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ABSTRACT

In recent years, educational policy makers have expressed increased interest in information about private elementary and secondary school expenditures. However, there is currently no national data collection of the finances of this school sector. A study was initiated for three main purposes: to determine the extent to which expenditure data are routinely collected by private school associations, to draw on the data available from private school associations so as to develop preliminary national estimates of such expenditures, and to determine whether the associations' surveys provide an accurate assessment of national estimates of expenditures or whether additional sources of data are required for this purpose. Data from three associations were acquired and analyzed (National Catholic Education Association, Lutheran Church--Missouri Synod, and the National Association of Independent Schools). Estimates of private school expenditure are broken down by total expenditures, estimated expenditures by sector, and estimated capital expenditures. It was estimated that the total operating expenditures for the roughly 26,000 private schools in the United States were between $16.4 and $17.7 billion in 1991-1992. It was concluded that precise estimates of private school expenditures cannot be obtained by relying solely on data provided by private school associations because most associations do not collect data on school finance. Seven appendices detail the private school associations contacted, sample estimate of average per-pupil expenditures, and other information. (RJM)

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Estimates of Expenditures for

Private K-12 Schools

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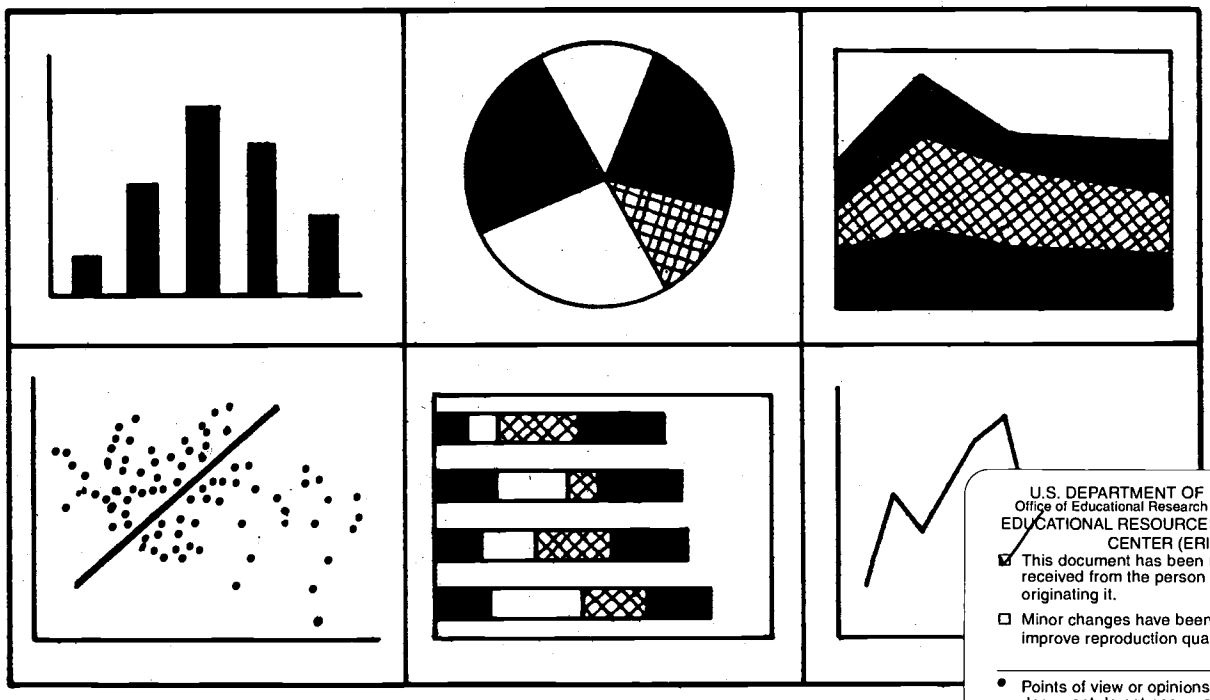

U.S. Department of Education
Office of Educational Research and Improvement

Estimates of Expenditures for

Private K-12 Schools

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FOREWORD

Each year a large number of written documents are generated by NCES staff and individuals commissioned by NCES which provide preliminary analyses of survey results and address technical, methodological, and evaluation issues. Even though they are not formally published, these documents reflect a tremendous amount of unique expertise, knowledge, and experience.

The ***Working Paper Series*** was created in order to preserve the information contained in these documents and to promote the sharing of valuable work experience and knowledge. However, these documents were prepared under different formats and did not undergo vigorous NCES publication review and editing prior to their inclusion in the series. Consequently, we encourage users of the series to consult the individual authors for citations.

To receive information about submitting manuscripts or obtaining copies of the series, please contact Suellen Mauchamer at (202) 219-1828 or U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, 555 New Jersey Ave., N.W., Room 400, Washington, D.C. 20208-5652.

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Estimates of Expenditures for

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We are especially indebted to the staff of the National Catholic Education Association (NCEA), the Lutheran Church-Missouri Synod, and the National Association of Independent Schools (NAIS) for their assistance in making available expenditure data on member schools. In particular, we acknowledge the assistance provided by Fred Brigham of the NCEA, Carl Moser of the Missouri Synod, and Martha Galindo and Jeff Burnett of NAIS.

Staff members of many other private school associations also provided helpful comments, assistance, and information. We are especially grateful for the advice and comments provided during a meeting of representatives of private schools held in Washington, D.C., in November, 1994. In addition, we thank Joyce McCray of the Council of American Private Education and Paul Konigstein of the American Montessori Society.

Finally, we thank our colleagues Mark Kutner and Sharon Deich for their help in organizing the study and contacting private school associations; and Sterlina Harper, for her skillful assistance in preparing the tables and text of our report.

EXECUTIVE SUMMARY

In recent years, policy makers have expressed increased interest in information about expenditures by private elementary and secondary schools. However, there currently does not exist a national data collection of the finances of this important school sector. The National Center for Education Statistics (NCES) does produce estimates of total expenditures each year based on surveys conducted during the late 1970s, but these estimates are not widely reported, in part because of uncertainty about their validity. Several private school associations also collect and publish expenditure figures for at least a sample of their members, but these associations do not include the entire private school sector.

This study was initiated by NCES for three main purposes. The first was to determine the extent to which expenditure data are routinely collected by private school associations. The second was to draw on the expenditure data available from private school associations to develop preliminary national estimates of private school expenditures. The third was to determine whether the associations' surveys provide an adequate basis on which to generate valid national estimates of expenditures or whether additional sources of data are required for this purpose.

In the initial phase of the project, we contacted representatives of more than twenty private school associations, requesting copies of published reports on school expenditures, survey instruments used to collect expenditure data, and accompanying instructions and definitions for the surveys. On the basis of this inquiry, we identified three associations that regularly collect expenditure data for member schools: the National Catholic Education Association (NCEA), the Lutheran Church-Missouri Synod (LCMS), and the National Association of Independent Schools (NAIS). Following these discussions we obtained complete data bases from NAIS and the Missouri Synod and published reports on elementary and secondary school expenditures from the

NCEA. We also made use of the 1991-92 NCES Private School Survey (PSS), which collected data on enrollment and other demographic characteristics for the population of private schools.

We used the data provided by the NCEA, the Missouri Synod, and the NAIS, along with data from the PSS, to develop preliminary national estimates of private school expenditures. Our basic estimation strategy was to divide the universe of private schools in the PSS into a set of nineteen mutually exclusive and collectively exhaustive sectors, defined on the basis of religious affiliation, association membership, and grade level organization.[1] Then, using the data provided by the associations, we developed expenditure estimates for each sector. Finally, we summed the sector totals to obtain the total expenditures for all private schools.

Three estimates were developed for each school sector for which data from private school associations were available. For the first estimate of total sector expenditures, we assigned each school in the sector the overall mean per-pupil expenditure estimate derived from the sector's sample data. We then estimated each school's total expenditures by multiplying the imputed per-pupil expenditure by the school's enrollment, as reported in the 1991-92 PSS. We then summed the estimated total expenditures across schools to obtain an estimate of the total expenditures for the sector.

For the second estimate of total expenditures, we assigned each school in a sector a per-pupil expenditure value derived from a sample estimate of sector per-pupil expenditures for the region in which the school was located. We then proceeded with the same approach as used for the overall sector mean. For the third estimate of per-pupil expenditures, we imputed a per-pupil

[1]The nineteen sectors include Catholic elementary and secondary schools (2 sectors); Lutheran elementary and secondary schools (2 sectors); religious elementary, secondary, and combined schools affiliated with NAIS (3 sectors); other religious elementary, secondary, and combined schools (3 sectors); non-sectarian elementary, secondary, and combined schools affiliated with NAIS (3 sectors); non-sectarian elementary, secondary, and combined schools (3 sectors); and elementary, secondary, and combined special education schools (3 sectors).

expenditure for each school based on the school's size (enrollment). We then proceeded exactly as we did for the estimates based on region.

To develop estimates of expenditures for schools for which we lacked data (i.e., special education schools; religious schools other than Catholic, Lutheran, or NAIS schools; and non-sectarian schools other than those affiliated with the NAIS), we proceeded by assigning per-pupil expenditure values for each school based on estimates from sectors for which we had data. For the special education schools, we imputed per-pupil expenditure values based on the sample data for the nonsectarian NAIS member schools. For each special education school, we developed three alternative estimates analogous to the estimates for the sectors for which we had sample data — one based on the overall NAIS sample mean, one based on NAIS regional sample means, and a third based on NAIS size-group sample means.

For other religious and non-sectarian schools, we derived two sets of estimates. First we assigned per-pupil expenditure values to each school based on Catholic sample data. This entailed developing three estimates of total expenditures for each of the sectors involved: one based on the overall Catholic sample mean; one based on regional Catholic sample means; and one based on size-group Catholic sample means. Then we developed a parallel set of estimates, relying on the sample data from the Lutheran Church-Missouri Synod. Thus, for all other religious and nonsectarian sectors, we produced six estimates of total expenditures.

Using these alternative estimation approaches, we obtained the following estimates of private school operating expenditures for the 1991-92 school year:

- Using data from Catholic schools to estimate expenditures for schools for which we lacked data, we estimated that total operating expenditures for all private schools in the nation were between $16.4 and $17.3 billion; we estimated that the average per-pupil expenditure was between $3,350 and $3,550.

- Using data from Lutheran schools to estimated expenditures for schools for which we lacked data, we estimate that total operating expenditures for all private

schools in the nation were between $17.2 and $17.7 billion; we estimated that the average per-pupil expenditure was between $3,500 and $3,600.

- Overall, we estimated that total operating expenditures were between $16.3 and $17.7 billion, and the average per-pupil expenditure was between $3,350 and $3,600.

- We derived estimates of annual capital expenditures as a percentage of annual operating expenditures, based on data for the public schools and for Catholic secondary schools. Based on these data, we estimated that the total expenditures for private schools in 1991-92 (including operating expenses and capital) were between $18.0 and $19.4 billion.

- Our estimate of total expenditures (including both operating and capital expenditures) is slightly lower than an NCES estimate of $20.2 billion extrapolated from surveys of private schools conducted in 1977-79 (NCES, 1994a, p 36).

Overall, we have a reasonable amount of confidence in the estimates for the sectors for which expenditure data were provided by private school associations. However, it is difficult to assess the error associated with our use of Catholic and Lutheran expenditure data to estimate expenditures for other religious and nonsectarian schools.

One conclusion of our study is that NCES cannot obtain precise national estimates of private school expenditures by relying solely on data provided by private school associations; most associations do not collect data on school finance. We therefore recommend two main steps to improve the estimates of private school expenditures. These are:

- Refine the estimates of expenditures using data from the Schools and Staffing Surveys. The analysis would include the use of school characteristics that might influence expenditures, e.g., teacher salaries and credentials, tuition, class size, administrative complexity, to develop new estimates of expenditures.

- Initiate a set of qualitative studies of private school organization and finance structures. Through a series of focus groups and case studies including a range of private schools, information could be obtained on the expenditures incurred by private schools, school accounting systems, and methods to appropriately account for all expenditures. This information could then be used to develop a survey to collect data on private schools' revenues and expenditures.

CHAPTER I

OBJECTIVES OF THE STUDY

In recent years, policy makers have expressed increased interest in information about expenditures by private elementary and secondary schools. Several factors have contributed to this interest. First, private schools enroll about five million school children nationally and represent about 12 percent of all students in elementary and secondary education. It is therefore important to have basic information on this large sector of American education. Second, it has frequently been argued in school policy debates that private schools operate more efficiently and more effectively than public schools (Chubb and Moe, 1990). Basic information about private school expenditures is therefore needed to create an informed debate. Finally, the United States is increasingly participating in international studies that compare expenditures for all education levels and sectors. Data on private school expenditures are needed for the United States to meet its international obligations and to improve the comparability of international expenditure comparisons.

Although information on private school expenditures is required to address a broad range of policy issues, there is no national collection of data on the finances of private elementary and secondary schools. The National Center for Education Statistics (NCES) does produce estimates of operating expenditures each year by inflating expenditures generated from private school surveys conducted during the 1976-77, 1977-78 and 1978-79 school years. But these estimates are not widely reported, in part because of uncertainty about their validity. Several private school associations also collect expenditure data from at least a sample of their members. But, prior to the conduct of this study, expenditures reported by these associations were not used to generate national estimates of private school expenditures.

This study was initiated by NCES for three main purposes. The first was to determine the extent to which expenditure data are routinely collected by private school associations. The second was to draw on the expenditure data available from private school associations to develop preliminary national estimates of private school expenditures. The third was to determine whether the associations' surveys provide an adequate basis on which to generate valid national estimates of expenditures or whether additional sources of data are required for this purpose.

Approach to the Study

Our approach to this study involved several key activities. The first was the establishment of an advisory group comprised of representatives of the private school community. The major roles of the advisory group were to help identify potential sources of data on private school expenditures and to facilitate access to the private school associations to obtain data required for the study. At a meeting held early in 1994, we confirmed that three associations — the National Catholic Educational Association (NCEA), the National Association of Independent Schools (NAIS), and The Lutheran Church-Missouri Synod — collected data on expenditures from their memberships and were advised that other associations may also collect relevant data.

The second major activity was the assembly of expenditure data from the private school associations. Following the advisory group meeting, a letter was sent from NCES to the leadership of more than twenty private school associations requesting copies of published reports on school expenditures, survey instruments used to collect expenditure data, and accompanying instructions and definitions for the surveys.[2] As a result of this inquiry we reconfirmed the

[2]Appendix A contains a list of the associations included in the information request.

availability of expenditure data from the three associations cited above, but were unable to locate other data sources.[3]

Meetings and telephone discussions were held with representatives of the three associations in the spring of 1994 to arrange to obtain their school-level data bases containing data on revenues and expenditures. Following these discussions we obtained complete data bases from NAIS and the Missouri Synod and published reports on elementary and secondary school expenditures from the NCEA. The NAIS data base contained expenditures for the 1991-92 school year and the Missouri Synod data base contained expenditures for the 1992-93 school year; the NCEA reports contained expenditure data for elementary schools for the 1990-91 school year and for secondary schools for the 1991-92 school year.

The third major activity was the development of national estimates of private school expenditures. This activity required the resolution of several important problems and involved the use of a number of different estimation methods. These are discussed below in our review of the methodology of the study.

Our report is organized in five chapters. Chapter II describes the data made available by the NAIS, the Missouri Synod, and NCEA. Chapter III considers the methodological foundations of the study and Chapter IV presents our estimates of private school expenditures. Chapter V assesses the quality of the estimates and outlines some directions for future research.

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[3]Two other associations (the Lancaster Area Council of Mennonite Schools and the Wisconsin Evangelical Lutheran Synod) provided expenditure data on member schools. The Council of Mennonite Schools provided data on 15 schools, and the Wisconsin Synod provided data on 23 high schools and 364 elementary schools. We did not use these data in our main analyses because the number of Mennonite schools and Wisconsin Synod high schools was quite small, and the Wisconsin Synod elementary data were not available in a form directly comparable to our other data. We discuss these data further in Chapter III.

CHAPTER II

SOURCES OF PRIVATE SCHOOL DATA

Expenditure Data

On the basis of discussions with the staff at NCES and about 20 national associations reflecting various sectors of private K-12 education, we were able to locate four sources of data on expenditures: data collected by the National Catholic Education Association (NCEA) on Catholic elementary schools; data collected by the NCEA on Catholic secondary schools; data collected by the Lutheran Church-Missouri Synod; and data collected by the National Association of Independent Schools (NAIS).[4] In this chapter, we discuss each of these data sets in turn. For each data set, we consider the sample of schools for which data are available, the form in which the data were provided to us, and the types of expenditure data included.

