PROPERTY REVALUATION AND STATE AID TO EDUCATION IN NEW YORK STATE: A LONGITUDINAL STUDY OF IMPACTS

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PROPERTY REVALUATION AND STATE AID TO EDUCATION IN NEW YORK STATE: A LONGITUDINAL STUDY OF IMPACTS

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FOREWORD

A research project of this magnitude cannot be undertaken without the substantial assistance of interested individuals and organizations who are concerned with questions concerning equity in school financing. The authors are indebted to a variety of persons who aided us in the acquisition of data, in checking our statements concerning timing and aid formulas, and in reviewing drafts of the manuscript.

In particular we would like to thank William W. Crotty, Daniel J. Curtin, Wilfred B. Pauquette, and Hollis A. Swett of the Division of Equalization and Assessment; J. Francis O'Connor, Roberta L. Gile, Howard Hallock, Charles R. Hunter, and Thomas J. Malesky of the Education Department; Stanley L. Raub and James V. Vetro of the School Boards Association; Lois Wilson of the Division of Budget; and Judy Mowczan of the Department of Audit and Control for their assistance during the course of the research.

Property Revaluation and State Aid to Education in New York State: A Longitudinal Study of Impacts

EXECUTIVE SUMMARY

Research Problem

During the 1970's a movement to reform the real property tax took place in many New York State communities. During this decade many local governments that had traditionally assessed real property at a fraction of its full value undertook revaluation programs. These programs revalued real property for assessment purposes to its full value, revising the tax base for other taxing units, such as school districts.

The relationship between the full value of real property in a school district and the education aid it receives is a matter of public policy in New York State. The distribution of education aid is in part designed to assist those school districts less able to raise revenues from the local real property tax base. Therefore, if a school district's real property wealth divided by the number of pupils increases at a faster rate than the State average of per pupil wealth, the district's State operating aid could show a relative decrease when compared to other districts. Since the full value of a school district's real property is a major component of the amount of education aid received, it is important to determine whether or not revaluation programs tend to inflate a district's wealth.

The State Board of Equalization and Assessment, because of recurring questions concerning the relationship between revaluation and the allocation of school aid, has conducted an extensive study of the effects of revaluation programs on school district operating aid. This research was conducted both in the interests of education finance equity and to insure that no disincentives for meaningful property tax assessment reform were being generated by revaluation programs. Hence, the major research problem addressed by the report is: Do revaluation programs themselves have a significant effect upon State

operating aid levels of school districts in revalued areas? The State Board is specifically concerned with examining the conjecture that revaluations are costly to school districts and therefore provide an incentive not to maintain a full value assessment.

New York State Aid to Education 1972-73 to 1981-82

For the ten year period covered in this report the percentage of school revenues funded by the local real property tax has remained at between 51 and 54% of total revenues. State and Federal funding during this period has comprised approximately 39% and 5% of school revenues, respectively. The remaining revenues have come from a variety of other sources such as rentals of school property, tuition of students from other school districts, and income producing events.

The education finance system in New York State is characterized by considerable variation in per pupil expenditures among school districts. These different spending levels result from differing amounts of taxable real property and different taxation rates, as well as different spending patterns and priorities on the part of local school boards. The State operating aid formula is designed, apart from "flat grant" and "save harmless" provisions, to distribute school aid in an inverse proportion to school district wealth.

This report is concerned with changes in the level of operating aid that take place in revalued and non-revalued school districts. Operating aid is not "total state aid" which includes such aid as building expenses, transportation, and reorganization incentives. However, operating aid in the period between the 1972-73 and 1981-82 school years comprised approximately three quarters of the total State school aid. The focus on operating aid does not suggest that other forms of State education aid are unimportant. However. since their occurrence within individual school districts is less consistent than operating aid and they comprise only one quarter of the total State aid, determining the

effects of revaluation upon these other aid categories becomes a less precise measurement. Changes in a school district's wealth factor that affect these other aid categories can be judged from the analysis of changing school district full value trends.

Equalization Rates and the State Education Aid Formula

The State Board of Equalization and Assessment has the task of ascertaining the ratio of assessed value of taxable real property in each of the State's municipalities to its market value. This ratio is used by the school district, the city or town, or other State agencies in determining the taxable full value. In order to do this the State Board establishes equalization rates for each municipality on an annual basis. The rates represent the ratio of a municipality's assessed value of real property to the State Board's estimation of the full value of its real property. For example, an equalization rate of 40.00 would mean that according to the State Board's measurement, the real property is being assessed at 40% of the State Board's full value standard.

In developing equalization rates the State Board conducts surveys in which sample properties from municipal assessment rolls are appraised for their market values. A market value survey takes two or three years to complete. For this reason a new survey cannot be introduced into the equalization rate process on an annual basis. The State Board, therefore, "phases in" the effects of a new market survey. In the first year that a new market value survey is available it is averaged with the findings from the most recent earlier survey and the date of the full value standard for equalization rates made in that year falls at a theoretical point someplace between the market value dates of the two surveys.

Once an annual equalization rate has been established and applied to the roll for a specific year, the resulting State Board estimate of a municipality's full value of taxable

real property takes two years to be used in the State school aid formula. For example, State aid received for the 1978-79 school year was based on the equalization rates applied to the 1976 assessment rolls. The 1976 equalization rate used to determine the full value is in turn based on an October 1, 1973 average weighting of market values derived from the 1973 and 1974 market value surveys. With this understanding of the equalization rate process it should be clear that any changes in the "wealth factor" of a school district taking place between 1975 and a 1976 revaluation program would reflect changing market conditions observed in the 1974 survey. It would not reflect changes in the wealth factor resulting from the revaluation program itself. Any effects of revaluation on school aid levels would probably occur five years after a revaluation when a full value determination based on market surveys using the revaluation roll was captured by the education aid formula.

Research Design

In order to test the hypothesis that revaluation programs are costly to school districts, two groups of school districts were chosen. The "test" group was comprised of 35 school districts geographically located in assessing units that were revalued between 1972 and 1977. The "control" group comprised 35 school districts where no revaluation had occurred during the same time period. The two groups were examined for a 10 year period for the 1972-73 through 1981-82 school years. Since the effect of any revaluation is captured two years later in the school aid formula, this time period permits the analysis of different revaluation years.

Counties with more than one selected revalued school district had county revaluation projects with most revaluations occurring in the same year. The revaluation years represented in the sample and the number of school districts in each year are as follows: 1972 (1), 1973 (4), 1974 (15), 1976 (9), 1977 (6).

A control group of 35 school districts where no revaluation had occurred was also selected. Each member of the group was chosen as a specific comparable for a corresponding test group school district. The major criteria for selecting the nonrevalued comparables were school district type (rural, urban, suburban), enrollment size, and regional proximity. "Comparable" does not mean that the two groups of school districts are necessarily the same in such ways as student body characteristics, curriculum, administrative organization, and pupil wealth factor.

Despite differences existing between the test and control groups, the total full value of taxable real property comprising them remains similar over the 10 year period. For the 1972-73 school year the total revalued test group full value was approximately $2.59 billion and the non-revalued control group $2.98 billion. In the 1981-82 school year their total full value was $6.03 billion and $6.40 billion, respectively.

Another factor concerning the comparability of test and control school districts over time is the change in pupil count measures used in the aid distribution formula. The only constant measure calculated for the entire period is resident weighted average daily attendance (RWADA). The two groups of districts show highly comparable RWADA levels for the ten year period under investigation. Also, a very similar trend for the two groups appears when full valuation growth and RWADA pupil count are combined for this period.

Statistical Analysis

The statistical analysis evaluates the effects of full-value reassessment both directly upon operating aid to school districts and indirectly through a study of changes in the level of property value within school districts. The analysis investigates the question of whether full value reassessment has a significant effect upon State operating aid to education through its effect upon real property value levels. Research methods including linear

regression and analysis of covariance have been used in this study to identify the effects of reassessment while controlling for the primary factors underlying the levels of aid awarded to school districts in New York State.

The average value of each school district's annual operating aid during the 10 year study was found to be overwelmingly in line with the average amount of each school's prior year operating aid (increased by the proportion of annual state-approved changes in total aid dollars). A total of 99.7% of each year's annual operating aid was explained in this way. When schools in revaluation districts were segregated from non-revaluation district schools, statistical evidence indicated there was no significant difference between the two groups' average operating aid. When studying only the schools in revaluation districts, there was no significant change in aid levels after revaluations became incorporated in the education aid formulas, compared with years prior to this event, aside from that explained by total state aid dollar variations.

A similar test of operating aid on a per-pupil basis revealed that 92.2% of the variation in state aid per pupil depended on last years aid level increased by the percent of new state aid. Revaluation made no significant change in per-pupil aid. Adjustments to the education aid formula and changes in pupil counts over time may account for the reduction in predictability of 99.7% for total dollar school operating aid to 92.2% for operating aid per pupil. The ability to predict future aid based on past aid levels is an indication of the strength of save-harmless and flat grant provisions. These cushions partially over-ride the provisions of aid formulas designed to offer dollars based on need and pupil count.

Two other tests were constructed to check the effects of revaluation while accounting for the principal aid formula criteria. On a total dollar basis, the state aid formula provisions which proved important under testing were these: the cumulative change in total annual state operating aid; a school district's property wealth as it differed from the state average of school district wealth; and each district's choice of a guaranteed minimum aid

level. These criteria were able to explain 86.6% of the annual aid changes in the 70 school districts studied. Including information of whether or not a school was in a revaluation district offered no significant additional predictability of how much operating aid would be received in the school years affected by the revaluation process.

A second test of the state aid formula attempted to explain the percent change in operating aid based on percent changes in the principal formula criteria. Of the factors tested, the percent change in total state operating aid dollars available per year had the most significant positive impact on the percent change in each district's operating aid. The second factor, the percent change in pupil count, showed a negative correlation with percent change in operating aid per pupil. This could be another indication of the strength of save-harmless; for even when the pupil count declines, aid nevertheless increases. The percent change in the school district property value relative to the state's average percent change was, as before, a significant factor in determining state aid. The final factor of significance was the percent change in each school's approved operating expenses per pupil divided by the percent change in the year's state maximum aid allowed per pupil. Once again, location of a school in a district which had revalued made no significant difference upon the rate of change in per pupil operating aid. The four significant predictors accounted for two-thirds of the annual variation in state aid. This lower predictability may be due to the absence of any measure of a guaranteed minimum aid level, again showing the aid formula distortions created by the flat grant and save-harmless provisions.

