Inequality and Intergenerational Mobility in Schooling: The Case of Mexico*

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I. Introduction

A growing body of theoretical and empirical research suggests that unequal income distribution creates obstacles to economic development.[1] One of the channels through which inequality is posited to operate is in hindering investments in human and physical capital: imperfections in capital markets prevent those with low incomes from making profitable investments. The failure to invest in human capital has long-term consequences, both for the individual and the economy. If the poor are unable to garner the resources needed to send their children to school, then income inequality is transmitted from one generation to the next.

The interaction between schooling levels and inequality has led many to suggest that broadening educational attainment is the best way to reduce inequality.[2] As such, it is fair to ask how much progress has been made in this area over the past several decades. We do this by examining intergenerational mobility in education in Mexico using a unique data set that provides characteristics of the household of origin, including parents' education and occupation, for adults born between 1925 and 1971. Only a handful of studies has explored intergenerational mobility in Latin American countries.[3] Moreover, most of the existing research provides mobility measures for a limited demographic sample.[4]

The Mexican data tell a mixed story. On the one hand, standard measures indicate that intergenerational mobility has increased markedly over the past 47 years. Even for the children from Mexico's poorest urban households, primary school completion rates have increased from 60% to more than 90% over this period. But we find a decided reversal in mobility for our youngest

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cohort, born between 1965 and 1971. We also find very little progress in rates of completion at the upper and postsecondary levels for children born in low-income households after 1954.

We consider two hypotheses for crowding at the lower-secondary level and the reversal in intergenerational mobility: (1) the economic crisis of the 1980s and (2) institutional barriers to the continued expansion of schooling. Though the crisis appears to have played a role, we find evidence that institutional barriers are also important. The existence of these barriers is problematic for the long-term prospects of educational expansion because it suggests a deep-rooted limit of the system and not just a temporary setback.

This article proceeds as follows. Section II discusses the links between schooling inequality, intergenerational mobility in schooling, and income inequality. Section III describes the data and provides an overview of educational expansion over the past 47 years. Section IV establishes trends in intergenerational schooling mobility. Section V ponders the causes and implications of the recent slowdown in schooling mobility, and Section VI concludes.

II. Schooling, Intergenerational Mobility, and Inequality

Several recent studies have documented a rise in income inequality in the 1980s in Latin America. J. L. Londoño and M. Székely provide data on 13 countries, including Mexico, from 1970 to 1995.[5] They report that inequality in Mexico fell steadily between 1970 and 1984, jumped abruptly between 1984 and 1987, and held at about its 1987 level in 1992 and 1994. Unequal schooling attainment and higher compensation paid to workers with more schooling are two key components of income inequality.[6] M. Cragg and M. Epelbaum document the rise in returns to college education between 1987 and 1993 and favor a demand-side explanation for the change, related to structural reform policies that liberalized the Mexican economy in the mid- to late 1980s.[7] Other authors share this emphasis.[8] Our view is that the relative supply of workers at different education levels likely accentuated the demand shift that favored the college-educated.[9] For a similar argument, see S. Duryea and M. Székeley.[10]

Income inequality measured as the coefficient of variation attributable to differences in schooling attainment (y) and returns to schooling (r) is

$$\frac{\sqrt{\sum_i \left[\sum_{y=0}^{y_i} r_y - \bar{r}\bar{y}\right]^2 / n}}{\bar{r}\bar{y}} \tag{1}$$

(i.e., the square root of the variance, divided by the mean), where i and y index individuals and years of schooling, respectively, $\bar{r}$ and $\bar{y}$ are the average returns (for the first through the average number of years of schooling) and average years of schooling, respectively, and r_y is the rate of return for the yth schooling year.[11] Accordingly, income inequality will be lower for (a)

greater compression in the distribution of schooling years, (*b*) lower schooling returns generally, and (*c*) diminishing returns to higher schooling levels. Condition *c* depends in large part on the relative supply of differently skilled workers, since

$$r_l = f\left\{\sum_i L/H\right\},\ r_h = f\left\{\sum_i H/L\right\},\ f' < 0, \tag{2}$$

where r_l and r_h represent returns to low and high schooling levels, respectively, and L and H are indicator variables that take the value of one for individuals with low and high schooling levels, respectively, and are otherwise zero. Returns to a given level of schooling will tend to fall as the relative supply of workers at that level rises, all else (e.g., labor demand for workers of different skill levels) being equal.

Note that condition *a* is crucial. Even if returns to schooling are low, educational inequality will increase the wage differential. At the same time, a more equal income distribution requires that the compression in schooling years not be offset by an increase in the returns to schooling at higher levels. N. Birdsall, D. Ross, and R. Sabot describe a process of the expansion of basic education that left few uneducated workers and created demand for higher schooling levels as the driving force behind increasing equality in income distribution in East Asia. However, the increased coverage of basic education does not ensure a tide of students who will continue on to advanced schooling. The Inter-American Development Bank points out that although Latin America and East Asia share similar rates of entrance into primary schooling, the completion rates in Latin America are much lower.[12] Thus it is possible that gains in average schooling may mask large differences in achievement among different groups of people. In particular, it is possible that rising schooling attainment depends on modest gains at the bottom of the distribution that do not translate into higher enrollments for advanced schooling. In fact, as basic education becomes the norm, supplies of moderately educated workers will expand and relative schooling returns will fall for this group. Falling inequality in schooling years is therefore not a sufficient condition for reducing income inequality.

G. Psacharopoulos reports higher returns to schooling in Latin America relative to returns in industrialized countries.[13] The higher returns no doubt reflect, in part, scarcity rent. According to human capital theory, these high returns, over time, should increase the demand for schooling, raise the supply of highly educated workers, and thereby dissipate the scarcity rents. Nevertheless, it is widely presumed that incomplete credit markets, the poor quality of basic public education, and noneconomic barriers prevent the majority of the population from pursuing optimal education investments, especially in higher education. The problem is that children from families with limited resources cannot finance even potentially very profitable investments in

schooling, are stuck in low-quality public schools, and lack access to the social capital—such as role models—that can greatly reduce information costs. Studies of both industrialized and developing countries show that family background is an important determinant of schooling attainment.[14] Thus a primary component of reducing income inequality is the degree of intergenerational mobility in schooling. Countries with rising mobility have better prospects for reducing income inequality.