After considering the data provided by the NCEA, Lutheran Church-Missouri Synod, and NAIS, we discuss the Private School Survey (PSS) conducted by the U.S. Bureau of the Census for NCES. While the PSS does not collect data on expenditures, it provides a nearly complete list of private schools in the United States. Thus, we relied on the PSS to define the full population of private K-12 schools for which expenditures must be estimated.

NCEA Elementary School Data

Every other year, the NCEA conducts a survey of a random sample of Catholic elementary schools and publishes the results in monograph form. We drew on the 1990-91 survey, the most recent available at the time we conducted our study. We did not have access to the school-level data; instead, we drew on tables published as part of a monograph reporting the

[4]See Appendix A for a list of associations contacted. Two other associations, the Lancaster Area Council of Mennonite Schools and the Wisconsin Evangelical Lutheran Synod, also provided expenditure data. See Chapter I, page 3, footnote 3.

results of the survey. (The report, by Robert Kealey, is titled Catholic Elementary Schools and their Finances, 1991.)

The NCEA questionnaire asks schools a broad range of questions, including questions on enrollment, staffing, tuition, fund-raising, and staff compensation. In addition, it asks each school to report its annual per-pupil expenditure. (See Appendix G for questionnaire items.) According to the questionnaire:

> **Per-pupil cost** is defined as the total cost to educate one child in the school. This can be found by adding all the operating costs of the school (excluding debt service or capital expenses) and dividing this by the total number of students in the school (Kealey, 1992, p. 33).

In the fall of the 1990-91 school year, the questionnaire was mailed to a random sample of 1,213 Catholic elementary schools. (Every sixth school on a master list of Catholic elementary schools was chosen to participate.) Altogether, 616 schools responded, producing a response rate of just over 50%. Although the monograph does not explicitly discuss the degree to which responding and non-responding schools differ, the data displayed in the report indicate that the regional distribution of the sample of responding schools is fairly similar to the regional distribution for the population of Catholic elementary schools as a whole.[5] The report does not compare responding schools and the population of Catholic schools on other characteristics — for example, size or urbanicity.

The published monograph for 1990-91 reports the average per-pupil expenditure for the sample of responding schools, as well as the average per-pupil expenditure for subgroups of schools defined by size (enrollment), region, community type (inner city, urban, suburban, and

[5]An explicit comparison of responding and non-responding schools would provide more powerful evidence of response bias than a comparison of respondents and the full population.

rural), and sponsorship (parish, private, interparochial, and diocesan).[6] (See Kealey, 1992, Appendix D, p. 51.)

NCEA Secondary School Data

The NCEA also conducts a bi-annual survey of a sample of Catholic secondary schools, and we drew on the 1991-92 survey. We lacked access to the school-level data; instead, we relied on tables appearing in the monograph reporting the results of the survey. (See Michael J. Guerra, Dollars and Sense: Catholic High Schools and their Finances, 1993.) The questionnaire asked schools to report on an array of topics, including enrollment, staffing, compensation, educational standards, and governance. With respect to finances; each school was asked to report total operating expenses, as well as subtotals for major expenditure areas (including salaries, fringe benefits, and maintenance). (See Appendix G.)

The survey was sent to a random sample of 500 secondary schools stratified by region and enrollment. Of the 500 schools chosen for the sample, 285 (57%) responded. Seven of the responding schools included grades 1-5, and thus they were excluded from the reported analyses, producing a final sample size of 278. The monograph reporting the results does not explicitly compare responding and non-responding schools, but tables included in the report indicate that the sample of responding schools is quite representative of the full population of Catholic high schools, in terms of region, governance (diocesan, parochial/interparochial, and private) and enrollment.

The report provides the average per-pupil expenditure for the full sample of responding schools, as well as average per-pupil expenditures for subgroups of schools stratified by

[6]The averages reported in the NCEA elementary school monograph are unweighted and use the school as the unit of analysis. Thus, the reported averages give equal weight to small and large schools. In most or our analyses, we estimate an enrollment-weighted average, computed by summing expenditures across schools and dividing by the total enrollment. The enrollment-weighted average can be interpreted as the average amount spent per pupil.

governance and size. (See Guerra, 1993, Appendix A, pp. 30-37.) These averages are weighted by enrollment.[7] In addition, the report provides estimates of the median per-pupil expenditure by region, governance, enrollment, and single-sex/coeducational status (Guerra, 1993, Exhibit 27, p. 24).

Lutheran Church-Missouri Synod Data

Each year the Missouri Synod of the Lutheran Church conducts a survey of member schools, including preschools as well as elementary and secondary schools. (See Appendix G.) The typical response rate for elementary and secondary schools is above 90%. The questionnaire asks each school to report basic information on enrollment and staffing and to provide an estimate of the school's total operating expenditures. A worksheet provided with the questionnaire gives some guidance on expenditure items to include in the reported total. According to the worksheet, the reported total should include expenditures for salaries and instructional materials, as well as any expenditures for mortgage or rent.

The Missouri Synod provided us with a data set containing individual school records for about 2000 schools. Of these, about 1000 schools were stand-alone pre-schools, and we excluded these from our analysis. Thus, we were left with about 1000 K-12 schools.

The data set contains the name and address of each school, as well as enrollment by grade, enrollment by ethnicity, accreditation status, school income, the value of building and grounds, and per-pupil expenditures (which the Missouri Synod obtained by dividing the school's total reported operating expenditures by total enrollment). The data on expenditures pertain to the 1992-93 school year; the remaining data are for 1993-94.

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[7]The average per-pupil expenditure appearing in the NCEA report was obtained by computing the total operating expenditures for the sample of schools and then dividing by the total enrollment for the sample. Subgroup averages by size and governance were computed in similar fashion. These estimates are equivalent to averages weighted by enrollment.

National Association of Independent Schools Data

The NAIS conducts an annual series of surveys of member schools, including separate surveys focusing on enrollment and staffing, tuition and salary, financial aid, and income and expenditures. (See Appendix G.) Schools are expected to complete the surveys as a condition of membership; thus, the response rate is nearly 100%.

NAIS provided us with a data set containing individual school records for 1,035 schools. Of these, 96 were foreign schools, leaving 939 domestic elementary and secondary schools. The data set provided by the NAIS includes the name and address of each school and much of the data from each of the questionnaires completed throughout the 1991-92 school year. The data set includes the total expenditures for each school, as well as data on components of expenditures including salaries, benefits, maintenance, and instruction.

Private School Survey

Data from the Private School Survey (PSS) were provided by NCES. (For a description of the PSS, see Broughman, Gerald, Bynum, and Stoner, 1994.) To conduct the PSS (and other surveys of private schools), NCES attempts to develop a complete population list of all private elementary and secondary schools in the United States. The list, which has been developed over more than a decade, was prepared by drawing together lists from various sources, including Quality Educational Data (a market research firm specializing in education), Jostens (the school ring company), and the membership lists provided by various national associations of private schools (for example, the NCEA and the Lutheran Church-Missouri Synod). (See Broughman, et al, 1994.) To supplement the list, NCES drew a random sample of geographic areas across the country and searched telephone books and other sources in each area to identify additional

schools. Because the area search was conducted in only a sample of geographic locations, schools identified in this way must be weighted to derive a full population count of schools.

The PSS data we used were collected in the 1991-92 school year, primarily by mailed questionnaire, although some schools were surveyed by telephone (Broughman, et al, 1994). Overall, the response rate was about 98%.[8]

The 1991-92 PSS asked schools to report enrollment by grade, as well as the number of full-time and part-time teaching staff. In addition, the questionnaire asked each school whether it had a "religious orientation or purpose," and, if so, the school was asked to check its religious orientation or affiliation. (See Broughman, et al, 1994, Appendix B, pp. 59ff.) Finally, the questionnaire included a list of private school associations, and each school was asked to check each of those to which it belonged.

Summary

Altogether, we were able to locate association data for four groups of schools: Catholic elementary and secondary schools, schools affiliated with the Lutheran Church-Missouri Synod, and schools that are members of the National Association of Independent Schools. These four sources of data, along with data from the PSS, provided the raw materials for our estimates of expenditures for private elementary and secondary education.

[8]To obtain population estimates of enrollment and other school characteristics, the school data must be weighted to reflect the pattern of non-response across schools.

CHAPTER III

METHODOLOGY

The task of estimating the total amount spent per year on private K-12 education poses a collection of methodological questions. In this chapter, we describe the main questions we considered and the estimation strategies we developed. We begin by summarizing several preliminary issues that frame the analysis. Then, we turn to the specific details of the estimation methods we chose.

Preliminary Questions

In attempting to estimate the total amount schools spend, the first question that must be addressed is: What expenditures should be counted? And, when schools have been asked on surveys to report expenditures, what have they been asked to report?

Operating Expenditures

The available data focus almost entirely on operating costs (which include salaries, materials, and so forth). On two of the surveys we used in estimating expenditures (the NCEA secondary school survey and the NAIS survey), schools were asked to report their total current expenditures, broken down into at least several components. On the Lutheran survey, schools were asked to report just total operating expenditures, without reporting specific components. On the NCEA elementary school survey, schools were asked to report their per-pupil expenditures.

In general, we are not sure how well the reported expenditures really reflect what schools actually spent. For example, if some costs were shared between a church and a school, how were they split? For purposes of the work we discuss here, we simply focused on total operating expenditures, as reported by responding schools, and we did not attempt to break this total into

components or categories. We do not know how completely the data as reported reflect the true overall operating costs of private schools, nor do we know exactly what expenditures were included in the totals the schools provided.

Capital Expenditures

Data on capital expenditures — expenditures for buildings and durable equipment — are very seldom collected for private schools (except insofar as mortgage costs are included in reported operating expenditures). Based on data collected by the NCEA on the total current market value of buildings and grounds for Catholic high schools, we estimated that capital expenditures for Catholic high schools are roughly 10% of operating costs.[9] Data collected by NCES for public schools provide a very similar estimate of 9.6%. (See NCES, 1994c). Since we had little other data on this question, we simply assumed that the capital expenditures for all private schools are roughly 10% of the operating budget.[10]

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[9]We obtained this estimate by making the very rough assumption that buildings and grounds have an average functional lifetime of 30 years. In other words, about 1/30 of the current dollar value of buildings and grounds must be reinvested each year to maintain or replace the current stock. Guerra (1993, p. 20) reports that the total value of buildings and grounds for Catholic high schools was $7.8 billion in 1991-92. To obtain the annual capital expenditure, we compute $7.8 billion * (1/30) = $0.26 billion. This is about 10% of the total estimated operating expenditures for Catholic high schools, reported as about $2.6 billion (Guerra, 1993, p. 22).

[10]The Lutheran data also include an estimate of the current market value of buildings and property for all elementary and secondary schools in the sample. To assess the reliability of these data, we computed the value of buildings and property per pupil for each school, as well as the ratio of the market value of buildings and property to the annual operating expenditures. The variation across schools in these estimates leads us to suspect that the reported market values are probably quite noisy. Nevertheless, we carried out an analysis of these data parallel to the analysis of the capital expenditure data for Catholic secondary schools, and we found that the annualized capital investment expenditure appears to be about 16% of operating expenditures — an estimate much higher than the Catholic and public school estimates. Because the Lutheran data on reported market values seem noisy, we decided not to make use of the 16% estimate in our analysis of capital expenditures, although the noise does not necessarily imply that the estimate is worse than the result we obtained based on the published Catholic data. This is an area of study that clearly merits additional attention.

Preschool Expenditures

One additional issue that must be resolved in estimating the total amount spent by private schools is determining the grade-levels for which expenditure data should be included. Many private schools operate preschool programs, and it is likely that many (or most) of these schools included expenditures for preschool programs in their total expenditures as reported on the surveys we used. Indeed, it would probably be very difficult for most schools to disentangle expenses for preschool from other school expenses — especially expenses for administration, facilities, and so forth. Because we wanted to obtain an estimate of expenditures for K-12 education only, we tried to exclude the expenditures for preschool from our estimates. We did this by computing the per-pupil expenditure for each school (by dividing the total expenditure by the total number of students enrolled, including preschool students), and then multiplying this per-pupil expenditure by the enrollment in grades K-12. This is not a precise solution to the problem, however, because it presumes that the average cost of education is roughly similar for preschool and other grades — an assumption which can hardly be precisely correct. Preschool is probably less expensive than other grades. But we believe this approach provides a sensible set of estimates, given the data we have.

School Characteristics

Once we decided which expenditures should count, we turned to a second question: What characteristics of schools might influence expenditures? We ended up focusing on four: religious or organizational affiliation, grade-level organization, region, and size. We chose these four characteristics because they appear to be plausible dimensions on which expenditures may differ and because we obtained data on these four characteristics in each of the four data sets provided by private school associations. Clearly, other school characteristics may have a large influence on expenditures as well, especially average class size (or student-teacher ratio), and

teacher salaries. We were unable to make use of these characteristics in our analyses, however, because we did not have the necessary data for the Catholic and Lutheran schools.[11]

Estimation Strategy

Our basic strategy in estimating the total amount spent on private K-12 schools was to divide the universe of private schools into a set of mutually exclusive and collectively exhaustive sectors. Then, using the data provided by the associations, we developed expenditure estimates for each sector. Finally, we summed the sector results to obtain the total expenditures for all private schools.

To obtain an unbiased estimate of the total operating expenditures for private K-12 schools, it is necessary to insure that the division of schools into sectors accounts for all schools in the population, and, insofar as possible, avoids doublecounting. The PSS data base provides the most complete population list of private schools available, and thus we decided to use it as the basis for our analysis. The PSS list sampling frame includes more than 90% of the private schools in operation in 1991-92, and the area sampling frame includes a random sample of the schools that were omitted from the list frame. By applying the PSS sampling weights, it is possible to use the PSS data set to obtain full population estimates of the number of private schools, school enrollment, and other school characteristics.

To classify schools by sector, we used PSS data on religious orientation or affiliation, association membership, and grade-level organization. We began by dividing the population of schools into seven categories based on religious affiliation and association membership. The seven categories include the following: Roman Catholic schools, Lutheran schools, other

[11]Data on a collection of school characteristics that may influence expenditures are available in the School and Staffing Survey (SASS) conducted by NCES. (See NCES, 1994b.) We consider some ways the SASS might be used in Chapter V.

religious schools that are NAIS members, non-sectarian schools that are NAIS members, other religious schools that are not NAIS members, non-sectarian schools that are not NAIS members, and special education schools. Table 3.1 provides detailed definitions and PSS questionnaire items used in this classification scheme.

TABLE 3.1

Classification of Schools by Religious Affiliation and Association Membership

Category	Definition	PSS items
Roman Catholic	Reported Roman Catholic religious affiliation	Q10c=1
Lutheran	Reported religious affiliation one of the following: Lutheran Church — Missouri Synod, Evangelical Lutheran Church in America (formerly AELC, ALC, or LCA), Wisconsin Evangelical Lutheran Synod, or Other Lutheran	Q10c=16, or Q10c=17, or Q10c=18, or Q10c=19
Other religious, NAIS member	Reported a religious orientation, purpose, or affiliation other than Catholic or Lutheran; and reported membership in NAIS	Q10a=1, and Q10e=23
Non-sectarian, NAIS member	Reported that the school does not have a religious orientation, purpose, or affiliation; and reported membership in NAIS	Q10a=2, and Q10e=23
Other religious, not NAIS member	Reported a religious orientation, purpose, or affiliation other than Catholic or Lutheran; did not report membership in NAIS	Q10a=1, and Q10e≠23 and
Non-sectarian, not NAIS member	Reported that the school does not have a religious orientation, purpose, or affiliation; did not report membership in NAIS; and did not report serving primarily handicapped students	Q10a=2, and Q10e≠23 Q11a≠4
Special education	Reported that the school does not have a religious orientation, purpose, or affiliation; did not report membership in NAIS; and reported serving primarily handicapped students	Q10a=2, and Q10e≠23, and Q11a=4

We also relied on PSS data to classify schools as elementary, secondary, or combined (that is, including both elementary and secondary grades). The definitions and the PSS items on which the classification is based are displayed in Table 3.2. Unfortunately, different reports employ somewhat different definitions of the exact grade levels included in "elementary," "secondary," and "combined" schools. We used definitions that matched, insofar as possible, those used in NCEA reports (since we relied on them for our data on Catholic schools).[12]

TABLE 3.2

Classification of Schools by Grade Level Organization

Grade level organization	Definition	PSS items
Elementary	Highest grade $\leq$ 8	Q2a
Secondary	Highest grade $\leq$ 12 and lowest grade $\geq$ 6	Q2a
Combined	Highest grade $\leq$ 12 and lowest grade $\leq$ 5	Q2a

[12]The classification we used differs somewhat from the NCES definition (Broughman et al, 1994, p 23). According to the NCES scheme, elementary schools include all schools that have a grade 6 or lower and have no grade above 8; secondary schools include all schools with a lowest grade of at least 7 and a highest grade of at least 9. All other schools are classified as combined. Our system differs from the NCES definitions primarily in the treatment of middle schools and junior high schools (6-8, 7-8, and 7-9 schools). We classify 6-8 and 7-8 schools as elementary and 7-9 schools as combined. The NCES scheme defines 6-8 as elementary, 7-8 schools as combined, and 7-9 as secondary.

