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**Revenue and Expenditure Projections:
California K-12 Education
1991-1995**

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June 1990

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Executive Summary

Forecasting revenues and expenditures is an integral part of public sector planning and budgeting. *Revenue forecasting* projects the level of resources available to accomplish governmental objectives. *Expenditure forecasting* estimates the level of future spending needed to accomplish such objectives. Since expenditures must equal revenues, an important function of forecasting is to see whether the existing revenue structure will provide funds sufficient for future needs. Where such is not the case, the critical policy options involve enhancing revenues by altering the revenue structure, cutting expenditures by reducing the scope of governmental objectives, or both.

Three characteristics of California's recent experience are pertinent to projecting future revenues and expenditures. First, between 1980 and 1989, total K-12 funding rose 91 percent. But school enrollment (measured as average daily attendance, or ADA) increased almost 19 percent, and inflation tempered real revenue growth in the early decade. In short, during the 1980s, as total K-12 funding increased from \$12.3 to \$23.4 billion, and as ADA climbed from 4.2 to 5 million, real spending per pupil increased \$423, a jump of 11 percent.

Second, revenue for K-12 education is derived from federal (7.38%), state (69.23%), and local (23.39%) sources. California relies considerably more on state revenues than the rest of the nation. (The state component of K-12 funding is 38 percent higher in California than in the nation on average.) Also, lottery revenues, projected to be 2.6 percent in 1989, compose a minor part of the total.

Third, California's "effort" in raising K-12 revenues, measured as a percentage of state personal income, in 1986 was about 86 percent of the U.S. average. This lower than average effort was not due to a greater effort being made for other programs, however, since total state and local tax collections in California as a percentage of state personal income were about 97 percent of the U.S. average. In fact, the revenue effort in California for both schools and other public functions is below that for the nation as a whole.

The Projections

K-12 revenues were projected by:

1. Estimating the responsiveness of revenues to state personal income growth (income elasticity of revenues)
2. Projecting state personal incomes through 1995
3. Projecting the number of public school students (ADA)
4. Projecting a price index through 1995*
5. Using the projections of state personal income together with the estimates of elasticity to project K-12 revenues

* The deflator used by the Legislative Analyst is the U.S. Gross National Product deflator for state and local government purchases of goods and services. It is not specific to California. However, this index and the California Consumer Price Index, which this report uses, move closely together. Any differences from using one series as opposed to the other would not materially change the conclusions reached in this report.

6. Using the projections of ADA and CPI to project constant 1988 dollar revenues per student.

Estimation of future revenue and expenditures requires a forecast of key series that affect revenue generation as well as the "need" for specific levels of expenditure. Important in this regard are state personal income and student enrollment. Total state personal income, for instance, is forecast to increase 71 percent from 1988 to 1995. Prices are expected to rise 41 percent over the same period. Thus, real state personal income (constant 1988 dollars) is expected to rise 21 percent. K-12 enrollment, on the other hand, is forecast to increase 25 percent, or slightly over one million students, between 1988 and 1994.

K-12 revenues consist primarily of state and locally generated funds. If the relationship between state personal income and K-12 revenue is stable, then revenue projections can be based on projections of state and personal income. In fact, since 1983, revenues for K-12 education have risen more rapidly than state personal income. If this pattern holds, and if the status quo in per-pupil spending is maintained, two projections result:

1. **Revenue Projection.** From 1988 to 1994, total K-12 revenue is projected to increase from \$21.8 to between \$37.4 (low estimate) and \$38.6 billion (high estimate). This reflects an increase of between 72 and 77 percent. With enrollment growth and inflation, however, real spending per pupil is projected to increase between approximately four and seven percent, that is, from \$4,290 to between \$4,454 and \$4,594.
2. **Expenditure Projection.** To maintain the status quo during this same period—1988 to 1994—in terms of real or inflation-adjusted per-pupil spending, total K-12 expenditures must rise from \$21.7 to \$36 billion, an increase of 66 percent. Both low and high revenue projections exceed this level of expenditure. Thus, the inflation-adjusted spending floor mandated by Proposition 98 will be exceeded.

Two final comments. First, general fund revenues were found to be less responsive to state personal growth than were public school revenues during the latter part of the 1980s. This lower responsiveness implies a slower growth in future general fund revenues than in K-12 revenues. Finally, in comparing similar forecasts made in 1985** with actual experience, 12 of 15 projections fell between the upper and lower estimates. Of the three remaining projections, their percentage deviations from the upper estimate were +0.6, +0.1, and +6.6, respectively.