A final consideration on the link between intergenerational schooling mobility and inequality concerns different patterns between and within cohorts. Almost universally, individuals complete their schooling in their youth. Thus rising schooling levels over time tend to increase between-cohort inequality even as within-cohort inequality falls.[15]

III. Data

We make use of the 1994 Gender, Age, Family and Work household survey (referred to hereafter by the Spanish acronym GEFT [Género, Edad, Familia y Trabajo]). The GEFT is to our knowledge the first household survey in Mexico that gathered data on characteristics of the household of origin in addition to the customary array of current demographic and economic traits. The survey was administered to 27,792 individuals as an addendum to the recurring National Urban Employment Survey (referred to hereafter by the Spanish acronym ENEU [Encuesta Nacional de Empleo Urbano]) during a 10-week period from August to October 1994. The ENEU collects information on the educational attainment of all household residents and the employment status of those 12 years of age or older. The GEFT collected additional information on families of origin for all respondents 18 years of age and older in Mexico City, Monterrey, Guadalajara, Veracruz, Orizaba, and Merida. The additional data include sibship size and birth order of the respondent, and the educational attainment and occupation of the person who was head of the household when the respondent was 14 years old. Although the recall method of identifying past family traits may produce noisy estimates due to measurement error, it has the advantage of providing data on household of origin for all adults. We are therefore able to compare intergenerational mobility among several age cohorts, spanning 47 years.[16]

The reported household head for families of origin was the father in 83% of the cases, the mother in 12% of the cases, and another adult in the remaining 5% of the cases. For convenience we refer to the household head as the parent. About 7% of those surveyed said they were independent at the age of 14. We exclude these respondents from the sample, since they are coded as being the household head at age 14 and therefore do not provide information on their parent's education. Likewise we exclude observations with missing data for parent education and own education. We also restrict our analysis to adults 23–69 years of age. The lower cutoff assures us that almost all respondents have completed their schooling;[17] the upper cutoff maintains reasonably sized

TABLE 1

COHORT DEFINITIONS AND CHARACTERISTICS

Cohort Label	Age in 1994	Years of Birth	Years Entered Primary School*	Years Entered Upper-Secondary School*	No. of Observations	Mean Years of Schooling (SD)		Coefficient of Variation for Cohort's Schooling		Gini Coefficient	
						Men	Women	Men	Women	Men	Women
1†	60–69	1925–34	1930s	1940s	1,332	5.8 (4.9)	5.0 (4.3)	.84	.86	.410	.461
1†	50–59	1935–44	1940s	1950s	2,149	7.7 (5.1)	6.2 (4.6)	.66	.74	.410	.461
2	40–49	1945–54	1950s	1960s	3,516	9.3 (5.0)	7.5 (4.3)	.54	.57	.314	.320
3	30–39	1955–64	1960s	1970s	4,933	10.3 (4.3)	9.2 (4.3)	.42	.47	.239	.268
4	23–29	1965–71	1970s	1980s	4,343	10.6 (3.7)	10.2 (3.8)	.35	.37	.196	.207

NOTE.—Estimates make use of sample weights.

* These are rough estimates that assume that children entered first grade at the age of six and did not repeat any grades. Late entry into school and grade repetition are, however, quite common.

† Cohort 1 combines two 10-year age groups in some analyses for reasons of sample size.

samples for comparisons among cohorts.[18] These restrictions leave us with a sample of 23,845 individuals.

Three-quarters of the Mexican population resides in urban areas, and the six cities in which the GEFT was administered contain about one-third of the urban population.[19] Although every urban area has distinct characteristics, with some caution our results can be interpreted as representative of urban Mexico. However, we are unable to say anything about the experience of rural Mexico, which may be quite different from that of the cities.[20]

We make use of both years of schooling (reported for surveyed individuals) and levels of schooling (reported for parents of respondents). The correspondence is as follows: 1–5 years indicates at least some schooling at the primary level; 6 years indicates completion of the primary level; 7–9 years corresponds to the 3 years of lower-secondary instruction; 10–12 years corresponds to the 3 years of upper-secondary instruction; and 13+ years indicates 1 year or more at the university level.

We also group the data by age cohorts of about 10 years. Trends among cohorts are the basis for our observations of educational change over time. Cohort definitions and characteristics are provided in table 1. Note that individuals born between 1925 and 1971 would have attended primary school from the early 1930s through the late 1970s. The last cohort would have entered the upper-secondary level in the early to mid-1980s.

Table 1 shows that mean schooling attainment for urban men grows from 5.8 years for the oldest cohort to 10.6 years for the youngest cohort. For urban women, attainment grows from 5.0 to 10.2 years. Figure 1 shows that this expansion proceeded rapidly for men in the first three cohorts and then slowed for the next two cohorts, especially for the youngest. The greatest expansion for women occurred between the second and fourth cohorts, with a slight

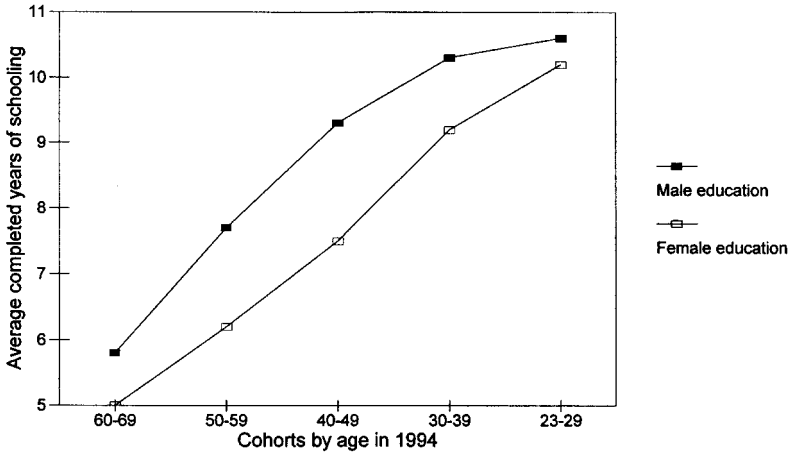

FIG. 1.—The expansion of schooling in Mexico

slowing in the youngest cohort. Throughout this period women's schooling often trailed men's by more than 1 year, but by the most recent cohort the gender gap all but disappears. This convergence appears to be the result of a slowing in the educational expansion of men.

