomes rich, v_r decreases with mobility and is not affected by public education spending.

Regarding the political setting, we assume that elected legislators, during their mandate, implement proportional tax rate τ on the incomes of rich and poor adult individuals in order to finance public education. We assume that in order to maintain their credibility and being reelected, they are committed to the policy platforms proposed during their electoral campaign. We furthermore assume that the government education budget is balanced, $\tau y = e$.

The timing of the model is as follows. (1) Adult become parents (2) Candidates simultaneously propose an electoral platform τ_A and τ_B. (3) Elections take place and parents vote. (4) The winning candidate implements his proposed platform. (5) Children grow up, their economic status is realized.

3.2 Individual preferred tax rate

Individuals care about their private consumption and about the economic status of their children. The following function specifies the utility of a parent from income group i, as a function of after-tax income and expected future child status.

$$U_i = (1 - \tau)y_i + \beta v_i \theta, \quad i = p, r \tag{2}$$

where β is parental altruistic parameter and θ is the extra utility that they get if their child belongs to the rich group as adult. From Equation (2) the optimal tax rate desired by the two income groups can be obtained.

The first order condition of a poor parent's optimization elucidates the tradeoff he faces from an increase in public education.

$$\frac{dU_p}{d\tau} = -y_p + \frac{q\beta\theta}{2(m+\tau)^{\frac{1}{2}}} = 0. \tag{3}$$

The first term in (3) is the marginal cost of increased provision of public education and is represented by the forgone income due to an increase in the tax. The second term is the marginal benefit of increased public education represented by the increase in the child's chances of getting rich. One can observe that increasing upward mobility reduces this marginal benefit parents get from education, making education comparatively less desirable.

Proposition 1. *The preferred tax rate of the poor parents is decreasing in their income y_p and decreasing in upward mobility m. The tax rate preferred by the rich parents is always zero.*

Proof. Solve for τ from (3) to get

$$\tau_p^* = \left[\frac{q\beta\theta}{2y_p}\right]^2 - m. \tag{4}$$

Meanwhile, maximizing the utility function of the rich parents yields a first order condition of $\tau_r^* = 0$. □

Proposition 1 characterizes the relationship between upward mobility and voter preferences towards in-kind redistribution. It implies that the more upward mobile the society is, the less will be the voter demand for in-kind redistribution, which is in line with the literature on policy preferences and social mobility (Corneo and Gruener, 2002; Alesina and La Ferrara, 2005; Gaviria et al., 2007; Lind, 2007; Rainer and Siedler, 2008; Guillaud, 2013).

3.3 Voting equilibrium

Consider a setting in which the voters elect by majority rule one candidate. Each candidate commits to the policy proposed during the electoral campaign in order to maintain credibility when facing reelection opportunities. Suppose that we have two candidates, each belonging to a party, e.g. one Republican and one Democrat, $L = R, D$. Each candidate proposes a platform τ_R and τ_D, which is assumed to maximize the expected value of some exogenous rent Q. If we denote by π_L the vote share for candidate L, then the probability of candidate L to be elected is given by $p_L = \Pr(\pi_L \geq \frac{1}{2})$ and his expected utility is then $p_L Q$.

As in a simple probabilistic voting model[6], the voting strategy of voter j in group i is affected by (i) the education policy, τ, that is proposed; (ii) his individual ideological bias ϕ_{ij} towards party D, which is uniformly distributed over $[-\frac{1}{2\sigma^i}, \frac{1}{2\sigma^i}]$ where σ^i is group specific; and (iii) some popularity shock δ, which is uniformly distributed over $[-\frac{1}{2\eta}, \frac{1}{2\eta}]$.

Therefore, voters in group i will vote to elect candidate R if $U_i^R > U_i^D + \phi_{ij} + \delta$. That is, all the individuals j in group i for which $\phi_{ij} \leq U_i^R - U_i^R - \delta$ will vote for R, thus his vote share will be:

$$\pi_R = \sum_i \gamma_i \sigma^i (U_i^R - U_i^D - \delta + \frac{1}{2\sigma^i}). \tag{5}$$

The winning probability of legislator R is given by:

$$p_R = \Pr\left(\pi_R \geq \frac{1}{2}\right) = \frac{1}{2} + \frac{\eta}{\sum_i \gamma_i \sigma^i}\left(\sum_i \gamma_i \sigma^i (U_i^R - U_i^D)\right). \tag{6}$$

Proposition 2. *The likelihood of a legislator voting in favor of an expansion in education spending is:*

(i) decreasing in the incomes of both rich and poor parents;

(ii) decreasing in the ratio of the density of the ideological bias in the rich and poor group, i.e. the more responsive to policy are the rich with respect to the poor, the less likely the legislator will vote in favor; and

(iii) decreasing in upward mobility.

Proof. Each legislator will maximize his probability of being elected.

$$\max_{\tau_R} \quad p_R = \frac{1}{2} + \frac{\eta}{\sum_i \gamma_i \sigma^i}\left[\gamma_p \sigma^p (U_p^R - U_p^D)\right] + \frac{\eta}{\sum_i \gamma_i \sigma^i}\left[\gamma_r \sigma^r (U_r^R - U_r^D)\right]$$

where

$$\begin{aligned} U_p^R &= (1 - \tau_R) y_p + \beta\theta q(\tau_R + m)^{\frac{1}{2}} \\ U_r^R &= (1 - \tau_R)\, y_r + \beta\theta q\,(1 - m + \xi)\,. \end{aligned}$$

The first order condition is

$$\frac{\eta}{\Sigma_i \gamma_i \sigma^i}\left[-\gamma_p \sigma^p y_p - (1 - \gamma_p)\,\sigma^r y_r + \gamma_p \sigma^p \frac{q\theta\beta}{\sqrt{(m + \tau_R)}}\right] = 0.$$

[6]Refer to Lindbeck and Weibull (1987) for a first example and Persson and Tabellini (2000) for an adaptation of the former, closer to the one we use here.

Solving for τ_R^*, we get

$$\sqrt{(m+\tau)} = \frac{q\theta\beta}{2(y_p + \frac{(1-\gamma_p)\sigma^r}{\gamma_p\sigma^p} y_r)}$$

which yields

$$\tau_R^* = \frac{1}{\left[\frac{2\left(y_p + \frac{(1-\gamma_p)\sigma^r}{\gamma_p\sigma^p} y_r\right)}{q\theta\beta}\right]^2} - m.$$

The unique equilibrium of this game has both legislators converging on the same strategy.

□

Proposition 2(iii) is the primary theoretical finding that we would like to test in this paper. It says that legislator support for education expansion weakens when upward mobility increases. The remaining part of the paper explores this relationship empirically.

4 Data

An ideal setting that allows us to test our model predictions is the behavior among U.S. state legislators who vote on legislative bills across many policy areas. Of particular interest for this study is the enactment of education policy reforms, which is the result of obtaining majority vote in the two chambers of the state legislature. Moreover, state legislators are elected by voters residing in their electoral districts, making them accountable to their constituency, and thereby responsive to their constituency's preferences. The model developed in the previous section predicts that legislators will decrease their support for redistributive education policy with more upward mobility in the districts they represent. To test this empirically, we use information on roll-call voting outcomes on enacted education bills in California. These voting outcomes are then matched to the upward mobility in the respective electoral district, henceforth called legislative districts (LD). In this section, we describe in detail the data that we use for the analysis.

4.1 Education bills

Education bills are obtained from the website of the California State Legislature (CSL) that publishes information on bill texts and roll-call voting for legislation enacted in every legislative session. Different versions of the bill (henceforth called bill drafts) are published, including the introduced version, the final enacted version, and all the intermediate drafts. We collect all bill drafts and voting outcomes of education bills enacted between 2008 to 2013. To ensure that our analysis captures behavior of legislators towards redistributive education policy, we restrict attention to *inclusive* education bills by using the taxonomy of education reforms proposed by Braga et al. (2013). According to Braga et al. (2013), policies to improve human capital can be classified according to their impact on the distribution of students' educational attainment. Education reforms that affect the bottom tail of the distribution provide school access to those who would otherwise be outside the system, and support low-achieving students, thereby increasing the mean and reducing the variance of the distribution. Braga et al. (2013) call these reforms *inclusive* and identify a set of education reforms satisfying this condition.[7] We use their classification as a guide to narrow down our sample of California bills to those that contain inclusive education reforms. Selection of such bills involve identifying inclusive policies in the bill text using a list of inclusive reform-related terms presented in Table 1.Of the 316 education bills enacted between 2008-2013, 54 of them (17.1%) contain inclusive reforms. Appendix A provides a detailed description of the procedure used for identifying those bills. Figure 1 illustrates which type of reforms were enacted in the two complete legislative sessions in our sample period.[8] Among the three types of inclusive reforms we identify in our sample, expansion of university access is found in the most number bills, while pre-primary expansion and increase grant size occur in about a third of the bills.