** Jack W. Osman. Revenue and Expenditure Projections for California K-12 Education, 1985-86 through 1989-90. Policy Analysis for California Education: Berkeley, CA.

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Policy Analysis for California Education

Policy Analysis for California Education, PACE, is a university-based research center focusing on issues of state educational policy and practice. PACE is located in the Schools of Education at the University of California at Berkeley, Stanford University, and the University of Southern California. It is funded by the William and Flora Hewlett Foundation and co-directed by James W. Guthrie, Michael W. Kirst, and Allan R. Odden. PACE operates a satellite center in Sacramento.

PACE efforts center on five tasks: (1) collecting and distributing objective information about the conditions of education in California, (2) analyzing state educational policy issues and the policy environment, (3) evaluating school reforms and state educational practices, (4) providing technical support to policy makers, and (5) facilitating discussion of educational issues.

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Introduction

Forecasting revenues is an integral part of the public sector planning and budgetary process. The availability of revenues sets a limit on the resources which may be commanded for accomplishing specific government objectives. On the other hand, projecting the levels of "necessary" expenditures can be equally important for program planning and the budgetary process.

The distinction between revenue forecasting and expenditure forecasting is significant. Revenue forecasting seeks to identify those factors impacting on revenues and to estimate their effect in order to project the availability of future revenues. Expenditure forecasting, on the other hand, is aimed at estimating the future levels of spending that would be required to meet particular objectives. Since expenditures must be met by equal revenues, the actual levels of spending obtained are determined by the revenue constraint. Thus, an important function of revenue and expenditure projections is to see whether existing revenue structures will provide adequate funds to meet the "necessary" level of expenditure. Where it is clear that such is not the case, the critical policy options involve planning for changes in the revenue structure to provide added revenues, cutting back on expenditures by scaling back the objectives to be met, or by a combination of the two options.

Forecasting methods may be divided into two broad categories: qualitative and quantitative. The former relies on the judgments and experience of the decision makers while the latter uses historical data to uncover relationships which may then be used for making forecasts. Quantitative methods range from simple extrapolations to the use of sophisticated time series methods to econometric models with parameters estimated through regression methods. Combinations of these methods are possible as well.

Generally, the forecasts based on econometric models are more accurate than trend-line extrapolations, but are more time consuming and costly as well. The tradeoffs between cost and accuracy have improved dramatically with the major advances in computing which have rapidly lowered the cost of data manipulation, parameter estimation, and system solution. The revenue forecasts developed in this paper involve a combination of econometric and extrapolative methods.

The approach here is the same as that employed by the author in his 1985 revenue forecasts. A comparison of the earlier projections with actual revenues is provided in the appendix and summarized in Tables A1 through A3. The results support the methodology adopted.

The Current Setting and Trends

In order to make projections of future revenues and expenditures it is necessary to examine the current levels and recent changes. To address the issue of adequacy of resources employed it is useful to compare California's revenues with the rest of the nation.

TABLE 1 Trends in Total Revenues for K-12 Education 1980-81 Through 1989-90

Year	Total Funding (Millions)	ADA	Total Funding Per ADA			
			Current Dollars		1988 Dollars	
			Amount	% Change	Amount	% Change
1980-81	12,262.9	4,215,399	2,909	11.6	3856	0.4
1981-82	12,528.0	4,202,000	2,981	2.5	3715	-3.7
1982-83	12,635.5	4,231,431	2,986	0.2	3660	-1.5
1983-84	13,348.4	4,260,873	3,133	4.9	3656	-0.1
1984-85	14,995.4	4,352,597	3,445	10.0	3844	5.1
1985-86	16,776.3	4,469,821	3,753	8.9	4059	5.6
1986-87	18,240.5	4,611,637	3,955	5.4	4116	1.4
1987-88	19,702.8	4,722,792	4,172	5.5	4172	1.4
1988-89	21,759.6	4,859,162	4,478	7.3	4290	2.8
1989-90	23,399.1	5,003,461	4,677	4.4	4279	-0.3

Sources: PACE, *Conditions of Education in California 1989*, Figure 8.1; from the Legislative Analyst, July 19, 1989. CPI used in conversions are courtesy of PG&E; see Table 5. Computations and adjustments by author.