Schooling inequality shows a similar pattern of improvements across cohorts, convergence between men and women, and a slowing in the rate of progress for the most recent cohort. The coefficient of variation falls from .84 to .35 for men and from .86 to .37 for women between the oldest and youngest cohorts. The Gini coefficient falls from .41 to .20 for men and from .46 to .21 for women.[21] As expected, schooling expansion induced a significant compression in the distribution of years of schooling.[22]

Figure 2 shows the proportion of each cohort completing each preuniversity schooling level and, in order to enhance comparability with the youngest cohort that may contain those who are still en route to completing their degrees, the proportion of each cohort with at least 1 year of university instruction. For both men and women, each successive cohort increases its rate of completion at every school level, except for the youngest cohort at the university level. For men, the expansion is clearly greatest at the primary and lower-secondary levels. The gains made by earlier cohorts at the upper-secondary level are not sustained for the two most recent cohorts, and there is very little progress at the university level in cohorts 3 and 4. For women, the expansion is sustained at the primary, lower-secondary, and upper-secondary levels, but again, there is little progress at the university level. In sum, the educational expansion depicted in figure 1 appears to be the result of increasing access at the primary and lower-secondary school levels for men and women, and at the upper-secondary level for women only.

Table 2 shows the supply of men and women at different schooling levels relative to those with a basic secondary education (8–11 years of schooling).

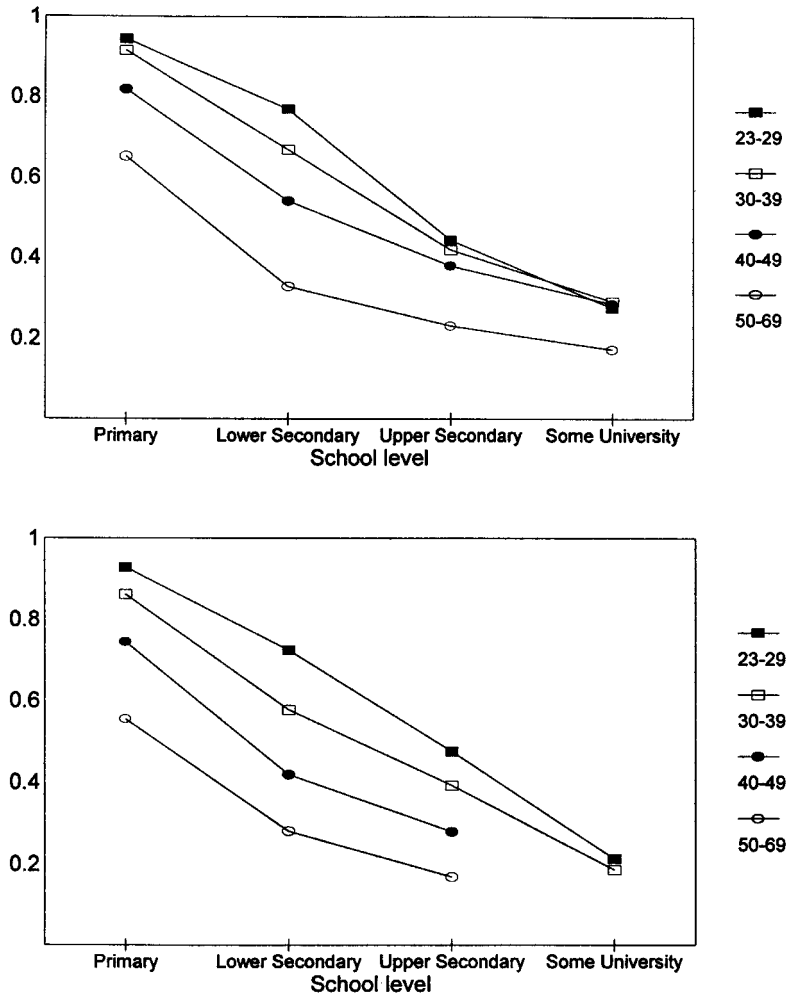

FIG. 2.—Top, proportion of male cohorts completing each school level. Bottom, proportion of female cohorts completing each school level.

Across cohorts, the relative supply of men with fewer than 8 years of schooling falls dramatically. The relative supply of men with college degrees rises between cohorts 1 and 2 and falls sharply for cohort 3. The supply of men with 12–15 years of schooling also falls relative to those with 8–11 schooling years.[23] Table 2 thus gives a clear picture of crowding at the preuniversity level for men. The pattern for women is quite different, with the relative supply of college graduates growing rapidly between cohorts 1 and 3.[24]

IV. Intergenerational Mobility in Education

Table 3 presents two measures of intergenerational schooling mobility by sex and cohort. The correlation coefficient is the more common measure. To

TABLE 2

SUPPLY OF MEN AND WOMEN AT DIFFERENT SCHOOLING LEVELS RELATIVE TO THOSE WITH 8–11 YEARS OF SCHOOLING, USING SAMPLE WEIGHTS

YEARS OF SCHOOLING	MEN BY COHORT				WOMEN BY COHORT			
	1	2	3	4	1	2	3	4
0–3	2.45	.69	.18	.04	3.05	1.30	.47	.18
4–7	2.92	1.61	.75	.42	2.79	2.45	1.53	.73
8–11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12–15	.78	.72	.63		.97	1.34	1.19	
16+	1.17	1.27	.76		.42	.47	.68	

facilitate comparisons with other studies, we use father-child correlations only.[25] For all cohorts, the intergenerational education correlation is .50 for men and .53 for women.[26] Table 3 also provides correlations reported in similar studies of other countries. Correlations in the Mexican sample appear to be much higher than those estimated for Germany and Malaysia, and in between the estimates for the United States and Panama.

Between the first and fourth cohorts, intergenerational correlations fall from .57 to .49 for men and .59 to .49 for women, a decline of 14% and 16%, respectively. The decline in correlation over time suggests a rise in intergenerational mobility. Nevertheless, the downward trend in correlation reverses itself between cohorts 3 and 4 for men (rising from .43 to .49), and appears to level off for women (at .49). This pattern suggests that intergenerational educational mobility stalled in the 1980s. This conclusion holds even if we make the extreme assumption that everyone in cohort 4 still attending school and who at least graduated from the upper-secondary level will attain 18 years of schooling.

Table 3 also shows the proportion of each cohort that exceeded its parents' educational level. This measure follows the same pattern across cohorts as the correlation coefficient. Again, the results do not change if students in cohort 4 eventually attain 18 years of schooling.