There are revaluation impact questions which are not answered by the analysis of revaluation districts' annual operating aid. What would happen in revalued districts if the state removed its save harmless and flat grant provisions? What are the effects of revaluation upon the remaining components of state aid which cannot be directly tested, but which are partially dependent upon school district property wealth? In order to evaluate these two impacts, tests were constructed to study the impact of revaluation directly upon

school districts' property valuation. The initial test results show that for the 70 school districts studied over the ten-year period, 99.7% of the variation in property value trends could be traced to the prior year's value with an average annual increase of 6.4%. The annual changes in property value in the districts not affected by revaluation follow a course very similar to those affected by revaluation, with a noticeable increase in both groups' property value in the 1976-77 school year.

One final test of revaluation effects compared property valuation trends for both groups in the years before and after revaluation. The average percent change per year in the pre-revaluation years was about 1% higher for the schools in areas where revaluations occurred than those in the other districts. Conversely, in the years after a revaluation, the average annual percent change in property values was a fraction of a percent (0.3%) lower for the schools in revaluation areas than for those not related to a revalued municipality.

The principal conclusion of this extensive examination of revaluation effects on State aid to education is that, on the average, there is no statistically significant difference between the 35 school districts where revaluations occurred and their "untouched" counterparts either in annual state operating aid dollars received or in annual changes in estimated property values. Thus, if some revalued districts happened to have experienced adverse changes, offsetting factors were occurring elsewhere. Either similar adverse effects in non-revalued districts were also taking place or other revalued districts were experiencing beneficial changes from the State's aid to education policies. We should be more cautious in making general claims about effects on interdistrict benefits and costs when revaluations occur: they may be no more than specific cases where prior equity "wrongs" have been righted.

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Introduction

Like public school students, taxpayers comprise a group for whom considerations of education finance equity should be made. As a matter of public policy, it is important that education finance systems have a reasonably equal impact on taxpayers both within and among school districts. Much of the concern with education finance equity has been on achieving equal tax burdens and equal revenues among school districts based on their relative wealth. Such interdistrict equity, or the lack of it, has been the subject of education finance reform and resulting litigation in New York and other states.

This study has been undertaken to ascertain whether the interests of equity within school districts has an impact on interdistrict taxpayer equity. It serves to analyze potential losses and gains in school district revenues and increases or reductions in tax liabilities resulting from real property revaluation programs in New York State. Since these programs affect assessments of taxable real property, it is important that they do not produce reductions in state education aid or shift the school tax burden among the various municipal components of a school district. Equity in education finance and real property tax reform in New York are not enhanced if taxpayers and school districts in areas that undertake revaluation programs appear to be penalized. Potential reductions in State education aid levels must also be viewed within the context of the State aid formulas themselves. Certain provisions such as "save harmless" and "flat grant" guarantees are specifically designed to prevent marked annual decreases in aid to each school district. The effects of these provisions and other changing components of the education aid formulas on aid levels must be considered in evaluating the equity implications of assessment revaluation.

During the 1970s a substantial movement to reform real property tax assessment took place in New York State communities. During this decade many local governments that had traditionally assessed real property at a fraction of full value undertook revaluation programs. These programs, mostly done on a voluntary basis although some were court ordered, revalued real property for assessment purposes to its full value.

This report is concerned with real property revaluation programs in New York State and their effects on levels of State education aid received by school districts. It is specifically concerned with the conjecture that revaluation programs have had negative impacts on school aid levels due to "found" property wealth. Such comments were made by a number of school superintendents in Genesee County after its 1976 revaluation program. At that time, the State Board of Equalization and Assessment (SBEA) conducted a study of the County aid levels and concluded there was no negative impact resulting from revaluation. The New York State School Boards Association has also transmitted claims to the State Board that Orange County's 1974 revaluation program resulted in State education aid reductions.

The relationship between the full value of a school district's real property and the education aid it receives is a matter of public policy in New York State. The distribution of education aid is in part designed to assist those school districts less able to raise revenues from the local real property tax base. Therefore, if a school district's real property wealth divided by the number of pupils increases at a faster rate than the State average of per pupil wealth, the district's State operating aid could show a relative decrease when compared to other districts. Since the full value of a school district's real property is a major component of the amount of education aid received, it is important to determine whether or not revaluation programs tend to inflate a district's wealth.

The State Board of Equalization and Assessment, because of the recurring concern with the effects of revaluation on education aid, has conducted this additional research on

the subject. Such research serves the interests of education aid equity and assures that no incentives exist for not maintaining revaluation projects. This report depicts research based on a statewide analysis of 70 school districts selected from 23 New York State counties. The number of revaluation programs in the last decade has provided an opportunity for the State Board to conduct a more comprehensive analysis of changes in education aid levels of school districts in revalued localities. The research findings contained herein address an important policy question for those governments, and other interested parties, attempting to determine whether revaluation programs have produced negative effects on education aid that should be ameliorated.

New York State Aid to Education 1972-73 to 1981-82

For the ten year period covered in this report the percentage of school revenues funded by the local real property tax has remained at between 51 and 54% of total revenues. State and Federal funding during this period has comprised approximately 39% and 5% of school revenues, respectively. The remaining revenues have come from a variety of other sources such as rentals of school property, tuition of students from other school districts, and income producing events. As can be seen in Table 1, the proportion of school district revenues from real property taxation and State aid remained relatively constant during the ten years.

The education finance system in New York State is characterized by considerable variation in per pupil expenditures among school districts. These different spending levels result from differing amounts of taxable real property and different taxation rates, as well as different spending patterns and priorities on the part of local school boards. The State operating aid formula is designed, apart from "flat grant" and "save harmless" provisions, to distribute school aid in an inverse proportion to school district wealth.

Table 1. New York State School District Revenues Sources: 1972-73 to 1980-81.*

SCHOOL YEAR	TOTAL SCHOOL REVENUES	PERCENTAGE BY REVENUE SOURCE			
		Property Tax	State Aid	Federal Total	Other Sources
1972-73	$ 5,957,713,552	51%	41%	5%	3%
1973-74	6,616,208,621	52%	39%	4%	5%
1974-75	7,416,702,494	51%	40%	5%	4%
1975-76	7,632,530,243	51%	40%	4%	5%
1976-77	7,872,765,349	52%	39%	4%	5%
1977-78	8,357,221,255	54%	38%	5%	3%
1978-79	8,722,372,377	52%	38%	6%	4%
1979-80	9,357,301,299	51%	38%	6%	5%
1980-81	10,047,771,854	51%	39%	5%	5%

Source: State Education Department, Annual Education Summary 1972-73 to 1980-81, Albany, New York (for the fiscal years noted above).

*: 1981-82 School year data not available.

Flat grant and save harmless provisions, which provide minimum per pupil and total dollar guarantees, have limited the equalizing effect of the formula. Flat grants guarantee wealthier school districts a minimum level of State aid. For example, in the 1978-79 school year, the flat grant guarantee was $360 per pupil. It was made available to districts with over $101,000 of full value per pupil. The flat grant guarantee in the same year for districts with $86,000 of full value per pupil tapers to $375. Flat grant recipients usually receive more than just the per pupil amount allotted by the grant. In the 1981-82 school year, 95 of 96 districts receiving flat grants also received additional save harmless aid.

In the last 20 years New York State has had various save harmless provisions. One such provision, "total dollar" save harmless, guarantees the total amount of operating aid received by a district in the prior year. It has been in effect since the mid-1960s and

protects districts which have had unusually high increases in property valuation or have had considerable decline in enrollments. Another, "per pupil" save harmless, used between the 1974-75 and 1979-80 school years, guaranteed the per pupil amount received by a school district in the prior year. School districts have taken the higher of the operating aid or per pupil operating aid save harmless formulas.

This report is concerned with changes in the level of operating aid that take place in revalued and non-revalued school districts. Operating aid is used to help reimburse school district expenditures for teachers, superintendents, guidance counselors, school nurses, janitors, textbooks, supplies, etc. The State shares operating aid costs only within certain prescribed ceiling amounts regardless of the expenditure of the district. These State support levels are established by the State Legislature in conjunction with its Constitutional mandate to "provide for the maintenance and support of a system of free public schools wherein all of the children of this State may be educated." The Legislature reviews operating aid ceilings annually to determine what increases are necessary due to rising increases in education costs, and feasible within State budgetary constraints.

Operating aid is not "total state aid" which includes such aid as building expenses, transportation, and reorganization incentives. However, operating aid in the period between the 1972-73 and 1981-82 school years comprised approximately three quarters of the total State school aid. Other forms of aid included in total State aid have a less consistent state-wide allocation and therefore only apply to certain school districts when warranted by special circumstances. The focus on operating aid does not suggest that other forms of State education aid are unimportant. However, since their occurrence within individual school districts is less consistent than operating aid and they comprise only one quarter of the total State aid, determining the effect of revaluation upon these other aid categories becomes a less precise measurement. Changes in a school district's wealth factor that affect these other aid categories can be judged from the report's analysis of changing school district full value.

An example of the basic two tier operating aid formula employed for the 1978-79 school year is as follows:

(1) 1st Tier: $[1 - (\frac{\text{District FV/RTAPU}}{\text{State Average FV/TAPU}} \times .51)]$ = aid ratio

(2) 2nd Tier: $[1 - (\frac{\text{District FV/RTAPU}}{\text{State Average FV/TAPU}} \times .80)]$ = aid ratio

Where:

FV = estimated full value of taxable real property.

RTAPU = resident total aidable pupil units, and

TAPU = total aidable pupil units (statewide).