Table 1 displays recent trends in total revenues generated for K-12 education in California, together with trends in the number of students in average daily attendance (ADA). Total funding rose by 90.8 percent from 1980-81 through 1989-90. ADA increased by 18.7 percent with the second half of the decade showing particularly strong growth. Thus, spending per student rose by 60.8 percent. However, the early 1980s in particular were a period of considerable inflation. When adjusted for inflation, a very different picture emerges. During the first half of the 1980s, there was virtually no growth in real—adjusted for inflation—spending per student. Table 1 shows that in constant 1988 dollars spending per student in 1984-85 was 12 dollars lower than in 1980-81. Growth in spending in real terms per student did occur in the second half of the decade. For example, per student constant dollar spending was 12 percent higher in 1988-89 than in 1984-85.

Several caveats should be noted in passing. First, the data for the latest years are subject to revisions. Second, the deflator used by the Legislative Analyst is the U.S. Gross National Product deflator for state and local government purchases of goods and services, and is not specific to California. However, this index and the California Consumer Price Index (CPI), which this report uses, move closely together, and any differences from using one series as opposed to the other would not materially change the conclusions reached from Table 1.

Sources of Revenues for K-12 Education in California

Elementary and secondary school revenues in California are now derived primarily from state sources. Table 2 shows that less than one-fourth of California's K-12 revenues were derived from local sources in the 1987-88 school year. Nearly 70 percent came from state sources, while federal aid accounted for only 7 percent. It should be noted that California relies considerably more on state revenues than the rest of the nation. Only about half of the nation's K-12 revenues are derived from state sources.

**TABLE 2 Estimated Revenue Receipts for Elementary and Secondary Schools
Percent Distribution by Level of Government: 1987-88**

	California	U.S. Average
Local	23.39%	43.59%
State	69.23	50.19
Federal	7.38	6.22

Source: National Education Association, Rankings of the States, 1988, September 1988, pp. 42-44.

TABLE 3 Total Revenues for K-12 Education and as a Percent of State Personal Income 1988-89 and 1989-90

	1988-89 (Estimated)	1989-90 (Projected)
<u>Revenue</u>	<u>\$Millions</u>	<u>\$Millions</u>
Total K-12	\$22,230.9	\$23,109.8
Federal Aid	1,429.6	1,431.2
Total State/Local	20,801.3	21,678.6
Lottery: Included Above	763.1	762.6
State Personal Income: Projected (\$Billions)	565.3	606.1
Total Revenue as a Percent of State Personal Income	3.93%	3.81%
State and Local Revenue as a Percent of State Personal Income	3.68%	3.58%

Sources: Revenue data from: Legislative Analyst, Legislative Analyst's Budget Review, 1989-90, Sacramento, CA, p.703. Personal income data: Courtesy of PG&E. Computations by author.

Note: The totals shown here differ slightly from those of Table 1. For 1989-90 the difference is primarily due to Table 2 data coming from the Governor's Budget rather than the Budget Act.

Table 3 displays the sources of K-12 revenues divided between federal revenues, on one hand, and state and local combined, on the other. Federal revenues are projected to fall to about 6.2 percent of total K-12 revenues in 1989-90. California state lottery revenues are but a minor part of K-12 revenues, projected at 2.6 percent of the total for 1989-90.

California Revenue Effort

In measuring the revenue effort put forth by California for K-12 education, it is instructive to examine revenues as a percent of state personal income. Total K-12 revenues are estimated at 3.9 percent of state personal income in 1988-89. Revenues generated from California's own sources (state and local) amount to 3.7 percent of personal income.

How does this compare with the effort put forth by other states? Table 4 displays California's revenues as a percent of personal income in comparison with the nation as a whole. With respect to public school revenues, California's effort in 1986 was about 86 percent of the U.S. average. This lower than average effort was not due to a greater effort being made for other programs, since total state and local tax collections in California as a percent of state personal income were about 97 percent of the U.S. average. In conclusion, we find that the revenue effort in California both for schools and other functions is below that for the nation as a whole.

TABLE 4 Revenues as a Percent of State Personal Income, 1986

	California	U.S. Average	California as a Percent of U.S. Avg.
Total Public School Revenue	3.75	4.34	86.41
State and Local Tax Collections (All Functions)	10.21	10.57	96.59

Source: National Education Association, Rankings of the States, 1988, September 1988, pp. 35, 41.

The Projections

We turn now to the projections of California's K-12 revenues and expenditures. This requires first a forecast of key series which impact on revenue generation and on the "need" for particular levels of expenditure. Particularly important in this regard are state personal income, both total and per capita, and student enrollment and attendance (ADA). The projections were developed using a number of different sources and through the use of methods ranging from the use of simple ratios between series to the use of econometric models. The sources are noted at the foot of each table.