Table 1. Inclusive reform terms

Reform[a]	Percent of all bills[b]	Terms used
Inclusive reforms	17.94	
Increase grant size	5.65	Student financial aid/grants, student scholarships, university/college scholarships, tuition equalization, equalization grants, tuition assistance
Pre-primary expansion	6.98	Early learning program, early child education, child learning centers, child care providers/facilities, kindergarten or preschool program/services, pre-K programs, age of pre-kindergarten enrollment, kindergarten enrollment age, admission age of kindergarten/preschool, pre-school fund/programs, preschools for all
Expansion of university access	12.62	College preparatory programs, college readiness, career and technical education, vocational schools/colleges, career coaching/counseling, early college programs, career pathway programs, work-study opportunity grant/program,apprenticeship/internship programs, dual/concurrent enrollment, advanced placement courses,

[a] This table reports only the reforms that appear in at least one bill.
[b] Percentages sum up to more than the total because some bills contain more than one type of inclusive reform.

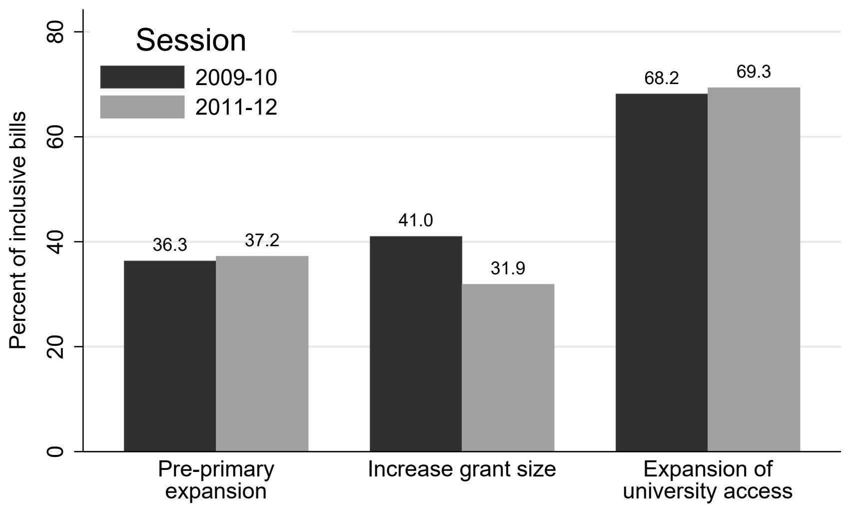


Figure 1: Education reforms by legislative session

[7] Alternatively, policies that affect the upper tail of the distribution, such as encouraging high achievers and boosting the performance of good students through intensified competition, effectively increase both the mean *and* the variance of the educational attainment distribution. They call these reforms *selective*. To obtain their classification they use information on various education reforms across 24 European countries combined with individual information.

[8] Our sample period 2008-213 encompasses only two *complete* legislative sessions, 2009-10 and 2011-12.

4.2 Legislator voting behavior

For each of the bills identified as having inclusive education reforms, we collect roll-call voting information provided by the California State Legislature (CSL). Each round of voting is recorded with the names of all the legislators who voted yes, no, or abstain on a particular draft of the bill. We exclude 16.8% of legislators who moved from the Assembly to the Senate during the sample period to ensure that each legislator represents the same legislative district throughout the sample period. We consider only the votes taken on the floor of the upper chamber (called the Senate) or lower chamber (called the Assembly) and disregard voting in legislative committees. Only the floor votes that are associated with the third reading in each chamber were considered. At this point the bill draft is read with all amendments for a third and last time and taken to a vote for final approval. About 2.5% of the sample of all bills that had more than one recorded third reading vote in either chamber were dropped to ensure that each legislator in our data voted on every bill just once. The result is a sample of 4,496 individual legislator votes on inclusive bills across 97 roll-call voting rounds, 54 legislative bills and 196 legislators. Table 2 presents an overview of the proportion of yes votes for each of a bill's third reading votes. Most of the bills have their third readings on the second to fourth voting round, which means that the first few voting rounds are held in committees before a third reading on the chamber floor takes place. There are a couple of extreme bills whose third readings are held after the 8th voting round, which could potentially indicate that these bills contain many issues and have to be approved by various committees before being voted on by the whole chamber. Third reading votes that occur on the very first voting round have a much lower proportion of legislator support on average, about 63%, compared to those that occur on later rounds. This means that bills that go directly to a floor vote get less support than those that first get committee approval. Looking at the last two columns of the Table 2, one can observe that there are some vote rounds for which there were no opposition. Also, the minimum proportion of yes votes always exceeds 50%, which stems from the fact that our sample contains only enacted bills.[9] Nonetheless, there are some bills wherein the vote outcomes were close to the margin, hovering at 52%.

Table 2. Proportion voting yes for each vote round of a bill

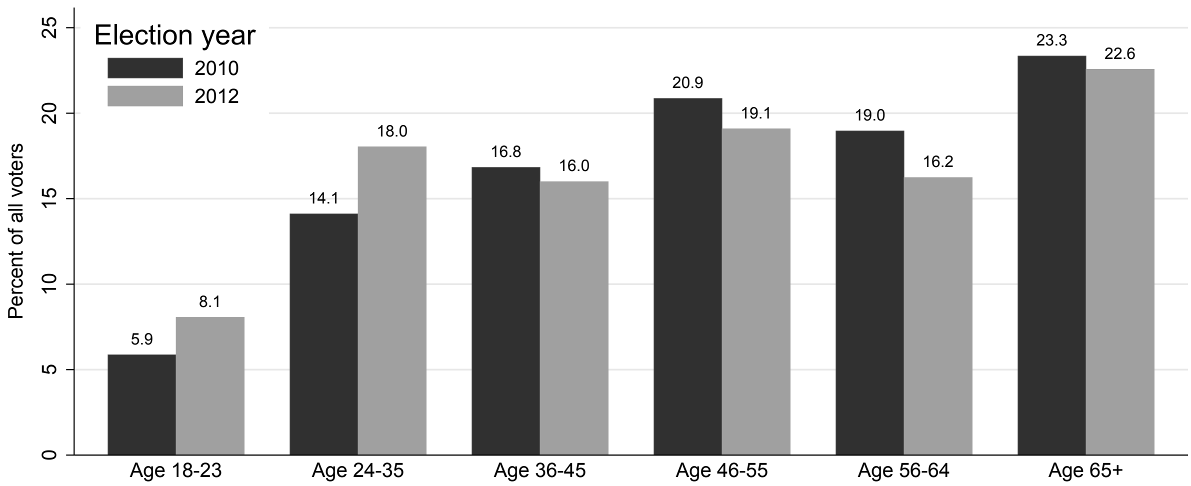
Voting Round	Number of roll call votes	Voted Yes			
		Observations	Percent	Minimum Percent	Maximum Percent
1	12	629	63.12	58.82	76.92
2	16	645	83.41	52.63	100.00
3	22	1,179	79.90	57.97	100.00
4	15	598	84.28	56.67	97.37
5	11	461	84.16	59.42	97.10
6	3	156	76.28	62.71	93.22
7	11	450	80.44	61.02	100.00
8	4	219	84.47	63.64	97.10
9	2	128	98.44	96.61	100.00
12	1	31	64.52	64.52	64.52
Total	97	4,496	79.65	52.63	100.00

4.3 Upward mobility

We supplement our voting data with information on legislative-district upward mobility derived from Chetty et al. (2014b). Using federal income tax records of 40 million parents and children between 1996-2012, Chetty et al.

[9] A bill must pass all voting rounds to be enacted into law.

(2014b) obtained measures for intergenerational mobility across counties and commuting zones in the United States. The scope of this data allowed for the calculation of social mobility across small geographic areas for birth cohorts between 1980-1993. Of particular interest is the measure of absolute upward mobility, defined as the mean percentile rank in the national child income distribution of children with parents at the 25th percentile of the national parent income distribution. The assignment of children to a county is based on where the child grew up.[10] Parent income is defined as the mean family income when the child was between the ages of 15-19. Two values of upward mobility were calculated: first, using child family income at the age of 24, and second at age 26. Since Chetty et al. (2014b) only has data until 2012, we use for each year the cohorts aged 25 and 27 respectively to have upward mobility for all years in our 2008-2013 sample. We take the average of these two mobility measures as a proxy for upward mobility in the county. Although these ages are fairly young, Chetty et al. (2014b) argue mobility at the mid-20s is a reliable summary of intergenerational mobility because estimates fully stabilize at the age of 30. Furthermore, the mid-20s cohort is ideal for our analysis for three reasons: (1) they have just gotten out of the public school system, (2) they are at that age where people start considering having children, and (3) they are young enough for their parents to still be part of the voting population. In fact, Figure 2 shows that the voters aged 65 and above are the largest group of voters in California and that the combined group of parents (65 and older) and children (aged 24-35) consist of almost 40% of the voting population. This is the group for whom the measure of upward mobility is particularly salient, because the children value their mobility, and the parents value their children's mobility. One can moreover observe from the figure that the highest increase in voting population between the 2010 and 2012 elections comes from the 24- to 35-year old voters, making them an important voting group for legislators vying for reelection.



SOURCE: Current Population Survey, Voting and Registration Supplement.

Figure 2: California voters by age group in the 2010 and 2012 elections

Figure 3 shows the trends in the average upward mobility of counties in the United States and in California for the period in which the data is available. California displayed a slightly downward trend throughout this period, despite the fact that national levels were relatively stable.