Note that for both of the intergenerational mobility measures, older women show greater intergenerational mobility than men, and the trend toward increasing mobility across cohorts is more moderate. It is likely that increasing opportunities for women meant that they were both more likely to benefit from an advantageous family background over time (which would reduce intergenerational mobility) and also to take advantage of the increasing availability of schooling (which would increase mobility). These opposing effects likely slowed the pace of increasing intergenerational mobility for women.

In addition to overall measures of mobility, we are interested in the distribution of mobility. Certainly rigidity at the high end of the distribution is less problematic than rigidity at the low end. Table 4 presents transition matrices that show the probability of completing a given schooling level by parents' educational background. For both men and women whose parents

TABLE 3

MEASURES OF INTERGENERATIONAL SCHOOLING MOBILITY: MEXICO AND OTHER COUNTRIES

	CHILD'S CHARACTERISTICS	FATHER-CHILD SCHOOLING ATTAINMENT CORRELATIONS (No. of Observations)		PROPORTION EXCEEDING PARENTS' SCHOOLING LEVEL	
		Men	Women	Men	Women
Mexico 1994:					
All cohorts	23–69 years of age	.498 (7,189)	.528 (8,588)	.76	.68
Cohort 1	50–69 years of age	.569 (1,413)	.588 (1,816)	.64	.49
Cohort 2	40–49 years of age	.481 (1,537)	.538 (1,860)	.75	.63
Cohort 3	30–39 years of age	.425 (2,143)	.491 (2,580)	.80	.73
Cohort 4	23–29 years of age	.491 (2,096)	.493 (2,332)	.79	.78
Cohort 4	Eventual schooling	.497	.489	.83	.80
Germany 1984	19–26 years of age	.237 (384)	.016 (245)		
Malaysia 1988	8–50 years of age	.194 (2,435)	.226 (2,359)		
Panama 1983	18+ years, living with father	.57 (780)	N.A.		
	Father of above	.68 (780)	N.A.		
United States 1984	20–30 years of age	.418 (1,139)	.402 (1,209)		

SOURCES.—Correlations for Germany and the United States are from panel data sets reported in table 6 of Kenneth Couch and Thomas Dunn, "Intergenerational Correlations in Labor Market Status: A Comparison of the United States and Germany," *Journal of Human Resources* 32 (1997): 210–32. Correlations for Malaysia are from table 2 in Lee Lillard and Robert Willis, "Intergenerational Educational Mobility: Effects of Family and State in Malaysia," *Journal of Human Resources* 29 (1994): 1126–66. Correlations for Panama are from table 8 in James Heckman and V. Joseph Hotz, "An Investigation of the Labor Market Earnings of Panamanian Males: Evaluating the Sources of Inequality," *Journal of Human Resources* 21 (1986): 507–42.

NOTE.—Measures for Mexico use sample weights. Figures for cohort 4, eventual schooling, are calculated for ascribed schooling attainments for those still in school as follows: students with fewer than 12 years of schooling are ascribed 12 years of schooling and those with 12 or more years of schooling are ascribed 18 years of schooling. Father-child correlations were used for Mexico to allow comparison with father-child correlations computed from data from other countries. N.A. = not available.

had 6 years of schooling or less, the probability of completing the primary and lower-secondary levels expanded steadily from cohorts 1 to 4. Ninety percent of these children completed the primary level in cohort 4, compared with 60% of men and 48% of women in the first cohort. An even greater expansion in access occurred at the lower-secondary level, with probabilities rising from .25 or less to about two-thirds. Still, these probabilities are smaller than those of cohort 1 children whose parents had 12 or more years of schooling. The discrepancy is even more pronounced at the upper-secondary and university levels. For example, the probability of completing the upper-secondary level was about one-third for cohort 4 men and women born to parents with 6 years of education or less, compared with .85 for those born to parents with 12 years of education or more.

Also notable is an apparent backsliding in the trend of increasing completion probabilities at the upper-secondary and university levels for cohort 4. This is particularly evident for sons of less educated parents: their upper-

TABLE 4

PROPORTIONS OF SAMPLE COMPLETING SUCCESSIVE SCHOOLING LEVELS, BY SEX, COHORT, AND PARENT'S SCHOOLING LEVEL USING WEIGHTED FREQUENCIES

	SCHOOLING LEVEL COMPLETED BY RESPONDENTS							
	Primary		Lower Secondary		Upper Secondary		University	
PARENT ED.[a]	0–6	12+	0–6	12+	0–6	12+	0–6	12+
Men:								
Cohort 1	.60	.96	.25	.83	.15	.79	.08	.57
Cohort 2	.80	.94	.45	.89	.28	.78	.16	.64
Cohort 3	.90	.98	.61	.92	.34	.80	.16	.59
Cohort 4	.92	1.00	.70	.98	.34	.84	.10	.47
Cohort 4, eventual schooling	.92	1.00	.70	.98	.35	.86	.12	.55
Women:								
Cohort 1	.48	.95	.20	.80	.10	.64	.02	.27
Cohort 2	.70	.97	.33	.92	.19	.77	.03	.37
Cohort 3	.83	.99	.49	.93	.30	.84	.08	.49
Cohort 4	.91	1.00	.64	.97	.36	.85	.09	.48
Cohort 4, eventual schooling	.91	1.00	.65	.97	.36	.87	.10	.52

NOTE.—See note to table 3 for explanation of eventual schooling.
[a] Parent's schooling level in years.

secondary completion probabilities rise steadily from .15 in the first cohort to .34 in the third but are virtually unchanged in the fourth cohort, and their university-level completion rates fall from .16 in the third cohort to (at best) .12 in the fourth. Sons of highly educated parents also experience a drop in university completion rates between the third and fourth cohorts, although their probabilities at the upper-secondary level appear to improve incrementally. Daughters of highly educated parents experienced rising completion rates from the first through the fourth cohorts, although a slowdown appears between cohorts 3 and 4. A similar pattern holds for daughters of less educated parents.