Personal Income

Short run economic forecasts for California are available from a number of sources including the California Department of Finance, UCLA's Business Forecasting Project, and several of the major banks. A review of the 1989 forecasts is in the Report of the Legislative Analyst, The 1989-90 Budget: Perspectives and Issues, p. 63. However, these are of limited use for long range revenue forecasts such as those to be presented in this paper.

Pacific Gas and Electric's Economics and Statistics Department develops long range forecasts covering the entire period of our projections. Table 5 displays recent data for California personal income and consumer prices together with forecasts for these series through 1995. Personal income is shown in both current and constant 1988 dollars. Total state personal income is forecast to increase 71 percent from 1988 through 1995. Given that prices are expected to rise 41 percent over the same period, real state personal income (in constant 1988 dollars) is expected to rise 21 percent.

Enrollment and Average Daily Attendance (ADA)

Both enrollments and average daily attendance are expected to rise considerably throughout the first half of the 1990s. Table 6 shows the growth in K-12 enrollments and ADA from 1986-87 through 1994-95. From 1988-89 to 1994-95, enrollments are forecast to increase by a fourth (25%) or slightly over one million students. ADA growth, which closely mirrors the growth in enrollment shows a similar increase.

TABLE 5 Long Range Forecasts California State Personal Income 1980-95 in Current and Constant 1988 Dollars (Billions)

Year	Personal Income		Calif.CPI Price Index (1988 = 100)
	Current \$ (\$Billions)	Constant 1988 (\$Billions)	
1980	276.1	406.1	67.98
1981	308.7	409.2	75.44
1982	328.0	408.7	80.25
1983	352.4	432.0	81.58
1984	389.2	454.1	85.70
1985	422.8	471.8	89.61
1986	455.3	492.4	92.46
1987	488.5	508.4	96.09
1988	522.6	522.6	100.00
1989*	565.3	541.5	104.39
1990*	606.1	554.6	109.29
1991*	657.6	573.1	114.75
1992*	712.8	589.6	120.89
1993*	766.4	602.8	127.14
1994*	825.0	617.4	133.62
1995*	891.5	633.8	140.67

*Forecast

Source: Pacific Gas and Electric.

Note: these forecasts are not necessarily those used in PG&E's official planning on rate analysis. This information is provided for use in forecasting school revenues. Price indices converted to base 1988 by author. Computations by author.

Teacher Requirements

The increased student population will require a proportional increase in teachers just to maintain the same ratio of students to teachers. Table 6 shows the number of teachers required in order to keep the same ratio of students to teachers as existed in 1987. Thus, it may be seen that with no change in the student/teacher ratio the number of teachers would need to increase by about 45,000 representing a 23 percent increase between 1988–89 and 1994–95.

TABLE 6 K–12 Enrollments and Average Daily Attendance with Projections Through 1995

Year	Fall Enrollments (1000s)	K–12 ADA* (1000s)	Teachers Required at 1987* Calif.Ratio (1000s)	Teachers Required at 1987* U.S. Ratio (1000s)
1986–87	4,301	4,303 [†]	188.4	264.5
1987–88	4,408	4,403 [†]	192.8	270.6
1988–89	4,513	4,525 ^{††}	198.1	278.1
1989–90	4,640	4,651 ^{††}	203.6	285.9
1990–91	4,806	4,813 ^{††}	210.7	295.8
1991–92	4,989	4,990 ^{††}	218.5	306.7
1992–93	5,186	5,178 ^{††}	226.7	318.3
1993–94	5,381	5,373 ^{†††}	235.2	330.2
1994–95	5,563	5,554 ^{†††}	243.2	341.4

* Total elementary and secondary

† Actual

†† Projected

††† Projected by author based on 1993 projected ratio of ADA to enrollment: 0.9985

Sources: Enrollment: California Department of Finance, Population Research Unit.
ADA 1986–87 through 1992–93: California Department of Education.

Notes: Teacher requirements based on total elementary and secondary ADA and Fall 1987 ratio of ADA to teachers (California: 22.84; U.S.A.: 16.27). Source: NEA, *Rankings of the States 1988*, p.18. ADA used in this table differ from that used in the Legislative Analyst's Reports, see Table 1.

California had the highest ratio of students to teachers in 1987. With a ratio of 22.84 compared with a national average of 16.27, California was about forty percent above the national average. Were California to chose to move toward the much smaller student/teacher ratio which exists nationally, a major effort would need to be expended. For example, if by 1994–95 California were to chose to be at the same ratio of teachers to students as exists nationally, 98,000 additional teachers would need to be hired in addition to the 45,000 required by the increase in students.