[10]They use the ZIP code reported in the tax return of the parents on the first year the child was reported as a dependent and they report that only 38% of the children moved out of their county as adults (Chetty et al., 2014a).

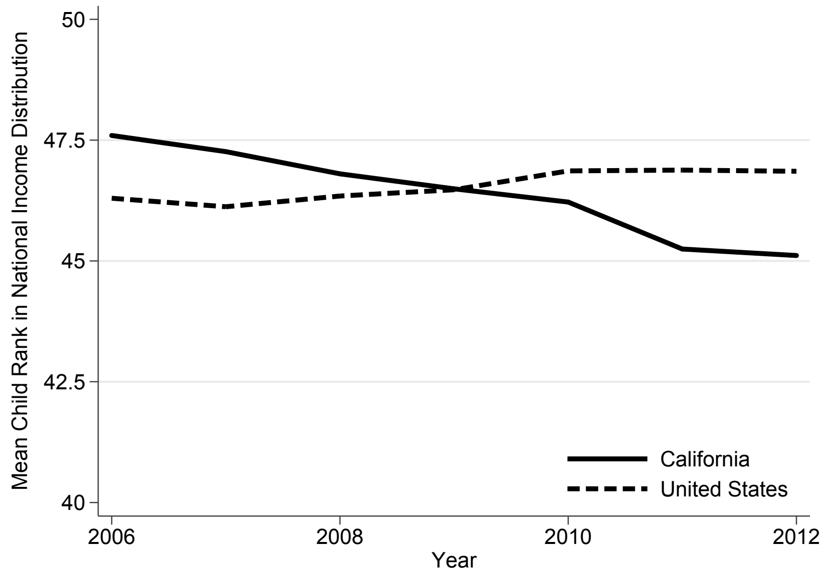


Figure 3: Upward mobility over time

We transform county-level upward mobility measures of Chetty et al. (2014a) into state legislative district (LD)-level measures using population-weighted averages.[11] Figure 4 gives an impression of the spatial variation in upward mobility for California LDs, averaged across the years 2008-2011[12]. Districts along the coastline are relatively more mobile than inland districts and districts around major cities also show generally higher upward mobility.

Finally, we complete our dataset by including time-varying information on legislators and districts. All district-level variables are lagged by one year. Table D5 of the Appendix presents the descriptive statistics on all the variables for the sample of inclusive bills, as well as subsamples for each type of inclusive bill. Table B2 enumerates the data sources.

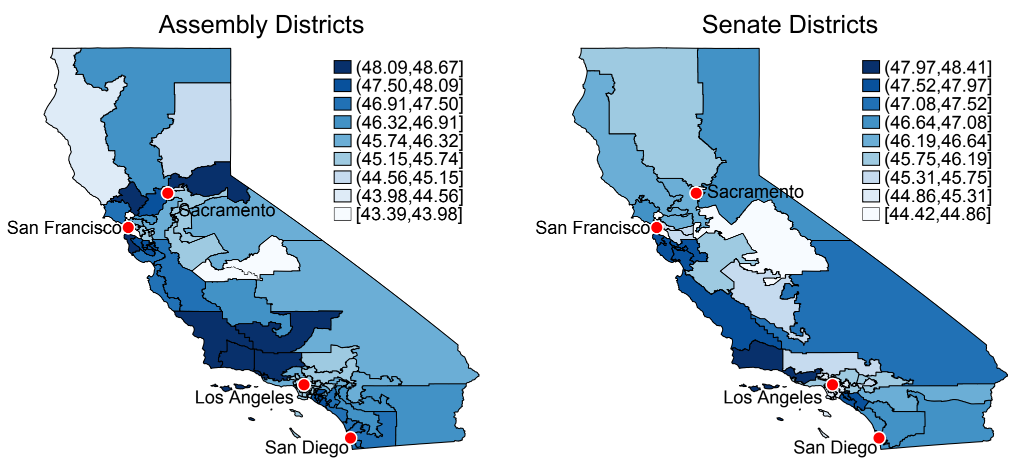


Figure 4: Upward mobility across legislative districts, 2008-2011

[11]Population counts of the U.S. Census Bureau (2010) Census Redistricting Data were used.
[12]Redistricting in 2012 make districts spatially incomparable to prior years.

5 Empirical Strategy

The question we are exploring is whether upward mobility has an influence on the formation of education policy. Our basic empirical approach is to analyze legislator opposition to inclusive education bills through their roll-call vote. Each legislator in our sample voted either yes or no, or abstained on an education bill draft. We use this vote choice as our key dependent variable and estimate the following linear probability model (LPM):

$$No_{ijt} = \alpha_0 + \alpha_1 UpMob_{it} + \boldsymbol{X'_{ijt}\alpha_2} + \theta_t + \gamma_i + u_{ijt} \tag{7}$$

where No_{ijt} is a binary variable indicating a "no" vote by legislator i on inclusive education bill j in period t. The primary regressor of interest is the variable $UpMob_{it}$, which is our proxy for upward mobility in legislator i's district at time t. The vector $\boldsymbol{X}$ represents time-varying controls for legislator (term limited, seat is up for reelection, and the margin of victory in the last election),[13] district (population, income, unemployment, student-teacher ratio, share of students eligible for free lunch, number of charter schools), and bill (introduced in the assembly) characteristics. The term θ_t measures year fixed effects, while γ_i measures legislator fixed effects, and u_{ijk} is an error term. Standard errors are clustered at the bill level. The parameter for year fixed effects control for systemic trends affecting all districts in California. The parameter for legislator fixed effects, on the other hand, controls for certain unobserved, time-invariant legislator characteristics that may confound the relationship between mobility and voting behavior. One possible unobserved characteristic is the degree to which individual legislators respond to their constituencies. In addition, since every legislator represents only one district throughout the sample, the parameter γ_i also controls for district fixed effects.

The parameter of interest in equation (7) is α_2, the coefficient of upward mobility. Proposition 2(iii) of the model predicts less support for education when upward mobility increases, that is, $\alpha_2 > 0$. The higher is the upward mobility in the district of the legislator, the more likely he is to vote "no" on an education bill containing inclusive reforms.

Although the LPM does not take account of the binary nature of our dependent variable, it has the advantage of being able to estimate a fixed effects model despite the potential quasi-complete separation of our data. Quasi-complete separation occurs when a binary outcome variable can be perfectly separated into its two groups by a regressor or a linear combination of regressors (Albert and Anderson, 1984). Given that our dataset consists of *enacted* bills, legislators vote "no" infrequently (see Table 2) causing the parameters for legislator fixed effects to perfectly separate the dependent variable into its two groups. In such cases, the maximum likelihood estimator of non-linear models such as logit or probit does not exist, and the estimate of the parameters causing the quasi-complete separation tend towards infinity (Albert and Anderson, 1984; Santner and Duffy, 1986).[14] For this reason, we use the LPM in order to incorporate legislator fixed effects into the specification, which we believe capture crucial time-invariant ommitted variables that must be controlled for. In section 7, we nonetheless present probit estimations to test the robustness of our results.

[13] Time-invariant legislator characteristics such as gender, party or chamber are included in the legislator fixed effects. Age is captured by the year fixed effects.

[14] Non-linear models remedy this by excluding the observations associated with the legislators that cause the separation. For rare dependent variables such as our no-vote, this requires dropping more than half of the sample.

6 Results

Our main results are presented in Table 3. The dependent variable in all regressions is the dummy for voting "no" on an *inclusive* education bill draft. Each column of the tables represents a different sample of inclusive bills. In column (1) of Table 3, the relevant sample is all the bills containing inclusive reforms, while succeeding columns use samples of bills containing specific types of inclusive reforms. The estimate for upward mobility in the baseline regression (column 1) is positive and highly significant. All things being equal, a standard deviation increase in upward mobility in the legislator's district increases his likelihood of voting "no" on an inclusive bill by 10.5 percentage points, an effect that could spell the difference between failure and passage for some bills on the margin (see Table 2). This is in line with our theoretical prediction that upward mobility reduces support for inclusive reforms.