Until this point, we have investigated the effect of parents' education on their children's education. While parents' education certainly has a large impact, the empirical and theoretical literature suggests several other factors affecting the educational attainment of children.[27] In a simple demand model typical of this literature and relying on the household utility function and human capital frameworks developed by Gary Becker, years of schooling attained depend on the price of schooling, expected returns to schooling, income, and preferences.[28] The price of schooling includes direct outlays for tuition, books, and transportation and the indirect costs of time dedicated to school and therefore forgone in other pursuits. Income determines the budget constraint and also affects the cost of financing. Wealthier parents presumably

can finance schooling costs internally and therefore more cheaply than parents who are poor and liquidity constrained.[29] We estimate a model of the form

$$y_i = \alpha_0 + \alpha_1 p_i + \alpha_2 I_i + \alpha_3 t_i + \varepsilon_i, \quad (3)$$

where y is years of schooling for individual i, p is a vector of individual-specific price variables, I is a vector of family income proxies, and t captures trends in preferences, school construction, and other secular changes over time. We are unable to control the effect of changes in the rate of return to schooling, except insofar as returns have trended in one direction over time. The price variables are as follows: (1) Rural and small-town place of birth indicator variables (relative to large cities) provide a measure of school supply. Many rural areas and small towns in Mexico lack schools or are served by schools only through the primary level (6 years) or less.[30] Transportation costs make schooling beyond what is supplied locally much more costly. This measure is imprecise, however, since we do not know from the survey the age at which children migrated from their place of birth. (2) Indicator variables for current city of residence proxy potential quality and supply differences among metropolitan areas. As with the place-of-birth measure, current city of residence imperfectly measures residence at school age, since we do not know the individual's migration history. (3) Although market wages for school-age children are unavailable in the survey, birth order and the number of siblings proxy the value of children in household production, another potentially large opportunity cost.

The "quality-quantity tradeoff" model of G. Becker and H. G. Lewis implies that sibship size and educational preferences are codetermined.[31] Because we have no data to develop a structural model that simultaneously estimates the desired number of children, we are unable to control the potential endogeneity. However, we do not believe that the endogeneity poses a large problem for our purposes, primarily because our intent is not to determine the independent effect of sibship size on educational attainment. Rather we are interested in the overall association of family characteristics on attainment, to determine to what degree family background as a whole determines attainment. Whether this comes about via a parental quality-quantity choice or as an independent effect is of secondary interest.[32] In addition, coefficient values and trends over time for the nonfertility variables were the same in models (not reported here) that exclude sibship size and birth order.

Since the survey does not include a direct measure of income of the household of origin, we use the following characteristics of the household when the respondent was 14 years of age: whether or not the father was present, and years of schooling, occupation, and medical insurance coverage of the household head.

Table 5 shows the results of ordinary least squares regressions of the model described above by cohort and gender, using years of schooling as the dependent variable.[33] Note that the coefficients for family background vari-

TABLE 5

ORDINARY LEAST SQUARES REGRESSION FOR YEARS OF SCHOOLING COMPLETED BY COHORT

	MEN BY COHORT				WOMEN BY COHORT			
	1	2	3	4	1	2	3	4
Parents' education	.79	.71	.55	.34	.57	.50	.42	.36
	(11.88)	(9.92)	(9.69)	(6.55)	(11.02)	(8.70)	(8.58)	(7.61)
Parents' education^2	−.02	−.03	−.02	−.01	−.01	−.01	−.01	−.01
	(4.65)	(5.47)	(4.24)	(2.17)	(3.77)	(2.21)	(2.55)	(2.23)
Father was household head	1.07	.39	.61	.90	.61	.66	.86	1.05
	(3.96)	(1.39)	(2.87)	(4.53)	(3.26)	(3.07)	(4.82)	(6.26)
Parent:								
Medical insurance	1.00	.46	.25	.32	.60	.21	.63	.41
	(4.12)	(1.98)	(1.43)	(2.17)	(3.10)	(1.13)	(4.30)	(3.04)
Professional worker	2.80	4.38	2.60	2.06	2.99	3.24	3.14	2.25
	(6.27)	(9.54)	(7.07)	(6.14)	(8.38)	(8.50)	(9.57)	(7.55)
Supervisor or clerical worker	3.27	3.15	2.43	1.28	2.12	2.82	2.63	1.84
	(10.86)	(9.64)	(9.12)	(5.03)	(8.94)	(11.11)	(11.32)	(8.45)
Skilled or service worker	.86	1.74	1.23	.26	1.14	1.76	1.37	1.03
	(3.60)	(6.69)	(5.98)	(1.29)	(6.13)	(8.89)	(7.84)	(5.92)
No. of siblings	−.10	−.20	−.23	−.29	−.09	−.12	−.22	−.37
	(2.88)	(5.50)	(7.41)	(8.50)	(3.35)	(4.17)	(8.22)	(12.11)
Birth order	.00	.08	.05	.14	−.01	.07	.12	.22
	(.13)	(1.64)	(1.34)	(3.77)	(.16)	(1.78)	(3.70)	(6.48)
Born in town, 15–100 K	.11	.24	.05	.12	−.52	−.08	−.36	−.38
	(.37)	(.72)	(.19)	(.40)	(2.27)	(.31)	(1.50)	(1.58)
Born in rural area	−.40	−.88	−.68	−.67	−1.29	−.74	−.96	−.60
	(1.59)	(3.17)	(2.73)	(2.86)	(6.65)	(3.35)	(4.65)	(2.79)
Time trend	.12	.16	.05	−.09	.10	.10	.14	.00
	(6.89)	(4.58)	(1.81)	(2.68)	(7.33)	(3.72)	(5.86)	(.14)
No. of observations	1,608	1,735	2,461	2,360	2,218	2,152	3,043	2,737
R^2	.44	.36	.27	.26	.38	.35	.32	.31
R^2 with family background variables only	.41	.33	.26	.25	.35	.33	.30	.30

NOTE.—Absolute value of *t*-statistic in parentheses; unweighted. All models also include a constant term and four city dummy variables.

ables that proxy income are everywhere positive and almost always significant at conventional levels. For the most part, these coefficients decline monotonically across cohorts. For example, the advantage of having a parent with 12 years of schooling in a supervisory or clerical position that provides medical insurance compared with a parent with 6 years of schooling working as an unskilled worker with no medical benefits declines from 7 extra years for cohort 1 men to 2.6 years for cohort 4 men. The decline for women in this situation is much more moderate: the more skilled parent is associated with 5 extra schooling years for cohort 1 women compared with 3 extra years for cohort 4 women. As in other measures of intergenerational mobility discussed above, women appear to have been less advantaged than men by high parental education and skilled occupations in earlier cohorts; in more recent cohorts, the advantages of favorable family backgrounds appear to have converged. In any case, the decline of the advantage of a favorable parental background

measured by education and job characteristics points to increasing intergenerational mobility.[34]

Nevertheless, other family background measures have increased in importance over time. For example, the coefficient on having a father present increases in value from .6 to 1.1 for women between cohorts 1 and 4. There is a similar increase for men between cohorts 2 and 4. The will and ability of extended families and communities to assist single mothers may have declined as female headship has become more common (and less exogenous?). An even more dramatic increase occurs for sibship size. For both men and women in cohort 1, each sibling reduced schooling by about one-tenth of a year. By cohort 4, each sibling reduced schooling by .3 years for men and .4 years for women. Birth order effects have also expanded remarkably. Later birth order provided no advantage at all to men and women in cohort 1 but increased schooling years by .14 and .22 for every older sibling for men and women in cohort 4, respectively. These changes probably reflect a rising differentiation in fertility decisions between rich and poor families over the period covered: in our data, parents with 6 years of schooling or less had on average .9 more children than those with 12 or more years of schooling in cohort 1. In cohort 4 they had three more children.

