

# ENTRY INTO THE SCHOOLING MARKET: HOW IS THE BEHAVIOUR OF PRIVATE SUPPLIERS INFLUENCED BY PUBLIC SECTOR DECISIONS?\*

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## ABSTRACT

This research examines the location choice of private schools entering the California schooling market in 1979–80. We find that entrants are more likely to locate in public school districts with lower levels of per-pupil expenditure and higher fractions of public school students who reside in low-income households. In addition, we provide evidence of differences in the responsiveness of different types of private schools to the underlying conditions. Also, in comparing our results to those of previous research, we find that the determinants of the location choices of entrants appear to be the same as the determinants of the location pattern of incumbent private schools.

## I. INTRODUCTION

We possess little concrete evidence on the response of private suppliers of elementary and secondary education to changes in public provision or

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the extent to which their decisions are sensitive to the characteristics of the population in a market. This paper addresses this gap by examining the behaviour of new entrants to the private schooling market in California in 1980. Specifically, we measure the sensitivity of entrants to variation in public provision of schooling and in the characteristics of the local schooling markets.

We examine the entry of private schools in California between 1978–79 and 1979–80. Our analysis takes advantage of a unique episode in the history of American school finance, the effective state-assumption of public school finance that followed property tax limitation (Proposition 13) and court-ordered school finance reform (*Serrano v. Priest*). This change in the method of financing public schools dramatically altered their relative attractiveness, inducing new entry of private schools and a large increase in the fraction of students enrolled in private schools (Downes and Schoeman, 1998).

This paper focuses on the location decisions of new entrants. They numbered in the several hundreds and comprised a significant fraction of the total number of the private schools in California in the early 1980s. While researchers trying to determine the supply response of private schools to changes in demand conditions must know how prospective entrants will respond to different market forces,<sup>1</sup> no previous research has quantified the responsiveness of this group. In addition, though it is thought that the flexibility over where to locate may make entrants more sensitive than incumbents to recent localized changes in demand, this notion has never been empirically tested. The California context provides us with an opportunity to implement such a test.

In modeling a new entrant's location decision, we build, to some extent, upon previous research (e.g., Downes and Greenstein, 1996) that provides information on the responsiveness of incumbent private schools to underlying conditions. However, since incumbents and entrants may not respond in the same way to these conditions, we must develop a different empirical methodology for modeling the behaviour of entrants. Thus, in the second and third sections of this paper, we outline a qualitative choice framework that allows us to develop estimates of the responsiveness of entrants to the attributes of the market. We presume that a new entrant chooses its location after comparing that location with other potential locations that are geographically proximate. The location choices made by entrants thus provide information on the underlying structure of preferences of these new suppliers. The empirical methodology also allows us to directly compare the preference structure of suppliers with different religious affiliations. Early research on this

<sup>1</sup>For example, in the context of a discussion of full school choice programmes, Neal (1997) argues that '... we know so little about potential supply responses in the private sector' (p. 31).

topic (Downes and Greenstein, 1996; Erickson, 1986) has provided evidence consistent with differences in the objectives of different types of suppliers.

Our approach is similar in spirit to several recent quantitative studies of entry. As in Reiss and Spiller, 1987; Lane, 1989; Berry, 1992 and Chevalier, 1995, we explicitly recognize the qualitative nature of entry. In the case we consider, a single location was chosen instead of plausible potential alternatives. As in Bresnahan and Reiss (1987, 1990, 1991), we try to relate net entry and exit to the determinants of behaviour of individual firms. However, because there are no widely accepted models of non-profit firm objectives (Weisbrod, 1988), we are uncomfortable imposing a particular behavioural structure on the suppliers of private education, as has been done in much of the previous research into profit-oriented entrants. Hence, we adopt a reduced-form preference structure for describing the objectives of private schooling entrants. As fits this conceptual experiment of location choice, we also experiment with different specifications of the geographic area relevant to the firm's location decision.

The fourth section discusses the context and the data used in the analysis. The fifth section presents the results of the empirical work. We find that entrants are more likely to locate in public school districts with lower levels of per-pupil spending and higher fractions of public school students who reside in low-income households. In addition, while there is no consistent evidence of statistically significant differences between private schools with different religious affiliations, in all of the estimated specifications there are important qualitative differences in the responsiveness of different types of private schools to the underlying conditions. Further, in comparing our results to those of previous research, we find that determinants of the location choices of entrants are the same as the determinants of the location pattern of incumbent private schools. We evaluate the implications of these and other results for future research in the concluding section of the paper.

## II. MODELING THE LOCATION DECISIONS OF NEW ENTRANTS

The two questions we consider in this section are: (1) What are the costs and benefits of analysing firms that recently entered a particular market? and (2) What is the appropriate characterization of the location decision of an entrant?

From the perspective of an analyst seeking to determine the likely supply response of private schools to the institution of a voucher programme or any other change in demand conditions, one key

question is whether the behaviour of incumbent private schools can be used to predict how entrants will behave. Very possibly, the answer to this question is no.<sup>2</sup> A growing body of research on entry behaviour (e.g., Bresnahan and Reiss, 1994) has argued that, when sunk costs are large relative to variable profits, the behaviour of entrants may differ dramatically from that of existing firms. Existing firms may still be willing to serve local demand while entrants may be unwilling to do so if they must incur large, unrecoverable entry costs. In addition, if existing firms cannot easily change their locations or expand, then growing demand may be served by new entrants who do incur these entry costs.

This body of research also implies that the existing structure of the market may be an important determinant of entry. In the context of elementary and secondary education, an important aspect of the existing structure is the behaviour of publicly-funded institutions.

The dilemma facing researchers, then, is to pinpoint a context that allows for determination of critical influences on entrants' behaviour. We do this by exploiting an important counterfactual associated with an entrant's location decisions – an entrant chose *where to locate and where not to locate*. Nevertheless, we are not able to avoid a reality highlighted by previous research; new entrants may comprise a select portion of potential new suppliers. Thus, any conclusions about supply responses based on the behaviour of actual entrants are necessarily based on a self-selected sample.<sup>3</sup> That said, our choice of empirical context will allow us to draw relatively powerful conclusions concerning the determinants of entrant behaviour.

To see this, note that just as a residential location choice can be decomposed into a choice of community in which to reside and, conditional on community choice, the choice of a dwelling in which to live, the entry decision can be decomposed into a decision to enter a particular market and, conditional on entering the market, a decision to choose a location in that market.<sup>4</sup> In other words, the location decision of entrants can be thought of as selecting a preferred alternative among

<sup>2</sup>In previous work (Downes and Greenstein, 1996), we examined the relationship between the total number of private schools in an area and the characteristics of the area served by these schools. If the decisions of new entrants to enter a market and of incumbents to stay in a market did not differ in any systematic way, then our previous analysis provides the information needed to determine which markets are particularly attractive to new entrants. If, however, the behaviour of entrants differs dramatically from the behaviour of existing firms, then our previous analysis may provide little information about how entrants will respond to changing demand conditions.

<sup>3</sup>Virtually all the literature faces the difficulty of identifying all potential entrants. Some possible approaches can be found in Lane (1989) and Berry (1992).