K-12 Revenues

As was seen in Tables 2 and 3, California's K-12 revenues consist primarily of state generated funds (69.2% for 1987-88), and secondarily of locally derived revenues (23.4%), with the federal government providing the remainder (7.4%). A model for revenue generation might be specified as below:

- 1) $REVNU\bar{E} = FEDREV + STAREV + LOCREV$
- 2) $FEDREV = f(NATINC)$
- 3) $STAREV = g(STAINC)$
- 4) $LOCREV = h(PROP)$

Where:

$REVNU\bar{E}$	= Total K-12 revenues
$FEDREV$	= Revenues for K-12 received from the federal government
$STAREV$	= State generated K-12 revenues
$LOCREV$	= K-12 revenues generated by local property taxes
$NATINC$	= U.S. (national) personal income
$STAINC$	= California personal income
$PROP$	= Property tax base (assessed value)

A separate equation could be specified for each level of revenue generated. However, local property values rise with income, federal incomes and state incomes are highly collinear, and state incomes are dominant. Given these considerations, the revenue generation model may be respecified more simply as:

- 5) $REVNU\bar{E} = r(STAINC)$

If the functional relationship between state personal income and K-12 revenue is stable, then revenue projections can be based on projections of state personal income. The methodology adopted here is to estimate the income elasticity of revenues for K-12 education for the recent past and to use the elasticity measures in conjunction with the forecasts of state personal income.

The income elasticity of revenues is a measure of the responsiveness of state revenues to changes in state income. Specifically, it measures the percent increase in revenues in response to a one percent increase in income. Thus, if revenues rise at the same percentage rate as income, the elasticity measure is unitary (equal to 1.0). If revenues rise more than in proportion to the rise in income, the elasticity exceeds 1.0.

TABLE 7 Estimation of Income Elasticity of K-12 School Revenues

Years	Total Funding (\$Millions)		Percent Change	Personal Inc. (\$Billions)		Percent Change	Rev. Elast.
	(A)	(B)		(A)	(B)		
1985-88	14,995	19,703	27.14	422.8	522.6	21.11	1.286
1985-89	14,995	21,760	36.81	422.8	565.3	28.84	1.276
1985-90	14,995	23,399	43.78	422.8	606.1	35.63	1.229
1984-88	13,348	19,703	38.45	389.2	522.6	29.26	1.314
1984-89	13,348	21,760	47.92	389.2	565.3	36.90	1.299
1984-90	13,348	23,399	54.70	389.2	606.1	43.58	1.255

Notes: Percent change is based on average of beginning and terminal year revenue and income. Elasticity is defined as the percent change in funding divided by the percent change in state personal income.

Source: See Table 1. Computations by author.

Table 7 provides estimates of the income elasticity of K-12 school revenues using data for the recent past. Since the estimates will vary depending on the beginning year and the terminal year selected, six separate estimates were made corresponding to two different beginning years and three terminal years. The estimates are relatively consistent, ranging from a low of 1.229 to a high of 1.314. This implies that revenues for K-12 education since 1983-84 have risen considerably more rapidly than state personal income. If the pattern for the recent past holds, we can expect that a 1.000 percent increase in state personal income will be associated with between a 1.229 and a 1.314 percent increase in K-12 revenues.

The range in elasticities was used together with the forecasts of state personal income to develop the projections of revenues for K-12 education as displayed in Table 8. Using the lower estimate of responsiveness, it is projected that total funding will rise by 72 percent between 1988-89 and 1994-95. The higher estimate projects revenues to grow by 77 percent in the same period.

TABLE 8 Revenues for K-12 Education With Projections Through 1995 Based on Alternative Income Elasticities

Year	Total Funding (\$Millions)	
1980-81	12,263	
1981-82	12,528	
1982-83	12,636	
1983-84	13,348	
1984-85	14,995	
1985-86	16,776	
1986-87	18,241	
1987-88	19,703	
1988-89	21,760	
1989-90	23,399	
Projections with income elasticity of revenue equal to:		
	1.229	1.314
1990-91	25,843	26,012
1991-92	28,509	28,881
1992-93	31,143	31,734
1993-94	34,070	34,923
1994-95	37,445	38,621

Source: 1979-80 through 1989-90, PACE and Legislative Analyst, See Table 1, Projections by author.