Thus although some dimensions of family background have declined in importance over time, others have become more tightly linked to schooling outcomes. The contribution of all available family background variables to schooling outcomes can be measured by the proportion of variation in schooling that is explained by these variables. The last row of table 5 provides the R^2 for a model estimated with family background variables only. This figure declines across cohorts, declines more sharply for men, and appears to stabilize for the last cohort. These patterns verify that the simpler intergenerational mobility measures given earlier are indeed capturing the effects of family background on schooling. Nevertheless, the regression analysis shows that it is not mobility in parent schooling per se that has stalled. The effect of parent schooling continues to drop quite steadily for the most recent cohort. Rather, the increasing importance of the presence of the father, sibship size, and birth order appear to be responsible for the lack of progress in intergenerational mobility in the most recent cohort.

V. Schooling in the 1980s

Much of our analysis suggests that gains in schooling levels and mobility have leveled off or backtracked, especially for men, in the last cohort. We consider two primary explanations for this change in trend. First, the recent slowdown in the growth of educational attainment may indicate limits to growth from natural (e.g., attainment rates cannot go above 100%) or institutional (e.g., the supply of upper-secondary schools has not expanded) causes. Second, the extended period of economic decline that began in Mexico in 1982 may be to blame. Members of the youngest cohort would have been between 11 and 17 years of age at the beginning of this economic crisis.

There are several indications that natural or institutional limits play a role. The top panel of figure 2 shows that progress on the primary school completion rate diminished as the rate approached 100%. Figure 1 and the top panel of figure 2 show that the slowing in educational attainment for men appears to have begun in the 1970s, a period of economic growth. There is a large gain between cohorts 1 and 2 at the upper-secondary level in the top panel of figure 2, with very little progress thereafter. Figure 1 is also consistent with a natural or institutional problem: men's schooling started slowing after it reached 9 years of schooling in cohort 2. This precrisis stagnation in the growth of education for males may reflect a dearth of facilities at that level or limited intergenerational mobility caused by lack of social or cultural capital, or by lack of financial resources. With a one cohort lag, recent women's educational patterns are very similar to men's. Note especially the similarity in slope between cohorts 2 and 3 for men and cohorts 3 and 4 for women in figure 1. The slowdown in progress for women may have come later because only in cohort 3 did average attainment reach 9 years.

However, the deterioration in intergenerational mobility variously measured (see tables 3 and 4 and the discussion of table 5 above) is clearly limited to cohort 4. Even with crowding at the secondary levels, there was still plenty of room for mobility, since 47% of cohort 4 had parents with 0–5 years of schooling, and another 28% had parents with 6 years of schooling. It is therefore unlikely that the reversal of progress in intergenerational mobility reflects only institutional barriers that existed before the crisis decade.

Related research has found that economic conditions are definitely implicated in the slowed educational progress in the 1980s in Mexico.[35] Both demand and supply factors likely played a role. On the demand side, labor market participation increased, as households tried to offset declining real wages by having more members enter the labor market. That declines in upper-secondary and university attainment levels fell disproportionately for children of parents with low education levels is consistent with a crisis effect. If, as is likely, the labor market opportunities and wages are higher for teenage boys than for teenage girls, then the larger effects on attainment rates for males compared with those for females also supports this view.

On the supply side, falling expenditures on education resulting from government austerity made any pre-existing infrastructure constraints worse during the 1980s. Real expenditure on education fell by 30% between 1983 and 1988,[36] and from more than 20% of total government spending in the late 1970s to less than 10% of government spending in the mid-1980s.[37]

We are therefore unable to distinguish between the two explanations. Indications of institutional barriers to postsecondary schooling appeared in the 1970s, but these barriers clearly became much more severe during the 1980s. In any case, the possibility of an institutional cause of the backsliding in educational progress is troubling, as it suggests a deep-rooted limit of the system and not just a temporary setback.

VI. Conclusions

Our analyses show that Mexico has succeeded in broadening the base of education in urban areas. For the youngest cohort of our sample, completion of primary schooling is almost universal. However, the data suggest that gains at the primary and lower-secondary levels do not automatically translate into increased enrollments at upper- and postsecondary levels. Despite marked increases in intergenerational mobility over the past several decades, a child born into a household whose head had 12 or more years of schooling is still 2.5 times more likely to complete high school than a child born into a household whose head had 6 or fewer years of schooling. The gains in basic education may therefore have had perverse effects on income inequality, as the supply of moderately educated workers increased relative to highly educated workers. This is not to say that the broadening of basic education is undesirable, but rather that the broadening alone is not enough. Mexico's challenge is to channel the increasing numbers of primary school graduates into the increasingly important upper levels of the educational system.

Crowding at the secondary level apparently began before the economic crisis of the 1980s, especially for men. At the same time, a reversal in the pattern of increasing intergenerational mobility in education clearly coincides with the economic crisis, for both men and women. The timing of these patterns suggests that the economic crisis can explain some, but not all, of the slowdown in educational progress. This implies that a reinvigorated economy alone will not necessarily move Mexico toward a better income distribution. More research needs to be done to determine whether the crowding at the lower-secondary schooling level is due to the low quality of primary and lower-secondary education, lack of facilities, or prohibitive costs.

Notes

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1. Philippe Aghion, Eve Caroli, and Cecilia García-Peñalosa, in their "Inequality and Economic Growth: The Perspective of the New Growth Theories," *Journal of Economic Literature* 37 (December 1999): 1615–60, review the theory and the empirical literature on this point. They discuss results from cross-country regressions that show a correlation between higher levels of inequality and lower growth rates in GDP.

2. See, e.g., Nancy Birdsall, David Ross, and Richard Sabot, "Inequality and Growth Reconsidered: Lessons from East Asia," *World Bank Economic Review* 9 (1995): 477–508.