<sup>4</sup>This description of the entrepreneur's decision-making process is apparently a particularly apt description of the decision-making process of the Edison Project. Thanks to Richard Romano for calling this fact to our attention.

those in the second level of a preference tree. Following the reasoning of McFadden (1981), suppose the stochastic components of each potential entrant's objective function have a joint distribution that yields a nested logit model. Then, conditional on entry, estimation of the parameters of the location choice probabilities provides consistent estimates of the parameters of the underlying choice structure, up to a scale factor. We illustrate this with Figure 1 for the case when a prospective school's choice set consists of four districts.

In this paper we build on the presumption that the entrepreneurs who form private schools tend to have strong attachments to certain geographic areas but not necessarily to particular school districts. Specifically, we explore two alternative definitions of the possible locations for potential entrants. The first definition assumes that the potential choices consist of the district actually entered and all contiguous districts. The second definition nests the first by allowing the set of potential choices to consist of all districts in the county in which the private school enters and all districts in contiguous counties.<sup>5</sup> Conditional on the definition of potential locations chosen, the statistical model we estimate characterizes the decision to locate in one school district as opposed to locating in another district in this set of potential locations. The next section formalizes the model of location choice described here.

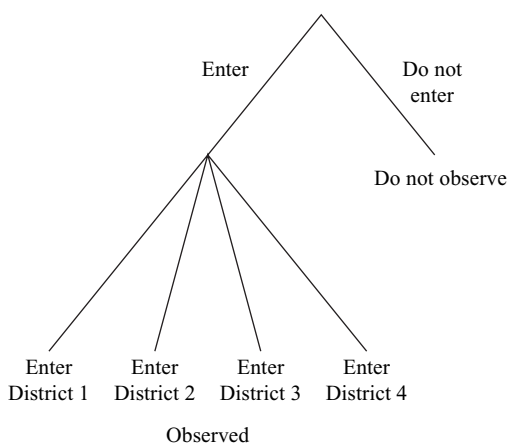


Fig. 1

<sup>5</sup>On average, California counties contain 2700 square miles in land area, with the land areas ranging from 45 square miles (San Francisco county) to 20 131 square miles (San Bernardino county). As a result, this second alternative represents an exhaustive collection of alternative location choices if potential entrepreneurs are not footloose.

## III. EMPIRICAL FRAMEWORK

We postulate that entrepreneurs base their location decisions on their subjective well-being at alternative locations in a market. This well-being depends upon the combination of the attributes of the publicly-supplied education available at that location, the demographic characteristics of the population at the location, and the number of incumbent private schools at the location. It also depends on the particular values of the entrepreneur and may not necessarily have to do with the academic features of the school. Entrepreneurs choose the location which provides the highest well-being for their goals, whatever those goals may be, whether these goals are academic, value-laden or profit-seeking.

Drawing on the arguments of Ben-Ner and Van Hoomissen (1991), we assume the entrepreneurs who contemplate forming new private schools come from the set of individuals interested in the schooling available in the area. These demand-side stakeholders may be a private household, though typically they are individuals drawn together by a church or quasi-public institution. The group of demand-side stakeholders contemplating formation of firm  $k$  of type I in district  $j$  is assumed to have the following reduced-form objective function:

$$U_{Ik}^j = U_I(N_{1j}^j, N_{-1j}^j, X^j, Z^j, N_I N_{-1}^{-j}, X^{-j}, Z^{-j}, \omega_{Ik}^j).^6 \quad (1)$$

Here  $N_{1j}^j$  is the number of schools of type I incumbent in district  $j$ ,  $N_{-1j}^j$  is the number of schools of other types in district  $j$ ,  $N_{1}^{-j}$  is the number of schools of type I incumbent in other districts in the region from which the school could draw students,  $N_{-1}^{-j}$  is the number of schools of other types in the drawing region. The firm-specific error  $\omega_{Ik}^j$  represents all the unobservable factors influencing the entry decision. Besides the number of incumbents, the observable exogenous variables are divided into four categories:  $X^j$  includes characteristics of district  $j$  that potentially influence the objectives of all potential entrants in the same manner,  $Z^j$  includes characteristics of district  $j$  that differentially influence only the objectives of different types of entrants,  $X^{-j}$  includes characteristics of all other districts in the drawing region that potentially have a common effect on the objectives of all entrants, and  $Z^{-j}$  includes characteristics of all other districts in the drawing region that have differential effects on the objectives of different types of entrants.<sup>7</sup>

<sup>6</sup> An important component of the decision-making environment for non-profits is the existence of a 'break-even' constraint or a constraint on the maximum financial loss a firm could take. Since the exact form of this constraint does not influence our estimation, we implicitly assume it is binding and absorb it into the objective function. This framework would require modification for application to the location decisions of firms outside the non-profit sector.

<sup>7</sup> For further discussion of the factors influencing the demand for and the supply of public and private education, see Sonstelie (1982).

Since entrants are small relative to the total local market for schooling, we assume potential entrants act as if incumbent private suppliers will not respond to their decision to enter. Similarly, the provision of publicly-provided education is taken to be exogenous. In addition, all entrants are assumed to take as given the demographics of the markets they are contemplating entering.<sup>8</sup> Finally, we make no specific assumptions concerning which characteristics of the public schools determine school quality. Instead, we consider a number of characteristics of the public schools that could be part of the information on local schools that entrants use when making their location decisions. The information used will depend on the information available to the entrants and on the entrants' perceptions of what factors determine school quality.

We maintain the assumption that the reduced-form objectives of all firms of the same type have the same form. However, firms of different types are allowed to have different objective functions. To best understand why we allow the objectives to vary across types and why we divide the variables into two sets, consider entering firm location patterns under the following simple scenario. Suppose that firms of each type initially had the same objective and that a fixed proportion of each religious group chose to attend private schools affiliated with its religion. In this scenario, variation in the number of private schools of a particular type would be fully explained by variation in the size of the student population and by variation in the fractions of the population belonging to particular religious groups. The effect of a variable measuring the fraction with a particular religious affiliation would vary across private school types, even if the cost structures and the objectives of these private schools types were the same. For this reason, we place variables like the fraction with a particular religious affiliation in the group of variables in  $Z^j$ , and we maintain the assumption that these variables have differential effects on the location patterns of different types of private schools.

Now complicate this scenario by allowing private school types to differ in the extent to which they have inclusion of low-income students as an objective. Entry patterns would be explained not only by variation in the size of the student population and in the fractions belonging to particular religious groups, but also by variation in the fraction of the school age population in each community in poverty. The differential effects of measures of the fraction of children in poverty on the entry patterns would signal the existence of differences in firms' objectives. Following this logic, we test for differences in objectives by testing the null

<sup>8</sup>An alternative model is one that allows individual residential location and school location to be jointly determined. Mobility in the California setting was limited, however, by sizable moving costs attributable to high mortgage rates and to fixities in property reassessment attributable to Proposition 13. Downes (1993) gives the rough magnitude of these moving costs. Given these limitations on mobility, we think treating community characteristics as exogenous is appropriate.

hypothesis that the effects of  $X^j$  and of  $X^{-j}$  are the same for all types of schools. The test is suggestive because differences in these effects could be the result of differences in the effects of other determinants of the equilibrium entry pattern. But if differences in the effects are found to exist, the natural explanation would be that the objectives of different types of private schools are not the same.