During the 1972-73 and 1973-74 school years the single operating aid ratio was determined by the formula:

(3) $1 - (\frac{\text{District FV/RWADA}}{\text{State Average FV/WADA}}) \times .51$

However, for 1974-75 through 1977-78 school years operating aid was determined by the formula:

(4) $\text{Ceiling} - (\frac{\text{District FV}}{\text{District RWADA}} \times .015) \times \text{TAPU}$

Where:

RWADA = resident weighted average daily attentance, and

WADA = weighted average daily attendance (statewide).

Districts spending up to but not more than the $1,450 per pupil ceiling in 1978-79 school year used the first tier formula and those spending more than this used the second tier formula as well, with a ceiling of $1,500. The spending ceiling amounts for these formula tiers have increased annually. A school district's full value represents the total taxable assessed valuation of property on the tax rolls within the district adjusted to full value by the equalization rate for towns' rolls comprising the district. The aid ratio is multiplied by the respective ceiling amounts and their product multiplied by the district's total aidable pupil units (TAPU) to derive the "formula aid." In the 1979-80 and 1980-1981 school years

FV/TWPU (total wealth pupil units) aid ratios were used on both tiers. Since 1981-1982, FV/TWPU has remained in the first tier and Income/TWPU has been used to calculate the second tier.

While the importance of a school district's full value determination in the allocation of school aid is important, there are other components of the formula that affect aid levels as well. Pupil and attendance counts vary among school districts and, like a district's wealth factor, change over time. TAPU comprises an aggregate of weighted and adjusted counts of average daily attendance, pupils with special educational needs, summer school pupils, evening school pupils, dual enrollments, and secondary school pupils. Other measures used are the resident weighted average daily attendance (RWADA) and the total wealth pupil unit (TWPU). Both are constructed as measures of a school district's weighted and adjusted pupil count.

Statewide average full value is a constant for every school district in the State for each school year. It is used to determine a relative wealth measure. Full value per TAPU was used for the first time in 1978-79 school year, with resident weighted average daily attendance (RWADA) used prior to that date. Statewide average full valuation is determined annually as the full valuation of the State divided by the total aidable pupil units of the State. The State average full value changes annually and has increased every school year for the ten years under consideration in this report.

School aid formulas allow the selection of operating aid from certain options, often depending upon what a school district received the previous year. It is often the case that operating aid and "formula aid," derived from the use of the operational aid formula before the application of formula options, will be different. For example, in the 1978-79 school year, four options determine the selection of operating aid after the formula aid has been derived. The options include two minimums and two maximums. Both reductions and increases in operating aid are constrained by the minimums and maximums in the formula.

Equalization Rates and the State Education Aid Formula

The State Board of Equalization and Assessment has the task of ascertaining the ratio of assessed value to full value of taxable real property in each of the State's municipalities. This ratio is used by the school district, the city or town, or other State agencies in determining the taxable full value. In order to do this the State Board establishes equalization rates for each municipality on an annual basis. The rates represent the ratio of a municipality's assessed value of real property to the State Board's estimation of the full value of its real property. For example, an equalization rate of 40.00 would mean that according to the State Board's measurement, the real property is being assessed at 40% of the SBEA full value standard.

In developing equalization rates the State Board conducts surveys in which sample properties from municipal assessment rolls are appraised for their market values. It is important to understand that the roll used to select sample parcels is not the roll to which final equalization rate will be applied to determine full value. This is because it usually takes two or three years for the State Board to complete a market value survey.

After the classes of real property to be sampled are chosen for a municipality, parcels from these classes are selected for appraisal by the State Board. Within each class, "intervals" - ranges of property values - are selected. Properties selected for appraisal are then chosen at random from each interval. This assures representation in the survey from each range of assessed value in each sampled class.

A market value survey takes approximately two or three years to complete. For this reason a new survey cannot be introduced into the equalization rate process on an annual basis. The State Board, therefore, "phases in" the effects of a new market survey. In the first year that a new market value survey is available it is averaged with the findings from the most recent earlier survey and the date of the full value standard for equalization rates made in that year falls at a theoretical point someplace between the market value dates of the two surveys.

The actual survey dates and the market value standards on which equalization rates have been based are as follows in column one below. Column two indicates the assessment roll year to which each full value standard was applied.

Effective Date of the Market Value Standard	Assessment Roll Completed
January 1, 1970 - Survey	1973
January 1, 1972 - (Average: 2/3 weighting of 1973)	1974
January 1, 1973 - Survey	1975
October 1, 1973 - (Average: even weighting)	1976
July 1, 1974 - Survey	1977
July 1, 1975 - (Average: even weighting)	1978
July 1, 1976 - Survey	1979
July 1, 1977 - (Average: even weighting)	1980
July 1, 1978 - Survey	1981

Once an annual equalization rate has been established and applied to the roll for that year, the resulting State Board estimate of a municipality's full value of taxable real property takes two years to be used in the State school aid formula. For example, State aid received for the 1978-79 school year was based on the equalization rates applied to the 1976 assessment rolls. The 1976 equalization rate used to determine the full value is in turn based on an October 1, 1973 average weighting of market values derived from the 1973 and 1974 market value surveys. With this understanding of the equalization rate process it should be clear that any changes in the "wealth factor" of a school district taking place between 1975 and a 1976 revaluation program would reflect changing market conditions observed in the 1974 survey. The special equalization rate established subsequent to a

revaluation is simply a mathematical modification attributable to a change in level of assessments. It would not reflect changes in the wealth factor resulting from the revaluation program. The following table shows the years of the revaluation programs examined by this report, the years they were built into market value surveys, and the years which were affected for school aid purposes.

It can be seen from Table 2 that every other school year captures more than one survey. This means that the full value determination used to allocate school aid in these years is based on a combination of two market value surveys.

Table 2. Translation of Revaluation Year into School Year via Equalization Rates: Revaluations Contained in Report.

Year of Revaluation	Year of Rate Survey	Equalization Rate for Roll Year	Year used in Education Aid
	1968	1971	1972-3 to 1974-5
	1970	1973	1974-5 to 1976-7
1972 or 1973	1973	1975	1976-7 to 1978-9
1974 or 1976	1974	1977	1978-9 to 1980-1
1976 or 1977	1976	1979	1980-1 to 1982-3

The use of a prior year's equalization rate for apportionment purposes for towns within a school district requires the assumption that no significant change in level of assessment occurred in the preceding year. It also assumes that the rate is equitable for application to the portions of the municipality in each school district in which they lie. For municipalities that have converted to full value assessment or have changed their level of assessment, the State Board must establish a "special" equalization rate for the apportionment of school district taxes. The special rate expresses the relationship between the current assessed value of the municipality and the State Board's estimate of the full value standard in use during the prior year. An equalization rate of more than 100 frequently occurs after

revaluation because the assessed values produced by the revaluation are compared to the State Board's full value estimate which uses an earlier valuation standard. Therefore, the inflationary trend of property values during the "time lag" usually results in a rate of more than 100. For example, a rate of 125 would mean that a municipality's property appreciated 25% in value between the date of the State Board's full value standard and the assessed value produced by the full value revaluation. As shown below, the apportionment of school district taxes among towns within the district may be affected by the revaluation process.

Research Problem

This report contains the results of research conducted by the State Board of Equalization and Assessment on the effects of revaluation programs on levels of school district operating aid. It is the State Board's intent that such research serve to further clarify the relationship between the administration of the State's real property tax assessment system and the allocation of State aid for public education.

The major research problem addressed by this report is: Do revaluation programs themselves have a significant effect upon State operating aid levels of school districts in revalued areas? The State Board is specifically concerned with examining the conjecture that revaluations are costly to school districts and therefore provide an incentive not to maintain a full value assessment standard.

The State Board has previously addressed the question of whether or not revaluation programs themselves have a significant effect on State education levels. In October 1978, the State Board published a study entitled "The Genesee County Revaluation: Relationship to School Aid and School Tax Levy Apportionment." It concluded that an examination of Genesee County education aid levels showed the County's 1976 revaluation "had little or no effect on the state's estimate of full value or on the aid payments to local school districts."

In a September 1979 report, "Education Finance and the New York State Real Property Tax", the State Board reiterated that revaluation of a municipality from fractional to full value assessment did not have a significant effect on school aid. Referring to the claim of Genesee and Orange County school superintendents that revaluation had resulted in an increased full value determination and therefore less school aid the report stated:

> "In both the Genesee County and Orange County cases, state aid full value (which derived from the SBEA market surveys that form the basis for equalization rates) used for calculation of school aid for the years that each county converted to full value assessments would have been the same whether or not the counties had adopted the full value assessments. This is because the SBEA market surveys are measuring a level of assessment relative to a valuation date fixed as of an earlier point in time, so that the corresponding full value standard derived from the market surveys is also historically fixed and varies independently of current changes in market values or assessment practices."*

One effect of revaluation relevant to school finance examined by the Genesee County study was the "Esopus Effect." The name derives from the town of Esopus in Ulster County. After a revaluation, one small portion of Esopus which had been considerably underassessed, experienced a large increase in its share of the school tax burden. The study found the Genesee County revaluation did result in small portions of school districts having both increases and decreases in their share of the school tax levy. Such changes in the levies of small school district portions resulted from the more accurate full value determination of the revaluation. Prior to revaluation, the State's equalization process was unable to determine full value in these portions with complete accuracy because of a lack of uniform assessments within municipalities. Revaluation, for these school district portions, resulted in equity replacing the historical accidents of previous assessment patterns. The State Board's examination of the Esopus Effect found no overall effect on school aid levels resulting from changes in the full value of small school district portions.