K-12 Revenues and Proposition 98

Given that revenue adequacy involves a consideration not so much of total revenues but the amount available per child, as well as the purchasing power of these revenues, several adjustments need to be made. Table 9 displays K-12 revenues per ADA both in current and constant 1988 dollars. Again, two sets of projections are made, reflecting the range in our elasticity estimates. Thus, it is projected that revenues per ADA will rise from an estimated \$4,478 in 1988-89 to between \$6,266 and \$6,463 by 1994-95, implying an increase of between 40 and 44 percent over this period.

TABLE 9 Total Revenues for K-12 Education per Student (ADA) with Projections through 1995 in Current and Constant 1988 Dollars

Total Funding Per ADA		
Year	Current Dollar Amount	Constant 1988 Dollars
1980-81	2,909	3,856
1981-82	2,981	3,715
1982-83	2,986	3,660
1983-84	3,133	3,656
1984-85	3,445	3,844
1985-86	3,753	4,059
1986-87	3,955	4,116
1987-88	4,172	4,172
1988-89	4,478	4,290
1989-90	4,677	4,279

Projections with income elasticities equal to:

	Current Dollar		Constant Dollar	
	1.229	1.314	1.229	1.314
1990-91	4,991	5,024	4,349	4,378
1991-92	5,311	5,380	4,393	4,450
1992-93	5,590	5,696	4,397	4,480
1993-94	5,893	6,041	4,410	4,521
1994-95	6,266	6,463	4,454	4,594

Note: See text for discussion of deflation. California CPI used for constant 1988 amounts shown above.

Sources: See Table 1 and Table 8. See text for discussion.

However, adjusting for expected inflation shows that the real resources will rise much more modestly, from \$4,290 (in 1988 dollars) to between \$4,454 and \$4,594 (also in 1988 dollars). The lower estimate reflects a modest 4 percent increase in the real resources available per student.

The upper range of forecasts shows a growth in real spending per student (ADA) of 7 percent from 1988-89 to 1994-95. Again, given the restrictions of Proposition 98, a floor of \$4,290 per ADA in 1988 dollars would be required. Our revenue estimates indicate that for each year in the first half of this decade, given the assumed values for elasticity, revenues are expected to exceed this floor.

To summarize, K-12 revenues have been projected by:

- estimating the responsiveness of revenues to state personal income growth (income elasticity of revenues)
- projecting state personal incomes through 1995

- projecting the number of public school students (ADA)
- projecting a price index (California CPI) through 1995
- using the projections of state personal income together with the estimates of elasticity to project K-12 revenues
- using the projections of ADA and CPI to project the constant 1988 dollar revenues per student (ADA)

Revenues per ADA are projected to increase through 1994-95 given the range of likely scenarios. In real terms the increase from 1988-89 through 1994-95 is projected to range between 4 and 7 percent.

Expenditures

Our expenditure projections consist not of forecasting what expenditures are expected to be, but rather what expenditures would be if certain objectives were to be met. As stated earlier, it is the availability of revenues which conditions the actual level of expenditures. At issue then are some of the objectives to be met.

If we assume that the real expenditure per ADA is to be kept constant (spending per student rising with the rate of general inflation), then the only increase in costs would be due to the increased number of students. Given the price indices presented in Table 5, current dollar expenditures can be projected. The results are presented in Table 10.

TABLE 10 Expenditures Required to Keep Real Expenditures per ADA at the 1988-89 Level

Year	Per ADA Expenditure 1988 \$'s	ADA (1000s)	Total K-12 Expenditure 1988 \$'s	Total K-12 Expenditure Current \$'s
1988-89	\$4,279	4,859	\$20,792	\$21,705
1989-90	"	5,004	21,412	23,401
1990-91	"	5,178	22,157	25,425
1991-92	"	5,368	22,970	27,768
1992-93	"	5,571	23,838	30,308
1993-94	"	5,781	24,737	33,054
1994-95	"	5,976	25,571	35,971

Sources: See Tables 1, and 5. Computations by author.

Thus, it is estimated that to maintain the status quo in terms of per student real spending, current expenditures must rise by 66% from 1988-89 to 1994-95. From the revenue projections in Table 8, it may be seen that the lower scenario forecasts revenues to grow 72 percent over this period. Thus, the inflation adjusted spending floor mandated by Proposition 98 would be exceeded. The upper limit projected reflects an increase of 77 percent from 1988-89 to 1994-95, consistent with the 66 percent increase required by Proposition 98.