Let

$$\delta_{ik}^j = \begin{cases} 1 & \text{if } U_{1k}^j > U_{1k}^l \quad \forall l \neq j \\ 0 & \text{otherwise} \end{cases}, \tag{2}$$

and let  $p_{1k}^j = P(\delta_{1k}^j = 1)$  give the probability firm  $k$  of type I chooses to enter at location  $j$ , conditional on the firm choosing to enter at all. If we assume that, in (1), the objective function can be written as  $U_{1k}^j = u_1^j + \omega_{1k}^j$  and that  $\omega_{1k}^j$  has an extreme value distribution of the type that leads to a nested logit model (McFadden, 1981, particularly pp. 227–9), then

$$p_{1k}^j = \exp(u_1^j) / \sum_{l \in J} \exp(u_1^l),$$

where  $J$  represents the set of potential locations. As was noted above, we consider two characterizations of  $J$ : (i) the school district of interest and all contiguous districts and (ii) all school districts in the county in which the school locates and in all contiguous counties.<sup>9</sup>

If a school’s objective depends only on characteristics of the potential location, then

$$U_1^j = X^j \beta_1 + Z^j \gamma_1 + N_1^j \lambda^1 + N_{-1}^j \eta^1, \text{ for } j \in J. \tag{3}$$

If a school’s evaluation of a potential location accounts for the fact that the local market served by a private school consists of a geographic area larger than the school district in which the private school is located, then

$$u_1^j = X^j \beta_1 + Z^j \gamma_1 + N_1^j \lambda^1 + N_{-1}^j \eta^1 + \sum_{h \in H_j} [\exp(-\alpha_1 d^{jh})(X^h \Phi_1 + Z^h \rho_1 + N_1^h \iota^1 + N_{-1}^h \varphi^1)], \text{ for } j \in J. \tag{4}$$

<sup>9</sup>One obvious drawback of using the nested logit model is the implication that the ratio of the probabilities of choosing two alternative locations is independent of the other alternative locations. Our decision to estimate the model using two alternative definitions of the choice set provides us with a natural check on the validity of the independence of irrelevant alternatives assumption. In particular, if we find that our parameter estimates and relative probabilities change little as we switch from the less restrictive to the more restrictive definition of the choice set, then we have fairly compelling evidence that the independence of irrelevant alternatives assumption is appropriate in this setting (Greene, 1990).

Here,  $H_j$  is the set of districts contiguous to district  $j$ , and  $d^{jh}$  is the distance between districts  $j$  and  $h$ . In other words, the drawing area for a school in district  $j$  is assumed to be the region included in  $H_j$ . The smaller are the  $\alpha_1$  (the coefficients on distance), the more important are the characteristics of other districts in the local market.

If decisions of individual entrants are independent, the log of the likelihood function is

$$\mathcal{L} = \sum_l \sum_k \sum_j \delta_{lk}^j \ln(p_{lk}^j). \quad (5)$$

Minimizing  $\mathcal{L}$  provides estimates of parameters of (3) or (4).

#### IV. THE CONTEXT AND THE DATA

##### *IV.1. The context*

California in the late 1970s provides a singular opportunity to examine supply behaviour of private schools. In 1976, in a landmark decision in the *Serrano v. Priest* case, the California Supreme Court ruled as unconstitutional any system of public school financing that allowed disparities in property wealth to translate into disparate levels of per pupil spending. In 1978, before the state's elected leaders could implement a new financing system that attempted to satisfy this decision, the voters of California approved Proposition 13, a ballot initiative that rolled back property assessments to their 1975 levels and imposed a statewide property tax rate of one per cent. The combination of the *Serrano* decision and Proposition 13 provided state leaders with the impetus (and the political cover) to implement changes in the system of public school finance that shifted effective control of school finances from the local school districts to the state.<sup>10</sup> Among the profound effects of these reforms and the resulting constraints on local discretion was a dramatic change in the relative position of public and private schools (Downes and Schoeman, 1998). An indication of the scope of this change is provided by the fact that the share of students enrolled in private schools grew from 8.5 per cent in 1974–75 to 11.6 per cent in 1982–83.<sup>11</sup>

The California situation thus provides a unique opportunity to analyse the behaviour of private schools. Further, since the market was growing so dramatically, we would not expect sunk costs to be as important a

<sup>10</sup> See Sonstelie, Brunner and Ardon (2000) for more detail on the finance reforms and on the long-run implications of these reforms for school finance reform in California.

<sup>11</sup> Downes and Schoeman (1998) present evidence of the extent to which this growth in the private school share in California represented a break from history.

determinant of supplier behaviour as they might be in a static market. This expectation is borne out; the number of private providers increased from 2495 in 1974–75 to 4497 in 1982–83. While it is impossible to show that this growth was caused by the finance reforms, all that matters for the purposes of this paper is that there was sufficient growth to create a context in which the behaviour of entrants could be examined.

The substantive constraints that Proposition 13 and the *Serrano*-inspired reforms imposed on the responsiveness of public school districts are, in and of themselves, of equal importance in making the California setting an unparalleled case. Localities could no longer choose their public schooling provision; the level and growth of per pupil spending were determined by state law.<sup>12</sup> As a result, current and prospective public provision was predetermined. This predetermination of public provision has two implications for the empirical work that follows. First, the assumption that public provision is statistically exogenous is justified in the post-*Serrano* world. Second, in response to the *Serrano* decisions, the state placed ceilings on the amount districts could spend on each student. Further, the state forced the range in these ceilings on per pupil expenditures, known as revenue limits, to contract over time. Since the finance reform legislation established the formula for calculating these revenue limits, future revenue limits provide clear and observable signals of the future direction of public provision. Thus, by controlling for future revenue limits, we can determine if the location decisions of entrants were sensitive to their perceptions of the condition of public alternative.

#### *IV.2. The data*

For this analysis, we merge data on 550 entrants to the California schooling market in the 1979–80 school year with observations on 910 elementary and unified (K–12) school districts. We restrict our sample to the 474 new schools that served elementary (K–8) school students, where our data are more complete.<sup>13</sup> This also allows comparison of the results of this paper to the conclusions reached in our previous work.

The data on the entrants and on the incumbent schools were drawn from the 1978–79 and 1979–80 *California Private School Directories*. The *California Private School Directory* provides an exhaustive list of all

<sup>12</sup> While those school districts affected eventually developed methods for limiting the impact of the constraints implicit in the finance reforms, these mechanisms to obviate the constraints were not in place by the late 1970s. Further, in no district does it appear that these non-traditional financing methods fully substituted for the lost discretion over property tax revenues. For further discussion of the effects of the finance reforms, see Downes (1992) and Sonstelie, Brunner and Ardon (2000).

<sup>13</sup> There were actually 475 entrants. One school was omitted from all of our analyses because no enrollment information was available.

private schools in the state, along with information on the location, enrolment, and religious affiliation of each school. Entrants were schools that appeared in the 1979–80 directory but not in the 1978–79 directory.<sup>14</sup>

Data on school districts were drawn primarily from the *1980 Census of Population and Housing* and from information supplied by the California Department of Education. The latter source provided the principal public provision measures, per pupil expenditures and the pupil-teacher ratio. Data on public school district revenue limits in 1979–80 and 1982–83 were also drawn from Department of Education publications. In addition, we had information available on such attributes of the public school student population as racial/ethnic composition, fraction of 6<sup>th</sup> graders with limited English proficiency, and fraction of 6<sup>th</sup> graders from families on Aid to Families with Dependent Children (AFDC).<sup>15</sup> Mean district scores on the tests administered as part of the California Assessment Program served as measures of student performance in the public schools.