There have been several other major studies on the subject of New York State education finance in recent years. While they have not focused topically on the relationship

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* "Education Finance and the New York State Real Property Tax," State Board of Equalization and Assessment, September, 1979, p. 41.

between revaluation programs and school aid levels, they are of general concern to the purposes of this report. In 1978 the Division of the Budget conducted two education finance studies. "Measuring the Wealth of School Districts for the Apportionment of Aid to Public Schools in New York State; Full Value vs. Personal Income" was conducted to assess the merit of using personal income in the determination of a school district's fiscal capacity for the allocation of State aid. Because of 1977 legislation, State residents were required to specify their school district when filing a personal income tax return. Therefore, it became important to determine the characteristics of districts that might receive additional aid if personal income were used as the operating aid formula wealth measure. The conclusions of the report included the finding that major interdistrict shifts in State aid would occur if 1976 taxable income replaced 1976 full real property valuation as a wealth measure for the 1978-79 school year. Another 1978 Division of the Budget report, "Reducing the Variations in Per Pupil Operating Expense Among New York State School Districts by Enlarging the Regional Tax Base", was conducted to examine variations in taxable real property per pupil, approved operating expenses per pupil, and tax yield accruing from a move to a regional tax base. The report examined the impact of a "Regional Tax Base Model" on the distribution of operating aid and presented examples of four alternative models. These models were presented as alternatives to the substantial range of educational opportunity in the State due to uneven access to taxable real property wealth.

"Measuring the Tax Burden of New York's Schools" by Charles W. de Seve, published May 1980, for the State Task Force on Equity and Excellence in Education, provides a comprehensive statistical description of the State's tax system and the distribution of the State education finance burden. The study raised questions concerning an unduly high real property tax burden encumbered by low income families; a phenomenon that is especially severe in suburban counties.

The New York State Special Task Force (the Rubin Commission) produced a three volume report and recommendations dated February, 1982. The report concluded that "vast disparities in wealth and expenditures among school districts existed and were reflected in differences in educational services." It stated that in order to address these inequities a new method of distributing education funds was needed. The report contained a series of recommendations for changes in the education aid formula including the phasing out of current flat grant and save harmless provisions.

The aforementioned research, aside from that produced by the State Board, was conducted in response to the June, 1978 State Supreme Court decision in Levittown v. Nyquist. The Court found that the State education finance system, because of gross disparities in education expenditure among school districts, was in violation of the education clause and the equal protection clause of the State Constitution. The decision was reversed by the State Court of Appeals in June, 1982. While the research was conducted on the subject of different methods of education finance and their effect on school aid equity, the relationship between school aid levels and statewide property tax revaluation programs was not broached. Since real property taxation will remain a major source of school finance for the forseeable future, careful examination of school district wealth determination processes and their effects on aid levels should be of paramount concern.*

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* As can best be determined there have not been any previously published research on the effects of revaluation on state education aid formulas other than the State Board's Genesee County study. There is quite a large body of tangentially related education finance literature. The following have particular pertinence to the New York education finance context: Adams, E. "Fiscal Response and the Capacity of New York School Districts," report to N.Y.S. Task Force on Equity and Excellence in Education, Oct. 79; Burke, A.J. "Development of Public School Finance in New York State," Occasional Paper #14, U.S. Dept. H.E.W., Apr. 78; "de Seve, C. "Who Bears the Cost of New York Schools: Measuring the Tax Burden," report to N.Y.S. Task force on Equity and Excellence in Education, Nov. 79; "Education Finance and the New York State Real Property Tax," SBEA, Sept. 79; "Full Value Assessment Rolls 1970 to 1981," SBEA, Dec. 81; Garms, W.I. "Whither School Finance in New York," Occasional Paper #5, U.S. Dept. H.E.W., Apr. 78; "The Genesee County Revaluation Relationship to School Aid and School Tax Levy Apportionment," SBEA, Oct. 78; Humphries, K.W. "A Study of Expenditure Controls with Special Emphasis for New York State," Occasional Paper #15, U.S. Dept. H.E.W., 1978;

Research Design

In order to test the hypothesis that revaluation programs are costly to school districts, two groups of school districts were chosen. The "test" group was comprised of 35 school districts whose portions were located in localities that were revalued between 1972 and 1977. The "control" group comprised 35 school districts where no revaluation had occurred during the same time period. The two groups were examined for a 10 year period for the 1972-73 through 1981-82 school years. Since the effect of any revaluation is captured two years later in the school aid formula, this time period permits the analysis of different revaluation years.

The test group of revalued school districts used in this study is not a "sample" in the sense of being a randomized selection from the population of New York State districts. The selection of revalued districts is constrained by both the actual physical location where the revaluations occurred and the suitability of certain districts for analysis. The only revalued districts suitable for the test group were those having components in different localities which all or almost all revalued during the same year. Partially revalued school districts, or districts with portions revalued in different years were not selected for analysis since the effect of the revaluation on operating aid would be much more difficult to ascertain at a fixed point in time. All counties having suitable revalued school districts were represented

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Lamitie, R.E. "Report of the Expanded Tax Base Study," N.Y.S. Dept. of Ed., Jan. 1981; Marriner, L.S. "The Cost of Educating Handicapped Pupils in New York City," Journal of Education Finance, Sprg. 76; "Measuring the Wealth of School Districts for the Apportionment of Aid to Public Schools in New York State," N.Y.S. Division of Budget, Aug. 78; "Money and Education," Am. Fed. of Teachers, Mar. 77; Odden, A. "Analysis of the New York State School Finance System, 1977-78," Pauquette, W.B. and Swett, H.A. "Impact of Rate Complaints on School Tax Apportionment, School Aid and County Tax Apportionment," SBEA, Feb. 83; Education Commission of States, Sept. 79; "Reducing the Variations in Per Pupil Operating Expense Among New York State School Districts," N.Y.S. Division of Budget, Sept. 78; The Report and Recommendations of the New York State Special Task Force on Equity and Excellence in Education," Feb. 82; Wendling, W. "The Cost of Education Index: Measuring of Price Differences of Education Personnel Among New York State School Districts," Journal of Education Finance, Sprg. 81.

in the test group. This was done to give the sample as much regional breadth as possible. The counties represented in the revalued test group and the number of school districts selected from each county are as follows: Chautauqua (4), Chenango (4), Cortland (3), Delaware (1), Dutchess (4), Genesee (4), Orange (4), Otsego (1), Rensselaer (1), Seneca (3), Warren (3), and Wayne (3).

Counties with more than one selected revalued school district had county revaluation projects with most revaluations occurring in the same year. The revaluation years represented in the sample and the number of school districts in each year are as follows: 1972 (1), 1973 (4), 1974 (15), 1976 (9), 1977 (6).

A control group of 35 non-revalued school districts was selected. Each member of the group was chosen as a specific comparable for a corresponding test group school district. The major criteria for selecting the nonrevalued comparables were school district type, enrollment size, and regional proximity. Regionally proximate non-revalued comparables were chosen to help control for different market value trends within the State. For example, the increase in land values may occur in a "ripple effect" expanding from metropolitan centers. However, no comparable in the control group was taken from the same county as the revalued school district. The necessity of crossing county lines to find comparables was due largely to the existence of county-wide revaluation programs. Suitable comparables, those school districts that had their portions in towns not revalued for the 10 year period under investigation, could not be found in the same county as revalued districts chosen for the test group.

Attempts were also made to match city, rural, and suburban districts with one another. "Comparable" does not mean that the two groups of school districts are necessarily the same in such ways as student body characteristics, curriculum, administrative organization, and pupil wealth factor. Complete isomorphism between test and control groups of State school districts is impossible to achieve and not necessary for the purposes

of this study. Those counties represented in the control group and the number of school districts selected in each include: Allegheny (2), Broome (3), Cattaraugus (1), Chemung (1), Erie (1), Essex (1), Fulton (2), Madison (2), Niagara (1), Oneida (1), Onondaga (2), Ontario (1), Orleans (3), Oswego (2), Otsego (1), Putnam (1), Schenectady (1), Suffolk (2), Sullivan (2). Tompkins (1), Washington (1), Westchester (3).

Despite differences existing between the test and control groups, the total full value of taxable real property comprising them remains similar over the 10 year period. For the 1972-73 school year the total revalued test group full value was approximately $2.59 billion and the non-revalued control group $2.98 billion. In the 1981-82 school year their total full value was $6.03 billion and $6.40 billion respectively. Figure 1 displays the estimated full value totals for the two groups of school districts over the ten year period.

The selection process to compare similar sizes of school districts was based on the enrollment in the 1981-82 school year. Consequently, the comparability of prior years' enrollments was difficult to ascertain when selecting the "control" districts.

Another factor concerning the comparability of test and control school districts over time is the change in pupil count measures used by the aid distribution formula over time. The only constant measure calculated for the entire period is resident weighted average daily attendance (RWADA). Figure 2 depicts the two groups of school districts over the ten year period using this constant measure. While they are very close in aggregate size at the end of the period (i.e., when the selection was done to choose equally sized districts). a gap is evident earlier in the evaluation period. This produces a slightly greater tendency on the part of the control districts to experience a decline in pupil counts over the period examined. As is evident in Figure 2, however, the two types of districts evidence similar declines in pupil counts.