We used the classification of schools by religious affiliation, association membership, and grade level to divide the full population of schools into 19 sectors. Table 3.3 displays the number of schools and enrollment for each of the sectors we defined.[13]

Because our estimates of the number of schools and the enrollment for each sector are based on the PSS, they differ somewhat from parallel estimates derived from association membership data. For example, our estimates indicate that there were about 1,244 Catholic secondary schools in 1991-92, enrolling about 620,274 students. This differs slightly from the estimate of 1,269 Catholic secondary schools reported by the NCEA (Guerra, 1993, p. 21).

Per-Pupil Expenditure Estimates

For the Catholic elementary and secondary sectors, the Lutheran elementary and secondary sectors, and the sectors including schools belonging to NAIS, we had data on per-pupil expenditures for a sample of schools.[14] As an initial step in our analysis, we attempted to assess the extent to which the sample of schools for which we have data for each sector is representative of the full sector population.[15] To do this, we compared the size and region distributions for the schools in the sample for each sector with the distributions for the population which the sample is supposed to represent. By and large, the distributions are quite parallel.

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[13]Nearly all of the Catholic and Lutheran schools in the PSS data set are strictly elementary or secondary in grade organization; very few have a combined elementary-secondary organization. Thus, for purposes of the analyses reported here, we collapsed the handful of Catholic and Lutheran combined schools into the Catholic and Lutheran elementary sectors.

[14]Strictly speaking, only the Catholic elementary and secondary samples were obtained through explicit probability sampling plans. The Lutheran Church-Missouri Synod and NAIS "samples" were each intended as a full-population census of association members. For clarity, however, we refer to the schools included in the data sets provided by the Missouri Synod and NAIS as "samples" to distinguish them from the full population of Lutheran and NAIS schools, as reflected in the PSS.

[15]For the Lutheran Church — Missouri Synod sample, we treated the relevant population as all schools in the PSS reporting an affiliation with the Lutheran church, including the Missouri Synod, as well as the Evangelical Lutheran Church in America, the Wisconsin Evangelical Lutheran Synod, and "Other Lutheran."

TABLE 3.3

Number of Schools and Total Enrollment, By Sector

School Level and School Type	Number of Schools	Number of Students
Elementary Schools		
Catholic	7,645	1,968,732
Lutheran	1,563	192,688
NAIS Religious	124	25,688
NAIS Non-Sectarian	325	62,354
Other Religious	5,240	534,431
Other Non-Sectarian	2,084	177,573
Special Education	114	5,692
All Schools	17,093	2,967,157
Secondary Schools		
Catholic	1,244	620,274
Lutheran	87	20,958
NAIS Religious	91	28,194
NAIS Non-Sectarian	208	58,730
Other Religious	477	74,776
Other Non-Sectarian	342	35,711
Special Education	171	10,327
All Schools	2,620	848,969
Combined Schools		
NAIS Religious	95	58,326
NAIS Non-Sectarian	346	152,590
Other Religious	408	641,354
Other Non-Sectarian	943	166,143
Special Education	817	54,890
All Schools	6,285	1,073,303

TABLE 3.3 (Continued)

Number of Schools and Total Enrollment, By Sector

School Level and School Type	Number of Schools	Number of Students
All Schools		
Catholic	8,889	2,589,006
Lutheran	1,650	213,645
NAIS Religious	309	112,208
NAIS Non-Sectarian	879	273,673
Other Religious	9,801	1,250,560
Other Non-Sectarian	3,369	379,427
Special Education	1,101	70,908
All Schools	25,998	4,889,429

NOTE: In this and all other tables, preschool enrollment, if any, is excluded.

Thus, at least with respect to the small number of demographic variables for on which we have data, despite some non-response, the samples appear to be reasonably representative of the populations from which they were drawn. (See Appendix D for the size and region distributions for the population of schools in each sector.)

We drew on the sample data provided by the associations to obtain three alternative estimates of the per-pupil expenditure for each school in the sector. As a first estimate, we used the sample average. We computed each school's per-pupil expenditure (x_i) by dividing the school's total expenditures (t_i) by the school's total enrollment (e_i). We then computed the sample average, weighting each school by its enrollment. This weighted average can be interpreted as the average amount spent per pupil, for the students in the sample schools. The weighted average is equivalent to an average computed by dividing the total expenditure for the schools in the sample (T_s) by the total enrollment for the sample (E_s):

$$\bar{x} = \frac{\sum e_i x_i}{\sum e_i} = \frac{\sum t_i}{\sum e_i} = \frac{T_s}{E_s}$$

The sample weighted average per-pupil expenditure can be viewed as an approximately unbiased estimate of the weighted average per-pupil expenditure for the population of schools in the sector.[16] Thus, the sample estimate can be used to obtain an approximately unbiased estimate of the total expenditures for the sector as a whole. (We discuss this further, in the section on "Estimating total expenditures," below.)

The estimates we obtained for each sector for which we have sample data are displayed in Table 3.4, below. Several patterns are evident in the estimates. First, for all sectors for which

[16]The estimate would be approximately unbiased if the sample were randomly drawn from the population to which inferences are to be made; and if any non-response were unrelated to per-pupil expenditure. Neither assumption is fully valid for the data we have, of course, and thus conclusions about bias must rest on judgments beyond formal statistical considerations.

TABLE 3.4

Sample Estimates of Average Per-Pupil Expenditure, by Sector

	Estimation sample size (n)	Sample average per pupil expenditure	Sample standard deviation	Standard Error	Maximum	Minimum
Catholic elementary	609	1,819*	—	—	—	—
Catholic secondary	278	3,909	—	—	—	—
Lutheran elementary	774	2,003	1,021	367	18,182	457
Lutheran secondary	44	4,527	2,520	3799	16,129	2,297
NAIS member, religious, elementary	51	6,313	2,796	392	29,202	3,017
NAIS member, religious, secondary	73	16,523	7,708	902	36,840	6,215
NAIS member, religious, combined	64	9,052	2,744	343	21,246	3,843
NAIS member, non-sectarian, elementary	170	8,807	3,341	256	32,327	2,595
NAIS member, non-sectarian, secondary	172	17,261	8,123	69	51,500	4,332
NAIS member, non-sectarian, combined	256	9,662	6,241	390	62,733	2,883

*The Catholic elementary mean is based on 1990-91 data.

we have data, average expenditures for secondary schools are substantially higher than average expenditures for elementary schools. Secondary schools appear to spend more than twice what elementary schools spend per pupil. Second, as might be anticipated, the estimates for NAIS member schools are much higher than the estimates for Lutheran and Catholic schools. One factor that contributes to the large difference between the per-pupil expenditure estimates for the sample of NAIS schools and the other schools is that a relatively large proportion of NAIS schools are boarding schools, and expenditures for dormitories are apparently included in the total operating expenditures for these schools. Very few Catholic and Lutheran schools are boarding schools.[17]

At both the elementary and secondary level, estimates for Catholic and Lutheran schools are quite similar. The estimated average per-pupil expenditures for Lutheran elementary schools is roughly 10% higher than the estimate for Catholic elementary schools, while the estimate for Lutheran secondary schools is about 15% higher than the estimate for Catholic secondary schools.[18]

Finally, there appears to be substantial variation in per-pupil expenditures across schools within each sector.[19] The within-sector standard deviation for Lutheran elementary schools, for example, is roughly $1,000, and, for the 774 schools for which we have data, expenditures range

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[17]Appendix F displays average per-pupil expenditures separately for NAIS boarding and non-boarding schools. As expected, the average per-pupil expenditure for boarding schools is substantially higher than the average for non-boarding schools.

[18]For purposes of comparison, we calculated an average per-pupil expenditure of $2,031 for the 13 Mennonite elementary schools for which we had data. The Wisconsin Evangelical Synod reported an average expenditure of $1,529 for 364 member elementary schools, and $4,062 for 20 member high schools.

[19]For the sectors for which we have school-level data (the Lutheran and NAIS member schools), we conducted exploratory analyses to detect potential defects in the data, and we corrected data that seemed clearly in error. For example, for a few schools, reported expenditures and reported income differed by a factor of 10, and the reported income provided a much more plausible per-pupil average than did the reported expenditures. In these cases, we assumed the reported expenditures were in error and substituted reported income. Except where we found clear evidence of reporting errors, we retained all schools in our analyses, including schools with per-pupil expenditures relatively far from the sample average.

from $457 per student in one school to $10,112 per student in another. The range for NAIS member schools is even wider: one NAIS combined elementary-secondary school has a per-pupil expenditure of more than $160,000.[20]

The wide variation in per-pupil expenditures across schools within sectors — especially within the NAIS sectors — suggests that the estimated sample means should be interpreted with some caution. While the means provide an appropriate basis on which to estimate the total expenditures for each sector, it is clear that many schools within each sector spend far more or less than the sample average.[21]

In an attempt to capture some of the potential sources of within-sector variation in expenditures, we developed two additional sets of estimates of per-pupil expenditures for each sector, one based on region and one based on school size.[22] In the approach based on region, we stratified schools by region within sector. We then computed the sample average for each region and used this regional average to represent the per-pupil expenditure for all sector schools in the region.[23] In the approach based on size, we stratified schools by enrollment and then

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[20]The school is a special education, boarding school. We examined the data provided by the school in some detail, and the data seem internally consistent. Since the data seem trustworthy, we decided not to exclude the school from the sample.

[21]Given the possibility of substantial outliers, the median per-pupil expenditure may provide a more robust estimate of central tendency than the mean. It would be possible to obtain an estimate of total sector expenditures by multiplying the median per pupil expenditure for a sector by the sector's enrollment. Although this estimate would in general be biased, it might have less sampling variability than an estimate based on the mean. This deserves further exploration.

[22]See Chapter V for a discussion of alternative ways of dealing with cross-school variation in per-pupil expenditures.

[23]The NCEA monographs from which we drew the regional estimates for Catholic elementary and secondary schools use a 6-region classification of states. (See Guerra, 1993; Kealey, 1992). For consistency, we elected to use the same classification scheme in the regional analyses of the Lutheran and NAIS samples. The 6 regions are: New England (Connecticut, Maine, New Hampshire, Rhode Island, Vermont); Mideast (Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania); Great Lakes (Illinois, Indiana, Michigan, Ohio, Wisconsin); Plans (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota); Southeast (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia); West/Far West (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah, Washington, Wyoming).

computed the sample average for each enrollment group.[24] Appendix Tables B-1 and B-2 display the sample sizes on which the regional and size-group estimates of average per-pupil expenditure for each sector are based, and Appendix Tables B-3 and B-4 display the estimated means and standard deviations.

The results indicate that, across sectors, small schools appear to spend somewhat more per pupil than large schools. For example, among Catholic elementary schools, the sample mean for schools enrolling 1-199 students is $2,008, while the mean for schools enrolling more than 500 students is $1,498. In part, the apparent effect of school size may reflect the influence of class size: small schools probably have smaller classes (and hence few students per teacher) than large schools. There are also some reasonably consistent regional patterns. For example, schools in the Northeast and in the Far West tend to spend more than schools in the Midwest and South. The observed pattern of regional variation may be a consequence of variation in cost of living, which may be reflected in salaries, rent, and other expenses.

Estimating Total Expenditures for Population of Schools

We used the sample estimates displayed in Table 4 (and in Appendix tables B3 and B4) to impute three alternative estimates of total expenditures for each of the 19 sectors into which we divided the population of private schools. We will begin by describing the approach used to

[24]The NCEA monograph on elementary schools reports per-pupil expenditures using the following size categories: 1-199; 200-299; 300-499; 500 or more. (See Kealey, 1992.) Because Catholic high schools tend to be larger than elementary schools, the NCEA secondary monograph reports spending using a somewhat different set of categories: 1-299; 300-500; 501-750; and 751 or more. (See Guerra, 1993.) Most private elementary, secondary, and combined schools are similar in size to typical Catholic elementary schools. Thus, for consistency, we used the Catholic elementary enrollment categories to classify schools by size for all sectors except the Lutheran elementary sector. Lutheran elementary schools are substantially smaller than typical Catholic elementary schools, and so we used a different size classification scheme for them: 1-99; 100-199; 200-299; 300 or more.

obtain the three sets of estimates for the sectors for which we had corresponding sample data, and then we will turn to the remaining sectors.

Estimating Total Expenditures for Catholic, Lutheran, and NAIS Sectors

For the first estimate of total sector expenditures, we assigned each school in a sector the overall mean per-pupil expenditure estimate derived from the sector's sample data. We then estimated each school's total expenditures by multiplying the imputed per-pupil expenditure by the school's enrollment.[25] We then summed the estimated total expenditures across schools (weighting each school by the PSS sampling weights) to obtain an estimate of the total expenditures for the sector.[26]

For the second estimate of total sector expenditures, we assigned each school in a sector a per-pupil expenditure value derived from the sample of sector schools in the school's region. Then, we proceeded exactly as in the approach based on the overall sector mean. First, we obtained an estimate of the total expenditure for each school, by multiplying the school's imputed per-pupil expenditure by the school's enrollment. We then summed the estimated total expenditures across schools (again weighting by the PSS sampling weights) to obtain a sector total.[27] The estimated sector total obtained in this way will differ from the total based on the overall sample mean if the regional per-pupil expenditure estimates differ, and the distribution of schools across regions differs for the sample and the population. To obtain an estimate of the

[25]This is a ratio estimator of the school's total expenditures. The approach we used implicitly assumes that a school's total expenditures can be modeled as the product of a common per-pupil expenditure rate and the school's enrollment, along with an error term with standard deviation proportional to enrollment.

[26]Since the imputed per-pupil expenditure is identical for all schools in the sector, this approach is equivalent to multiplying the per-pupil expenditure by the total sector enrollment.

[27]This approach is equivalent to multiplying the estimated average per-pupil expenditure for each region by the total enrollment in the region, and then summing across regions.

sector per-pupil expenditure rate implied by the total expenditure based on regional means, we divided the sector total by the sector enrollment.

For the third estimate of total sector expenditures, we imputed a per-pupil expenditure value for each school based on the school's size (enrollment).[28] We then proceeded exactly as we did for the estimates based on region.

For convenience, we refer to the three alternative estimates of total expenditures for each sector as the estimates based on overall sector means, regional means, and size-group means.

Estimating Total Expenditures for the Other Religious, Other Non-Sectarian, and Special Education Sectors

The principal problem we faced in estimating total expenditures for the other religious, other non-sectarian, and special education schools was that we lacked estimates of per-pupil expenditures based on sample data for these sectors. Thus, we proceeded by assigning per-pupil expenditure values for each school based on estimates from sectors for which we had data. The assumptions involved here are clearly the most critical in the estimation process, and we consider the sensitivity of our results to these assumptions in Chapter V.

For the special education elementary, secondary, and combined sectors, we imputed per-pupil expenditure values based on the sample data for non-sectarian NAIS member schools. For each special education school, we developed three alternative estimates analogous to the estimates for the sectors for which we had sample data — i.e., we developed an estimate based on the overall NAIS sample mean, a second estimate based on NAIS regional sample means, and a third estimate based on NAIS size-group sample means.

For the other religious and other non-sectarian elementary, secondary, and combined schools, we derived two sets of estimates. First, we assigned per-pupil expenditure values to

[28]In imputing total expenditures, we used the same classifications used in the analysis of sample data. See Appendix table B4.

each school based on Catholic sample data. This entailed developing three estimates of total expenditures for each of the sectors involved, one based on the overall Catholic sample mean, one based on regional Catholic sample means, and one based on size-group Catholic sample means. Then, we developed a parallel set of estimates, relying on sample data from the Lutheran Church-Missouri Synod rather than Catholic schools. Thus, for the other religious and other non-sectarian sectors, we produced six estimates of total expenditures in all.

Summary

Overall, in estimating the total annual expenditures by private schools, we relied on two basic sources of data. First, we derived estimates of average per-pupil expenditures, using survey data provided by three national associations of private schools (the NCEA, the Lutheran Church-Missouri Synod, and the NAIS). Then, we used these estimates to derive national totals, by drawing on the PSS data set, which provides nearly complete information on the enrollment, religious orientation, and organizational affiliation of all private schools in the country. In Chapter IV, we present the estimates we obtained based on these two sources of data.