We combined demographic information supplied by the Census with the data on the public schools. Among the community characteristics available were the mean family income, the distribution of family income, the distribution of adult educational attainment, the size of the student population, the racial/ethnic composition of the full student population, the fraction of the population residing in rental housing, and the fraction of families with school-age children. By using this information on the composition of the population in each community, we control directly for the extent of heterogeneity in that community. For example, once we have controlled for the mean family income in a community, adding to the specification the fraction of families with incomes below \$10 000 (1980 dollars) and the fraction of families with incomes above \$50 000 (1980 dollars) has the effect of adding controls for income variability in the community. This follows since, all else equal, communities with larger fractions of families with incomes over \$50 000 have a distribution of family income that is more dispersed.

While the Census data included no information on the share of the population in each district affiliated with individual churches, we were able to construct county-level shares of the population belonging to the Catholic church and to evangelical Protestant churches, using the results of a 1980 study entitled *Churches and Church Membership in the United States – 1980*, sponsored by the Glenmary Research Center and the

<sup>14</sup> Schools that changed location between 1978–79 and 1979–80 were not treated as entrants. There were only 29 schools that changed the city in which they operated; of these, only eight moved across district boundaries.

<sup>15</sup> At the time these data were collected, AFDC was the principle source of public support for children from low-income, single-parent households. Thus, the fraction of 6<sup>th</sup> graders on AFDC measures the extent of poverty in a school district.

research units of the National Council of Churches of Christ, the African Methodist Episcopal Zion Church, the Southern Baptist Convention, and the Lutheran Council in the USA.

Data on busing and other desegregation programmes were drawn from *New Evidence on School Desegregation*, prepared for the United States Commission on Civil Rights (Welch and Light, 1987). This report only included information on larger school districts and may thus have failed to account for all desegregation programmes. However, few small districts were subject to court-ordered desegregation, making any potential error negligible. Approximate distances between locations were calculated by computing the straight line distance from the zip code region of the public school district of interest to the zip code region of the contiguous public school district.

Building on the growing literature that explores the roles that history and expectations can play in determining the structure of a market (e.g., Rauch, 1993), we constructed several measures of the competitive environment and innate attractiveness of a market. First, we used the *1978–79 California Private School Directory* to develop counts of the number of schools of each type present in each district in 1978–79. We supplemented this relatively standard measure of the competitive environment with indicators of the occurrence of an exit of a private school between the 1978–79 and 1979–80 academic years. In particular, we defined two dummy variables, one that equalled one if a school affiliated with an evangelical Protestant church exited after the 1978–79 academic year, and a second that equalled one if any other school exited after the 1978–79 academic year. Finally, a pre-finance reform indication of private school presence was provided by a National Center for Education Statistics (NCES) census of private schools in 1970–71. The NCES data offered a third control for unobserved variation in the attractiveness of certain locations.

Finally, California Department of Education records yielded two potential measures of the costs of operating a school at a particular location: average public school teacher salary and per-pupil assessed value. Since employment in the public sector represents an important option for both new (Ballou, 1996) and experienced private school teachers, public sector salaries provide the best available measure of labour costs. In the post-Proposition 13 period, the combination of the *Serrano*-inspired finance reforms and the strict limits on local property tax discretion meant that variation in per-student assessed value no longer signaled variation in local ability to fund the public schools. As a result, per-student assessed value provides the best available measure of the variation in the rental costs facing potential entrepreneurs. The other obtainable measure of property value, the median value of single family homes, fails to reflect variation in the cost of commercial property.

*IV.3. Do all entrants have the same objectives?*

In previous work (Downes and Greenstein, 1996), we divided private schools into four groups: 1) schools affiliated with the Roman Catholic church, 2) schools affiliated with evangelical Protestant churches,<sup>16</sup> 3) all other schools with a religious affiliation, and 4) schools with no religious affiliation.<sup>17</sup> While we did find that evangelical Protestant schools had substantively different location patterns than other types of schools, evidence for differences between the other types of schools was far less persuasive. That result, in combination with the fact that, save for schools affiliated with evangelical Protestant churches, we observe few entrants with a religious affiliation, led us to distinguish only evangelical Protestant schools from other private schools.

The model presented above allows for variation between private schools in two ways. First, certain groups in society may, for religious reasons, attend a particular type of private school independent of the quality of the local public schools, and certain types of private schools

TABLE 1  
*Summary statistics*  
*(475 entering private school)*

<i>Variable</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Number of schools</i>
Lowest grade served	0.92	1.88	0	8	438
Highest grade served	5.61	4.26	0	12	438
Fraction Evangelical Protestant schools	0.28	0.45	0	1	475
Fraction non-affiliated schools	0.67	0.47	0	1	475
Fraction Catholic schools	0.01	0.11	0	1	475
Fraction other religious schools	0.04	0.20	0	1	475
Fraction of schools with five or fewer students	0.32	0.47	0	1	474
Enrollment	31.88	63.57	1	690	474

<sup>16</sup>Included in this group were any schools affiliated with Seventh Day Adventist, Calvinist, Assembly of God, Pentecostal, or Church of Christ churches. Also included were schools the NCES categorized as Christian.

<sup>17</sup>The number of schools affiliated with evangelical Protestant churches could not be determined in the 1970–71 data. Therefore, in 1970–71 schools of this type were merged with all other schools with a religious affiliation.

TABLE 2  
*Summary statistics*  
 (910 public schools districts)

<i>Variable</i>	<i>Mean</i>	<i>Mean – incumbent present</i>	<i>75<sup>th</sup> percentile</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Number of private schools – 1978–79	3.21	6.49	3.00	18.30	0.00	514.00
Number of Catholic schools – 1978–79	0.69	1.41	1.00	4.57	0.00	124.00
Number of Evangelical Protestant schools – 1978–79	0.68	1.38	1.00	2.06	0.00	49.00
Number of other religious schools – 1978–79	0.37	0.75	0.00	2.95	0.00	84.00
Number of non-affiliated schools – 1978–79	1.46	2.95	1.00	9.11	0.00	257.00
Total number of elementary school students – 1978–79	3451.46	6434.79	3166.20	16 322.67	11.70	461 441.75
Public school pupil-teacher ratio – 1978–79	24.79	26.86	28.10	4.79	1.60	32.80

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Public school expenditures per pupil – 1978–79	2469.70	2334.32	2599.00	849.67	1128.74	14 943.68
Percent of public school 6 <sup>th</sup> graders on AFDC – 1978–79	10.80	10.89	14.40	9.62	0.00	100.00
Mean family income	23 902.42	25 355.10	26 398.00	7426.75	11 853.73	80 485.17
Percent of adults who are high school graduates	53.96	55.05	60.98	10.24	10.08	84.19
Percent of adults who are college graduates	15.74	18.52	19.54	10.76	0.00	60.44
Percent of population Roman Catholic (county)	17.05	17.67	20.87	6.36	0.00	40.03
Percent of population Evangelical Protestant (county)	7.06	6.47	8.84	2.33	0.00	12.24
Percent of students African-American	2.51	3.45	2.00	7.15	0.00	69.45
Percent of students Hispanic	21.23	20.36	28.60	21.16	0.00	98.73
Percent of students Asian-American	2.22	3.18	3.50	3.85	0.00	36.69
Presence of desegregation programme	0.01	0.02	0.00	0.11	0.00	1.00
Elementary district	0.70	0.54	1.00	0.45	0.00	1.00

may get larger subsidies from their supporting organizations (Hoxby, 1994). These types of variation will be reflected in the differing influences of the elements of  $Z^j$ . Second, differing goals of different types of private schools may be reflected in structural differences in the objective functions between different types. We test for the existence of these structural differences.