Table 3. Baseline results

	Dependent variable: Voted No			
	(1) Any inclusive reform	(2) Pre-primary expansion	(3) Increase grant size	(4) Expansion of university access
Upward mobility[a]	0.105***	0.170**	0.210**	0.0791*
	[0.0448,0.165]	[0.0551,0.286]	[0.0868,0.334]	[0.0125,0.146]
Term limited	-0.0233	-0.00910	-0.0275	-0.0273
	[-0.0492,0.00266]	[-0.0535,0.0353]	[-0.0907,0.0356]	[-0.0606,0.00591]
Margin of victory in last election[a]	0.0134	0.0251	0.00671	0.00366
	[-0.00571,0.0324]	[-0.0166,0.0667]	[-0.0228,0.0363]	[-0.0161,0.0234]
Seat is up for election	0.0164	0.0972	0.0790	-0.00829
	[-0.0714,0.104]	[-0.0731,0.268]	[-0.0922,0.250]	[-0.130,0.113]
Assembly bill	0.00653	-0.0262	0.0764	0.0156
	[-0.0686,0.0816]	[-0.170,0.118]	[-0.0575,0.210]	[-0.0809,0.112]
District income per capita (log)[b]	-0.153	-0.458	-1.755	-0.319
	[-1.462,1.157]	[-3.172,2.255]	[-6.545,3.034]	[-2.022,1.384]
District unemployment rate[a,b]	0.0569*	0.0522	0.112	0.0682*
	[0.0107,0.103]	[-0.0650,0.169]	[-0.0616,0.285]	[0.00880,0.128]
District Gini coefficient[a,b]	0.0257	0.0828	0.00797	-0.00638
	[-0.0370,0.0883]	[-0.00169,0.167]	[-0.0789,0.0949]	[-0.0751,0.0624]
District black share[a,b]	0.0158	0.0485	0.105**	-0.00697
	[-0.0549,0.0864]	[-0.0250,0.122]	[0.0329,0.176]	[-0.0857,0.0717]
District hispanic share[a,b]	-0.228*	-0.400	-0.352	-0.270*
	[-0.419,-0.0372]	[-0.830,0.0301]	[-0.975,0.271]	[-0.520,-0.0208]
District share over 65 years old[a,b]	-0.00678	-0.0576	-0.00746	-0.00476
	[-0.0561,0.0425]	[-0.141,0.0263]	[-0.115,0.0996]	[-0.0664,0.0569]
District share below 18 years old[a,b]	0.167**	0.228*	0.297*	0.132*
	[0.0670,0.266]	[0.0155,0.441]	[0.00644,0.588]	[0.00278,0.260]
District preprimary share[a,b]	0.00735	0.0396	0.0345	0.0153
	[-0.0172,0.0319]	[-0.0126,0.0918]	[-0.0228,0.0918]	[-0.0143,0.0449]
District student-teacher ratio[a,b]	0.0603**	0.0827	0.112*	0.0399
	[0.0219,0.0987]	[-0.00198,0.167]	[0.0153,0.209]	[-0.000180,0.0800]
Share of students eligible for free lunch[a,b]	0.00891	0.0472*	0.0330	0.00356
	[-0.0268,0.0447]	[0.00390,0.0904]	[-0.0173,0.0833]	[-0.0382,0.0453]
Number of charter schools in district[a,b]	-0.0123	-0.0304	-0.0443	-0.00458
	[-0.0456,0.0211]	[-0.0990,0.0382]	[-0.114,0.0254]	[-0.0470,0.0379]
Constant	1.683	4.896	18.10	3.153
	[-11.22,14.58]	[-21.96,31.75]	[-29.33,65.54]	[-13.62,19.93]
Year FE	Yes	Yes	Yes	Yes
Legislator FE	Yes	Yes	Yes	Yes
Observations	4,496	1,645	1,357	3,020
R-squared	0.3052	0.4720	0.5530	0.2464

Robust standard errors clustered by bill, 95% confidence intervals in brackets. *** p <0.001, ** p <0.01, * p <0.05.
[a] Expressed in standard deviations.
[b] Lagged by one year.

When the sample is disaggregated to specific types of inclusive reforms in columns (2) to (4), we find positive and significant coefficients for all three types, although the point estimate in column (3) is more than double in magnitude, suggesting that effect is strongest for reforms that provide scholarships and financial aid to students. The impact of upward mobility is indeed statistically significantly different between those reforms and the ones related to university access. [15] The positive and significant coefficients of upward mobility in all columns nevertheless indicate that there is an effect of upward mobility for any type of inclusive education policies.

Table 3 also reveals that the propensity to oppose an inclusive education reform is affected by district characteristics. More unemployment in the district induces more opposition to inclusive reforms, particularly in university access. When economic circumstances worsen, legislators might prefer to divert funds to policies that address the problem directly instead of appropriating to education. Meanwhile, a larger hispanic population induces on average more support for inclusive policies, in particular, university expansion; while a larger black population induces on average less support for increasing grant size. The positive coefficient of black share might seem counter-intuitive because districts with more minorities tend to be poorer and would therefore benefit more from inclusive education policies. However, of the 196 legislators in our sample, only 6.1% are black.[16] Since one would expect a legislator of a certain race to vote in favor of his minority, the weak representation of the black population in the legislature might explain the positive coefficient of the black share in column (3).[17]

Finally, the estimates in Table 3 reveal that a younger district population and a higher student-teacher ratio increase the probability of voting "no" on inclusive education reforms. This effect of student-teacher ratio is in particular driven by the opposition to financial support for higher education. Since increases in the young population and the student teacher ratio are related to secondary school education, this result suggests that a substitution might take place between secondary and higher education reforms when the need for secondary school access increases.

Thus far we have found that an increase in upward mobility in a legislator's district increases his likelihood of opposing an inclusive education bill by a little over 10 percentage points. We now consider the possibility that this effect varies depending on other legislator and district characteristics. To see this, we interact upward mobility with individual controls from the baseline specification. Adding interaction terms to the regression yields a marginal effect of upward mobility of 11.8 percentage points, which is of similar magnitude as the estimate in our baseline regressions (10.5 percentage points).[18] It also reveals that the influence of upward mobility increases significantly with inequality and student-teacher ratio. Figures 5(a) and **??** show these results graphically.

A low student-teacher ratio can signal better school quality in the district. The positive interaction effect could therefore imply that the when the quality of schooling decreases, the more responsive legislators become to upward mobility, that is, the stronger is the substitution between upward mobility and education. In our model, upward mobility and education essentially serve the same purpose: to augment the economic status of the children. If education quality falls, upward mobility becomes comparatively more effective at achieving this purpose, thereby intensifying its effect. This is indeed what we find in the data.

With respect to inequality, our results suggest that an increase of one standard deviation in inequality in the district

[15] The null hypothesis of the coefficients being equal in the two sub-samples of grant size and university access reforms can be rejected at the 5% significance level ($\chi^2 = 5.81$, $p = 0.0159$), while in all the other pairwise comparisons the null cannot be rejected.

[16] In comparison to hispanic legislators which comprise 15.3% of our sample.

[17] Refer to the seminal contribution of Alesina et al. (1999) on ethnic division and public good provisions and the more recent contributions of Desmet et al. (2009) on linguistic division and Bellani and Scervini (2015) on socio-demographic heterogeneity and public good provision in support of this claim.

[18] Refer to Table D3 in the Appendix.

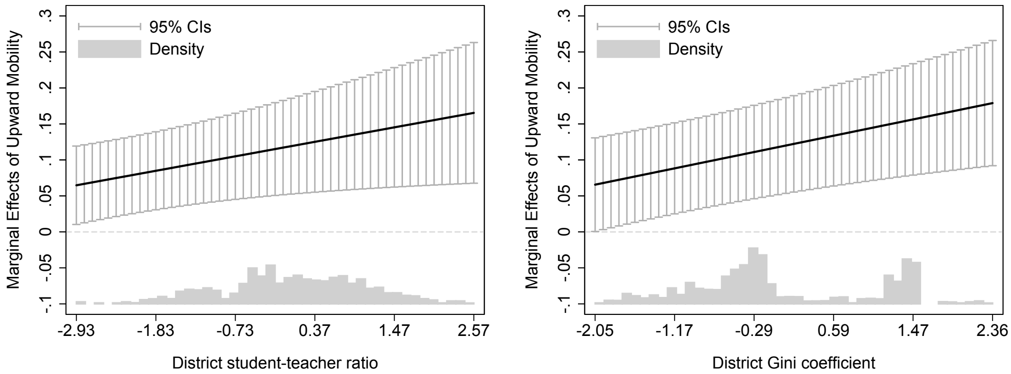


Figure 5: Marginal effect of upward mobility

increases the average impact of a standard deviation increase in upward mobility from 11.8 to 14.4 percentage points. Consistent with previous theoretical contributions, we would expect that the higher the inequality, the higher is the support for redistribution.[19] More support for redistribution, in our theoretical setting, could be perceived as an increase in the importance poor parents give to their current consumption relative to the importance they give to the future status of their children. In this scenario, reelection seeking legislators would even more likely oppose inclusive education reform for the same level of upward mobility, as we see in our data.

In exploring further possible heterogeneity in the effects of upward mobility, it is also instructive to estimate the baseline specification for different subsamples of the data. We do this in Table 4. The upper panel divides the sample according to district characteristics, while the lower panel divides the sample according to legislator characteristics. The main result is robust to splitting the sample by income, inequality and gender. When it comes to comparing the effect for high- and low-mobility samples (column (3)), we see that upward mobility is only statistically different from zero in high-mobility districts. Such a result is consistent with column (4) where we divide the sample by coastal and inland districts, since districts along the coast tend to be more upward mobile (as seen in Figure 4). These results, however, do not control for the possibility that districts with different characteristics may choose to elect different legislators that respond to upward mobility in a dissimilar manner. Table D4 of the Appendix presents test of means of legislator characteristics across different subsamples. It suggests that low-mobility, low-income and high-inequality districts tend to elect more black or hispanic legislators. Conversely, if high-mobility districts elect more non-black and non-hispanic legislators, this could explain why the coefficient of upward mobility in columns (3) and (5) of Table 4 are very close in magnitude and significance. We also get an unexpected result that hispanic legislators respond to upward mobility in the opposite direction as the rest. An increase in upward mobility increases their support for inclusive education reforms. It is however possible that this is a result of the fact that hispanic legislators are on average more likely to represent very different districts in terms of inequality, mobility, unemployment rate and also school quality, as shown in Table D4.