CHAPTER IV

ESTIMATES OF PRIVATE SCHOOL EXPENDITURES

Introduction

Drawing on expenditure data provided by NCEA, the Lutheran Church-Missouri Synod, and the National Association of Independent Schools, we obtained two sets of estimates of the total operating expenditures for private schools enrolling children in grades K-12. The first set of estimates was based on the assumption that the expenditures for the religious and non-sectarian schools for which we lacked data are similar to the expenditures for corresponding Catholic schools. The second set of estimates was based on the assumption that the expenditures for the religious and non-sectarian schools for which we lacked data are similar to the expenditures for corresponding Lutheran schools.[29] For both sets of assumptions, we developed three alternative estimates of total expenditures, one using per-pupil expenditure estimates based on overall sector means, one using estimates based on within-sector regional means, and one based on within-sector size-group means. In this chapter, we describe the results obtained based on these assumptions.

Estimates of Total Expenditures

Table 4.1 summarizes the total expenditures obtained using the Catholic schools as a model for the schools for which we lacked expenditure data, and Table 4.2 displays the estimated average per-pupil expenditures for the population of schools. According to the estimates based on overall sector means, private schools in the United States spent a little over $16.5 billion in

[29]See Chapter III. In all models, the expenditures for special education schools were estimated using data for corresponding NAIS schools.

TABLE 4.1

Estimated Current Expenditures of Private Schools by School Level, Based on the Catholic School Model

School Level	Number of Schools	Number of Students	Estimated Current Expenditures ($ millions) Based on:		
			Overall Means	Regional Means	Size Means
Elementary Schools	17,093	2,967,157	6,228	6,343	6,103
Secondary Schools	2,620	848,969	4,609	4,500	4,725
Combined Schools	6,285	1,073,303	5,689	5,547	6,496
All Schools	25,998	4,889,429	16,527	16,390	17,324

NOTE: Expenditures for sectors for which we lacked association data were derived from Catholic schools.

TABLE 4.2

Estimated Per Pupil Expenditures of Private Schools by School Level, Based on the Catholic School Model

School Level	Number of Schools	Number of Students	Estimated Current Expenditures ($ per pupil) Based on:		
			Overall Means	Regional Means	Size Means
Elementary Schools	17,093	2,967,157	2,099	2,138	2,057
Secondary Schools	2,620	848,969	5,429	5,300	5,565
Combined Schools	6,285	1,073,303	5,301	5,168	6,053
All Schools	25,998	4,889,429	3,380	3,352	3,543

NOTE: Expenditures for sectors for which we lacked association data were derived from Catholic schools.

1991-92. The estimate based on regional means is slightly lower ($16.4 billion), and the estimate based on size-group means is somewhat higher ($17.3 billion). Based on the estimates using overall sector means, about 38% of the total spending by private schools was accounted for by elementary schools; about 28% by secondary schools; and about 34% by combined elementary-secondary schools.

Based on the overall sector means, the average amount spent per pupil for the roughly five million students enrolled in private schools in 1991-92 was about $3,380. The average amount spent for students enrolled in elementary schools was $2,099, considerably lower than the average for secondary schools ($5,429) and combined schools ($5,301).

Tables 4.3 and 4.4 provide parallel estimates using Lutheran schools as a model for schools for which we lacked association data. According to the results using estimated per-pupil expenditures based on overall sector means, the total amount spent by private schools in 1991-92 was about $17.2 billion. This estimate is about $0.7 larger than the estimate based on the Catholic school data. Estimates based on Lutheran regional and size group means are $17.4 and $17.7 billion, respectively, also slightly higher than the corresponding estimates based on Catholic data. The estimated average per-pupil expenditures obtained from the Lutheran model ranged from $3,512 to $3,616.

Estimated Expenditures by Sector

Tables 4.5 and 4.6 display estimated total expenditures and per-pupil expenditures by sector. The estimates for 10 of the 19 sectors (Catholic elementary and secondary schools, Lutheran elementary and secondary schools, and both religious and non-sectarian NAIS elementary, secondary, and combined schools) were based on expenditure data from corresponding associations; the estimates for 6 of the 19 sectors (other religious and other non-

TABLE 4.3

Estimated Current Expenditures of Private Schools by School Level, Based on the Lutheran School Model

School Level	Number of Schools	Number of Students	Estimated Current Expenditures ($ millions) Based on:		
			Overall Means	Regional Means	Size Means
Elementary Schools	17,093	2,967,157	6,305	6,393	6,161
Secondary Schools	2,620	848,969	4,678	4,647	4,780
Mixed Schools	6,285	1,073,303	6,188	6,392	6,739
All Schools	25,998	4,889,429	17,171	17,432	17,680

NOTE: Costs for sectors for which we lack association data are derived from costs of Lutheran schools.

TABLE 4.4

Estimated Per Pupil Expenditures of Private Schools by School Level, Based on the Lutheran School Model

School Level	Number of Schools	Number of Students	Estimated Current Expenditures ($ per pupil) Based on:		
			Overall Means	Regional Means	Size Means
Elementary Schools	17,093	2,967,157	2,125	2,155	2,076
Secondary Schools	2,620	848,969	5,510	5,474	5,631
Mixed Schools	6,285	1,073,303	5,766	5,956	6,279
All Schools	25,998	4,889,429	3,512	3,565	3,616

NOTE: Costs for sectors for which we lack association data are derived from costs of Lutheran schools.

TABLE 4.5

Estimated Current Expenditures of Private Schools by School Level and School Type (Based on Catholic School Model)

School Level and School Type	Number of Schools	Number of Students	Estimated Current Expenditures ($ million) Based on:		
			Overall Means	Regional Means	Size Means
Elementary Schools					
Catholic	7,645	1,968,732	3731.5	3754.9	3579.7
Lutheran	1,563	192,688	385.9	384.5	385.4
NAIS Religious	124	25,688	162.2	165.1	166.4
NAIS Non-Sectarian	325	62,354	549.1	534.5	551.7
Other Religious	5,240	534,431	1012.9	1086.3	1022.4
Other Non-Sectarian	2,084	177,573	336.6	3715.1	346.8
Special Education	114	5,692	50.1	46.2	50.8
All Schools	17,093	2,967,157	6228.5	6343.0	6103.3
Secondary Schools					
Catholic	1,244	620,274	2424.7	2362.4	2470.0
Lutheran	87	20,958	94.9	94.2	101.5
NAIS Religious	91	28,194	465.8	442.1	447.6
NAIS Non-Sectarian	208	58,730	1013.7	1002.4	1022.0
Other Religious	477	74,776	292.3	287.5	335.5
Other Non-Sectarian	342	35,711	139.5	139.4	155.9
Special Education	171	10,327	178.3	171.9	192.0
All Schools	2,620	848,969	4609.3	4500.0	4724.7
Combined Schools					
NAIS Religious	95	58,326	527.9	513.6	523.4
NAIS Non-Sectarian	346	152,590	1474.3	1436.1	1521.9
Other Religious	4,085	641,354	2507.1	2402.0	2754.7
Other Non-Sectarian	943	166,143	649.5	603.5	709.6
Special Education	817	54,890	503.3	592.1	986.7
All Schools	6,285	1,073,303	5689.1	5547.2	6496.2

TABLE 4.5 (Continued)

Estimated Current Expenditures of Private Schools by School Level and School Type (Based on Catholic School Model)

School Level and School Type	Number of Schools	Number of Students	Estimated Current Expenditures ($ million) Based on:		
			Overall Means	Regional Means	Size Means
All Schools					
Catholic	8,889	2,589,006	6156.2	6117.3	6049.7
Lutheran	1,650	213,645	480.8	478.6	486.9
NAIS Religious	309	112,208	1156.0	1120.8	1137.4
NAIS Non-Sectarian	879	273,673	3037.2	2972.9	3095.6
Other Religious	9,801	1,250,560	3812.3	3775.8	4112.7
Other Non-Sectarian	3,369	379,427	1125.6	1114.4	1212.3
Special Education	1,101	70,908	758.7	810.2	1229.5
All Schools	25,998	4,889,429	16526.8	16390.2	17324.1

NOTE: Estimates for "Other Religious" and "Other Non-Sectarian" schools were based on Catholic schools of comparable level. For special education schools, the estimates for each school were derived from NAIS schools of comparable level.

TABLE 4.6

Estimated Per Pupil Expenditures of Private Schools by School Level and School Type (Based on Catholic School Model)

School Level and School Type	Number of Schools	Number of Students	Estimated Per Pupil Expenditures Based on:		
			Overall Means	Regional Means	Size Means
Elementary Schools					
Catholic	7,645	1,968,732	1,895	1,907	1,818
Lutheran	1,563	192,688	2,003	1,995	2,000
NAIS Religious	124	25,688	6,313	6,429	6,477
NAIS Non-Sectarian	325	62,354	8,807	8,571	8,848
Other Religious	5,240	534,431	1,895	2,032	1,913
Other Non-Sectarian	2,084	177,573	1,895	2,092	1,953
Special Education	114	5,692	8,807	8,114	8,923
All Schools	17,093	2,967,157	2,099	2,137	2,057
Secondary Schools					
Catholic	1,244	620,274	3,909	3,809	3,982
Lutheran	87	20,958	4,527	4,494	4,845
NAIS Religious	91	28,194	16,523	15,681	15,877
NAIS Non-Sectarian	208	58,730	17,261	17,069	17,402
Other Religious	477	74,776	3,909	3,845	4,487
Other Non-Sectarian	342	35,711	3,909	3,905	4,365
Special Education	171	10,327	17,261	16,642	18,589
All Schools	2,620	848,969	5,429	5,300	5,565
Combined Schools					
NAIS Religious	95	58,326	9,052	8,805	8,973
NAIS Non-Sectarian	346	152,590	9,662	9,411	9,974
Other Religious	408	641,354	3,909	3,745	4,295
Other Non-Sectarian	943	166,143	3,909	3,632	4,271
Special Education	817	54,890	9,662	10,788	17,976
All Schools	6,285	1,073,303	5,300	5,168	6,053

TABLE 4.6 (Continued)

Estimated Per Pupil Expenditures of Private Schools by School Level and School Type (Based on Catholic School Model)

School Level and School Type	Number of Schools	Number of Students	Estimated Per Pupil Expenditures Based on:		
			Overall Means	Regional Means	Size Means
All Schools					
Catholic	8,889	2,589,006	2,378	2,363	2,337
Lutheran	1,650	213,645	2,251	2,241	2,279
NAIS Religious	309	112,208	10,302	9,989	10,136
NAIS Non-Sectarian	879	273,673	11,098	10,863	11,311
Other Religious	9,801	1,250,560	3,048	3,019	3,289
Other Non-Sectarian	3,369	379,427	2,967	2,937	3,195
Special Education	1,101	70,908	10,700	11,426	17,339
All Schools	25,998	4,889,429	3,380	3,352	3,543

NOTE: Estimates for "Other Religious" and "Other Non-Sectarian" schools were based on Catholic schools of comparable level. For special education schools, the estimates for each school were derived from NAIS schools of comparable level.

sectarian elementary, secondary, and combined schools) were based on the Catholic school data; and the estimates for the remaining three sectors (special education elementary, secondary, and combined schools) were based on data from NAIS member schools.

Overall, about 75% of the expenditures by private schools can be accounted for by six of the 19 sectors: Catholic elementary and secondary schools, other religious elementary and combined schools, and NAIS non-sectarian elementary and combined schools. Catholic elementary schools alone accounted for more than a third of the total estimated private school expenditures. The large Catholic and other-religious share of the total is due to the large student enrollment in these sectors; the estimated per-pupil expenditures for these sectors are low (see table 4.6). The NAIS non-sectarian schools, on the other hand, enrolled many fewer students, but their per-pupil expenditures were much higher.

Overall, the sectors for which we lacked data comprise a substantial portion of the total expenditures on private education. Based on the Catholic model, we estimated that the total expenditures in 1991-92 for the nine sectors for which we lacked association expenditure data were about $5.7 billion, or roughly one third of the total expenditures by private schools. We estimated that two of the nine sectors for which we lacked data — other religious elementary and combined schools — spent an estimated $3.5 billion, or about 20% of the overall total.

One way to assess the sensitivity of our results to the assumptions we made about the nine sectors for which we lacked data is to adjust the total expenditures for these sectors upwards or downwards and examine the effect on the estimated total expenditures for the overall population of private schools. For example, if our estimated total expenditures for the nine sectors for which we lacked data are 20% too low, the total expenditures for the nine sectors should be increased by 20% of $5.7 billion, or about $1.1 billion. This would increase the total expenditures by private schools from 16.5 to about 17.6 billion — an increase of about 6%. This

suggests that unless our estimates of the expenditures for which we lacked data are off by more than 20%, our estimate for the total expenditures on private education are unlikely to be off by more than roughly 6%.

Tables 4.7 and 4.8 provide expenditure estimates by sector, using the Lutheran school model rather than the Catholic model. The Lutheran and Catholic models differ in their assumptions for only six of the 19 private school sectors — the other religious and other non-sectarian elementary, secondary, and combined sectors. For the remaining 13 sectors (the 10 for which we had association expenditures data and the three special education sectors), the Catholic and Lutheran models incorporate identical assumptions. Thus, for these 13 sectors, the estimates in Tables 4.7 and 4.8 are the same as those in Tables 4.5 and 4.6.

The other religious schools form the largest group for which we lacked association data. Based on the Lutheran overall means model, the estimated total expenditure for the other religious elementary, secondary, and combined sectors was $4.3 billion (see Table 4.7). The corresponding estimate based on the Catholic model was $3.8 billion (see Table 4.5). Thus, the estimates based on these two alternative sets of assumptions differ by about 0.5 billion dollars, or a little more than 10% of the estimated total ($3.8 to $4.3 billion).

The pattern is roughly similar for the other non-sectarian schools. Based on the Lutheran overall means model, the estimated total expenditure for the other non-sectarian schools was $1.3 billion (see Table 4.7), while the corresponding estimate based on the Catholic model was $1.1 billion (see Table 4.5). The estimates differ by $0.2 billion, or somewhat less than 20%.

Estimated Capital Expenditures

Unfortunately, as reported in Chapters II and III, almost no data were available on private schools' capital expenditures. Thus, we did not attempt to obtain separate estimates of

TABLE 4.7

Estimated Current Expenditures of Private Schools by School Level and School Type (Based on Lutheran School Model)

School Level and School Type	Number of Schools	Number of Students	Estimated Current Expenditures ($ million) Based on:		
			Overall Means	Regional Means	Size Means
Elementary Schools					
Catholic	7,645	1,968,732	3731.5	3754.9	3579.7
Lutheran	1,563	192,688	385.9	384.5	385.4
NAIS Religious	124	25,688	162.2	165.1	166.4
NAIS Non-Sectarian	325	62,354	549.1	534.5	551.7
Other Religious	5,240	534,431	1070.5	1126.9	1071.6
Other Non-Sectarian	2,084	177,573	355.7	380.7	355.5
Special Education	114	5,692	50.1	46.2	50.8
All Schools	17,093	2,967,157	6305.1	6392.8	6161.0
Secondary Schools					
Catholic	1,244	620,274	2424.7	2,362	2,470
Lutheran	87	20,958	94.8	94.2	101.5
NAIS Religious	91	28,194	465.8	442.1	447.6
NAIS Non-Sectarian	208	58,730	1013.7	1002.4	1022.0
Other Religious	477	74,776	338.5	393.1	371.7
Other Non-Sectarian	342	35,711	161.7	181.3	175.3
Special Education	171	10,327	178.3	171.8	192.0
All Schools	2,620	848,969	4677.5	4647.4	4780.3
Combined Schools					
NAIS Religious	95	58,326	528.0	513.6	523.3
NAIS Non-Sectarian	346	152,590	1474.3	1436.1	1521.9
Other Religious	4,085	641,354	2903.4	3085.3	2947.4
Other Non-Sectarian	943	166,143	75.2	76.5	75.9
Special Education	817	54,890	530.3	592.1	986.7
All Schools	6,285	1,073,303	6188.2	6392.5	6738.9

TABLE 4.7 (Continued)

Estimated Current Expenditures of Private Schools by School Level and School Type (Based on Lutheran School Model)

School Level and School Type	Number of Schools	Number of Students	Estimated Current Expenditures ($ million) Based on:		
			Overall Means	Regional Means	Size Means
All Schools					
Catholic	8,889	2,589,006	6156.2	6117.3	6049.7
Lutheran	1,650	213,645	480.8	478.7	486.9
NAIS Religious	309	112,208	1155.9	1120.8	1137.4
NAIS Non-Sectarian	879	273,673	3037.2	2973.0	3095.6
Other Religious	9,801	1,250,560	4312.4	4605.4	4390.8
Other Non-Sectarian	3,369	379,427	1269.5	1327.3	1290.4
Special Education	1,101	70,908	758.7	810.2	1229.5
All Schools	25,998	4,889,429	17170.8	17432.7	17680.3

NOTE: Estimates for "Other Religious" and "Other Non-Sectarian" schools are based on Lutheran schools of comparable level. For special education schools, the costs for each school are derived from NAIS schools of comparable level.