Table 1 presents basic information on the entering private schools. The majority of entrants had no religious affiliation, and their market share is out of proportion to their numbers as incumbents. The decision to group Catholic schools and schools with other religious affiliations with non-affiliated schools is partly driven by necessity; only 26 of the new schools had religious affiliations that were not with evangelical Protestant churches. Since the religious schools tend to enter with larger enrollments,<sup>18</sup> these numbers somewhat understate the new growth in evangelical-linked private schools.

Table 2 provides an overview of the characteristics of the public school districts in California at the time these entrants were making their location decisions. On average, there were more than three private elementary schools incumbent in each school district, though only 450 of the 910 districts contained at least one private elementary school. Private schools with some religious affiliation were more common than schools with no religious affiliation. Of those schools with a religious affiliation, Catholic schools were still the most common. However, the numbers in Table 2 confirm what we saw in Table 1; schools affiliated with evangelical Protestant churches were becoming very important actors in the schooling market.

## V. RESULTS

### *V.1. The base specification*

Table 3 presents estimates of the parameters of the base specification of equation (3); the mean across all entrants of the implied elasticities are given in Table 3A.<sup>19</sup> The objectives of entrants are assumed to depend only on characteristics of the potential location. Further, while we allow the influence of elements of  $Z^j$  to differ for different types of private schools, the estimates in Table 3 follow from the specification of the

<sup>18</sup> Church-based schools tend to have access to church buildings and other capital, so they tend to enter with higher capacity than unaffiliated schools that enter small and grow into their long term enrollment size.

<sup>19</sup> In the case of a discrete variable, Table 3A gives the mean across all entrants of estimated probability that a school locates in a district with the given characteristic minus the estimated probability the school locates in the district when that discrete variable is set to 0 and all other variables are unchanged.

TABLE 3

*Determinants of location choice of entering private schools: base specification, home schools dropped<sup>1</sup>*

*Form of probability: multinomial logit (Heteroskedastic-consistent standard errors in parentheses)<sup>2</sup>*

<i>Variable</i>	<i>Specifications 1-choice set includes contiguous districts</i>		<i>Specification 2-choice set includes all districts in contiguous counties</i>	
	<i>All other entering schools</i>	<i>Evangelical Protestant schools</i>	<i>All other entering schools</i>	<i>Evangelical Protestant schools</i>
Total number of students (x.00001)	-0.1558 (0.1548)		0.1198 (0.0992)	
Dummy for type of district (= 1 if elementary)	-0.3112 (0.2101)		-0.3865** (0.1628)	
Public school per pupil expenditures	-0.6488** (0.2562)		-0.9204*** (0.2260)	
Mean score of 6 <sup>th</sup> graders on CA assessment programme test	0.0237 (0.0182)		0.0085 (0.0132)	
Public school 6 <sup>th</sup> graders on AFDC (%)	0.0102 (0.0146)		0.0187* (0.0103)	
Mean family income (x.0001)	-0.7648 (0.7644)		-0.6028 (0.6395)	
Percent of families with incomes below \$10 000	-0.0017 (0.0270)		-0.00002 (0.0227)	
Percent of families with incomes above \$50 000	0.0126 (0.0631)		0.0193 (0.0526)	
Percent of adults high school graduates	0.0295* (0.0157)		0.0349*** (0.0117)	
Percent of adults college graduates	0.0517*** (0.0155)		0.0555*** (0.0117)	
Percent of families with children	-0.0111 (0.0127)		-0.0165 (0.0105)	
Percent of population residing in rental property	0.0068 (0.0080)		0.0134** (0.0068)	
Dummy for existence of desegregation programme	0.7681** (0.3803)		0.4600 (0.2973)	

*(continued)*

TABLE 3  
Continued

Variable	Specifications 1-choice set includes contiguous districts		Specification 2-choice set includes all districts in contiguous counties	
	All other entering schools	Evangelical Protestant schools	All other entering schools	Evangelical Protestant schools
Per-pupil assessed value	-0.8366** (0.4061)		-1.0001*** (0.3613)	
Percent of population catholic (in county)	0.0040 (0.0600)	-0.0053 (0.0636)	0.0293 (0.0223)	0.0278 (0.0231)
Percent of pop. evangelical protestant (in county)	0.1632 (0.1431)	0.0567 (0.1780)	-0.1665*** (0.0553)	-0.1763*** (0.0623)
Number of catholic and non-affiliated schools, 1970	-0.5072 (0.6021)	-0.0123 (0.9888)	-0.2595 (0.4453)	-0.3056 (0.6044)
No. of evang. protestant and other religious schools, 1970	-0.9142 (0.6066)	-0.7486 (0.8310)	-0.9964** (0.5091)	-0.7037 (0.6241)
No. of incumbent schools (evang. protestant excluded)	0.4704 (0.3148)	0.1008 (0.4387)	0.1705 (0.2649)	-0.0316 (0.3015)
No. of incumbent evang. protestant schools	1.0392 (0.6486)	2.5078*** (0.7714)	0.9606* (0.5553)	2.1084*** (0.6275)
Dummy for incumbent school exit (evang. protestant excluded)	0.7369*** (0.2213)	0.0447 (0.2779)	1.1571*** (0.1910)	0.2042 (0.2400)
Dummy for incumbent evang. protestant school exit	0.2014 (0.2747)	1.2130*** (0.2829)	0.1480 (0.2417)	1.0085*** (0.2257)
Log of likelihood function		-498.65		-1,143.31

Notes: 1) All schools with enrolments of five students or less are assumed to be 'home' schools. In addition, one school which did not report its enrolment is omitted.

2) Throughout the table, \*\*\* denotes significant at 1% level, \*\* denotes significant at 5%, and \* denotes significant at 10% level in two-tailed tests.

TABLE 3A

*Means across entrants of elasticities of probability of choosing a location based on estimates in Table 3*

<i>Variable</i>	<i>Specification 1-choice set includes contiguous districts</i>		<i>Specification 2-choice set includes all districts in contiguous counties</i>	
	<i>All other entering schools</i>	<i>Evangelical Protestant schools</i>	<i>All other entering schools</i>	<i>Evangelical Protestant schools</i>
Total number of students (x.00001)		-0.58		0.42
Dummy for type of district (= 1 if elementary)		-0.27		-0.11
Public school per-pupil expenditures		-1.10		-1.93
Mean score of 6 <sup>th</sup> graders on CA assessment programme test		1.12		0.50
Public school 6 <sup>th</sup> graders on AFDC (%)		0.09		0.20
Mean family income (x.0001)		-1.46		-1.43
Percent of families with incomes below \$10K		-0.02		0.00
Percent of families with incomes above \$50K		0.08		0.15
Percent of adults high school graduates		1.19		1.75
Percent of adults college graduates		0.77		1.05
Percent of families with children		-0.42		-0.77
Percent of population residing in rental property		0.18		0.43
Dummy for existence of desegregation programme		1.09		0.18
Per-pupil assessed value		-0.25		-0.38