[19]See among others Borck (2007); Alesina and Giuliano (2010); Bellani and Ursprung (2016) for surveys of this literature.

Table 4. Subsample regressions

	(1) Income		(2) Inequality		(3) Mobility		(4) Geography	
	Low	High	Low	High	Low	High	Coast	Inland
Upward mobility[a]	0.162*	0.0876*	0.0990**	0.165*	0.0883	0.107**	0.116**	0.141
	[0.0389,0.285]	[0.0210,0.154]	[0.0410,0.157]	[0.0389,0.292]	[-0.00802,0.185]	[0.0343,0.179]	[0.0466,0.186]	[-0.0355,0.318]
Observations	2,184	2,312	2,217	2,279	2,375	2,121	3,520	976
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

	(4) Gender of legislator		(5) Race of legislator		
	Female	Male	Non-black, non-hispanic	Black	Hispanic
Upward mobility[a]	0.0973**	0.0919**	0.122***	0.563	-0.0732*
	[0.0291,0.165]	[0.0237,0.160]	[0.0543,0.189]	[-0.558,1.683]	[-0.141,-0.00572]
Observations	1,224	3,272	3,491	285	720
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Dependent variable is the probability of voting “no” on a bill. The sample consists of all types of inclusive bills. Robust standard errors clustered by bill, 95% confidence intervals in brackets. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

[a] Expressed in standard deviations.

7 Robustness Checks

In this section we conduct robustness checks of the baseline results. The first set of checks involves alternative definitions of inclusive bills and upward mobility presented in the top panel of Table 5. Given the fact that we are extracting information from legal text, and given the complexity of legal parlance, we might be concerned that our algorithm identifies both false positive and false negative inclusive bills. False positives occur when inclusive terms are mentioned in bills that have nothing to do with inclusive reforms. On the other hand, false negatives occur when bills that propose inclusive reforms do not use the exact terms included in the list given in Table 1. For this reason we also looked deeper into the education bills and subjectively identified those containing inclusive reforms. We then estimate the specification using the sample of subjectively identified bills and present the results in column (1) of Table 5. We also estimate the same specification using a strict sample of bills that were identified as inclusive by both subjective *and* objective methods (column (2)). In both cases the coefficients of upward mobility are positive and statistically significant at 5%, suggesting that our results are robust to various definitions of inclusive bills.

Recall that the proxy for upward mobility we have been using is the average upward mobility of the 25- and 27-year olds in the district. Column (3) tests whether our results hold when using only the mobility of the 25-year old cohort. One would expect this to be a weaker proxy of upward mobility as it was measured for a younger cohort. Nevertheless, the coefficient of this variable remains positive and statistically significant.

Table 5. Robustness checks

	(1) Subjective inclusive bills	(2) Strict inclusive bills	(3) Mobility of 25-year olds
Upward mobility[a]	0.0812**	0.109**	0.0812***
	[0.0250,0.137]	[0.0314,0.186]	[0.0454,0.117]
Observations	4,268	2,571	4,496
Year FE	Yes	Yes	Yes
Legislator FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
	(4) Abstain votes removed	**(5) Bills with only one third reading removed**	**(6) Horrace-Oaxaca trimmed sample**
Upward mobility[a]	0.0942**	0.0991**	0.118***
	[0.0279,0.160]	[0.0340,0.164]	[0.0577,0.179]
Observations	4,096	4,256	3,255
Year FE	Yes	Yes	Yes
Legislator FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes

Dependent variable is the probability of voting "no" on a bill. The sample consists of all types of inclusive bills. Robust standard errors clustered by bill, 95% confidence intervals in brackets. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

[a] Expressed in standard deviations.

The next set of robustness checks test different variations of a reduced sample of observations. In our baseline specification, the regressions include both yes votes and abstain as the base category of the dependent variable. However, choosing to abstain from the vote could potentially signal a different kind of behavior from choosing to

Table 6. Comparing LPM and Probit estimates

	(1) No FE	(2) Year FE	(3) Year & Legislator FE
Upward mobility[a]			
Probit (marginal effects)	0.0624***	0.0511***	0.133**
	[0.0394,0.0853]	[0.0328,0.0695]	[0.0331,0.233]
Linear probability model	0.0880***	0.0932***	0.151**
	[0.0555,0.121]	[0.0572,0.129]	[0.0620,0.241]
Corr($\hat{y}_{Pr}, \hat{y}_{LPM}$)	0.8804	0.8692	0.9065
Observations	4,496	4,496	1,958
Controls	Yes	Yes	Yes
Year FE		Yes	Yes
Legislator FE			Yes

Dependent variable is the probability of voting "no" on a bill. The sample consists of all types of inclusive bills. Robust standard errors clustered by bill, 95% confidence intervals in brackets. *** p <0.001, ** p <0.01, * p <0.05.

[a] Expressed in standard deviations.

vote yes. It would therefore be instructive to test whether the results still hold after excluding the abstain votes, which make up 8.9% of the sample. Column (4) shows that this reduction in sample size has only a marginal impact on the size and significance of the upward mobility estimate.

The legislative process in California requires that proposed bills go through both chambers of the legislature before it is enacted into law. This means that each of the enacted bills in our sample must have had at least two-third reading voting rounds, one for the Senate, and one for the Assembly. There are, however, enacted bills in our sample that have only one reported voting outcome. There are two possible reasons for this. Either the bill was reported as enacted when in fact it was not (a false positive), or the missing voting round was not published on the CSL website. For these reasons, we re-run the baseline regressions with a reduced sample that exclude these cases (making up 1.6% of all bills.) Column of (6) of Table 5 presents the results of this exercise. The coefficient of upward mobility is not affected by the removal of these bills from the sample.

Another robustness check addresses concerns about the use of the LPM in estimating a binary "no"-vote outcome variable. The LPM has the disadvantage of yielding predicted probabilities outside of the unit interval, and–more importantly–yielding biased and inconsistent estimators under certain conditions. These conditions were formalized by Horrace and Oaxaca (2006), who show that the LPM estimates will be unbiased and consistent when all predicted probabilities fall within the unit interval. The more observations with predicted probabilities outside of the unit interval, the larger is the bias. Horrace and Oaxaca (2006) thus recommend trimming the sample of observations that fall outside of the unit interval to reduce the extent of the bias. In the baseline specification in Table 3, column (1), about 28% of the predicted values fall outside the unit interval. In column (6) of Table 5 we exclude these observations, which considerably reduces the sample size, but the upward mobility estimate remains remarkably stable.

Given the nature of our dataset of *enacted* education bills, there are relatively fewer instances in which a legislator votes 'no'. As already mentioned in Section 5, adding controls for legislator fixed effects in the specification there-

Table 7. Falsification Tests.

	(1) Bills without inclusive reforms	(2) Rank-rank slope	(3) Random mobility
Upward mobility[a]	0.0190		
	[-0.00384,0.0419]		
Rank-rank slope[a]		-0.0905	
		[-0.228,0.0472]	
Random mobility[a]			-0.00220
			[-0.0104,0.00604]
Observations	22,603	4,496	4,496
Year FE	Yes	Yes	Yes
Legislator FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes

Dependent variable is the probability of voting "no" on a bill. The sample consists of all types of inclusive bills. Robust standard errors clustered by bill, 95% confidence intervals in brackets. *** p <0.001, ** p <0.01, * p <0.05.

[a] Expressed in standard deviations.

fore causes quasi-complete separation of the data, which non-linear probit or logit models remedy by excluding observations. We investigate the difference between linear and non-linear estimation models in more detail in Table 6, where we compare the LPM estimate to the probit marginal effects across different specifications. At the bottom of each column are the correlation coefficients of the predicted probabilities obtained from the probit and LPM estimations. There is a high positive correlation between the two predicted probability vectors, indicating that the predicted values generated by the LPM and the probit regressions do not differ considerably. One can also observe that the coefficient of upward mobility in the probit models are slightly smaller compared to the LPM, suggesting that the LPM estimates might be upward biased. Note however that the number of observations in column (3) has fallen substantially due to quasi-complete separation.[20] The resulting probit estimates are positive and significant across all specifications. The effect we find of upward mobility remains regardless of whether a linear or non-linear estimation procedure is used.

Finally, we conduct a number of falsification tests to strengthen our baseline result. Table 7 presents the estimates of three falsification tests, the first of which is a regression using the sample of bills not containing any inclusive reforms. A positive coefficient in this regression would cast doubt on the primary logic of our theoretical framework. In column (1) we see that as expected, upward mobility has no statistically significant effect on legislator opposition to bill that do not contain inclusive reforms.