TABLE 4.8

Estimated Per Pupil Expenditures of Private Schools by School Level and School Type (Based on Lutheran School Model)

School Level and School Type	Number of Schools	Number of Students	Estimated Per Pupil Expenditures Based on:		
			Overall Means	Regional Means	Size Means
Elementary Schools					
Catholic	7,645	1,968,732	1,895	1,907	1,818
Lutheran	1,563	192,688	2,003	1,995	2,000
NAIS Religious	124	25,688	6,313	6,429	6,477
NAIS Non-Sectarian	325	62,354	8,807	8,571	8,848
Other Religious	5,240	534,431	2,003	2,109	2,005
Other Non-Sectarian	2,084	177,573	2,003	2,144	2,002
Special Education	114	5,692	8,807	8,114	8,923
All Schools	17,093	2,967,157	2,125	2,155	2,076
Secondary Schools					
Catholic	1,244	620,274	3,909	3,809	3,982
Lutheran	87	20,958	4,527	4,494	4,845
NAIS Religious	91	28,194	16,523	15,681	15,877
NAIS Non-Sectarian	208	58,730	17,261	17,069	17,402
Other Religious	477	74,776	4,527	5,258	4,972
Other Non-Sectarian	342	35,711	4,527	5,076	4,910
Special Education	171	10,327	17,261	16,642	18,589
All Schools	2,620	848,969	5,510	5,474	5,631
Combined Schools					
NAIS Religious	95	58,326	9,052	8,805	8,973
NAIS Non-Sectarian	346	152,590	9,662	9,411	9,974
Other Religious	4,085	641,354	4,527	4,811	4,596
Other Non-Sectarian	943	166,143	4,527	4,606	4,572
Special Education	817	54,890	9,662	10,788	17,976
All Schools	6,285	1,073,303	5,766	5,956	6,279

TABLE 4.8 (Continued)

Estimated Per Pupil Expenditures of Private Schools by School Level and School Type (Based on Lutheran School Model)

School Level and School Type	Number of Schools	Number of Students	Estimated Per Pupil Expenditures Based on:		
			Overall Means	Regional Means	Size Means
All Schools					
Catholic	8,889	2,589,006	2,378	2,363	2,337
Lutheran	1,650	213,645	2,251	2,241	2,279
NAIS Religious	309	112,208	10,302	9,989	10,136
NAIS Non-Sectarian	879	273,673	11,098	10,863	11,311
Other Religious	9,801	1,250,560	3,449	3,683	3,511
Other Non-Sectarian	3,369	379,427	3,346	3,498	3,401
Special Education	1,101	70,908	10,700	11,426	17,339
All Schools	25,998	4,889,429	3,512	3,565	3,616

NOTE: Estimates for "Other Religious" and "Other Non-Sectarian" schools are based on Lutheran schools of comparable level. For special education schools, the costs for each school are derived from NAIS schools of comparable level.

capital expenditures by sector. Instead, we generated an aggregate estimate of the total spending on capital expenditures for private schools as a whole. To obtain this aggregate estimate, we assumed that the spending on capital could be estimated as a percentage of operating expenses and obtained two alternative estimates of this percentage (see Chapter III). The first estimate (9.6%) was drawn from the U.S. Fiscal Data Submission to the OECD Education Indicators Project (1994c) and the second estimate (10%) was based on data collected by the NCEA on Catholic secondary schools (Guerra, 1993).

Using these percentages, we estimated that the total expenditure on private elementary and secondary education for 1991-92, including both operating and capital expenditures, lay somewhere between about 18 billion and 19.4 billion dollars (see Table 4.9). These estimates are clearly quite rough and should be treated with more caution than the other estimates we have presented.

Comparison with NCES Estimates

NCES publishes an annual estimate of the total operating expenses by private elementary and secondary schools in the *Digest of Educational Statistics* (NCES, 1994a, p 36). This estimate is based on data on operating expenditures collected as part of a set of universe surveys of private schools conducted in the late 1970's and inflated to reflect changes in expenditures since the period in which the data were collected.[30] (For a description of the universe surveys, see McLaughlin and Wise, 1980.) The NCES estimate for 1991-92 was $20.2 billion. Table 4.10 compares the NCES estimates with the six estimates we generated.

[30]NCES uses the data on operating expenditures to obtain an estimate of total expenditures by assuming that annual expenditures on capital are a fixed percent of operating expenditures. To account for changes in expenditures since the period during which the data were collected, NCES adjusts the estimates based on the annual percentage growth in expenditures per teacher in the public schools.

TABLE 4.9

Total Expenditures (Operating Expenditures Plus Capital) By Estimation Method

Capital Spending Assumed to be 9.6% Operating Expenditure			Capital Spending Assumed to be 10% Operating Expenditure		
Estimates Based on Overall Means	Estimates Based on Regional Means	Estimates Based on Size Means	Estimates Based on Overall Means	Estimates Based on Regional Means	Estimates Based on Size Means
Based on Catholic School Expenditures					
18,114	17,963	18,987	18,180	18,029	19,056
Based on Lutheran School Expenditures					
18,819	19,105	19,377	18,888	19,175	19,448

TABLE 4.10

Comparing NCES Estimates and Model-Based Estimates of Total Expenditures (Operating Expenditures Plus Capital)

NCES ($ Million)	Overall Means			Regional Means			Size Means		
	Estimated Expenditures ($ Million)	Difference		Estimated Expenditures ($ Million)	Difference		Estimated Expenditures ($ Million)	Difference	
		$	Percent		$	Percent		$	Percent
Catholic School Model									
20,200	18,180	2,020	-10.0	18,029	2,171	-10.7	19,056	1,144	-5.7
Lutheran School Model									
20,200	18,888	1,312	-6.5	19,175	1,025	-5.1	19,448	752	-3.9

NOTE: Capital spending assumed to be 10% of operating expenditures.

When we used the Catholic school data for sectors for which we lacked association data, and estimated the average per-pupil expenditure using the overall sector means, we obtained an estimated total expenditure of $18.2 billion — roughly $2.0 billion lower than the NCES estimate of $20.2 billion. Thus, the model-based estimate is roughly 10% lower than the NCES estimate. The estimates based on the Catholic region and size-group models are $18.0 billion and $19.1 billion, also lower than the NCES estimate.

Our Lutheran-based estimates are somewhat closer to the NCES estimates, but, like the Catholic-based estimates, all three are lower than the NCES estimate of $20.2 billion. The Lutheran-based estimates lie between $18.9 billion and $19.4 billion — or roughly 4-6% below the NCES estimates.

Summary

Based on data provided by the NCEA, Lutheran Church-Missouri Synod, and the NAIS, as well as data from the PSS, we obtained estimates for the total 1991-92 operating expenditures for private schools ranging from about $16.4 billion to about $17.7 billion for 1991-92. In the concluding chapter, we will examine the strengths and weakness of our estimates and consider some ways in which the estimates might be improved.

CHAPTER V

CONCLUSIONS

In the work reported here, we drew on expenditure data collected by several national associations of private schools to estimate the total annual operating expenditures for private K-12 education in the United States. Drawing on data provided by the National Catholic Education Association, the Lutheran Church-Missouri Synod, and the National Association of Independent Schools, we estimated that the total operating expenditures for the roughly 26,000 private schools in the United States was between $16.4 and $17.7 billion in 1991-92. If capital expenditures are included, we estimate of total expenditures were between $18.0 and $19.4 billion.

In this chapter, we assess the quality of these estimates and consider some ways our knowledge of private school expenditures might be improved.

Assessing the Quality of the Estimates

The task of assessing the quality of the estimates we obtained can be broken down into three parts. First, we consider the adequacy of our estimate for the sectors for which we had expenditure data from the associations: Catholic Schools, Lutheran Schools, and schools that are members of the NAIS. Then, we turn to the sectors for which we lacked expenditure data. Finally, we consider some general questions concerning the estimation methods we utilized.

Estimates for Catholic, Lutheran, and NAIS Sectors

Our estimates of expenditures for the Catholic, Lutheran, and NAIS sectors are based on data collected through mailed questionnaires administered by the NCEA, the Missouri Synod, and the NAIS. Thus, the quality of our estimates depends fundamentally on the quality of the expenditure data reported on the questionnaires. In general, the expenditure items appearing on

the questionnaires are well-crafted, and our examination of the data suggests that most of the questionnaires were filled out with care. Nevertheless, we do not know how well the reported expenditures match actual school expenditures, nor do we know exactly what expenditures respondents included and excluded in filling out the questionnaires. Furthermore, the questionnaires used by the three associations differ in the level of detail required in reporting expenditures, and this may have had some influence on the results. Without additional data — for example, from case studies — it is difficult to assess the reliability and validity of the expenditure measures. Thus, we simply take the questionnaire data at face value. Later in the chapter, we propose some new data collection efforts that may cast more light on the quality of expenditure data collected using mailed questionnaires.

With this caveat, we have a reasonable amount of confidence in the estimates for the Catholic, Lutheran, and NAIS sectors. Although each data set on which we relied has some clear weaknesses, each also has clear strengths, and we would be surprised if new data collected using similar surveys revealed an estimate of per-pupil operating expenditures that differed by more than perhaps 10% from the estimates we obtained.

The main area of concern in the data for Catholic elementary and secondary schools is the response rate: each had a response rate far below 100%. (The response rate for the elementary survey was just above 50%, and for the secondary survey it was about 57%.) The potential bias due to non-response is difficult to assess, but we suspect the problem is not too serious, since the sample of respondents appears reasonably similar, at least in size and region, to the overall population of Catholic schools.

A second source of uncertainty in our estimates for Catholic elementary and secondary schools is sampling error. Since the data were obtained from (intendedly) random samples, we can at least in principle calculate a standard error of the estimated sample mean per-pupil

expenditure. The calculation of the standard error of the mean requires an estimate of the population standard deviation, which the published reports on the Catholic data do not provide. But some indication of the likely magnitude of sampling error can be obtained by choosing a plausible estimate for the standard deviation. For example, for Catholic elementary schools (which had a mean 1990-91 per-pupil expenditure of $1819), one might assume that the standard deviation was about $1,000. (This is roughly the standard deviation we obtained for Lutheran elementary schools.) Using this estimate, the estimated standard error of the mean for the Catholic elementary sample is roughly $40 (based on a sample size of a little over 600 schools).[31] Thus, we expect that the estimated sample average per pupil expenditure of $1,819 might be off by perhaps $80 (2 standard errors), or a little over 4%.[32]

Neither non-response nor sampling error are problems for the data on the Lutheran Church-Missouri Synod schools, since expenditure data for these schools were collected (at least in principle) from the full set of members. But other difficulties remain, which introduce some uncertainty into the estimates. Although we had data on nearly the full population of Lutheran Church-Missouri Synod schools, we drew on the data to estimate the expenditures of three other groups of Lutheran schools (those identifying themselves in the PSS as affiliated with the Evangelical Lutheran Church in America, the Wisconsin Evangelical Lutheran Synod, or "Other Lutheran"). We do not know how much expenditure patterns differ across these different groups

[31]The standard error is the estimated standard deviation (1000) divided by the square root of the sample size (600).

[32]Since we use the Catholic elementary sample mean of $1,819 to estimate the per-pupil expenditures of many schools in the sample, it is quite possible that the overall total expenditures for all of the schools for which the Catholic schools are used as a model could be off by roughly 4%, simply due to sampling error in the Catholic elementary sample.

of Lutheran schools, but it would not be implausible to imagine that the Lutheran schools for which we lacked data had a mean somewhat different from the mean for the Missouri Synod.[33]

Finally, non-response and sampling error should not be problems for the NAIS sector, since, like the data for the Missouri Synod, expenditure data for NAIS were in principle collected for the full population of NAIS member schools. But one source of potential error appeared, nonetheless: the count of NAIS member schools obtained from the PSS data set is nearly 50% higher than the count of NAIS member schools according to the data provided by NAIS. (See Appendix C.) We used our estimate of per-pupil expenditures derived from the NAIS sample data to estimate expenditures for the full set of schools identified as NAIS members in the PSS. It is hard to know how much error this has introduced.

Overall, then, for the sectors for which we had sample data, there are several sources of potential error, and it is difficult to assess how large this error might be. The easiest source of error to take into account is sampling error, and a rough estimate from the Catholic elementary sample suggests that sampling error is likely to be a relatively modest problem. Issues of Catholic sample non-response and extrapolation of Lutheran and NAIS estimates from the samples to the larger PSS universe are likely to be more substantial sources of concern.

With these caveats in mind, there are several reasons to believe that our estimates for the Catholic, Lutheran, and NAIS member schools are reasonably precise. First, our estimates of average per-pupil expenditure for Catholic and Lutheran elementary schools are relatively similar — they differ by only about 10%. These two sectors have a number of organizational characteristics in common — for example, many schools in both sectors are closely affiliated with local parish churches. In addition, both sectors have a large concentration of schools in the Midwest, both sectors have a long history of involvement in elementary education, and both

[33]Indeed, the reported average expenditure for Wisconsin Synod elementary schools was $1,529, somewhat lower than the Missouri Synod overall sample mean of $2,003.

sectors are represented by active, national associations. Thus, the relatively similar expenditure estimates we have obtained for the two sectors are reassuring.

Second, the sectors for which we had data appear to exhibit roughly similar patterns of variation in per-pupil expenditure by size and region. In general, across sectors, small schools appeared to experience higher per-pupil expenditures than large schools, and schools in the Northeast and West often had higher expenditures than schools in other regions. These relatively consistent patterns suggest that the per-pupil expenditure estimates reflect stable aspects of school organization and context.

Sectors for Which We Lacked Data

Our estimates for the nine sectors for which we lacked expenditure data are more difficult to assess. We based our estimates for special education elementary, secondary, and combined schools on corresponding NAIS schools, and we prepared two sets of estimates for the other religious and non-sectarian elementary, secondary, and combined schools, one based on Catholic estimates, and the other based on Lutheran estimates.

Our estimates for special education schools are clearly a rough approximation, and it is difficult to assess the degree to which the estimates might be in error. Special education schools, by our estimate, account for only about 5% of the total spending by private schools. Thus, our estimate of per-pupil spending for private education could be off by a substantial amount without having a profound effect on our estimate of total expenditures.

It is also difficult to assess the error associated with our use of Catholic and Lutheran data to estimate costs for the other religious and non-sectarian schools. One issue worth mentioning is that many of the schools for which we lack data are combined elementary-secondary schools, while almost no Catholic and Lutheran schools are organized as combined schools. We based our estimates for other religious and non-sectarian combined schools on our estimates of average

per-pupil spending for Catholic and Lutheran secondary schools. This estimate may well be high (since the costs of secondary education are substantially higher than the costs of elementary education), but our data are insufficient to determine the extent to which this is a problem.

In addition, the sectors for which we lacked data are surely more diverse in organizational form than either the Catholic and Lutheran schools. While many of the other religious schools, like most of the Catholic and Lutheran schools, are probably closely affiliated with a neighborhood church, others are probably not, and this may have an important influence on expenditures. The non-sectarian schools are likely to be even more diverse. Some are free schools, some are alternative schools, some are schools with special curricula (foreign language schools, and so forth). We do not know what influence this may have on expenditures.

Nevertheless, especially at the elementary level (which accounts for about two thirds of the population and private schools for which we have data), we would be surprised if improved data changed our overall estimate of total expenditures on private education by more than perhaps 10 or 15%. In part, our confidence at the elementary level lies in the fact that Catholic schools comprise a major part of the sector. And, in part, it is based on the reassuring similarity of the Catholic and Lutheran estimates.[34]

Estimation Methods

Apart from questions about the quality and coverage of the available data, the main methodological questions that can be raised concern the approaches taken in making use of the sample data to estimate per-pupil expenditures. We chose to develop three estimates for each sector, one based on the overall sample mean, one based on regional means, and one on size group means. Clearly, the factors that we examined are not the only plausible candidates to be

[34]The Catholic and Lutheran Church-Missouri Synod elementary school estimates are also reasonably similar to the average per-pupil expenditures for the 13 Mennonite elementary schools and 364 Wisconsin Evangelical Lutheran Synod schools for which we had expenditure data. See Chapter III, footnote 18.

used as predictors of expenditure, but our choices were circumscribed by the data that have been collected, and by the fact that the data collected by the NCEA were available only in report form.