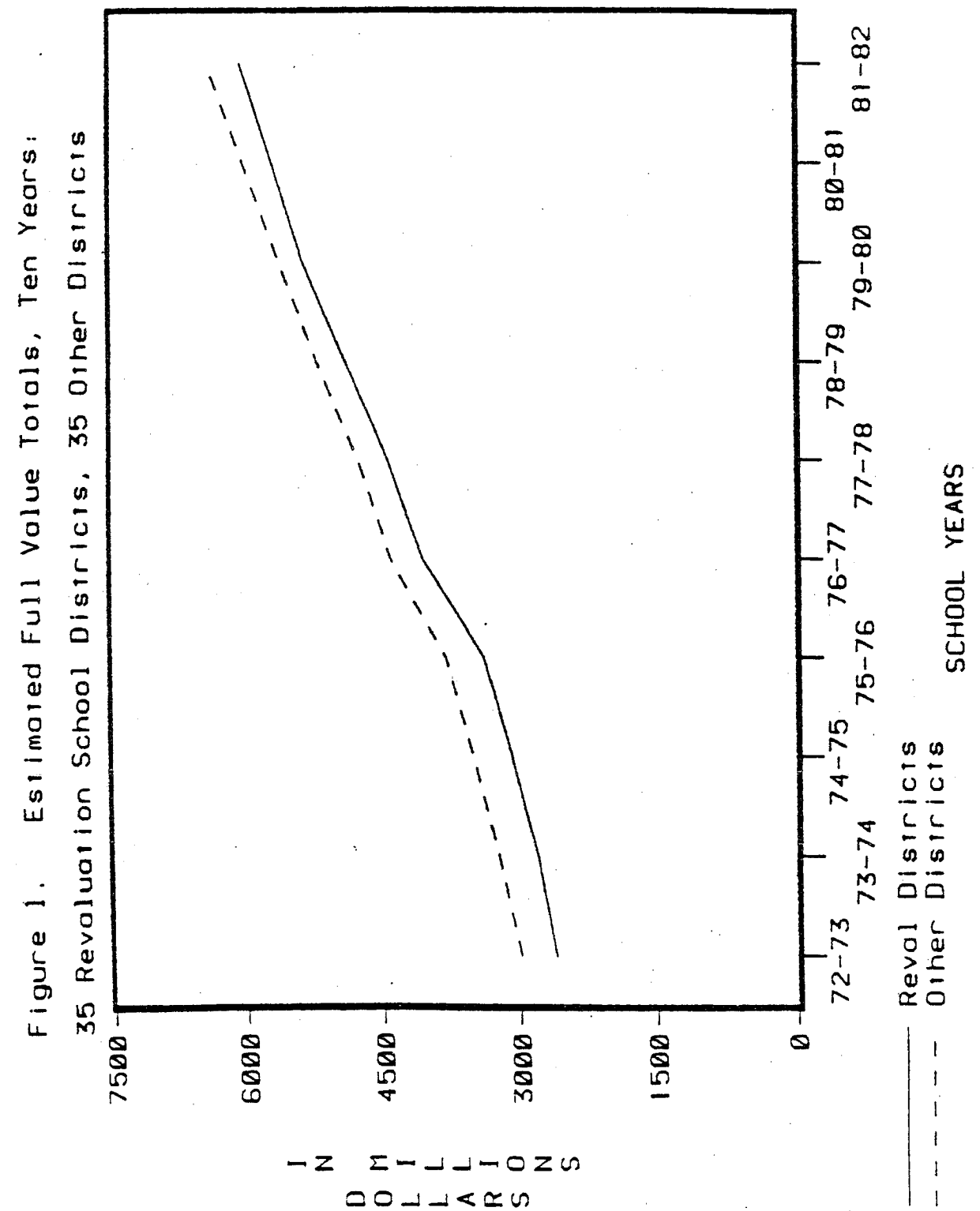


Figure 1. Estimated Full Value Totals, Ten Years:
35 Revaluation School Districts, 35 Other Districts
IN DOLLARS
7500
6000
4500
3000
1500
0
72-73
73-74
74-75
75-76
76-77
77-78
78-79
79-80
80-81
81-82
SCHOOL YEARS
Reval Districts
Other Districts

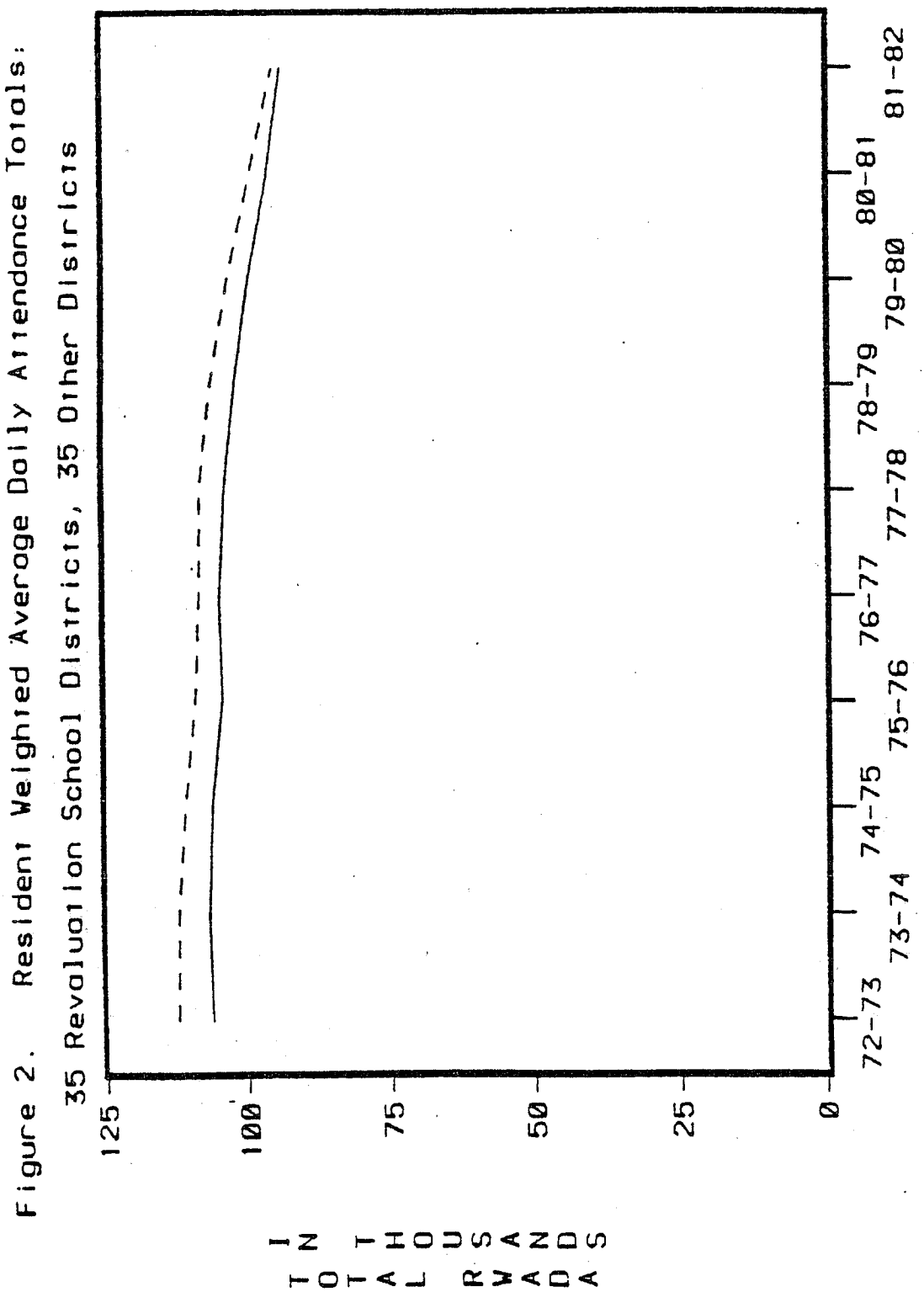
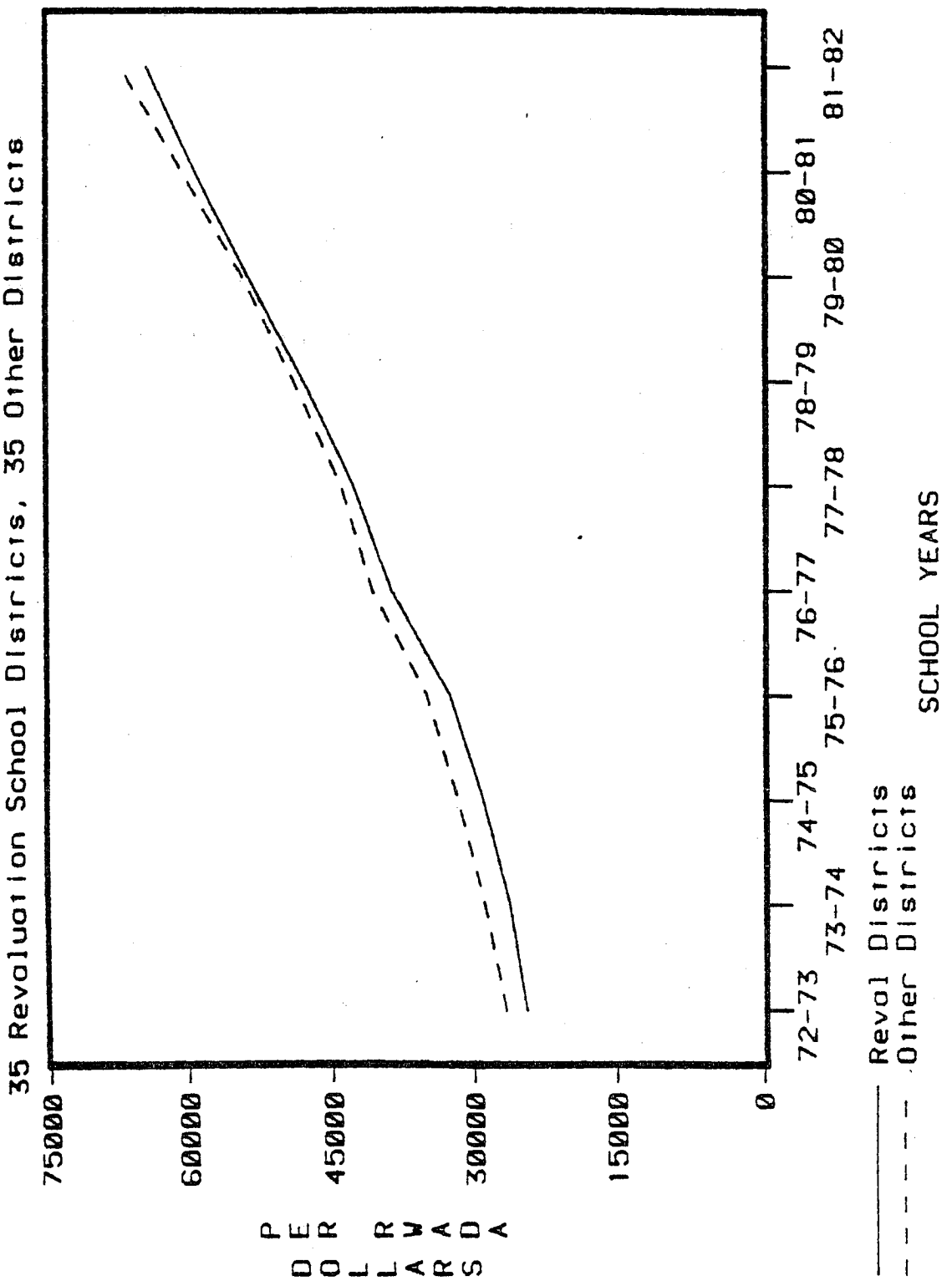


Figure 2. Resident Weighted Average Daily Attendance Totals:

Figure 3 combines these two phenomena of full valuation growth and pupil count decline over the ten year period. The similarity in full value growth (Figure 1) divided by the constant pupil count measure (Figure 2) produces a trend for the two types of school districts that is similar. At the beginning of the ten year period there is a slight difference between the two groups, with the "control" districts having slightly more property value per pupil than the "test" group. Over time a convergence occurs (1978-1981), with another divergence at the end of the study period. This convergence produces a rigorous test of the primary hypothesis, if there is a revaluation-caused growth in the value per pupil it will show up more readily if this group of school districts increases at a faster rate than the group to which it is being compared.