3. Jere Behrman, Nancy Birdsall, and Miguel Székely, "Intergenerational Schooling Mobility and Macro Conditions and Schooling Policies in Latin America," Working Paper no. 386 (Inter-American Development Bank, Office of the Chief Economist, 1998); and James Heckman and V. Joseph Hotz, "An Investigation of the Labor Market Earnings of Panamanian Males: Evaluating the Sources of Inequality," *Journal of Human Resources* 21 (1986): 507–42, consider intergenerational educational mobility directly for 16 Latin American countries, and for Panama, respectively. Momi Dahan and Alejandro Gaviria, "Sibling Correlations and Social Mobility in Latin America," Working Paper no. 395 (Inter-American Development Bank, Office of the Chief Econ-

omist, Washington, D.C., 1999) measure social mobility by examining sibling correlations. Other studies shed light on intergenerational mobility by considering the role of parents' schooling and labor market characteristics on children's schooling and earnings. These include Jere Behrman and Barbara Wolfe, "Investments in Schooling in Two Generations in Pre-Revolutionary Nicaragua: The Roles of Family Background and School Supply," *Journal of Development Economics* 27 (1987): 395–419, for Nicaragua; Melissa Binder "Family Background, Gender and Schooling in Mexico," *Journal of Development Studies* 35 (1998): 54–71, for Mexico; and David Lam and Robert Schoeni, "Effects of Family Background on Earnings and Returns to Schooling: Results from Brazil," *Journal of Political Economy* 101 (1993): 710–40, for Brazil.

4. For example, Behrman, Birdsall, and Székely use individuals born between 1959 and 1990, Behrman and Wolfe use a sample of adult women and their children, Binder uses fifth graders and their siblings, Dahan and Gaviria use siblings 16–20 years of age, and Heckman and Hotz use adult men who were living with their fathers.

5. Juan Luis Londoño and Miguel Székely, "Persistent Poverty and Excess Inequality: Latin America 1970–1995," Working Paper no. 357 (Inter-American Development Bank, Office of the Chief Economist, Washington, D.C., 1997).

6. Wage income inequality in Latin America is closely associated with overall income inequality. Differences in educational attainment account for an average of 70% of all explained wage inequality and 25% of the total—explained and unexplained—wage inequality according to the Inter-American Development Bank, *Economic and Social Progress in Latin America 1998–99: Facing Up to Inequality in Latin America* (Washington, D.C.: Inter-American Development Bank, 1998), pp. 19–20.

7. Michael Cragg and Mario Epelbaum, "Why Has Wage Dispersion Grown in Mexico? Is It the Incidence of Reforms or the Growing Demand for Skills?" *Journal of Development Economics* 51 (1996): 99–116.

8. Albert Berry, "Confronting the Income Distribution Threat in Latin America," in *Poverty, Economic Reform and Income Distribution in Latin America*, ed. Albert Berry (Boulder, Colo.: Lynne Rienner, 1998), pp. 9–41, provides a summary.

9. Crowding at the secondary schooling level is in fact consistent with the finding by Cragg and Epelbaum that medium-skilled factory workers are most disadvantaged, relative to less skilled and more skilled workers. Cragg and Epelbaum do not consider the importance of the relative supply of secondary and primary level workers. Rather, they make the extreme assumption that secondary and primary level workers have high, and equal, supply elasticities to urban formal markets because they are waiting around in low-paying informal and rural jobs. Studies of the informal labor market often reject the notion of dual labor markets. See, e.g., Douglas Marcouiller, Veronica Ruiz de Castilla, and Christopher Woodruff, "Formal Measures of the Informal-Sector Wage Gap in Mexico, El Salvador and Peru," *Economic Development and Cultural Change* 45 (1997): 367–92.

10. Suzanne Duryea and Miguel Székely, "Labor Markets in Latin America: A Supply-Side Story," Working Paper no. 374 (Inter-American Development Bank, Office of the Chief Economist, Washington, D.C., 1998).

11. Following Jacob Mincer, *Schooling, Experience and Earnings* (Boston: National Bureau of Economic Research, 1974), studies of the relationship between educational inequality and income inequality typically use variance of income as the measure of income inequality. See, e.g., Rati Ram, "Can Educational Expansion Reduce Income Inequality in Less Developed Countries?" *Economics of Education Review* 8 (1989): 185–95; and David Lam and Deborah Levison, "Declining Inequality in Schooling in Brazil and Its Effects on Inequality in Earnings," *Journal of Development Economics* 37 (1991): 199–225. The variance of income, $Var(rY)$, is $YVar(r) + \bar{r}Var(Y) + Var(Y)Var(r)$, if Y and r vary independently. Measured this way, income inequality will rise with rising mean years of schooling. Also, since variance measures

absolute dispersion and typically rises with increasing means, *Var*(*Y*) also increases with rising mean years of schooling. Inequality, however, concerns relative dispersion and is better captured by the coefficient of variation, which scales absolute dispersion by the mean value.

12. Inter-American Development Bank, p. 49.

13. George Psacharopoulos, "Returns to Investment in Education: A Global Update," *World Development* 22 (1994): 1325–43.

14. See Robert Haveman and Barbara Wolfe, "The Determinants of Children's Attainments: A Review of Methods and Findings," *Journal of Economic Literature* 33 (1995): 1829–78, for a review of studies that focus on the United States. Recent examples for developing countries include Ricardo Barros and David Lam, "Income and Educational Inequality and Children's Schooling Attainment," in *Opportunity Foregone: Education in Brazil*, ed. Nancy Birdsall and Richard Sabot (Washington, D.C.: Inter-American Development Bank, 1996), pp. 337–66; Binder, "Family Background, Gender and Schooling in Mexico" (n. 3 above); Anil Deolalikar, "Gender Differences in the Returns to Schooling and in School Enrollment Rates in Indonesia," *Journal of Human Resources* 28 (1993): 899–932; Paul Glewwe and Hanan Jacoby, "Student Achievement and Schooling Choice in Low-Income Countries: Evidence from Ghana," *Journal of Human Resources* 23 (1994): 843–64; Lee Lillard and Robert Willis, "Intergenerational Educational Mobility: Effects of Family and State in Malaysia," *Journal of Human Resources* 29 (1994): 1126–66; Cynthia Lloyd and Ann Blanc, "Children's Schooling in Sub-Saharan Africa: The Role of Fathers, Mothers, and Others," *Population and Development Review* 22 (1996): 265–98; Ram Singh, "Underinvestment, Low Economic Returns to Education, and the Schooling of Rural Children: Some Evidence from Brazil," *Economic Development and Cultural Change* 40 (1992): 645–64; and Ram Singh and Maria Santiago, "Farm Earnings, Educational Attainment, and Role of Public Policy: Some Evidence from Mexico," *World Development* 25 (1997): 2143–54. Transient macroeconomic conditions also influence schooling decisions. See, e.g., Jere Behrman, Suzanne Duryea, and Miguel Székely, "Schooling Investments and Aggregate Conditions: A Household Survey-Based Approach for Latin America and the Caribbean," Working Paper no. 407 (Inter-American Development Bank, Office of the Chief Economist, Washington, D.C., 1999); Melissa Binder, "Schooling Indicators during Mexico's 'Lost Decade,'" *Economics of Education Review* 18 (1999): 183–99; and Karnit Flug, Antonio Spilimbergo, and Erik Wachtenheim, "Investment in Education: Do Economic Volatility and Credit Constraints Matter?" *Journal of Development Economics* 55 (1997): 465–81.