*(continued)*

TABLE 3A  
Continued

<i>Variable</i>	<i>Specification 1-choice set includes contiguous districts</i>		<i>Specification 2-choice set includes all districts in contiguous counties</i>	
	<i>All other entering schools</i>	<i>Evangelical Protestant schools</i>	<i>All other entering schools</i>	<i>Evangelical Protestant schools</i>
Percent of population Catholic (in county)	0.06	-0.07	0.50	0.49
Percent of pop. Evangelical Protestant (in county)	0.68	0.27	-0.85	-1.07
Number of Catholic and non-affiliated Schools, 1970	-0.63	-0.01	-0.31	-0.20
No. of Evang. Protestant and other religious schools, 1970	-1.00	-0.46	-0.96	-0.39
No. of incumbent schools (Evang. Protestant excluded)	2.06	0.24	0.69	-0.07
No. of incumbent Evang. Protestant schools	0.55	0.89	0.49	0.80
Dummy for incumbent school exit (Evang. Protestant excluded)	1.42	0.01	0.92	0.01
Dummy for incumbent Evang. Protestant school exit	0.31	0.39	0.08	0.05

equation in which there are no other structural differences in the objectives of different types of private schools.<sup>20</sup>

Comparison of specifications 1 and 2 in Table 3 reveals that the choice of a market definition has little influence on the qualitative relationship between the determinants of an entrant's perception of a location and the

<sup>20</sup> We have estimated the specifications in Table 3, and all of the specifications that follow, including those private schools that serve five or fewer students. When these 'home' schools are included, we get results that are, in all important dimensions, qualitatively the same as the results presented here. These results are available from the authors upon request.

likelihood that the entrant chooses that location. Using Levinson's (1996) terminology, it appears that entering private schools are not particularly 'footloose'.<sup>21</sup> Because specification 2's market definition nests the definition for specification 1, we prefer specification 2. Our discussion concentrates on the estimates of specification 2 and notes where specification 1 slightly limits our conclusions.

Entering private schools appear to take public provision into account when making their location choices. All else equal, entrants are more likely to locate in school districts with lower per-pupil expenditures<sup>22</sup> and, for specification 1, in districts under court order to desegregate the public schools.<sup>23</sup> School districts with larger shares of students from families on AFDC and thus, *ceteris paribus*, with higher costs, also represent more attractive locations for entrants, though this effect is not quantitatively important.<sup>24</sup>

When making their location decision, entrants also appear to account for the costs of operating a private school at a particular location. We find that the probability that an entrant chooses a particular location is negatively related to our proxy for the rental cost at that location, the per pupil assessed value of property in the school district.<sup>25,26</sup>

Community characteristics will influence a potential entrant's assessment of the attractiveness of a particular location only if the entrant believes that those characteristics signal the existence of a market niche

<sup>21</sup> As we noted above, the fact that entrants do not appear to be 'footloose' implies that the independence of irrelevant alternatives assumption is reasonable in this context. Firms are 'footloose' if they possess no strong ties to specific geographical areas. Formally, the choice set for a footloose school would be all school districts in the state or the country. For further discussion of this concept, see Levinson (1996).

<sup>22</sup> We have also estimated all of the specifications here with the pupil-teacher ratio replacing per-pupil expenditures. We find that entrants are more likely to locate in districts with higher pupil-teacher ratios. Also, when this substitution is made, none of the estimated effects of the other variables change substantively.

<sup>23</sup> This latter result matches the finding of a number of researchers, starting with Clotfelter (1976), who have found that there is more demand for private schooling in communities forced to desegregate their schools. Downes and Schoeman (1998) confirm that there is evidence of this demand-side relationship in California.

<sup>24</sup> Other measures of the cost structure of the public schools in a district exhibited even weaker relationships with the likelihood a school chooses to enter in that district. For example, we found that the fraction of public school students with limited English proficiency was not a significant determinant of the likelihood that entrants chose to locate in a particular district.

<sup>25</sup> Alternatively, per pupil assessed value could signal the past quality of a district's public schools. If switching between the public and the private sectors involves costs over and above tuition, past quality could be an important determinant of the attractiveness of a particular location. We feel that past quality of the public schools is more clearly signaled by other controls, particularly by the number of incumbents. Thus we interpret per pupil assessed value as a measure of rental costs.

<sup>26</sup> We received, however, no indication that entering private schools were sensitive to the likely labour costs at a particular location. Coefficients on average school teacher salaries in a district did not differ significantly from zero.

at that location. For example, in a Tiebout-type model individuals are able to sort themselves into optimally-sized communities providing the amount of public education desired by each resident. In such a setting, private education will not be viable. However, once there is more than one type of individual residing in a community, the provision of public education can no longer be perfectly tailored to all of the residents of the community. Therefore, only those community characteristics that are correlated with community heterogeneity should affect an entrant's assessment of the attractiveness of a particular location.

Previous work on schooling demand and supply (e.g., Sonstelie, 1982; Downes and Greenstein, 1996) has found that heterogeneity in the educational attainment of a community's adults is an important determinant of the equilibrium share of students attending private school. Thus, it is unsurprising that we find that entrants view as more attractive locations with larger shares of adults who have completed high school and who have completed college. The literature has not found as strong a relationship exists between the private school share and measures of racial/ethnic heterogeneity in a community. Thus, it is also not surprising that we find no clear connection between the probability a school chooses to locate in a particular district and the fraction of that district's student population that is African-American, Hispanic, or Asian-American.

The absence of a significant relationship between mean family income and the likelihood of choosing a particular location is not surprising since mean family income tells us nothing about heterogeneity in a community and thus, on the basis of the reasoning above, should not influence the equilibrium private school share. At the same time, we do get the expected results that, all else equal, entrants are less likely to locate in communities in which a larger fraction of families have incomes below \$10 000 (in 1980 dollars) and more likely to locate in communities in which a larger fraction of families have incomes in excess of \$50 000 (in 1980 dollars). However, neither of these estimated coefficients is significant.

Other indicators of within-community heterogeneity in the demand for the public schools also prove to be important determinants of the location choice of entering schools. Renters will tend to demand higher levels of public provision if they perceive their tax burden to be lower than that of homeowners (Inman, 1978). As a result, if renters had children in the schools and had incomes at or above the median, we would expect an increase in the fraction renting to signal a less attractive environment for potential entrants. However, in practice, renters tend to be disproportionately young and low-income. Thus, given our imperfect controls for income dispersion, it seems likely that the positive relationship we observe between the fraction of the population residing in rental housing and the probability an entrant locates in a community

indicates that the dominant effect is not the lower perceived tax burden but the low average demand of households that are renting. Similarly, the negative, though insignificant, relationship between the fraction of families with children in a community and the probability an entrant locates in that community undoubtedly reflects the fact that, *ceteris paribus*, support for public education is higher in such communities.

We find that schools are more likely to locate where there are more incumbent private schools of the same type in the previous year, a result that parallels the findings of McConnell and Schwab (1990) and Levinson (1996). Our hope was that the total number of schools present in 1970 would control for unobserved attributes of a location that make it attractive and that the number of incumbent schools would signal the extent of competition at the location. Instead, the reverse seems to have occurred. It appears that the number of schools present in 1970 does not adequately control for unobservables and for the ability of incumbent private schools to respond to changes in demand by expanding. Undoubtedly, this result is attributable both to the fact that many schools were omitted from the 1970–71 data and to the growth of demand in California.