The second falsification test investigates whether a more general measure of social mobility has an impact on the voting behavior of legislators. Recall that the mobility measure we have used thus far involves the income rank of only those children whose parents come from the bottom quartile of the income distribution. It is however possible that our findings are driven by social mobility across the full parent income distribution. To see whether it is indeed *upward* mobility that is driving the results and not mobility across the whole distribution, we run the baseline specification using another measure of social mobility generated by Chetty et al. (2014a), called the *rank-rank slope* (RRS). The RRS is the correlation between child and parent percentile rank in the national family

[20]For purposes of comparison, the LPM coefficient in column (3) is estimated using the same sample of 1,958 observations.

income distribution.[21] and essentially captures social *immobility* of the population. The higher the RRS, the more correlated is a child's income to his parents', regardless of his parents' position in the distribution. The results of the regression with the RRS are presented in column (2) of Table 7. The estimate of the RRS is not significant, confirming that our findings are indeed specific to mobility from the bottom quartile of the income distribution,[22] i.e. *upward* mobility.

Column (3) presents results of a falsification test that randomly assigns to the legislative districts mobility levels drawn from the same distribution as our upward mobility variable.[23] If this random mobility variable yields the same results as our baseline estimates, it would call into question the relationship we find between upward mobility and legislator opposition towards inclusive reforms. We therefore do not expect to find an association between this mobility variable and legislator voting behavior. Indeed, this is what we observe in the last column of Table 7.

8 Conclusion

This paper is among the first to investigate the link between upward mobility and legislator voting behavior. We develop a probabilistic voting model where voters care about the social-economic status of their children, whose opportunities are augmented both by (endogenous) education policies and by (exogenous) upward mobility. We find that an increase in upward mobility decreases the marginal benefit of public education for the poor, thereby decreasing the support for education reform of re-election seeking legislators. We test this hypothesis empirically using a new dataset that compiles California education legislation matched with legislative voting outcomes and electoral district-level upward mobility. We focus primarily on education bills that are redistributive in nature, called *inclusive bills*, and find that indeed, more upward mobility in a legislator's district reduces his support for inclusive education policies. The data also suggest that this effect is stronger for reforms increasing student grants, which are mainly related to secondary education, compared to university access policies. We furthermore find that the effect varies according to inequality and student-teacher ratio in the district. The main results are robust to different definitions of inclusive bills, changes in the sample and the choice of estimation procedure.

While we provide some evidence that upward mobility is relevant for the enactment of redistributive education reforms, exploring whether it influences the formation of other types of policy, such as social welfare, would be a natural avenue for further research.

References

Albert, A. and Anderson, J. A. (1984). On the existence of maximum likelihood estimates in logistic regression models. *Biometrika*, 71(1):1–10.

Alesina, A., Baqir, R., and Easterly, W. (1999). Public goods and ethnic divisions. *Quarterly Journal of Economics*, 114:1243–1284.

Alesina, A. and Giuliano, P. (2010). Preferences for redistribution. In Benhabib, J., Jackson, M. O., and Bisin, A., editors, *Handbook of Social Economics*, pages 93–131. The Netherlands: North Holland.

[21] According to Chetty et al. (2014a,b), the RRS is a more robust measure of intergenerational mobility than the traditional intergenerational income elasticity (IGE).

[22] One interesting question that arises at this point is to find the threshold level of the distribution for which the effect of upward mobility becomes insignificant. This question however cannot be answered with the data we have available. Such an investigation requires the confidential federal income tax records obtained by Chetty et al. (2014b).

[23] Figure C6 shows the comparison between the distributions of our upward mobility variable and the random mobility variable.

Alesina, A. and La Ferrara, E. (2005). Preferences for redistribution in the land of opportunities. *Journal of Public Economics*, 89:897– 931.

Alesina, A., Stantcheva, S., and Teso, E. (2017). Intergenerational mobility and support for redistribution. Technical report, National Bureau of Economic Research. Working Paper 23027.

American Community Survey (2016). 3-Year Estimates.

Bellani, L. and Scervini, F. (2015). Heterogeneous preferences and in-kind redistribution: Theory and evidence. *European Economic Review*, 78:196 – 219.

Bellani, L. and Ursprung, H. W. (2016). The political economy of redistribution policy. WP 6189, CESifo.

Benabou, R. and Ok, E. A. (2001). Social mobility and the demand for redistribution: The POUM hypothesis. *The Quarterly Journal of Economics*, 116(2):447–487.

Bernasconi, M. and Profeta, P. (2012). Public education and redistribution when talents are mismatched. *European Economic Review*, 56(1):84 – 96.

Borck, R. (2007). Voting, inequality and redistribution. *Journal of Economic Surveys*, 21(1):90–109.

Braga, M., Checchi, D., and Meschi, E. (2013). Educational policies in a long-run perspective. *Economic Policy*, 28(73):45–100.

Bureau of Labor Statistics (2017). Local area unemployment statistics. Published online.

California Department of Education (2016). Staff Data Files.

California State Legislature (2016). Bill Information Archives.

Checchi, D. and Filippin, A. (2004). An experimental study of the POUM hypothesis. In Cowell, F., editor, *Inequality, Welfare and Income Distribution: Experimental Approaches (Research on Economic Inequality, Volume 11)*, pages 115–136. Emerald Group Publishing Limited.

Chetty, R., Hendren, N., Kline, P., and Saez, E. (2014a). Where is the land of opportunity? The geography of intergenerational mobility in the United States. *Quarterly Journal of Economics*, 129(4).

Chetty, R., Hendren, N., Kline, P., Saez, E., and Turner, N. (2014b). Is the United States still a land of opportunity? Recent trends in Intergenerational mobility. *American Economic Review Papers and Proceedings*, 104(5):141–147.

Corneo, G. and Gruener, H. P. (2002). Individual preferences for political redistribution. *Journal of Public Economics*, 83(1):83 – 107.

Danziger, L. and Ursprung, H. W. (2001). Risk aversion and social mobility: The implausibility of order-preserving income redistributions. *Economics Letters*, 71:9–13.

Desmet, K., Weber, S., and Ortuño Ortín, I. (2009). Linguistic diversity and redistribution. *Journal of the European Economic Association*, 7(6):1291–1318.

Gaviria, A., Graham, C., and Braido, L. H. B. (2007). Social mobility and preferences for redistribution in Latin America [with Comments]. *Economica*, 8(1):55–96.

Guillaud, E. (2013). Preferences for redistribution: An empirical analysis over 33 countries. *The Journal of Economic Inequality*.

Hirschman, A. O. (1973). The changing tolerance for income inequality in the course of economic development (with a mathematical appendix by Michael Rothschild). *The Quarterly Journal of Economics*, 87(4):544–566.

Horrace, W. C. and Oaxaca, R. L. (2006). Results on the bias and inconsistency of ordinary least squares for the linear probability model. *Economics Letters*, 90:321–327.

Klarner, C., Berry, W. D., Carsey, T., Jewell, M., Niemi, R., Powell, L., and Snyder, J. (2013). State legislative election returns (1967-2010) ICPSR34297-v1.

Lind, J. T. (2007). Does permanent income determine the vote? *The B.E. Journal of Macroeconomics*, 7(1).

Lindbeck, A. and Weibull, J. W. (1987). Balanced-budget redistribution as the outcome of political competition. *Public Choice*, 52(3):273–297.

National Center for Education Statistics (2016). Common core data.

OECD (2017). Public spending on education. DOI: 10.1787/6932ce5c-en. Accessed 07 May 2017.

Okun, A. M. (1975). *Equality and efficiency: The big tradeoff*. The Brookings Institution, Washington, DC.

Persson, T. and Tabellini, G. (2000). *Political economics: Explaining economic policies*. The MIT Press.

Piketty, T. (1995). Social mobility and redistributive politics. *The Quarterly Journal of Economics*, 110(3):551–584.

Piketty, T. (2014). *Capital in the 21st century*. Harvard University Press.

Rainer, H. and Siedler, T. (2008). Subjective income and employment expectations and preferences for redistribution. *Economics Letters*, 99:449–453.

Ravallion, M. and Lokshin, M. (2000). Who wants to redistribute? The tunnel effect in 1990s Russia. *Journal of Public Economics*, 76:87–104.

Santner, T. J. and Duffy, D. E. (1986). A note on A. Albert and J. A. Anderson's conditions for the existence of maximum likelihood estimates in logistic regression models. *Biometrika*, 73:755–758.

U.S. Census Bureau (2010). The 2010 Census redistricting data sets.

Appendices

Appendix A Identification of inclusive bills

In this appendix we describe the algorithm we use to identify inclusive bills. Our interest is in determining for each bill whether its text contains inclusive reforms. The simplest way to do this would be to do a count of inclusive-related words in the bill text. The problem with this simple word count is that it ignores the direction of the reform. For example, a reform that says "abolish the kindergarten program" will be identified as an inclusive reform by a simple word count of "kindergarten program", but would not be an inclusive reform. To remedy this, we augment our simple word count by using nearby qualifying words that indicate the correct direction of an inclusive reform. Table A1 presents the list of qualifiers we use for each of the inclusive-related policy terms we locate in the bill text. Only the bills with reform terms accompanied by these qualifiers will be tagged as inclusive reforms.

To accomplish this task, we borrow a concept from computational linguistics called the N-gram, which is a sequence of n adjacent terms taken from a longer sequence of text. An N-gram is essentially an n-word slice of a sentence. Every sentence is typically sliced into a set of overlapping N-grams. For example, the sentence "The bill is long" will have the following N-grams of length 2 (bi-grams): "the bill", "bill is", and "is long." For our purposes, we set the length of the N-grams to 5 words (5-grams), so that we can capture a maximum of 4 words to the left and to the right of each reform term. We therefore take 5-grams of every sentence in the bill text and keep only those 5-grams that contain both the reform term *and* its associated qualifiers. The bills which contain such 5-grams are our inclusive bills.