15. See Duryea and Székeley for an exploration of the interactions between demography, schooling, and inequality.

16. Lillard and Willis use this strategy for their analysis of intergenerational educational mobility in Malaysia.

17. Six percent of 23–29-year-olds were still attending school at the time of the survey.

18. Since better educated individuals tend to be healthier and live longer, survivors in the oldest cohort (i.e., those in our sample) may have above average educational attainment. The progress of younger cohorts relative to the oldest cohort may therefore be understated.

19. Inter-American Development Bank (n. 6 above), table A2. The survey is designed to be representative and provides sampling weights that sum to each city's population. Unless otherwise noted, our statistics make use of the sample weights.

20. We do know whether the interviewees lived in small towns or rural areas when they were 14 years old. We make use of this information in the educational attainment regressions discussed in Section IV.

21. We calculate the Gini coefficient using the method for weighted observations

provided by Robert Lerman and Shlomo Yitzhaki, "Improving the Accuracy of Estimates of Gini Coefficients," *Journal of Econometrics* 42 (1989): 43–47.

22. Our finding contradicts the Inter-American Development Bank, p. 49, interpretation of sustained inequality in schooling years until the 1940s birth cohorts. The difference is in the measure of inequality. The Inter-American Development Bank uses variance, which is a scale-sensitive measure. We report the standard deviation (the square root of the variance) in table 1, which shows the same trend. The coefficient of variation and the Gini coefficient, are, however, preferred measures of dispersion. See n. 11 above.

23. The relative supplies for those in cohort 4 with 12 or more years of schooling are omitted, since the youngest in this cohort may still be pursuing college degrees.

24. This discussion suggests that education wage premiums would be less for women, since they did not experience crowding. We do not know if this is true: Cragg and Epelbaum only report education premiums for men.

25. Mother-child correlations—not reported here—appear to be slightly lower.

26. Parent schooling is reported in 10 levels. We use the midpoint of years of schooling that corresponds to each level as follows: none, 0 years; some primary level, 3 years; completed primary level, 6 years; some lower secondary, 7.5 years; completed lower secondary, 9 years; some upper secondary, 10.5 years; completed upper secondary, 12 years; some postsecondary, 14 years; completed university, 16 years; and some graduate study, 18 years. The correlations we report are of these parent schooling codes with actual number of years for children. The results were similar when we ran the correlations with identically constructed child schooling codes.

27. See n. 14 above.

28. Gary Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education* (New York: National Bureau of Economic Research, 1964), and *A Treatise on the Family* (Cambridge, Mass.: Harvard University Press, 1981).

29. Gary Becker and Nigel Tomes, "Human Capital and the Rise and Fall of Families," *Journal of Labor Economics* 4 (1986): S1–S39.

30. Twenty percent of primary schools—mostly in rural areas—offered less than a full 6-year program in 1988. See Carlos Salinas de Gortari, *Primer Informe de Gobierno 1989: Anexo* (First report of the government 1989: Appendix) (Mexico City: Estados Unidos Mexicanos, 1989).

31. Gary Becker and H. Gregg Lewis, "On the Interaction between the Quantity and Quality of Children," *Journal of Political Economy* 81 (1973): S279–S288.

32. In any case, Rachel Connelly, Deborah DeGraff, Deborah Levison, and Brian McCall, "Tackling the Endogeneity of Fertility in the Study of Women's Employment: Alternative Estimation Strategies Using Data from Urban Brazil" (2001, mimeographed, Bowdoin College, Brunswick, Maine), argue that the potential bias from omitting fertility is worse than the bias caused by endogeneity.

33. The regressions reported in table 5 use unweighted observations. Weighted regressions produce similar results. There is a slightly larger negative effect of being born in a rural area, and the effect of parents' education is slightly larger for older cohorts and slightly smaller for younger cohorts. See Angus Deaton, *The Analysis of Household Surveys* (Baltimore: Johns Hopkins University Press, 1997) for a discussion of the problems of weighted and unweighted regressions.

34. In one sense, our data probably underestimate the extent of the increase in mobility found in the cohort regressions. The respondents provide the data on both their own educational attainment and their parents' educational attainment. In the likely case that parents' education is measured less precisely than the adult child's education, Samuel Bowles, "Schooling and Inequality from Generation to Generation," *Journal of Political Economy* 80 (May/June 1972): S219–S251, shows that the effect of parents' education will be underestimated. In our case, the measurement error would be expected

to be increasing in the age of the respondent, since older respondents are remembering more distant information. If so, then the underestimation of parental effects is greater for older cohorts than for younger cohorts, and hence the fall in intergenerational correlation over time is larger than estimated here.

35. Binder, "Schooling Indicators during Mexico's 'Lost Decade'" (n. 15 above); and Behrman, Duryea, and Székely (n. 15 above).

36. Nora Lustig, *Mexico: The Remaking of an Economy* (Washington, D.C.: Brookings Institute, 1992) points out that the resources available to the education system did not fall as much as these percentages indicate because of declines in teacher salaries and other education-related price levels. Nonetheless, the cutbacks were felt by the education sector.

37. Carlos Salinas de Gortari, *Sexto Informe de Gobierno 1994: Anexo* (Sixth report of the government 1994: Appendix) (Mexico City: Estados Unidos Mexicanos, 1994).