We also find the probability that a school of a particular type locates in a district increases if a school of the same type exited that market after the previous academic year.<sup>27</sup> However, schools of one type do not view exit of a school of a different type in the same way as they view exit of one of their own.<sup>28</sup> One possible explanation for this result is that, even though a particular market is attractive for a certain type of entrant, exit of the same type of schools may also be observed in that market because recent entry of that type may have driven out older incumbents of that type who are no longer competitive. A related explanation is that an exiter of a particular type leaves a hole that is filled by the entrant. Filling this hole is made easier by the fact that the costs of new entry are lower when an existing pool of organizers from closed schools still reside in the community.<sup>29</sup>

All of the explanations of the signs of the coefficients on the variables measuring the presence of incumbents and the exit behaviour

<sup>27</sup> A total of 268 schools exited after the 1978–79 academic year. Thus, on net, there were 207 entrants.

<sup>28</sup> Not only are the signs on exit dummies different, but so too is the significance. Only exit by one's own type has a positive effect.

<sup>29</sup> One additional explanation for this result is that many of the schools we count as exiters are not truly exiters, and many of the schools we count as entrants are not truly entrants. To lessen the likelihood of this possibility, we used information on each school's street location and contact person to avoid counting as exiters and entrants schools that changed name between 1978–79 and 1979–80. In our data, a school that changed both its name and its street location would be counted as an exiter and an entrant. Counting such schools as both exiters and entrants is unavoidable given available information and, we feel, is appropriate.

of incumbents support the conclusion that entering schools are sensitive to the competitive environment in a particular market. Further, all of these results are consistent with the claim that the history of a market matters in the sense of Rauch (1993).<sup>30</sup> What is less clear from the results is how exactly entrants interpret the available information on the presence of incumbents and on exit in assessing the attractiveness of a market.

We also find that, while schools not affiliated with evangelical Protestant churches are more likely to locate in districts with larger fractions of the population Catholic, the likelihood that an evangelical Protestant school enters a market is negatively related to the per cent of the population that is evangelical Protestant. Why we observe a counterintuitive relationship between per cent evangelical Protestant and the likelihood that a school with an evangelical Protestant affiliation chooses to locate in a district is unclear. Our suspicion is that, since the per cent evangelical is at the county level, it is a coarse measure of the true intensity of demand for church-affiliated schools within a school district, a much smaller geographic region. Alternatively, in counties in which the per cent evangelical Protestant is high, families with particularly strong religious views may be able to establish effective control over the public schools, making these markets less attractive for prospective entrants with an evangelical Protestant affiliation.<sup>31</sup>

Finally, we cannot reject the null hypothesis that the decisions of entrants depend only upon the characteristics of the district in which they locate (Equation 3).<sup>32</sup> The estimates of Equation 4 that support this conclusion are available from the authors. This result suggests that entry is primarily a response to very localized conditions.

As an aside, while it is tempting to use these estimates to assist in developing predictions concerning the implications of the implementation of a full-choice school programme, such as vouchers, it would be hasty to conclude that these results provide clear predictions concerning the implications of a voucher programme for private school entry. The estimates do seem to support a frequently expressed presumption within the debate over school choice (e.g., Barro, 1994) that new

<sup>30</sup> We find no compelling evidence that entrants use evidence on the future direction of the market in making their decisions. In specifications not presented here, we found that the probability that an entering school locates in a particular school district does not depend upon changes in the revenue limit of that public school district. Thus, entrants do not appear to be utilizing a readily available source of information on prospective changes in public school expenditures.

<sup>31</sup> For evidence that conservative Christians have succeeded in controlling school districts in California, see Gaw (1992).

<sup>32</sup> Formally, we can implement a Wald test of the null hypothesis that the coefficients on neighbouring district characteristics jointly equal 0. For specification 1 in Table 4, the resultant test statistic is 26.447. For specification 2, the test statistic is 34.494. Since there are 30 degrees of freedom, we cannot reject the null in either case.

entrants will tend to locate where public schools are weaker. However, some further caution is required. Vouchers do more than alter the relative price of private alternatives; they also represent a supplement to family income that, under most voucher plans, would not alter the shape of the community's income distribution. If, all else equal, an entrant's decision to locate in a particular community is unrelated to the mean income in that community, as our results seem to indicate, then income supplements may result in very little new entry. On the other hand, since we find that entry is more likely where operating costs (as proxied by per pupil-assessed value) are lower, our results could also support the conclusion that any policy that lowers the cost of entry, as a voucher does, will result in substantial new entry. Finally, any full voucher programme might bring about demand changes on a much larger scale than we observe here, even though this case does involve growth in the private school share in California of unprecedented proportions. Such a more dramatic change could also alter the responsiveness of marginal entrants to local conditions and to incumbent providers.

### *V.2. Is there evidence of differences in objectives?*

Table 4 provides estimates of specifications of Equation (3) that allow for structural differences in the objectives of different types of private schools. We find some statistical evidence that there are structural differences between types, but one would hardly call this evidence compelling.<sup>33</sup> We present the results in Table 4 both to provide the reader with the flavour of the qualitative differences in the determinants of the entry decisions of different types of private schools and to permit direct comparison between this work and our previous work (Downes and Greenstein, 1996).

We find that private schools affiliated with evangelical Protestant churches are more sensitive in their location choices to the per-pupil expenditures of the public schools and to the fraction of the population with a high school degree than are other entering private schools. On the other hand, the results in Table 4 also indicate that the location decisions of evangelical Protestant schools are less dependent on standardized test scores in the public schools and on the fraction of the population with a college degree. We also find that schools affiliated with an evangelical Protestant church show less of a propensity to locate in communities in which property is more costly.

<sup>33</sup> When the choice set is the set of contiguous districts, the Wald statistic for the null hypothesis that there is no structural difference is 19.436. When the choice set is the set of districts in contiguous counties, the Wald statistic is 26.594. Since there are 14 degrees of freedom in each case, we can reject the null in the second case but not the first case.

TABLE 4

*Determinants of location choice of entering private schools: structural differences allowed, home schools dropped<sup>1</sup>*

*Form of probability: multinomial logit (Heteroskedastic-consistent standard errors in parentheses)<sup>2</sup>*

<i>Variable</i>	<i>Specification 1-choice set includes contiguous districts</i>		<i>Specification 2-choice set includes all districts in contiguous counties</i>	
	<i>All other entering schools</i>	<i>Evangelical Protestant schools</i>	<i>All other entering schools</i>	<i>Evangelical Protestant schools</i>
Total number of students (x.00001)	-0.2151 (0.1960)	0.0199 (0.3016)	0.0349 (0.1162)	0.3670* (0.2058)
Dummy for type of district (= 1 if elementary)	-0.3375 (0.2701)	-0.2543 (0.3524)	-0.5168** (0.2137)	-0.2472 (0.2580)
Public school per-pupil expenditures	-0.3908 (0.3020)	-1.1089** (0.4547)	-0.6246** (0.2734)	-1.5445*** (0.3924)
Mean score of 6th graders on CA assessment programme test	0.0351 (0.0269)	0.0136 (0.0272)	0.0123 (0.0186)	0.0048 (0.0191)
Public school 6th graders on AFDC (%)	0.0109 (0.0209)	0.0155 (0.0220)	0.0198 (0.0134)	0.0166 (0.0162)
Mean family income (x.0001)	-0.7525 (0.9765)	-0.6102 (1.3249)	-0.7386 (0.8111)	-0.2347 (1.0831)
Percent of families with incomes below \$10 000	-0.0219 (0.0369)	0.0176 (0.0433)	-0.0276 (0.0305)	0.0308 (0.0358)
Percent of families with incomes above \$50 000	-0.0013 (0.0815)	0.0254 (0.1100)	0.0170 (0.0666)	0.0146 (0.0895)
Percent of adults high school graduates	0.0209 (0.0223)	0.0493** (0.0241)	0.0304* (0.0165)	0.0557*** (0.0181)
Percent of adults college graduates	0.0563*** (0.0201)	0.0235 (0.0290)	0.0660*** (0.0147)	0.0198 (0.0232)
Percent of families with children	-0.0085 (0.0168)	-0.0208 (0.0206)	-0.0144 (0.0138)	-0.0258 (0.0167)
Percent of population residing in rental property	0.0087 (0.0106)	0.0040 (0.0130)	0.0130 (0.0089)	0.0155 (0.0109)
Dummy for existence of desegregation programme	0.7161 (0.4659)	1.2222* (0.7235)	0.7964** (0.3648)	0.1554 (0.5102)