Figure 3. Full Value per Resident Weighted Average Daily Attendance:



Statistical Analysis

The statistical analysis evaluates the effects of full-value reassessment both directly upon operating aid to school districts and indirectly through a study of changes in the level of property value within school districts. The analysis investigates the hypothesis that full-value reassessment has a statistically significant effect upon State operating aid to education through its effect upon real property value levels.

The research methods include the use of linear regression and analysis of covariance (see Appendix) to identify the effects of reassessment while controlling for the primary factors underlying the levels of aid awarded to school districts in New York State. Table 3 lists the regression equations used in the study.

Table 3. Regression Equations Tested for Revaluation Impacts.

I. School District Annual Operating Aid

(1) Annual Operating Aid = Operating Aid in Prior Year times the State Percentage Change in Aid Dollars and Revaluation Effect (all 70 districts)

(2) Annual Operating Aid = Operating Aid in Prior Year times the State Percentage Change in Aid Dollars and Pre/Post Revaluation Measure (35 Revaluation districts only)

(3) Annual Operating Aid per Pupil = Operating Aid per Pupil in Prior Year and Revaluation Effect

(4) Annual Operating Aid per Pupil = Cumulative change in Total State Oper. Aid per Year and State Average Property Value per Pupil minus each District's PVP and District's Choice of Guaranteed Minimum Aid Levels and Revaluation Effect

(5) Change in Annual Operating Aid = Change in Total State Operating Aid per Year and Change in State Average Property Value per Pupil less District Property Value per Pupil Change and Change in Approved Operating Expense per Pupil divided by Change in State Maximum Aid per Pupil and Revaluation Effect

II. Change in Annual Real Property Value

(1) Annual Property Value = Prior Year Property Value and Revaluation Effect

(2) Comparison of test and control groups' average annual percent change in property value in four revaluation time periods

For most of the equations tested, a table will outline the statistical information determined by regression and the analysis of covariance. A sample of the information and its meaning is outlined in Table 4.

Table 4. Example of Regression and Analysis of Covariance Statistics

Regression Equation:

$$\bar{Y} = a + b_0\bar{X}_0 + b_1\bar{X}_1 + \cdots\cdots + b_k\bar{X}_k$$

$$t_0= \qquad t_1= \qquad\qquad t_k=$$

Where

$\bar{Y}$ = the mean value of the dependent variable (Y) (Eg. Operating Aid)

k = the number of independent (explanatory) variables

$\bar{X}_k$ = the mean value of the k^{th} independent variable (Eg. Operating Aid in Prior Year)

a = the intercept derived from the regression (Y=a when all k values of X equal zero)

b_k = the coefficient (or slope) of each independent variable, which is derived from the regression

t_k = a measure of whether the k^{th} independent variable lends significant explanatory value to the regression. A t-value would have to be greater than 1.65 in the equations studied to offer a 95% level of confidence that the given $\bar{X}$ variable has a significant correlation with the dependent variable.

Sample Size (n) = number of school districts multiplied by number of school years used in the regression

Coefficient of Determination (R^2) = the percent of variance in Y explained by the variance in the K explanatory variables.

Analysis of Covariance: the "F" ratio expresses the amount of additional variance explained by the revaluation variable. An F-value of 3.84 or greater would offer a 95% level of confidence that revaluation is statistically significant in explaining variations in state aid or property value.

I. School District Annual Operating Aid

The analysis of annual operating aid to school districts assumes a continuation of the current funding trend which provides aid to school districts based upon a combination of the education aid formula and the notion of retaining prior levels of aid to each school district. In this case, regression equations were formulated to test revaluation effects while accounting for the factors which had the heaviest correlation with each of the following operating aid dependent variables:

a. Annual school district operating aid

b. Annual school district operating aid per pupil

c. Annual percent change in school district operating aid per pupil

The "flat grant" and "save harmless" concepts of providing annual dollar operating aid at least at the district's prior level was tested in a regression equation (Table 3, Equation I. 1) outlined in Table 5.

Table 5. Annual Operating Aid as a Function of Prior Year Aid

Operating Aid in Current Year	=			
		a	(-13314)	Constant
t = 456.00	+	b_0	(1.006)	Operating Aid in Prior Year x Percent State Aid Annual Increase
t = 0.36	+	b_1	(3099)	Revaluation District variable ("1" if revaluation, "0" if not)

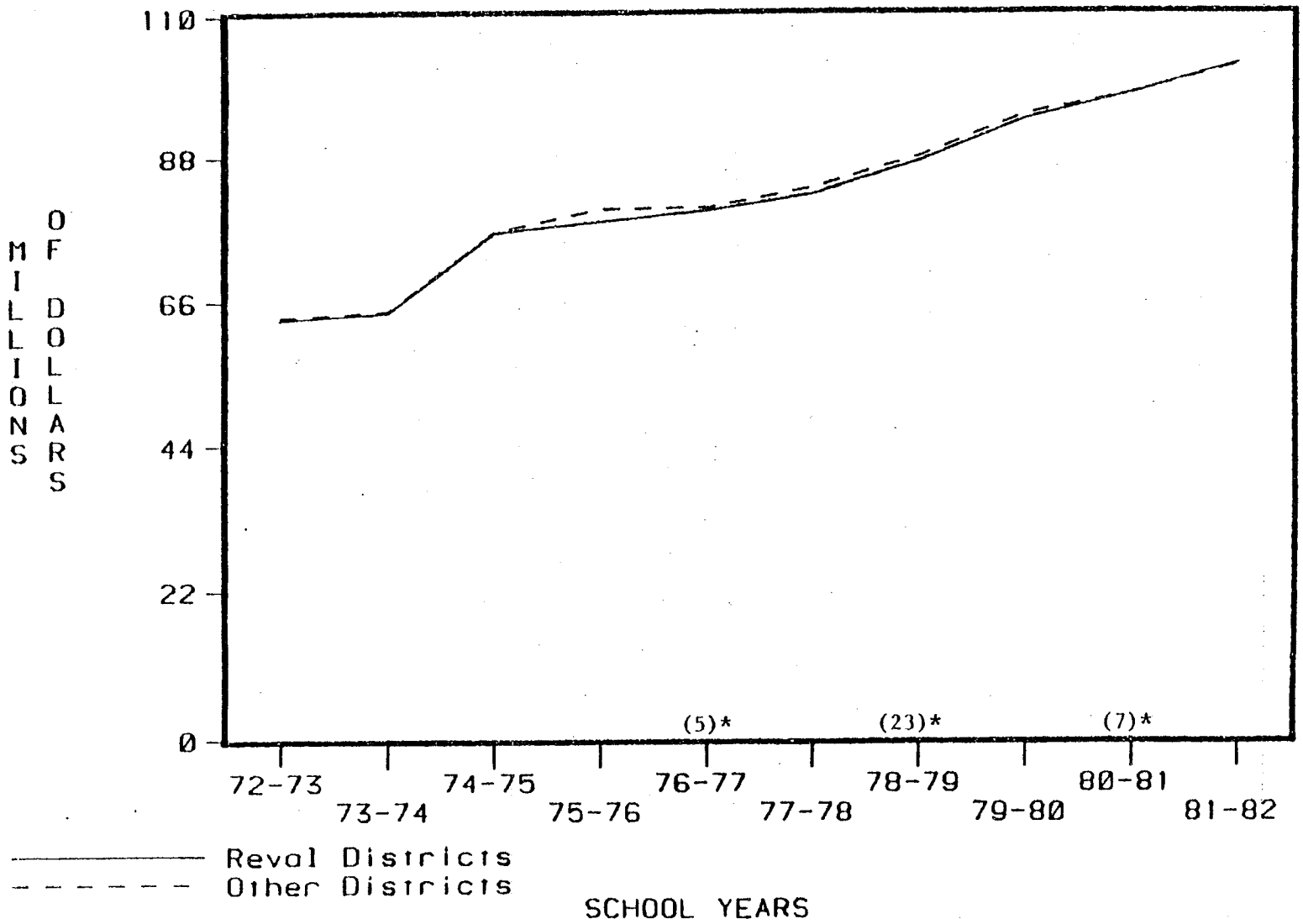
Sample Size = 630
Coefficient of Determination (R^2) = 99.7%
Analysis of Covariance: F = 0.13

Annual operating aid for the years from 1973-74 through 1981-82 was regressed upon the prior year's operating aid multiplied by a factor representing the increase in total state

aid dollars available over the prior year. This equation revealed a 99.7% correlation between each school district's state aid and its prior year's aid level. A variable was added to the regression representing revaluation districts as "1"s and non-revaluation districts as "0"s. The analysis of covariance statistical procedure was performed on this regression. Analysis of covariance essentially subtracts statistically the effects of revaluation districts' operating aid from non-revaluation districts' aid to see if any significant difference exists between the groups in the level of aid predicted. The additional variation between the two groups was extremely small relative to the variation which occurred within the entire sample of 70 districts combined. (The F-ratio calculated in the analysis of covariance test of 0.13 is significantly smaller than the 3.84 F ratio which would provide a 95% assurance that revaluation effects are significant). This indicates that the difference in aid levels among the school districts sampled can safely be assumed to be variations caused by factors other than revaluation.