Total General Fund Tax Revenues

In order to better understand the potential limiting impact of other state funded programs on revenues for K-12 education, projections were made of the growth in total state general fund tax revenues through 1994-95. The procedure followed was the same as that employed in generating forecasts of K-12 revenues. The recent trends in tax revenues and state personal incomes were examined and the responsiveness of general fund revenues to income growth (income elasticities of revenues) were computed for the same period as used in the K-12 revenue projections. These elasticity estimates are displayed in Table 11. In comparing these elasticity estimates with those for K-12 revenues, it is clear that revenues in general were not as responsive to income growth as were revenues for public schools. This is the reverse of the pattern which existed during the first half of the 1980s decade. In fact, the lowest estimate of K-12 elasticity is about the same as the highest estimate of general revenues elasticity (1.229 and 1.174 respectively). This finding implies that other program revenues increased less rapidly than school revenues during the second half of the 1980s decade. That is, the share of revenues going to K-12 public education increased.

TABLE 11 Estimation of Income Elasticity of California General Fund Tax Revenues

Years	General Fund Tax Revenue (\$Millions)		Percent Change	California Personal Inc. (\$Billions)		Percent Change	Rev. Elast.
	(A)	(B)		(A)	(B)		
1985-88	25,515	31,231	20.15	422.8	522.6	21.11	0.9545
1985-89	25,515	34,646	30.35	422.8	565.3	28.84	1.052
1985-90	25,515	37,380	37.73	422.8	606.1	35.63	1.059
1984-88	22,309	31,231	33.33	389.2	522.6	29.26	1.139
1984-89	22,309	34,646	43.32	389.2	565.3	36.90	1.174
1984-90	22,309	37,380	50.50	389.2	606.1	43.58	1.159

Notes: Percent change is based on average of beginning and terminal year tax revenue and income. Elasticity is defined as the percent change in funding divided by the percent change in state personal income.

Source: Governor's Budget Summary 1989-90, p.33. Computations by author.

Given these estimates of general revenue income elasticity together with the forecasts of state personal income, projections were made of total state general tax revenues. These are given in Table 12, both in current and constant 1988 dollars. From 1988-89 to 1994-95, current dollar spending is forecast to increase by between 56 and 69 percent. This should be contrasted with the expected increase in K-12 revenues of between 63 and 76 percent. That is, if the trend of the past half decade continues, school revenue growth will exceed general tax fund revenue growth. In constant 1988 dollars, general fund revenues are expected to grow by between 16 and 26 percent.

To summarize, general fund revenues were forecasted using the same approach used in forecasting K-12 revenues. General fund revenues were found to be less responsive to state personal income growth than were public school revenues during the latter part of the 1980s. This lower responsiveness implies a slower growth in future general revenues than in K-12 revenues.

TABLE 12 California General Fund Tax Revenues with Projections Through 1995: in Current and Constant 1988 Dollars (Millions)

Year	Current Dollar Amount	Constant 1988 Dollars
1979-80	\$16,860	\$24,801
1980-81	17,808	23,606
1981-82	19,109	23,812
1982-83	19,579	24,000
1983-84	22,309	26,032
1984-85	25,515	28,473
1985-86	26,982	29,182
1986-87	31,331	32,606
1987-88	31,231	31,231
1988-89	34,646*	33,189*
1989-90	37,380*	34,203*

Projections with income elasticities equal to:

Current Dollar		Constant Dollar	
0.9545	1.174	0.9545	1.174
40,412	41,109	35,217	35,825
43,650	45,160	36,107	37,356
46,783	49,147	36,796	38,656
50,197	53,558	37,567	40,082
54,059	58,627	38,430	41,677

* Estimate

Source: Historical data: Governor's Budget Summary, 1989-90, p.33. Projections by author. See text for methodology.

Caveats and Limitations

Several potential limitations and sources of error need to be borne in mind when interpreting the finding of this report. First, the elasticity measures used have been derived from past observed behavior. The state's revenue structure and the division of revenues among competing programs is subject to change by legislative action or voter behavior. Thus, the projections here, as is the case for most projections, assume that the structure will remain fixed over the projected period, or that structural changes will be systematic and predictable. Second, it should be noted that differences in either the beginning or terminal year for computing the income elasticity of revenues will result in different estimates. The estimates used here are based on a judgment of the likely range.