Table A1. List of qualifiers associated with reform terms

Reform terms	Qualifiers
Panel A: Pre-primary expansion	
Age of pre-kindergarten enrollment, kindergarten enrollment age, admission age of kindergarten/preschool	Decrease, lower, reduce
Pre-school fund/programs, preschools for all, pre-K programs, child learning centers, child care providers/facilities, early learning program, early child education, kindergarten or preschool program/services	Establish, develop, create, support, offer, expand, provide, appropriate, fund, administer, implement
Panel B: Increase grant size	
Tuition equalization, equalization grants, tuition assistance, student scholarships, university/college scholarships, student financial aid/grants	Offer, increase, fund, establish, provide, appropriate, create, add
Panel C: Expansion of university access	
Work-study opportunity grant/program, apprenticeship/internship programs, dual/concurrent enrollment, advanced placement courses, career pathway programs, early college programs	Allow, broaden, strengthen, authorize, support, establish, grant, develop, create, offer, expand, provide, appropriate, fund, administer, implement
College preparatory programs, college readiness, career and technical education, vocational schools/colleges, career coaching/counseling	Strengthen, broaden, authorize, establish, develop, create, offer, expand, provide, appropriate, fund, administer, implement

Appendix B Data sources

Table B2. Data sources

Variables	Sources
Inclusive and selective reforms	Authors' calculations from bills texts provided by the California State Legislature (2016).
Upward mobility, rank-rank slope	Chetty et al. (2014a,b)
Legislator votes	California State Legislature (2016)
Margin of victory in last election	Klarner et al. (2013)
Unemployment rate	Bureau of Labor Statistics (2017) Local Area Unemployment Statistics
Demographic variables	American Community Survey (2016) Tables B01001, B03002, B19083 and U.S. Census Bureau (2010) Redistricting Data
Income and Gini coefficient	American Community Survey (2016) Tables B19301 and B19083
Student-teacher ratio in district	National Center for Education Statistics (2016) Common Core Data supplemented by the California Department of Education (2016) Staff Demographics Data for 2011.
Total students in district and pre-primary share	National Center for Education Statistics (2016) Common Core Data
Share of students eligible for free lunch	National Center for Education Statistics (2016) Common Core Data
No. of charter schools in district	National Center for Education Statistics (2016) Common Core Data

Appendix C Histograms of upward mobility and random mobility

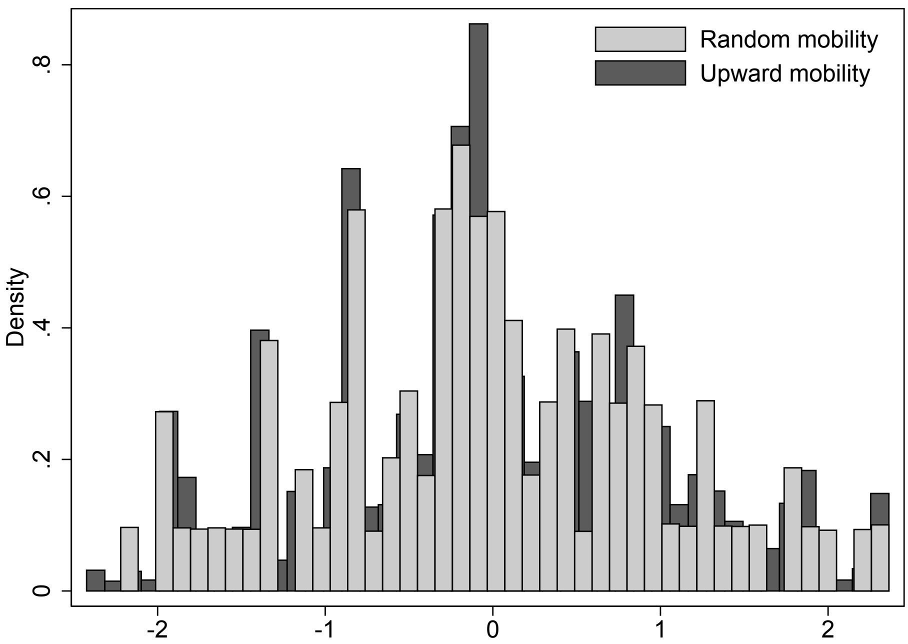


Figure C6: Histograms

Table D3. Upward mobility interacted with control variables

	(1) Regression with interactions	(2) Marginal effects
Upward mobility[a]	0.211	0.118***
	[-3.567,3.988]	[0.0522,0.185]
Margin of victory[a]	0.0158	0.0158
	[-0.00208,0.0337]	[-0.00208,0.0337]
Upward mobility[a] × Margin of victory[a]	-0.00553	
	[-0.0189,0.00781]	
Income per capita (log)[b]	0.200	0.200
	[-0.970,1.370]	[-0.970,1.370]
Upward mobility[a] × Income per capita (log)[b]	-0.00843	
	[-0.376,0.360]	
Unemployment rate[a,b]	0.121*	0.121*
	[0.0255,0.216]	[0.0255,0.216]
Upward mobility[a] × Unemployment rate[a,b]	0.00616	
	[-0.0282,0.0405]	
District Gini coefficient[a,b]	0.0458	0.0458
	[-0.0233,0.115]	[-0.0233,0.115]
Upward mobility[a] × District Gini coefficient[a,b]	0.0257**	
	[0.00867,0.0428]	
Black share[a,b]	0.0129	0.0129
	[-0.0919,0.118]	[-0.0919,0.118]
Upward mobility[a] × Black share[a,b]	0.0195	
	[-0.0237,0.0626]	
Hispanic share[a,b]	-0.291*	-0.291*
	[-0.549,-0.0324]	[-0.549,-0.0324]
Upward mobility[a] × Hispanic share[a,b]	-0.0294	
	[-0.0756,0.0167]	
Share over 65 years old[a,b]	-0.0619	-0.0619
	[-0.130,0.00654]	[-0.130,0.00654]
Upward mobility[a] × Share over 65 years old[a,b]	-0.0194	
	[-0.0631,0.0242]	
Share below 18 years old[a,b]	0.151**	0.151**
	[0.0437,0.258]	[0.0437,0.258]
Upward mobility[a] × Share below 18 years old[a,b]	-0.00778	
	[-0.0632,0.0476]	
District preprimary share[a,b]	0.0147	0.0147
	[-0.0193,0.0487]	[-0.0193,0.0487]
Upward mobility[a] × District preprimary share[a,b]	0.00269	
	[-0.0235,0.0289]	
Student-teacher ratio[a,b]	0.0706*	0.0706*
	[0.0162,0.125]	[0.0162,0.125]
Upward mobility[a] × Student-teacher ratio[a,b]	0.0183*	
	[0.00160,0.0350]	
Share of free-lunch students[a,b]	0.0180	0.0180
	[-0.00734,0.0433]	[-0.00734,0.0433]
Upward mobility[a] × Share of free-lunch students[a,b]	0.0180	
	[-0.0261,0.0621]	
Charter schools in district[a,b]	0.00311	0.00311
	[-0.0276,0.0338]	[-0.0276,0.0338]
Upward mobility[a] × Charter schools in district[a,b]	0.0130	
	[-0.0128,0.0388]	
Term limited	-0.0160	-0.0160
	[-0.0477,0.0158]	[-0.0477,0.0158]
Term limited × Upward mobility[a]	-0.00831	
	[-0.0311,0.0145]	
Seat is up for election	0.0198	0.0198
	[-0.0595,0.0991]	[-0.0595,0.0991]
Seat is up for election × Upward mobility[a]	-0.0207	
	[-0.0645,0.0231]	
Assembly bill	0.00515	0.00515
	[-0.0683,0.0786]	[-0.0683,0.0786]
Assembly bill × Upward mobility[a]	0.00588	
	[-0.0377,0.0494]	
Observations	4,496	4,496
Year FE	Yes	
Legislator FE	Yes	
Controls	Yes	

Dependent variable is the probability of voting "no" on a bill. The sample consists of all types of inclusive bills. Robust standard errors clustered by bill, 95% confidence intervals in brackets. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

[a] Expressed in standard deviations.

[b] Lagged by one year.