Figure 4 tracks the total state operating aid received by the 35 revaluation school districts along with the aid received by the school districts located in jurisdictions which did not undergo full value assessment. The figures in parentheses at the bottom of Figure 4 indicate that five districts received their first year of revaluation effects in their state aid formula in the 1976-77 school year, twenty-three districts were first affected in 1978-79, and seven districts in 1980-81. During the 10 years aid was tracked, the total aid levels for both groups were virtually identical through 1974-75. In 1975-76, aid to the revaluation districts dropped below the others but this was in a year prior to any revaluation effects. Thereafter, as revaluations occurred in the 35 test districts, the aid levels gradually converged again.

Figure 4. State Operating Aid Totals, Ten Years:
35 Revaluation School Districts, 35 Other Districts



*Number of districts experiencing first year of revaluation effects on state aid formula.

To further test the effects of revaluation on state aid, the variable for revaluation effects was altered to represent just the revaluation districts in the operating aid equation (Table 3, Equation I. 2). Each of the years after revaluation effects had been captured in the state aid formula were compared with the years prior to revaluation effects for the 35 revaluation districts only. The regression equation results revealed that the new revaluation variable provided no statistically significant impact upon the level of operating aid received by the 35 districts after revaluation compared with their pre-revaluation years. This was indicated by a t-value of -0.56 for the revaluation coefficient exhibiting less than 50% level of confidence that there was any appreciable difference in aid levels.

Operating aid per pupil as a function of last year's operating aid per pupil was compared between the test and control groups in order to determine whether aid was affected on a per pupil basis as a result of full value assessment (Table 3, Equation I. 3).

Table 6. Operating Aid per Pupil as a Function of Prior Year.

Operating Aid Per Pupil	=			
		a	(-2.63)	Constant
t = 126.70	+	b_0	(1.07)	Operating Aid per Pupil in Prior Year
t = -0.71	+	b_1	(-2.53)	Revaluation District variable

Sample Size = 630
Coefficient of Determination (R^2) = 92.2%
Analysis of Covariance: F = 0.56

This equation showed results (outlined in Table 6) virtually identical to the regression of total district operating aid upon lagged operating aid. The correlation between each year's operating aid per pupil with the prior year's aid was 92.2%. The slight reduction in predictability (down from 99.7%) may be due to the annual changes in the computation of pupil counts upon which aid levels are based relative to the resident weighted average daily

attendance (RWADA) figures used in this analysis to compute operating aid per pupil. The t- value of -0.71 indicates a low 52% level of confidence for the variable which determines revaluation effects. The analysis of covariance test shows a similarly insignificant effect of revaluation upon operating aid per pupil with an F-value of 0.56, well below the 3.84 value which would offer a 95% level of confidence.

A second regression of operating aid per pupil (Table 3, Equation I. 4) was fitted to isolate the impact of the principal aid formula criteria in order to test for revaluation effects. The regression equation (see Table 7) fitted operating aid per pupil as a function of:

- Cumulative change in total annual state operating aid
- The difference between the annual state average and each school district's property value per pupil
- A variable for a district's choice of a guaranteed minimum aid level
- Reval/Non-Reval District Variable

Table 7. Operating Aid per Pupil as a Function of Aid to Education Formula.

Operating Aid Per Pupil	=			
		a	(-374)	Constant
t = 49.39	+	b_0	(856)	Cumulative change in total annual state operating aid
t = 47.38	+	b_1	(0.008)	Difference between annual state average and school district's property value per pupil
t = -5.02	+	b_2	(-33.11)	Use of guaranteed minimum aid level ("1" if used, "0" if not used)
t = -1.27	+	b_3	(-8.17)	Revaluation District variable

Sample size = 700
Coefficient of Determination (R^2) = 86.84%
Analysis of Covariance: F = 1.61

Table 7 shows that in this equation, 86.8% of the total variation in operating aid per pupil could be explained by similar variations in the aid formula criteria tested. The inclusion of the revaluation variable caused no significant change in the explanatory capability of the equation with a t-value of -1.27. Analysis of covariance, testing for incremental change in operating aid per pupil due to revaluation, reinforced this conclusion with a low F-value of 1.61. This equation exhibits slightly lower predictive power than the regression upon lagged operating aid per pupil. This reinforces the notion that the "save harmless" factor of maintaining prior levels of aid tempers the effects of aid formula components which reflect wealth and pupil count changes.

Figure 5 depicts the average operating aid per pupil for the 35 revaluation school districts compared with the 35 control districts. It corroborates the results of the statistical analysis that the changes in operating aid per pupil follow a similar pattern for both the test and control groups.

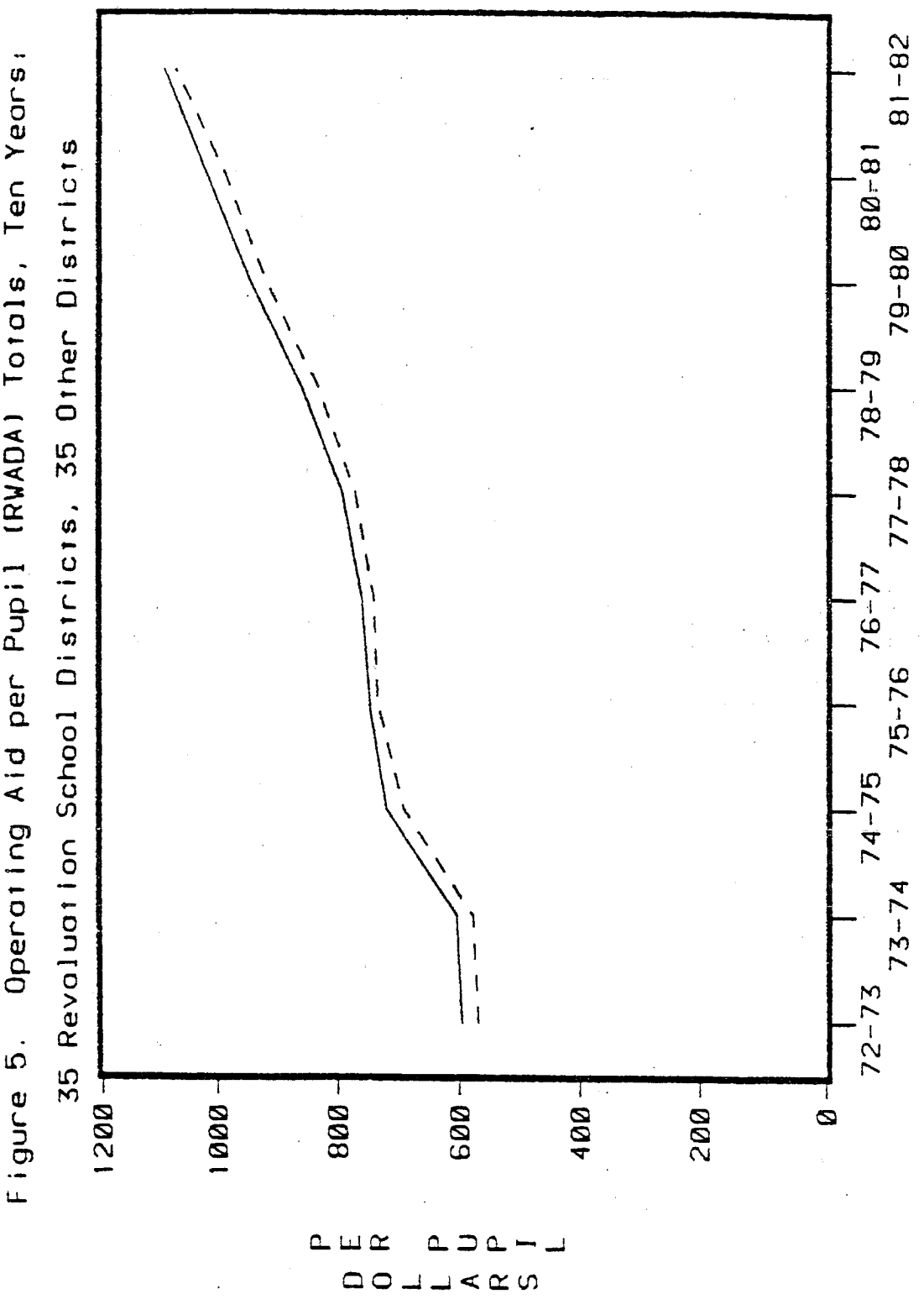


Figure 5. Operating Aid per Pupil (RWADA) Totals, Ten Years:
35 Revaluation School Districts, 35 Other Districts
PER PUPIL DOLLARS
1200
1000
800
600
400
200
0
72-73
73-74
74-75
75-76
76-77
77-78
78-79
79-80
80-81
81-82
SCHOOL YEARS
Reval Districts
Other Districts

The annual percent change in operating aid per pupil was tested in a regression equation as being predictable by the following variables:

- Percent change in total state operating aid per year
- Percent change in pupil count
- Percent change in state average property value per pupil minus percent change in school district property value per pupil
- Percent change in approved operating expenses per pupil divided by percent change in state maximum aid per pupil
- Reval/Non-Reval District variable

This is referenced in Table 3, Equation I. 5 with results outlined in Table 8.