Another potential weakness in our method is that the sample sizes for some regions and size groups within sectors are quite small. Thus, it is possible that the estimates for some of these groups may be heavily influenced by one or two unusual schools. One response to this problem would be to draw on empirical Bayes methods, in which the estimate for each group is a weighted average of the sample mean for the group and the overall sector mean, and the weight for each group is a function of the relative samples sizes of the group and the sector as a whole. (For a discussion of empirical Bayes approaches, see Morris, 1983.) The Bayes approach tends to "shrink" the estimate for groups with small samples toward the overall sector mean.

A related methodological issue concerns the general treatment of schools with unusually high and low costs. We decided to include all schools in the analysis, with the exception of those with data that were clearly and obviously in error. In future work, it would be worth giving more attention to the distribution of per-pupil expenditures across schools within sectors. It would be especially valuable to give additional attention to the sensitivity of the estimated means to the treatment of outliers.

Another issue concerns our treatment of school size as a small set of discrete categories (enrollment from 1-200, 201-299, etc.), rather than as a continuous predictor of per-pupil expenditures. In the sectors for which we had school-level data (the Lutheran and NAIS sectors), it would be possible to develop estimates based on a continuous linear regression model. It would in addition be possible to explore potential nonlinear effects of size, and to estimate models containing both size and region as variables. Unfortunately, however, this approach could not be used with the data for the Catholic sample, since we lacked school-level data, and

we elected to follow the same approach across sectors. Clearly, this deserves additional attention in future work.

In addition, our use of region as a proxy for geographic variation in expenditures may be somewhat crude. To the extent that expenditures vary within region (for example, across states, or between urban, suburban, and rural schools), our approach may have introduced some error. For the sectors for which we have school level data, it would be possible to develop more sophisticated indicators of geographic variation (relying, for example, on census classifications based on the school's address or PSS variables classifying the locale as urban, suburban, or rural).

Finally, the classification of schools by grade level organization deserves more attention. We divided schools into three grade-level groups (elementary, secondary, and combined).[35] The typical patterns of organization appear to differ across sector, however, and this basic classification may not fully capture the dimensions of variation. Almost all Catholic and Lutheran schools are either K-8 or 9-12, but these organizational forms appear to be less common in the other sectors. It is possible that different grade level structures entail different expenditures. This clearly would require additional exploration.

Overall Assessment of the Precision of our Estimates

The main weakness in our estimates, we believe, is less a function of the methodology than of the kinds of data available. The principal caveat that needs to be attached to our estimates is that we are uncertain about the specific expenditures school officials included in their responses to the survey items we relied on in our analysis. We do not know, for example, whether (and to what extent) schools included mortgage payments in their reported operating expenditures. We do not know how schools that share facilities with a parish church determine

[35]As we indicated in Chapter III, we used a somewhat different classification scheme than the NCES definition.

the expenditures that are allocated to education. Nor do we know whether most schools responded to the survey items on the basis of a formal school budget or on the basis of less formal materials.

Given this general caveat, we would be quite surprised if our estimates of total expenditures for the full population of private schools were to differ by more than 15% from an estimate obtained if all schools were surveyed using questionnaire items similar to those on which we relied. The main sources of error in our estimates (apart from the uncertainties attached to the interpretation of the survey items themselves) derive from sampling error and from the error introduced by using Catholic, Lutheran, and NAIS member data to impute per-pupil expenditures for the other religious, non-sectarian, and special education schools.

Next Steps

One conclusion of our study is that NCES cannot obtain precise estimates of private school expenditures by relying solely on data provided by private school associations: most associations do not collect data on school finance, and it is difficult to assess the reliability and validity of the expenditure data collected by the three associations that do routinely survey their members.

We therefore recommend that two main steps be taken to improve the estimates of private school expenditures. First, we recommend that new analyses be undertaken examining some of the key factors (beyond school size and region) that influence school expenditures. One strategy might be to merge data from the School and Staffing Survey (SASS), which contains detailed information on staff composition and staff salaries, tuition, library expenditures, with school-level data on operating expenditures for the Lutheran Church-Missouri Synod and the National Association of Independent Schools. This merged data set would permit the estimation of

regression models examining the effects of various school characteristics on operating expenditures — for example, the effects of educational credentials of the principal and teaching force, teacher and administrator salaries and benefits, tuition, school organizational complexity (number of administrative positions), and the number of books and periodicals (and perhaps videos and software) in the school library.

Once a set of school characteristics related to expenditures is identified, they might be used to refine our estimates of total operating expenditures for the full population of private schools. For example, if, as might be expected, teacher salaries are strongly related to expenditures, a regression model that includes staff salaries along with other variables might be used to impute expenditures for all schools in the SASS. The imputed school-level expenditures could then be weighted and summed to provide an estimate of the total expenditures for the full population of private schools.

As a second approach to improving estimates of expenditures by private schools, we recommend that NCES initiate a set of qualitative studies of private school organization and finance structures. One of the main challenges in collecting survey data on private school finance is the development of questionnaire items that both capture the major components of school expenditures and can be completed easily and consistently. This task is especially challenging, given the diversity of the population of private schools. We thus recommend that NCES conduct a set of case studies of private schools, chosen to reflect the diversity of schools in terms of size, religious affiliation, and association membership. The purpose of these cases studies would not be to gather expenditure data, but rather to learn more about the kinds of expenditures involved, the types of records schools keep, and complications that are involved in determining the amount spent for buildings and other property. (For example, the cases might focus in particular on the ways schools report mortgage payments and rent. The studies might also consider the difficulties

that arise in estimating expenditures for schools that share facilities with other organizations — for example, schools located in church buildings.) The information gained through the cases might be used to develop an improved set of questionnaire items that might be used in future national surveys of private schools

In general, then, providing an improved estimate of national expenditures by private schools will require answers to two questions: What are the main components of expenditures by private schools? And, how do various school characteristics (for example, size and organization) influence the amount spent in these categories? Addressing these questions will require the analysis of additional data, including both existing data such as the SASS, and new in-depth case studies of private school resources and organization.

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APPENDIX A

PRIVATE SCHOOL ASSOCIATIONS CONTACTED DURING EXPLORATORY PHASE OF STUDY

APPENDIX A

PRIVATE SCHOOL ASSOCIATIONS CONTACTED DURING EXPLORATORY PHASE OF STUDY

Accelerated Christian Education
American Montessori Society
Association of Military Colleges and Schools of the US
Association of Waldorf Schools of North America
Christian Schools International
Evangelical Lutheran Church in America
Friends Council on Education
Greek Orthodox Archdiocese of North and South America
Hattie M. Strong Foundation
Lancaster Area Council of Mennonite Schools
Lutheran Church-Missouri Synod
National Association of Episcopal Schools
National Association of Independent Schools
National Association of Private Schools for Exceptional Children
National Catholic Education Association
National Christian School Association
National Society for Hebrew Day Schools
Seventh-day Adventists Board of Education, K-12
Solomon Schecter Day School Association
United States Catholic Conference
Wisconsin Evangelical Lutheran Synod

APPENDIX B

SAMPLE ESTIMATES OF AVERAGE PER-PUPIL EXPENDITURES FOR CATHOLIC, LUTHERAN, AND NAIS SECTORS, BY REGION AND SIZE

TABLE B-1

Estimation Sample Sizes, by Sector and Region

	New England	Atlantic	Great Lakes	Plains	South	West
Sector						
Catholic elementary*	78	165	163	79	69	95
Catholic secondary*	25	68	91	36	43	45
Lutheran elementary	2	45	298	173	64	192
Lutheran secondary	0	2	19	8	1	14
NAIS member, religious, elementary	3	16	1	0	15	16
NAIS member, religious, secondary	14	19	3	1	26	10
NAIS member, religious, combined	4	25	2	1	19	13
NAIS member, non-sectarian, elementary	50	45	9	5	24	37
NAIS member, non-sectarian, secondary	73	31	8	5	16	39
NAIS member, non-sectarian, combined	20	90	31	10	66	39

**May include cases with missing information on expenditures.*

TABLE B-2

Estimation Sample Size by Sector and School Size

	Very small[1]	Small	Moderate	Large
Catholic elementary	219	188	142	60
Catholic secondary	211	336	193	97
Lutheran elementary	189	310	181	94
Lutheran secondary	16	13	10	5
NAIS member, religious, elementary	18	11	19	3
NAIS member, religious, secondary	32	14	19	8
NAIS member, religious, combined	5	1	8	50
NAIS member, non-sectarian, elementary	68	48	45	9
NAIS member, non-sectarian, secondary	64	36	46	26
NAIS member, non-sectarian, combined	21	37	66	132

[1]NOTE: size categories differ by school type. For Catholic Elementary, Lutheran Secondary and all NAIS schools, very small: 0-199; small: 200-299; moderate: 300-499; large: 500+. For Catholic secondary, very small: 0-299; small: 300-500; moderate: 501-750; large: 750+. For Lutheran elementary schools, small: 0-99; small: 100-199; moderate: 200-299; large: 300+.

TABLE B-3

Sample Estimates of Average Per-Pupil Expenditure, by Sector and Region

	New England	Atlantic	Great Lakes			
Sector						
Catholic elementary*	1,628	1,741	1,719	1,696	1,711	2,385
Catholic secondary**	4,285	3,831	3,579	3,526	3,392	4,228
Lutheran elementary	2,130	2,036	1,949	1,703	2,219	2,206
Lutheran secondary	—	8,239	3,834	5,872	4,006	4,159
NAIS member, religious, elementary	12,641	7,652	6,892	—	5,162	5,946
NAIS member, religious, secondary	25,426	18,694	22,970	26,283	13,654	11,317
NAIS member, religious, combined	12,126	11,131	9,551	10,811	6,959	8,618
NAIS member, non-sectarian, elementary	10,869	9,925	7,616	8,257	6,370	7,446
NAIS member, non-sectarian, secondary	19,522	18,187	25,726	10,638	11,668	13,490
NAIS member, non-sectarian, combined	16,422	11,381	9,969	8,423	6,620	9,635

**Unadjusted for inflation.*

***Median per pupil expenditures.*

TABLE B-4

Sample Estimates of Average Per-Pupil Expenditure, by Sector and Size

	Very small[2]	Small	Moderate	Large
Catholic elementary*	2,008	1,783	1,725	1,498
Catholic secondary	4,725	4,366	3,800	3,666
Lutheran elementary	1,988	1,998	1,990	2,029
Lutheran secondary	5,861	3,657	5,709	3,257
NAIS member, religious, elementary	7,464	6,536	6,173	5,110
NAIS member, religious, secondary	19,503	17,799	18,498	11,602
NAIS member, religious, combined	15,606	6,674	8,505	8,975
NAIS member, non-sectarian, elementary	8,984	8,334	8,931	9,103
NAIS member, non-sectarian, secondary	18,757	16,528	15,198	18,991
NAIS member, non-sectarian, combined	19,707	10,315	9,340	9,407

**Unadjusted for inflation.*

[2]NOTE: size categories differ by school type. For Catholic Elementary, Lutheran Secondary and all NAIS schools, very small: 0-199; small: 200-299; moderate: 300-499; large: 500+. For Catholic secondary, very small: 0-299; small: 300-500; moderate: 501-750; large: 750+. For Lutheran elementary schools, small: 0-99; small: 100-199; moderate: 200-299; large: 300+.

APPENDIX C

MATCHING SCHOOLS IN THE NAIS AND PSS DATA SETS

APPENDIX C

For both the NAIS and Missouri Synod schools, we had two sources of school-level data: the data provided by the associations and the data included in the PSS. We conducted a series of small studies to examine the consistency of these two sources of data. In this appendix, we report on our effort to match the schools in the data set provided by NAIS with the schools in the PSS reporting NAIS membership.

We attempted to match schools in the two data sets using a number of strategies. We began by matching on the basis of the full school name, city, and state. Using this strategy, we were able to match about half of the schools in the NAIS data set with schools in the PSS. We then tried to match the remaining schools in the NAIS data set with schools in the PSS, using the school zip code. This strategy of course produced many "false matches," because multiple schools often shared the same zip code. We examined all matches by hand to insure that the matching schools were indeed "true" matches. In most cases, the decision was extremely clear. (For example, a school might appear as "Jefferson High School" in one data set and "Jefferson High" in the other — clearly a match.) In a few cases, we discovered that a school appearing as a single "combined" school in the NAIS set appeared as two or three distinct elementary, junior, and or senior high schools in the PSS. In these cases, we counted the NAIS school as matching, and recording the number of PSS schools accounted for by the match. Finally, in a few cases, we discovered duplicate records in the PSS (i.e., more than one record containing data on the same school).

Overall, the data set provided by NAIS contained 1,035 schools. Of the 1,035 NAIS cases, 96 were foreign schools, leaving 939 cases that potentially should match schools appearing in the PSS. Table C-1 reports the results.

TABLE C-1

Schools in the NAIS Data Set: Number Matching Schools in the PSS

Outcome of Matching Process	Number	Percent
Matches PSS school that reported NAIS membership	804	86
Matches PSS school that did nor report NAIS membership	87	9
Matches PSS school that did not respond to PSS survey	31	3
Does not match PSS school	17	2
TOTAL	**939**	**100**

Overall, 98% of the schools in the data set provided by NAIS matched a school in the PSS. The match rate is quite high, although there is one anomaly: 9% of the matching schools did not report on the PSS that they were members of NAIS.

The PSS data set contains 1,355 schools reporting NAIS membership. Of these, a small number are duplicates (or are separate schools appearing as a single school in the NAIS data set). Eliminating these special cases leaves 1,339 PSS schools reporting NAIS membership. Table C-2 reports the extent to which these 1,339 schools match schools in the NAIS data set.

TABLE C-2

Schools in PSS Reporting NAIS Membership: Number Matching Schools in NAIS Data Set

Outcome of Matching Process	Number	Percent
Matches NAIS school	804	60
Does not match NAIS school	535	40
TOTAL	**1,339**	**100**

Overall, only 60% of the schools in the PSS reporting NAIS membership appeared in the data set NAIS provided. According to conversations with NAIS staff, the membership in 1991-92 was well under 1,000 schools (not including foreign schools). Thus, it is clear that some PSS schools reporting NAIS membership were not actually NAIS members.

Table C-3, below, reports the number of duplicates and other special cases we discovered as part of our effort to match schools in the NAIS and PSS data sets.

TABLE C-3

Special Cases in PSS Data Set

PSS schools reporting NAIS membership	
• Duplicate cases	13
• Cases appearing on separate elementary, junior high, or high schools in PSS but as single combined schools in NAIS. (Together, these schools correspond to 2 NAIS schools.)	5
PSS schools not reporting NAIS membership but matching NAIS school	
• Duplicate cases	2
• Cases appearing as separate elementary, junior high, or high schools in PSS but as a single combined school in NAIS. (Together, these schools correspond to 2 NAIS schools.)	2
TOTAL	**22**

Overall, we identified 15 duplicate cases among the PSS schools either reporting that they belonged to NAIS or matching a school in the NAIS data set. This is a duplicate rate of roughly 1%. To preserve consistency with other analyses based on the PSS, we did not drop the duplicates from our analysis.