Table D5. Descriptive statistics

					Sub-sample											
	Any inclusive reform $N = 4,496$ Bills $= 54$				Pre-primary expansion $N = 1,645$ Bills $= 21$				Increase grant size $N = 1,357$ Bills $= 17$				Expansion of university access $N = 3,020$ Bills $= 38$			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Mobility																
Upward mobility	45.9287	1.4575	42.3959	49.3727	46.0085	1.4540	42.3959	49.3727	45.9859	1.4214	42.3959	49.3727	45.8848	1.4517	42.3959	49.3727
Rank-rank slope	0.1742	0.0181	0.1388	0.2356	0.1744	0.0180	0.1388	0.2356	0.1743	0.0180	0.1388	0.2356	0.1740	0.0181	0.1388	0.2356
Legislator characteristics																
Voted Yes	0.7965	0.4027	0	1	0.7198	0.4493	0	1	0.7104	0.4537	0	1	0.8152	0.3882	0	1
Voted No	0.1145	0.3185	0	1	0.1653	0.3716	0	1	0.1651	0.3714	0	1	0.0993	0.2992	0	1
Abstained	0.0890	0.2847	0	1	0.1149	0.3190	0	1	0.1245	0.3303	0	1	0.0854	0.2796	0	1
Term limited	0.3287	0.4698	0	1	0.3313	0.4708	0	1	0.3419	0.4745	0	1	0.3305	0.4705	0	1
Seat is up for election	0.3136	0.4640	0	1	0.3009	0.4588	0	1	0.2778	0.4481	0	1	0.3099	0.4625	0	1
Margin of victory in last election	34.4209	22.9377	0.2000	100	34.9361	23.0771	0.2000	100	35.4082	23.3870	0.2000	100	34.2925	22.8978	0.2000	100
Bill characteristics																
Assembly bill	0.5632	0.4960	0	1	0.5015	0.5001	0	1	0.5851	0.4929	0	1	0.5964	0.4907	0	1
District characteristics																
Income per capita (log)	10.2649	0.1981	9.8085	10.7643	10.2641	0.1985	9.8085	10.7643	10.2686	0.1983	9.8085	10.7643	10.2659	0.1981	9.8085	10.7643
Unemployment rate	9.5205	3.1861	3.8000	18.5871	9.2234	3.2464	3.8000	18.5871	9.4226	3.0844	3.8000	18.5871	9.7070	3.1317	3.8000	18.5871
District Gini coefficient	0.4614	0.0221	0.4160	0.5135	0.4612	0.0222	0.4160	0.5135	0.4613	0.0223	0.4160	0.5135	0.4614	0.0221	0.4160	0.5135
Black share	0.0618	0.0301	0.0120	0.1324	0.0620	0.0302	0.0120	0.1324	0.0619	0.0301	0.0120	0.1324	0.0618	0.0301	0.0120	0.1324
Hispanic share	0.3691	0.1134	0.1259	0.5601	0.3685	0.1136	0.1259	0.5601	0.3688	0.1137	0.1259	0.5601	0.3694	0.1133	0.1259	0.5601
Share below 18 years old	0.2536	0.0275	0.1335	0.3214	0.2539	0.0275	0.1335	0.3214	0.2539	0.0275	0.1335	0.3214	0.2534	0.0275	0.1335	0.3214
Share over 65 years old	0.1113	0.0129	0.0817	0.1718	0.1110	0.0129	0.0817	0.1718	0.1110	0.0126	0.0817	0.1718	0.1114	0.0130	0.0817	0.1718
Student-teacher ratio	20.7194	2.4447	13.5614	26.9996	20.5900	2.4785	13.5614	26.9996	20.3294	2.6232	13.5614	26.9996	20.7805	2.4470	13.5614	26.9996
District preprimary share	0.0748	0.0080	0.0512	0.1093	0.0745	0.0080	0.0512	0.1093	0.0743	0.0079	0.0512	0.1093	0.0750	0.0080	0.0512	0.1093
Share of students eligible for free lunch	0.3828	0.1980	0.0050	0.8497	0.3946	0.1904	0.0050	0.8497	0.4042	0.1835	0.0050	0.8497	0.3809	0.1994	0.0050	0.8497
Number of charter schools in district	12.6919	10.9969	0	65	12.6942	11.1146	0	65	12.9602	11.2035	0	65	12.8457	11.0442	0	65
Other statistics																
Total bills voted on by legislator	31.5525	12.3441	2	47	11.7161	4.4958	1	17	10.7391	4.0705	1	17	21.4093	8.4364	2	33

Note: all district controls are lagged by one year.

Appendix D Other regressions and statistics

Table D4. Test of means of legislator characteristics across different subsamples

	High mobility			High income			High inequality			Coastal district		
	0	1	Diff	0	1	Diff	0	1	Diff	0	1	Diff
Male	0.747	0.712	0.036	0.787	0.677	0.110*	0.701	0.761	-0.060	0.723	0.760	-0.037
Black	0.111	0.011	0.100***	0.098	0.031	0.067**	0.037	0.090	-0.053*	0.060	0.080	-0.020
Hispanic	0.212	0.102	0.110**	0.224	0.099	0.125***	0.102	0.218	-0.116**	0.187	0.053	0.133**
Age	52.626	53.901	-1.275	52.537	53.880	-1.344	53.404	53.072	0.331	52.851	54.756	-1.905
Senator	0.263	0.299	-0.037	0.290	0.271	0.019	0.283	0.277	0.007	0.263	0.347	-0.083
Democrat	0.778	0.508	0.269***	0.689	0.615	0.074	0.583	0.718	-0.135**	0.660	0.613	0.047
Term limited	0.318	0.322	-0.004	0.333	0.307	0.026	0.342	0.298	0.044	0.310	0.360	-0.050
Margin of victory	36.260	30.313	5.947*	35.517	31.487	4.031	31.316	35.579	-4.263	34.728	28.355	6.373*
Observations	198	177		183	192		187	188		300	75	

	Male			Black			Hispanic		
	0	1	Diff	0	1	Diff	0	1	Diff
Upward mobility	45.911	45.853	0.058	45.930	44.964	0.966**	45.963	45.372	0.591**
Gini coefficient	0.514	0.526	-0.012	0.520	0.572	-0.052**	0.517	0.553	-0.036***
Income per capita (log)	10.284	10.252	0.032	10.265	10.201	0.064	10.271	10.210	0.061*
Unemployment rate	9.114	9.213	-0.099	9.170	9.435	-0.266	9	10.168	-1.169**
Black share	0.065	0.060	0.005	0.059	0.091	-0.032***	0.061	0.062	-0.001
Hispanic share	0.351	0.377	-0.026*	0.365	0.435	-0.070**	0.356	0.440	-0.084***
Share below 18 years old	0.252	0.255	-0.003	0.254	0.258	-0.004	0.253	0.262	-0.009*
District preprimary share	0.075	0.075	0	0.075	0.081	-0.006***	0.074	0.079	-0.005***
Share over 65 years old	0.111	0.111	0	0.112	0.103	0.009**	0.112	0.107	0.006**
Student-teacher ratio	20.751	21.190	-0.439	21.080	20.945	0.135	20.918	21.875	-0.956**
Free lunch share	0.324	0.350	-0.026	0.333	0.488	-0.155***	0.323	0.447	-0.124***
Charter schools in district	12.936	13.058	-0.122	12.301	23.621	-11.320***	13.404	11.037	2.367
Observations	101	274		351	24		315	60	

Notes: The universe used is the sample of legislators per legislative session.

Table D6. Regression using sample of bills without inclusive reforms

	(1) Baseline regression	(2) Bills without inclusive reforms
Upward mobility[a]	0.105***	0.0190
	[0.0448,0.165]	[-0.00384,0.0419]
Term limited	-0.0233	-0.00666
	[-0.0492,0.00266]	[-0.0176,0.00428]
Margin of victory in last election[a]	0.0134	-0.00251
	[-0.00571,0.0324]	[-0.00893,0.00392]
Seat is up for election	0.0164	0.00548
	[-0.0714,0.104]	[-0.0132,0.0242]
Assembly bill	0.00653	-0.0443***
	[-0.0686,0.0816]	[-0.0698,-0.0188]
District income per capita (log)[b]	-0.153	-0.206
	[-1.462,1.157]	[-0.696,0.283]
District unemployment rate[a,b]	0.0569*	0.00542
	[0.0107,0.103]	[-0.0161,0.0269]
District Gini coefficient[a,b]	0.0257	-0.0173
	[-0.0370,0.0883]	[-0.0357,0.00105]
District black share[a,b]	0.0158	0.00330
	[-0.0549,0.0864]	[-0.0187,0.0253]
District hispanic share[a,b]	-0.228*	-0.0273
	[-0.419,-0.0372]	[-0.0915,0.0369]
District share over 65 years old[a,b]	-0.00678	0.0197*
	[-0.0561,0.0425]	[0.000135,0.0392]
District share below 18 years old[a,b]	0.167**	0.0444*
	[0.0670,0.266]	[0.00139,0.0874]
District preprimary share[a,b]	0.00735	0.00193
	[-0.0172,0.0319]	[-0.00716,0.0110]
District student-teacher ratio[a,b]	0.0603**	0.0276**
	[0.0219,0.0987]	[0.0112,0.0440]
Share of students eligible for free lunch[a,b]	0.00891	-0.00630
	[-0.0268,0.0447]	[-0.0190,0.00640]
Number of charter schools in district[a,b]	-0.0123	-0.0122
	[-0.0456,0.0211]	[-0.0270,0.00254]
Observations	4,496	22,603
Year FE	Yes	Yes
Legislator FE	Yes	Yes
Controls	Yes	Yes

Dependent variable is the probability of voting "no" on a bill. Robust standard errors clustered by bill, 95% confidence intervals in brackets. All continuous regressors are expressed in standard deviations. *** p <0.001, ** p <0.01, * p <0.05.

[a] Expressed in standard deviations.

[b] Lagged by one year.