TABLE 4  
Continued

Variable	Specification 1-choice set includes contiguous districts		Specification 2-choice set includes all districts in contiguous counties	
	All other entering schools	Evangelical Protestant schools	All other entering schools	Evangelical Protestant schools
Per-pupil assessed value	-0.5810 (0.4832)	-1.5525 ** (0.7620)	-0.7075 * (0.4232)	-1.5434 ** (0.6750)
Percent of population Catholic (in county)	-0.0020 (0.0605)	-0.0109 (0.0665)	0.0279 (0.0243)	0.0284 (0.0239)
Percent of pop. Evangelical Protestant (in county)	0.1670 (0.1464)	-0.0733 (0.2084)	-0.1258 ** (0.0573)	-0.2359 *** (0.0663)
Number of Catholic and non-affiliated schools, 1970	-0.2206 (0.6792)	-0.7430 (1.3020)	-0.3276 (0.4744)	-0.0801 (0.7923)
No. of Evang. Protestant and other religious schools, 1970	-0.7364 (0.6333)	-1.2745 (0.8818)	-0.7908 (0.5130)	-0.9775 (0.6821)
No. of incumbent schools (Evang. Protestant excluded)	0.3690 (0.3430)	0.3105 (0.5224)	0.1814 (0.2812)	-0.2053 (0.3992)
No. of incumbent Evang. Protestant schools	1.3994 ** (0.6892)	1.9986 ** (0.8642)	1.3112 ** (0.5745)	1.5991 ** (0.7062)
Dummy for incumbent school exit (Evang. Protestant excluded)	0.7250 *** (0.2280)	0.0823 (0.2941)	1.0465 *** (0.1965)	0.3763 (0.2467)
Dummy for incumbent Evang. Protestant school exit	0.2291 (0.2855)	1.2563 *** (0.2924)	0.1299 (0.2475)	1.0606 *** (0.2329)
Log of likelihood function		-492.36		-1,128.75

Notes: 1) All schools with enrolments of five students or less are assumed to be 'home' schools. In addition, one school which did not report its enrolment is omitted.  
2) Throughout the table, \*\*\* denotes significant at 1% level, \*\* denotes significant at 5% level, and \* denotes significant at 10% level in two-tailed tests.

All of these qualitative differences in the relationships between community characteristics and location choices of different types of private schools parallel the findings of our earlier work. In particular, the accumulated evidence seems to be that, while the operators of private schools with an evangelical Protestant affiliation are not completely insensitive to the nature of public provision, those who run these schools are less driven by purely academic considerations than are their counterparts in the private school world. Thus, taken together with our earlier work, the estimates in Table 4 confirm the popular view that the objectives of different types of private schools differ, with schools affiliated with evangelical Protestant churches possessing a more inward-looking perspective.

### *V.3. Comparing behaviour of entrants and incumbents*

The post-*Serrano* experience in California does not just provide us with an opportunity to better understand the behaviour of private schooling providers. This setting also allows us to examine entry behaviour in a growing market and to begin to explore the patterns of entry relative to existing market structure. In earlier work (Downes and Greenstein, 1996), we considered the relationship between location patterns of incumbent schools and the public schooling provision and characteristics of the population at a prospective location. In that work, which examined the location pattern of private schools in California in 1978–79, we found that measures of public schooling provision that are likely to be correlated with perceptions of how well local public schools are performing, particularly the pupil-teacher ratio, have a significant and quantitatively important influence on the number of private schools in a community. The educational attainment of adults in the community proved to be another influential determinant of the location patterns of incumbent schools, while the racial/ethnic composition and the religious composition of the local population were frequently unimportant. In addition, the mean income of families in a community did not appear to affect the number of private schools.

All of these results parallel the findings in this paper. Further, the pattern of differences between different types of entering private schools duplicate what we observed in the earlier work to be the pattern of differences between different types of incumbent schools. In other words, the factors that correlated with the location pattern of incumbent California private schools were also the factors that made a location more or less attractive to new entrants. The magnitudes of the elasticities were also similar. That the results of these two papers are qualitatively similar is striking since the underlying empirical models are so dissimilar and need not lead to qualitatively similar coefficients (Levinson, 1996).

That said, there are also some notable differences in the results of the two papers. First, in our earlier work, we found that the number of private schools in a community depended upon the characteristics of neighbouring communities. We see no evidence that neighbouring community characteristics drive the location decisions of entrants. Second, while, in our analysis of the location pattern of incumbents, we found evidence of substantive differences between the educational objectives of schools affiliated with evangelical Protestant churches and other private schools, we find few statistically significant differences in this work.

Nonetheless, the similarities between the two sets of results outnumber the differences. The preponderance of evidence indicates that the growth of private schools in this rapidly growing market closely paralleled previous location patterns. Taken together, incumbents and entrants tend to respond to many of the same features of demand. The two sets of results provide a compelling and consistent picture of the behaviour of private suppliers of education.

## VI. CONCLUDING REMARKS

This project examines the location behaviour of new entrants to the schooling markets in California in 1979–80. The combination of dramatic changes in public provision resulting from school finance reforms implemented in the preceding years and of the diversity of the population served by the public and private schools in California make this a setting uniquely suited to investigating the behaviour of new entrants.

We find that the location choices of new entrants are influenced by the characteristics of the publicly-provided alternative. New private schools are more likely to locate in communities with lower per-pupil expenditures and higher percentages of students from low-income families. We also find that entrants tend to locate in communities in which larger shares of the adult population have completed college and high school. All of these results are consistent with the conclusions we reached in earlier research (Downes and Greenstein, 1996) and provide considerable support for the argument that new entry behaviour in these growing markets has many similarities to previous market structure.

As noted, the implications of these results for public policy are unclear. It is tempting to combine Hoxby's (1994) finding of a salutary effect of private sector competition with our finding that, all else equal, new private schools are more likely to locate in communities in which public school students have lower standardized test scores. This could indicate that a voucher programme could improve the status of children residing in the worst public school systems. In addition, we find some

evidence that entrants are sensitive to entry costs, which would be lowered by a voucher programme. Yet we found no evidence of a relationship between family income and the likelihood an entrant chooses a particular location. It is unclear how much entry behaviour would be stimulated by vouchers and other public policies that supplement income. Further, entrants appear to choose markets in which high income families are likely to reside, which opens the possibility that entrants may well seek to first 'cream off' these high income families. The results of this research do not, and cannot, provide a conclusive answer to the question of whether vouchers or full-school choice represent an advisable policy. Nonetheless, we do show that a fully developed analysis of a policy that provides families with vouchers that can be used to defray the cost of attending private schools must examine all aspects of supply-side behaviour in the schooling market, including entry behaviour.

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