Table 8. Percent Change in Operating Aid per Pupil as a Function of Percent Change in Formula Aid Factors

Percent Change in Operating Aid Per Pupil	=			
		a	(.502)	Constant
t = 27.30	+	b_0	(1.059)	Percent change in total state operating aid per year
t =-12.17	+	b_1	(-.682)	Percent change in pupil count
t = 5.10	+	b_2	(0.101)	Percent change in state average property value per pupil minus percent change in school district value per pupil
t = 4.60	+	b_3	(0.124)	Percent change in approved operating expenses per pupil divided by percent change in state maximum aid per pupil
t = -1.08	+	b_4	(-.003)	Revaluation District variable

Sample size = 630
Coefficient of Determination (R^2) = 65.79%
Analysis of Covariance: F = 1.14

Table 8 shows that the independent variables explained 66% of the variation in annual change in aid between school districts. The lower predictability may be due to the difficulty in identifying funding differences occurring from variations in the aid formula criteria each year. The strongest correlation with change in operating aid per pupil was with the annual change in total state operating aid dollars. The addition of the revaluation variable to this equation caused no basic change in predictive power with a low F-value of 1.14.

II. Change in Annual Real Property Value

The second phase of the study is designed to test the effect of revaluation assuming the state educational aid policy is changed to remove the flat grant and save harmless guarantees to school districts. The potential effect of revaluation upon aid to each district in such a situation can be gauged by a study of the impact which revaluation has had upon the annual change in property values. This impact was tested for the 10-year sample of test and control districts (Table 3, Equation II. 6). Table 9 displays the regression of each district's annual real property values upon the prior year's property values.

Table 9. Real Property Values per School District as a Function of Prior Year

Property Value in Current Year =				
		a	(2,808,398)	Constant
t = 426.20	+	b_0	(1.064)	Property Value in Prior Year
t = 1.21	+	b_1	(719,918)	Revaluation District variable

Sample size = 630
Coefficient of Determination (R^2) = 99.66%
Analysis of Covariance: F = 1.46

The Coefficient of Determination indicates that 99.7% of the variance in property value trends could be traced to the prior year's value. In other words, property value trends were relatively constant across the 70 school districts, with an average annual increase of 6.4%. The addition of the revaluation class effect showed there was no significant difference between the two groups in annual change in real property value (F-value = 1.46).

Figure 1 on page 18 tracks the 10 years of total real property value for the 35 revalued school districts and their 35 control group pairs. The annual changes in property value in the districts not affected by revaluation follow a course very similar to the test group, with a noticeable increase in both groups' property values in the 1976-77 school year.

To further check these results, the average annual percent change in property values was calculated for the revaluation districts and their paired control group separately for each of four time periods. The four time periods pivot around the first year in which each of the test school districts feel the effects of full value reassessment upon the state aid formula. Their paired control group districts were assigned comparable time rankings in order to compute the associated period's average annual percent change in property value for the districts not affected by revaluation. The four time periods are:

Time 0: All years prior to the capture of revaluation effects in the school aid formula for each revalued district.

Time 1: The first year of revaluation effects when half of the change in revaluation is incorporated into the school aid formula.

Time 2: The second year of revaluation effects when the full impact of revaluation is incorporated into the formula.

Time 3: All remaining test years subsequent to the second year of revaluation effects.

Table 10 compares the mean percent increase in property value for the 35 revaluation and 35 control school districts in New York State during the four time periods and combinations of periods after revaluation effects occur.

Table 10. Mean Percent Increase in Property Value*

School Group		(R) Reval Districts	(C) Control Districts	
Time Period	District-Years per Group	Mean Percent Change per Year	Mean Percent Change per Year	Difference R - C
Pre-Reval				
0	179	12.5%	11.6%	+0.9%
Post Reval				
1	35	15.3%	14.1%	+1.2%
2	35	10.2%	10.5%	-0.3%
3	66	6.6%	7.7%	-1.1%
1 + 2	70	12.7%	12.3%	+0.4%
1 + 2 + 3	136	9.8%	10.1%	-0.3%

*Weighted by School District-Years per Group

In the years prior to any incorporation of revaluations into the equalization rate, and therefore into the school aid formula, the school districts affected by revaluation had about a 1% higher annual change in property value than the control group. When revaluation had its initial impact upon the equalization rates and the aid formula, the average annual increase in property value for the revaluation districts stayed at 1.2% more than their control group counterparts during the same time period. In the second year of revaluation values used in the aid formula, the revaluation group's average-annual increase was slightly less than that of the group not subject to revaluation (-0.3%). In each of these time periods a test of mean differences indicates that there is a 95% level of confidence that these

differences among the two groups' average property values is not statistically significant*. This infers that the average change in property value is likely to be the same for both the revaluation districts and the control districts as the sample increases.

In all the remaining years after the second year (Time period 3) the districts not involved with revaluation exhibited a slightly higher annual change in property value (7.7% versus 6.6%). The combined impact in the critical first two years of revaluation effects (periods 1 & 2) and in all the test years following revaluations (periods 1 through 3) do not support the hypothesis that revaluation adversely effects property values. The average increase in value was virtually identical for both the test and control school districts in these post-revaluation time periods, with +0.4 and -0.3% differences.

Conclusion

The principal point of this intensive examination of revaluation effects on State aid to education is to discover whether, in the general case, there may be disincentives to conduct a revaluation of real property value. We can state, from our evidence, that this is not true.

For the 70 districts examined over a ten year period, where half of them underwent property revaluations, there is no statistically significant difference between the two groups of school districts. The evidence is that no "found" property value materializes to distort real property values and State aid payments to school districts. On the contrary, a general increase of 6.4% annually in real property value was true during this period for both types of districts. Obviously, some variations in the overall trend of real property value increase will occur. But these differences are not systematically related to the initiation of a real property revaluation.

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* In Time Period 1 there is a 95% level of confidence that the mean difference lies between -4.4% and +6.8%. In Time Period 2 the 95% confidence interval is -2.7% to +2.3%. Both of these ranges include a 0% difference.

Sampling from a wide variety of school districts statewide will produce more reliable results than a citation of idiosyncracies occurring in one or another district. A school district's real property wealth may change relative to another district's by the simple addition of a shopping center. When we look at the more general case, with a statewide picture of effects, such particular instances should cancel one another out. The evidence we have examined demonstrates that this is so.

Over the period we have examined, the best single predictor of a school district's State aid to education is the prior year's amount. This is true due to save harmless provisions. It is also true due to the concurrent phenomena of rises in real property values and declines in enrollments taking place in many districts. The analysis of the ten-year trend in real property values indicates that even in the absence of save harmless provisions, revaluations do not uncover wealth hidden by fractional value assessments. All of the school districts are affected by the events of property value and enrollment changes, some more so than others. When we step back a bit and view the trends and general cases, however, the differences which seem of considerable moment and "harmful" to a given district can be seen to be but minor variations in an overall trend.

APPENDIX

REGRESSION AND ANALYSIS OF COVARIANCE

The statistical techniques of regression and analysis of covariance are the methods which were used to determine the effects of revaluation on state aid to education. Regression analysis is a statistical method which seeks to establish a linear relationship that allows the prediction of one dependent variable (such as a school district's annual operating aid per pupil) in terms of other independent, but correlated, variables (such as district wealth, pupil count, total state aid available or prior district levels of aid). Each actual, observed dependent variable diverges somewhat from the average predicted value. Regression decomposes this variation into two parts: (1) that "explained" by the difference between the regression equation prediction and the average predicted value, and (2) the "unexplained" or random variation between the regression equation prediction and the actual observed value.

A "t-statistic" is the measure calculated to reveal the relative importance of each of the independent variables being tested. Technically, it is a ratio of each regressor's calculated coefficient to the variance of the coefficient. For a large sample, (greater than 120) the calculated t-statistic" must be at least 1.65 to provide a 95% level of confidence that the independent variable has a significant impact on the dependent variable.

Analysis of variance is identical to a regression analysis when all of the independent (predictor) variables are "dummy" variables; ones which assume a value of either 1 or 0, "on" or "off" variables such as "male" or "female", "reval district" or "non-reval district". The analysis of variance test makes use of a table of F-statistics which express the ratio of explained variation to unexplained variation given certain preconditions (number of observations, number of predictor variables and desired level of reliability for the prediction). An F-ratio computed for a particular relationship which is smaller than the

table's F-statistic indicates that the predictor dummy variable has a weak causal effect on the dependent variable.

Analysis of covariance is a combination of the two procedures, standard regression analysis and analysis of variance. It affords an evaluation of revaluation versus non-revaluation "class" effects upon operating aid and property value while other major effects upon these dependent variables are accounted for. Analysis of covariance was developed to test for class effects (e.g., revaluation vs. non-revaluation) upon a dependent variable (such as operating aid) while controlling other causal variables which could not be properly standardized between classes (such as prior levels of aid for each district). The method of calculation is as follows:

A. Establish four regression equations:

(1) Using the combined data for both classes, regress the dependent variable on the causal variables whose effects we wish to control;

(2) Again using the combined data, regress the dependent variable in both classes upon the causal variables whose effects we wish to control and add a dummy variable to the regression equation to distinguish between the two classes;

(3&4) Separate the data into the two classes, revaluation and non-revaluation, and establish two equations, one for each class. which regress the dependent variable on the causal variables whose effects we wish to control.

B. Compare the difference in the "error" terms between the first two regression equations, those run on the entire data set with and without the revaluation dummy variable. This error is measured by the residual sum of squares and is an indication of the unexplained variation between the observed and the average dependent variable. The difference between the error terms in these two equations is the amount of

additional variation explained by including the revaluation class effect. Determine the ratio of this difference in error terms to the original error term of the dummy regression. (The ratio must be divided by the appropriate "degrees of freedom" determined by the number of observations per class and independent variables in the equation.) Compare the calculated F-ratio with the value listed in a standard table of F-distributions for a predetermined confidence level (e.g., 95% confidence) and the appropriate degrees of freedom. If the additional variation explained by the calculated F-ratio is smaller than the F-statistic listed, the "class" effect can be assumed to have an insignificant effect upon the dependent variable. A table statistic of 3.84 must be attained in each of the analysis of covariance tests performed in this study in order to provide a 95% level of confidence that the revaluation variable being tested has a significant impact upon property value or operating aid.

References

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Note: The validity of this test assumes that there is no significant difference in the effect upon each class of the variables we wish to control. To insure that this is so, a similar F-test is first run upon the error terms found in the dummy regression equation and the sum of the two class regression equations.