APPENDIX D

DISTRIBUTION OF POPULATION OF PRIVATE SCHOOLS BY LEVEL, SECTOR, SIZE AND REGION

TABLE D-1

Percent Distribution of Enrollment in PSS (1991 - 92) By Level, Sector, Size and Region

School Level and Type	Number of Students	Regions				Size			
		Northeast	Midwest	South	West	1-199	200-299	300-499	500+
Elementary									
Catholic	1,968,732	32.0	36.2	17.9	13.9	17.2	30.4	32.0	20.4
Lutheran	192,688	6.0	55.6	11.1	17.5	52.7	27.9	14.1	5.3
NAIS Religious	25,688	18.3	2.6	53.0	26.1	23.2	22.5	47.1	7.2
NAIS Non-Sectarian	62,354	38.8	9.0	22.4	29.8	15.7	17.1	29.8	37.4
Other Religious	534,431	25.8	17.9	28.4	27.9	47.9	17.9	18.9	15.4
Other Non-Sectarian	177,573	11.9	14.7	33.4	40.0	56.6	18.4	15.5	9.5
Special Education	5,692	28.4	11.7	31.7	28.3	90.6	9.4	0	0
All Schools	2,967,157*	28.0	32.4	20.8	18.8	27.9	27.0	27.6	17.6
Secondary									
Catholic	620,274	35.1	30.0	17.8	17.1	4.8	8.4	20.0	66.8
Lutheran	20,958	4.9	73.8	7.4	13.9	28.6	15.2	32.2	24.1
NAIS Religious	28,194	28.8	1.7	41.3	28.1	16.8	14.1	30.1	39.0
NAIS Non-Sectarian	58,730	54.7	9.4	13.9	22.0	31.0	20.7	33.8	14.4
Other Religious	74,776	25.6	24.0	19.4	31.0	39.4	20.2	24.9	15.5
Other Non-Sectarian	35,711	41.2	11.7	31.1	15.9	43.6	7.2	20.2	29.0
Special Education	10,327	48.9	12.4	10.6	28.1	82.3	2.4	3.9	11.3
All Schools	848,969*	35.1	27.2	18.7	19.1	12.1	10.3	21.6	56.0

TABLE D-1 (Continued)

Percent Distribution of Enrollment in PSS (1991 - 92) By Level, Sector, Size and Region

School Level and Type	Number of Students	Regions				Size			
		Northeast	Midwest	South	West	1-199	200-299	300-499	500+
Combined									
NAIS Religious	58,326	20.4	6.3	58.6	14.8	1.6	2.8	8.9	86.8
NAIS Non-Sectarian	152,590	24.3	15.7	50.3	9.7	5.0	7.1	21.2	66.7
Other Religious	641,354	15.4	17.1	47.0	20.5	27.7	14.1	23.2	35.1
Other Non-Sectarian	166,143	10.9	9.9	63.8	15.5	24.1	12.7	26.2	36.9
Special Education	54,890	50.7	15.4	19.0	14.9	82.3	10.9	6.8	0
All Schools	1,073,303*	18.1	15.1	49.3	17.6	25.3	12.1	21.8	40.9

*Items may not sum to the total, due to rounding.

TABLE D-2

Percent Distribution of Schools in PSS (1991 - 92) By Level, Sector, Size and Region

School Level and Type	Number of Schools	Regions				Size			
		Northeast	Midwest	South	West	1-199	200-299	300-499	500+
Elementary									
Catholic	7,645	32.0	38.1	16.9	13.0	34.7	33.8	22.8	8.7
Lutheran	1,563	6.2	63.4	12.8	17.7	75.4	17.4	5.9	1.4
NAIS Religious	124	24.6	4.1	44.3	27.1	47.5	21.3	28.8	2.5
NAIS Non-Sectarian	325	38.3	8.8	21.9	31.0	57.3	19.2	18.8	4.7
Other Religious	5,240	23.8	21.9	30.4	23.8	82.2	9.2	6.0	2.5
Other Non-Sectarian	2,084	15.0	13.6	29.3	42.1	85.4	8.9	4.3	1.4
Special Education	114	23.9	11.9	28.5	35.6	97.3	2.7	0	0
All Schools	17,093*	25.1	31.5	22.6	20.9	60.1	21.2	13.7	5.1
Secondary									
Catholic	1,244	32.9	31.4	19.7	15.9	17.7	17.0	25.2	40.1
Lutheran	87	4.6	66.7	10.3	18.4	56.4	14.9	20.7	8.0
NAIS Religious	91	35.7	4.6	48.6	11.1	42.3	17.7	25.6	14.5
NAIS Non-Sectarian	208	54.2	8.9	14.3	22.6	43.9	19.7	22.2	14.3
Other Religious	479	25.9	23.2	25.9	25.0	72.9	13.3	10.2	3.7
Other Non-Sectarian	342	26.5	14.1	32.0	27.4	87.5	3.1	5.5	3.9
Special Education	171	36.8	16.2	13.0	34.0	97.6	0.6	0.6	1.2
All Schools	2,620*	31.9	25.1	22.3	20.7	46.3	13.6	17.9	22.2

TABLE D-2 (Continued)

Percent Distribution of Schools in PSS (1991 - 92) By Level, Sector, Size and Region

School Level and Type	Number of Schools	Regions				Size			
		Northeast	Midwest	South	West	1-199	200-299	300-499	500+
Combined									
NAIS Religious	95	24.2	7.7	54.1	14.0	7.5	7.6	15.2	69.7
NAIS Non-Sectarian	346	32.6	13.9	43.5	10.0	24.5	12.3	24.9	37.7
Other Religions	4,085	15.1	21.0	45.1	18.7	72.3	9.7	10.3	7.8
Other Non-Sectarian	943	14.1	15.6	47.6	22.7	67.8	9.8	12.8	9.6
Special Education	817	43.1	18.0	19.0	19.8	94.9	3.6	1.4	0
All Schools	6,285*	19.7	19.2	42.2	18.9	70.9	9.1	10.4	9.6

*Items may not sum to the total, due to rounding.

APPENDIX E

COMPARING THE QUALITY OF THE ESTIMATES BASED ON OVERALL MEANS, REGIONAL MEANS, AND SIZE-BASED MEANS

APPENDIX E

To assess the quality of the estimates we obtained, we conducted an exploratory study using the sample of elementary schools contained in the data set provided by the Lutheran Church-Missouri Synod. We proceeded by dividing the sample of Lutheran elementary schools in half. We used the first half of the data set (the estimation sample) to derive an estimate of the overall sector mean per-pupil expenditures as well as estimates of the sector regional and size-group means. We then used the estimates derived from the estimation sample to impute per-pupil expenditures for each of the schools in the second half of the data set (the imputation sample). For each school in the imputation sample, we developed three estimates: one based on the overall mean from the estimation sample, one based on the appropriate regional estimate, and one based on the appropriate size-group estimate. Finally, we determined the error in each of the three per-pupil expenditure estimates for each school in the imputation sample. We then summed the errors across schools to obtain an index of the overall quality of each of the three estimates.

We ran the experiment 100 times, randomly drawing the schools to be included in the estimation and imputation samples for each replication. The results are shown in Table E-1.

TABLE E-1

Error in Estimates of Average Per-Pupil Expenditures: Results of an Experiment Using Missouri-Synod Elementary School Data

Estimate	Mean Error	Standard Deviation of Error	Minimum Error	Maximum Error
Overall mean	-3.47	82.81	-176.96	180.21
Regional mean	-4.45	79.48	-183.92	183.31
Size-group mean	-4.11	82.43	-176.97	183.84

The mean error across the 100 experiments is small for all three estimation approaches: the three means range from - $3.47 for the average estimation error using the overall sample mean to - $4.45 using the regional means. The standard deviation of the mean estimation error obtained in the 100 experiments ranged from $82.81 for the estimates based on the overall mean to $79.48 for the estimates based on the regional means. In other words, in most of the replications, the average estimated per-pupil expenditures based on the estimates derived from the estimation sample differed from the true value for the imputation sample by no more than about $80.00.

Our experiment using the Missouri Synod data indicates that the performance of the three estimation strategies was roughly equivalent. This suggests that the potential reduction in error that might be expected by using region-based or size-based means was offset by the relatively small samples available to estimate means for each of the six regions and four size-groups. The region-based estimates produced a somewhat smaller standard deviation than the other two approaches, but the improvement is too small to be of much practical interest.

In this experiment, the samples used to estimate parameters and to test the estimates were drawn from the same population. Thus, the region and size distributions of the estimation and imputation samples were generally quite similar. The advantages of controlling for region and size are likely to be larger when the region and size distributions of the estimation and imputation samples are more dissimilar.

APPENDIX F

COMPARISON OF NAIS BOARDING, NON-BOARDING, AND SPECIAL EDUCATION SCHOOLS

APPENDIX F. COMPARISON OF NAIS BOARDING, NON-BOARDING, AND SPECIAL EDUCATION SCHOOLS

Our estimate of the per-pupil expenditures for NAIS schools are based on the full sample of schools included in the data set provided.[3] Many NAIS schools are boarding schools, and these schools apparently included expenditures associated with room and board in their expenditure reports. In addition, a few NAIS members are special education schools, and their expenditures are much higher than those of typical NAIS members. To assess the influence of special education and boarding-school status on our NAIS estimate, we computed separate estimates of average expenditures for three mutually exclusive groups of schools: special education schools, boarding schools (not classified as special education schools), and non-boarding schools. For each group, we computed estimates separately for religious and non-sectarian schools, by grade level organization.

The results are displayed in Table F-1. For elementary and secondary schools, boarding schools spent substantially more than non-boarding schools. For example, among religious secondary schools, non-boarding schools spent $9,883 per student, while boarding schools spent $19,545 — a difference of nearly $10,000. The effect of boarding status is much less pronounced for combined elementary/secondary schools. One possible explanation is that combined schools may include non-boarding elementary students and boarding secondary students.

The results in Table F-1 also support our expectation that special education schools tend to spend substantially more than regular day schools. The NAIS data set did not include any religiously-affiliated special education schools, but among non-sectarian elementary and secondary schools, special education schools spent nearly twice the amount spent per pupil by

[3]The estimate excludes the 96 NAIS schools located outside the United States.

TABLE F-1

Sample Estimates of Average Per-Pupil Expenditure for NAIS Member Schools, by Religious Affiliation, Level, and Boarding/Special Education Status

School Level and School Type	Estimation Sample Size n	Sample Average Per Pupil Expenditure	Standard Deviation	Minimum	Maximum
Religious					
Elementary Schools					
Non-Boarding	49	6,122	2,222	3,017	11,872
Special Education	0	—	—	—	—
Boarding Schools	2	20,032	4,894	17,421	29,202
Secondary Schools					
Non-Boarding	16	9,883	2,524	6,215	17,491
Special Education	0	—	—	—	—
Boarding Schools	57	19,549	7,371	6,962	36,840
Combined Schools					
Non-Boarding	51	8,687	2,503	3,843	14,808
Special Education	0	—	—	—	—
Boarding Schools	13	11,027	3,122	6,675	21,246
Non-Sectarian					
Elementary Schools					
Non-Boarding	151	8,281	2,235	2,595	15,775
Special Education	7	15,252	4,535	11,043	28,164
Boarding Schools	12	15,853	6,851	6,769	32,327
Secondary Schools					
Non-Boarding	60	10,708	3,432	4,532	22,308
Special Education	6	19,859	8,038	7,085	30,478
Boarding Schools	106	21,750	7,317	4,686	51,500
Combined Schools					
Non-Boarding	224	9,162	2,876	2,883	19,158
Special Education	4	70,949	72,052	10,701	162,733
Boarding Schools	28	11,714	4,429	6,392	27,987

regular day schools. Among non-sectarian combined schools, there were just four special education schools, but one reported expenditures of $162,733 per student. The school's expenditure data appear to be consistent with other data for the school, which leads us to believe that the school's expenditure report might be valid. But it is clearly an outlier, which has a drastic influence on the cell mean for combined special education schools.

Overall, it is clear that both special education status and boarding status are important determinants of per-pupil expenditures, and neither is ideally represented in our main analyses of expenditures. While we included special education schools as a separate sector, we lacked expenditure data for the sector (with the exception of NAIS special education schools, which are few in number and undoubtedly quite atypical). Thus, we used the overall NAIS mean (including boarding, non-boarding, and special education schools) to represent the sector. While this may be a plausible estimate, we have little to go on in assessing its validity. With respect to boarding schools, the PSS does not contain information on boarding status. Thus, we do not know how many private schools (apart from NAIS schools) are boarding schools, and we were not able to include boarding status as a school characteristic in estimating overall private school expenditures.

APPENDIX G

EXPENDITURE ITEMS ON NCEA, MISSOURI SYNOD, AND NAIS QUESTIONNAIRES

NCEA ELEMENTARY QUESTIONNAIRE: COVER LETTER AND EXPENDITURE ITEM (#24)

NCEA

NATIONAL CATHOLIC EDUCATIONAL ASSOCIATION

September 17, 1991

To: affix label here

From: Robert J. Kealey, Ed.D.
Executive Director
Department of Elementary Schools

Re: **Survey of Catholic Elementary School Finances, 1990 - 1991 School Year**

In September 1989, I wrote to you and invited you to participate in our study of Catholic school finances for the 1988-1989 school year. You and almost one thousand of your colleagues responded to my request which enabled us to produce a report on Catholic elementary school finances. Because so many principals took the time to complete the questionnaire, the report was extremely accurate.

I write to you again this September to ask you to complete a similar questionnaire on the finances of your school for the last school year, 1990-1991. Your assistance will help furnish accurate and recent data to members of Congress, the Department of Education, arch/diocesan offices, news media and individual principals and their school boards.

Several questions may have come to your mind about this request.

Why was this school chosen again? This was done purposely so that we can use the information supplied this year and compare it with the information supplied two years ago. You were selected two years ago as a result of a random sample. Using the same populations will enable us to show more accurately the changes that have taken place since the last study.

Will the information that you supply be confidential? I assure you that all the information that you supply to NCEA will be held in the strictest confidence. Information about any individual school will not be made available to any source by me or anyone in NCEA. Reports based on the data that you and your colleagues supply will be presented for the following areas: 1) national norms; 2) regional norms; 3) type of school (inner city, urban, suburban, rural); 4) norms according to the size of the school. Information will not be presented on any individual school, diocese or even state.

Why is there a label with the name of the school on the top of the form? 1) If any information on the label is incorrect, I ask that you please correct it. The label allows me to determine the geographic region that the school is located in; 2) The label also allows me to send a complimentary copy of the financial report to those schools that have participated in the study as a small way of thanking you for your assistance; 3) I need to know which schools have replied on time because I will send a reminder to those schools who did not reply by the end of September. By sending the reminder letter to only those schools that do not reply we save substantial dollars because almost 1,200 schools are invited to participate in this study.

Why is the information asked for the 1990-1991 school year? This is the last completed school year. Therefore, all your financial reports for the year are closed. This provides accurate data rather than data based on predictions for this school year.

How long will it take to complete the questionnaire? I think that you will take about 20 minutes to complete the report. Although there are about 80 questions, many of these you can answer without looking up data. A copy of your end-of-year financial report for last school year will provide most of the information that you cannot recall from memory.

When is the report due back to NCEA? I would like the report back as soon as possible. This will enable us to begin to enter the data which you can imagine is quite a task because 1,200 schools will be responding. Our goal is to analyze the data and have results available the end of January 1992 so that you can use the information as you set budgets for the following school year. I do request that all questionnaires be returned to me by October 7, 1991.

I thank you for your help with this project. Your assistance will enable us to provide accurate data as we move forward with our efforts to secure for our parents the financial support to choose the school that they believe is best for their children. Your assistance provides all Catholic schools with a guide when they set tuitions and salaries for the next year. Your assistance manifests your oneness with the entire Catholic elementary school community.

23. List the percent of the students from these backgrounds during the 1990-1991 school year.
a._____% Asian Americans
b._____% Black Americans
c._____% Hispanic Americans
d._____% Native Americans
e._____% Others
100 % Total

Per-pupil cost is defined as the total cost to educate one child in the school. This can be found by adding all the operating costs of the school (exclude debt service or capital expenses) and dividing this by the total number of students in the school.

24._____What was the per-pupil cost for the 1990 - 1991 **academic year**?

Section 2. FINANCING

Tuition is defined as money paid directly to the school for the education of the child. On the following lines write the tuition for the **1990 - 1991 academic year**. While a sliding scale may be used for families of more than one child, please give the tuition for the **full year** for one child only. This tuition should only be for a child who is a **member of the parish**.

25._____What was the tuition for the pre-school program during the 1990 - 1991 school year?

26._____What was the tuition for the kindergarten program?

27._____What was the tuition for one child for grades 1 to 8 who was a member of the parish?

28._____Did the school have a tuition scale for more than one child from the same family?
a) yes b) no

29._____Did the school have separate tuition scales for Catholic children who were not members of the parish or for non-Catholic children
a) yes b) no

If you answered YES to question 29, please answer question 30 and 31.

If you answered NO to question 29, please go on to question 32.

30._____What was the tuition for one Catholic child in grade 1-8 who was not a member of the parish?

31._____What was the tuition for one non-Catholic child in grade 1-8?

32._____Did the school have a tuition assistance program?
a) yes b) no

33. List the percentage of students in the school last year for each of the following groups.
a._____% Catholic children who are members of the parish
b._____% Catholic children who are not members of this parish
c._____% Non-Catholic children
100 % TOTAL

Materials are non-salary instructional expenses. Included in materials would be such items as textbooks, workbooks, computer programs, maps and all other fees.

34._____What was the approximate **per pupil cost** of materials last year? Do not include the cost of materials supplied by the state or federal government under loan programs.

35._____What was the average tuition/fee received per pupil (total tuition and fees divided by enrollment)?

School Fund Raising is defined as activities that produce money specifically for the school. Do not include in these fund raising activities the money raised for the parish. These activities will be considered later under parish subsidy.