Finally, the current and past revenue data presented in this paper are the widely used series from the Legislative Analyst's Office. These data were selected because they are used by the state's decision makers—the legislature and the governor—and other school finance researchers, and because the Analyst's Office has earned respect for its nonpartisan analyses and recommendations. The data are not without limitations, however. Certain revenues, such as Adult Education and those for the Office of Private Post-Secondary Education, are for purposes

which may not directly benefit K-12 students. Others, such as the state payments to the State Teachers Retirement System (STRS), vary dramatically from year to year and, as such, may result in errors in projecting general trends.

A modified measure of revenues per ADA could be developed to address some of these data problems. This was undertaken in the author's 1985 revenue projection report. Using the modified measure of revenue did not materially alter the findings of the report. Thus, such a modification was not undertaken for the present study.

Appendix

A Review of the 1985–86 to 1989–90 Forecasts

It is instructive to review the results of the earlier forecasts for a number of reasons. First, the analysis is useful for determining whether the methodology and data employed were sound. Second, the direction of bias—whether the forecast values were consistently higher or lower than the actual values—can be identified. Finally, such a review can cast light on what factors contributed to the forecasting errors.

Table A1 displays the upper and lower expected limits to total revenues, the actual, and the percent deviation from the upper limit. Deviations from the upper limit were used in this comparison since the actual values tended to be on the upper end of the amounts projected. An examination of these years shows that the actual values generally fell below the upper limit. The sole exception was 1988–89 when the actual exceeded the upper limit by 0.6 percent. The major contributor to this general underestimate of the revenue growth was the finding in the earlier report that K–12 revenues were relatively unresponsive to state personal income changes (the elasticity range was between 0.6095 and 0.9194). This was based on a study of revenue and income growth in the period prior to 1985. The current study reveals that the responsiveness of K–12 revenues to income was considerably greater in the second half of the decade (the elasticity range was between 1.229 and 1.314). These higher estimates are used for making the current forecasts through 1994–95.

The findings in Table A2 closely mirror those of Table A1. Actual spending per ADA tended to be close to the upper limit, falling within the upper limit by 1.1 to 3.5 percent.

Finally, Table A3 reviews the results of the projections for total general fund tax revenues. With the exception of 1986–87, the forecast values are within the range projected, or was slightly above the upper range (+0.1 percent in 1985–86).

Overall, the results are viewed as satisfactory. The major factor contributing to the general downward bias in the projections was the fact that the responsiveness of revenues to state personal income was greater in the second half of the decade than in the first. Our earlier projections, based on recent trends, used the elasticities derived from the data of the first half of the decade. The projections through 1994–95 are based on the higher elasticity measures (1984–85 through 1989–90).

TABLE A1 Comparison of 1985 Projections of K-12 Revenues with Actual Revenues (Millions of Current \$'s)

Year	Lower	Upper	Actual	Percent Deviation from Upper Limit
1985-86	\$16,419	\$16,833	\$16,776	-0.3%
1986-87	17,349	18,269	18,241	-0.2
1987-88	18,356	19,872	19,703	-0.9
1988-89	19,438	21,639	21,760	+0.6
1989-90	20,611	23,608	23,399	-0.9

Sources: Projections, See the author's Revenue and Expenditure Projections, 1985-86 Through 1989-90, PACE, 1985, p.20.

Actual: See Table 1.

TABLE A2 Comparison of 1985 Projections of K-12 Revenues Per Student (ADA) with Actual Revenues (Current \$'s)

Year	Lower	Upper	Actual	Percent Deviation from Upper Limit
1985-86	\$3,703	\$3,796	\$3,753	-1.1%
1986-87	3,834	4,037	3,955	-2.0
1987-88	3,976	4,304	4,172	-3.1
1988-89	4,109	4,574	4,478	-2.1
1989-90	4,232	4,847	4,677	-3.5

Sources: Projections, See the author's Revenue and Expenditure Projections, 1985-86 Through 1989-90, PACE, 1985, p.20.

Actual: See Table 1.

TABLE A3 Comparison of 1985 Projections of California General Fund Tax Revenues with Actual Revenues (Millions of Current Dollars)

Year	Lower	Upper	Actual	Percent Deviation from Upper Limit
1985-86	\$26,499	\$26,950	\$26,982	+0.1%
1986-87	28,242	29,248	31,331	+6.6
1987-88	30,153	31,814	31,231	-1.9
1988-89	32,222	34,645	34,646*	0.0
1989-90	34,482	37,796	37,380*	-1.1

* Estimated

Sources: Projections, See the author's Revenue and Expenditure Projections, 1985-86 Through 1989-90, PACE, 1985, p.27.

Actual: See Table 12.

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