36. Check all the fund raising activities that generated income directly for the school during the 1990 - 1991 school year.
a)___ bingo b)___ carnival
c)___ raffle d)___ bazaar
e)___ candy sale f)___ magazine sale
g)___ booster club h)___socials
i)___ Night at the Races j)___ Las Vegas Night
k)___ booster club l)___ socials
m)___ other (please explain)
n)___ We do not have fund raising activities that generate income directly for the school.

37._____Who had the major responsibility for fund raising?
a) school personnel b) parent group

Endowment or Development Fund is capital that has been set aside for the specific purpose of providing revenue to the school from the interest or earnings that are generated from the principal.

38._____Did your school have a school endowment fund?
a) yes b) no

If you answered YES to question 38, please answer question 39.

If you answered NO to question 38, please go to question 40.

39._____What is the amount of the principal of the endowment fund?

Parish Subsidy refers to the amount of money that the parish contributes to the school from sources of income that are specifically designated for parish projects. The parish subsidy might come from such sources as the weekly collection, parish endowment or parish fund raisers. Do not include in parish subsidy costs for capital improvement or debt service.

40._____Did your school receive a parish subsidy during the 1990 - 1991 school year?
a) yes b) no

41. On the lines below list the percent of income that comes from the following sources:
a._____% tuition and fees
b._____% school fund raising
c._____% endowment
d._____% parish subsidy
e._____% other (please specify)_____
100 % TOTAL

NCEA SECONDARY SCHOOL QUESTIONNAIRE: COVER LETTER AND EXPENDITURE ITEMS (H.17 — H.25)

NCEA

NATIONAL CATHOLIC EDUCATIONAL ASSOCIATION

October 1, 1992

[Head of School]
[Name of School]
[Address]

Dear [Head of School]:

In 1991 NCEA published *Catholic High Schools and Their Finances 1990*. This biennial survey of Catholic high schools described the finances, governance, administration and development efforts of secondary schools and has functioned as a valuable resource for understanding the state of Catholic secondary education. Along with studies on the outcomes of students in Catholic secondary schools, this study made it possible to demonstrate that Catholic high schools are not only effective but efficient.

Many important recent NCEA initiatives are now shaping a new context for American Catholic schools. The *National Congress on Catholic Schools for the 21st Century* has provided a foundation for renewed commitment to a stronger and more expansive network of Catholic schools. The recent Gallup Poll, *The Peoples' Poll on School and School Choice*, was commissioned by NCEA and revealed a very favorable national report card for Catholic schools as well as important and broad based support for educational choice among non-Catholics and Catholics alike. We believe we can draw on a potentially powerful coalition to create a new vision of education in which our schools exercise a critical leadership role. We have the support. We need your help in sketching accurately *how* Catholic schools, like [Name of School], function so well.

[Name of School] has been selected to participate in a national survey of Catholic secondary schools. The process by which your school was selected is designed to identify a representative group of Catholic high schools from all over the country. Since [Name of School] is representing a number of schools, your participation is very important. I urge you to complete the enclosed questionnaire.

I understand that many demands compete for your time. In order to express appreciation for your cooperation, I will send every participating school a copy of the final report, *Catholic High Schools and Their Finances, 1992* soon after the new year. The report will be bound, about 60 pages long, and will contain not only composite information but analyses of school finances by region, size, and type of governance.

The questionnaire itself may be returned any time before November 1, 1992, but please take a moment now to complete and return the enclosed reply card, informing us of your response to our request.

Thank you for your willingness to cooperate in our efforts to serve the Catholic educational community. We know that our Catholic high schools are a great and effective gift to the church and the nation. While measures of material resources are neither the only nor the best way to assess our contributions, it is important to provide timely and accurate financial data for planning, public relations, public policy and political action on behalf of [Name of School] and all Catholic schools. Please help us by participating in our biennial survey.

Sincerely,

Michael J Guerra

Michael J. Guerra
Executive Director
Secondary School Department

MJG:lgm

Suite 100, 1077 30th Street, NW, Washington, DC 20007-3852 • (202) 337-6232

F. FACILITIES, RESOURCES AND LOCATION

*F.1 In what year was your school established? _____

F.2 In what year was the oldest building that currently houses your school built?

_____

*F.3 What is your best estimate of the current market value of the school buildings and grounds?

_____

F.4 If your school were at maximum enrollment, how many students could your school facility serve?

_____

G. PARENT INVOLVEMENT

G.1 Does your school make use of volunteer work by parents and family members?

☐ Yes
☐ No

G.2 What is the approximate number of parents or family members of students who contributed volunteer time during 1991-92?

_____

G.3 Estimate the total number of volunteer hours given by parents and family members in 1991-92.

_____

H. FINANCES AND DEVELOPMENT

REMINDER: Your answers are confidential. No information about any individual school will be released without written permission from the head administrator.

Please indicate the school's 1991-92 income and operating expenses, using the categories shown. Reminder: Definitions and explanations for all items bearing an asterisk (*) will be found in the accompanying instruction manual

Please make an entry on every line. If the appropriate answer is "none" or zero, write "0." This will considerably increase the accuracy of our final report.

Source of Income (round to the nearest dollar)

H.1 Tuition and fees $_____

*H.2 Contributed services $_____

Subsidies or grants from:

H.3 Religious community $_____
H.4 Parish $_____
H.5 Diocese $_____
H.6 Other $_____

Development:

*H.7 Alumni $_____
*H.8 Parents $_____
*H.9 Other contributions to the 1991-92 operating fund $_____

*H.10 Fundraising from special events $_____

*H.11 Income from auxiliary services (Excess of income over expense) $_____

H.12 Income from federal government sources $_____

H.13 Income from state government sources $_____

H.14 Income from endowment $_____

*H.15 All (any) other income $_____

H.16 Total operating income (should equal sum of H.1 to H.15) $_____

Operating Expenses (round to the nearest dollar)

H.17 Salaries-lay professional staff, including development office $_____

*H.18 Salaries-religious professional staff $_____

*H.19 Contributed services (if not included in H.18 under "religious salaries") $_____

H.20 Other salaries (e.g., general office, maintenance, but not auxiliary services) $_____

H.21 All fringe benefits (FICA, health insurance, retirement, unemployment, etc.) $_____

*H.22 Expenses for all auxiliary services (excess of expenses over income) $_____

*H.23 Maintenance costs $_____

*H.24 All other operating expenses $_____

H.25 Total operating expenses (should equal sum of H.17 to H.24) $_____

LUTHERAN CHURCH-MISSOURI SYNOD QUESTIONNAIRE: SECTION CONTAINING EXPENDITURE ITEMS (SCHOOL COSTS)

SECTION II: CURRENT ENROLLMENT INFORMATION (Continued)

Totals on this page must correspond with the total enrollment reported on page 1.

STUDENT ENROLLMENT BY ETHNIC ORIGIN (Indicate the number of students in each category.)

AMERICAN INDIAN ☐ ASIAN ☐ BLACK ☐ HISPANIC ☐ WHITE ☐ OTHER ☐ TOTAL ☐

CHILD CARE ENROLLMENT BY AGE/GRADE

LEVEL	Spec Ed	0-2 Yr	3 Yr	4 Yr	Kinder garten	1st	2nd	3rd	4th	5th	6th	7th	8th	Totals
Full Day Child Care														
Before School Care														
After School Care														

EARLY CHILDHOOD EDUCATION ENROLLMENT BY AGE

LEVEL	0-2 YR. OLD	3 YR. OLD	4 YR. OLD	5 YR. OLD	Totals
2 Day Preschool (Half Day)					
3 Day Preschool (Half Day)					
4/5 Day Preschool (Half Day)					
Kindergarten (Half Day)					
Kindergarten (Full Day)					

SECTION III: CONGREGATION PARTICIPATION

Number of children baptized the past school year as a direct result of school attendance.	
Number of adults who transferred from another LCMS congregation to the sponsoring congregation(s) the past school year as a direct result of their child's attendance at your school.	
Number of adults who jointed the Lutheran Church-Missouri Synod through baptism and/or confirmation (and other means) this past school year as a direct result of their child's attendance at your school.	
Number of eligible children of school age presently in your operating/member congregation(s).	
Percent of congregation budget designated for school use.	%

SECTION IV: FINANCIAL

MONTHLY TUITION (Current Year)

(For first child from family)

LEVEL	Member	Non-Member	Months Paid
2 Day Preschool	$	$	
3 Day Preschool	$	$	
4/5 Day Preschool	$	$	
Kindergarten (Half Day)	$	$	
Kindergarten (Full Day)	$	$	
Full Day Child Care	$	$	
Grades 1-3	$	$	
Grades 4-6	$	$	
ades 7-8	$	$	
ades 9-12	$	$	

SCHOOL INCOME (Previous Year)

Sources of School Income	
Congregational Budget	$
Tuition and Fees	$
Other Sources	$
Total School Income	$

SCHOOL COSTS (Previous Year)

Annual Operating Cost (See Worksheet)	$
Estimated Current Value of Property and Buildings	$

ENROLLMENT (Previous Year) ☐

NAIS QUESTIONNAIRE: SECTION ON FINANCIAL OPERATIONS

NATIONAL ASSOCIATION OF INDEPENDENT SCHOOLS
75 Federal Street, Boston, Massachusetts 02110
TEL. (617) 451-2444 • FAX (617) 482-3913

FINANCIAL OPERATIONS INFORMATION FORM
SCHOOL YEAR 1991-92

Completed form is due at NAIS by

1991-92 enrollment:

FINANCIAL OPERATIONS, 1991-92

BASIC	SUPPLEMENTAL
INCOME	
1. **Tuition and fees** $,, Does reported tuition and fees revenue include revenue foregone? Yes ☐ No ☐ If not, report amount foregone. $_____	**PLEASE READ INSTRUCTION SHEET BEFORE COMPLETING THIS FORM**
2. **Auxiliary services** $,,	**(*supplemental* sub-total must equal *basic* total)**
3. **Other programs** $,,	
4. **Investment income** $,,	*A. Endowment income* $,, *B. Other investment income* $,,
5. **Gifts and grants** $,,	
6. **Public aid** $,,	*A. Local* $,, *B. State* $,, *C. Federal* $,,
7. **Affiliated enterprise net income** $,,	
8. **Other** *(See instructions)* $,,	
TOTAL INCOME $,,	
EXPENSES	
9. **Teaching salaries** $,,	
10. **Instructional support salaries** $,,	
11. **Administrator salaries** $,,	**(*supplemental* sub-total must equal *basic* total)**
12. **Other salaries** $,,	*A. Auxiliary* $,, *B. Plant / maintenance* $,, *C. Secretarial and clerical* $,,
13. **Benefits and payroll taxes** $,,	
14. **Student activities** $,,	
15. **Financial aid/tuition remission** $,,	
16. **Other** $,,	*A. Instructional* $,, *B. Athletic* $,, *C. Auxiliary* $,, *D. Other services* $,, *E. Plant* $,, *F. PPRSM* $,, *G. Administrative* $,, *H. General* $,,
TOTAL EXPENSES $,,	

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PLEASE SEE REVERSE SIDE

Listing of NCES Working Papers to Date

Number	Title	Contact
94-01	Schools and Staffing Survey (SASS) Papers Presented at Meetings of the American Statistical Association	Dan Kasprzyk
94-02	Generalized Variance Estimate for Schools and Staffing Survey (SASS)	Dan Kasprzyk
94-03	1991 Schools and Staffing Survey (SASS) Reinterview Response Variance Report	Dan Kasprzyk
94-04	The Accuracy of Teachers' Self-reports on their Postsecondary Education: Teacher Transcript Study, Schools and Staffing Survey	Dan Kasprzyk
94-05	Cost-of-Education Differentials Across the States	William Fowler
94-06	Six Papers on Teachers from the 1990-91 SASS and Other Related Surveys	Dan Kasprzyk
94-07	Data Comparability and Public Policy: New Interest in Public Library Data Papers Presented at Meetings of the American Statistical Association	Carrol Kindel
95-01	Schools and Staffing Survey: 1994 papers presented at the 1994 Meeting of the American Statistical Association	Dan Kasprzyk
95-02	QED Estimates of the 1990-91 Schools and Staffing Survey: Deriving and Comparing QED School Estimates with CCD Estimates	Dan Kasprzyk
95-03	Schools and Staffing Survey: 1990-91 SASS Cross-Questionnaire Analysis	Dan Kasprzyk

Listing of NCES Working Papers to Date (Continued)

Number	Title	Contact
95-04	National Education Longitudinal Study of 1988: Second Follow-up Questionnaire Content Areas and Research Issues	Jeffrey Owings
95-05	National Education Longitudinal Study of 1988: Conducting Trend Analyses of NLS-72, HS&B, and NELS:88 Seniors	Jeffrey Owings
95-06	National Education Longitudinal Study of 1988: Conducting Cross-Cohort Comparisons Using HS&B, NAEP, and NELS:88 Academic Transcript Data	Jeffrey Owings
95-07	National Education Longitudinal Study of 1988: Conducting Trend Analyses HS&B and NELS:88 Sophomore Cohort Dropouts	Jeffrey Owings
95-08	CCD Adjustments to the 1990-91 SASS: A Comparison of Estimates	Dan Kasprzyk
95-09	The Results of the 1993 Teacher List Validation Study (TLVS)	Dan Kasprzyk
95-10	The Results of the 1991-92 Teacher Follow-up Survey (TFS) Reinterview and Extensive Reconciliation	Dan Kasprzyk
95-11	Measuring Instruction, Curriculum Content, and Instructional Resources: The Status of Recent Work	Sharon Bobbitt & John Ralph
95-12	Rural Education Data User's Guide	Samuel Peng

Listing of NCES Working Papers to Date (Continued)

Number	Title	Contact
95-13	Assessing Students with Disabilities and Limited English Proficiency	James Houser
95-14	Empirical Evaluation of Social, Psychological, & Educational Construct Variables Used in NCES Surveys	Samuel Peng
95-15	Classroom Instructional Processes: A Review of Existing Measurement Approaches and Their Applicability for the Teacher Follow-up Survey	Sharon Bobbitt
95-16	Intersurvey Consistency in NCES Private School Surveys	Steven Kaufman
95-17	Estimates of Expenditures for Private K-12 Schools	Steve Broughman
95-18	An Agenda for Research on Teachers and Schools: Revisiting NCES' Schools and Staffing Survey	Dan Kasprzyk
96-01	Methodological Issues in the Study of Teachers' Careers: Critical Features of a Truly Longitudinal Study	Dan Kasprzyk
96-02	Schools and Staffing Survey (SASS): 1995 Selected papers presented at the 1995 Meeting of the American Statistical Association	Dan Kasprzyk
96-03	National Education Longitudinal Study of 1988 (NELS:88) Research Framework and Issues	Jeffrey Owings
96-04	Census Mapping Project/School District Data Book	Tai Phan

Listing of NCES Working Papers to Date (Continued)

Number	Title	Contact
96-05	Cognitive Research on the Teacher Listing Form for the Schools and Staffing Survey	Dan Kasprzyk
96-06	The Schools and Staffing Survey (SASS) for 1998-99: Design Recommendations to Inform Broad Education Policy	Dan Kasprzyk
96-07	Should SASS Measure Instructional Processes and Teacher Effectiveness?	Dan Kasprzyk
96-08	How Accurate are Teacher Judgments of Students' Academic Performance?	Jerry West
96-09	Making Data Relevant for Policy Discussions: Redesigning the School Administrator Questionnaire for the 1998-99 SASS	Dan Kasprzyk
96-10	1998-99 Schools and Staffing Survey: Issues Related to Survey Depth	Dan Kasprzyk
96-11	Towards an Organizational Database on America's Schools: A Proposal for the Future of SASS, with comments on School Reform, Governance, and Finance	Dan Kasprzyk
96-12	Predictors of Retention, Transfer, and Attrition of Special and General Education Teachers: Data from the 1989 Teacher Followup Survey	Dan Kasprzyk
96-13	Estimation of Response Bias in the NHES:95 Adult Education Survey	Steven Kaufman
96-14	The 1995 National Household Education Survey: Reinterview Results for the Adult Education Component	Steven Kaufman
96-15	Nested Structures: District-Level Data in the Schools and Staffing Survey	Dan Kasprzyk

Listing of NCES Working Papers to Date (Continued)

Number	Title	Contact
96-16	Strategies for Collecting Finance Data from Private Schools	Stephen Broughman
96-17	National Postsecondary Student Aid Study: 1996 Field Test Methodology Report	Andrew Malizio


DEPARTMENT OF EDUCATION
UNITED STATES OF AMERICA

EA 028 910

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Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

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